

2021 **ANNUAL REPORT**



FINANCIAL STABILITY OVERSIGHT COUNCIL

Financial Stability Oversight Council

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

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

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

The voting members are:

- the Secretary of the Treasury, who serves as the Chairperson of the Council;
- the 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:

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

Approval of the Annual Report

This annual report was approved unanimously by the voting members of the Council on December 17, 2021.

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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Member Statement

The Honorable Nancy Pelosi
Speaker of the House
United States House of Representatives

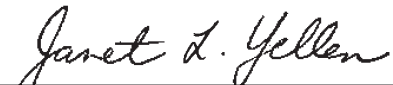
The Honorable Kevin McCarthy
Republican Leader
United States House of Representatives

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

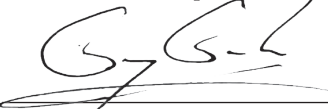
The Honorable Charles E. Schumer
Majority Leader
United States Senate

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.

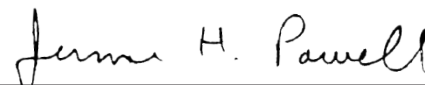

Janet L. Yellen
Secretary of the Treasury
Chairperson, Financial Stability Oversight Council


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

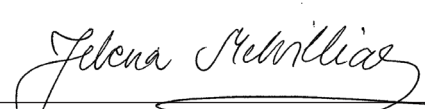

Gary Gensler
Chair
Securities and Exchange Commission


Rostin Behnam
Acting Chairman
Commodity Futures Trading Commission

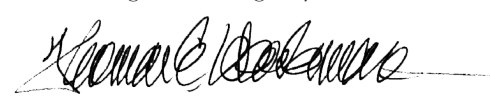

Todd M. Harper
Chairman
National Credit Union Administration


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


Rohit Chopra
Director
Consumer Financial Protection Bureau


Jelena McWilliams
Chairman
Federal Deposit Insurance Corporation


Sandra L. Thompson
Acting Director
Federal Housing Finance Agency


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

The United States economy has continued to rebound over the past year from disruptions related to the COVID-19 pandemic, supported by monetary and fiscal policy, substantial progress in vaccination, and broadly accommodative financing conditions. The acute financial crisis that occurred at the onset of the pandemic in 2020 has moved farther into the rear-view mirror, though the Council continues to focus on vulnerabilities in the financial system induced or made more salient by that episode.

Financing conditions have been accommodative for nonfinancial firms, commercial real estate (CRE) borrowers, and municipalities borrowing in the capital markets. Similarly, households have had relatively strong access to consumer credit and residential mortgage loans. However, somewhat tight conditions have continued to prevail for small businesses and bank-dependent CRE borrowers as a result of pandemic-induced uncertainties. In addition, residential real estate borrowers with low credit scores or undocumented incomes have relatively more difficulty accessing credit, in line with pre-pandemic standards.

The normalization of financial conditions since spring 2020 in part reflected the effectiveness of extraordinary measures taken by the Federal Reserve to support the functioning of a wide range of financial markets and institutions. By the end of 2020, the take-up of many of the Federal Reserve's lending facilities had fallen to very low levels, and the Federal Reserve ceased new operations of most of these facilities in late 2020 and early 2021.

The financial condition of households and businesses has been bolstered significantly by the substantial direct monetary support and forbearance on federally backed mortgages and student loans provided for by the Coronavirus Aid, Relief, and Economic Security Act (CARES Act) and American Rescue Plan Act of 2021 (ARP Act). Recently, however, many households that rent their residences have come under pressure following the end of

the Center for Disease Control (CDC) eviction moratorium in August, and homeowners and student loan borrowers may come under pressure in coming months as forbearance arrangements expire. Additionally, households with members employed in sectors particularly hard-hit by the pandemic continue to face significant stresses. On the business side, credit quality has broadly remained strong over the past year, though delinquencies remained elevated on certain types of CRE loans, particularly loans on properties located in central business districts. The outlook for small businesses has improved over the past year, but compared to larger firms they remain more vulnerable, particularly to pandemic-driven disruptions.

Asset valuation pressures have grown in several markets over the past year amidst an improvement in the macroeconomic outlook and low interest rates. Broad equity market indexes have reached record highs and corporate bond spreads remain at low levels by historical standards. In the residential real estate market, rapid price gains also reflect very strong demand. Looking forward, the evolution of asset prices will depend on investor risk appetite, the outlook for inflation, continued progress in containing the virus, and the pace of the ongoing economic recovery.

The rapid pace of the economic recovery this year was accompanied by growing pains, evidenced by supply chain problems or rising prices in many markets. Amid the national vaccination campaign, demand for many goods and services grew faster than supply in the short run. As a result, commodity markets and associated derivatives recorded volatile prices. Inflation has risen, and inflation compensation measures rose in financial markets. Lastly, supply chain bottlenecks and materials shortages affected a number of sectors.

Some episodes in financial markets this year generated unusually high volatility. A surge of interest by retail investors in certain equities such

as GameStop Corp. that were widely discussed on social media led to elevated volatility in equity, options, and securities lending markets at the beginning of the year. This episode highlighted evolving considerations related to financial innovations that have eased access to these markets. Digital assets have also seen a surge of interest since the onset of the pandemic, and the values of those assets have been highly volatile over the past year. Another episode involved the failure of the family investment fund Archegos, which led to large losses for some banks. This episode highlighted the importance of counterparty credit risk management practices and relatively limited visibility into the activities of highly levered private investment vehicles. In February, the Treasury market experienced a sudden drop in liquidity conditions that only slowly reversed. This episode underscored the importance of inter-agency efforts to improve the resilience of Treasury markets. Finally, cyberattacks affected two major firms in commodity markets, though the effects of these attacks on markets were ultimately limited.

In addition, the toll of climate change has continued to mount. According to the National Oceanic and Atmospheric Administration's National Centers for Environmental Information, 2020 was a "historic year of extremes" for the United States. The year 2020 witnessed 22 billion-dollar-or-greater weather and climate disasters, a record number of such events, which caused a combined \$95 billion in damages. Physical harm caused by such events and the process of transitioning to a low greenhouse gas economy together are an emerging threat to economic activity and to the U.S. financial system. President Biden issued Executive Order 14030, Climate-Related Financial Risk, on May 20, 2021, directing the Secretary to engage with Council members on climate-related financial risks and report on the Council's activities.

Council Initiatives

A key goal of the Council and its member agencies is to monitor vulnerabilities to U.S. financial stability so that abrupt and unpredictable changes in economic or financial conditions—"shocks"—do not disrupt the ability of the financial system to meet the demand for financial services. Vulnerabilities

include structural weaknesses in the financial system and its regulatory framework. Vulnerabilities in the financial system can amplify the impact of an initial shock, potentially leading to substantial disruptions in the provision of financial services, such as the clearing of payments, the provision of liquidity, and the availability of credit.

Regulatory reforms after the 2008 financial crisis strengthened the ability of the financial system to withstand a shock or an economic downturn. However, risks to U.S. financial stability today are elevated compared to before the pandemic. The outlook for global growth is characterized by elevated uncertainty, with the potential for continued volatility and unevenness of growth across countries and sectors. The financial crisis in March 2020 at the onset of the pandemic has also made some vulnerabilities more salient. That experience showed that asset liquidation pressures can be amplified by liquidity mismatches and the leverage of certain nonbank financial intermediaries such as hedge funds. That episode also demonstrated that pressures on dealer intermediation can limit the availability of liquidity during times of market stress.

This year, the Council has identified a set of priorities for addressing risks and vulnerabilities in the U.S. financial system.

One priority is climate change. The Council first discussed climate-related financial risks at its March 2021 meeting, at which members highlighted a broad set of initiatives being undertaken at individual agencies and organizations. The Council views climate-related financial risks as an emerging threat to the financial stability of the United States. The Council and its members have the responsibility to assess the magnitude of these risks and take appropriate measures to ensure the resilience of the financial system. The Council issued a [Report on Climate-Related Financial Risk](#) on October 21, 2021 that identified steps the Council and financial regulators can take to promote the resilience of the financial system to climate-related financial risks. These steps include expanding capacity, improving data and measurement, enhancing disclosure of climate-related risks, assessing the scale of potential vulnerabilities, and making appropriate adjustments in regulatory and supervisory tools.

Another priority is addressing vulnerabilities in nonbank financial intermediation. Intermediation by nonbanks provides essential funding that underpins the United States economy. However, the acute financial market stress that occurred in March 2020 highlighted the potential for liquidation pressures to be amplified by prime money market funds (MMFs) and open-end mutual funds because of the liquidity risk in their business models, and by hedge funds because of their use of leverage. Over the past year, the Council has established an open-end fund working group and re-established a hedge fund working group, in order to better share data and identify risks associated with both kinds of nonbanks. The structural vulnerabilities of MMFs were the subject of a statement by the Council on June 11, 2021, which emphasized the importance of reforms to improve the resilience and functioning of short-term funding markets. The Council expressed support for the SEC's engagement on this critical issue and will continue to monitor this initiative.

Resilience of the U.S. Treasury market is an additional key priority. A deep and liquid Treasury market is essential for a strong U.S. economy, is critical to the entire financial system, supports the U.S. dollar as the world's reserve currency, and is the benchmark for asset classes globally. Through the Inter-Agency Working Group for Treasury Market Surveillance (IAWG), and in close coordination with the Council, federal agencies are working to understand the deterioration in the liquidity of the Treasury market in March 2020 and commonalities with other recent episodes of stress. As discussed in the November 2021 [Staff Progress Report](#), the IAWG is analyzing specific policy steps that could improve the Treasury market's resilience, including improving data quality and availability, bolstering the resilience of market intermediation, evaluating expanded central clearing, and enhancing trading venue transparency and oversight.

Of course, these priorities are not the only challenges to financial stability. It is critical that the Council continue to identify and address other vulnerabilities. For example, the rapid growth of digital assets, including stablecoins and lending and borrowing on digital asset trading platforms, is an important potential emerging vulnerability. Other

significant vulnerabilities reviewed regularly in recent annual reports include the LIBOR transition, cybersecurity risks, the growth of nonfinancial corporate credit, and the importance of large banks and central counterparties in the U.S. financial system.

Summary of Risks and Vulnerabilities

Climate-Related Financial Risk

In assessing the risks to the financial system, this year the Council has focused on financial risks related to climate change. These risks can be grouped into two broad categories: physical risks and transition risks.

Physical risks refer to the harm to people and property arising from acute climate-related disaster events, as well as longer-term chronic phenomena such as higher average temperatures and sea level rise. Physical risks have direct effects on households, businesses, and other entities located where those risks are realized, as well as to the set of financial institutions and investors connected to those impacted. These effects create climate-related financial risks in several ways. Increased legal and operational risks may also occur. In response, creditors may pull back from impacted regions, potentially amplifying the initial impact of a natural disaster and creating further financial and economic strain.

Transition risks refer to stresses to certain institutions or sectors arising from the shifts in policy, consumer and business sentiment, or technologies associated with the changes necessary to limit climate change. As countries fulfill their commitments and transition to a low-greenhouse gas economy, changes in public policy, the adoption of new technologies, and shifting consumer and investor preferences all have the potential to impose costs on some firms and communities even as they reduce overall climate risks. As a result, the ability of impacted firms to meet their financial obligations may decrease. Therefore, the economic effects associated with a transition may transmit through the financial sector and the economy in ways that weaken the resilience of financial institutions or the financial sector. The impact of these changes is likely to be more sudden and disruptive if the changes

occur in a disorderly way owing to substantial delays in action or abrupt changes in policy.

The Council recognizes the critical importance of taking prompt action to improve the availability of data and measurement tools, enhance assessments of climate-related financial risks and vulnerabilities, and incorporate climate-related risks into risk management practices and supervisory expectations for regulated entities, where appropriate. In addition, financial regulators, consistent with their mandates and authorities, should also promote consistent, comparable, and decision-useful disclosures that allow investors and financial institutions to take climate-related financial risks into account in their investment and lending decisions. Through these actions, financial regulators can both promote financial-sector resilience and help the financial system support an orderly economy-wide transition to net-zero emissions. The Council provided more detailed recommendations to Council members in its [Report on Climate-Related Financial Risk](#).

Corporate Credit

The average leverage of nonfinancial corporations is elevated relative to historical standards. Since the onset of the pandemic, many firms increased their leverage but have subsequently retraced those increases. However, in some industries leverage remains elevated compared to pre-pandemic averages, including the airline, hospitality and leisure, and restaurant sectors.

The potential risks to financial stability from nonfinancial business borrowing depend in part on the ability of businesses to service their obligations, the ability of the financial sector to absorb losses from defaults and downgrades, and the continued willingness of market participants to provide intermediation during times of stress.

Elevated leverage has been accompanied by rising valuations in U.S. equities and corporate bonds. These valuation pressures make these markets vulnerable to a major repricing of risk, increased volatility, and weakening balance sheets of financial and nonfinancial businesses. Sharp reductions in the valuations of different assets could heighten debt rollover risk.

The Council recommends that member agencies continue to monitor levels of nonfinancial business leverage, trends in asset valuations, and potential implications for the entities they regulate in order to assess and reinforce the ability of the financial sector to manage severe, simultaneous losses. Regulators and market participants should also continue to assess ways in which leveraged nonfinancial corporate borrowers and elevated asset prices may amplify stresses in the broader market in the event of a rapid repricing of risk or a slowdown in economic activity.

Short-Term Wholesale Funding Markets

Wholesale funding markets provide essential short-term funding to businesses, local governments, and financial intermediaries. Developments in these markets can have implications for financial stability and the implementation of monetary policy.

Certain MMFs can amplify stress in short-term funding markets by liquidating assets in those markets to meet redemptions. The gap between the liquidity of prime and tax-exempt MMF assets and the availability of daily redemptions contributes to a so-called first mover advantage. Investors have an incentive to be the first to redeem in order to avoid losses, which would be borne by the remaining investors.

In repurchase agreement (repo) markets, recent episodes of stress have included large spikes in repo rates in September 2019 and in March 2020. The 2019 episode has been attributed to technical and seasonal factors, while the 2020 episode came at the onset of the pandemic amidst intense selling in the cash Treasury market. Reliance on repo funding by leveraged investors, such as hedge funds and mortgage real estate investment trusts (mREITs), can amplify stress in short-term funding markets in response to deleveraging pressure, because many of the assets sold at declining prices are the same types of assets used as collateral in repo funding. The complexity of interactions involving leveraged participants raises concerns regarding their role in amplifying funding stresses.

The Council commends steps taken over the past year by member agencies to understand the nature of structural vulnerabilities of MMFs and potential

reform options, including the release of a report by the President's Working Group on Financial Markets (PWG) in December 2020 and the request for public comment by the SEC in February 2021. The Council recommends that regulators continue to consider these structural vulnerabilities, including the vulnerability to large-scale redemptions in prime and tax-exempt MMFs and the vulnerabilities posed by leveraged investors relying on short-term funding, and take appropriate measures to mitigate these vulnerabilities.

Residential Real Estate Market

Nonbank mortgage companies have come to play a large role in residential mortgage markets but are often subject to key vulnerabilities. Many nonbank mortgage companies rely on short-term funding and therefore remain vulnerable to adverse market conditions. In addition, many mortgage companies have limited loss-absorbing capacity in the face of adverse economic shocks. Disruption to nonbank mortgage companies could interrupt mortgage servicing operations, especially for nonperforming loans, and might have knock-on effects on these servicers' mortgage originations in the residential real estate market.

The Council commends steps taken by the Government National Mortgage Association (Ginnie Mae) and the Conference of State Bank Supervisors over the past year to understand options for standards and regulations for nonbank mortgage companies to address these vulnerabilities. The Council recommends that relevant federal and state regulators continue to coordinate closely to collect data, identify risks, and strengthen oversight of nonbank companies involved in the origination and servicing of residential mortgages.

Commercial Real Estate Market

The COVID-19 pandemic continues to substantially weigh on CRE properties in central business districts (CBDs). Depending on the course of the pandemic and the long-run demand for CBD properties, if acute stress were to emerge in CRE markets, asset sales from financially distressed individual properties could lead to a cycle of lower valuations and more distress. Defaults on CRE loans would result in losses to banks, which hold a sizable

portion of CRE loans, and potentially lead to tighter credit availability.

The Council recommends that regulators continue to monitor CRE asset valuations, the level of CRE concentration at banks, and the performance of CRE loans. The Council recommends that regulators continue to encourage banks and other entities to bolster, as needed, their loss-absorption capacity by strengthening their capital and liquidity buffers commensurate with the levels of CRE concentration on their balance sheets.

Large Bank Holding Companies

The 2008 financial crisis demonstrated that financial distress at a large, complex, interconnected bank holding company (BHC) has the potential to affect global financial markets and amplify tightening of credit conditions. Since then, large and complex U.S. financial institutions have built up stronger capital and liquidity positions and become significantly more resilient. Today, some uncertainty regarding the outlook of credit quality at banks remains, given the unknown path that the pandemic will take, and the ongoing economic recovery. Banks could also once again face challenges to their ability to build capital through retained earnings, given the current low interest rate environment. In addition, the failure of Archegos this past year highlighted the importance of maintaining adequate counterparty credit risk management practices.

The Council recommends that financial regulators continue to require that the largest financial institutions maintain sufficient capital and liquidity to enhance their resilience against economic and financial shocks. The Council also recommends that regulators continue to monitor and assess the impact of rules on financial institutions and financial markets—including, for example, on market liquidity and capital—and ensure that BHCs are appropriately monitored based on their size, risk, concentration of activities, and offerings of new products and services. In addition, the Council recommends that regulators continue to review counterparty credit risk management and capital practices at financial institutions.

Investment Funds

Investment funds play a critical intermediary role in the U.S. economy, promoting economic growth through efficient capital formation. While recognizing these benefits, the Council has identified certain vulnerabilities related to redemption risk in certain open-end funds. Since some fixed-income markets have limited liquidity, particularly during periods of market stress, open-end mutual funds holding mostly fixed-income instruments may be vulnerable to run risks. The Council has focused in particular on whether the structure of open-end funds results in greater selling pressure than if investors held the fixed-income instruments directly.

The Council has also identified a vulnerability related to the use of leverage by investment funds, which is most widespread among hedge funds, depending on their sizes and investment strategies. Leverage can allow investment funds to hedge risk or increase exposures, depending on the activities and strategies of the fund. However, in a period of stress, leverage can magnify losses or lead to margin calls, which can cause funds to liquidate assets at a size and speed that disrupt the underlying markets.

The Council plans to review the findings of the hedge fund and open-end fund working groups as they are developed. The Council supports initiatives by the SEC and other agencies to address risks in investment funds. The Council also supports data collection and analytical work by member agencies aimed at the identification of potential emerging risks. The Council recommends that the SEC and other relevant regulators consider whether additional steps should be taken to address these vulnerabilities.

Central Counterparties

Although central counterparties (CCPs) provide significant benefits to market functioning and financial stability, they can also introduce strains to the financial system. While CCPs have multi-layered provisions in their rulebooks to address default and plans for recovery from events that threaten their ability to maintain critical services as a going concern, the inability of a CCP to meet its obligations arising from the default of one or more clearing members or from non-default losses could

strain the surviving members of the CCP and, more broadly, the financial system. At the same time, CCPs' rulebooks and internal risk management frameworks are designed to reduce these risks by imposing liquidity and resource requirements on clearing members that can increase with market volatility. In addition, both the CFTC and SEC maintain active risk surveillance programs of CCPs' and intermediaries' risk management and receive daily or weekly reports on positions, risk measures, margins, collateral, and default resources. Supervisory stress tests involving multiple CCPs can also be, and have been, an important tool in the assessment of risks.

The Council recommends that the CFTC, Federal Reserve, and SEC continue to coordinate in the supervision of all CCPs designated by the Council as systemically important financial market utilities (FMUs). Relevant agencies should continue to evaluate whether existing standards for CCPs are sufficiently robust to mitigate threats to financial stability from both default and non-default losses. These agencies should pay particular attention to, and seek to balance, the tradeoff between counterparty risk and liquidity risk. Agencies that regulate clearing members should continue to assess those firms' liquidity risk management practices and capabilities. The agencies should continue to assess the effectiveness of guidance or standards on managing margin payments and exposure to CCPs. Finally, the Council encourages regulators to continue to advance recovery and resolution planning for systemically important FMUs and to coordinate in designing and executing supervisory stress tests of multiple systemically important CCPs.

Alternative Reference Rates

After years of planning and preparation, the transition away from LIBOR is entering a critical stage. The Council has identified certain risks for this transition period. One risk relates to the selection of new reference rates. The Council advises market participants to conduct a comprehensive evaluation of the market depth and design of any alternative reference rate and notes the recommendation of the Secured Overnight Financing Rate (SOFR) by the Alternative Reference Rates Committee (ARRC). A rate based on small

transaction volume, especially if much lower than the volume of instruments that reference a given rate, could introduce risks if the rate is susceptible to volatility and disruption during times of market stress. A second risk relates to the possibility of continued issuance of instruments that create or extend LIBOR exposure, which would be inconsistent with guidance from U.S. regulators and unnecessarily increase exposures to a rate that will soon cease. A third risk relates to legacy contracts without robust fallback provisions in the event of LIBOR's cessation, which will create risks for market participants if they do not take feasible actions to transition these contracts.

End dates for LIBOR have now been set, and U.S. regulators have issued guidance on the LIBOR transition, most recently in October 2021. Market participants should act with urgency to address their existing LIBOR exposures and transition to robust and sustainable alternative rates. The Council commends the efforts of the ARRC and recommends that it continue to facilitate an orderly transition to alternative reference rates. Member agencies should determine whether regulatory relief is necessary to encourage market participants to address legacy LIBOR portfolios. Member agencies should also continue to use their supervisory authority to understand the status of regulated entities' transition from LIBOR, including their legacy LIBOR exposure and plans to address that exposure.

Financial Market Structure

Advances in information and communications technologies, as well as regulatory developments, have altered the structure of financial markets over the past decade. The Council and member agencies are closely monitoring how changes in market structure have affected the robustness and efficiency of capital markets and the stability of the financial system.

Interlinkages among dollar funding markets:

Since the 2008 financial crisis, new regulations on bank capital and liquidity, structural reforms in MMFs, and a new operating environment for bank-affiliated broker-dealers have fundamentally altered how market participants interact and the various interlinkages among the federal funds market, the repo market, and the Eurodollar market.

There are benefits from interdependencies among markets, including enhanced price discovery and more options for hedging risks. At the same time, interdependencies create transmission risks from volatile or inaccurate pricing that have the potential to amplify market shocks across different markets.

Pressures on dealer intermediation: Traditionally, market-making and arbitrage mechanisms involving securities dealers have helped in the orderly functioning of the secondary market for Treasuries and mortgage-backed securities (MBS). However, issuance volumes have increased, especially for Treasury securities. In addition, with large banks having taken action to limit balance sheet growth in light of capital requirements designed to constrain leverage, major bank-affiliated broker-dealers have reduced the portion of their balance sheet that is allocated to trading and repo transactions. Together, these developments may have contributed to episodes of illiquidity in Treasury, MBS, and corporate bond markets in March 2020.

Role of non-traditional market participants: Non-traditional market participants, including principal trading firms, play an increasingly important role in securities and other markets. These firms may improve liquidity and investor outcomes under normal circumstances, but they may also introduce new potential risks. For instance, the trading strategies that non-traditional market participants employ and the incentives and constraints that they operate under may not be as well understood, leading to uncertainty about how these firms might behave during periods of market stress.

Disruptive events in securities markets: An episode of stress in the Treasury market in February is a recent example of occasional abrupt disruptions to asset prices and liquidity conditions that have occurred in securities markets. These episodes may signal a vulnerability regarding the resilience of key financial markets, rooted in the financial structure of trading in these markets.

Consideration of central clearing in the U.S.

Treasury market: Significant parts of the Treasury market are not centrally cleared. Expansion of central clearing could have a range of benefits, including reducing chains of settlement failures

and counterparty risk concerns, and increasing the provision of dealer liquidity. Expanded central clearing could also have a number of costs, necessitating careful study to understand whether more widespread central clearing would benefit Treasury market resilience.

The Council recommends that member agencies continue to review market structure issues that may contribute to market volatility in key markets, including short-term funding, Treasuries, MBS, and corporate bond markets, and study the interlinkages between them. Market participants should also regularly assess how market developments affect the risk profile of their institutions. The Council recommends that financial regulators continue to monitor and evaluate ongoing changes that might have adverse effects on markets, including on market integrity and liquidity, or that might underlie flash events. In the Treasury market, the Council recommends that agencies consider whether an increase in central clearing would enhance the resilience of the market, taking into consideration the factors limiting central clearing to date, and assess the likely impact on liquidity of such an increase.

Cybersecurity

The financial sector, like other critical sectors, is vulnerable to ransomware and other malware attacks, denial of service attacks, data breaches, and other events. A destabilizing cybersecurity incident could potentially threaten the stability of the U.S. financial system by disrupting a key financial service or utility, causing a loss of confidence among a broad set of customers or market participants, or compromising the integrity of critical data.

The implementation of teleworking strategies using virtual private networks, virtual conferencing services, and other technologies can increase cybersecurity vulnerabilities, insider risks, and other operational exposures. At the same time, financial institutions have increased their reliance on third-party service providers for teleworking tools and services. The interdependency of these networks and technologies supporting critical operations magnifies cyber risks, threatening the operational risk mitigation capabilities not just at individual

institutions, but also of the financial sector as a whole.

The Council recommends that federal and state agencies continue to monitor cybersecurity risks and conduct cybersecurity examinations of financial institutions and financial infrastructures to ensure, among other things, robust and comprehensive cybersecurity monitoring, especially in light of new risks posed by the pandemic, ransomware incidents, and supply chain attacks. The unique and complex threats posed by cyber risks also require the public and private sectors to cooperate to identify, understand, and protect against these risks. The Council supports the continued use and enhancement of public-private partnerships to identify and mitigate cybersecurity risks. The Council also supports agency efforts to increase the efficiency and effectiveness of cybersecurity examinations across relevant agencies.

Data Gaps and Challenges

Episodes of acute financial stress in 2008 and 2020 have exposed several major gaps and deficiencies in the range and quality of data available to financial regulators to identify emerging risks in the financial system. These gaps and shortcomings include firm-level structure and ownership information, transaction data in certain important financial markets, and limitations in financial statement reporting for certain types of institutions. Often, the usefulness of data is limited by institutional or jurisdictional differences in reporting requirements. Gaps and legacy processes may inhibit data sharing.

The Council recommends that regulators and market participants continue to work together to improve the coverage, quality, and accessibility of financial data, as well as improve data sharing among relevant agencies. These partnership efforts include implementing new standardized or digital identifiers; developing and linking data inventories; and implementing industry standards, protocols, and security for secure data sharing. The Council also recommends that member agencies support adoption and use of standards in mortgage data, including consistent terms, definitions, and data quality controls, which will make transfers of loans or servicing rights less disruptive to borrowers and investors. The Council recommends that member

agencies continue to work to harmonize domestic and global derivatives data for aggregation and reporting and ensure that appropriate authorities have access to the trade repository data needed to fulfill their mandates.

Financial Innovation

Financial innovation can offer considerable benefits to consumers and providers of financial services by reducing the cost of certain financial services, increasing the convenience of payments, and potentially increasing the availability of credit. But innovation can also create new risks that need to be understood.

Digital Assets

Digital assets are a prominent example of financial innovation that present potential benefits and risks. Regulatory attention and coordination are critically important in light of the quickly evolving market for these assets. Because speculation appears to drive the majority of digital asset activity at this time, the price of digital assets may be highly volatile. Digital assets may also be subject to the risk of operational failures, fraud, and market manipulation. For example, though stablecoins are marketed with the claim that they will maintain a stable value, they may be subject to widespread redemptions and asset liquidations if investors doubt the credibility of that claim. In addition, digital assets pose risks through direct or indirect connections with banking services, financial markets, and financial intermediaries. For instance, the potential for the increased use of stablecoins as a means of payment raises a range of prudential concerns. If stablecoin issuers do not honor a request to redeem a stablecoin, or if users lose confidence in a stablecoin issuer's ability to honor such a request, runs on the arrangement could occur that may result in harm to users and the broader financial system. Finally, digital assets also pose risks related to illicit financing, national security, cybersecurity, privacy, and international monetary and payment system integrity.

The Council recommends that federal and state regulators continue to examine risks to the financial system posed by new and emerging uses of digital assets and coordinate to address potential issues that arise from digital assets. The Council has reviewed the [Report on Stablecoins](#) published by the PWG,

the FDIC, and the OCC on November 1, 2021 (PWG Report on Stablecoins), and recommends that member agencies consider the recommendations in that report. The Council will further assess and monitor the potential risks of stablecoins and recommends that its members consider appropriate actions within each member's jurisdiction to address those risks while continuing to coordinate and collaborate on issues of common interest. The Council will also be prepared to consider steps available to it to address risks outlined in the PWG Report on Stablecoins in the event comprehensive legislation is not enacted.

The Use of Technology in Financial Services

Financial firms' rapid adoption of technological innovations in recent years may increase operational risks, including those associated with financial institutions' use of third-party service providers. For example, if critical services are outsourced, financial or operational failures or faults at a key service provider could disrupt the activities of multiple financial institutions or financial markets.

Technology has increasingly enabled retail investors to participate at higher rates in U.S. equity markets, as evidenced by the growth in self-directed trading. Innovations that democratize access to trading markets can offer positive outcomes, such as increasing the diversity of market participants. However, vulnerabilities may also emerge, including increased price volatility and the manipulation of markets driven by social media, which existing policy and enforcement tools may not be designed to address.

The Council encourages agencies to continue to monitor the effects of new financial products and services on consumers, regulated entities, and financial markets, and evaluate their potential effects on financial stability. The Council encourages continued coordination among federal and state financial regulators to support responsible financial innovation and competitiveness, to promote consistent regulatory approaches, and to identify and address potential risks that arise from such innovation.

Managing Vulnerabilities amid Uneven and Volatile Global Growth

The outlook for global growth is characterized by elevated uncertainty, with the potential for continued volatility and unevenness of growth across countries and sectors. Risks include the possibility of higher-than-expected inflation leading to higher interest rates, causing losses at some financial institutions, higher borrowing costs, and the global economic recovery to lose momentum; the possibility that financial vulnerabilities in China could lead to a hard landing and weigh on the global economy; and the possibility that the ongoing pandemic could continue to cause volatility in economic activity, including economic shutdowns and reopenings.

Volatile or uneven global growth could affect the U.S. financial system in a few ways. Losses at financial institutions in advanced foreign economies could spill over to the U.S. financial system through direct exposures and counterparty risks. The direct consequences of a Chinese hard landing for U.S. financial stability appear manageable since direct U.S. exposures to the Chinese financial sector are more limited. However, U.S. economic performance could be affected indirectly if developments in China or other countries weigh on the global economy or global market confidence.

The Council recommends that member agencies ensure that the financial institutions they oversee are attentive to the risks posed by uneven or volatile global growth, including higher levels of inflation and interest rates, stress at foreign financial institutions including banks and nonbanks, and changes in global economic activity and market confidence. Supervisors should review in particular the risks faced by large banks with global footprints and trading operations. Market regulators should review available steps that could be taken in anticipation of increased stress in funding markets if global funding flows become more volatile.

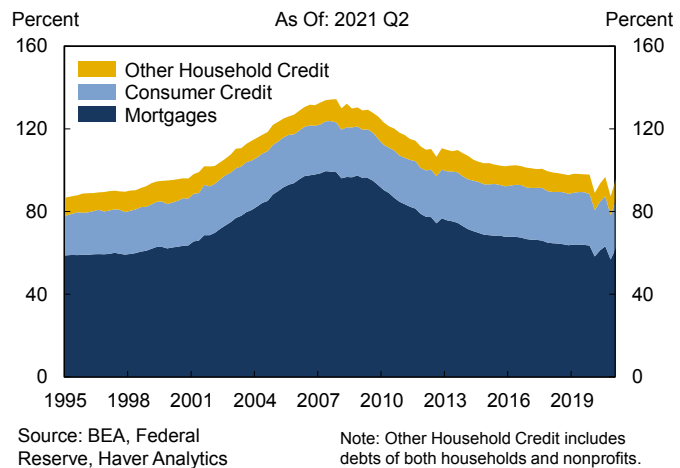
3.1 Household Finance

Stresses on households have moderated significantly over the past year, aided by extraordinary policy actions, improving economic conditions, and some lessening in the severity of the COVID-19 pandemic. Government policies—including enhanced unemployment insurance and direct stimulus payments—have supported household balance sheets, helping many households build up a buffer of liquid assets. Credit growth remains concentrated among borrowers with prime credit scores, and the share of mortgages and consumer loans in delinquency or forbearance has declined steadily. Nonetheless, some households, such as those still in forbearance or delinquency and those with members employed in sectors particularly hard-hit by the pandemic, continue to face significant stresses.

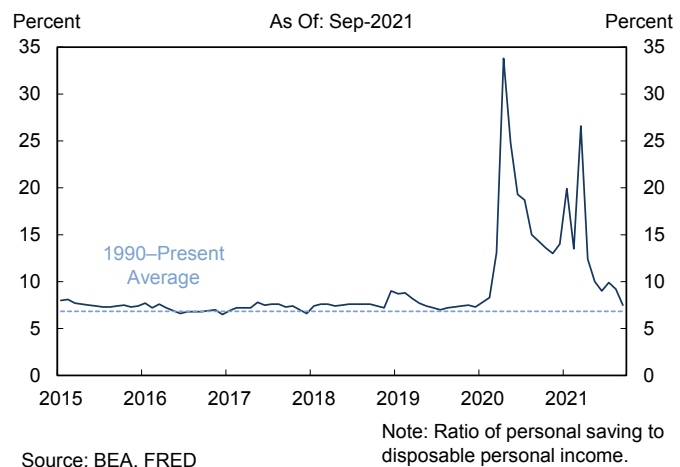
Household debt has grown at a moderate pace over the past decade, reaching a total of \$17 trillion in the second quarter of 2021. While this is a record level of debt in nominal terms, the corresponding ratio of household debt to disposable personal income is well below its 2007 peak and is slightly below pre-pandemic levels (**Chart 3.1.1**). This ratio moved up and down notably over the course of the pandemic, driven by changes in incomes, some of which came from federal aid programs. The personal savings rate, which spiked in April 2020 and March 2021 following the disbursement of household stimulus payments, remained well above its long-term average through much of 2021 before returning to its long-term average in September 2021 (**Chart 3.1.2**).

In the years leading up to the pandemic, the household debt service ratio remained at fairly low levels, which can be attributed to rising incomes and years of relatively low interest rates. Since the onset of the pandemic, this ratio has declined to record lows as interest

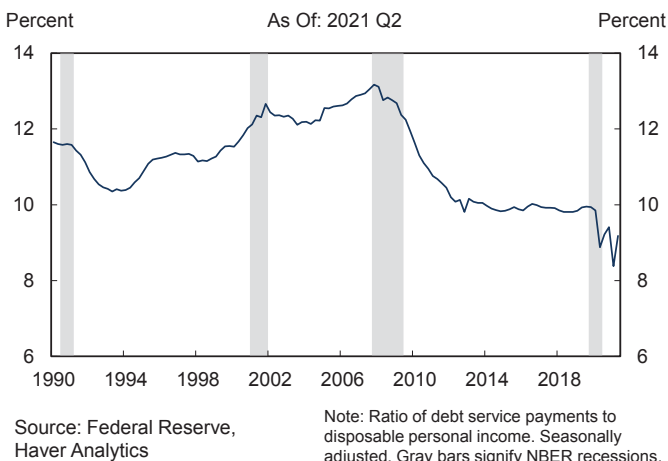
3.1.1 Household Debt as a Percent of Disposable Personal Income



3.1.2 Household Personal Savings Rate



3.1.3 Household Debt Service Ratio

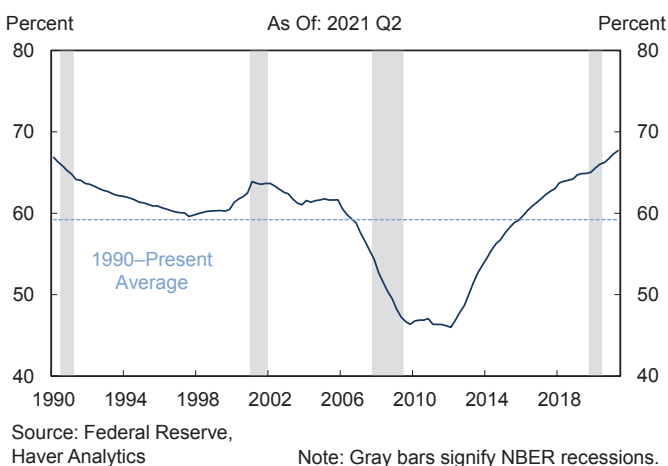


rates fell further and federal relief programs raised disposable personal incomes (**Chart 3.1.3**). Aided by strong house price growth, the share of owners' equity in household real estate continued to increase from its lows in 2012 and has recently exceeded the range that prevailed in the early 2000s (**Chart 3.1.4**). The increase in house prices over the past year has been particularly notable, with annualized growth rates exceeding 20 percent in recent months (**see Box B**).

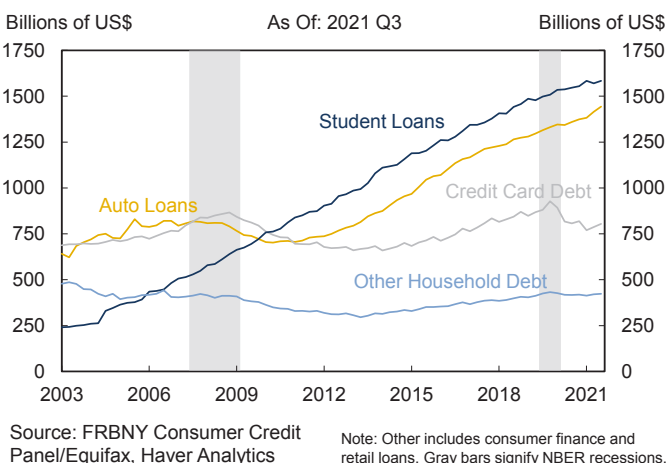
Household net worth has increased notably in the last decade, driven by stock market and real estate gains; this has been particularly true for high-net-worth and high-income households. However, household net worth declined by 5.6 percent in the first quarter of 2020 as the stock market fell sharply. Household net worth has since rebounded to all-time highs, as stock prices recovered from initial pandemic-related economic and financial market uncertainty and as house prices grew rapidly.

Consumer credit—which consists primarily of credit card debt, auto loans, student loans, and installment loans—has grown over the past decade to account for about one-quarter of total household debt. This faster pace of growth compared to mortgage debt has been driven by student and auto loans. Since the onset of the pandemic, credit card balances have declined, while student loan and auto loan balances have increased (**Chart 3.1.5**).

3.1.4 Owners' Equity as Share of Household Real Estate



3.1.5 Components of Consumer Credit



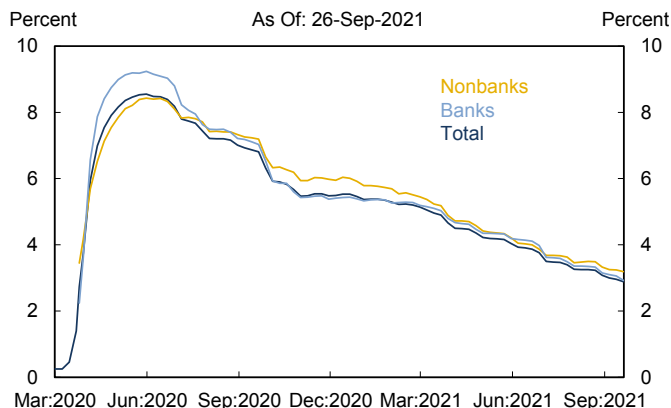
Over the past decade, borrowers with prime credit scores have accounted for almost all the growth in loan balances. This trend has continued through the pandemic, as the steady growth in mortgages for prime borrowers has more than offset their notable declines in credit card balances. By contrast, after holding steady in the years prior to the pandemic, total loans for subprime borrowers have decreased in 2020 and 2021, with mortgages, auto loans, and credit card debt all contributing to the decline. This decrease is largely attributable to relatively tight lending standards for subprime borrowers over the past decade. However,

COVID-19 relief programs may have also led to a reduction in the number of borrowers being classified as subprime. For example, the CARES Act provision requiring loans in forbearance programs to be reported as non-delinquent to credit bureaus may have led to an upward shift in credit scores at the bottom of the credit score distribution.

Credit standards have generally eased over the past year, increasing market access for some households. According to the July 2021 Senior Loan Officer Opinion Survey (SLOOS), banks have, on net, eased standards on credit cards and auto loans over the second quarter of 2021. After tightening at the start of the pandemic, standards for consumer loans and mortgages are now close to or below their pre-pandemic levels for prime borrowers and generally somewhat tighter than their pre-pandemic levels for subprime borrowers.

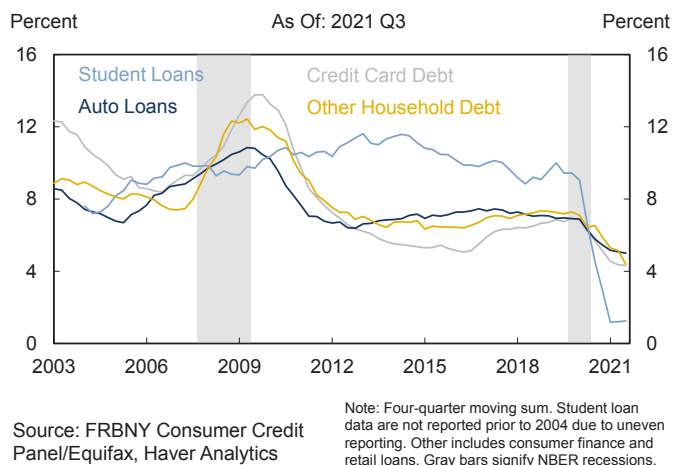
The economic impact of COVID-19 on household finances was mitigated by several government actions, including enhanced unemployment benefits, direct stimulus payments, loan forbearance, and the federal eviction moratorium. The share of mortgages in forbearance increased sharply in the second quarter of 2020 and has declined steadily thereafter (**Chart 3.1.6**).

3.1.6 Percentage of Mortgages in Forbearance



Source: Mortgage Bankers Association

3.1.7 Transition to Delinquency (30+Days) by Loan Type



Credit record data show notable decreases in the delinquency rates of major forms of household credit during the pandemic (**Chart 3.1.7**). Forbearance programs likely contributed to these declines, as loans in these programs are reported as non-delinquent to credit bureaus upon enrollment. Notably, student loan delinquency rates declined sharply, which can be attributed to the Department of Education's decision to suspend interest and monthly payments on all federally held loans and report all student loans eligible for CARES Act forbearances as current. Federal, state, and local policy interventions, which counteracted to some degree the income and employment shocks stemming from the pandemic, also likely helped lower these delinquency rates.

Nonetheless, the share of mortgages in some form of non-payment remains elevated compared to the years immediately preceding the COVID-19 pandemic. Mortgage forbearance is scheduled to expire at the end of 2021 for about 50 percent of mortgages currently in forbearance. These mortgage borrowers show signs of being under some financial strain. They are more likely to have suffered income losses in the past year, to work in industries particularly hard-hit by the pandemic, and to have below-average credit scores at origination. The expiration of extended unemployment benefits and mortgage forbearance programs may lead to an increase in mortgage delinquency rates. Eviction rates, which fell sharply in 2020, may increase meaningfully in the coming months with the lifting of the federal eviction moratorium and as state moratoria roll off. According to the Census Bureau's Household Pulse Survey, approximately 15 percent of renters were in arrears in October with around 42 percent of these renters expecting to be evicted in the next two months. Similarly, borrowers in auto loan forbearance may be vulnerable to the expiration of extended unemployment insurance.

3.2 Nonfinancial Business Finance

3.2.1 Corporate Debt

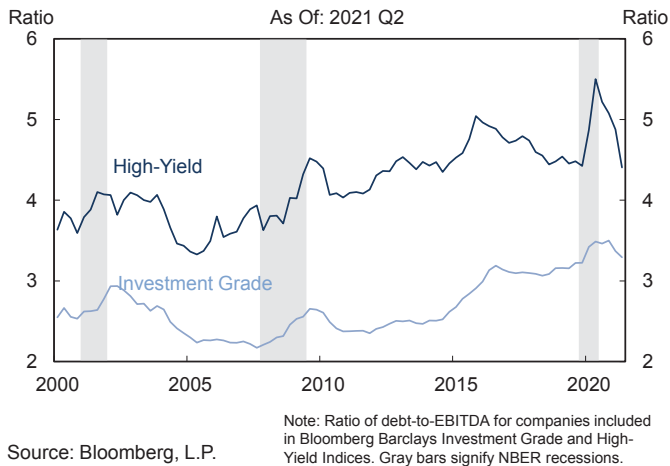
Many indicators of corporate balance sheet health have improved since the onset of the COVID-19 pandemic. Low interest rates, coupled with the strong rebound in earnings, helped improve corporate debt servicing indicators, leverage metrics, and overall credit quality. Nevertheless, business leverage remains elevated relative to historical standards and firms in sectors particularly hard-hit by the pandemic continue to show strain.

For several years before the pandemic, nonfinancial corporate debt grew more quickly than nominal gross domestic product (GDP). In the first half of 2020, corporate debt increased further while GDP fell, causing the corporate-debt-to-GDP ratio to spike to an all-time high. This ratio has since declined as GDP has recovered and debt growth has slowed (**Chart 3.2.1.1**). Corporate debt levels relative to earnings also increased sharply early in the pandemic before declining more recently (**Chart 3.2.1.2**).

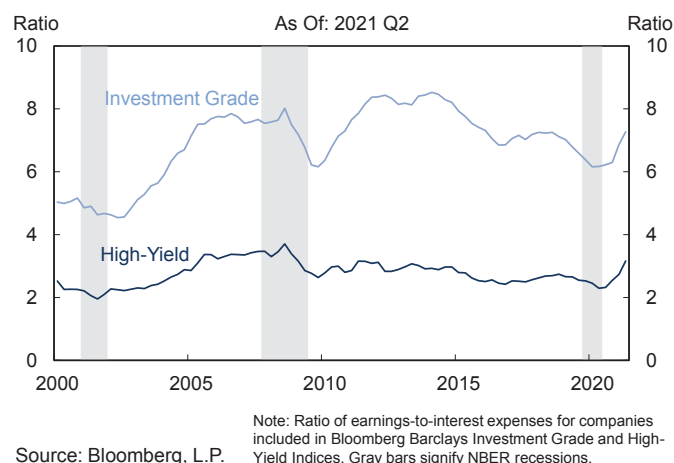
3.2.1.1 Nonfinancial Corporate Credit as Percent of GDP



3.2.1.2 Corporate Leverage: Debt / EBITDA

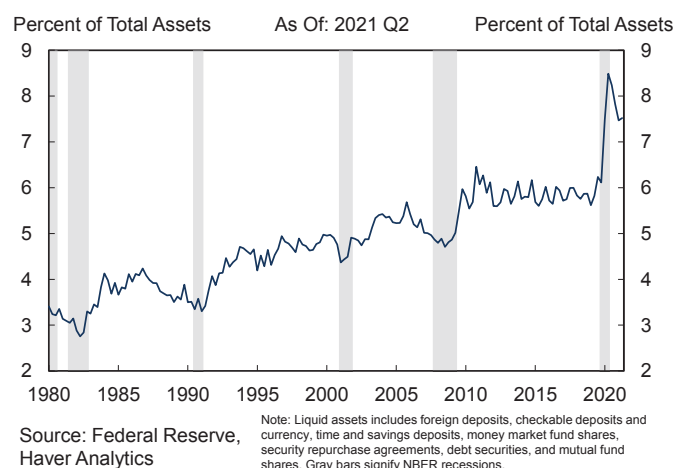


3.2.1.3 Interest Coverage Ratios



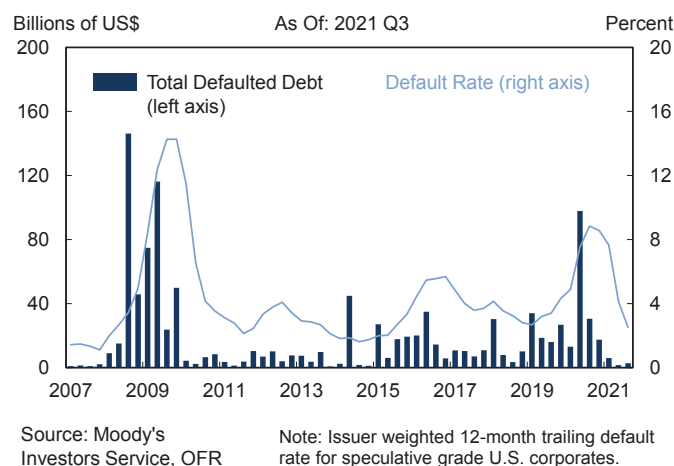
Although corporate debt growth has been outpaced by GDP or earnings growth since the early months of the pandemic, overall debt and leverage levels are still elevated. However, a number of factors such as continued low interest rates and recovering earnings partially mitigate the burden of this debt. As of the second quarter of 2021, the interest coverage ratio—the ratio of earnings to interest expense—is near the middle of its historical distribution for publicly traded corporations (**Chart 3.2.1.3**). Additionally, the share of debt due within one year is at a moderate level, as many firms have refinanced debt to lower interest rates and extend maturities. Firms continue to maintain significant holdings of liquid assets, which serve as a buffer against future drops in revenue or interest rate increases (**Chart 3.2.1.4**).

3.2.1.4 Nonfinancial Corporations Liquid Assets



In 2020 an increasing number of high-yield firms defaulted on debt obligations, with the trailing four quarter default rate peaking at 8.8 percent in the third quarter of 2020 (**Chart 3.2.1.5**). While this increase represented the highest default rate in over ten years, it was well below forecasts made at the onset of the pandemic, when the three major rating agencies projected the U.S. high-yield corporate default rate would peak at between 12-15 percent in early 2021. The pace of defaults has since declined considerably, with U.S. corporate defaults totaling just \$10 billion in the first nine months of 2021 compared with \$159 billion for the full-year 2020. Consistent with the more favorable outlook, ratings upgrades have outpaced downgrades in recent quarters, and in the first three quarters of 2021, the number of upgrades at Moody's exceeded downgrades by a record factor of 2.5 to one.

3.2.1.5 U.S. Corporate Defaults



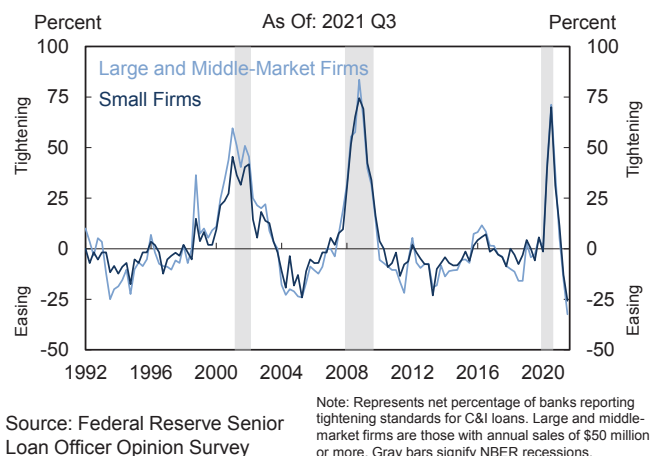
Despite the more optimistic outlook, some firms still face difficulties servicing their debt. Moreover, debt levels relative to earnings have remained elevated for firms in sectors particularly hard-hit by the pandemic such as airlines, hotels, restaurants, and leisure. However, elevated debt levels in these sectors may partly be attributed to firms issuing

additional debt to build their liquidity buffers given the uncertain outlook.

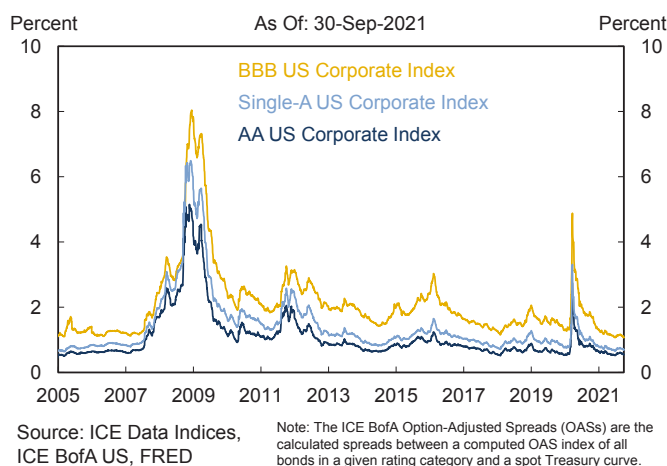
The Federal Reserve's SLOOS indicates that banks' willingness to lend to businesses has increased so far this year, with the net percentage of respondents reporting an easing of standards reaching its highest level ever in the July 2021 survey (**Chart 3.2.1.6**). This reflects a sharp reversal in credit conditions from mid-2020, when respondents reported a significant tightening of standards for loans disbursed outside of the Small Business Administration's Paycheck Protection Program (PPP).

After surging in March 2020 to levels not seen since the 2008 financial crisis, investment-grade corporate bond spreads declined steadily and are now slightly below their pre-pandemic levels (**Chart 3.2.1.7**). Spreads on high-yield corporate bonds have likewise declined significantly since the market stress in March 2020 and are now at very low levels (**Chart 3.2.1.8**). These low spreads reflect in part the more favorable credit outlook. Market conditions early in the pandemic improved following the announcement of the Federal Reserve's Primary Market Corporate Credit Facility and Secondary Market Corporate Credit Facility (Corporate Credit Facilities).

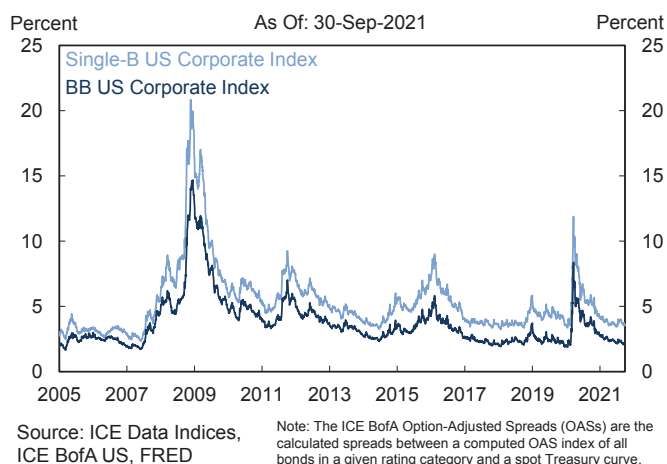
3.2.1.6 Bank Business Lending Standards



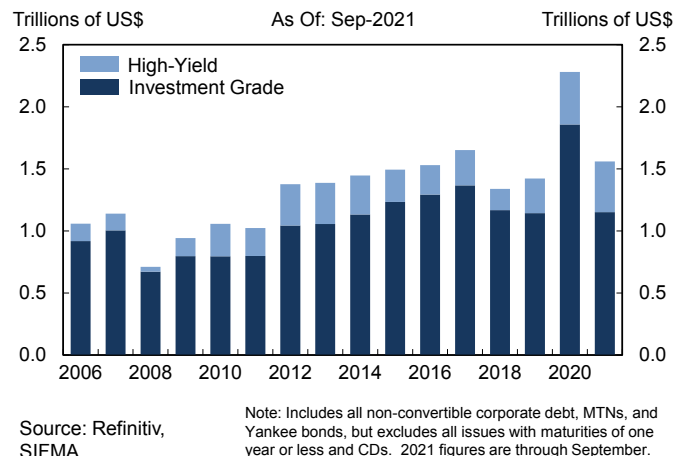
3.2.1.7 Investment Grade Corporate Bond Spreads



3.2.1.8 High-Yield Corporate Bond Spreads



3.2.1.9 Gross Issuance of Corporate Bonds



Consistent with generally accommodative financing conditions following the market turmoil of early 2020, issuances of investment grade corporate bonds have been robust, over the past year, with investment grade companies issuing a record \$1.9 trillion of corporate bonds in 2020 and a further \$1.2 trillion in the first nine months of 2021. Additionally, issuances of high-yield bonds have been robust as financing conditions remain substantially accommodative. In the first nine months of 2021, high-yield bond issuances have totaled a record \$408 billion on top of the record \$424 billion issued in 2020 ([Chart 3.2.1.9](#)).

A substantial fraction of this issuance has been used to refinance debt at more favorable rates, as borrowing rates are near-record-low levels. Firms have also used issuance proceeds to increase their cash buffers and to pay down their substantial credit line draws from the first half of 2020. As of the second quarter of 2021, nonfinancial corporate holdings of cash and cash-like instruments were 38 percent higher than year-end 2019.

Institutional leveraged loan issuance came to a halt in March 2020 as spreads widened significantly. Since then, spreads have tightened to the low levels seen before the pandemic (**Chart 3.2.1.10**). Even as spreads tightened in the second half of 2020, issuance of leveraged loans remained subdued (**Chart 3.2.1.11**). However, issuance rebounded to record pace through the first nine months of 2021, with 31 percent of institutional issuances consisting of refinancing transactions. Demand from collateralized loan obligations (CLOs), the main purchaser of syndicated loans, has been robust in the first nine months of 2021, with year-to-date issuance exceeding the previous record set in 2018. After peaking in September 2020, the leveraged loan default rate has steadily declined to below 1 percent in September 2021. Similarly, the monthly number of loan downgrades in September reached its lowest level since 2012.

3.2.2 Small Business Debt

Small businesses were hit hard by the pandemic, especially in service industries such as restaurants and entertainment. Many small businesses had to close, in some cases permanently, due to the economic disruptions caused by COVID-19. However, easing of social distancing measures, expansion of vaccine distribution, advances in therapeutics, and support from government policies improved the economic outlook for surviving small businesses. Nonetheless, small businesses remain more vulnerable relative to larger firms.

The Small Business Administration's PPP, supported by the Federal Reserve's Paycheck Protection Program Liquidity Facility, provided multiple rounds of support to small businesses, totaling over \$270 billion in 2021 and almost \$800 billion overall. These funds were crucial to the survival of many small businesses as economic activity dropped precipitously at the onset of the pandemic. As of September 26, 2021, 61 percent of all PPP loans have been fully or partially forgiven and it is projected that a large majority of PPP loans will ultimately be forgiven.

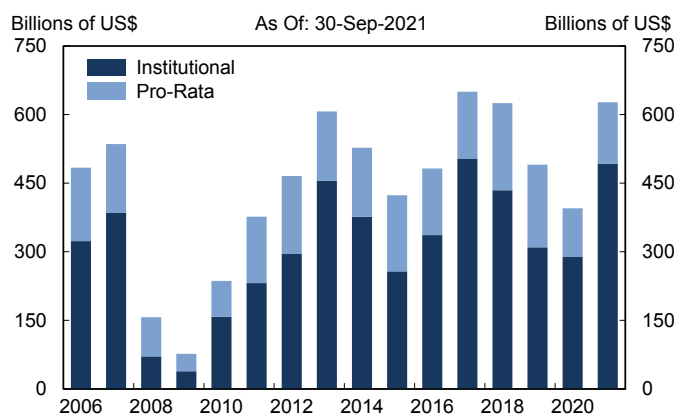
3.2.1.10 Leveraged Loan Spreads



Source: S&P LCD

Note: Spread-to-maturity for syndicated loans included in the S&P LCD Leveraged Loan Index.

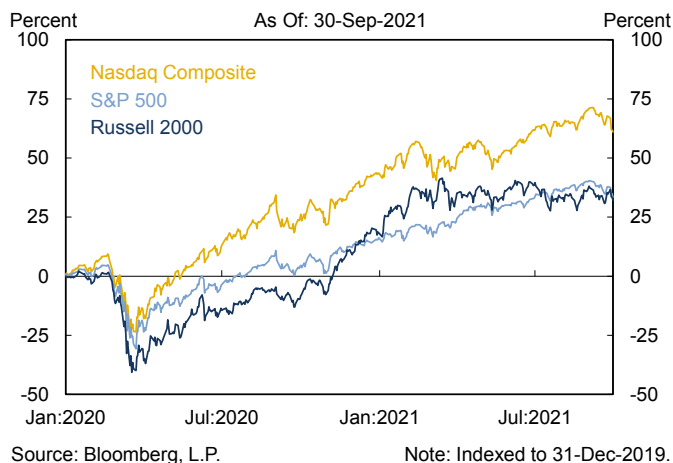
3.2.1.11 Leveraged Loan Issuance



Source: S&P LCD

Note: 2021 figures are through September.

3.2.3.1 Performance of U.S. Stock Indices



Aided by PPP loans, lending to small businesses rebounded after declining sharply at the onset of the pandemic. Despite the continued vulnerability of many small businesses, lending remains at roughly pre-pandemic levels. For instance, the PayNet Small Business Lending Index in September 2021 was at levels similar to those observed in summer 2019. Loan demand remains weak. According to the National Federation of Independent Business Small Business Economic Trends Survey, the percent of small business owners borrowing on a regular basis fell from 29 percent in December 2019 to 20 percent in September 2021.

After rapidly deteriorating during the first half of 2020, small business loan performance has improved in recent months, supported by PPP funding, other government support, and improving economic conditions. PayNet's measure of short-term delinquencies has declined steadily since the summer of 2020 and is now below its pre-pandemic levels. The PayNet longer-term delinquency rate has also declined considerably. The share of Census Small Business Pulse Survey respondents reporting that they expect to need financial assistance within the next six months has decreased so far in 2021, with particularly notable declines in the accommodation and food services sector.

3.2.3 Equities

U.S. equity prices have increased significantly over the past year (**Chart 3.2.3.1**). The gains have been driven by strong earnings results, reassessments of the potential for future earnings growth, historically low interest rates, supportive monetary and fiscal policies, and a more positive economic outlook. The strong pace of initial public offerings (IPOs), including the increased use of special purpose acquisition companies (SPACs), also signals increased investor risk appetite in U.S. equity markets.

Starting in November 2020, positive vaccine news and the potential for further fiscal stimulus prompted market participants to revise their outlook for the U.S. economy, which drove cyclicals and small caps to outperform

companies with longer-duration cash flows, such as major tech companies. This rotation accelerated in the first quarter of 2021, when longer-dated Treasury yields rose sharply, as investors adopted a more optimistic view of the U.S. economic recovery amid additional government support, successful vaccine distribution efforts, and continued business reopenings. By September 30, 2021 the S&P 500 was up 15 percent since the beginning of the year. Recently, the spread of the COVID-19 Delta variant has weighed on investor sentiment at times but has been offset by positive developments in COVID-19 caseloads among advanced economies and the Food and Drug Administration’s full approval of the Pfizer vaccine.

Earnings estimates have improved over the year. Nearly nine in ten firms beat consensus profit forecasts throughout the first and second quarters, and full-year 2021 earnings per share estimates have been revised sharply upwards. Meanwhile, in qualitative corporate earnings commentary, companies have generally adopted an optimistic stance on the U.S. economic recovery, while identifying some headwinds, including higher input costs, labor shortages, and global supply chain disruptions. Amid the rosier outlook for corporate profits, the S&P 500’s 12-month forward price-to-earnings ratio remained elevated relative to its pre-pandemic average (**Chart 3.2.3.2**).

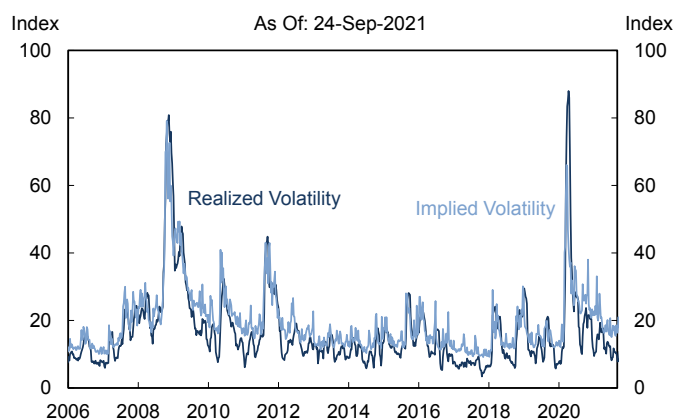
Realized equity market volatility has largely stayed within typical pre-pandemic levels over the past year (**Chart 3.2.3.3**). However, option-implied volatility has remained elevated relative to pre-pandemic levels through the first nine months of 2021, a potential sign of forward-looking uncertainty by investors. Even as aggregate realized volatility has receded, several stocks that were the subject of social-media attention (such as GameStop Corp. and AMC Entertainment Holdings Inc.) have experienced extreme movements in their share prices. On June 7, 2021, the SEC announced that “in light of the ongoing volatility in certain stocks,” it is monitoring “if there have been any disruptions

3.2.3.2 S&P 500 Forward Price-to-Earnings



Source: Bloomberg, L.P.

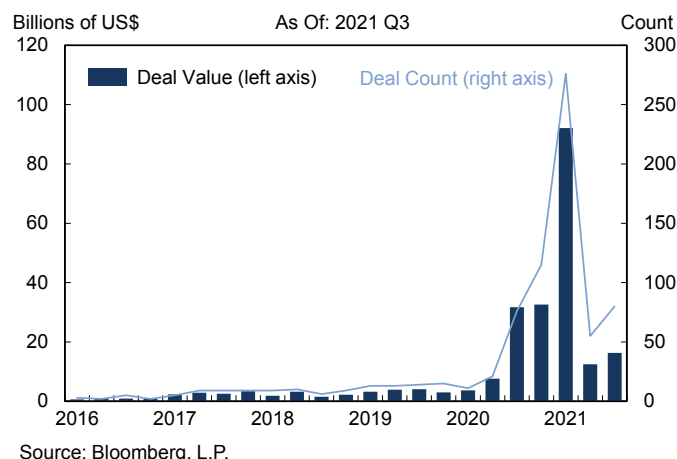
3.2.3.3 S&P 500 Volatility



Source: Bloomberg, L.P.

Note: 30-day realized and implied volatility.

3.2.3.4 SPAC Issuances



3.2.3.5 Returns in Selected Equities Indices

As Of: 30-Sep-2021

	YTD	Since YE 2019	5 Year (Annualized)
U.S. Indices			
S&P 500	14.7%	33.3%	14.7%
Nasdaq Composite	12.1%	61.0%	22.1%
Russell 2000	11.6%	32.1%	12.0%
Other Major Indices			
Topix	12.5%	17.9%	8.9%
FTSE 100	9.7%	-6.0%	0.5%
Euro Stoxx 50	13.9%	8.1%	6.2%
DAX	11.2%	15.2%	7.7%
Emerging Markets			
MSCI Emerging Market Index	-3.0%	12.4%	6.8%
Brazil (Bovespa)	-6.8%	-4.0%	13.7%
India (S&P BSE Sensex)	23.8%	43.3%	16.2%
MSCI China	-17.4%	4.6%	7.3%
Onshore China (CSI 300)	-6.6%	18.8%	8.4%
Taiwan (TAIEX)	14.9%	41.2%	13.1%
South Korea (KOSPI)	7.2%	39.6%	8.5%

Source: Bloomberg, L.P.

of the market, manipulative trading, or other misconduct.” Additionally, on October 14, 2021, the SEC published its [Staff Report on Equity and Options Market Structure Conditions in Early 2021](#), which focused on the January 2021 trading activity of GameStop Corp.

One sign of strong investor appetite for risk in U.S. equity markets has been the recent growth of SPAC IPOs, which raised a record \$92 billion in the first quarter of 2021 ([Chart 3.2.3.4](#)). SPAC IPOs slowed in the second and third quarters of 2021 after the SEC released communications highlighting investor protection issues, liability risks for sponsors and managers, and considerations on the accounting treatment of warrants. While SPACs provide a structure for increased participation in private company acquisitions, they are inherently speculative investments. Companies going public via SPACs are subject to limited due diligence, financial reporting, and disclosure requirements ([see Section 3.5.2.8](#)). SPACs have generally underperformed the broader market, with the IPOX SPAC Index trailing the S&P 500 by 24 percentage points year-to-date through September 30, 2021.

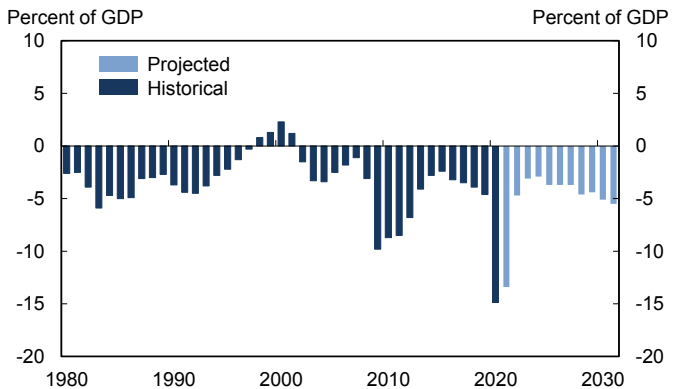
Outside the United States, global bourses have also generally rallied over the past year. Significant disparities in index composition, political developments, and COVID-19 vaccination efforts and related activity restrictions were key factors differentiating performance ([Chart 3.2.3.5](#)). Major indices in other advanced economies rallied in the first nine months of 2021 but continue to underperform U.S. indices. Within emerging markets, Chinese equities have notably underperformed in 2021, with the MSCI China Index and the Shanghai-Shenzhen CSI 300 Indices declining by 17 percent and 6.6 percent year-to-date, respectively. The underperformance of Chinese equities can be partly attributed to the broader regulatory clampdown in China and increased regulatory scrutiny in the U.S., including the 2020 Holding Foreign Companies Accountable Act, enhanced disclosure requirements, and the potential for delistings.

3.3 Government Finance

3.3.1 Treasury Market

Since early 2020, Congress has enacted several rounds of fiscal assistance to help mitigate the impact of COVID-19 and enable a robust recovery. These programs, which totaled \$5.8 trillion through September 2021, have pushed the primary deficit and the amount of public debt outstanding to recent highs ([Charts 3.3.1.1, 3.3.1.2](#)). In July 2021, the Congressional Budget Office projected that public debt would rise to 106 percent of GDP in 2031 as compared to 103 percent of GDP in 2021 and 66 percent of GDP in 2011. While the credit ratings for U.S. sovereign debt published by Standard & Poor's (S&P), Moody's, and Fitch have remained unchanged at AA+, Aaa, and AAA, respectively, Fitch revised its outlook from stable to negative in 2020, citing the deterioration in U.S. public finances and the absence of a credible fiscal consolidation plan.

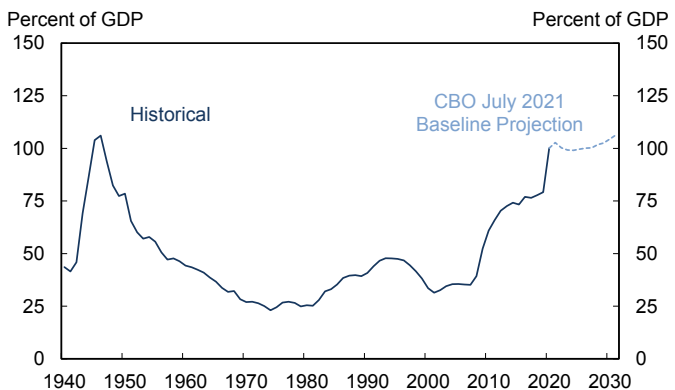
3.3.1.1 Federal Budget Surplus/Deficit



Source: CBO, Haver Analytics

Note: Data for fiscal years. Years after 2020 are projected as of July 2021.

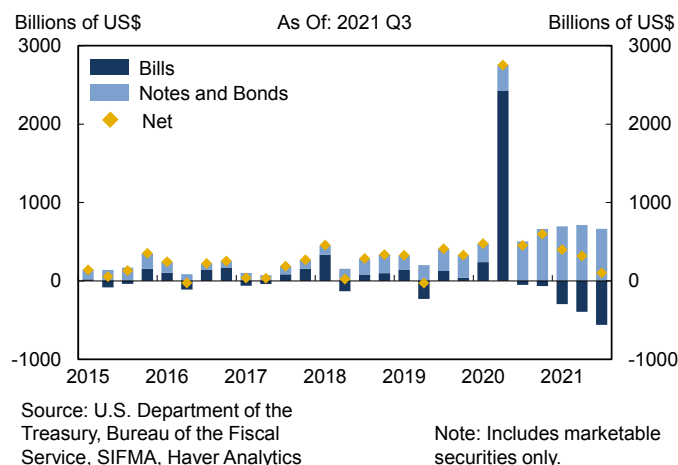
3.3.1.2 Federal Debt Held by the Public



Source: CBO, Haver Analytics

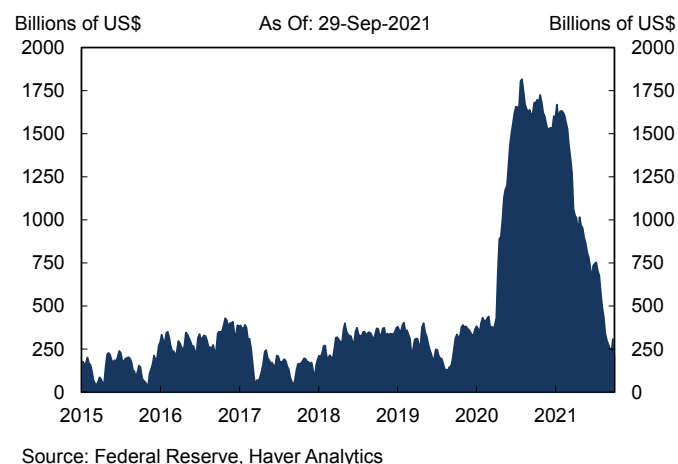
Note: Data for fiscal years. Years after 2020 are projected.

3.3.1.3 Net Issuance of Treasury Securities



At the beginning of the COVID-19 pandemic, Treasury issued a record amount of Treasury securities, with net issuance totaling \$2.8 trillion in the second quarter of 2020 ([Chart 3.3.1.3](#)). The increase in net issuance came primarily in the form of Treasury bills, which lowered the weighted average maturity of marketable debt from 69 months in March 2020 to 62 months in June 2020. At the same time, the Treasury General Account at the Federal Reserve increased significantly, as Treasury maintained a higher cash balance given the considerable uncertainty regarding the timing of COVID-19 related outlays relative to more normal periods ([Chart 3.3.1.4](#)). Net issuance of Treasury securities tapered off between the third quarter of 2020 and the third quarter of 2021. During this period, bill supply declined by \$1.4 trillion and coupon supply increased by \$3.2 trillion, as Treasury termed out its debt, which pushed the weighted average maturity of marketable debt to a multi-decade high of 72 months as of September 2021.

3.3.1.4 Treasury General Account Balance



The decline in Treasury bill supply came in anticipation of the reinstatement of the debt ceiling in August. In the fall, the yields on certain Treasury bills—maturing just past the date at which the Treasury estimated it would exhaust its extraordinary measures—were modestly elevated for a time, as investors reduced exposures to securities that could be at risk for delayed payments.

Between September 2020 and September 2021, foreign holdings of U.S. sovereign debt increased by 6.8 percent to \$7.6 trillion. European countries accounted for the majority of the increase in Treasury holdings. Over the past year, the European Union (EU), the United Kingdom (UK), and Switzerland increased holdings of Treasury securities by \$153 billion, \$138 billion, and \$41 billion, respectively. Japan continues to be the largest foreign holder of U.S. sovereign debt, with \$1.3 trillion in holdings as of September 2021. China, the second largest foreign holder of U.S. Treasury securities, has maintained its holdings at approximately \$1.0 trillion.

Longer-dated U.S. Treasury yields, which remained at historically low levels through 2020, rose in the first quarter of 2021, as investors adopted a more optimistic view of the U.S. economic recovery while pricing in higher expected inflation over the longer-term. Between December 31, 2020 and March 31, 2021, the yield on the 10-year Treasury rose by 81 basis points (**Chart 3.3.1.5**). Longer-dated Treasury yields largely stabilized in the second quarter before declining steadily, given reduced optimism on the pace of the economic recovery due to the spread of the COVID-19 Delta variant and Federal Reserve communication about the outlook for monetary policy. By September 30, 2021, the 10-year yield had fallen to 1.49 percent, a decline of 48 basis points from March 31, 2021. Shorter-dated Treasury yields remained anchored at or near the zero lower bounds since the start of the pandemic, with the yield on the 2-year Treasury standing at 0.28 percent as of September 30, 2021.

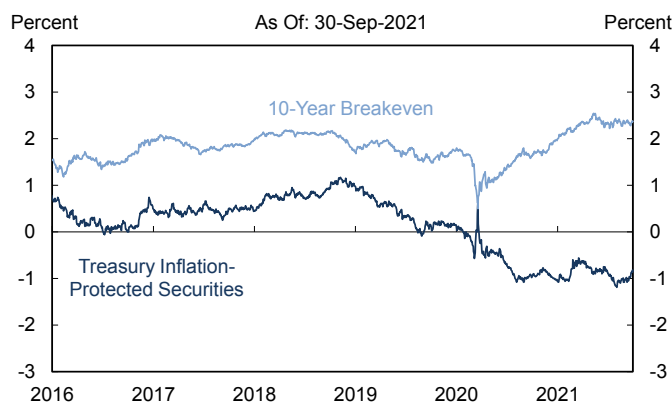
Real yields, which fell to historically low levels in 2020, were little changed on a year-over-year basis through September 2021 (**Chart 3.3.1.6**). The historically low yield on Treasury Inflation Protected Securities (TIPS), coupled with the increase in nominal yields, pushed the 10-year breakeven inflation rate to a multiyear high of 2.53 percent on May 11, 2021. The breakeven inflation rate has since declined to below 2.4 percent, as the decline in nominal yields over the summer outpaced the decline in real yields. While the breakeven rate can provide information about investors' inflation expectations, it is an imperfect indicator given that the breakeven inflation rate is also influenced by the risk premium.

3.3.1.5 U.S. Treasury Yields



Source: U.S. Department of the Treasury

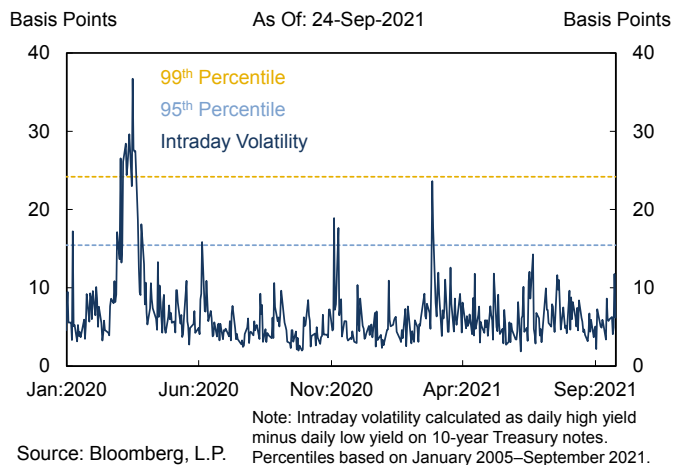
3.3.1.6 10-Year TIPS Yield and Breakeven



Source: U.S. Department of the Treasury

Note: Breakeven represents the difference between the nominal and TIPS yield.

3.3.1.7 Intraday Volatility for 10-Year Treasury Yields



Broadly speaking, U.S. Treasury market liquidity conditions have been relatively stable since the stress observed in the spring of 2020. However, on February 25, 2021, the Treasury market experienced an abrupt decline in liquidity conditions in conjunction with record high trading volumes, as market participants were reportedly repositioning. On the afternoon of the 25th, market liquidity deteriorated, and yields sharply spiked following a disappointing Treasury auction (**Chart 3.3.1.7**). While the event was short-lived, market depth did not fully recover for several weeks. Similar to previous episodes of diminished Treasury market liquidity, the February 25 event raised concerns regarding Treasury market resilience.

Box A: IAWG Work on Treasury Market Resilience

The Treasury market is the deepest and most liquid fixed income market in the world. In recent years there have been several episodes in which liquidity abruptly deteriorated. These events are important to consider given the Treasury market's growing size and its critical importance for both the official and private sectors. For example, by issuing Treasury securities, the Treasury Department seeks to finance the government at the lowest cost to the taxpayer over time. The Federal Reserve uses the Treasury market to implement monetary policy and seeks efficient and effective transmission of its actions to the broader financial system. Treasury securities also support the broader financial system by serving as a source of safe and liquid assets that support the efficient, stable flow of capital and credit, and by establishing a benchmark credit-risk-free yield curve. To ensure that the Treasury market continues to reliably fulfill its crucial roles, the agencies responsible for overseeing the market are pursuing a program of analysis and policy reform to strengthen the resilience of Treasury market structure.

The Treasury market has multiple segments, including cash securities, repo, and derivatives. Different agencies have different regulatory responsibilities for the Treasury market and the agencies collaborate to ensure effective surveillance and coordinated policymaking in a group called the Inter-Agency Working Group for Treasury Market Surveillance (IAWG), which consists of staff from the Treasury, Federal Reserve, FRBNY, SEC, and CFTC. The joint staffs are analyzing specific policy steps that could strengthen the market. On November 8, 2021, the IAWG published a [Staff Progress Report](#) on the areas of focus.

While the Treasury market has experienced several recent episodes of stress, the market disruption in March 2020 in particular has been well documented, including in the Council's 2020 annual report. March 2020 was unique and unprecedented in nature, but has some commonalities with other recent market disruptions, including the October 2014 flash rally and the September 2019 repo market disruption. In February 2021, a similar disruption occurred amid a sudden and sizeable shift in investor positioning. The February 2021 liquidity disruption was relatively short-lived and did not require official sector intervention, but it shared common characteristics with the previous episodes including:

- A sudden decline in market depth and intermediation capacity;
- Abnormally high trading volumes associated with a shift in crowded investor positioning; and
- Lack of visibility by both the official sector and the broader market in terms of the flows that were driving the market disruption at the time.

The IAWG staffs have looked across these episodes and created principles that should guide public policy when pursuing improvements in Treasury market resilience including:

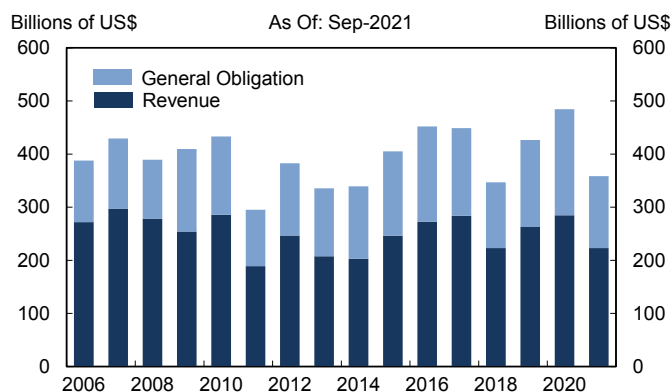
- Resilient and elastic liquidity;
- Transparency that fosters public confidence, fair trading, and a liquid market;
- Prices that reflect prevailing and expected economic and financial conditions;
- Economic integration across cash, funding, and derivatives markets;
- Financing that does not pose a significant threat to financial stability; and
- Infrastructure that operates effectively and efficiently.

With these established principles as a guide, the IAWG has identified workstreams for further study and policy considerations to improve Treasury market resilience and work towards better meeting the principles laid out above. These workstreams are considering:

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

The IAWG plans to take a comprehensive and collaborative approach to exploring these workstreams and evaluating potential next steps. These efforts will complement the Council's work on open-end mutual funds and hedge funds as well as align with the broad agenda laid out by the Financial Stability Board regarding core bond markets and nonbank financial intermediation.

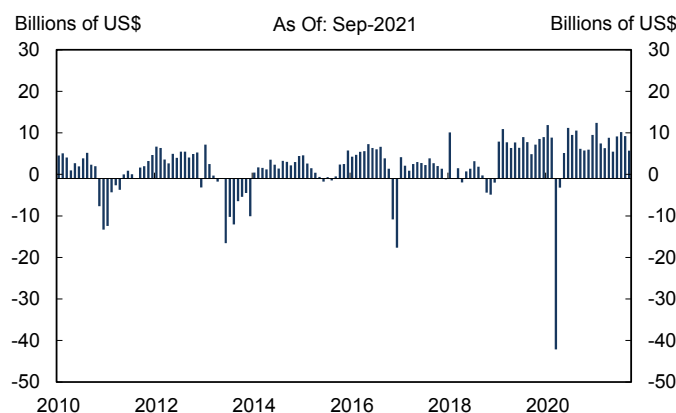
3.3.2.1 Municipal Bond Issuance



Source: Refinitiv, SIFMA

Note: Excludes maturities of less than 13 months. 2021 figures are through September.

3.3.2.2 Municipal Bond Mutual Fund Flows



Source: ICI, Haver Analytics

Note: Net fund flows.

3.3.2 Municipal Bond Market

Municipal bond issuers have taken advantage of strong market conditions over the past year to issue debt at or near record high volume. Accommodative financing conditions were supported by the improvement in the economic outlook, inflows to municipal bond funds, and a low interest rate environment.

Municipal debt issuance reached \$359 billion during the first nine months of 2021, following a record annual issuance of \$485 billion in 2020 (**Chart 3.3.2.1**). New money issuance totaled \$236 billion in the first nine months of 2021, up 20 percent compared to the first nine months of 2020. The shift toward new money bonds came as increased federal aid and improved revenue forecasts led state and local authorities to greenlight new projects, including projects to address aging critical infrastructure. The issuance of municipal bonds as taxable debt has increased significantly over the past few years, reaching a high of 31 percent of municipal bonds issued in 2020, partly attributable to changes to the tax code in 2017 that prohibited tax-exempt advance refunding. While still at historically high levels, during the first nine months of 2021, taxable debt issuance dropped to 24 percent of all new municipal offerings, likely due in part to the shift toward new money bond issues as well as increased use of forward delivery tax-exempt debt to effect refinancings as an alternative to taxable advance refundings.

The strong pace of municipal bond issuance has been supported by municipal bond funds, the largest institutional buyer of municipal securities. These funds have seen robust inflows since mid-2020, following very large but short-lived outflows at the onset of the pandemic. Cumulative net inflows totaled \$75 billion in the first nine months of 2021, the highest level in over 15 years, following \$39 billion in cumulative net inflows over 2020 (**Chart 3.3.2.2**).

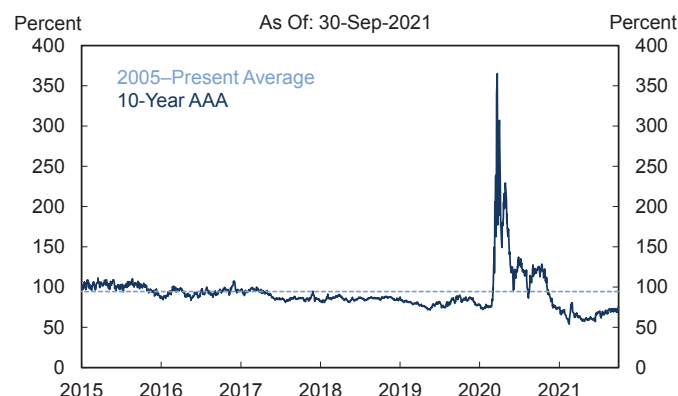
Municipal borrowing costs have fallen, and spreads fell to historically low levels through the first nine months of 2021. The ratio of 10-year AAA-rated general obligations to 10-year

Treasury yields, which spiked to 340 percent in March 2020, was reported at 74 percent as of September 30, 2021 (Chart 3.3.2.3). The sharp tightening of spreads can be partly attributed to steps taken by the Federal Reserve that helped restore investor confidence, including the announcement that it would expand the Money Market Mutual Fund Liquidity Facility (MMLF) and the Commercial Paper Funding Facility (CPFF) to accept certain short-term municipal securities as eligible collateral, and that it would create the Municipal Liquidity Facility (MLF). In light of the significant improvement in borrowing conditions, participation in the MLF was ultimately limited and the MLF ceased purchasing notes on December 31, 2020. Only the state of Illinois and the Metropolitan Transportation Authority of New York accessed the facility.

Municipal revenue growth has rebounded sharply through the second quarter of 2021 (Chart 3.3.2.4). Revenue had contracted in the second quarter of 2020 amid delayed tax filings and an abrupt contraction in economic activity. Over the past year, expectations for continued negative fiscal impacts from COVID-19 have significantly subsided, in light of the vaccine-led economic reopening and federal fiscal support for households from the CARES and ARP Acts. Higher property values have also lifted revenues through greater property tax intakes. Revenue losses were also ultimately limited partly by the pandemic's disproportionate impact on lower-wage earnings and services consumption, which tend to account for a smaller share of state and local revenue.

Aggregate reserve fund balances have declined only slightly through fiscal year 2021 compared to the record high reached in 2019, according to the National Association of State Budget Officers. States were able to keep reserve funds relatively stable in aggregate by relying on unassigned surpluses, spending cuts, hiring freezes, and support provided by the CARES Act to offset pandemic spending needs. The ARP Act also included \$350 billion of direct aid to state, local, territorial, and tribal governments.

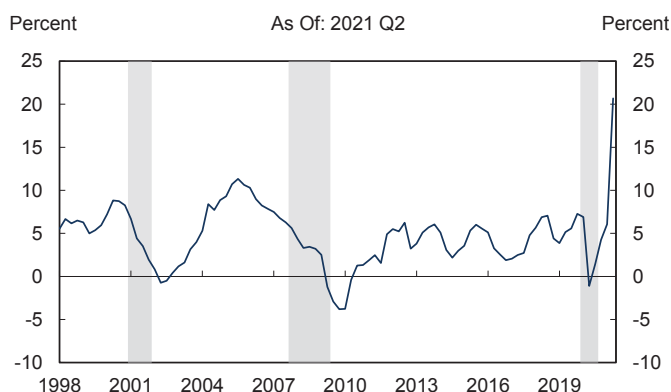
3.3.2.3 Municipal Bonds to U.S. Treasuries



Source: Municipal Market Advisors, Bloomberg, L.P.

Note: Percentage of municipal yields against equivalent Treasury yields. Bloomberg's BVAL AAA Benchmark replaced MMA as the provider for municipal yields on September 1, 2010.

3.3.2.4 Changes in State and Local Government Tax Revenues



Source: U.S. Census Bureau, Haver Analytics

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

Downgrades in the municipal sector have been limited, in light of the relatively steady reserve fund balances and the rapid recovery in revenue. The relatively slow pace of rating downgrades may also be partly attributed to the forward-looking nature of credit ratings. In 2020, downgrades represented 4 percent of Fitch's credit reviews, while S&P downgraded approximately 4 percent of its municipal ratings universe. Rating agencies have reversed the negative ratings outlook for most municipal sectors. While the recent rebound in invested asset prices supported improved pension funding ratios, longer-term challenges around pension and retiree health care liabilities remain a concern in the market. In addition, the pandemic and the emergence of the Delta variant continue to raise uncertainty about commuting patterns, hospitality, and tourism.

Public sector employment declined sharply despite the rebound in revenues. State and local employment fell by 1.4 million people, or 6.9 percent, from February 2020 to February 2021, due to pessimistic budget forecasts and reduced hiring needs. Social distancing restrictions and school closures disproportionately impacted workers in the education sector, including K-12 schools and higher education institutions. While state and local employment has since rebounded, it remains below pre-pandemic levels through September 2021.

Despite initial concerns regarding pension funding at the onset of the COVID-19 pandemic, most state and local employers met their pension contribution requirements. According to the Pension Plan Database, approximately three-quarters of funds have met or exceeded their actuarially determined employer contribution requirement in fiscal year 2020.

Puerto Rico

The fiscal crisis of Puerto Rico remains distinctive in a sector with few defaults historically. The Puerto Rico debt adjustment process has continued over the past year.

The Puerto Rico Oversight, Management, and Economic Stability Act (PROMESA), enacted in June 2016, established the Financial Oversight and Management Board for Puerto Rico (FOMB).

The FOMB has the authority to designate Puerto Rico instrumentalities to be subject to its oversight. Further, the FOMB has the authority to file and litigate bankruptcy-like cases on behalf of the Commonwealth or any covered territorial instrumentality. Debt restructuring cases filed under Title III of PROMESA remain pending for the Commonwealth and certain other Puerto Rico instrumentalities.

The FOMB has filed a number of proposed Plans of Adjustment to adjust the debts of the Commonwealth of Puerto Rico, including a proposed resolution of Puerto Rico's pension liabilities during the pendency of the Commonwealth's PROMESA Title III case. The FOMB filed a Modified Eighth Amended Plan of Adjustment for the Commonwealth on November 7, 2021. This Modified Eighth Amended Plan of Adjustment includes a post-debt adjustment debt sustainability analysis for Puerto Rico. If approved, it would reduce over \$33 billion of Commonwealth and instrumentality debt claims to approximately \$18 billion of cash payments and new debt instruments, in addition to payments from contingent value instruments.

The PROMESA Title III case of the Puerto Rico Electric Power Authority (PREPA) also remains pending as of September 2021. PREPA's 2021 Fiscal Plan requires it to transfer management of its main operating assets to private service providers. A service contract for PREPA's transmission and distribution system began in June 2021 by LUMA Energy, a consortium of U.S. and Canadian private corporations. PREPA is currently engaged in the selection process for a private operator for some of its generation assets.

The Commonwealth's 2021 Fiscal Plan, certified by the FOMB, projects real economic growth to average 0.4 percent annually over the next eight years, mostly due to various forms of federal assistance. This projected economic growth, in combination with required fiscal measures and structural reforms, are expected to contribute to an average annual pre-debt service surplus of \$1.3 billion over the next five years, up from an expected \$578 million in the 2020 Fiscal Plan.

General fund collections by the Commonwealth fell sharply at the onset of the pandemic but have since rebounded. General fund collections were 2.6 percent higher in fiscal year 2021 (ended June 30, 2021) compared to 2019. The 2021 Fiscal Plan forecasts that outmigration, rising healthcare costs, and the phase-out of federal aid will lead to annual deficits starting in 2036—five years later than projected in the 2020 plan.

3.4 Financial Markets

3.4.1 Wholesale Funding Markets: Unsecured Borrowing

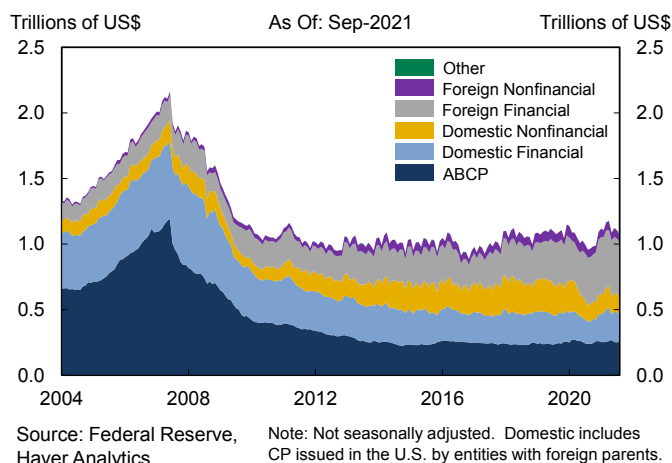
Commercial Paper

The commercial paper (CP) market is an important source of unsecured funding for financial and nonfinancial companies to meet current operating needs. CP is a financial instrument with maturity up to 270 days, with approximately 80 percent of CP having a maturity of less than 21 days. Firms relying on the CP market for funding are susceptible to changing market conditions during the rollover period. In mid-March 2020, the U.S. CP market was severely disrupted amid economic uncertainty arising from the COVID-19 pandemic. Federal Reserve actions, including the establishment of the Commercial Paper Funding Facility (CPFF) on March 17, 2020, helped stabilize the CP market, and firms have since been able to roll-over debt at favorable terms.

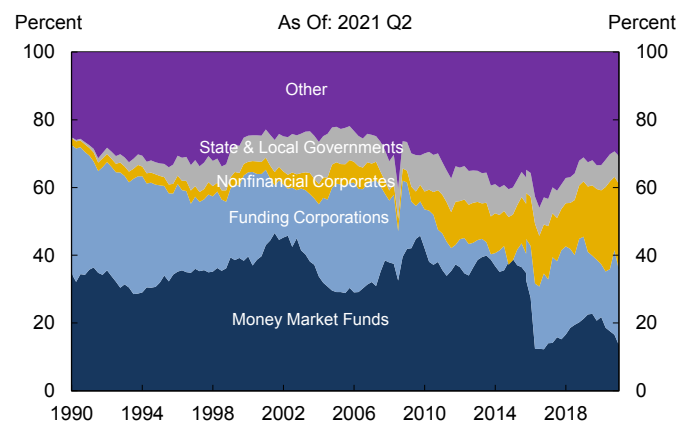
The size of the CP market declined in the months following the initial COVID-19 market shock, with total CP outstanding falling by \$88 billion, or 8.4 percent, between year-end 2019 and September 2020 (**Chart 3.4.1.1**). Issuances have since picked up, and by September 2021, the total amount of CP outstanding totaled \$1.1 trillion, up 12 percent from September 2020 as investors' appetite for CP improved.

Since year-end 2019, there has been a significant shift in the composition of CP outstanding. The share of CP outstanding issued by domestic nonfinancial companies steadily declined from 19 percent at year-end 2019 to 11 percent as of September 2021. In

3.4.1.1 CP Outstanding by Issuer Type

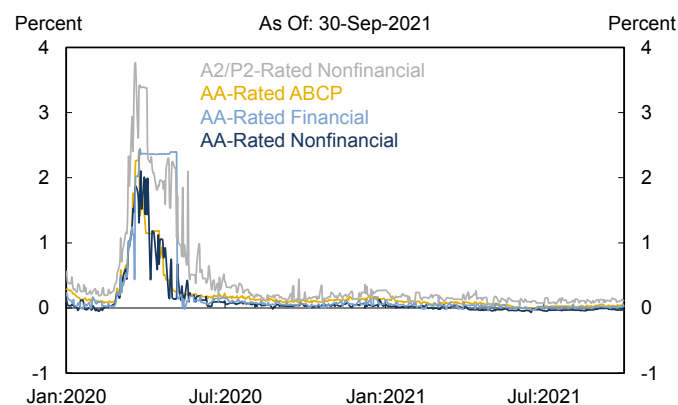


3.4.1.2 CP Investors



contrast, foreign financial companies, which are the largest issuers of CP, saw their share of the CP outstanding increase from 31 percent to 40 percent over the same period. This reflects a longer-term trend of foreign financial companies increasing their usage of the U.S. CP market to meet their dollar funding needs. For comparison, foreign financial companies accounted for 9.1 percent of the CP market at the end of 2005. The share of CP market issued by other participants has remained fairly stable over the past two years, and as of September 2021, asset-backed commercial paper (ABCP), domestic financial, and foreign nonfinancial issuers accounted for 24 percent, 19 percent, and 5.6 percent of the CP market, respectively.

3.4.1.3 3-Month CP Interest Rate Spreads



The CP investor base is diverse, with financial and nonfinancial corporations, state and local authorities, MMFs, and other investment vehicles all participating in the CP market ([Chart 3.4.1.2](#)). While MMFs' share has declined considerably since the implementation of MMF reforms in 2016, they are still among the largest investors in the CP market. In March 2020, prime MMFs sought to reduce CP holdings and raise cash in response to realized and expected investor redemptions ([see Section 3.5.2.3](#)). After the establishment of the CPFF and the MMLF, conditions among prime MMFs stabilized. Funds have maintained a fairly stable share of assets invested in CP.

Ample liquidity conditions, particularly for financials, and strong investor demand are reflected in the low spreads of the 90-day CP rate to the overnight index swap (OIS) rate ([Chart 3.4.1.3](#)). Over the past year, the quarterly average spreads on 90-day AA Nonfinancial CP declined from 3 to -3 basis points, spreads on 90-day A2/P2 Nonfinancial CP declined from 24 to 11 basis points, and spreads on 90-day AA Financial CP narrowed from 6 to 2 basis points.

Bank Deposits

Deposits can be a stable source of funding for banks, although the stability of different types of deposits can vary. Rate sensitive deposits,

such as brokered certificates of deposit (CDs), listing service deposits, and large-denomination deposits, are considered riskier sources of funding than retail deposits because balances can be volatile if customers find more appealing rates elsewhere. Credit sensitive deposits, such as uninsured deposits and municipal deposits, may also be a riskier source of funding because balances can be volatile if customers have concerns about the credit quality of the bank.

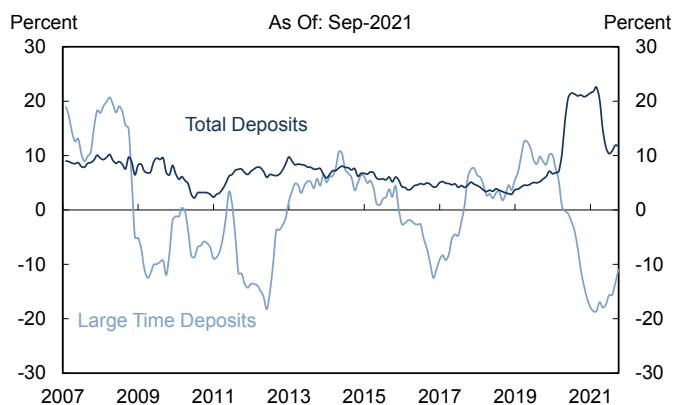
Since the start of the pandemic, total deposits at U.S. commercial banks have grown significantly. Total deposits at U.S. commercial banks increased by \$2.9 trillion in 2020 and a further \$1.4 trillion in the first nine months of 2021 to stand at nearly \$18 trillion as of September 2021. Much of the increase in bank deposits was driven by insured retail deposits and operational corporate deposits, which are relatively stable sources of funding. In contrast, large time deposits, which include wholesale CDs, declined by over 11 percent on a year-over-year basis through September 2021 ([Chart 3.4.1.4](#)). The increase of bank deposits, coupled with the shift in the composition of bank deposits, has likely resulted in a more stable funding base.

3.4.2 Wholesale Funding Markets: Secured Borrowing

The repo market is an important source of secured financing for dealers and other financial institutions and is an important venue for the implementation of monetary policy. Well-functioning repo markets support liquidity and price discovery in cash markets, helping to improve the efficient allocation of capital and to reduce the funding costs of firms in the real economy. However, firms reliant on repo financing may be vulnerable to funding shocks, particularly during periods of market stress.

Repo borrowing, as reported in the Financial Accounts of the United States, totaled \$4.8 trillion as of the second quarter of 2021, up from \$4.1 trillion a year earlier. The market consists of two main segments: tri-party repo, in which settlement occurs within the custodial accounts of a clearing bank, and bilateral

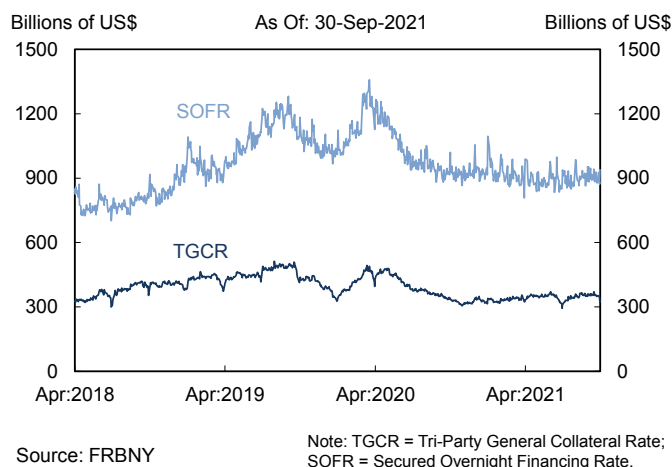
3.4.1.4 Commercial Bank Deposit Growth



Source: Federal Reserve

Note: Year-over-year percentage change.

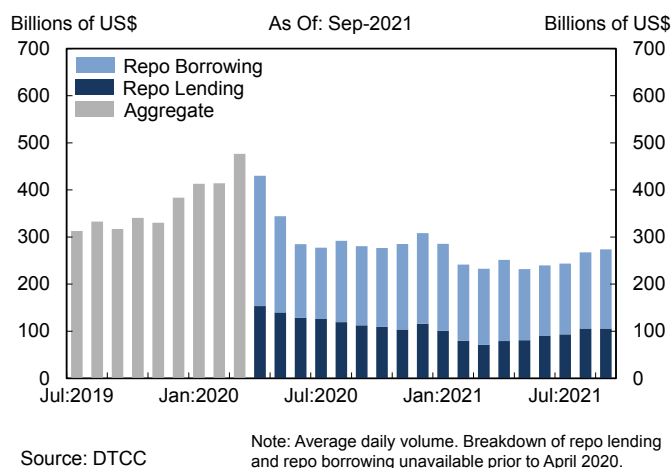
3.4.2.1 Repo Volumes



repo, which typically refers to all activity not settled within the tri-party system, including bilateral repo transactions cleared through the Fixed Income Clearing Corporation (FICC) and bilateral repo that is not centrally cleared. Primary dealers, which are trading counterparties of FRBNY, are active in both segments of the market, and often act as borrowers in the tri-party segment, and both borrowers and lenders in the bilateral segments.

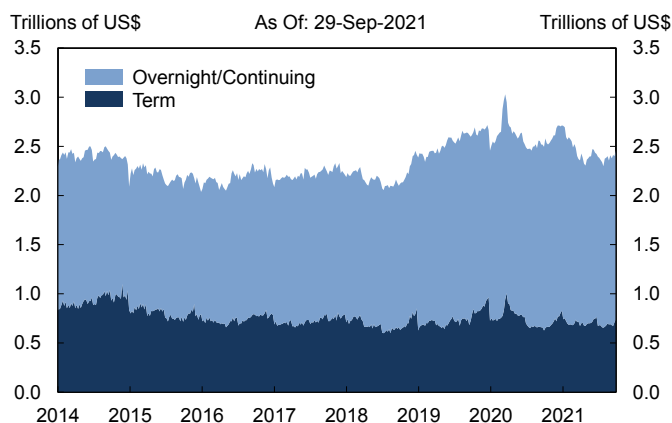
SOFR and Tri-party General Collateral Rate (TGCR) volumes, which temporarily spiked at the onset of the pandemic, have remained relatively steady over the past year (**Chart 3.4.2.1**).¹ Similarly, the total volume at FICC's sponsored repo service, which is a subset of SOFR volume, has declined from its March 2020 peak and is now below pre-pandemic levels (**Chart 3.4.2.2**). Sponsored repo allows cash lenders, such as MMFs, and repo borrowers, such as hedge funds, to participate in the FICC-cleared bilateral segment. The service also allows sponsoring members to minimize balance sheet usage by netting their repo lending and borrowing. While clearing sponsors guarantee sponsored members obligations, the growth of sponsored repo increases overall market exposure to FICC as a central counterparty.

3.4.2.2 Sponsored Repo Activity



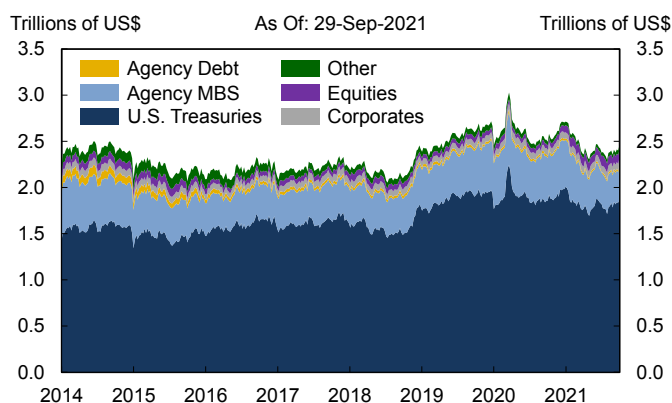
Primary dealer cash borrowing in the repo market stood at \$2.4 trillion as of September 29, 2021, largely unchanged from the previous year (**Chart 3.4.2.3**). Of this borrowing, over 90 percent was collateralized by Treasuries or agency MBS (**Chart 3.4.2.4**). Focusing on the aggregate tri-party market, where primary dealers are the main borrowers, 86 percent of repo transactions were backed by Treasuries or agency MBS at the end of September 2021. Median haircuts on collateral used in tri-party repo transactions were relatively flat for the year across most collateral classes.

3.4.2.3 Primary Dealer Repo Agreements



Source: FRBNY, Haver Analytics

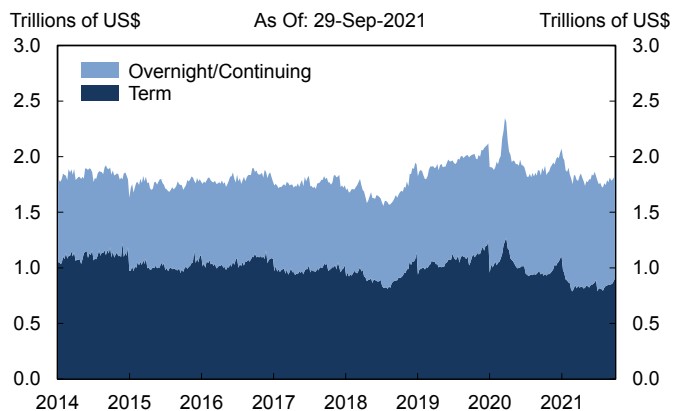
3.4.2.4 Primary Dealer Repo Collateral



Source: FRBNY, Haver Analytics

Note: U.S. Treasuries includes TIPS. Other includes ABS.

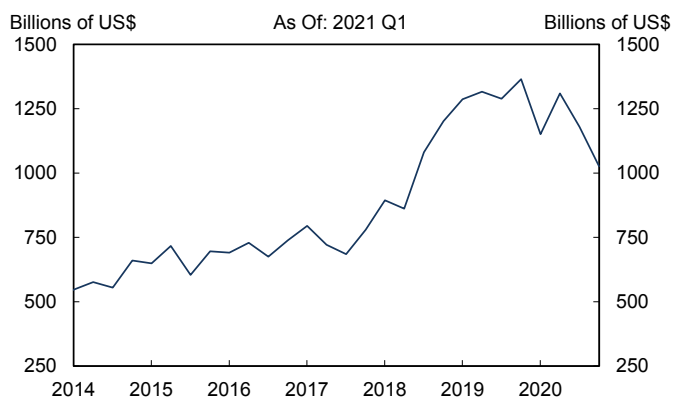
3.4.2.5 Primary Dealer Reverse Repo Agreements



Source: FRBNY, Haver Analytics

Similarly, cash lending by primary dealers in the repo market (reverse repo) was unchanged over the past year, totaling \$1.9 trillion on September 29, 2021 (**Chart 3.4.2.5**). However, the share of primary dealer reverse repo that is lent overnight has continued to increase, and as of the end of September 2021, overnight repo lending accounted for 51 percent of outstanding reverse repo agreements compared with 39 percent five years prior. Primary dealers typically lend to leveraged investors, such as hedge funds, in the segment of the bilateral repo market that is not centrally cleared. Hedge fund repo borrowing declined from its pre-pandemic peak, but remained elevated in the aftermath of the March 2020 market stress. As of the first quarter of 2021, hedge funds' repo borrowing totaled \$1.0 trillion (**Chart 3.4.2.6**).

3.4.2.6 Repo Borrowing of Qualifying Hedge Funds



Source: SEC Form PF Statistics Report

Note: Repo borrowing as reported on Question 43 of Form PF.

Over the past year, repo market rates were low and stable, in part because of the ample liquidity in funding markets (**Chart 3.4.2.7**). Participation at the Federal Reserve's Overnight Reverse Repurchase Agreement Facility (ON-RRP) has been high, with take-up in excess of \$1.6 trillion on September 30, 2021 (**Chart 3.4.2.8**). The increase in participation has largely been driven by MMFs, as the facility provides an alternative investment vehicle for MMFs amid the declining supply of Treasury bills and low money market rates.

On July 28, 2021, the Federal Reserve announced a Standing Repo Facility (SRF) and a permanent repo facility for foreign and international monetary authorities (FIMA repo facility), which are intended to support the effective implementation of monetary policy and smooth market functioning. The SRF allows primary dealers and eligible depository institutions to borrow in overnight repo backed by Treasury or agency securities. In March of 2020, the U.S. Treasury market experienced extraordinary volumes of selling by a broad range of investors, including foreign official accounts. To address global funding pressures that may affect U.S. financial conditions, the FIMA repo facility allows foreign central banks and international accounts to raise funds against their holdings of Treasury securities maintained in custody at the FRBNY. Both facilities will operate similar to the temporary operations that helped stabilize market functioning at the onset of the pandemic. The facilities should act as backstops in money markets to dampen upward pressures in repo markets that may spill over to the federal funds market, as was the case in September 2019.²

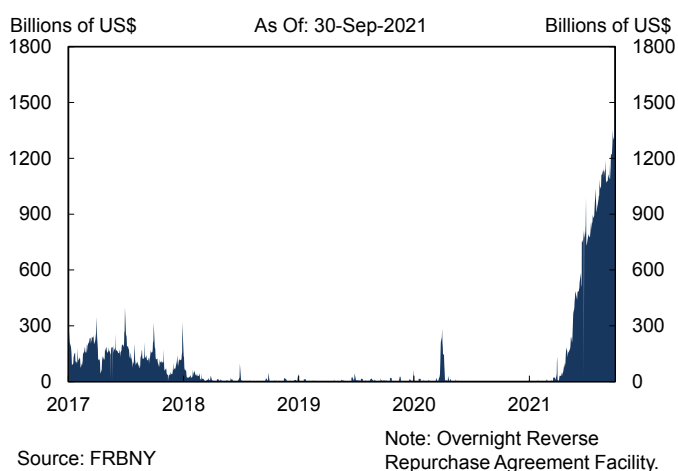
Wholesale Funding Markets: Securities Lending

Securities lending plays an important role in financial market functioning. Securities lending transactions involve the temporary transfer of a security by one party (the lender) to another (the borrower) in exchange for cash or non-cash collateral. In addition to broker-dealers using rehypothecated securities from customers' margin accounts for lending,

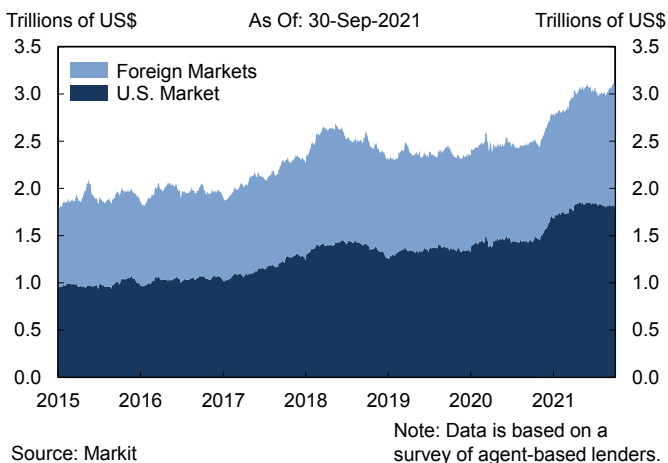
3.4.2.7 Repo Rates



3.4.2.8 ON-RRP Participation



3.4.2.9 Value of Securities on Loan



other lenders consist of large institutional investors, including mutual funds, pension plans, and insurers. Initial borrowers of securities are typically broker-dealers or banks. They generally do not retain borrowed securities, but re-lend them to the ultimate borrowers of securities, which include hedge funds, derivatives traders, and market makers. Lenders generally use a securities lending agent to facilitate loans, although some may lend securities directly to a borrower. Banks that specialize in providing custodial services for securities are the most common lending agents, and some asset managers also perform this function. For lenders, securities lending is generally used to enhance income. Lenders can generate additional income by receiving a fee from the transactions' borrowers or reinvesting the cash collateral if the borrower posts cash collateral. Most security lending arrangements allow the borrower to return the borrowed securities on short notice in exchange for the collateral posted.

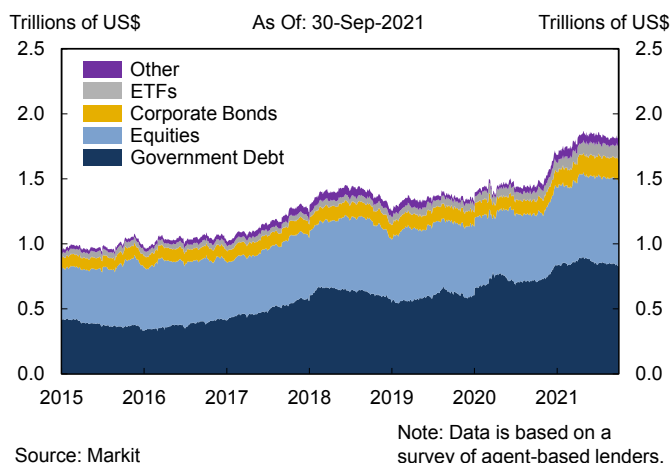
Centralized monitoring of securities lending activities is difficult due to the lack of comprehensive, standardized statistics on securities lending activities. Instead, data on the securities lending market is based on surveys. According to the Markit survey of agent-based lenders, the estimated value of securities on loan globally was \$3.1 trillion at the end of September 2021, up from \$2.5 trillion at the end of September 2020 ([Chart 3.4.2.9](#)). Most of the growth during the period occurred in the last quarter of 2020 and the first quarter of 2021, as equity markets experienced short squeezes and the demand for borrowing government bonds rose. U.S. securities continue to account for the majority of global securities on loan, accounting for 58 percent of global securities on loan as of the end of September 2021.

Equities and government bonds continue to account for most of the estimated value of securities on loan in the United States. As of September 30, 2021, government bonds totaled \$811 billion or 46 percent of securities on loan

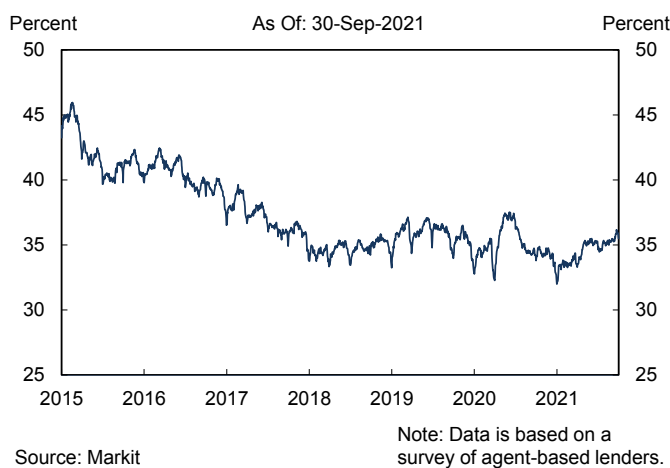
while equities totaled \$646 billion or 36 percent of the total amount of securities on loan (**Chart 3.4.2.10**). Notably, borrowers' use of cash collateral rose in 2021 after reaching a new low at the end of 2020. The estimated share of cash posted as collateral to borrow securities globally has stabilized slightly above 35 percent as of the end of September 2021 (**Chart 3.4.2.11**).

In the U.S., reinvestment of cash collateral from securities lending was estimated to be \$747 billion at the end of the second quarter of 2021, up from about \$649 billion at the end of the second quarter of the previous year (**Chart 3.4.2.12**). The mean and median weighted average maturity of cash reinvestment portfolios were reported at 70 days and 63 days in the second quarter of 2021, respectively.

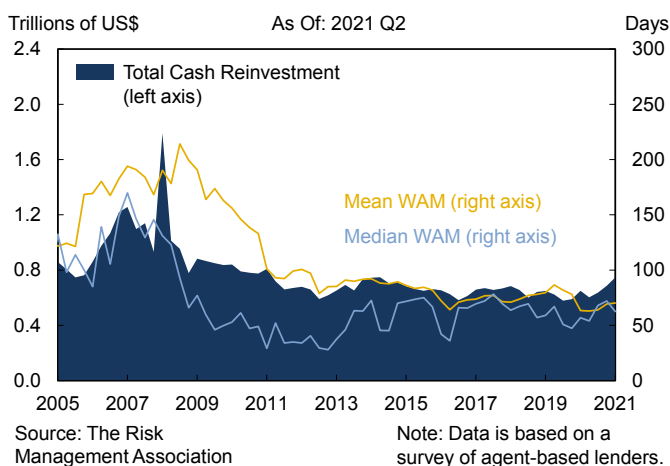
3.4.2.10 Value of U.S. Securities on Loan



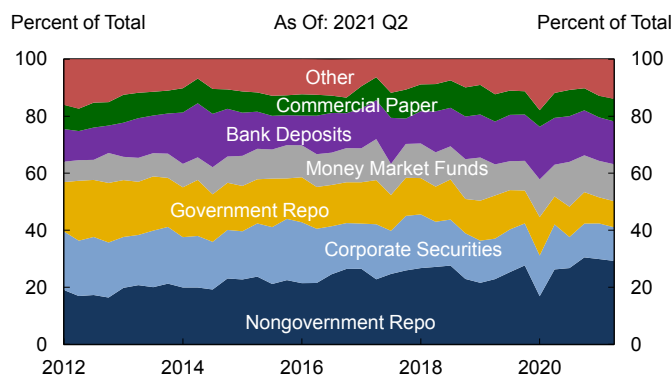
3.4.2.11 Securities Lending Cash Collateral



3.4.2.12 U.S. Securities Lending Cash Reinvestment



3.4.2.13 U.S. Securities Lending Cash Reinvestment Collateral

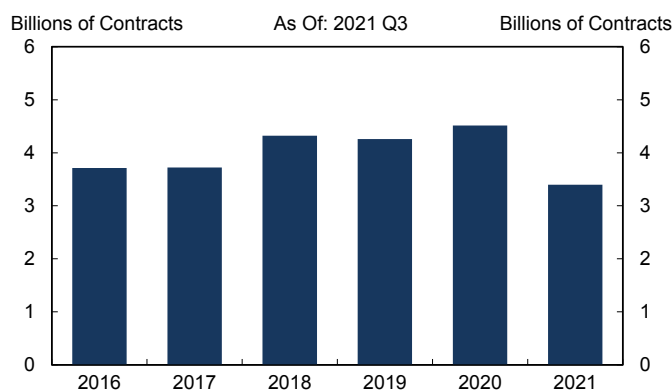


Source: The Risk Management Association, OFR

Note: Nongovernment repos have collateral of whole loans, equity, and corporate debt. Other includes ABS, funding agreements, other funds, and other vehicles. Data is based on a survey of agent-based lenders.

In terms of the composition of cash reinvestment portfolios, the estimated share allocated to repos backed by non-government collateral was 29 percent at the end of the second quarter of 2021, up from 26 percent at the end of the second quarter of 2020. This increase is mainly due to the rise of repo backed by equity and non-investment grade corporate collateral. The share of bank deposit and government repo fell to 15 percent and 9.2 percent, respectively, from 16 percent and 9.8 percent one year earlier. The estimated share of cash reinvestment portfolios allocated to CP declined to 8.0 percent at the end of the second quarter of 2021 from 8.7 percent at the end of the second quarter of 2020 (**Chart 3.4.2.13**).

3.4.3.1 U.S. Futures Markets Volume



Source: CFTC

Note: 2016–2020 figures represent full year volumes. 2021 figure represents year-to-date volume through September 30, 2021.

3.4.3 Derivatives Markets

3.4.3.1 Futures

The U.S. futures markets attract broad participation from domestic and international market participants seeking to hedge or manage risk and invest or speculate in U.S. markets. Commercial participants routinely use the commodity markets for hedging and risk management activities. Financial intermediaries and other non-commercial participants, who provide liquidity and order book depth in U.S. futures markets, have increased their participation.

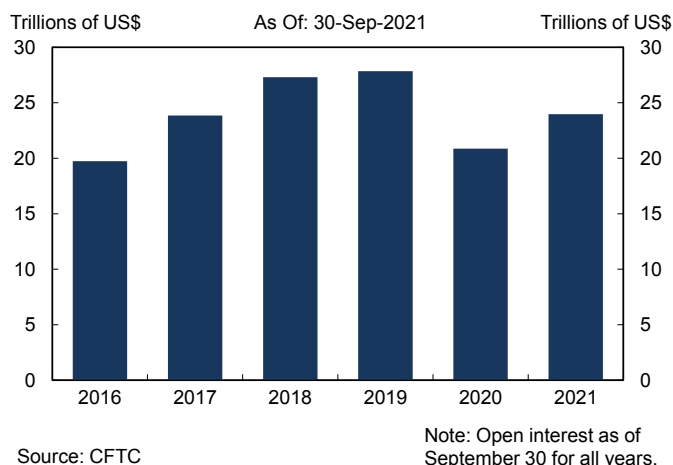
In 2020, a record 4.5 billion futures contracts were executed across all U.S. exchanges (**Chart 3.4.3.1**). 2021 volumes are on a similar pace, with 3.4 billion contracts traded through the first nine month of 2021. Interest rate futures continued to account for a large share of futures market activity, comprising approximately 38 percent of contracts traded to date in 2021. Equity index futures comprised 17 percent of total volume, and energy futures comprised 20 percent, notably in crude oil, gasoline, and natural gas. Agriculture, base metals, and industrial metal futures were each approximately 10 percent of total volume.

But using another measure of market activity, open interest, defined as the total notional amount of outstanding contracts, activity declined in 2020 (**Chart 3.4.3.2**). This decline

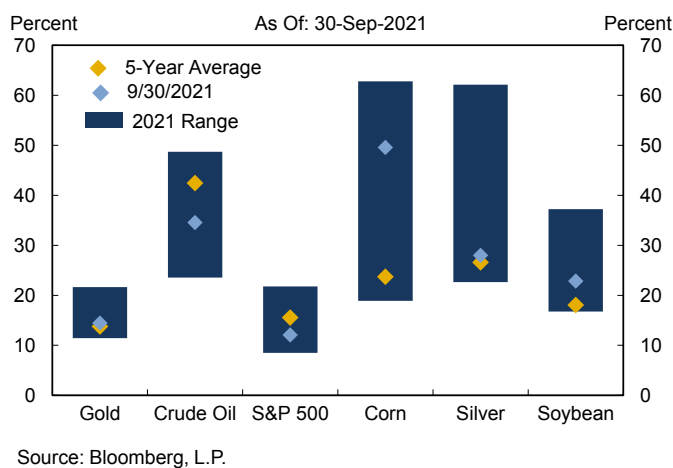
in open interest can be largely attributed to reduced open interest in short-term interest rate futures, which account for a disproportionate share the total notional amount outstanding. Between year-end 2019 and year-end 2020, open interest in Eurodollar futures declined by \$1.8 trillion. Open interest in Eurodollar futures and the broader futures market increased slightly in 2021 but remain below 2019 levels.

Volatility levels were elevated in 2021 for certain commodity futures. Realized volatility levels for agricultural futures, such as corn and soybean futures, were particularly elevated as these asset classes saw a record run-up in prices followed by fairly significant mean reversion (**Chart 3.4.3.3**). In contrast, realized volatility in S&P 500 futures was subdued relative to the past five years on average.

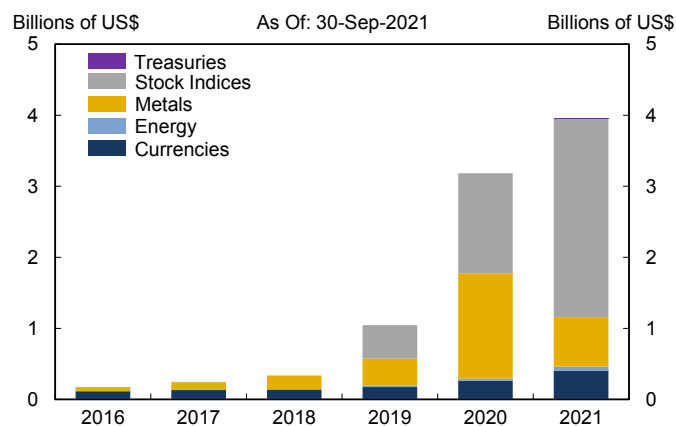
3.4.3.2 U.S. Futures Markets Open Interest



3.4.3.3 Futures 60-Day Historical Volatility



3.4.3.4 Micro Futures Contracts Open Interest



Source: CFTC

Note: Open interest as of September 30 for all years.

Smaller-sized “micro” futures have expanded significantly since 2018, particularly futures on stock indices, such as the S&P 500, Nasdaq 100, Dow Jones Industrial Average, or Russell 2000 indices ([Chart 3.4.3.4](#)). The Micro E-Mini S&P 500 and the Micro E-Mini Nasdaq 100 are now among the most actively traded futures contracts ([Chart 3.4.3.5](#)). However, when adjusted for contract size, micro futures’ trading volumes are still significantly lower than their larger E-mini counterparts. Dollar volumes for Micro E-Mini S&P 500 and Micro E-mini Nasdaq 100 futures were approximately 5.3 percent and 17 percent of E-mini contracts through the first nine months of 2021, respectively.

3.4.3.5 Futures Transaction Volume – Leaderboard

Futures Contract	Number of Contracts (YTD)
1. 3-Month Eurodollars	439 Million
2. 10-Year Treasury Notes	357 Million
3. E-Mini S&P 500 Stock Index	300 Million
4. 5-Year Treasury Notes	209 Million
5. WTI Crude Oil	183 Million
6. Micro E-Mini NASDAQ 100	174 Million
7. Micro E-Mini S&P 500 Index	161 Million
8. E-mini NASDAQ 100 Index	103 Million
9. U.S. Treasury Bonds	86 Million
10. 2-Year U.S. Treasury Notes	82 Million

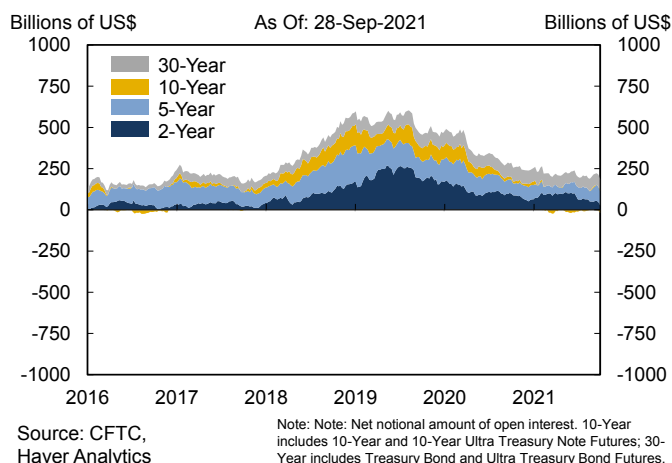
Source: CFTC

Note: Total futures volume through September 30, 2021.

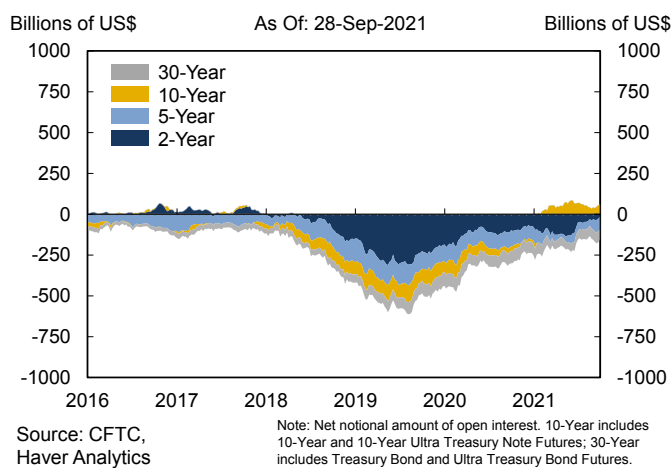
Positioning in Treasury Futures

In U.S. Treasury futures, asset managers and leveraged funds have significantly changed their positions over the past year (**Chart 3.4.3.6, 3.4.3.7**). Asset managers, including pension and other long-only unleveraged funds, have historically been long futures across the Treasury curve, while leveraged funds have been short futures across the curve. However, since the onset of the COVID-19 pandemic, asset managers have reduced their net long positions and in early 2021, these investors became net short in the 10-year for the first time since 2017. Similarly, leveraged funds have reduced their net short positions, and were net long the 10-year contract for much of 2021. For asset managers, one potential explanation for the positioning change is that with interest rates at the zero-lower bound, hedging demand has fallen. The decline in leveraged funds' net short positions can be partly attributed to an unwinding of the cash-futures basis trade since March 2020. Ample liquidity in the financial system has diminished the profitability of this trading strategy.

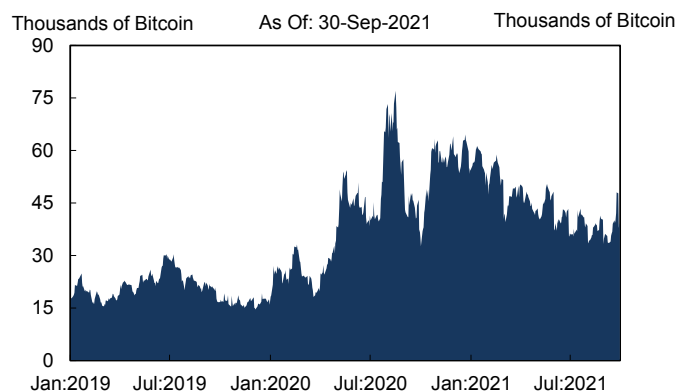
3.4.3.6 U.S. Treasury Futures Open Interest: Asset Manager



3.4.3.7 U.S. Treasury Futures Open Interest: Leveraged Funds



3.4.3.8 CME Bitcoin Futures Open Interest



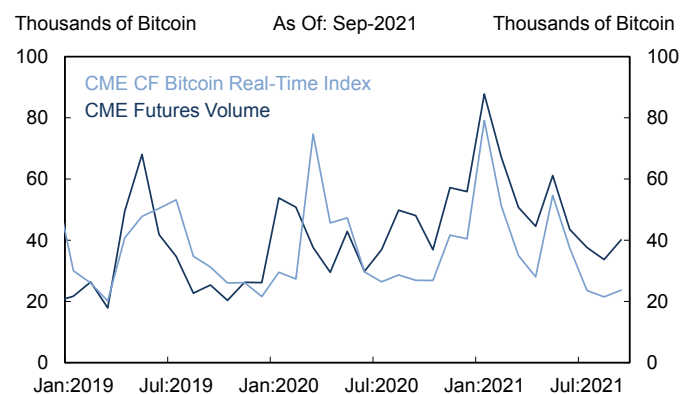
Source: Bloomberg, L.P.

Note: Includes Bitcoin Futures and Micro Bitcoin Futures contracts. Open interest converted into Bitcoin equivalents using respective futures contract units.

Digital Asset Futures

U.S.-regulated digital asset futures and options markets have expanded over the last several years, both in terms of open interest and volumes as well as in terms of the number of product offerings. However, open interest in Chicago Mercantile Exchange (CME) Bitcoin futures generally declined over the first nine months of 2021 (**Chart 3.4.3.8**). Similarly, CME Bitcoin futures volumes declined over the same period, with levels comparable to spot exchange volumes reported by underlying exchanges that determine the CME CF Bitcoin Real-Time Index, to which the futures contracts settle (**Chart 3.4.3.9**). Volatility in bitcoin futures markets remains elevated relative to other asset classes.

3.4.3.9 Bitcoin Futures and Reference Index Volume



Source: Bloomberg L.P.,
Bitcoin.org

Note: Average daily volume. Includes CME Bitcoin and Micro Bitcoin volumes converted into bitcoin equivalents. Spot volumes are Bitcoin/USD pairs from underlying spot exchanges referenced by the CME CF Bitcoin Real-Time Index.

Emission & ESG Futures

During the past few years, emission and environmental, social, and governance (ESG) derivatives markets have grown rapidly as several state and regional carbon cap-and-trade markets have been established and investors have sought ESG products (**Chart 3.4.3.10**). Designated contract markets (DCMs) have listed over 100 emissions futures contracts and the number is expected to continue to increase. Another significant development is the growth of ESG index futures. As of September 2021, ESG index futures exceeded \$3.1 billion in notional value (**Chart 3.4.3.11**).

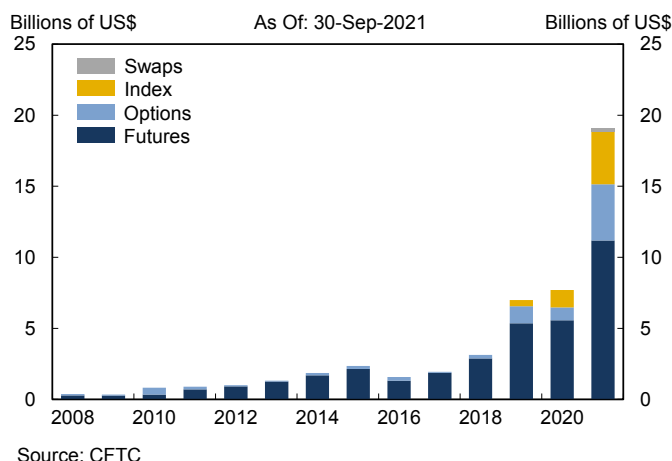
3.4.3.2 Exchange-Traded Options

Equity Options

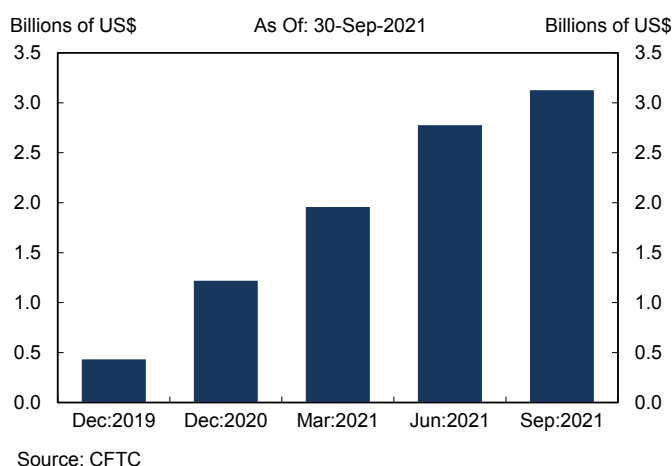
There are sixteen registered national securities exchanges that list and trade standardized equity options. Transactions in securities-based standardized options are all centrally cleared by the Options Clearing Corporation, which is the issuer and guarantor of each standardized options contract. Because Options Clearing Corp. generally only accepts exchange-traded contracts for clearing, standardized options only trade on exchanges. In addition to standardized options, bespoke options trade over-the-counter (OTC) on a bilateral basis, but generally are not centrally cleared.

The volume of activity in exchange-traded equity options has been volatile over the past year. Average daily volume of exchange-traded equity options peaked early in the year, reaching a record high of 31 million contracts in January 2021 (**Chart 3.4.3.12**). Some reports indicate that the increase in volume was driven, in part, by an increase in retail investor participation. Broker-dealers enhanced options trading offerings, including mobile app-based trading, and lowered or eliminated trading commissions. Some of the increase in volume was also attributable to options on “meme stocks” that attracted considerable social media attention in January and February 2021, with many experiencing elevated trading volume and increasing share prices that exceeded broader market movements.

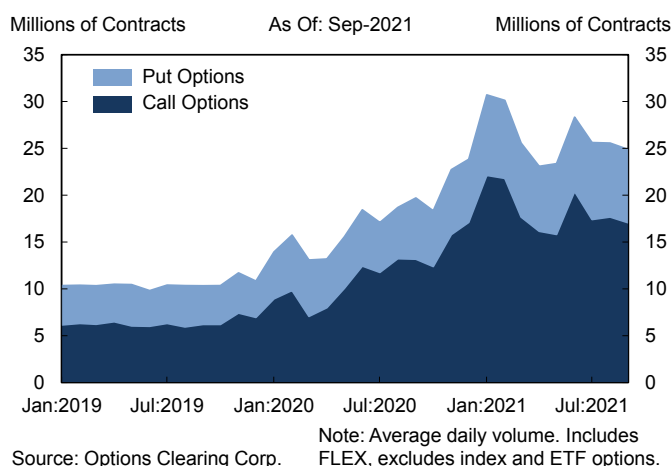
3.4.3.10 Growth of USD ESG and Emissions Derivatives Markets



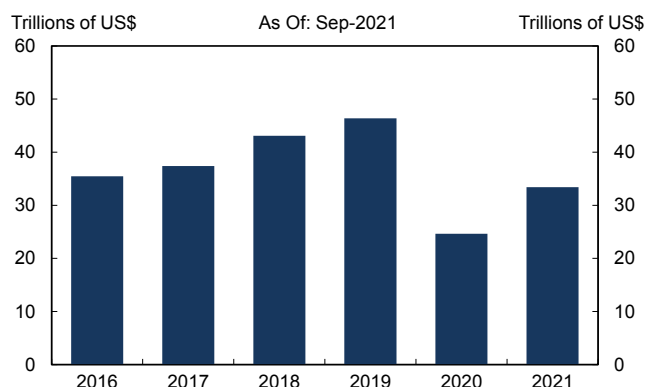
3.4.3.11 Growth of the ESG Indices Futures Markets



3.4.3.12 Exchange-Traded Equity Option Volume

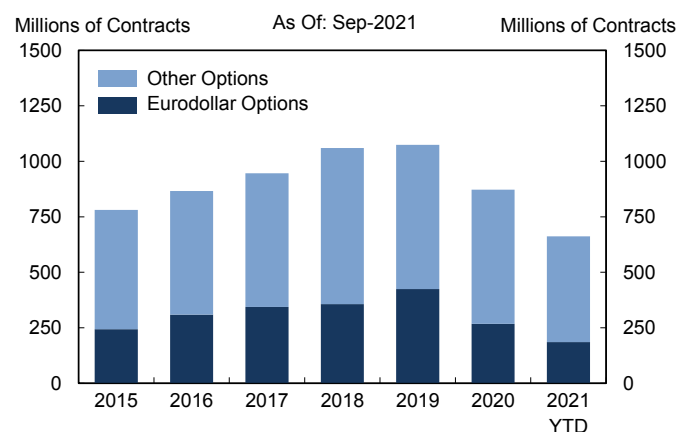


3.4.3.13 Options on Futures: Open Interest



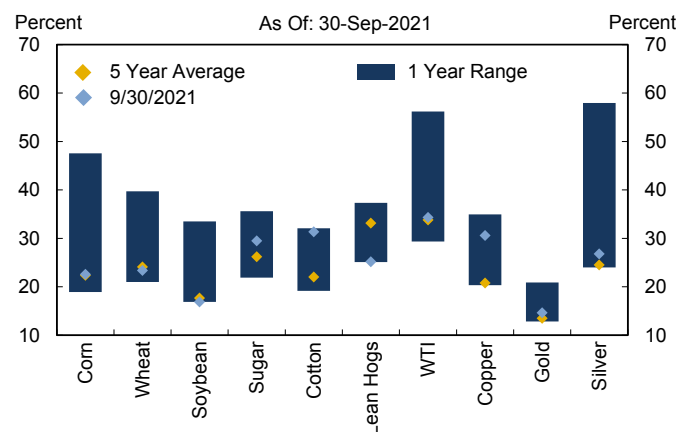
Source: CFTC

3.4.3.14 Options on Futures: Volume



Source: CFTC

3.4.3.15 3-Month Implied Volatility for Select Commodities Options



Source: Bloomberg, L.P.

While overall volume has stabilized during the first nine months of 2021, it remains significantly above pre-pandemic levels. Total exchange-traded equity option volume, excluding options on ETFs and index options, was 255 percent higher in the first nine months of 2021 compared to the first nine months of 2019. As of July 30, 2021, there were over 4,200 equity securities underlying exchange-traded equity options and over 4,300 series listed for trading. Options Clearing Corp. required approximately \$116 billion in total initial margin as of the second quarter of 2021, compared to \$76 billion in the second quarter of 2020.

Options on Futures

Over the past five years, open interest for U.S. options on futures averaged approximately \$37 trillion on a non-delta adjusted basis ([Chart 3.4.3.13](#)). Notional exposures to options on futures are concentrated in the highly liquid benchmark CME 3-month Eurodollar interest rate contract. Options on futures volumes fell in 2020, which can be primarily attributed to a decline in Eurodollar futures amid prospects for a continued low-rate environment. Volumes are on pace to be slightly higher in 2021 but Eurodollar option volumes remain subdued given the low-rate environment ([Chart 3.4.3.14](#)).

The implied volatility in agricultural commodity options was slightly elevated but within historic norms despite weather and supply chain disruptions over the past year ([Chart 3.4.3.15](#)). The range of implied volatility for silver contracts was unusually wide due to the spike in retail trading in February and March of 2021.

3.4.3.3 OTC Derivatives

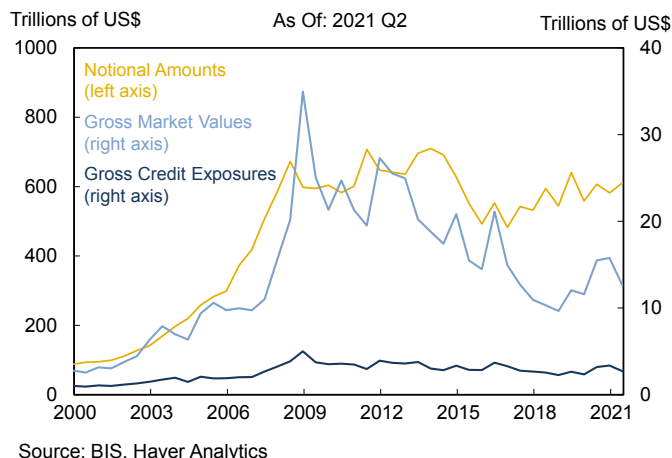
Global OTC Derivatives Markets

As of June 2021, the notional amount of global OTC derivative positions totaled \$610 trillion, a 0.5 percent increase compared to June 2020 (**Chart 3.4.3.16**). At the same time, the gross market value of OTC derivatives, which measures the amounts at risk, fell to \$13 trillion as of June 2021, an 18 percent decrease over the year. Interest rate derivatives, which accounted for 80 percent of derivatives on a notional basis and 71 percent of derivatives on a gross market value basis, saw the largest decrease in gross market value. Gross credit exposures, which adjust gross market values for legally enforceable bilateral netting agreements (but not for collateral), also decreased, from \$3.2 trillion in June 2020 to \$2.7 trillion in June 2021.

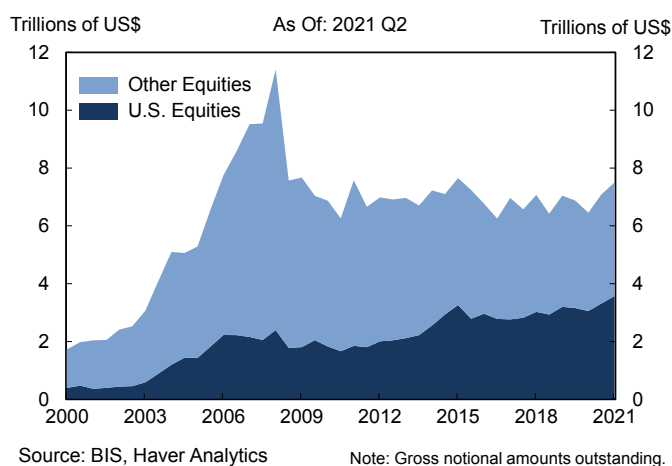
Global OTC options decreased slightly to around \$58 trillion as of June 2021. Interest rate option contracts represent the bulk of that figure, totaling approximately \$42 trillion in notional outstanding. The notional amount of OTC equity options as of June 2021 was approximately \$3.7 trillion, remaining below the peak of \$8.5 trillion in June 2008.

As discussed in **Box D**, equity-linked total return swaps allow market participants to obtain synthetic exposures to individual equity securities. While there are limited, high frequency data on these swaps, the Bank for International Settlements's Semiannual OTC Derivatives Report provides insight into the size of the global OTC equity derivative market. Over the past ten years, the notional amount of equity-linked OTC derivatives has remained fairly stable, totaling \$7.5 trillion as of June 2021 (**Chart 3.4.3.17**). Nevertheless, there has been a significant shift in the composition of equity-linked OTC derivatives, with derivatives referencing U.S. equities becoming increasingly popular. As of June 2021, the notional amount of OTC derivatives referencing U.S. equities totaled \$3.6 trillion, nearly double the amount outstanding as of year-end 2010.

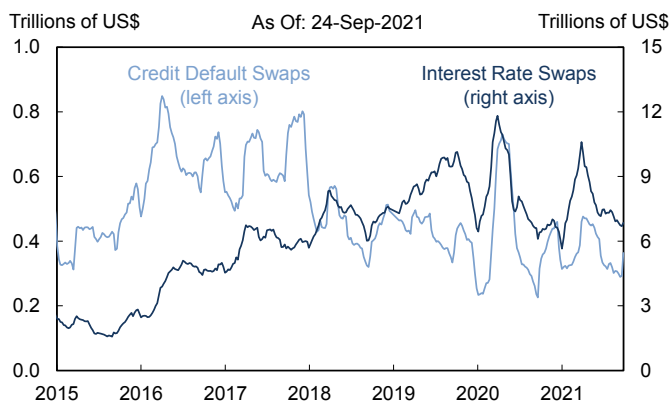
3.4.3.16 Global OTC Positions



3.4.3.17 Global OTC Equity Derivatives Outstanding



3.4.3.18 Derivatives Notional Volume



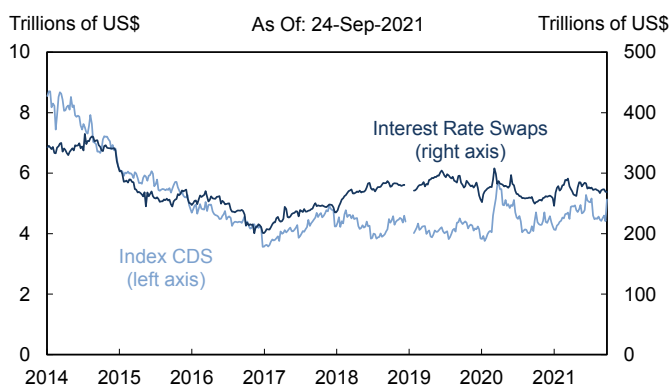
Source: CFTC, ISDA

Interest Rate and Credit Default Swaps

The volume of activity in credit default swap (CDS) markets, which peaked in the March 2020 market stress, has since declined to below pre-pandemic levels (**Chart 3.4.3.18**). Interest rate swap volumes, in contrast, rose significantly in early 2021, amid an increase in British Pound- and Euro-denominated swaps traded in the United States due to Brexit. Since then, interest rate swap volumes have returned to pre-pandemic, pre-Brexit levels.

Concurrently, the notional amount of OTC derivatives outstanding rose during the COVID-19 market stress but has since returned to pre-pandemic levels (**Chart 3.4.3.19**). The notional amount of index CDS outstanding peaked at \$5.7 trillion in the last week of March 2020, a nearly 50 percent increase from year-end 2019 while interest rate swaps outstanding peaked at over \$300 trillion in the first week of March 2020, a 20 percent increase from year-end 2019. By the end of September 2021, the notional amount of index CDS and interest rate swaps declined to \$5.1 trillion and \$269 trillion, respectively.

3.4.3.19 Derivatives Notional Amount Outstanding

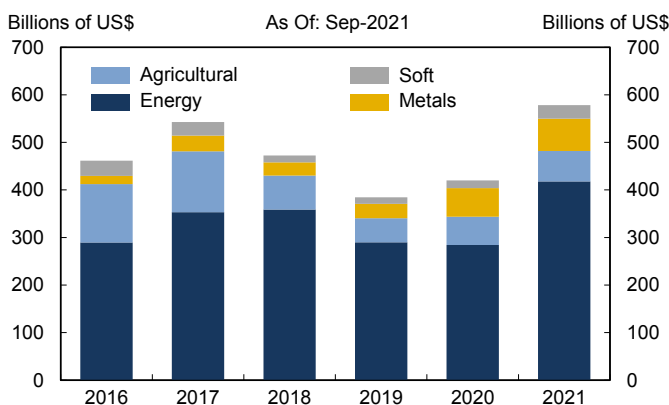


Source: CFTC

Commodity Swaps

The use of swaps referencing energy and other commodities has seen notable growth this past year (**Chart 3.4.3.20**). This activity reflects changing commodity market conditions in which demand for many commodities has grown faster than supply, amid the reopening of the economy. Additionally, exchange traded product (ETP) participation in the commodity swap market has also been increasing in tandem with the growth of ETP assets under management (AUM).

3.4.3.20 Commodity Swaps: Open Interest



Source: CFTC

Energy swaps have driven much of the recent growth in the commodity swaps market, as crude oil and natural gas markets have rallied significantly since they reached lows at the onset of the COVID-19 pandemic. Similarly, the notional value of swaps referencing gold rose to over \$50 billion between February and March 2021 despite gold falling to a 52-week low of \$1,678 per troy ounce on March 8, 2021. Other market segments, such as agriculture

swaps, have also seen increases in notional value. Underlying prices in key markets such as corn, soybeans, and wheat all saw large rallies in the first half of 2021 due to anticipated supply issues caused by drought and increased demand amid the reopening of retail food and beverage shops.

Similarly, the gross notional value of swaps referencing commodity indices has also increased over the last year. As of September 2021, the notional value of swaps referencing commodity indices totaled \$551 billion, up \$151 billion from September 2020 (**Chart 3.4.3.21**).

3.4.3.4 Derivatives Intermediaries and Platforms

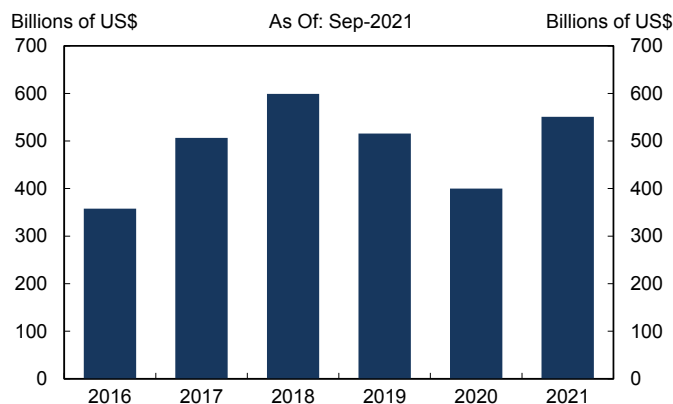
Futures Commission Merchants

FCMs collect funds from customers to margin centrally cleared futures, options on futures, and swap transactions. In addition to managing the deposit and withdrawal of customer margin funds with CCPs, FCMs guarantee the financial performance of their customers to the CCP.

The total amount of required client margin funds held by FCMs has remained elevated over the past year. The amount of margin held by FCMs spiked in March 2020, due to increased trading volumes and increases in CCP and FCM margin requirements. While market volatility has since subsided, the total amount of required client margin held by FCMs remained elevated, totaling \$456 billion in September 2021 (**Chart 3.4.3.22**).

Over the last two decades, the number of FCMs holding customer funds has declined considerably, with the number of FCMs clearing futures for clients falling from over 100 in 2002 to 49 as of September 2021; 22 of these are bank affiliated. The number of FCMs that reported holding segregated client funds for centrally cleared swaps decreased from 23 at year-end 2014 to 15 as of September 2021; all of these are bank affiliated. The pace of consolidation in the FCM industry has slowed since 2015 and the number of FCMs clearing swaps and futures for customers remained relatively consistent over the last several years.

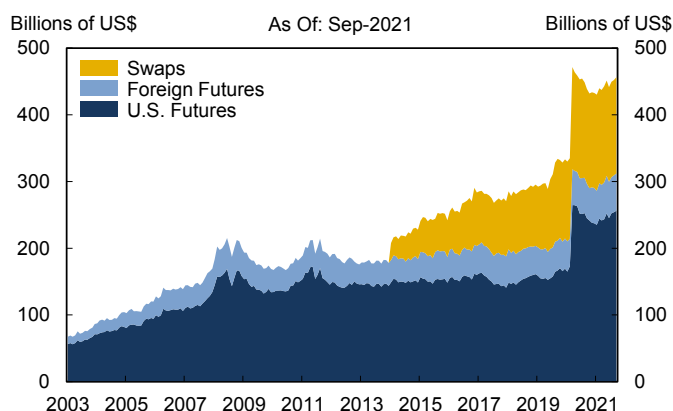
3.4.3.21 Commodity Index Swaps Gross Notional Value



Source: CFTC

Note: Estimated notional value. Figures as of end of September.

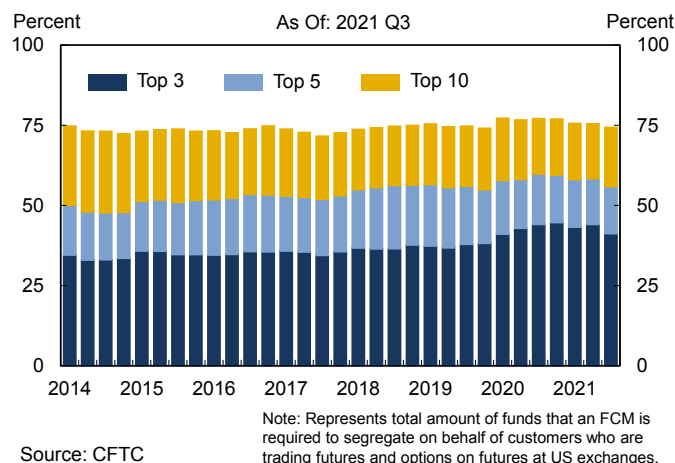
3.4.3.22 Customer Margin Funds Held at FCMs



Source: CFTC

Note: Includes CFTC registered FCMs.

3.4.3.23 FCM Concentration: Customer Futures Balances

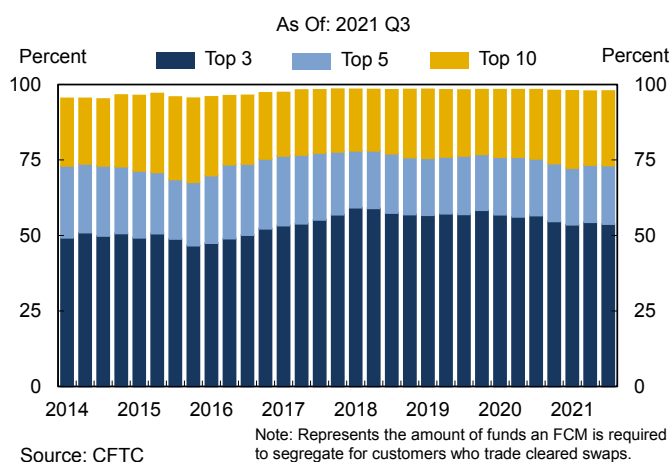


Between the first quarter of 2014 and the third quarter of 2021, the top five FCM clearing members at futures exchanges held between 48 and 60 percent of client margin for futures products, and the top five FCM swap clearing members held between 68 and 78 percent of client margin for swaps products (**Charts 3.4.3.23, 3.4.3.24**).

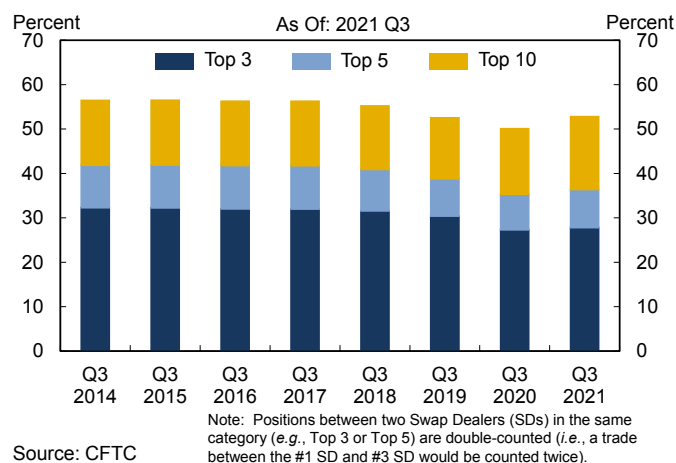
Swap Dealers

The number of registered swap dealers (SDs) stood at 112 as of August 2021, an increase from the 80 at the end of 2013. As of the third quarter of 2021, the top three SDs accounted for 28 percent of swap positions and the top ten SDs accounted for 53 percent of swap positions (**Chart 3.4.3.25**). Since 2017, the concentration of swap contracts with the largest SDs has declined slightly.

3.4.3.24 FCM Concentration: Customer Swap Balances



3.4.3.25 Concentration of Swap Positions for Registered SDs



Swap Execution Facilities

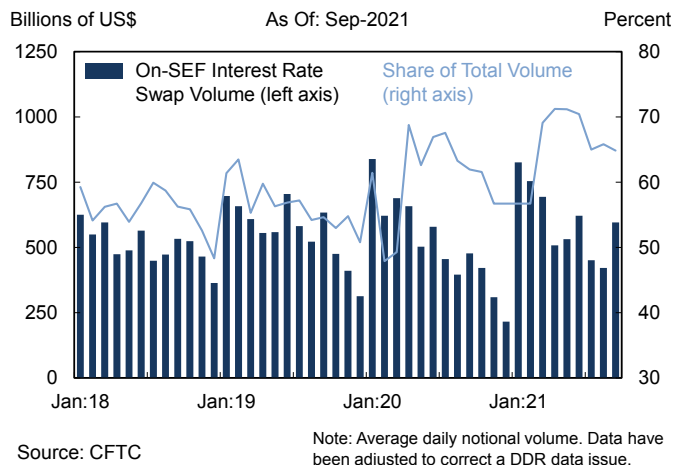
The notional amount of interest rate swaps executed on swap execution facilities (SEFs) fell considerably in the second half of 2020 and by December 2020, the average daily volume fell to \$216 billion. Since then, SEF trading volumes have been robust and average daily volume rose to nearly \$600 billion in September 2021. The share of interest rate swaps executed on SEFs has trended upward in recent years, and in September 2021 approximately 65 percent of interest rate swaps were executed on SEFs (**Chart 3.4.3.26**).

During the March 2020 market stress, the value of index CDS traded on SEFs roughly doubled to reach record levels. Index CDS SEF trading has since returned to pre-pandemic levels, averaging \$42 billion in September 2021. The share of index CDS swaps trading that occurred on SEFs has remained relatively stable at around 80 percent (**Chart 3.4.3.27**).

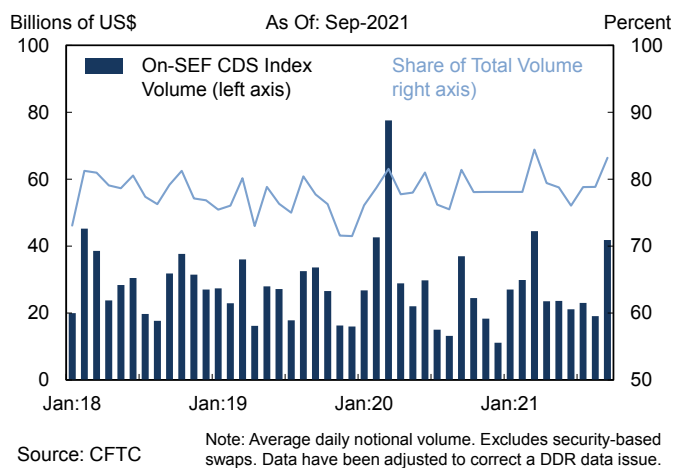
3.4.4 Commodities Market

Commodity prices increased significantly over the past year amid the manufacturing-led global economic recovery (**Chart 3.4.4.1**). Higher commodity prices likely fed into elevated readings of the U.S. Producer Price Index. Factors that drove higher commodity price include significant weather events, China's engagement and disengagement in acquiring large quantities of agriculture and metal commodities, supply chain bottlenecks, and labor shortages.

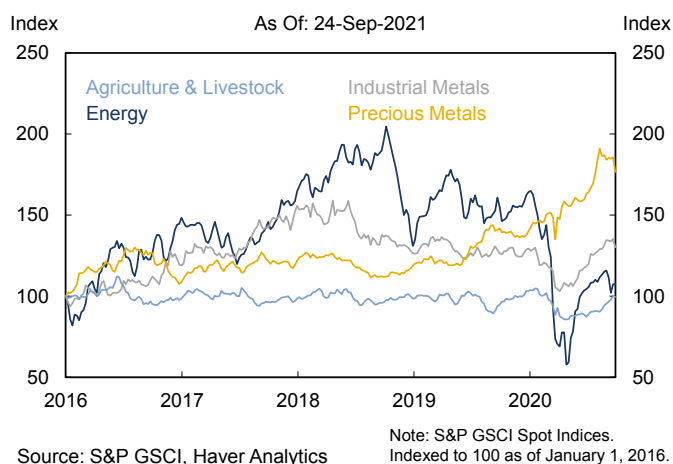
3.4.3.26 SEF Trading Volumes: Interest Rate Swaps



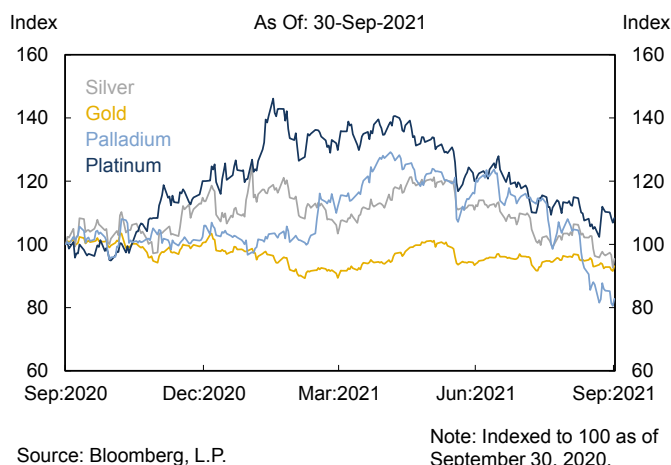
3.4.3.27 SEF Trading Volumes: CDS Index



3.4.4.1 Relative Performance of Commodity Indices



3.4.4.2 Relative Performance of Precious Metals

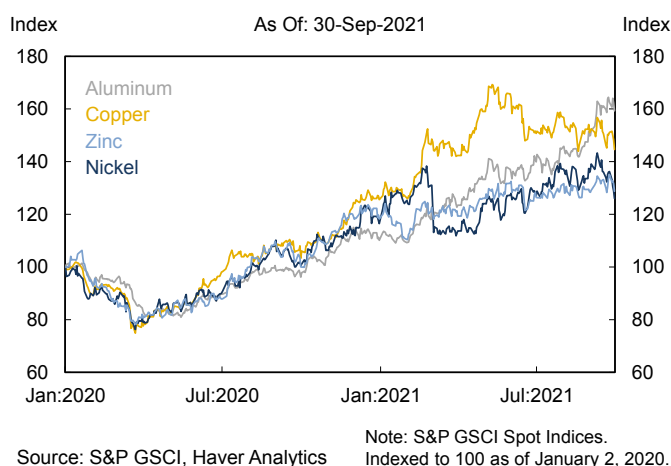


Precious and Industrial Metals

Precious metals prices have been volatile since the onset of the COVID-19 pandemic. Silver, platinum, and palladium rallied in late 2020 and early 2021 and then generally retraced those gains. Gold remained relatively range-bound over the past year, after having experienced significant bouts of volatility in 2020 (**Chart 3.4.4.2**).

Precious metals with industrial applications outperformed gold in late 2020 and early 2021 due to increased demand and supply constraints. Platinum and palladium, which are used in the production of catalytic converters, rallied, as demand from auto manufacturers increased with the global economic recovery. Supply constraints, including the flooding of two mines operated by Norilsk, the world's largest palladium producer, pushed palladium prices to all-time highs in early May. Between early May and the end of September 2021, platinum and palladium prices declined by approximately 20 percent and 36 percent, respectively, as imbalances between supply and demand receded.

3.4.4.3 Relative Performance of Industrial Metals



Base metal prices rebounded over the past year and are now generally above pre-pandemic levels (**Chart 3.4.4.3**). On the demand side, the rally in industrial metals prices has been supported by the recovery in global manufacturing, expectations for increased infrastructure spending, strong Chinese demand amidst its production-led recovery, and a lower dollar. Downward pressure on supply has come from logistic bottlenecks, rising freight costs, and regional labor disruptions. Tariffs also continue to weigh on supply, as Russia has placed duties on aluminum exports, and U.S. Section 232 import tariffs on steel and aluminum remained in place. Decarbonization efforts have also contributed to price increases, as demand for copper has increased, and China has committed to cut steel output. Finally, the Chinese government has become increasingly involved in the base metals market over the past year, and has released state inventories with the explicit goal of lowering prices and reducing speculative activity.

Agriculture Markets

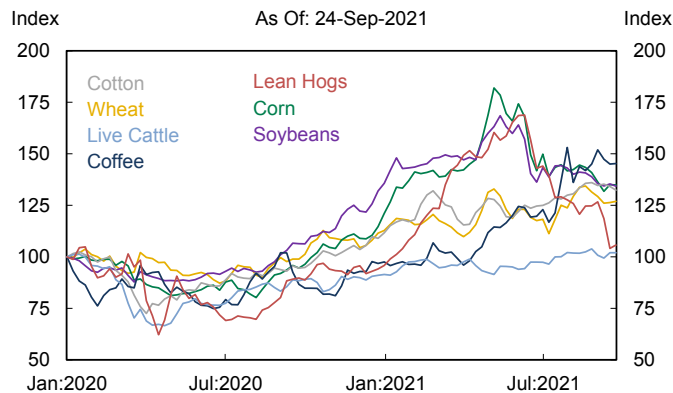
In the second half of 2020 and the first half of 2021, prices for many agricultural commodities rose sharply: poor weather in the U.S. and South America reduced supply and export demand for U.S. products was strong (**Chart 3.4.4.4**). Corn, soybeans, and lean hog prices have fallen from their June 2021 peaks, but remain elevated relative to pre-pandemic levels.

Production in the U.S. agricultural sector was diminished greatly over the past year by drought, extreme heat, and wildfires. According to the U.S. Drought Monitor, by September 2021, 48 percent of the continental U.S. was classified as experiencing moderate to exceptional drought on the Palmer Index, which measures the balance between moisture demand and moisture supply (**Chart 3.4.4.5**). The Condition Monitoring Observer Reports system reported severe impacts from the enduring drought to farming and ranching operations. These impacts included increased stress on plants and animals, water shortage, increased fire risks, and poor air quality mostly in the west and northern plains.

South America has also experienced poor weather conditions, disrupting production of crops including coffee, corn, sugarcane, and oranges. Central and Southern Brazil have experienced their worst drought conditions in almost a century, resulting in crop losses, water scarcity, and increased fires in the Amazon rainforest and Pantanal wetlands.

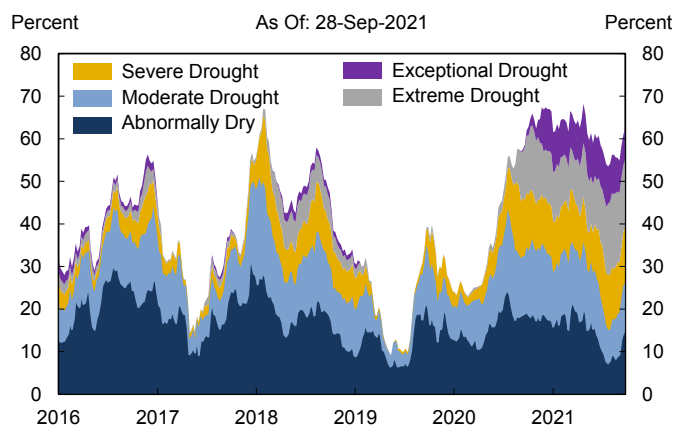
Lumber producers have struggled to meet demand amidst these weather conditions. Wildfires in Western Canada and the Pacific Northwest have destroyed softwood timber frequently used by mills that supply U.S. homebuilders. In addition to wildfires, the lumber supply chain has been challenged by labor shortages over the past year. Meanwhile, demand for lumber in housing and retail markets has increased since the onset of the pandemic. This surging demand, coupled with lumber supply constraints, pushed lumber prices to an all-time high of \$1,686 per

3.4.4.4 Relative Performance of Agriculture Products



Source: S&P GSCI, Haver Analytics Note: S&P GSCI Spot Indices. Indexed to 100 as of January 3, 2020.

3.4.4.5 U.S. Drought Conditions



Source: University of Nebraska-Lincoln Note: Limited to Continental U.S.

3.4.4.6 CME Lumber Futures



Source: CME, Haver Analytics

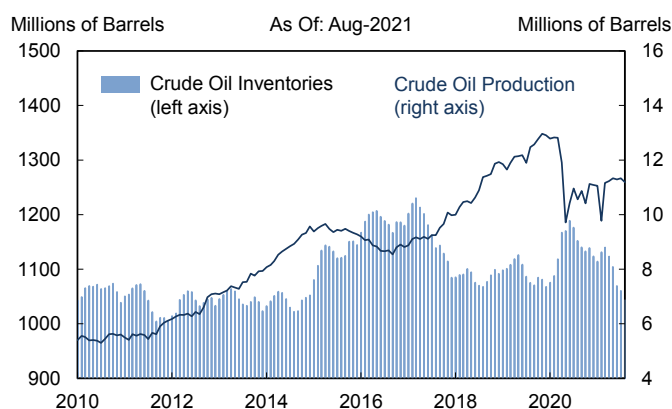
Note: US\$ per 1,000 Board Feet.

thousand board feet on May 7, 2021 before falling to \$628 as of September 30, 2021 ([Chart 3.4.4.6](#)). Plants and sawmills have increased their capacities and multiple firms have announced expansions or new facilities, as the higher priced products allow for additional and easier financing.

Livestock prices have appreciated considerably over the past year. At the onset of the pandemic, demand for live cattle and hogs collapsed as a result of packing plant closures and reduced downstream demands from restaurants and others. Since then, livestock prices have risen, as animal producers have gradually adjusted their inventories, packing plants increased safety measures, and wholesalers, retailers, and restaurants adjusted to shifts in consumer preferences. Supply and demand fundamentals have generally returned to pre-pandemic patterns with two notable differences. First, wholesale beef and pork prices are about 50 percent above pre-pandemic levels. Second, China has significantly increased its demand for pork imports.

The meat processing firm JBS S.A. was the victim of a cyberattack impacting their internal data network on May 30, 2021, resulting in the closure of most JBS U.S. operations for nearly two days. JBS is the largest meat processor in the world; on the days that JBS was affected, total daily U.S. hog slaughter was down 12 percent and cattle slaughter was down 20 percent. The closure caused CME Lean Hog and Live Cattle prices to move sharply lower. Prices rebounded when JBS resumed operations.

3.4.4.7 U.S. Crude Oil Production & Inventories



Source: EIA, Haver Analytics

Note: Crude oil production presented as millions of barrels per day.

Energy Markets

Increased demand amid the global economic recovery pushed up energy prices significantly in the first nine months of 2021. While U.S. crude oil production has increased in the past year, it remains below pre-pandemic levels ([Chart 3.4.4.7](#)). Additionally, the Organization of Petroleum Exporting Countries (OPEC) and OPEC+ has been slow to restore production following cuts in the spring of 2020. On July

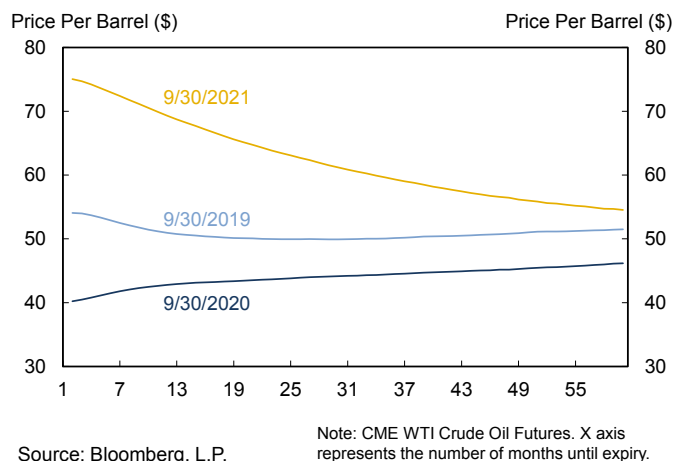
14, 2021, after a long period of negotiations, OPEC+ reached an agreement to increase oil production, with an immediate increase of 400,000 barrels per day beginning in August 2021.

U.S. crude oil inventory levels have fallen over the past year in order to meet short-term demand. The slow return of supply has led to higher prices and steep backwardation in crude oil markets (**Chart 3.4.4.8**). In September 2021, WTI crude oil was trading at its highest price since 2018. Similar trends have materialized in the U.S. gas market. Increased demand coupled with depressed production led to steep backwardation and a sharp increase in natural gas prices (**Chart 3.4.4.9**).

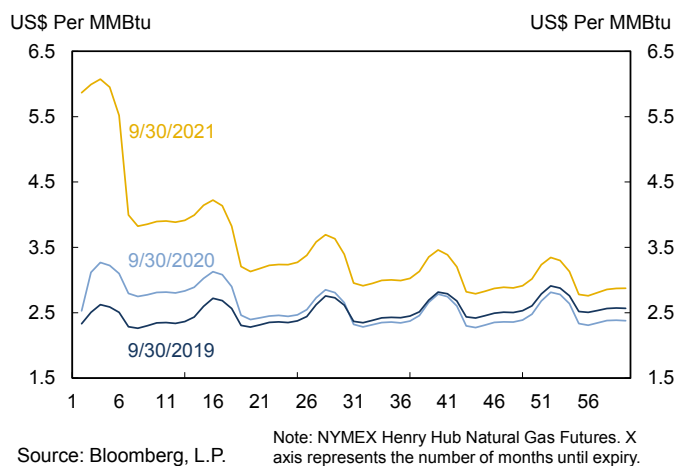
U.S. energy markets experienced two major bouts of volatility in 2021. First, a February 2021 winter storm brought extreme cold temperatures to the mid-continent from Minnesota to Texas. The storm strained natural gas operations and electricity grids that operate in market structures that disincentivize excess capacity and redundancies to address load surges. The high space-heating demand combined with fuel disruptions to power generators led to forced blackouts and a disruption in power for more than four million customers across Texas. The extreme cold lasted about a week, so the impact on the March natural gas contract was minimal. However, natural gas spot prices rose sharply, and regional basis spreads widened significantly (**Chart 3.4.4.10**). By February 17, the Henry Hub spot price rose to nearly \$25 per MMBtu, a 600 percent increase over the week, and in Oneok, Oklahoma, natural gas reportedly traded at \$1,250 per MMBtu.

The second major event in energy markets was the ransomware cyberattack on Colonial Pipeline on May 6 and 7, 2021. The pipeline is the largest pipeline system in the United States and provides the east coast with around 45 percent of its fuel, a total of approximately 2.5 million barrels a day. The shutdown led to long lines at gas stations, as drivers scrambled to refill their tanks. Gasoline futures spiked

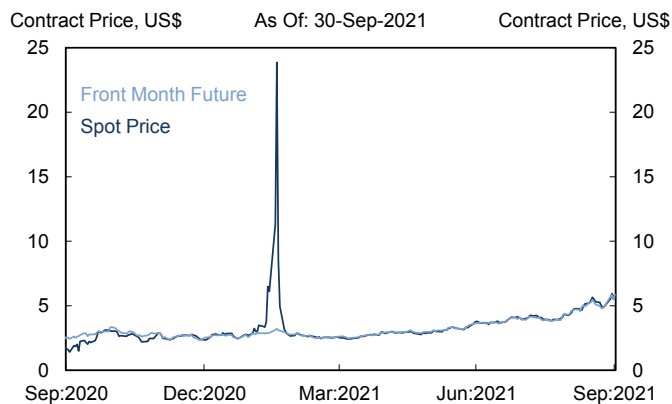
3.4.4.8 WTI Crude Oil Futures Curve



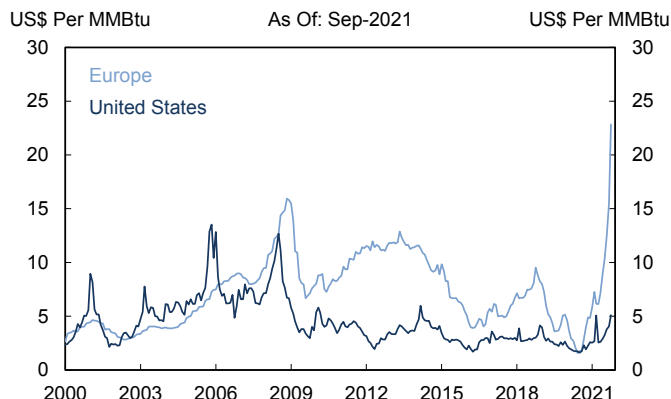
3.4.4.9 Natural Gas Futures Curve



3.4.4.10 Natural Gas Spot and Futures Price

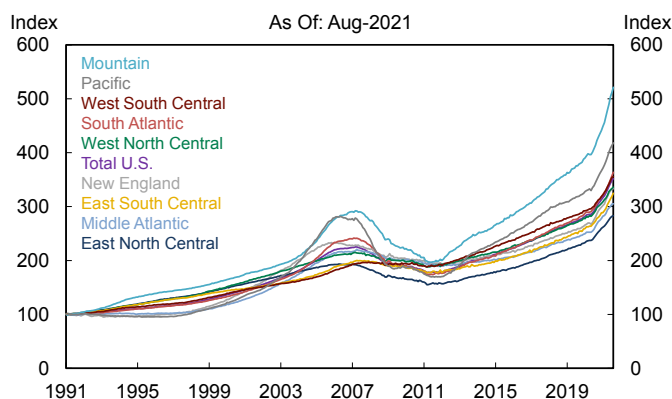


3.4.4.11 European & U.S. Natural Gas Prices



Source: World Bank Group, Bloomberg, L.P.

3.4.5.1 House Prices by Census Division



Source: FHFA

Note: Purchase-only, seasonally adjusted, nominal, constant-quality price index. Indexed to January 1991.

higher on Monday, May 9, but ended the day off slightly from the prior business day's close. Oil, gasoline, and diesel prices fell sharply on Thursday, May 13, 2021, after Colonial Pipeline announced the schedule for operations to restart.

In addition, European natural gas prices surged in the fall of 2021, as a recovery in demand and tight Russian supply has led to seasonally low inventories ([Chart 3.4.4.11](#)). The recent dynamics in European gas markets have raised concerns of potential shortages in the winter, which could amplify inflationary pressures, curtail industrial production, and potentially undermine the European recovery. In October, the EU published a “toolbox” of measures for national authorities to protect consumers and industry amid the spike in energy prices.

3.4.5 Residential Real Estate Markets

3.4.5.1 Residential Housing Finance

House prices have risen rapidly, gaining 18 percent from August 2020 to August 2021 according to the seasonally adjusted, purchase-only FHFA House Price Index® (HPI). Among census divisions, gains were highest in the Mountain division, which posted a 26 percent increase over the same period ([Chart 3.4.5.1](#)). The majority of the U.S., including nearly all of the largest 100 metropolitan statistical areas, experienced positive annual growth. Annual gains appear to have reached their peaks in most areas and although the pace of gains is declining, price growth is still extremely high. **Box B** discusses the rise in house prices, the factors behind price increases, the state of valuation pressures, and how housing finance conditions compare to the 2000s housing bubble.

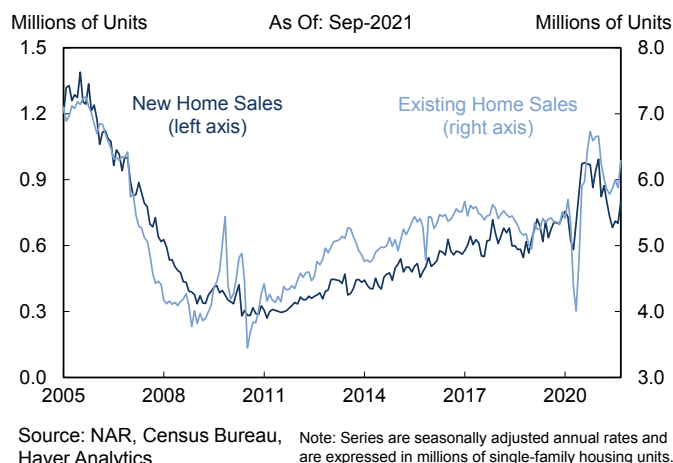
The volume of home sales has been volatile over the past two years. Existing home sales, which fell to 4.0 million units on a seasonally adjusted, annualized basis in May 2020 amid pandemic-driven lockdowns, rebounded sharply in the second half of 2020. Existing home sales peaked in October 2020 at 6.7 million units, the highest level since 2006, and have since retreated to

6.3 million units in September 2021 (**Chart 3.4.5.2**). New home sales have followed a similar pattern. Overall, total home sales remain elevated compared to pre-pandemic trends.

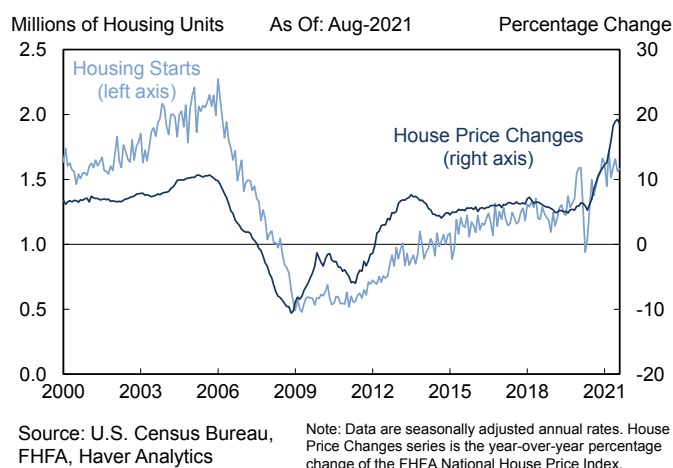
Single family housing starts, which fell sharply at the onset of the COVID-19 pandemic, rebounded in the second half of 2020 (**Chart 3.4.5.3**). Despite the increase in housing prices, the growth in housing starts stalled out in the first eight months of 2021, as the shortage of labor and building materials limited homebuilders' ability to ramp up production. Increasing new housing supply remains a longstanding challenge for the U.S., as new housing starts have not kept up with rising household demand for many years.

According to the Census Bureau, the national homeownership rate was 65 percent in the third quarter of 2021, slightly above pre-pandemic levels (**Chart 3.4.5.4**). The spike in the reported homeownership rate in mid-2020 was largely attributed to data collection challenges during the COVID-19 pandemic. During this period, in-person interviews were suspended and most of the survey was conducted by telephone. In the rental market, vacancy rates have declined, falling from a five-year average of 6.8 percent to 5.8 percent in the third quarter of 2021. The pandemic has led to a rise in demand for single family rentals, as households have reconsidered their housing arrangements. In addition, eviction moratoria have likely put downward pressure on rental vacancy rates by keeping some households in their existing rental units.

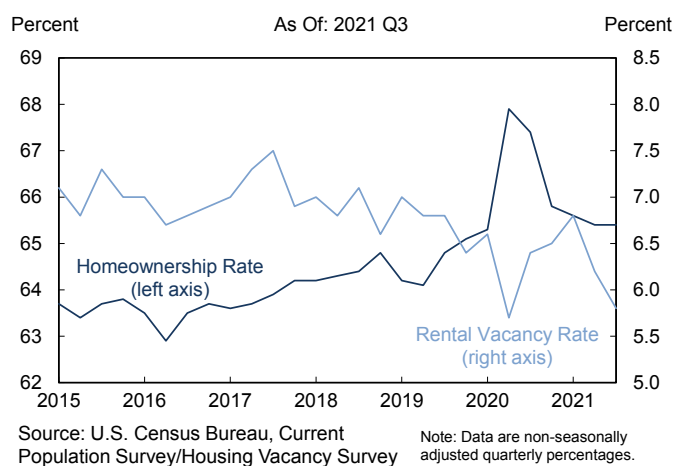
3.4.5.2 Home Sales



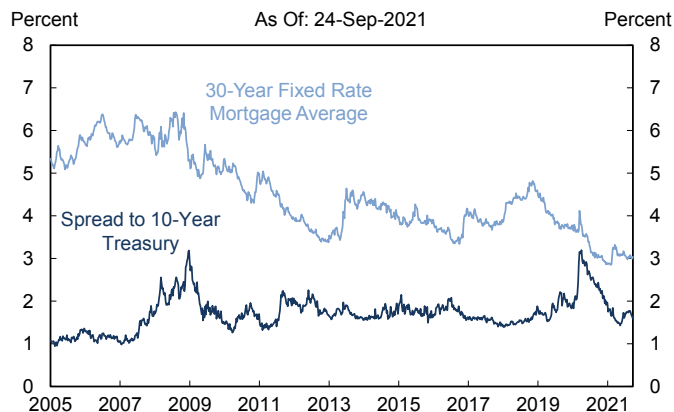
3.4.5.3 New Housing Starts and Price Changes



3.4.5.4 Homeownership and Vacancy Rates

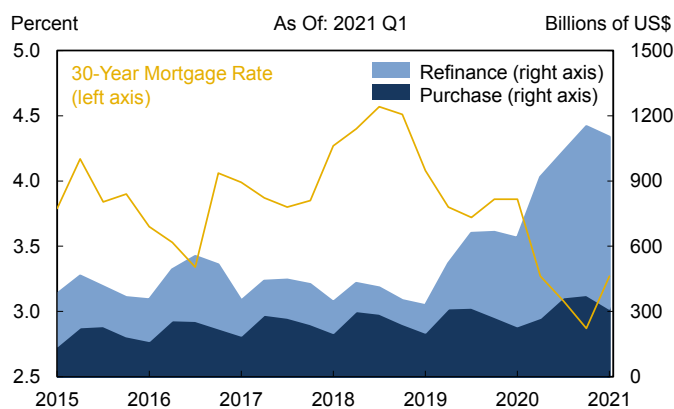


3.4.5.5 30-Year Fixed Rate Mortgage Rate and Spread



Source: Bankrate.com, Bloomberg, L.P.

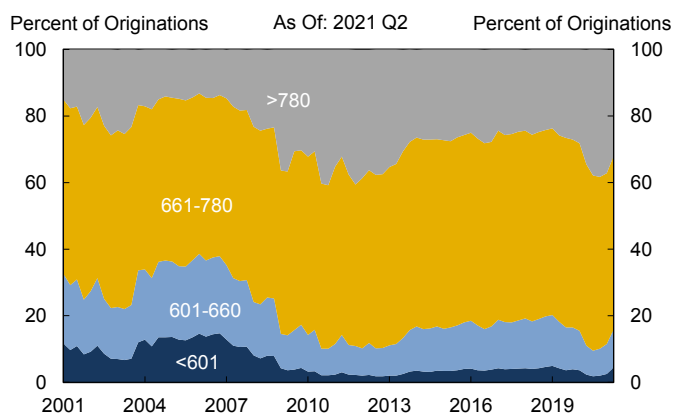
3.4.5.6 Mortgage Originations and Rates



Source: NMDB®, Bankrate.com

Note: Quarterly originations represent all 1-4 family homes with first-lien, closed-end residential mortgages.

3.4.5.7 Purchase Origination Volume by Credit Score



Source: NMDB®

Note: Based on all-borrower VantageScore 3.0 for first-lien, closed-end residential purchase mortgages; excludes territories.

Mortgage Originations, Servicing, and Loan Performance

The average rate on a 30-year fixed rate mortgage fell sharply in the spring of 2020 and remained at historically low levels through the first nine months of 2021 (**Chart 3.4.5.5**). Throughout late 2020 and early 2021, the spread between primary mortgage rates and Treasury yields tightened to levels roughly in line with pre-pandemic averages. Low rates appear to have boosted refinancing activity. Based on the National Mortgage Database (NMDB®), refinance originations remained robust into 2021, rising to \$788 billion in the first quarter of 2021, as mortgage rates reached their lowest levels in decades (**Chart 3.4.5.6**). This represents a 95 percent increase year-over-year compared to \$404 billion in the first quarter of 2020. Over the same period, home purchase originations increased 35 percent from \$233 billion to \$314 billion.

Credit quality of new purchase mortgages remained relatively strong through the second quarter of 2021 (**Chart 3.4.5.7**). 52 percent of borrowers had scores in the middle of the credit spectrum (VantageScore 3.0 scores between 661 and 780) stood at 52 percent in the second quarter of 2021, similar to recent trends. Prior to the COVID-19 pandemic the share attributed to the highest credit quality group (borrowers with scores at or above 781) was fairly stable at below 30 percent. Their share increased materially in 2020, as the highest quality borrowers accounted for 38 percent of the market as of the end of 2020 but decreased back to 32 percent as of the second quarter of 2021. The percentage of borrowers in the lowest score categories (below 661) initially declined at the onset of the COVID-19 pandemic but has since returned to pre-pandemic levels.

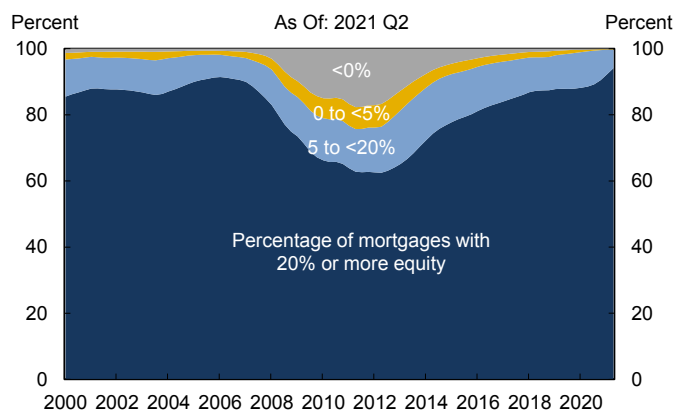
Non-depository institutions have been expanding their share of the mortgage origination market in recent years. The nonbank share of total originations reached approximately 60 percent in 2020. Many of these nonbank mortgage companies continue to rely on short-term wholesale funding and

may have limited ability to absorb shocks. Among depository institutions, larger depository institutions—those with more than \$10 billion in assets—have increased their share of originations in recent years compared to smaller institutions.

Amid rapidly rising house prices, home equity continued to strengthen. As of the second quarter of 2021, 94 percent of active mortgages had 20 percent or more of positive equity, and nearly all mortgages had at least 5 percent of positive equity, (**Chart 3.4.5.8**). Over the past two decades, positive equity reached its lowest point in the second quarter of 2012, with only 62 percent of borrowers holding equity of 20 percent or more. Before that, borrower equity positions were at their strongest in the first quarter of 2006, at the height of the housing bubble.

Delinquency rates on residential mortgage loans have remained low over the past year. In response to the pandemic, federal and state governments enacted a series of public assistance policies, including through the CARES Act in 2020 and the ARP Act in 2021. These policies have supported household incomes, suspended foreclosures and evictions, and offered flexibility in home purchase and mortgage acquisition processes. Under the CARES Act, borrowers with a federally backed mortgage have been able to request temporary forbearance on mortgage payments. If the loans were current when they entered forbearance, servicers were required to report these loans as current to credit bureaus. Conversely, borrowers that entered forbearance in arrears could cure delinquency status by bringing their loans current during the forbearance period. As a result, credit bureau data show that the 30- or 60-day delinquency rate dropped from 1.9 percent in the first quarter of 2020 to 0.8 percent in the second quarter of 2021 (**Chart 3.4.5.9**). Similarly, the 90-to-180-day delinquency rate dropped from 0.8 to 0.5 percent in the same period. These credit bureau reports can differ from other mortgage performance data depending

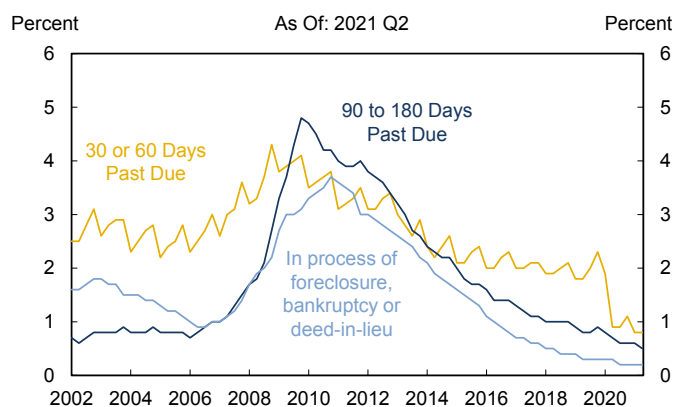
3.4.5.8 Shares of Mortgages by Equity Percentage



Source: NMDB®

Note: Quarterly percentage of all mortgage loans that are not closed or terminated.

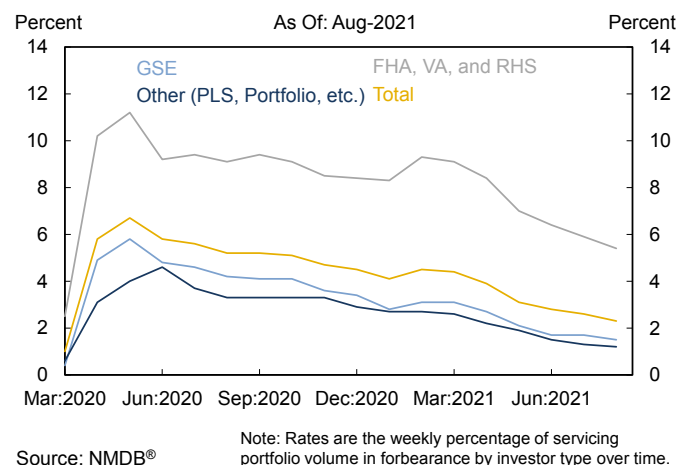
3.4.5.9 Mortgage Delinquency



Source: NMDB®

Note: Quarterly percentage of all mortgage loans that are not closed or terminated.

3.4.5.10 Forbearance Rates by Investor Type



on how forbearance is treated. For example, the Mortgage Bankers Association's National Delinquency Survey, based on reports from mortgage servicers rather than credit bureau data, estimated a 4.0 percent seriously delinquent rate in the second quarter of 2021, an increase of 2.3 percentage points from the first quarter of 2021. Finally, the percentage of loans in the process of foreclosure, bankruptcy, or deed-in-lieu has also remained stable at 0.2 percent from the second quarter of 2020 to the second quarter of 2021.

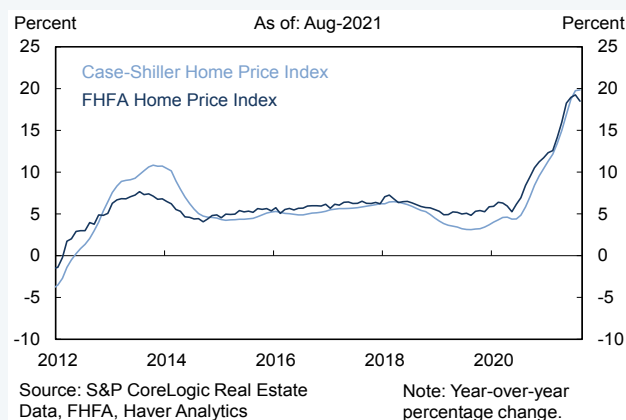
Forbearance rates remain elevated relative to before the pandemic when forbearance options were more limited. Total single-family forbearance rates were 1.0 percent in March 2020, peaked at 6.7 percent in May 2020, and have fallen to 2.3 percent as of August 2021 (**Chart 3.4.5.10**). Forbearance rates were higher for certain loan types, including Federal Housing Administration (FHA), U.S. Department of Veterans Affairs (VA), and Rural Housing Service (RHS) loans.

The credit scores of many mortgage borrowers have improved during the pandemic from several factors, including mortgage loan forbearance, lower credit usage of credit lines, and fiscal support to household incomes. The median credit score of mortgage borrowers continued to increase in 2021, rising 3 points from December 2020 to July 2021, according to Experian VantageScore 3.0 data. Only 11.5 percent of mortgage borrowers had their credit scores decrease by 20 points or more during that period.

Box B: The Rapid Rise in House Prices

House prices have risen substantially since the onset of the pandemic. The FHFA House Price Index®, for example, has increased 18 percent from August 2020 to August 2021 (**Chart B.1**). In comparison, from 2012 to 2019 prices increased by an average of nearly 6 percent annually.

B.1 House Price Growth



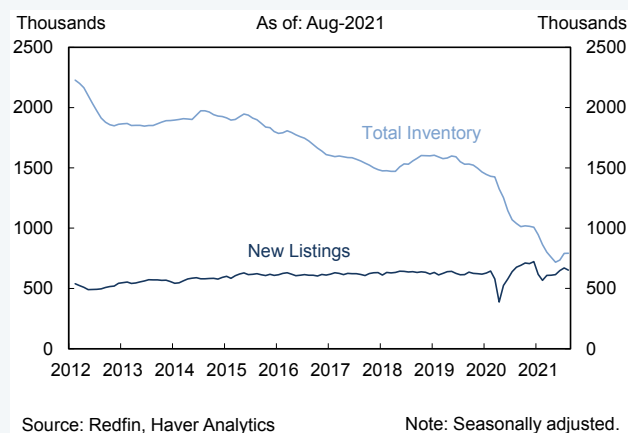
Overall, rising prices have been the result of a significant increase in demand for homeownership, while the supply of housing for sale has, overall, been relatively inelastic. On the demand side, historically low interest rates have reduced debt servicing costs for households, shifting up the number of households that are able to afford a given house price. The pandemic has also increased the amount of time that Americans spend at home, inducing many households to consider homeownership or the purchase of second homes.

The imbalance between supply and demand is evident in the decline of total inventory, which fell by nearly 50 percent between December 2019 and August 2021 (**Chart B.2**). The deficit in the supply of housing is estimated to have risen rapidly and reached 3.8 million units at the end of 2020, according to a Freddie Mac study. After the onset of the pandemic, the volume of houses actively listed for sale declined rapidly and housing starts were interrupted for a time, amid stay-at-home orders and

other pandemic-related concerns. Since then, new listings have recovered and the number of homes for sale has stabilized, but at a low level.

A number of factors may have contributed to downward pressure on supply, including higher prices for construction materials, forbearance programs, and foreclosure moratoria which have enabled some households to remain homeowners and prevented houses from coming to market. Research at the Federal Reserve has suggested that the combination of high house price appreciation and a tighter housing market has been driven largely by the surge in demand.³ New for-sale listings would have to expand by 20 percent for price growth to return to a pre-pandemic pace. Given that the supply of new listings, and particularly new construction, is not easily expanded, the housing market will likely remain tight in the short run.

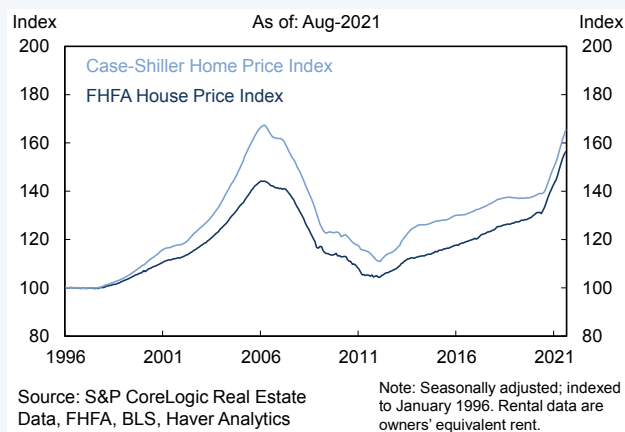
B.2 Inventory of Homes Listed for Sale



Box B: The Rapid Rise in House Prices (continued)

The most recent episode in which house prices have increased at an elevated pace was the mid-2000s housing bubble. This parallel naturally raises questions about financial stability risks arising from valuation pressures. One measure of valuation pressure, the price-to-rent ratio, has risen significantly since the beginning of the pandemic. How this measure compares to its peak in 2006 depends on the house price index used (**Chart B.3**). For example, the price-to-rent ratio is high but remains below the peak of this measure in 2006 using the S&P Case-Shiller Index. The higher peak of the S&P Case-Shiller Index in 2006 is likely caused by that index placing more weight on higher-valued homes compared to the FHFA House Price Index®, due to conforming loan limits on mortgages purchased by the Federal National Mortgage Association (Fannie Mae) and Federal Home Loan Mortgage Corporation (Freddie Mac) that underlie the FHFA index. In addition, the price-to-rent ratio is not necessarily as elevated once the low level of yields on Treasury securities is taken into consideration.

B.3 Price-to-Rent Ratios



Valuation pressures raise the risk that house prices may decline, as they did after the 2000s housing bubble. In assessing the vulnerability of borrowers to this risk, mortgage borrowers today are likely better able to avoid defaulting after a house price shock compared to borrowers after the housing bubble.

Default by mortgage borrowers is often the result of a double trigger consisting of both a decline in house prices and a decline in income, so that a borrower can neither afford mortgage payments nor repay their debt in full by selling the property. The inability of borrowers to make their payments after the 2000s housing bubble was a reflection, in part, of the poor underwriting standards and risky mortgages that were prevalent at the time, in addition to widespread unemployment. Obtaining mortgage credit was much easier in that period for borrowers who had low credit scores, difficult-to-document income, or high debt payments relative to their incomes. Commonly available risky mortgage products included pick-a-pay and negative amortization contracts. In contrast, post-financial crisis reforms have required lenders to make a reasonably good faith determination of borrowers' ability to repay their loans. An additional distinction between the two episodes of house price growth is the relatively smaller presence of speculative activity over the past year. Further, policies at the federal level have provided greater stability to the housing market today, including active policy outreach, improved consumer protections, and quick responses when potential financial stress has risen.

Going forward, the course of the pandemic will be a key driver of household income and housing market trends. The expiration of forbearance arrangements may put stress on some households and cause more houses to come on the market. Finally, obstacles to new construction and affordability issues are longstanding challenges that will continue to put pressure on the financial positions of American homebuyers.

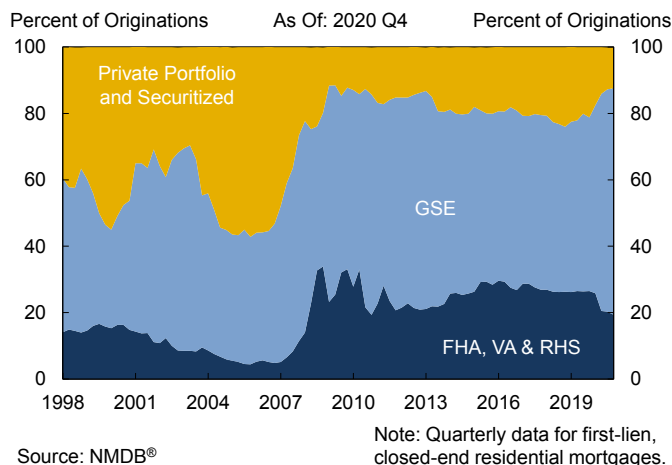
3.4.5.2 Government-Sponsored Enterprises and the Secondary Mortgage Market

The federal government continues to back the majority of new mortgages either directly through the FHA, the VA, and the RHS under the United States Department of Agriculture, or indirectly through Fannie Mae and Freddie Mac (the Enterprises). The federal government share of mortgage originations—which averaged 82 percent over the past decade—was 88 percent in the fourth quarter of 2020 (Chart 3.4.5.11). This share has increased since the onset of COVID-19, as the government stabilized markets with various financial actions that helped provide liquidity to primary and secondary markets.

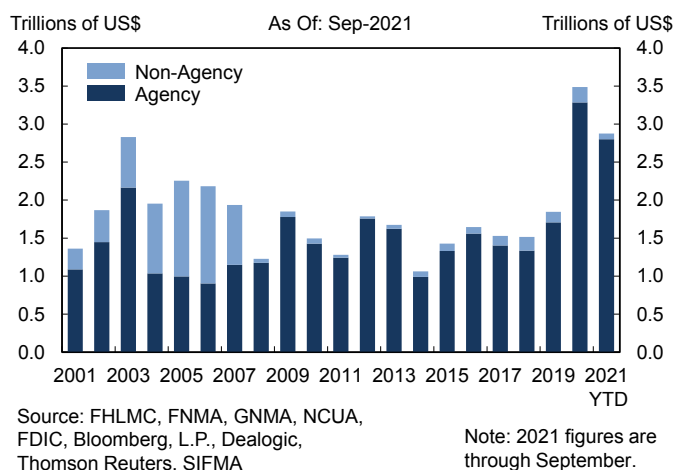
New mortgages not securitized by the Enterprises or into Ginnie Mae securities continue to be held mostly in lender portfolios, rather than securitized in private MBS known as non-agency residential mortgage-backed securities (RMBS). According to the Securities Industry and Financial Markets Association (SIFMA), non-agency RMBS issuance totaled \$74 billion in the first nine months of 2021 compared to approximately \$200 billion for the full-year 2020 (Chart 3.4.5.12). In comparison, agency RMBS issuance was over \$2.5 trillion in the same period, exceeding total RMBS issuance in any year during this century except in 2003 and 2020.

The federal government has continued to support housing markets over the past year. The FHFA, CFPB, and the Department of Housing and Urban Development have continued to work together to provide assistance under the CARES and ARP Acts in the form of temporary mortgage relief, payment suspensions, protection for renters, remittance transfers, and informational resources (see Section 4.5). In addition, the Federal Reserve has continued to purchase agency MBS to sustain the smooth functioning of the market for those securities, and to support progress toward the Federal Reserve's maximum employment and price stability goals. The Federal Reserve's agency MBS purchases totaled approximately \$1.4

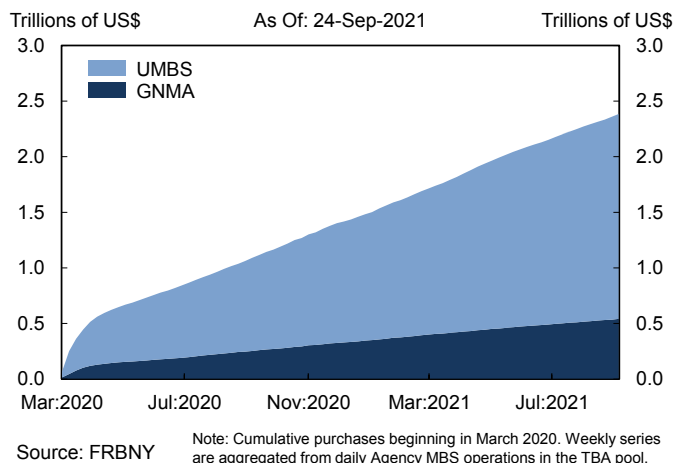
3.4.5.11 Mortgage Originations by Product



3.4.5.12 RMBS Issuance



3.4.5.13 Cumulative MBS Purchases by the Federal Reserve



trillion through the end of 2020 and \$2.4 trillion by the end of September 2021 ([Chart 3.4.5.13](#)).

Fannie Mae and Freddie Mac

Fannie Mae and Freddie Mac, which are in their 14th year of conservatorship, are an important source of liquidity to the mortgage market and stability to the housing market.

After the onset of the pandemic, FHFA instructed the Enterprises to take a variety of critical actions to support borrowers and renters, such as suspending foreclosures and evictions in Enterprise-backed properties in forbearance. The Enterprises also initially offered single-family borrowers 12 months of forbearance, but the deepening impacts of the pandemic required targeted actions to stem growing concerns about borrowers who would not be financially capable of resuming their prior mortgage payments after the standard forbearance period ends. As a result, on February 25, 2021, FHFA announced, on a limited basis, the availability of an additional three-month extension of COVID-19 forbearance, up to a total of 18 months of forbearance. FHFA had previously announced on February 9, 2021 that the Enterprises would offer one three-month extension.

To address borrowers' needs after the forbearance period ends, the Enterprises have used two existing workout solutions, Payment Deferral and Flex Modification, in addition to reinstatement or repayment plans, for borrowers who continue to have a financial hardship. Under Payment Deferral, the borrower resumes original payments, and the forborne amounts are placed in a non-interest-bearing balloon until the loan prepays or matures. COVID Payment Deferral has the same terms as the existing Payment Deferral option. Under Flex Modification, the monthly loan payment is reduced by extending the term to 40 years and, in some cases, the interest rate may be reduced. On June 30, 2021 FHFA announced that Flex Modification terms would be adjusted for COVID-19 hardships to

make interest rate reduction possible for eligible borrowers, regardless of the borrower's loan-to-value ratio. Previously, only borrowers with mark-to-market loan-to-value ratios greater than or equal to 80 percent were eligible for a possible interest rate reduction. If a borrower uses either of these workout solutions, they become eligible to refinance their mortgage after making three on-time payments. These solutions will enable a larger share of borrowers more time to resume their monthly payment or receive a meaningful payment reduction.

FHFA also continued support this year for multifamily borrowers and tenants adversely impacted by the COVID-19 pandemic. On July 28, 2021, FHFA announced that tenants of multifamily properties with mortgages backed by the Enterprises who are subject to eviction for nonpayment of rent must be given a 30-day notice to vacate before the tenant can be required to leave the unit. This requirement applies to all Enterprise-backed multifamily properties, regardless of whether the loan is in forbearance.

On September 24, 2021, FHFA announced the Enterprises will continue to offer COVID-19 forbearance to qualifying multifamily property owners as needed, subject to the continued tenant protections FHFA has imposed during the pandemic. This is the fourth extension of the programs, which were set to expire September 30, 2021. Property owners with Enterprise-backed multifamily mortgages can enter a new or, if qualified, modified forbearance for up to six months if they experience a financial hardship due to the COVID-19 emergency.

The Enterprises continued to be profitable through the COVID-19 pandemic. Through the first half of 2021, the Enterprises have recorded over \$19 billion in net income, compared to about \$5 billion in the same period the year before. Income over the past year was primarily driven by the surge in refinances due to low interest rates and supported in part by an Adverse Market Refinance Fee of 50 basis points on mortgages with balances above \$125,000. FHFA announced that the Enterprises would implement this fee on December 1, 2020, in order to cover losses projected as a result of the pandemic. FHFA

announced the elimination of the fee as of August 1, 2021, in recognition of the success of policies that had reduced the impact of the pandemic on households.

Affordable Housing

In 2021, FHFA, in partnership with the other federal agencies, began a targeted focus on increasing the nation's affordable housing supply. To support underserved markets, FHFA announced that the Enterprises may each invest up to \$850 million annually in the Low-Income Housing Tax Credit (LIHTC) equity market. Previously, each Enterprise was limited to \$500 million of investment annually in the LIHTC market. Within this \$850 million annual funding cap, any investments above \$425 million in a given year are required to be in areas that have been identified by FHFA as markets that have difficulty attracting investors. This marks an increase in the amount of investment under the cap that must be made in targeted transactions that either support housing in Duty to Serve-designated rural areas, preserve affordable housing, support mixed-income housing, provide supportive housing, or meet other affordable housing objectives.

Credit Risk Transactions

Since 2013, FHFA has encouraged the Enterprises to transfer a meaningful amount of credit risk to private investors through credit risk transfer (CRT) transactions. CRTs help to protect taxpayers from potentially large credit-related losses in severely stressful economic scenarios. From the inception of the Enterprises' single-family CRT programs in 2013 through the end of 2020, Fannie Mae and Freddie Mac have transferred a portion of credit risk on \$4.1 trillion of unpaid principal balance, with a combined risk-in-force of about \$137 billion.

In September 2021, FHFA published a notice of proposed rulemaking that would amend the Enterprise regulatory capital framework by refining the leverage buffer and the risk-based capital treatment of CRT transactions. These amendments are intended to facilitate an environment where leverage is not the binding capital constraint for the Enterprises and where the Enterprises have incentives to distribute acquired credit risk to private investors through CRT rather than to buy

and hold that risk. Through the first three quarters of 2021, Freddie Mac has already transferred \$12 billion of risk-in-force on \$543 billion of unpaid principal balance. Additionally, although it had not entered into any new CRT transactions since the first quarter of 2020, Fannie Mae resumed entering into new CRT transactions in the fourth quarter of 2021.

Federal Home Loan Banks

The Federal Home Loan Banks (FHLBs) continue to serve as an important source of liquidity for financial institutions in the mortgage market and to exhibit strong financial performance. The main assets of the FHLBs are advances, loan products FHLBs extend to their members to help them meet short- and long-term liquidity and housing finance needs. Advances reached a post-2008 peak of 807 billion in the first quarter of 2020, increasing by 26 percent from year-end 2020 as a result of members' liquidity needs induced by the onset of the pandemic. As market volatility subsided and liquidity needs decreased, advances fell by 54 percent, to \$370 billion, by June 30, 2021.

Mortgage holdings purchased by the FHLBs from their members have also decreased due to greater prepayment activity and less attractive yields. From March 31, 2020, to June 30, 2021, mortgages decreased \$18 billion to \$57 billion. Reflecting the lower holdings of advances and mortgages, total assets at the FHLBs declined from \$1,259 billion on March 31, 2020 to \$738 billion as of June 30, 2021.

The financial performance of the FHLBs remains solid. The FHLBs reported aggregate net income of \$2.4 billion in the year ended June 30, 2021, moderately down compared to \$2.9 billion earned in the previous four-quarter period, reflecting lower asset holdings. Retained earnings continued to grow at the FHLBs, increasing to \$22 billion on June 30, 2021, an all-time high for the FHLB System.

3.4.6 Commercial Real Estate Market

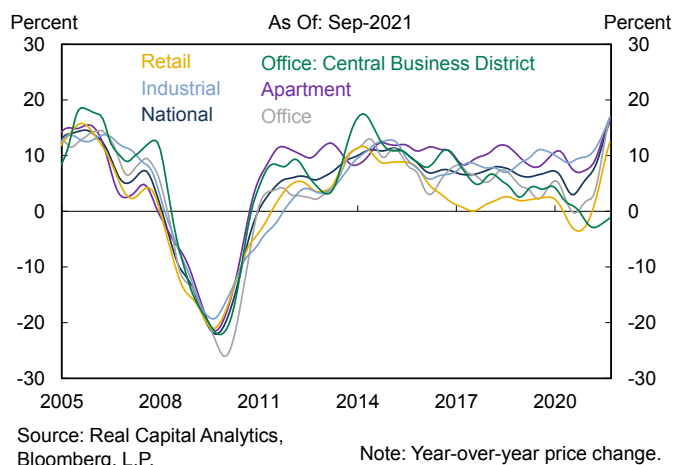
The CRE market is slowly recovering from pandemic-induced disruptions. Increasing vaccination levels and the lifting of pandemic-imposed travel restrictions and social distancing requirements have supported recovery of many CRE properties. Significant uncertainties remain, though, especially for properties that depend on office workers or business travelers. Return to office plans continue to evolve, particularly in light of the COVID-19 Delta variant.

The volume of CRE transactions rebounded in 2021, after a sharp decline at the onset of the pandemic. According to Real Capital Analytics, CRE deal volume totaled a record \$450 billion in the first three quarters of 2021, with apartment and industrial property sales driving volume during this period. CRE deal volume remains subdued in the market for office properties in central business districts. Transaction volumes also remain below pre-pandemic levels for retail and lodging properties, many of which are also located in central business districts and rely on office workers or business travelers. In contrast, CRE price growth has rebounded more evenly across sectors, and price growth overall reached 16 percent for the twelve months ended September 2021, the fastest pace in over twenty years (**Chart 3.4.6.1**). Nevertheless, prices for offices in central business districts remained depressed through September 2021.

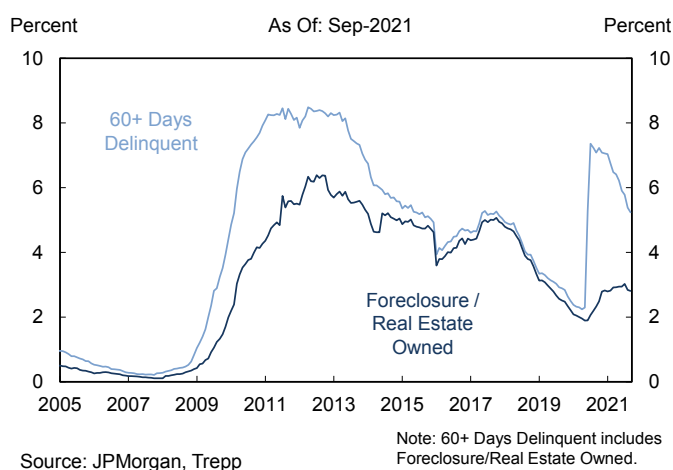
Delinquency rates have declined from the peak they reached in 2020, but remain elevated, especially on lodging and hotel properties. By September 2021, the overall rate of serious delinquency (60+ days past due) on conduit commercial mortgage-backed securities (CMBS) had fallen to 5.2 percent after reaching a high of 7.4 percent in July 2020 (**Chart 3.4.6.2**). Delinquency rates on lodging and retail properties remained elevated at 13.9 and 8.0 percent, respectively. In contrast, industrial, multifamily, and office properties had delinquency rates of 0.7 percent, 1.9 percent, and 2.2 percent, respectively.

CRE capitalization rates—the ratio of a property’s annual net operating income to its price—remained low by historical standards through the first nine months of 2021 (**Chart 3.4.6.3**). However, the risk premia in CRE—as measured by the spread between CRE capitalization rates and the 10-year Treasury yield—remained elevated relative to historical standards. By this measure, CRE valuations do not appear to be stretched on a relative basis.

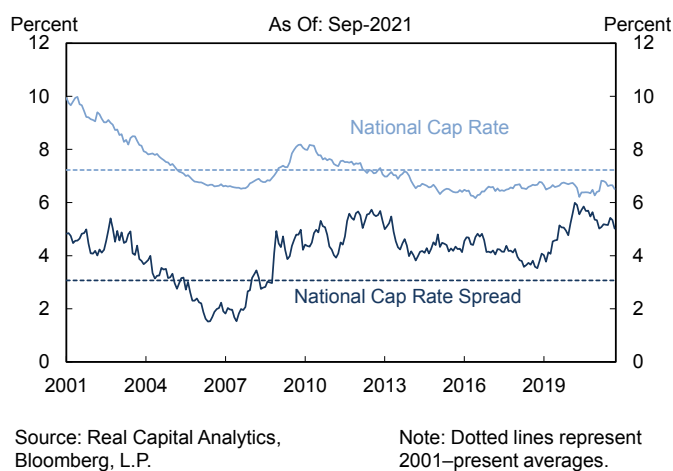
3.4.6.1 Commercial Property Price Growth



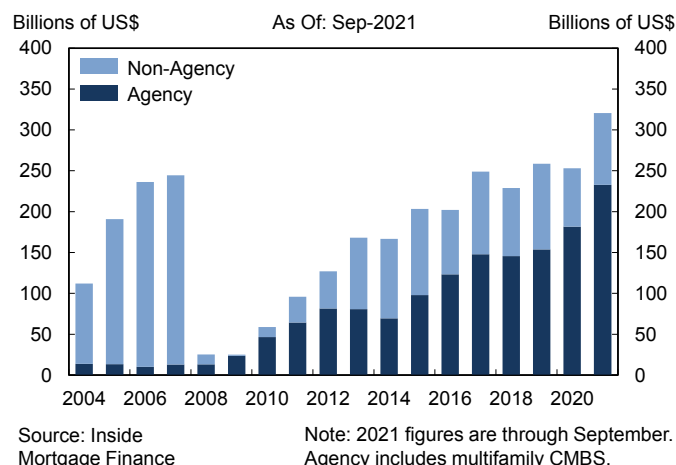
3.4.6.2 Conduit CMBS Delinquency and Foreclosure Rate



3.4.6.3 Average Capitalization Rates and Spreads



3.4.6.4 CMBS Issuance



Outstanding CRE loans totaled \$5.0 trillion as of the second quarter of 2021, a 5.2 percent increase year-over-year and equal to approximately 22 percent of GDP, according to the Financial Accounts of the United States. Fannie Mae, Freddie Mac, and Ginnie Mae continue to be the most significant players in multifamily lending, and collectively hold 48 percent of total outstanding multifamily mortgages either in portfolio or in securitization pools of CMBS. The growth of CRE loans held by banks and life insurance companies has slowed over the past year, with year-over-year CRE loan growth at banks and insurance companies declining from 5.6 percent and 6.7 percent to 2.9 percent and 3.1 percent, respectively.

CMBS issuance has rebounded strongly, with agency and non-agency issuances hitting a record \$321 billion through the first nine months of 2021 ([Chart 3.4.6.4](#)). The increased issuance of CMBS was particularly concentrated in multifamily agency CMBS, where issuances in the first nine months of 2021 already exceeded the previous full-year record hit in 2020. Somewhat slower issuance of conduit CMBS deals has been offset by a record pace of relatively short-term floating rate CRE securitization deals, such as CMBS deals backed by single asset or single borrowers (which tend to be highly rated and strongly underwritten), and CRE collateralized loan obligations. The CMBS issuance volume is an indication of the improved economic outlook, strong investor demand for yield, and confidence in the recovery of CRE, even with the pandemic-induced risks that remain for many properties.

3.5 Financial Institutions

3.5.1 Bank Holding Companies and Depository Institutions

3.5.1.1 Bank Holding Companies and Dodd-Frank Act Stress Tests

Bank holding companies (BHCs) are companies that have control over any bank or any company that is a BHC. BHCs may also be financial holding companies. Subsidiaries of BHCs may also include nonbanks such as broker-dealers, investment advisers, or insurance companies. Under the “tailoring rules” issued by the federal banking agencies in 2019, capital and standardized liquidity requirements for BHCs increase with risk, size, and complexity. The largest BHCs with total consolidated assets above \$100 billion fall into four categories: U.S. global systemically important banks (G-SIBs) (Category I); two categories of large complex BHCs (Categories II and III); and large noncomplex BHCs (Category IV) (**Chart 3.5.1.1**). Other BHCs with total consolidated assets less than \$100 billion are not subject to supervisory stress test requirements, the liquidity coverage ratio, or the net stable funding ratio. Foreign banking organizations (FBOs) with sizeable operations in the United States must hold all non-branch interests in U.S. subsidiaries in an intermediate holding company (IHC).

As of the second quarter of 2021, BHCs in the United States (excluding IHCs) held nearly \$22 trillion in assets. The eight U.S. G-SIBs account for 66 percent of this total. Six large complex BHCs account for 10 percent, and nine large noncomplex BHCs account for 7 percent. All other BHCs account for the remaining 17 percent (**Chart 3.5.1.2**).

Capital Adequacy

Adequate capital supports banks’ ability to lend in an economic downturn by providing a buffer to absorb loan losses, declines in market value of securities and trading portfolios, counterparty defaults, and operational and legal costs. Due to regulatory reforms introduced after the 2008 financial crisis, BHCs entered the COVID-19 pandemic with

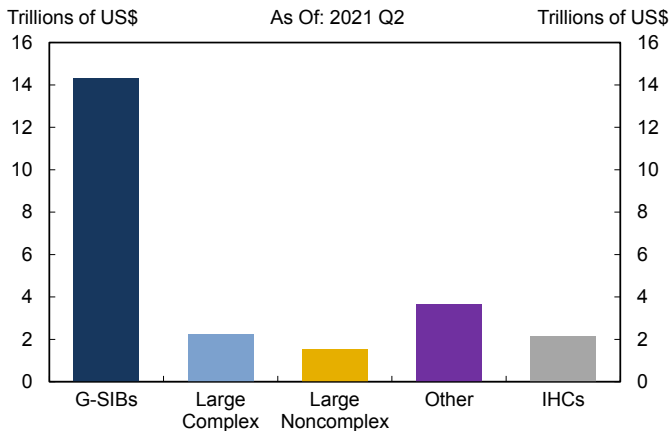
3.5.1.1 Categorization of Large U.S. BHCs

Description	U.S. Domestic Banking Org.
Category I (U.S. G-SIBs)	Bank of America Bank of New York Mellon Citigroup Goldman Sachs JPMorgan Chase Morgan Stanley State Street Wells Fargo
Category II (Large complex, ≥\$700b Total assets, or ≥ \$75b in Cross-Jurisdictional Activity)	Northern Trust
Category III (Large complex, ≥\$250b Total assets or ≥ \$75b in NBA, wSTWF, or Off-balance sheet exposure)	Capital One Charles Schwab PNC Financial Truist Financial U.S. Bancorp
Category IV (Large noncomplex, other firms with \$100b to \$250b Total assets)	Ally Financial American Express Citizens Financial Discover Fifth Third Huntington KeyCorp M&T Bank Regions Financial

Source: Federal Reserve

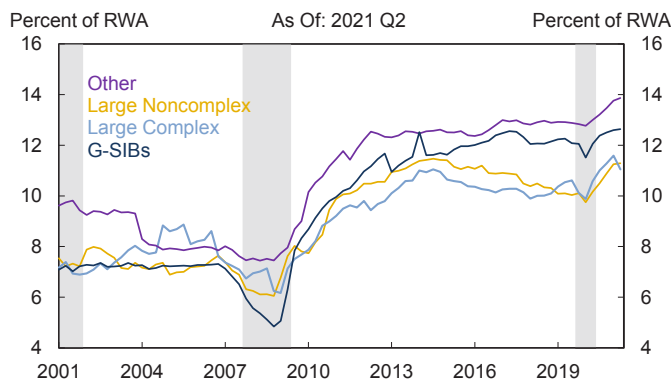
Note: Northern Trust is in Category II due to its cross-jurisdictional activity. Synchrony Financial dropped out of Category IV in 2021:Q2 and did not participate in the 2020 or 2021 stress tests.

3.5.1.2 Total Assets by BHC Type/IHC



Source: FR Y-9C

3.5.1.3 Common Equity Tier 1 Ratios



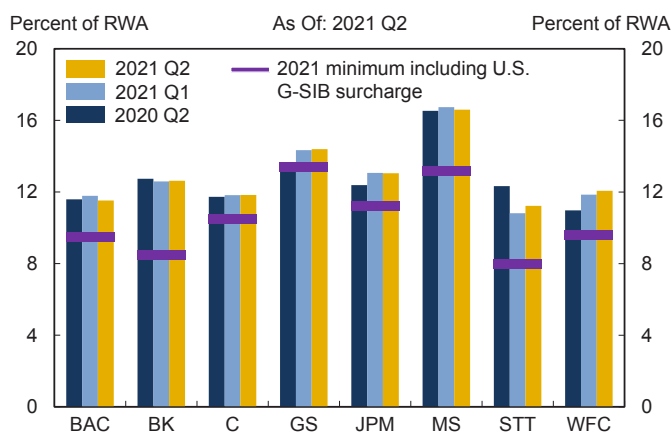
Source: FR Y-9C,
Haver Analytics

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

more than double pre-2008 financial crisis levels of aggregate risk-based equity capital. These higher capital levels allowed banks to continue to lend to households and businesses and to absorb significant increases in loan loss provisions as the pandemic unfolded.

As of the second quarter of 2021, common equity tier 1 (CET1) ratios surpassed pre-pandemic levels across all four groups of BHCs, more than reversing the drop in the second quarter of 2020 (**Chart 3.5.1.3**). The CET1 ratio, defined as the ratio of CET1 capital to total risk-weighted assets (RWAs), is a risk-based capital requirement. Capital positions have improved as BHCs have released significant portions of the loan loss provisions they booked at the onset of the pandemic. In addition, RWAs have decreased as businesses have repaid credit lines they drew, and households have paid down credit card balances. Despite significant stress during the first half of 2020, U.S. G-SIBs have exceeded Basel III standards for the minimum risk-based capital requirement ratios, including the G-SIB surcharge and stress capital buffer (SCB) (**Chart 3.5.1.4**).

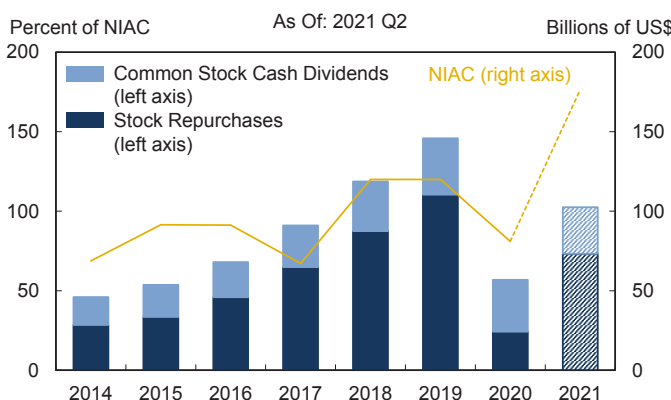
3.5.1.4 Common Equity Tier 1 Ratios at U.S. G-SIBs



Source: FR-Y9C

Stock repurchases have rebounded at U.S. G-SIBs in 2021 as restrictions imposed at the onset of the pandemic have rolled off (**Chart 3.5.1.5**). Aggregate payout rates, defined as the sum of stock repurchases and common stock dividends, increased leading up to 2020 and then decreased during the second half of 2020 and the first half of 2021, relative to pre-pandemic levels. In 2020, all U.S. G-SIBs announced a voluntary suspension of share buybacks, and the Federal Reserve temporarily halted stock repurchases for banks with more than \$100 billion in total assets and capped dividends payments for all BHCs at 2019 levels as part of the June 2020 stress test results. Following favorable stress test results in December 2020, the Federal Reserve announced it would permit BHCs to resume share repurchases during the first quarter of 2021, allowing common stock dividends and share repurchases that in aggregate did not exceed the average quarterly profits during the

3.5.1.5 Payout Rates at U.S. G-SIBs



Source: FR Y-9C

Note: Net income available to common shareholders (NIAC) is net income minus preferred dividends. 2021 data represents YTD data through Q2.

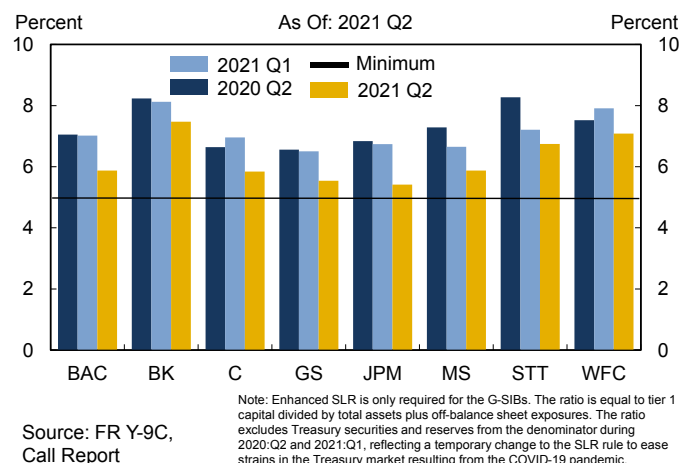
past year. In March 2021, the Board announced that the temporary restrictions on distributions would be lifted for firms that remained above minimum risk-based capital requirements in the 2021 stress test. Stress test results were released in June 2021, and all BHCs subject to the stress test maintained adequate post-stress capital levels. As a result, temporary restrictions on capital distributions were lifted and distributions remain governed by the rules set forth in the SCB framework.

U.S. G-SIBs' supplementary leverage ratios during the first half of 2021 were comparable to pre-pandemic levels (**Chart 3.5.1.6**). The supplementary leverage ratio (SLR) is a non-risk-based capital adequacy measure defined as the ratio of tier 1 capital to total assets, plus certain off-balance sheet exposures. The SLR applies to large complex BHCs and an enhanced version of the SLR applies to U.S. G-SIBs. Expanding balance sheets since the start of the COVID-19 pandemic have put downward pressure on SLRs. The Federal Reserve introduced a temporary modification to the SLR rule, which was subsequently extended to depository institutions through a joint interagency rulemaking, that allowed BHCs to exclude Treasury securities and reserves at the Federal Reserve from the denominator of the ratio until March 31, 2021. Those temporary modifications provided flexibility to certain banks to continue to accept customer deposits and provide credit to households and businesses.

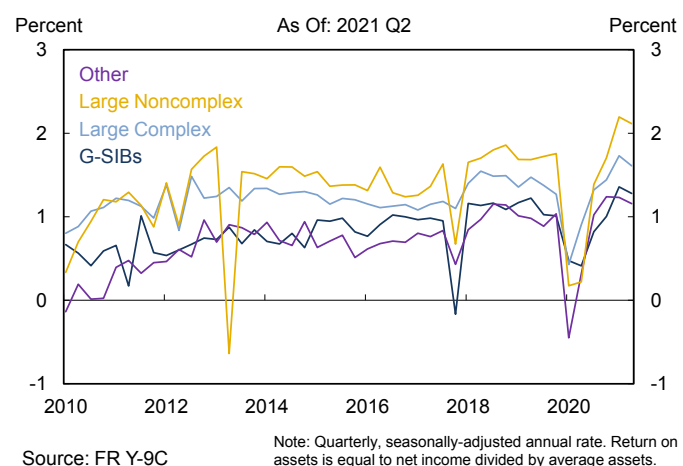
Profitability

Profitability is a key method for BHCs to improve capital positions. Profitability rebounded in 2021, driven in part by the release of substantial amounts of the loss provisions that BHCs had built in 2020 after the onset of the pandemic (**Chart 3.5.1.7**). Strong non-interest income, including from trading and investment bank activity, also lifted net income among large BHCs. However, net interest margins have declined significantly relative to pre-pandemic levels, attributable in part to a decline in interest rates and to

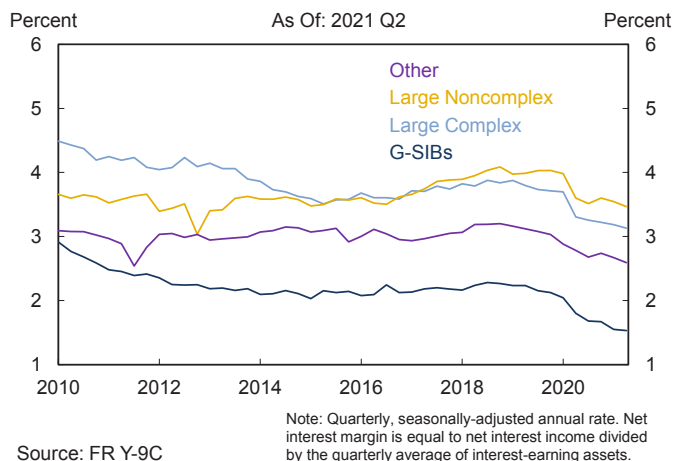
3.5.1.6 Supplementary Leverage Ratios at U.S. G-SIBs



3.5.1.7 Return on Assets



3.5.1.8 Net Interest Margins

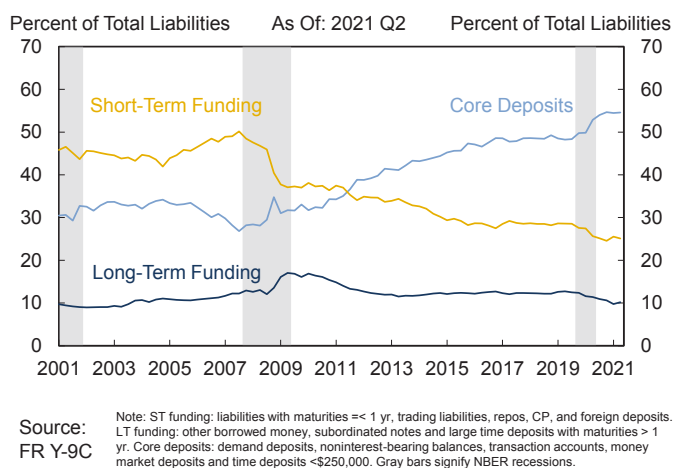


compositional shifts in banks' balance sheets (**Chart 3.5.1.8**). Looking forward, though profitability has rebounded in 2021, downside risks include limited loan growth, a low interest rate environment, and potential moderation in trading and investment banking activity.

Funding Sources

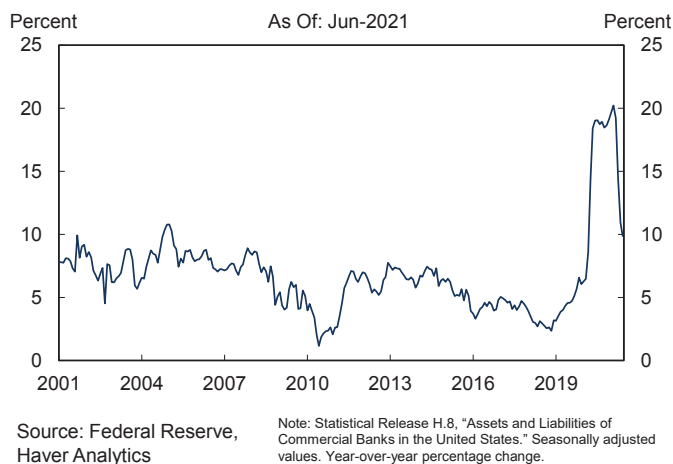
BHCs continue to have fairly stable funding sources. After the 2008 financial crisis, BHCs reduced reliance on short-term wholesale funding, which funding exposed them to significant liquidity and solvency risks in the event of disruptions in interbank markets. As the use of short-term funding has declined, more stable funding sources, such as core deposits, have increased markedly (**Chart 3.5.1.9**). This more stable funding mix helped BHCs avoid significant funding disruptions during the onset of the COVID-19 pandemic.

3.5.1.9 Sources of Funding at G-SIBs and Large-Complex



Deposit growth has moderated in 2021 but remains elevated relative to pre-pandemic growth rates (**Chart 3.5.1.10**). Deposits increased rapidly in 2020, as many corporate firms drew down credit lines and deposited the funds to establish bigger cash buffers. Fiscal programs have bolstered retail deposit growth through 2021. Deposits stand at \$17.1 trillion as of June 2021, about \$4 trillion higher than pre-pandemic levels.

3.5.1.10 Deposit Growth, All Commercial Banks



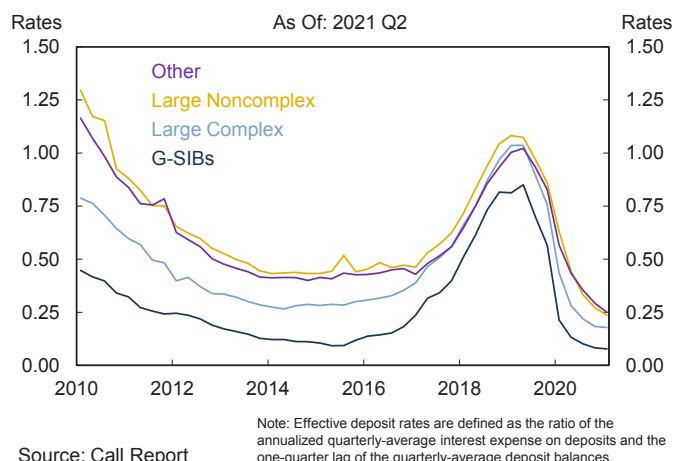
Deposit rates have remained at low levels in 2021, having fallen in 2020 with the decline in short-term interest rates. G-SIBs continue to have materially lower effective deposit rates than large complex and large noncomplex banks (**Chart 3.5.1.11**).

Asset Quality

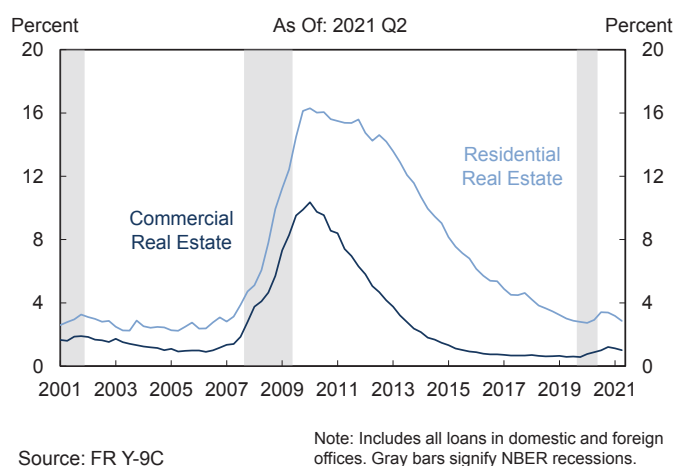
Asset quality at BHCs has improved, despite the challenges presented to businesses and households by the pandemic. Fiscal relief, forbearance, higher vaccination rates, and the broad reopening of the economy mitigated BHCs' credit risk in the second half of 2020 and the first half of 2021. Delinquency rates remain subdued on residential and CRE loans relative to recent business cycles, due in part to more conservative underwriting practices and higher lending standards in the mortgage market, as well as legislative or voluntary forbearance actions that have provided debt service relief to some borrowers (**Chart 3.5.1.12**). Delinquency rates on credit cards and auto loans stand near their lowest historic levels, as the consumer sector has benefited from fiscal stimulus. While delinquency rates on commercial and industrial (C&I) loans inched up in 2020, they fell in 2021 and remain significantly lower than in previous business cycles (**Chart 3.5.1.13**).

Banks tightened standards after the onset of the pandemic but have since unwound that tightening at least partially. In July 2021, banks reported in the SLOOS that their lending standards had eased for all loan categories relative to July 2020. Banks were also asked in the SLOOS about the current level of lending standards relative to the midpoint of the range in standards since 2005, a period that encompasses very tight standards after the 2008 financial crisis and very loose standards before that crisis. Banks, on balance, reported that their lending standards on C&I loans are currently at the eased end of the range of standards between 2005 and the present. In contrast, for subprime consumer loans and most categories of commercial or residential mortgages, banks reported currently having relatively tighter levels of lending standards on net.

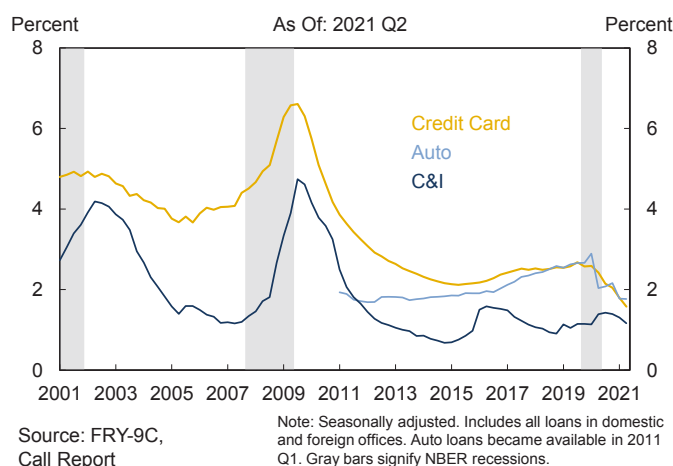
3.5.1.11 Effective Deposit Rates by BHC Category



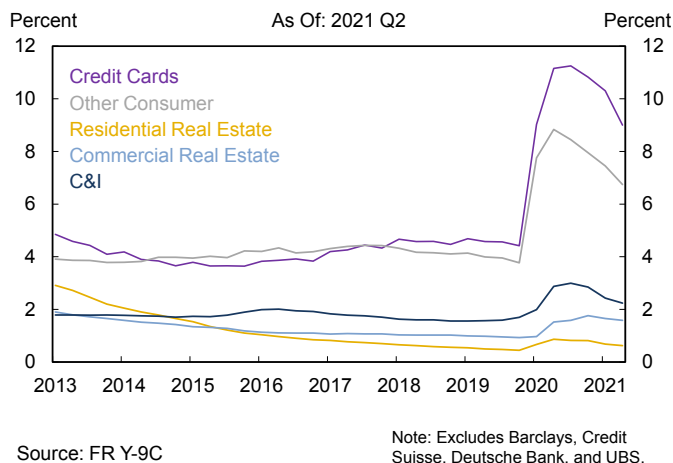
3.5.1.12 Delinquency Rates on Real Estate Loans



3.5.1.13 Delinquency Rates on Selected Loans

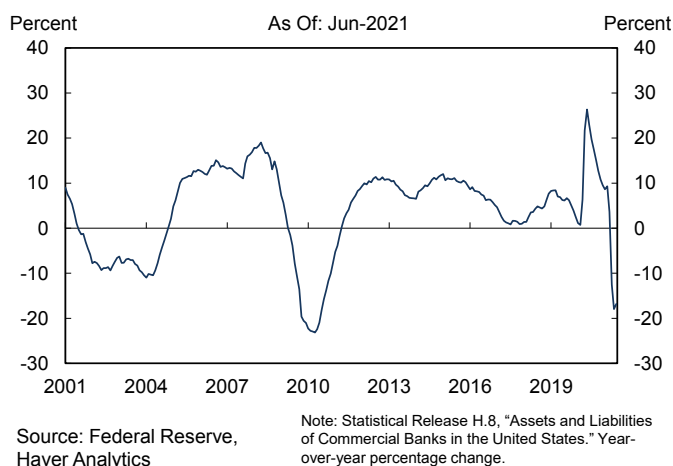


3.5.1.14 Provisions to Loans Ratios at BHCs



Loan loss provisions have been volatile over the past two years. During the first three quarters of 2020, banks provisioned for large loan losses, more than doubling their pre-pandemic allowances, though a significant part of this increase is due to the current expected credit losses (CECL) accounting change. Vaccine development and broad-scale accessibility, along with fiscal support and the broad reopening of the economy, significantly improved the outlook for loan losses and reduced uncertainty about those losses. As a result, BHCs have reduced their allowances for loan losses during the fourth quarter of 2020 and first half of 2021 (**Chart 3.5.1.14**).

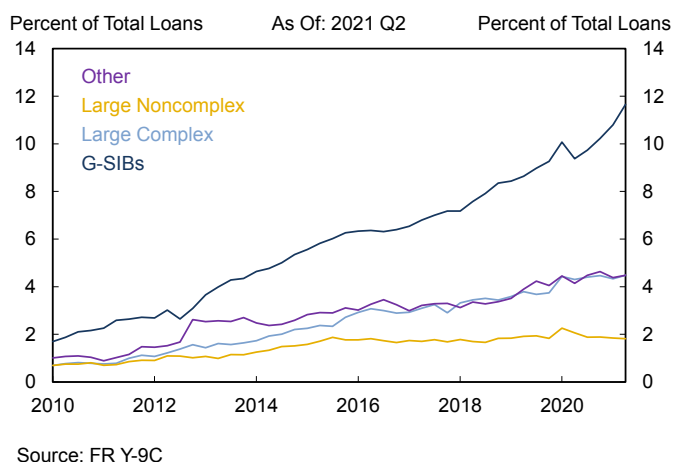
3.5.1.15 C&I Loan Growth, All Commercial Banks



C&I loans outstanding have shrunk in recent data amid repayment of credit draws taken out at the onset of the pandemic and forgiveness of PPP loans, though some of the weakness can be attributed to substitution effects. The average year-over-year growth of C&I loans exceeded 15 percent from April through December 2020, slowed to about 7 percent during the first quarter of 2021, and fell to negative 15 percent in the second quarter of 2021 (**Chart 3.5.1.15**).

U.S. G-SIBs' lending to nondepository financial institutions has significantly outpaced commercial lending to nonfinancial firms since 2010, and now accounts for about 11 percent of U.S. G-SIBs' total loans (**Chart 3.5.1.16**).

3.5.1.16 Loans to Nondepository Financial Institutions

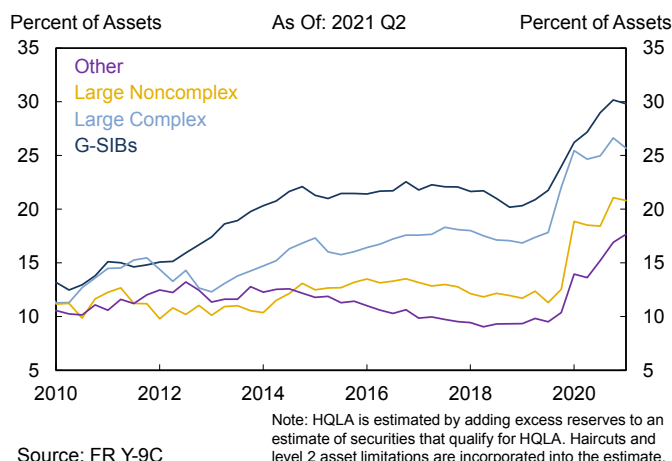


Liquidity Management

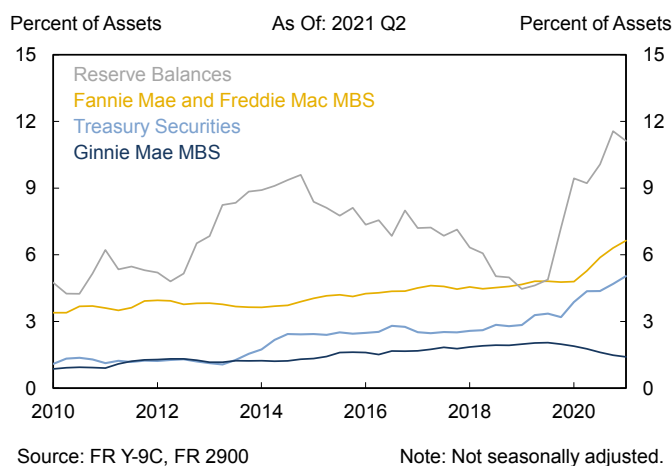
Liquidity positions at BHCs have improved over the past year. High-quality liquid assets reached historically high levels during the first quarter of 2021 as BHCs increased their holdings of reserves, Treasury securities, and agency mortgage-backed securities (**Chart 3.5.1.17**). Levels decreased slightly in the second quarter but remain high by historical standards. The Federal Reserve's asset purchase program has increased the amount of reserves in the banking system significantly since the onset of the pandemic (**Chart 3.5.1.18**).

Inflows of relatively stable insured retail deposits helped alleviate liquidity pressures from large credit line drawdowns. U.S. G-SIBs maintained liquidity coverage ratios (LCR) well above the 100 percent requirement as stress peaked during the first half of 2020 (**Chart 3.5.1.19**). LCRs remain similar to pre-pandemic levels, with U.S. G-SIBs ranging between 4 and 38 percentage points above the required 100 percent of net outflows in the second quarter of 2021.

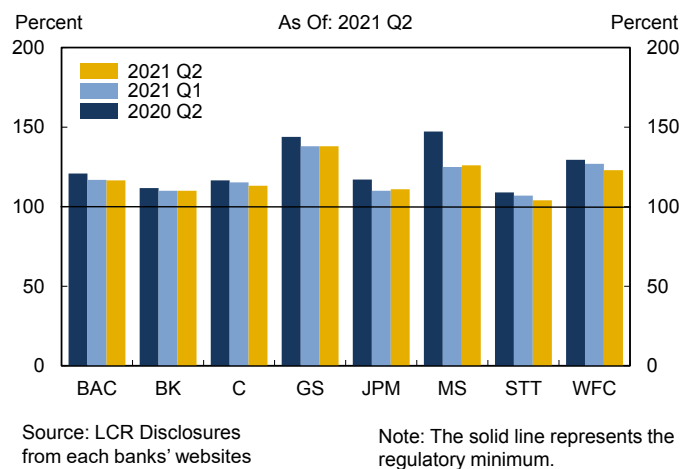
3.5.1.17 High-Quality Liquid Assets by BHC Type



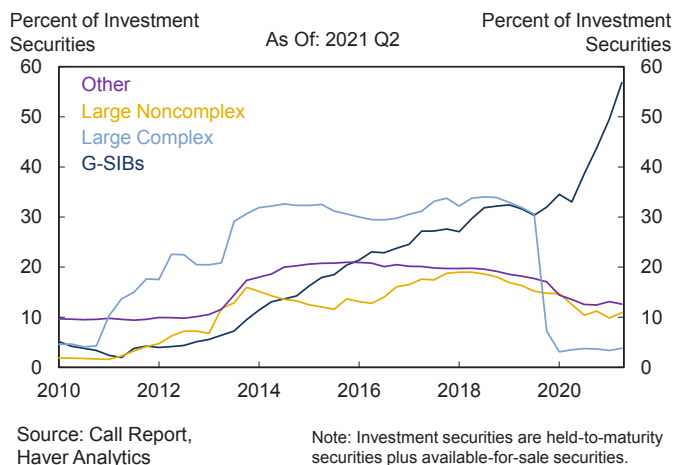
3.5.1.18 Selected Liquid Assets at All BHCs



3.5.1.19 Liquidity Coverage Ratios at U.S. G-SIBs

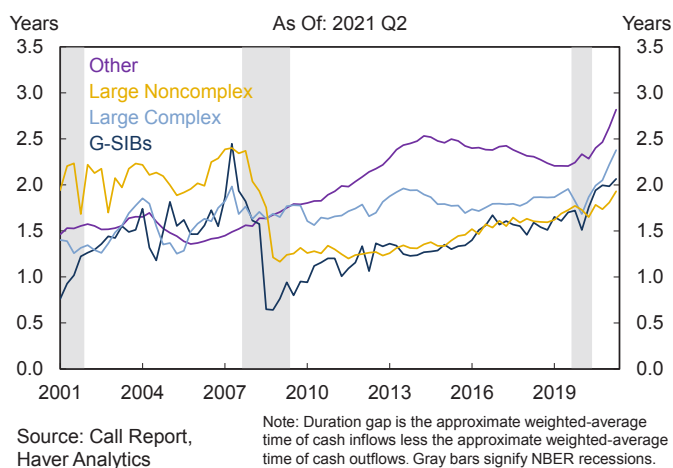


3.5.1.20 Held-to-Maturity Securities



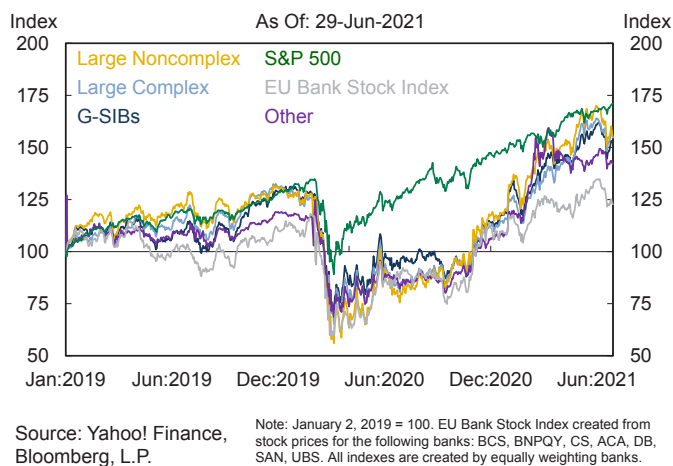
At the end of 2019, large complex and large noncomplex BHCs significantly reduced the share of investment securities classified as held-to-maturity investment securities as the tailoring rules went into effect. The tailoring rules allowed most large complex and large noncomplex BHCs to opt out of including accumulated other comprehensive income from available-for-sale accounts in their capital calculation. As a result, most large complex and some large noncomplex BHCs shifted their entire holdings of securities from held-to-maturity into available-for-sale accounts, where they remain today (**Chart 3.5.1.20**). In late 2020 and early 2021, the share of G-SIB investment securities classified as held-to-maturity increased markedly, as firms transferred a significant portion of their available-for-sale securities and deployed their significant deposit inflow into longer term investments. The preference for held-to-maturity securities by G-SIBs reflects their desire to minimize the impact that accumulated other comprehensive income from available-for-sale securities has on the calculation of CET1 capital. Other regulatory requirements that may incentivize investment in held-to-maturity securities over available-for-sale securities include the impact that available-for-sale securities can have on the G-SIB score calculation and on the determination of the stress capital buffer.

3.5.1.21 Duration Gap



The duration gap, which reflects the difference between the timing of cash inflows from assets and the timing of cash outflows from liabilities, increased during the past year across all four BHC categories as BHCs acquired long-term Treasuries and agency MBS amid large deposit inflows (**Chart 3.5.1.21**). The duration gap is a measure of interest rate risk; a larger, positive duration gap implies that if rates rise, assets will lose more value than liabilities, thus pressuring BHC capital.

3.5.1.22 Bank Stock Performance



Market Perception of Value and Risk

Market perceptions of BHC values have grown over the past year (**Chart 3.5.1.22**). Large BHC stock prices have mostly recovered from the sharp declines in valuations that occurred in

March 2020. BHC stock prices have posted similar cumulative gains to the broader S&P 500. Additionally, price-to-book ratios of U.S. G-SIBs have trended higher over the past year, after having declined materially during the first quarter of 2020 (**Chart 3.5.1.23**).

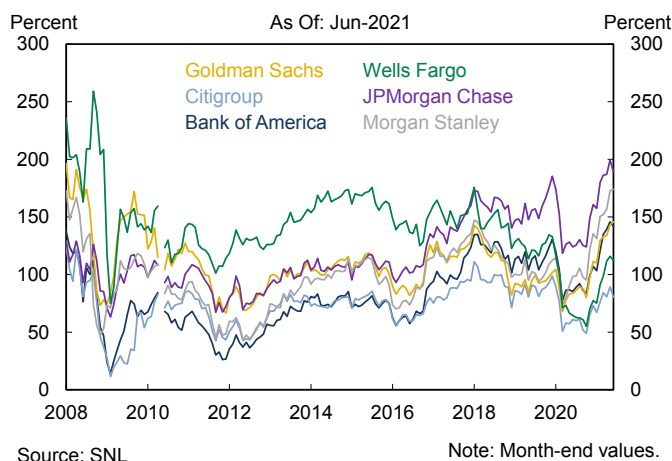
Consistent with growth in their market valuations, market perceptions of risk at BHCs have remained low over the past year. CDS spreads of U.S. G-SIBs, a measure of default risk, have almost returned to pre-pandemic levels. In large part, the lower CDS spreads that prevailed before the onset of the COVID-19 pandemic reflect the strong liquidity and capital positions of BHCs (**Chart 3.5.1.24**). CDS spreads of foreign G-SIBs performed similarly to U.S. G-SIBs with the exception of Deutsche Bank, which experienced the largest increase in CDS spreads among foreign G-SIBs, exceeding 200 basis points (**Chart 3.5.1.25**).

Stress Tests and Capital Planning

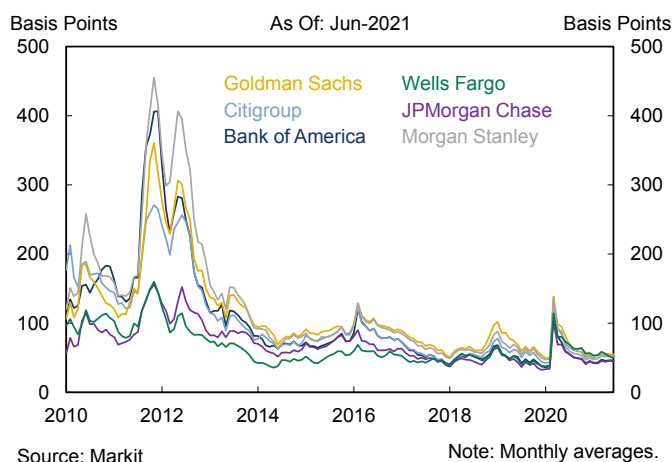
The Federal Reserve's stress tests are intensive assessments of the capital adequacy of the largest U.S. BHCs and U.S. IHCs of foreign banking organizations. The Federal Reserve's stress testing framework includes supervisory and company-run stress tests, the sizing of each firm's stress capital buffer requirement, and an assessment of the practices that the firms use to assess their capital needs. The supervisory stress test is conducted by the Federal Reserve, and the supervisory scenarios are designed by the Federal Reserve. The Federal Reserve consults with the FDIC and the OCC on these scenarios, which are also used for company-run stress tests by national banks, state nonmember banks, and federal savings associations.

During the period of significant economic uncertainty related to the pandemic, the Federal Reserve took several actions to preserve the resilience of the banking system and those actions were informed by analysis stemming from the Federal Reserve's stress tests. In June 2020, the Federal Reserve required BHCs and IHCs subject to stress testing requirements to temporarily suspend share repurchases and

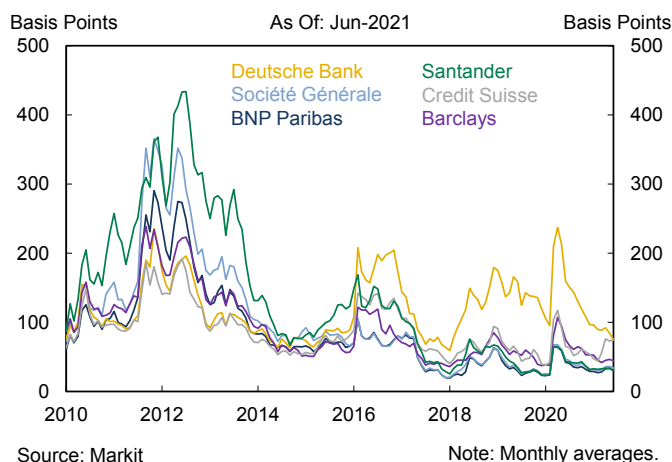
3.5.1.23 Price-to-Book for Select U.S. G-SIBs



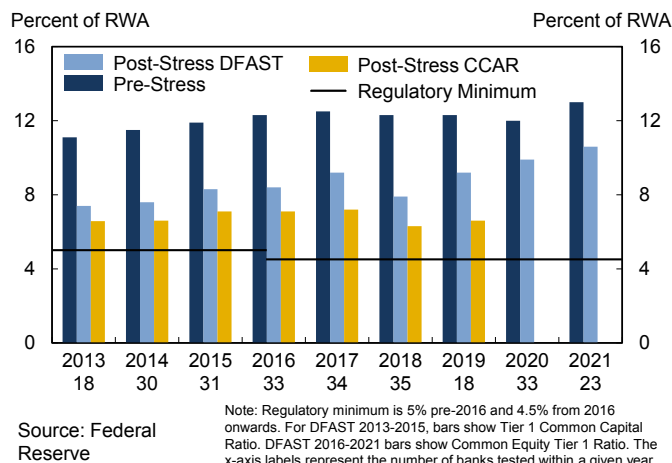
3.5.1.24 5-Year CDS Premiums Select U.S. G-SIBs



3.5.1.25 5-Year CDS Premiums Select Foreign Banks



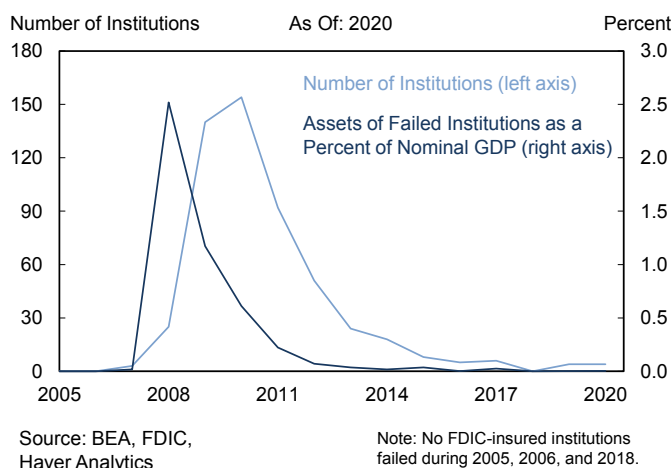
3.5.1.26 Initial and Stressed Capital Ratios



limited dividend payouts to 2019 levels. In addition, the Federal Reserve required large banks to re-evaluate and resubmit their long-term capital plans in November 2020. Following a second round of stress tests in December, the Board limited firms' capital distributions to levels based on their average quarterly earnings during the past year.

The Federal Reserve announced in June 2021 that none of the 23 BHC and IHCs that were tested dropped below minimum capital requirements on a post-stress basis. The aggregate CET1 ratio among those tested declined from 13.0 percent in the fourth quarter of 2020 to its minimum of 10.6 percent as part of the severely adverse scenario. The aggregate CET1 ratio remains well above the required minimum levels throughout the projection horizon. (**Chart 3.5.1.26**). Loan losses as a fraction of average loans were comparable to loan losses in previous annual stress testing exercises. The temporary restrictions on dividends and share repurchases were lifted following the announcement of the 2021 stress test results. Capital distributions remain governed by the SCB framework, which automatically limits capital distributions for BHCs that fall below their capital requirements in the stress scenarios.

3.5.1.27 FDIC-Insured Failed Institutions



3.5.1.2 Insured Commercial Banks and Savings Institutions

As of the second quarter of 2021, the banking industry included 4,953 FDIC-insured commercial banks and savings institutions with total assets of nearly \$23 trillion. During 2020, 168 institutions were absorbed by mergers, while eight new institutions were added. Ten additional institutions opened in 2021 as of September 30, 2021 and 28 institutions were absorbed by mergers as of the second quarter of 2020. Failures of insured depository institutions are down significantly since the 2008 financial crisis. Although four institutions failed in 2020, no banks failed through the second quarter of 2021 (**Chart 3.5.1.27**).

The FDIC's 'problem bank' list included 56 institutions—slightly more than 1 percent of all

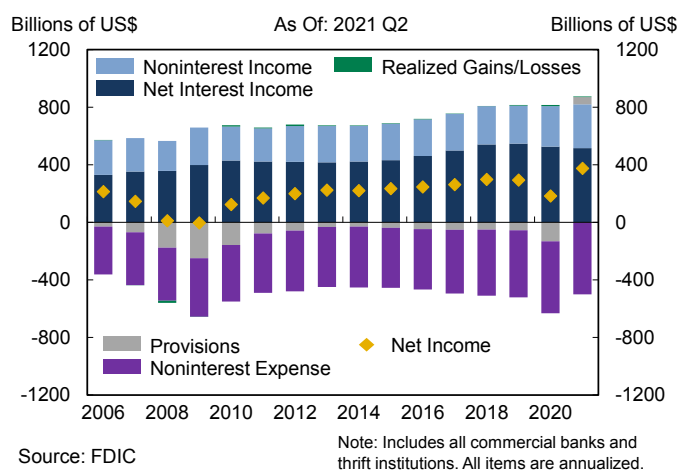
institutions—at the end of 2020, in comparison to 51 banks in the prior year. Banks on this list have financial, operational, or managerial weaknesses that require corrective action in order to operate in a safe and sound manner.

Developments at insured commercial banks and savings institutions were similar to the developments at large BHCs. Total assets increased by \$1.6 trillion between the second quarter of 2020 and the second quarter of 2021. Loans and leases declined by \$134 billion during that period. Loan portfolios that declined include C&I loans, 1-4 family residential real estate loans, and credit card loans, which were down \$360 billion, \$36 billion, and \$16 billion, respectively. Loan portfolios that grew include nonfarm, nonresidential CRE loans, and construction and development loans, which increased by \$49 billion and \$13 billion, respectively. The decline in the C&I portfolio was driven by a combination of repayments of lines of credit by businesses and paydowns and forgiveness of PPP lending. Banks increased their investment securities portfolio by \$1.2 trillion since the second quarter of 2020. U.S. Treasury securities balances were up by 41 percent and mortgage-backed securities were up by 28 percent compared to the second quarter of 2020. Cash and due from accounts also grew \$635 billion, or 22 percent, driven by a large inflow of deposits, and now represent 15 percent of total assets, up from 14 percent a year ago.

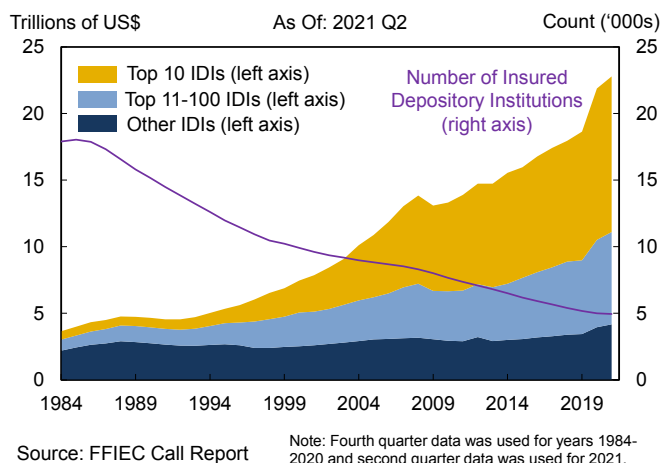
Net income for all U.S. commercial banks and savings institutions totaled \$147 billion during the first six months of 2021, a 297 percent increase from the first six months of 2020, driven by a decline in loan loss provisions (**Chart 3.5.1.28**). Net interest income fell by 4.0 percent in the first half of 2021 due to interest income declines outpacing interest expense declines. Interest-earning assets grew 8.2 percent since June 2020; however, many of these assets are low-yielding, such as cash and due froms.

The long-term trend of banking industry consolidation continued in 2019 and 2020, as the 10 largest and 100 largest institutions held

3.5.1.28 Commercial Bank and Thrift Net Income



3.5.1.29 Total Assets of Largest Insured Depository Institutions



over 50 percent and 82 percent of total industry assets, respectively (**Chart 3.5.1.29**). As of the second quarter of 2021, the total number of banks and savings associations decreased to 4,951, which is a historical low.

3.5.1.3 U.S. Branches and Agencies of Foreign Banks

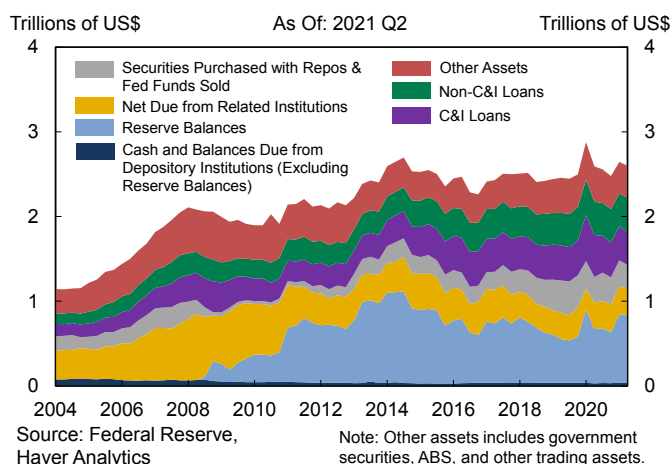
As of June 30, 2021, assets of U.S. branches and agencies of foreign banks totaled \$2.6 trillion, accounting for roughly 11 percent of total U.S. banking assets. Following a first quarter increase, asset levels fell in the second quarter, leaving them little changed year-over-year (**Chart 3.5.1.30**).

Reserve balances for U.S. branches and agencies of foreign banks totaled \$794 billion and comprised 31 percent of total assets as of the second quarter of 2021. Reserve balances increased \$154 billion or 24 percent from the prior year. While reserve balances decreased after the first quarter, they remain elevated compared to pre-pandemic levels.

Reverse repos and fed funds sold at U.S. branches and agencies of foreign banks decreased by \$26 billion or 8.6 percent from June 30, 2020 to June 30, 2021. Reverse repos represented 11 percent of total assets at U.S. branches and agencies of foreign banks, compared to 12 percent of total assets one year prior. The \$26 billion reduction in reverse repos was partly driven by the relative level of repo rates versus interest on excess reserves, creating an incentive for firms to leave excess liquidity in reserves as opposed to reverse repo.

As of June 30, 2021, total loan balances accounted for approximately 30 percent of total assets at U.S. branches and agencies of foreign banks. Non-C&I lending constituted a slightly larger portion of overall lending than C&I lending, reversing a historic trend. Compared to June 30, 2020, C&I loans decreased \$104 billion or 21 percent. The year-over-year C&I loan decrease is a function of utilization rates and funded balances normalizing from elevated levels, reflective of customer pay downs. C&I loan balances are now roughly in line with

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



pre-pandemic trends. In addition, C&I loan origination generally remains muted, likely due to uncertainty in the economic outlook and related efforts to reduce risk exposures.

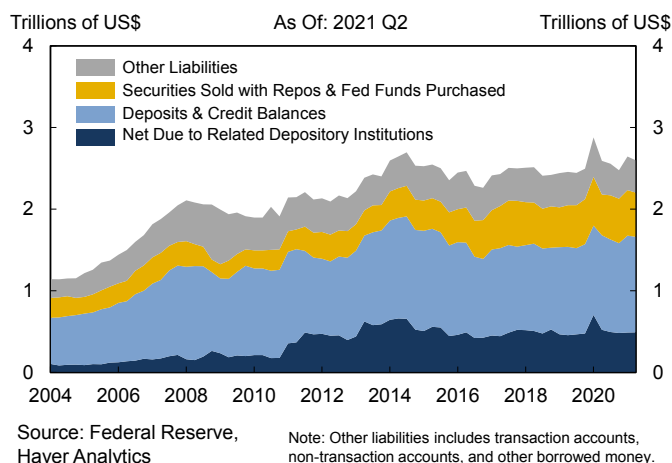
Deposits and credit balances represent 45 percent of total liabilities for U.S. branches and agencies of foreign banks as of June 30, 2021 (**Chart 3.5.1.31**). Deposits and credit balances remain virtually unchanged year-over-year but are elevated compared to pre-pandemic levels. Net due to related depository institutions decreased \$31 billion or 5.9 percent from June 30, 2020. The year-over-year decrease is attributable to the elevated baseline level that was driven in part by substantial borrowing by foreign head offices at their central banks' dollar auctions, largely funded via the Federal Reserve's liquidity swap lines. These borrowings flowed downstream to U.S. branches and agencies of foreign banks during the initial pandemic stress to support local operations and meet dollar liquidity needs. Since then, funding from head offices decreased substantially as conditions improved. Securities sold with repos and federal funds purchased increased \$44 billion or 8.8 percent between June 30, 2020, and June 30, 2021. Repos totaled 21 percent of total liabilities for U.S. branches and agencies of foreign banks and remain unchanged year-over-year.

3.5.1.4 Credit Unions

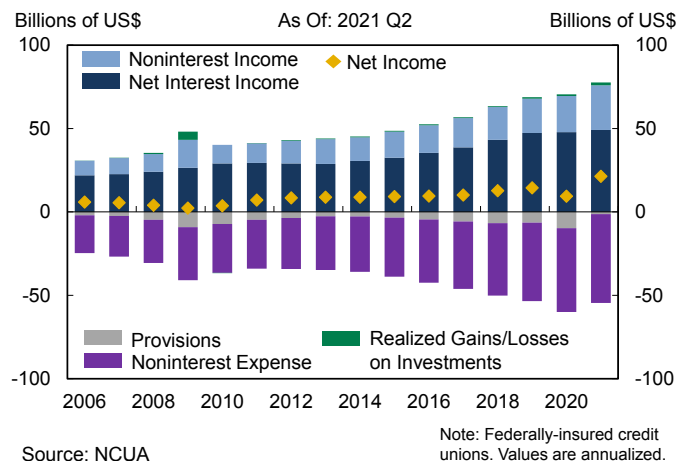
Credit unions are member-owned, not-for-profit, depository institutions. As of the second quarter of 2021, there were 5,029 federally insured credit unions with aggregate assets of \$1.98 trillion.

The credit union industry currently serves just over 127 million members. The industry is dominated in number by institutions with relatively small financial footprints compared to other depositories. Nearly two-thirds of credit unions had assets under \$100 million, and 22 percent of credit unions had assets under \$10 million. There were 1,361 credit unions with assets between \$100 million and \$1 billion, and 392 credit unions with assets over \$1 billion. These smaller institutions account for the bulk of institutions but a very modest,

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



3.5.1.32 Credit Union Income



and shrinking, share of assets and members. For example, credit unions with less than \$100 million in assets account for 65 percent of the number of institutions but less than 5 percent of industry assets, while credit unions with more than \$1 billion in assets account for 72 percent of system-wide assets and 67 percent of credit union members. Consolidation in the credit union industry has continued, particularly among smaller institutions, in line with long-running trends among depository institutions.

The COVID-19 pandemic has presented the credit union system with numerous challenges. However, the data show that the industry has remained on a relatively solid financial footing. Net income at consumer credit unions summed to \$21 billion on an annualized basis in the second quarter of 2021, a sharp increase from just \$9.4 billion over the same period in 2020 (**Chart 3.5.1.32**). Strong income gains have been supported by sizeable declines in system-wide provisions for loan, lease, and credit loss expenses in recent quarters. Interest income declined \$3.0 billion, or 4.9 percent, over the year to \$58 billion, reflective of compressed margins due to continued low interest rates. The net interest margin among credit unions declined to 257 basis points from 288 basis points a year earlier. In contrast, non-interest income increased 24 percent over the year to \$27 billion, mainly due to growth in other operating income, which includes income from the sale of residential mortgages.

The amount of outstanding loans at credit unions increased by a moderate 5.0 percent over the year to nearly \$1.2 trillion. That growth is down somewhat from the 6.6 percent pace recorded during the same period a year earlier. The average outstanding loan balance for a credit union member is currently \$16,156.

Credit union real estate loans, which represent roughly half of the credit union industry's loan portfolio, increased 6.1 percent in the most recent four-quarter period, with a particularly strong gain in fixed-rate first mortgages. Auto loans, which represent one-third of the credit union loan portfolio, grew 3.9 percent over

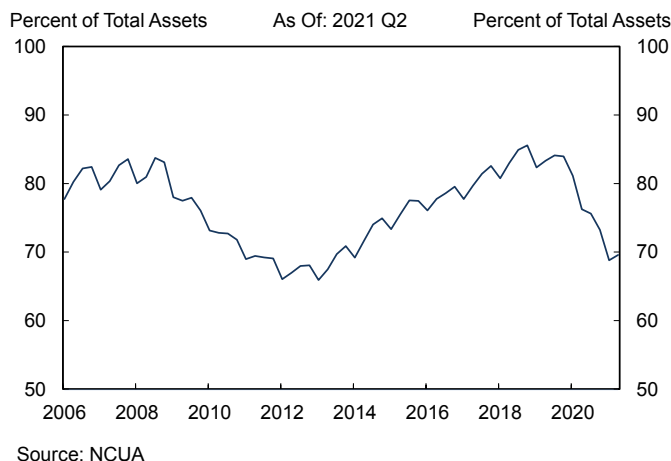
the year ended June 30, 2021. Loans for new autos edged down over that period, but loans for used autos increased a solid 6.5 percent, a result of strong nationwide demand for preowned vehicles. Credit card loan balances edged down by 1.7 percent over the past year as many consumers, aided by government stimulus payments during the pandemic, paid off credit card debt.

Despite the ongoing economic stresses of the pandemic, overall loan performance has been quite strong and has largely mirrored performance of consumer loan portfolios at other credit institutions. The system-wide delinquency rate stood at 46 basis points in the latest quarter, down 12 basis points from a year earlier. The delinquency rates on fixed-rate real estate loans and auto loans stood at 36 basis points and 31 basis points, respectively. The delinquency rate on credit cards, roughly 5 percent of total credit union loans, was just 77 basis points in the latest quarter, down 60 basis points from early 2020. Income support from federal relief payments, enhanced unemployment benefits, and loan forbearance programs helped credit union members stay current on loan obligations.

The credit union system experienced a return on average assets (ROAA) of 112 basis points at an annual rate in the second quarter of 2021, double the return recorded a year earlier. That strong rate of return is skewed toward the very largest institutions. The median ROAA across all federally insured credit unions was 46 basis points.

Based on a number of standard measures, smaller credit unions have continued to underperform larger credit unions. ROAA at the smaller institutions averaged just 33 basis points on an annualized basis in the second quarter of 2021, while ROAA at credit unions with more than \$1 billion in assets was 127 basis points. At the same time, the loan delinquency rate for smaller credit unions was 82 basis points in the second quarter of 2021, compared to 46 basis points at the \$1 billion-plus institutions.

3.5.1.33 Loans as a Percent of Total Deposits



One hallmark of the pandemic for financial institutions has been a surge in deposits due to multiple rounds of government stimulus payments and the sharp rise in the personal saving rate resulting from curtailed spending options stemming from COVID-19 restrictions. Credit unions have been no exception to this trend. Insured shares and deposits at credit unions increased \$224 billion, or 15 percent, over the past year. With this influx of funds, the loan-to-share ratio at credit unions stood at 70 percent in the second quarter of 2021, down from 76 percent a year earlier (**Chart 3.5.1.33**).

The overall investment share of the asset side of credit union balance sheets stood at 22 percent in the second quarter of 2021, up from 18 percent a year earlier. Cash and equivalents (assets with a maturity of three months or less) rose 23.8 percent from a year earlier. The asset share of these liquid assets stood at 13 percent in the latest quarter, up from 10 percent at the onset of the pandemic. The increase in cash and equivalents, along with the general rise in share deposits, has fortified the liquidity position of credit unions during the pandemic.

The industry-wide net worth ratio in the second quarter was 10.17 percent, a decrease of 29 basis points from a year earlier. A primary driver of this decline has been elevated share growth. However, the credit union industry remains well capitalized; under statutory guidelines, a credit union is considered “well capitalized” if it holds a net worth ratio at or above 7 percent, and 95 percent of credit unions currently exceed this threshold.

The pandemic remains ongoing, and the economic outlook is still somewhat uncertain. Despite very low delinquency rates, significant deterioration in loan outcomes is a material risk. In the past, macroeconomic shocks have affected industry loan performance only after a significant lag. Given the typical lag and the fact that the labor market still remains far from maximum employment, weakening loan performance is a distinct risk for the year ahead. Going forward, NCUA is focusing on ensuring that the credit union system and

the Share Insurance Fund are prepared to weather any remaining economic fallout related to the pandemic. The NCUA is encouraging its regulated credit unions to focus on the fundamentals of capital, asset quality, earnings and liquidity, particularly as certain temporary government assistance programs come to an end.

3.5.2 Nonbank Financial Companies

3.5.2.1 Securities Broker-Dealers

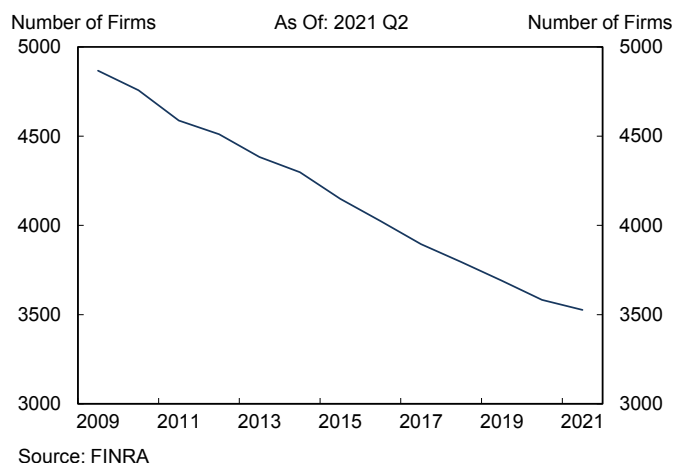
As of June 2021, there were approximately 3,500 securities broker-dealers registered with the SEC, a decline of 1.6 percent from year-end 2020, reflecting a steady decline since 2009 (**Chart 3.5.2.1**).

Broker-dealer aggregate revenues declined modestly in 2020 (**Chart 3.5.2.2**). Increases in underwriting, fees, and trading were offset by decreased interest income. However, declines in expenses, including decreased interest expense, led to an 85 percent increase in net income in 2020. Net income was robust in the first half of 2021, totaling \$52 billion compared to \$85 billion for the full-year 2020.

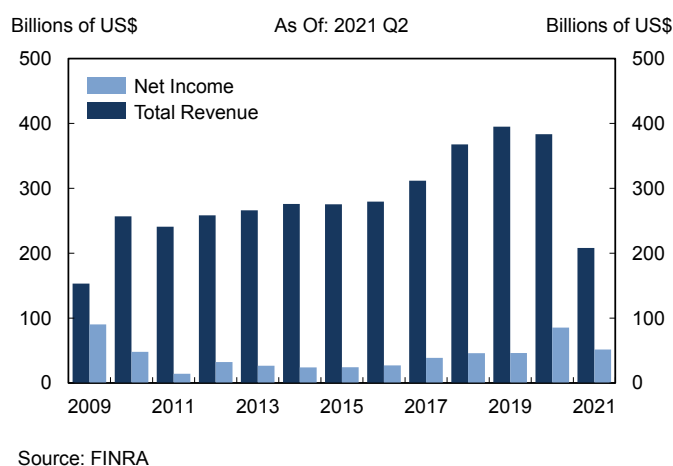
Total assets in the U.S. broker-dealer industry increased to \$5.2 trillion as of the second quarter of 2021 but were well below the peak of \$6.8 trillion in 2007 (**Chart 3.5.2.3**). The U.S. broker-dealer sector remains relatively concentrated, with the ten largest broker-dealers accounting for over 50 percent of industry assets. Broker-dealer leverage, typically obtained through the use of secured lending arrangements such as repos and securities lending transactions, has held relatively steady since 2015.

Most large U.S. broker-dealers are affiliated with U.S. BHCs, IHCs or FBOs. Among this group of broker-dealers, aggregate assets for BHC-affiliated broker-dealers have increased steadily since 2015 (**Chart 3.5.2.4**). The aggregate leverage ratio for large BHC-

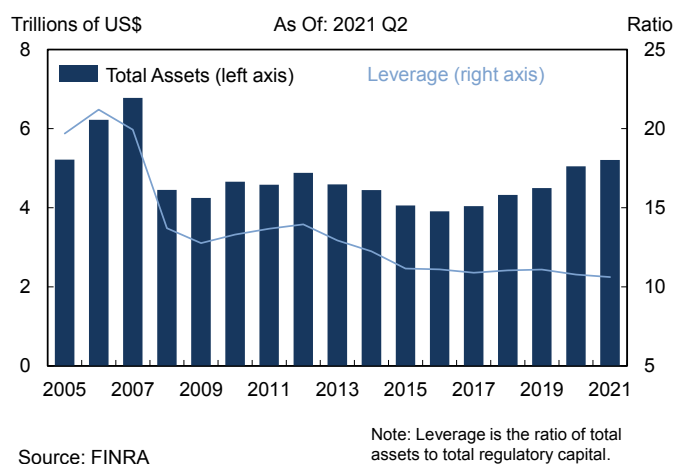
3.5.2.1 Number of Broker-Dealers



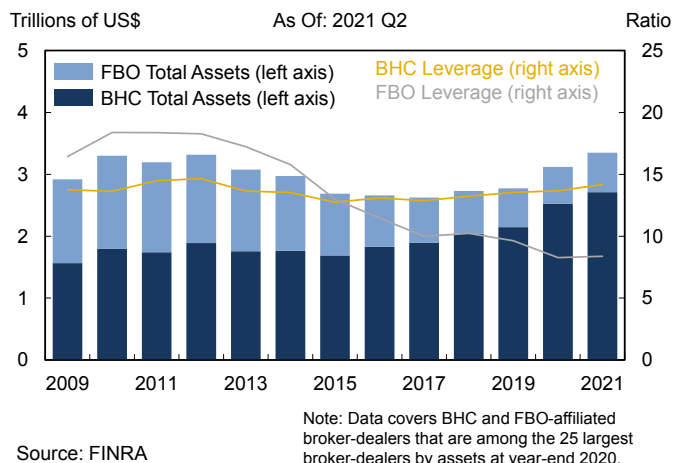
3.5.2.2 Broker-Dealer Revenues and Net Income



3.5.2.3 Broker-Dealer Assets and Leverage



3.5.2.4 Broker-Dealer Assets and Leverage by Affiliation

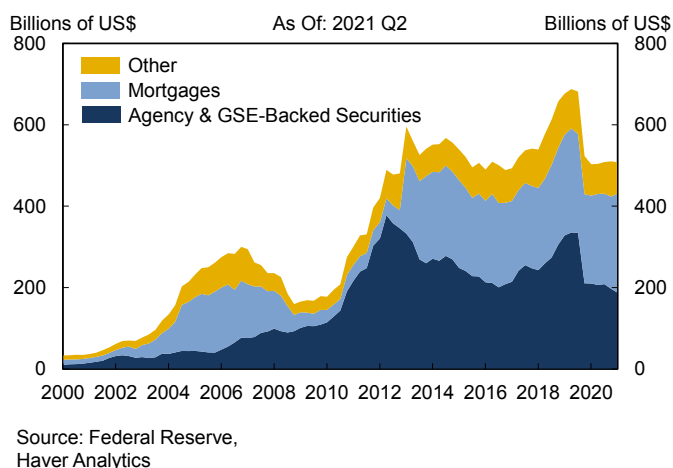


affiliated broker-dealers rose from 13.5 percent in the fourth quarter of 2019 to 14.2 percent in the second quarter of 2021, while the aggregate leverage ratio for large FBO-affiliated broker-dealers fell from 9.6 percent to 8.4 percent.

3.5.2.2 3 REITs

Real estate investment trusts (REITs) are companies that own or finance income-producing real estate across a range of property sectors. Broadly speaking, REITs can be broken down into two major categories: equity REITs, which typically own and operate income-producing real estate, and mREITs, which provide financing for purchasing or originating mortgages and MBS. mREITs can be further divided into agency mREITs, which invest in agency MBS, and non-agency mREITs, which invest in a broad range of mortgage-related assets.

3.5.2.5 mREIT Financial Assets



mREITs tend to deploy significantly more leverage than equity REITs, and the amount of leverage used by mREITs is largely dependent on the credit quality and liquidity of the underlying investments. mREITs typically fund their operations through the short-term repo markets, and the combination of high leverage and short-term borrowing can lead to considerable funding risk. In addition to funding risk, non-agency mREITs can be exposed to credit and liquidity risks. In normal market conditions, these risks typically do not extend to agency mREITs.

mREIT financial assets, which fell sharply in the first quarter of 2020, have remained fairly stable over the past year (**Chart 3.5.2.5**). As of the second quarter of 2021, mREIT financial assets totaled \$508 billion, with agency and GSE-backed securities accounting for 37 percent of financial assets. mREIT repo borrowing, which is often used to finance MBS spread trading, totaled \$211 billion in the second quarter of 2021, significantly below its pre-pandemic peak of \$379 billion as of the fourth quarter of 2019.

During the walling by nearly 70 percent between March 4 and April 3, 2020 (**Chart 3.5.2.6**). Improved liquidity conditions in MBS markets have helped mREIT stock prices partially retrace their March 2020 losses. Nevertheless, the recovery of mREIT stock prices stalled in mid-2021, which can be partially attributed to the flattening of the yield curve. In contrast to mREITs, equity REITs have retraced their pre-pandemic losses and, as of September 2021, the FTSE NAREIT Equity REITs Index was 6.5 percent above year-end 2019 levels. Industrial and apartment focused REITs have led the recovery, while office, lodging, and retail focused REITs generally remain below pre-pandemic levels.

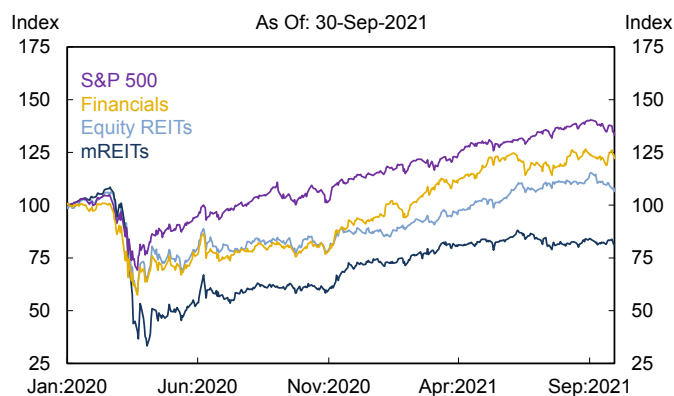
3.5.2.3 Money Market Funds

MMFs are a type of mutual fund that are generally used by investors to manage their cash needs. SEC rules distinguish between retail MMFs, which are limited to individual investors, and institutional funds, which do not require investors to be natural persons. Retail MMFs and government MMFs may price their shares at a stable net asset value (NAV), while prime and tax-exempt institutional MMFs are required to price their shares at a floating NAV.

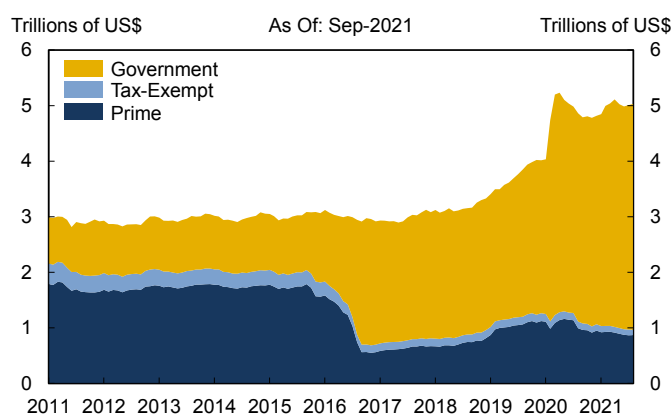
There has been a multiyear shift in assets from prime and tax-exempt MMFs to government MMFs since the implementation of MMF reforms in October 2016. This trend became more pronounced at the onset of the pandemic due to a shift in risk preferences by investors. While growth normalized over the rest of 2020, government MMF assets rose in 2021, driven by an increased preference for cash-like holdings among investors. Government fund assets were \$4.1 trillion, or 81 percent of MMF assets as of September 2021 (**Chart 3.5.2.7**).

In contrast to government MMFs, prime funds experienced large outflows in March 2020, as structural vulnerabilities contributed to increased redemptions, while outflows continued at a more measured pace over the past year. Prime fund assets have declined by \$122 billion or 12 percent for the twelve months ended September 2021. A major driver

3.5.2.6 REIT Stock Performance



3.5.2.7 MMF Assets by Fund Type



of this decline is the conversion of prime MMFs to government MMFs. Challenges in maintaining attractive yields in a low-rate environment, renewed concerns about the riskiness of prime funds, and the possibility of future regulatory changes may also be contributing to declines in prime MMF assets. The PWG released a [Report on MMFs](#) in December 2020 that presented several options to mitigate the vulnerabilities of prime MMFs. In February 2021, the SEC issued a request for comment on this report. At the international level, the Financial Stability Board (FSB) released a report on policy proposals to enhance MMF resilience in October 2021, which is intended to inform any jurisdiction-specific reforms of its members.

The asset composition of MMFs has shifted towards repo holdings over the past year. Repo assets of MMFs stood at \$2.3 trillion in September 2021, accounting for 45 percent of total assets, compared to 21 percent of MMF total assets in September 2020. This increase in repo assets has come even as MMFs have reduced their investments in sponsored repos, which are centrally cleared by FICC, to \$92 billion at the end of September 2021 from \$272 billion at the end of 2019. MMFs have significantly increased their investments in the Federal Reserve's Overnight Reverse Repurchase Agreement Facility (ON-RRP). The ON-RRP is a supplementary policy tool used by the Federal Reserve to set the floor for money market rates and target the federal funds rate within the range set by the FOMC. MMFs generally place cash with the ON-RRP when better investment opportunities are not available. MMF take-up of the ON-RRP was around zero at the beginning of the year when the rate paid on investments was 0.00 percent and reached a high of \$1.4 trillion on September 30, 2021 after the rate was raised to 0.05 percent in June. Recently, MMFs have received significant inflows as some banks take steps to limit deposit growth at the same time that a falling supply of Treasury bills has created fewer investment opportunities.

MMFs remain significant investors in Treasury bills, despite low prevailing interest rates and decreased supply since the debt ceiling's reinstatement at the end of July. As of the end of September 2021, MMFs

directly held \$1.7 trillion, or around 34 percent of total industry assets, in Treasury securities.

Asset yields across all types of MMFs declined in 2021, following the path of short-term rates. For example, the average gross 7-day yield on prime institutional MMFs dropped to 0.09 percent in September 2021 from 0.20 percent in September 2020. The difference between the MMFs' gross and net yields, which represents total industry revenues, has declined sharply amid the fall in interest rates. The decline in revenues can be attributed to many MMF sponsors waiving their fees and reimbursing fund expenses to keep yields paid to investors above zero.

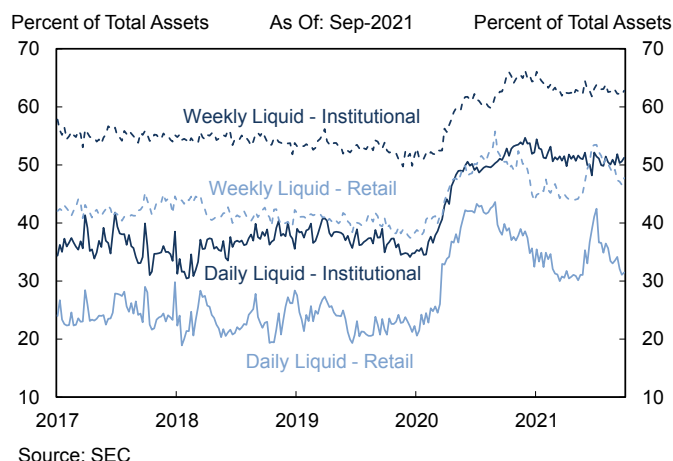
Daily and weekly liquid assets of prime MMFs remained well above regulatory minimums, though prime MMFs are nevertheless susceptible to runs as demonstrated in March 2020. Prime institutional MMFs' daily liquid assets (the share of assets convertible to cash within one business day) averaged 51 percent of assets in the last week of September 2021, around the same level reported in September 2020 and substantially above the 10 percent required by SEC rules. Weekly liquid assets for prime institutional MMFs averaged 63 percent in September 2021, also at approximately the same level reported in September 2020 and well above the 30 percent minimum required under SEC rules (**Chart 3.5.2.8**).

The sensitivity of funds to changes in market interest rates, as measured by the weighted average maturity (WAM) of fund assets, has declined in 2021 after having risen amidst the decline in interest rates at the onset of the COVID-19 pandemic. The recent decline in part reflects the change in the composition of assets towards overnight repo assets. WAMs remain well below the 60-day maximum permitted under SEC rules (**Chart 3.5.2.9**).

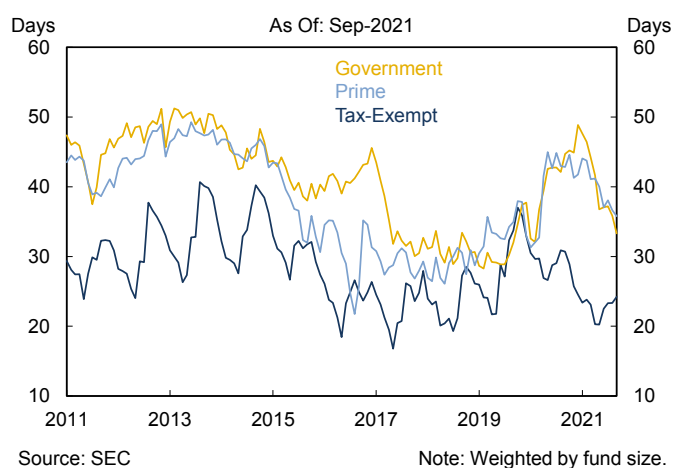
One measure of the credit sensitivity of MMF portfolios, the weighted average life (WAL) of fund assets, has declined slightly over the past year. While the WAM is based on the date of the next interest repricing of each asset, the WAL is based on the final maturity date of assets. MMFs that have higher WALs are subject to increased risk when spreads rise. Average WALs have declined to 50 days in September 2021 from 59 days in September 2020 for prime institutional funds, and from 101 days to 77 days for Government funds over the same period. These averages were well below the 120-day maximum permitted under SEC rules.

Finally, the long-term trend towards consolidation in the MMF sector has continued in 2021. Over the last decade, the number of MMFs declined from 673 in November 2010 to 314 in September 2021, including 189 government MMFs, 61 tax-exempt MMFs, and 64 prime MMFs. As of September 2021, the five

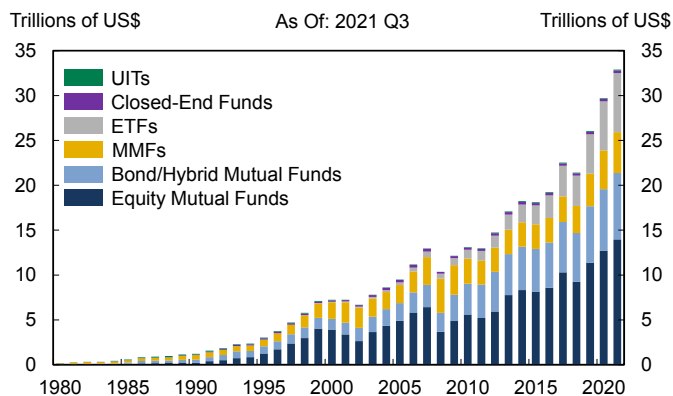
3.5.2.8 Liquid Asset Shares of Prime MMFs



3.5.2.9 Weighted Average Maturities by Fund Type

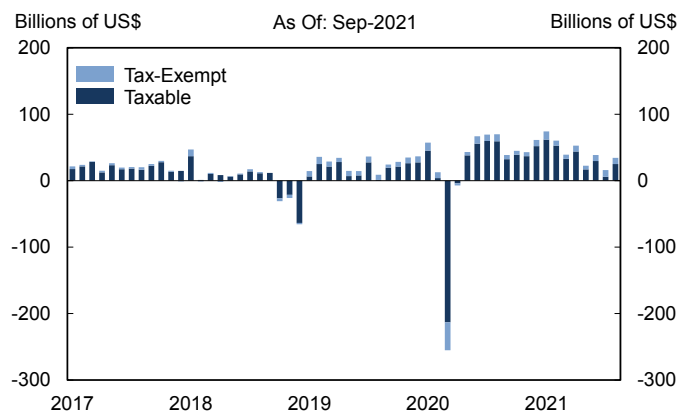


3.5.2.10 Net Assets of the Investment Company Industry



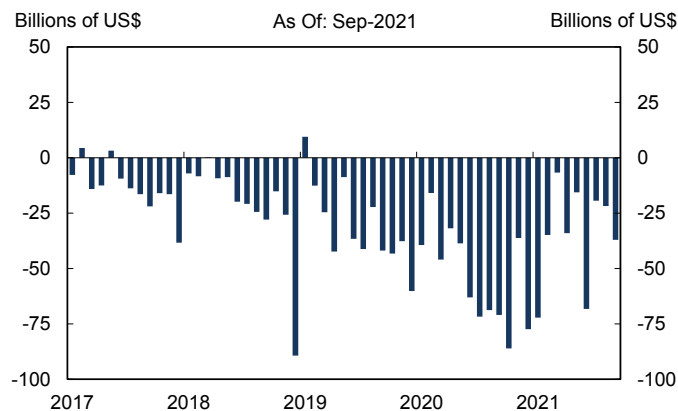
Source: ICI, Federal Reserve, SEC Note: Excludes non '40 Act ETPs.

3.5.2.11 Monthly Bond Mutual Fund Flows



Source: ICI, Haver Analytics Note: Net fund flows.

3.5.2.12 Monthly Equity Mutual Fund Flows



Source: ICI, Haver Analytics Note: Net fund flows.

largest MMF complexes managed 54 percent of total assets, up from approximately 46 percent at year-end 2015.

3.5.2.4 Registered Investment Companies

Mutual Funds

Mutual funds are investment vehicles that pool money from many investors, invest in a variety of securities or assets, and give investors daily redemption rights. As of September 30, 2021, net assets of equity, bond, and hybrid mutual funds totaled \$21.4 trillion, or approximately 65 percent of total U.S. investment company assets.

Over the past year, bond mutual funds have experienced steady inflows while equity mutual funds have experienced outflows. These developments are in line with trends that were in place before the pandemic but were interrupted in March 2020, when mutual funds experienced large outflows, including a record \$255 billion from bond funds. Excluding MMFs, U.S. mutual funds' net assets increased by 9.3 percent in the first nine months of 2021 after increasing 12 percent in 2020 ([Chart 3.5.2.10](#)). Overall, since April 2020, bond mutual funds have taken in \$796 billion while equity funds experienced net redemptions of \$855 billion, through September 2021 ([Charts 3.5.2.11, 3.5.2.12](#)).

Bank loan mutual funds, which are a subset of fixed income funds, offer investors daily redemptions and hold assets with lengthy settlement periods. Between November 2018 and December 2020, cumulative outflows from bank loan mutual funds totaled \$77 billion, or more than 55 percent of AUM. Outflows from bank loan funds surged dramatically in March 2020, as the early days of the pandemic raised concerns that borrowers would be unable to service their debt in an economic downturn. During times of significant market stress, some assets may take longer to sell and settle than the redemption period offered to a fund's investors. In 2021, expectations of the likelihood of future interest rate increases led to stronger interest in floating rate notes. Bank loan funds took in \$26 billion in the first nine months of 2021 and

breaking the trend of outflows that had been in place for 26 consecutive months through December 2020. Meanwhile, high-yield bond mutual fund flows strongly recovered after March 2020 to post full-year 2020 net inflows of \$33 billion but saw \$4.0 billion in net outflows for the first nine months of 2021 (**Chart 3.5.2.13**).

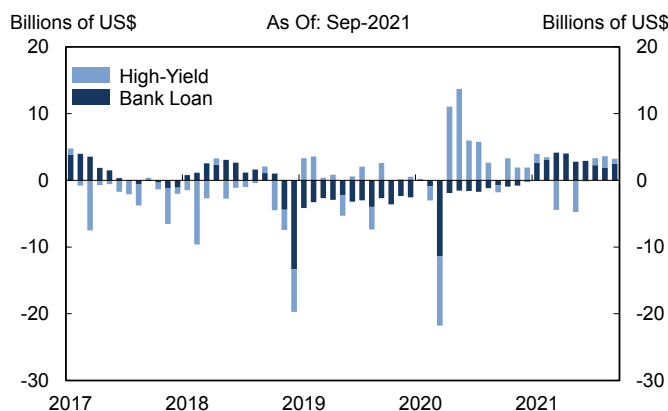
Investors continued to move away from actively managed equity mutual funds and towards lower-cost, index-based equity funds and exchange traded products (ETPs). According to Morningstar, passively managed mutual funds and ETPs represented 51 percent of equity fund assets as of September 2021, up from 25 percent at year-end 2009. Since 2016, inflows to passively managed equity mutual funds and ETPs totaled a combined \$1.9 trillion, while their actively managed counterparts saw outflows of \$1.5 trillion (**Chart 3.5.2.14**). Passively managed equity mutual funds, which saw steady inflows between 2016 and 2019, have experienced outflows since March 2020 with investors favoring passively managed ETPs. Between March 2020 and September 2021, passively managed equity mutual funds recorded net outflows totaling \$116 billion while passively managed ETPs recorded \$611 billion of net inflows.

In contrast to actively managed equity funds, actively managed bond funds have continued to experience inflows (**Chart 3.5.2.15**). Nevertheless, passively managed funds continue to gain market share and as of September 2021, passively managed bond mutual funds and ETPs represented 31 percent of bond fund assets, up from 12 percent at year-end 2009.

Exchange-Traded Products

Exchange-traded products include ETFs registered under the Investment Company Act of 1940 (Investment Company Act), ETPs registered with the CFTC as commodity pools that primarily hold commodities or physical metals, and exchange-traded notes. By September 2021, ETFs, which constitute most ETP assets, accounted for 20 percent of U.S.

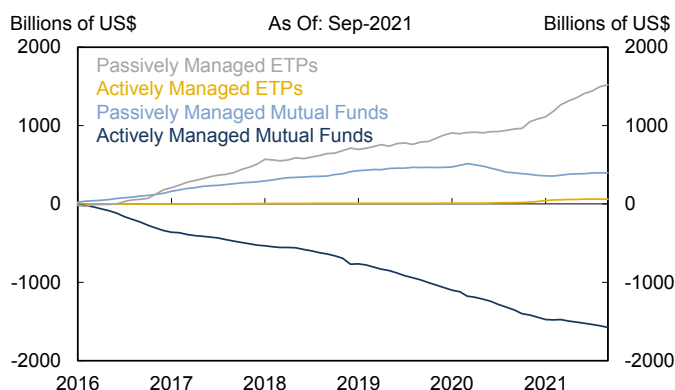
3.5.2.13 Monthly Bank Loan and High-Yield Mutual Fund Flows



Source: Morningstar, Inc.

Note: Net fund flows.

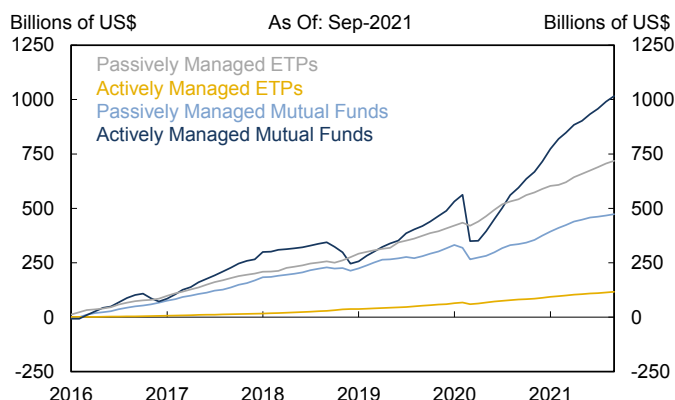
3.5.2.14 Cumulative Equity Fund Flows



Source: Morningstar, Inc.

Note: Cumulative net fund flows. Includes U.S., international, sector, and nontraditional equity funds.

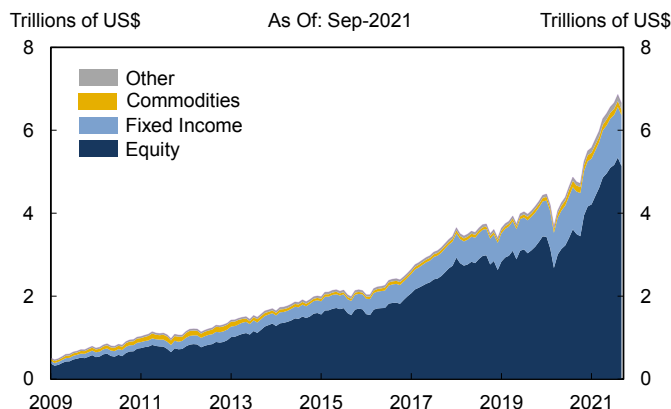
3.5.2.15 Cumulative Fixed Income Fund Flows



Source: Morningstar, Inc.

Note: Cumulative net fund flows. Includes taxable and municipal bond funds.

3.5.2.16 ETP Assets by Category of Investment



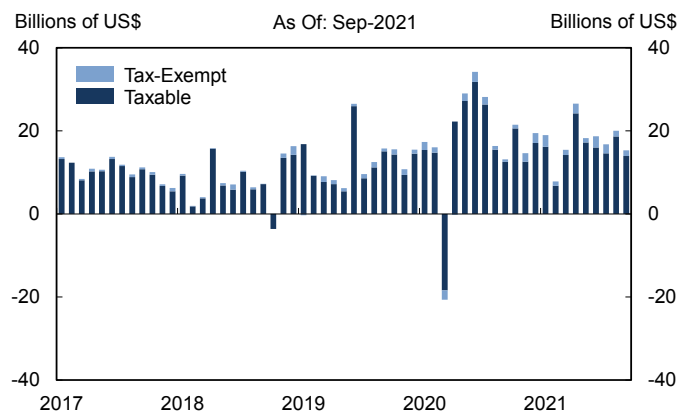
Source: Morningstar, Inc.

investment company assets, up from 12 percent in 2015 and 7.6 percent in 2010.

ETPs continue to grow at a faster pace than many other SEC-registered investment vehicles. After rising 24 percent in 2020, ETP assets rose a further 21 percent over the first nine months of 2021, settling at \$6.6 trillion in September 2021 (**Chart 3.5.2.16**).

In contrast to mutual funds, both equity and fixed income ETPs have experienced relatively steady net monthly inflows over the last few years. The most significant exception came at the onset of the COVID-19 pandemic, when fixed income ETPs experienced record monthly outflows, totaling \$21 billion or 2.3 percent of assets. Following the immediate dislocation caused by the COVID-19 pandemic, the market stabilized and fixed income ETPs experienced inflows totaling \$356 billion between April 2020 and September 2021 (**Chart 3.5.2.17**). Despite the March 2020 market turmoil, equity ETP flows remained positive, totaling \$16 billion in March and \$664 billion between April 2020 and September 2021 (**Chart 3.5.2.18**).

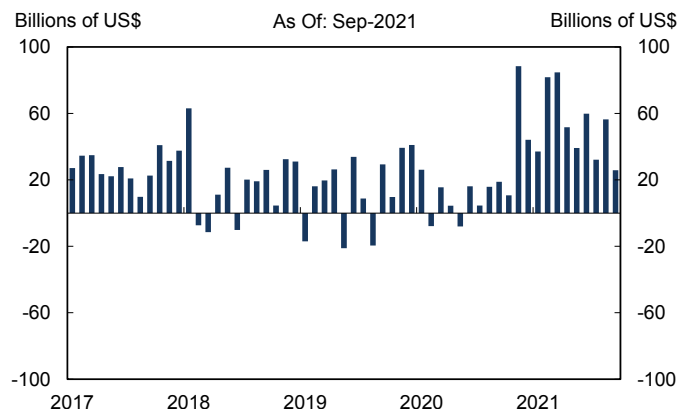
3.5.2.17 Monthly ETP Flows: Fixed Income Funds



Source: Morningstar, Inc.

Note: Net fund flows.

3.5.2.18 Monthly ETP Flows: Equity Funds



Source: Morningstar, Inc.

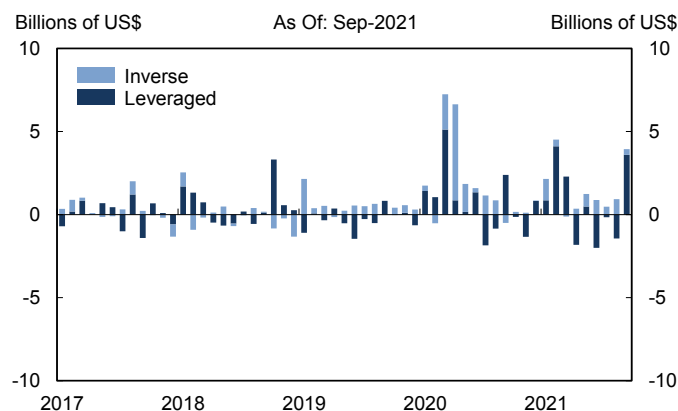
Note: Net fund flows.

Inflows to leveraged and inverse ETPs spiked in March and April 2020 amid heightened market volatility associated with the onset of the COVID-19 pandemic and leveled off thereafter, continuing into 2021 (**Chart 3.5.2.19**).

The industry remains concentrated, as the three largest managers account for over 78 percent of ETP assets, and the top ten managers account for 93 percent. Over the first nine months of 2021, the number of available ETPs increased 12 percent in addition to the 2.0 percent increase in 2020.

Actively managed ETPs are a small but growing part of the industry. Active ETPs attracted 11 percent of all ETP inflows in the first nine months of 2021, despite holding only 3.3 percent of all ETP assets as of year-end 2020. During this period, sponsors launched 211 new active ETPs, compared to 122 passive ETPs.

3.5.2.19 Monthly Inverse and Leveraged ETP Flows



Source: Morningstar, Inc.

Note: Net fund flows.

Box C: Nonbank Financial Intermediation & Council Initiatives

Intermediation between borrowers and savers in the U.S. economy occurs both through the banking system and through a variety of nonbank financial institutions (NBFIs). These intermediation activities provide essential funding that underpins the U.S. economy. However, the acute financial market stress that occurred in March 2020 highlighted the potential for NBFIs to amplify liquidity pressures in the financial system. The Council is evaluating the vulnerabilities posed by three types of NBFIs: MMFs, open-end mutual funds, and hedge funds.

Money Market Funds

As a key participant in short-term funding markets, MMFs provide funding for businesses, local governments, and other market participants in support of the U.S. economy. Stresses in short-term funding markets can therefore impact other economically significant borrowers and the broader economy. Some types of MMFs may amplify stresses in short-term funding markets because of the liquidity transformation they engage in. Many MMF investors have a low tolerance for principal losses and liquidity restrictions and use MMFs as a cash management tool. MMFs offer shareholder redemptions on at least a daily basis, even though a potentially significant portion of portfolio assets may not be easily converted into cash within a day without a reduction in value. If a MMF does sell portfolio assets at a discount, the fund's remaining shareholders generally bear those losses. These factors can lead to greater redemptions if investors believe they will be better off by redeeming earlier than other investors—a so-called “first mover” advantage—when there is a perception that the fund may suffer a loss in value or liquidity. While a fund's board of directors can generally impose fees or gates on redemptions if weekly liquid assets comprise less than 30 percent of total assets, approaching this threshold may itself spark widespread redemptions.

In March 2020, in response to escalating concerns about the economic impact of the pandemic,

market participants liquidated risky assets in favor of low-risk liquid holdings. These liquidity pressures affected prime and tax-exempt MMFs through intense redemption requests and a drop in assets under management ([see Section 3.5.2.3](#)). Affected MMFs experienced significant redemptions that, through the sale of assets to meet redemptions, contributed to dislocations in short-term funding markets. While no MMFs imposed fees or gates or failed to meet redemptions during this time, MMF outflows contributed to a rapid deterioration of conditions in short-term funding markets that prompted the official sector to provide support. On March 18, 2020, the Federal Reserve, with Treasury approval, established the MMLF with \$10 billion of credit protection from Treasury's Exchange Stabilization Fund. The facility was designed to assist prime and tax-exempt MMFs in meeting demands for redemptions and enhance overall market functioning and the provision of credit to households, businesses, and municipalities. In part due to the establishment of this facility, outflows from prime and tax-exempt MMFs subsided and conditions in short-term funding markets improved, supporting access to credit and the recovery in market conditions and economic activity.

In response to this episode, the PWG released the [Overview of Recent Events and Potential Reform Options for Money Market Funds](#) (PWG Report) in December 2020. The PWG Report on MMFs described potential policy measures while not recommending a specific course of action. The PWG Report on MMFs emphasized that future reforms should, individually or in combination, address structural vulnerabilities in MMFs, improve the resilience and functioning of short-term funding markets, and reduce the likelihood that official-sector interventions and taxpayer support will be needed to halt future MMF runs and address stresses in short-term funding markets more generally. The SEC published a request for public comment on potential policy measures and briefed the Council on the comments it received. The Council is supportive of

Box C: Nonbank Financial Intermediation & Council Initiatives (continued)

the SEC's engagement and will continue to monitor this initiative in the broader context of efforts by financial regulators to strengthen short-term funding markets and support orderly market functioning, including during periods of heightened market stress.

Open-End Mutual Funds

Open-end mutual funds may also pose a vulnerability by amplifying asset liquidation pressures. Open-end funds allow investors to redeem shares daily at NAV, with payment of redemption proceeds required within seven days, though settlement typically occurs within two trading days. If these funds invest in assets with less liquidity or longer settlement periods, they are engaging in liquidity transformation. Open-end funds process buy and sell orders at NAV as of the next market close, a practice known as forward pricing. This NAV may not consider all transaction costs associated with a redemption, including market impact and trading costs, if such costs have not yet been incurred. Instead, these costs may be passed on to the remaining investors in the fund and could give rise to a first-mover advantage. This effect may be more significant for open-end funds invested in relatively less-liquid assets. As a result, the vulnerability posed by open-end funds is that they may amplify asset liquidation pressures when facing large outflows.

At the onset of the pandemic, open-end funds, particularly those focused on fixed income, experienced significant outflows. While funds generally managed their liquidity and no fund suspended redemptions, their liquidity needs may have contributed to broader market stress. Further study is needed to understand how funds managed their liquidity during this period.

The Council has established the Open-End Fund Working Group, an interagency staff level working group, to consider the risks posed to financial stability arising from open-end fund liquidity and redemption features. The group will evaluate whether additional

action is necessary and may formulate and present recommendations to the Council as appropriate.

Hedge Funds

Hedge funds are not subject to regulatory liquidity guidelines and therefore may invest in assets of varying liquidity profiles, consistent with their disclosures to investors. They may also restrict investors' ability to redeem, which may better align investor liquidity with asset liquidity.

However, hedge funds are also not subject to the leverage restrictions imposed on MMFs and open-end funds. While actual risk exposure depends on various factors, leverage can magnify the impact of asset price movements on a fund's net assets and performance. If faced with collateral or margin calls due to significant changes in asset prices, a hedge fund may be forced to sell assets to satisfy those demands. Assets purchased with borrowed short-term funds may be particularly vulnerable to selling pressure in stress conditions if short-term borrowing becomes unavailable and positions need to be unwound quickly. A disorderly liquidation of positions could in turn have a significant price effect on assets, and potentially impact 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.

Prior to the pandemic, borrowing and the use of leverage increased among the most leveraged hedge funds. At the same time, hedge funds increased their exposures to U.S. Treasuries, as some funds employed trading strategies designed to exploit pricing discrepancies between products or securities that tended to trade with very high correlation. In March 2020, some funds sold assets in order to reduce their leverage, which may have amplified price declines in certain markets, including the Treasury market. Overall, funds markedly reduced their exposures to Treasuries and interest rate derivatives.

Box C: Nonbank Financial Intermediation & Council Initiatives (continued)

Like other market participants, hedge funds likely benefited from the extraordinary official sector interventions to stabilize markets.

Partly in response to the March 2020 market turmoil, the Council reestablished the Hedge Fund Working Group (HFWG). A primary objective of the HFWG is to update the Council's assessment of potential risks

to financial stability from hedge funds, their activities, and their interconnections with other market participants. The HFWG will also seek to establish a risk monitoring framework to identify potential risks to financial stability and communicate these risks to the relevant regulatory agencies.

3.5.2.5 Alternative Funds

Hedge Funds

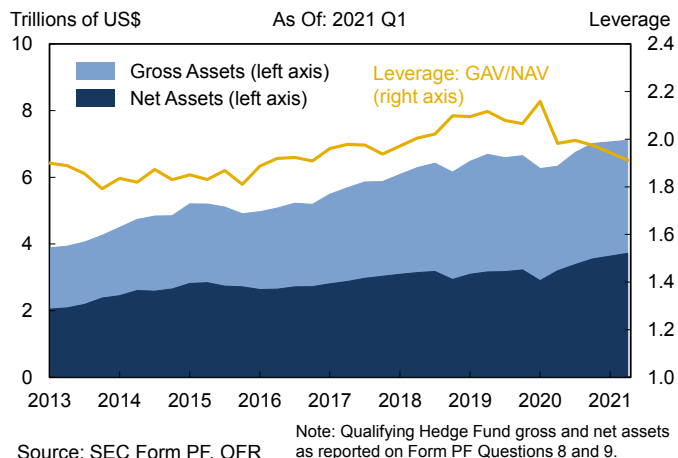
Approximately 1,850 hedge funds and 570 hedge fund advisers have enhanced Form PF reporting requirements with the SEC. These large, qualifying hedge funds have an aggregate NAV of \$3.7 trillion in the first quarter of 2021. This represents a 28 percent increase from the first quarter of 2020. The gross asset value (GAV) of qualifying hedge funds—which reflects the effect of leverage obtained through cash and securities borrowing—totaled \$7.1 trillion, a 14 percent increase year-over-year (**Chart 3.5.2.20**).

There are various measures of aggregated leverage for hedge funds, including measures of off-balance sheet exposures. GAV divided by NAV, which stood at 2.2 in the first quarter of 2020, fell to 1.9 as of the first quarter of 2021. The mean gross leverage ratio for qualifying hedge funds, as measured by gross notional exposure (GNE) divided by NAV, was 5.1 in the first quarter of 2021, down from 5.2 in the first quarter of 2020. When interest rate derivatives are excluded, the mean qualifying hedge fund GNE/NAV leverage ratio was 3.1, unchanged from the first quarter of 2020.

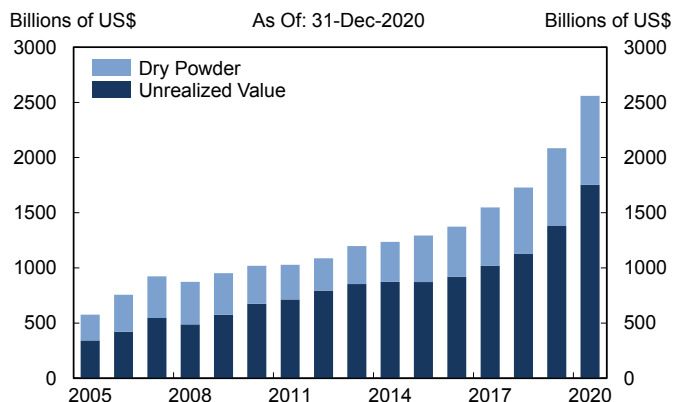
The aggregate level of hedge fund borrowing has increased significantly in recent years. As of the first quarter of 2021, hedge fund borrowing totaled \$3.2 trillion, up from \$2.1 trillion at year-end 2016. Over this same period, repo borrowing grew from \$0.7 trillion to \$1.0 trillion while prime broker borrowing grew from \$1.1 trillion to \$1.7 trillion.

Hedge funds deploy a wide range of strategies and are invested in various products and asset classes. As of the first quarter of 2021, qualifying hedge funds' GNE totaled \$24 trillion, of which \$15 trillion, or 64 percent, were attributed to rates products (interest rate derivatives, U.S. government debt, repo, and other sovereign debt) or foreign exchange (FX) products. Equity and credit products accounted for 27 percent of GNE, and all other asset classes accounted for the remaining 9 percent of exposures.

3.5.2.20 Hedge Fund Gross and Net Assets



3.5.2.21 Private Equity AUM



Source: Preqin

According to eVestment data, which covers a smaller percentage of the hedge fund industry when compared to Form PF, the hedge fund industry experienced net outflows of \$59 billion, or roughly 2 percent of AUM in 2020 and net inflows of \$30 billion, or 1 percent of AUM, over the first nine months of 2021. Outflows in 2020 were concentrated in macro, directional credit, and long-short equity hedge funds. These categories reported outflows of approximately \$48 billion in 2020 and a further \$15 billion in the first nine months of 2021. After experiencing sizable outflows in 2019 and 2020, multistrategy funds saw \$20.7 billion of inflows in the first nine months of 2021. Event-driven funds continued to experience strong inflows, reporting inflows of \$6.0 billion in the first six months of 2021. Hedge fund returns, as provided by the Hedge Fund Research's HFRI Fund Weighted Composite Index, stood at 11.8 percent in 2020 and 9.7 percent year-to-date through September 30, 2021.

Private Equity

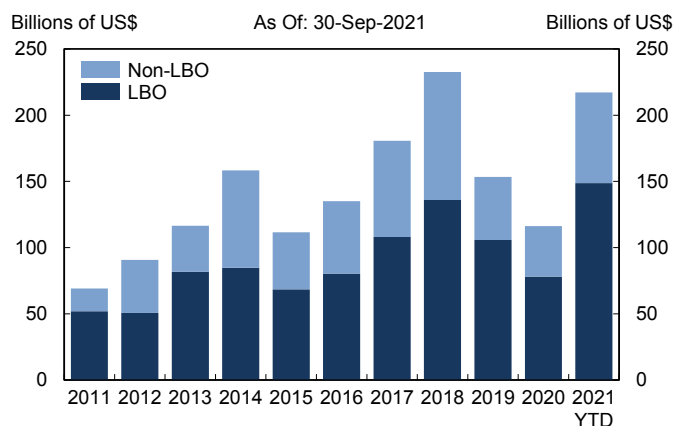
According to the SEC's most recent Private Funds Statistics Report, the GAV of private equity funds in the United States totaled \$4.8 trillion in the first quarter of 2021, a 27 percent increase from the first quarter of 2020. The funds' NAV totaled \$4.3 trillion, a 26 percent increase over that same period. These figures cover over 15,000 private equity funds, for which over 1,400 private equity advisers filed information on Form PF. Data from Preqin, which covers less of the industry but provides a longer time series for comparison, shows the significant growth in the private equity industry over the last several years ([Chart 3.5.2.21](#)). Between year-end 2015 and year-end 2020, private equity AUM roughly doubled, a significantly higher growth rate relative to the preceding five years when private equity AUM grew by approximately 25 percent. The recent growth of the industry can be largely attributed to capital fundraising by private equity managers. Between 2016 and 2020, managers raised \$1.4 trillion compared to \$650 billion between 2011 and 2015.

The private equity industry remains concentrated. Among private equity advisers filing Form PF—which are defined as those with \$2 billion or more in AUM—large private equity advisers made up 25 percent in first quarter of 2021 and managed 76 percent of gross assets. Pension funds are the largest beneficial owners of funds managed by large private equity advisers, accounting for 28 percent of net assets; other private funds account for 20 percent, foreign official sector investors account for 12 percent, and insurance companies account for 5.8 percent.

Acquisition-related activity backed by private equity trended upwards from 2015 to 2018, peaking at \$230 billion in 2018, before slowing in 2019 to \$150 billion (**Chart 3.5.2.22**). Private equity merger and acquisition (M&A) activity fell dramatically at the onset of the pandemic, with sponsored M&A loan volume totaling just \$4 billion between March and May 2020 compared to \$36 billion over the same period in 2019. Private equity M&A activity has since picked up considerably, totaling \$217 billion year-to-date through September 30, 2021. Leveraged buyouts (LBOs) accounted for 68 percent of private equity M&A activity in 2021 compared to 62 percent of M&A activity over the preceding ten years.

Private equity managers are major participants in private debt markets, which primarily involve direct lending to borrowers backed by private equity sponsors. Private equity activity in private debt markets also includes real estate loan origination and asset-based lending. Between year-end 2015 year-end 2020, global private debt AUM roughly doubled to over \$1 trillion. The growth in private debt has been partly fueled by the retreat of banks from certain lending activities coupled with search for yield by institutional investors. Private equity's increased involvement in private debt has been a factor in its recent emergence and expansion in the U.S. life insurance industry. Some private equity firms are acquiring life insurers or assuming life business (through owned reinsurers), in order to access and leverage long

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



term assets. In addition to supporting the private credit business of their private equity firm owners such arrangements may also generate investment management fee income. This intersection may increase interconnectivity among nonbank lenders, insurers, and the broader financial sector while exposing a growing investor base to lending activities that may be subject to less regulatory scrutiny.

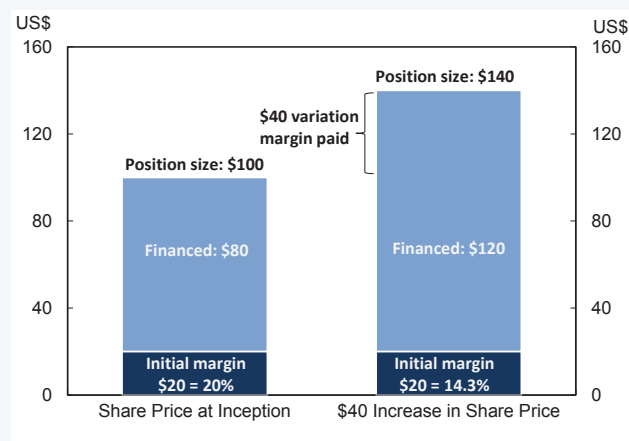
Box D: Failure of Archegos Capital Management

Archegos Capital Management was a family office that failed in March 2021, causing several large financial institutions to incur material losses. While Archegos' failure did not pose a risk to financial stability, potential spillovers might have been more significant if the failure had occurred during a period of market stress. The episode highlighted potential deficiencies in counterparty credit risk management and margining practices. In addition, the episode highlighted gaps in transparency regarding the security-based swap market, and also served as a reminder of the limited visibility into the activities and leverage of private investment vehicles.

Background

Archegos was established as a family office in 2012 to manage the assets of a former hedge fund manager.⁴ In addition to holding long positions in cash securities, Archegos gained exposure, and additional turns of leverage, through the use of OTC equity derivatives, including total return swaps. From June 2020 leading up to its default, the office's gross market value grew rapidly amid strong performance of the underlying securities. Its exposures were concentrated in a limited number of U.S. and Chinese technology and media companies.

D.1 Static Margin Model Example



Beginning on March 22, 2021, price declines in certain stocks to which Archegos was exposed

triggered significant margin calls. Two days later, Archegos notified its counterparties that it was unable to meet additional margin calls.⁵ After negotiations for an orderly wind down failed, Archegos' counterparties issued notices of default and began liquidating their separate positions. These large-scale liquidations exacerbated the price declines in a number of stocks, wiping out \$35 billion in market capitalization in a single day.

Archegos' failure ultimately led to over \$10 billion in counterparty credit losses across multiple large financial institutions. Losses were particularly concentrated at Credit Suisse and Nomura, which reported losses of \$5.5 billion and \$2.9 billion, respectively. While Morgan Stanley avoided major losses by unwinding some of Archegos' positions before the default event and thus materially reducing its exposures to Archegos and the stocks in its portfolio, it still reported a loss of nearly \$1 billion.

Counterparty Credit Risk Management and Margining Practices

Archegos' failure highlighted potential deficiencies in counterparty credit risk management and margining practices at large financial institutions. Reports have noted weak margining practices by at least one of Archegos' counterparties that allowed Archegos to take on excessive leverage and amplify losses.⁶ Because of static margining at the firm, Archegos did not have to increase its margin as the value and risk of its position grew, even while it received variation margin when the underlying value of the securities increased. **Figure D.1** provides an illustration: as the value of a security increases from \$100 to \$140, the holder of the swap receives \$40 of variation margin payments while its \$20 of initial margin is unchanged. The result is known as margin erosion, as the equity position provided by the initial margin falls from 20 percent to 14.3 percent. In the case of Archegos, by December 2020, its average swap margins at Credit Suisse had fallen to just 6.9 percent under the static margining method.⁷ While dynamic margining models

Box D: Failure of Archegos Capital Management (continued)

might have provided better risk management, it is important to note that dynamic models must also be appropriately calibrated in terms of risk coverage and severity.

The episode also highlighted that margining practices should be accompanied by close monitoring of a client's aggregate portfolio composition, concentration, and exposures to other firms. According to earnings calls and news media reports, some firms were not aware of the positions Archegos had taken with other firms. These reports have also suggested that a number of firms are reviewing their stress testing methodologies in response to the episode. Finally, at least at one firm, other contributing factors included a lack of stature in independent second line of defense risk management functions, poorly defined communication channels or escalation protocols, or red flags that were ignored despite multiple and persistent breaches of shortfall limits of counterparty stress tests.⁸ Notably, Archegos also had a history of risky and improper behavior, including insider trading charges relating to its key official.

Security-based Swaps

At the time of Archegos' failure, there was no requirement to report security-based swaps to a swap data repository (SDR). Consequently, there was little reliable data available to counterparties or regulators on the buildup of Archegos' equity swap positions. Additionally, the lack of public reporting on security-based swaps meant that Archegos' counterparties were unaware of the amount of swaps written on a select number of equity securities.

The SEC had adopted rules related to security-based swaps to increase transparency and reduce risks in this market, but these rules had not been fully implemented at the time of Archegos' failure. Security-based swap dealers and major security-based swap participants began registering with the SEC on October 27, 2021. The registration

requirements include new counterparty protections, requirements for capital and margin, and internal risk management requirements. Additionally, new post-trade transparency rules went into effect on November 8, 2021 and require security-based swap transaction data to be reported to an SDR. SDRs will be required to disseminate data about individual security-based swap transactions to the public by February 22, 2022.

Family Offices

As a family office, Archegos was not subject to the Investment Advisers Act of 1940 (Advisers Act) by statute, and therefore did not make certain regulatory filings. As a result, regulators have limited direct insight into family offices' portfolios, leverage, or counterparty exposures, though firms that deal with family offices can request such information in the course of their business relationships. The Archegos episode demonstrated the potential importance of high frequency and granular information of this kind in order to understand the activities and leverage of private investment vehicles, including some family offices. While the typical family office uses leverage sparingly, the Archegos event highlighted the potential for the accumulation and management of large, complex, and highly leveraged portfolios to occur with limited regulatory reporting.

3.5.2.6 Pension Funds

Defined benefit pension plans are significant holders of financial assets. As of the second quarter of 2021, total pension fund entitlements funded by assets of U.S. private and public defined benefit pensions were \$11 trillion, 16 percent higher than one year earlier. At the same time, defined benefit pension fund entitlements rose to nearly \$17 trillion, a 2.7 percent increase compared to the second quarter of 2020.

Sponsors of pension plans strive to keep pace with the benefits owed to beneficiaries. However, sustained, low interest rates may decrease the income produced by debt securities and increase the present value of pension liabilities, generating large funding deficits. Although sponsors may respond to growing shortfalls by increasing contributions, they often respond by increasing the risk profile of their asset allocations. Already experiencing large deficits in recent years, public pension plans have significantly increased their allocations to illiquid asset classes, such as hedge funds, private equity funds, and real estate. While sudden redemptions are generally rare as retirement cohorts are typically more predictable, plans could be forced to sell assets at depressed prices, further stressing their financial position.

It is difficult to analyze the direct impact of the COVID-19 pandemic on defined benefit pension plans in the aggregate because the disclosure requirements differ between single-employer private plans, multiemployer plans, and public plans. For example, disclosures concerning a defined benefit pension plan's return assumptions and investment strategies may have a different level of granularity, be in a different format, and cover a different period than disclosures concerning similarly situated funds. However, some indirect effects of the pandemic can be seen in that some sponsors of public pension plans have announced significant pension plan contributions in 2021 and 2022 given the sponsors' improved financial positions. Additionally, the ARP Act of 2021 allows certain financially troubled multiemployer plans to apply for special financial assistance.

Single-Employer Private Plans

According to the Milliman Corporate Pension Funding Study, the funded ratio of the 100 largest single-employer private defined benefit plans rose to 88.4 percent as of year-end 2020, compared to 87.5 percent as of year-end 2019. The funded percentage of a plan is its assets relative to the estimated value of plan liabilities. Milliman estimates that the 100 largest corporate defined benefit pension plans in the United States had an aggregate funded ratio of 97.2 percent at the end of September 2021.

Multiemployer Plans

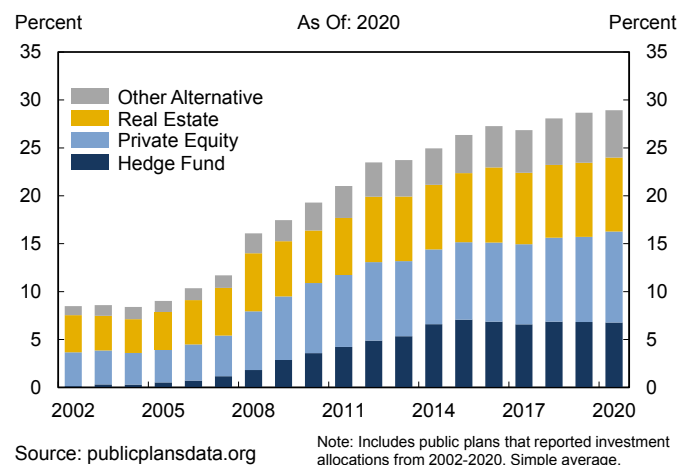
Milliman estimates that the aggregated funded percentage of multiemployer private defined benefit plans as of June 30, 2021 was 92 percent, up from 88 percent at year-end 2020. While the 2019 Pension Benefit Guaranty Corporation (PBGC) report estimated that PBGC's Multiemployer Program would likely become insolvent in fiscal year 2026, new projections that reflect the enactment of the ARP Act and associated assistance now estimate insolvency to occur outside of the ten-year projection period, with a mean projection year of 2055.

Public Plans

According to Milliman, the aggregate funded status of the 100 largest U.S. public defined benefit plans in June 2021 was 82.6 percent, up from 71 percent in June 2020. In addition, public pension fund sponsors are permitted to assume investment returns based on their own long-run expectations by the relevant accounting rules. Accordingly, pension funds that do not meet their assumed return may be overstating their current funded status. These return assumptions may be higher than recent average investment returns, and, in recent years, several large public pension funds have revised long-term investment return expectations downward.

According to the Center for Retirement Research at Boston College, the aggregate ratio of assets to liabilities for public plans rose from 72.8 percent to 74.7 percent between June 2020 and June 2021. The average actuarially determined contribution was estimated to rise from 21.3 percent to 22.0 percent of payroll in this same period.

3.5.2.23 Public Plan Allocation to Alternative Assets



Underfunded public pension funds are a significant source of fiscal pressure on several U.S. states, territories, and municipalities. Seventeen large pension funds were less than 60 percent funded as of June 30, 2021. To increase expected returns and meet benefit obligations, public pension funds have steadily increased their exposure to alternative assets for years (**Chart 3.5.2.23**).

3.5.2.7 Insurance Companies

The insurance industry provides an array of important financial services to individuals and businesses in the United States. The U.S. insurance industry is composed of approximately 4,500 operating insurance companies, of which approximately 2,600 are licensed as property and casualty (P&C) carriers, 1,200 are licensed as health insurers, and 700 are licensed as life insurance companies. Many of these are affiliated through common ownership in the form of a holding corporation or parent insurance company.

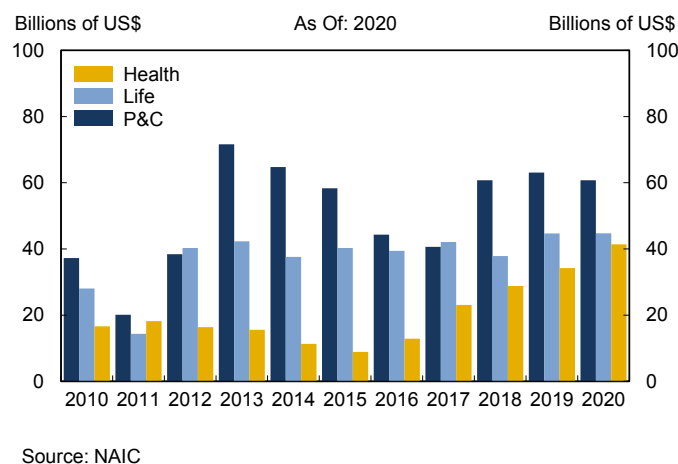
P&C and life insurance companies are significant sources of capital for the economy and are among the largest investors in several key asset classes. According to the Financial Accounts of the United States compiled by the Federal Reserve, P&C and life insurance companies are the largest investors in corporate and foreign bonds. As of the second quarter of 2021 they hold \$4.2 trillion, or 27 percent, of outstanding bonds. Insurance companies are also major investors in mutual funds and equities, with holdings of \$1.8 trillion and \$1.0 trillion, respectively.

All three industry sectors reported positive net income in 2020, with results broadly comparable to the previous year (**Chart 3.5.2.24**). The following sections provide an overview of the performance of each insurance sector in view of the COVID-19 pandemic.

U.S. Life Insurance Industry

The COVID-19 crisis negatively impacted the operating performance of life insurance companies, mainly through higher claims, lower product sales, and, to a lesser extent, the

3.5.2.24 Insurance Industry Net Income



effects of lower sustained interest rates that resulted in spread compression and actuarial assumption “true ups” of reserves for interest-sensitive products. Credit conditions improved following the March 2020 market stress, largely due to Federal Reserve actions that improved consumer and business confidence, helping to stabilize credit markets and averting severe funding strains and widespread losses.

On the asset side, anticipated credit impairments did not occur in asset classes such as corporate bonds, CRE, CLOs, and other alternative investments. Although corporate bond downgrades caused some deterioration in the quality of insurance company investment portfolios, this resulted in only modest changes in the composition of insurance company bond portfolios.

On the liability side, the pandemic resulted in increased reserves to reflect higher expected mortality and morbidity rates. However, life insurers benefitted from results of annuity, health, and long-term care products. Life insurers’ dependence on non-traditional liabilities, notably funding from the FHLBs, has grown significantly since the onset of the pandemic. The single largest FHLB client is now a life insurance company.

The low interest rate environment continues to present significant challenges to the U.S. life insurance subsector. Over the past years some life insurance companies have increased investments in less liquid, more complex, and higher credit risk assets in a “reach for yield.” As an example, some life insurers have increased their exposure to alternative investments such as private equity funds. Low interest rates also affect a life insurer’s reserves and, in turn, its capital. Persistently low rates could continue to pressure life insurers’ earnings as maturing bonds are reinvested at lower rates and may spur increased investments in illiquid assets with higher credit risk. Life insurance companies hedge against changes in interest rates, but the continuation of low interest rates may spur the exit of more incumbent insurers from some lines of insurance. Low interest rates have also contributed to increased instances of private equity firms (which generally have expertise in investing in higher credit risk assets) acquiring U.S. life insurance companies or assuming blocks of life insurance

business through reinsurance agreements. Such business acquisitions align with the business models of private equity firms, that is, seeking to create incremental yield, leveraging in-house private credit expertise, leveraging offshore reinsurance operations, and generating investment fee income.

U.S. P&C Insurance Industry

The initial worst-case scenario loss estimates for the P&C subsector as a result of the pandemic did not materialize in 2020. P&C insurers experienced pandemic-related losses in multiple lines, including business interruption, event cancellation, travel, workers’ compensation, and professional liability. P&C insurance companies benefited from a favorable loss experience in some personal and commercial lines, in part resulting from reduced economic activity. For example, a significant reduction in auto claims drove strong underwriting results in personal lines and prompted some auto insurers to offer reduced premiums or credits in response. This trend largely reversed in the first half of 2021; loss ratios weakened at 14 of the 20 largest auto insurers as a result of increased activity.

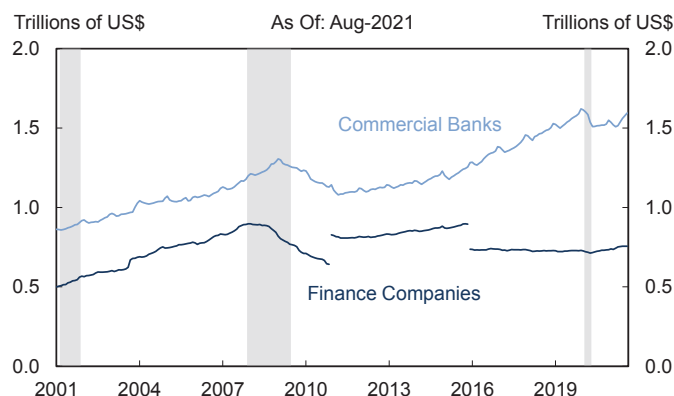
Numerous coverage disputes in connection with COVID-19 business interruption losses have been brought to court, and many remain pending. So far, most courts have agreed with the insurers’ position that coverage is precluded by the lack of COVID-19-related physical damage at the policyholders’ premises, or by explicit virus exclusions in the policies. However, the ultimate outcome of many of these lawsuits remains to be seen.

The P&C subsector will likely benefit from favorable market conditions in commercial lines with premium pricing continuing to exceed loss cost trends. However, additional losses related to COVID-19 are expected to emerge in the longer tail third-party liability lines, particularly in the director and officers and general liability coverages.

U.S. Health Insurance Industry

The health insurance subsector significantly outperformed expectations in 2020 amid the COVID-19 pandemic, and posted particularly strong financial performance, as individuals delayed routine and elective medical care and procedures.

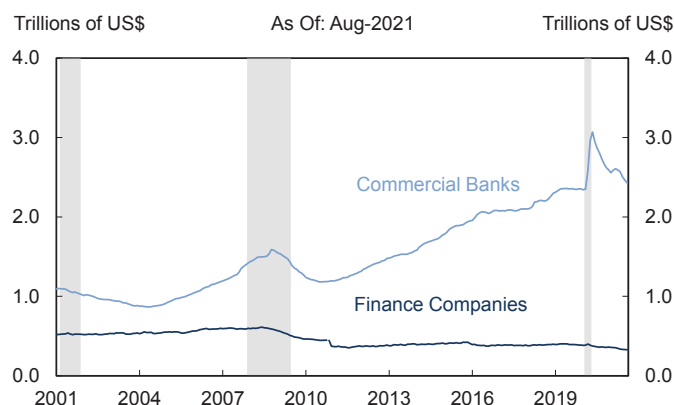
3.5.2.25 Consumer Loans and Leases Outstanding



Source: Federal Reserve, Haver Analytics

Note: Loans and leases owned and securitized. Series breaks in December 2010 and December 2015 due to change in data collection methodology. Gray bars signify NBER recessions.

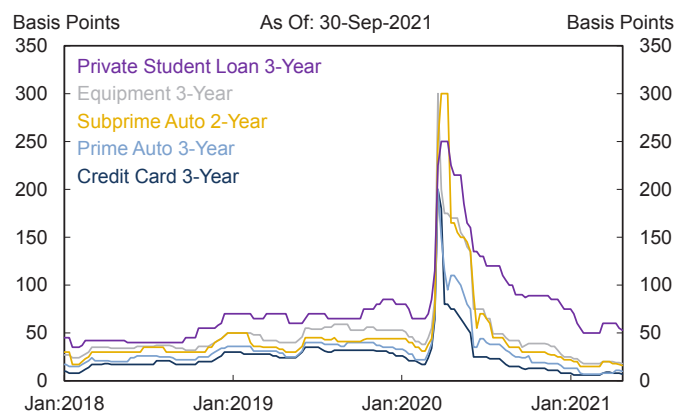
3.5.2.26 Business Loans and Leases Outstanding



Source: Federal Reserve, Haver Analytics

Note: Loans and leases owned and securitized. Series break in December 2010 due to change in data collection methodology. Gray bars signify NBER recessions.

3.5.2.27 AAA Securitization Spreads



Source: JPMorgan

However, those delayed claims could impact the subsector as utilization returns to normal and individuals seek medical care they previously delayed.

3.5.2.8 Specialty Finance

Specialty finance companies are non-depository institutions that provide loans to consumers and businesses. The amount of financing activity by specialty finance companies decreased modestly over the past year. Specialty finance companies held \$758 billion of consumer loans and leases and \$328 billion of business loans and leases as of August 2021 (**Charts 3.5.2.25, 3.5.2.26**).

While specialty finance companies account for a relatively small share of overall consumer lending, they have a significant footprint in certain types of consumer lending activities such as auto lending. Compared to banks, which generally have more stable sources of funding such as deposits, specialty finance companies are more reliant on wholesale funding and the securitization market.

Asset-Backed Securities

After the significant pandemic-induced market disruption in March and April of 2020, the asset-backed securities (ABS) market recovered quickly, driven in part by the Federal Reserve's establishment of the Term Asset-Backed Securities Loan Facility (TALF). Spreads tightened significantly since the announcement of TALF, and ABS issuance resumed. Since the first half of 2020, spread tightening continued for virtually all major ABS asset classes, and senior tranche spreads of major ABS products are at or near multi-year lows as of September 2021 (**Chart 3.5.2.27**). For instance, spreads on AAA-rated tranches of 2-year maturity subprime auto loan ABS tightened from 75 basis points in June 2020 to just 10 basis points as of September 30, 2021.

Tight spreads of ABS created favorable funding market conditions for specialty finance companies, and issuance of ABS in 2021 is running at a record pace and significantly higher compared to the same period in 2020. ABS issuance totaled \$168 billion over the first

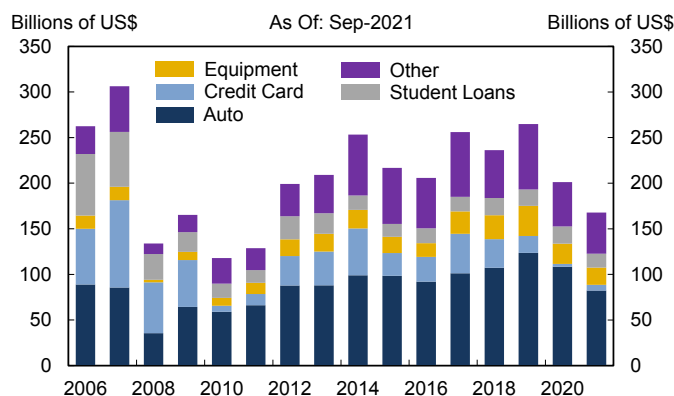
nine months of 2021, exceeding the \$201 billion issued over the full-year 2020 (**Chart 3.5.2.28**). Of note, some of the ABS sectors particularly hit by the pandemic-induced market disruption, such as aircraft lease ABS and, to a lesser degree, subprime auto ABS, have not only resumed issuance but are experiencing robust market demand.

Special Purpose Acquisition Companies

While special purpose acquisition companies (SPACs) raised a record amount of capital in 2020, 2021 issuance through September 30, 2021 exceeded that level, with \$137 billion raised in 549 transactions; more than 90 percent of issuances occurred in the United States. SPACs have driven the robust U.S. equity primary market issuance over the past three quarters, representing 53 percent of total IPO issuances.

However, the pace of SPAC IPOs slowed materially in the second and third quarters of 2021 following a price correction among pre-merger SPACs and SEC communications that highlighted investor protection issues, liability risks for sponsors and managers, and accounting treatment of SPAC warrants.

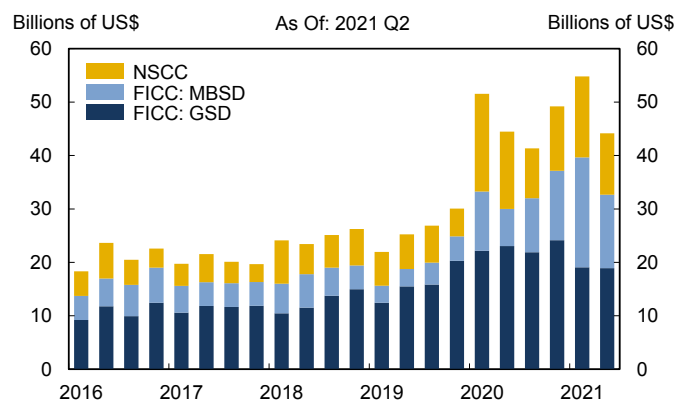
3.5.2.28 ABS Issuance



Source: Thomson Reuters, SIFMA

Note: Figures are as of year end through 2020. 2021 figures are through September.

3.6.1.1 DTCC Clearing Fund Requirements



Source: PFMI Quantitative Disclosures, Clarus FT

3.6 Financial Market Structure, Alternative Reference Rates, and Financial Innovation

3.6.1 Market Structure: Central Counterparty Clearing

Cash Securities Clearing

In the United States, the Depository Trust & Clearing Corporation (DTCC) is the dominant provider of clearing services for cash securities through its subsidiaries, the Fixed Income Clearing Corporation (FICC) and National Securities Clearing Corporation (NSCC). FICC consists of two divisions, the Government Securities Division (GSD) and the Mortgage-Backed Securities Division (MBSD). GSD provides CCP services for its customers with respect to 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, ADRs, ETPs, and UITs.

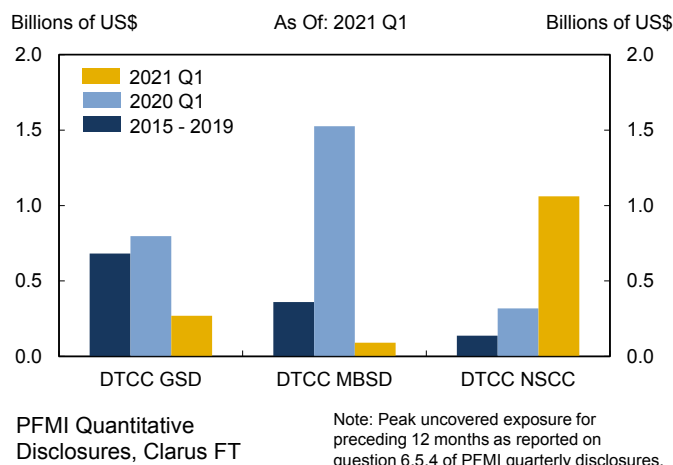
DTCC clearing fund requirements, which spiked at the onset of the COVID-19 pandemic, remained elevated through the first quarter of 2021. As of June 30, 2021, clearing fund requirements across the three clearing services totaled \$44 billion, unchanged compared to June 30, 2020 ([Chart 3.6.1.1](#)). In the first quarter of 2021, MBSD's clearing fund requirement totaled \$21 billion, up \$10 billion from the prior year. The increase in MBSD's clearing fund requirement can be primarily attributed to the extension of durations in members' to be announced (TBA) portfolios. Initial margin at MBSD has since declined, totaling \$14 billion as of June 30, 2021.

The maximum backtesting deficiency, or margin breach, at DTCC's FICC clearing services fell for the twelve months ended March 31, 2021 as market volatility observed in the first quarter of 2020 rolled off (**Chart 3.6.1.2**). In contrast, NSCC reported a backtesting deficiency of \$1.1 billion on January 22, 2021, the largest since public disclosure began in the third quarter of 2015. In its quarterly Principles for Financial Market Infrastructures (PFMI) disclosure, NSCC attributed the backtesting deficiency mainly to a single security exhibiting idiosyncratic risk.

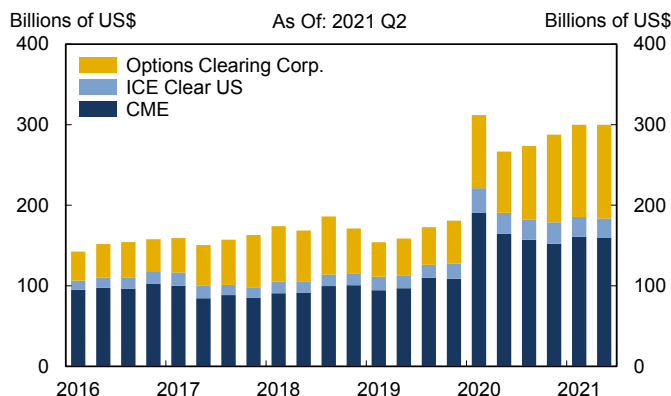
During the week of January 25, 2021, NSCC observed unusually high volumes and volatility in GameStop Corp. and other securities that had been popularized on internet message boards. Activity in these “meme stocks” was concentrated in certain clearing members primarily serving retail investors. On January 27, 2021, NSCC made intraday margin calls to 36 clearing members totaling \$6.9 billion, bringing the total required margin across all members to \$26 billion. Of the \$6.9 billion, \$2.1 billion were intraday mark-to-market calls, while the remaining \$4.8 billion was an excess capital premium charge.⁹ The capital premium charge is intended to discourage clearing members from taking on more risk in their portfolios at NSCC than their capital levels can reasonably support. Because clearing members' ratios of excess risk versus capital were not driven by individual clearing member actions, but by extreme volatility in individual cleared equities, NSCC waived the capital premium charge for all clearing members.

In February 2021, DTCC proposed settling securities trades in one day instead of the current market practice of two days. Reducing settlement time will allow NSCC to reduce the amount of margin it collects from its members; DTCC estimated a 25 percent reduction. DTCC noted it has the operational capability to settle securities trades same-day but said market participants were generally against it because of the loss of netting benefits, an increase in failed trades, and funding difficulties.

3.6.1.2 Maximum Uncovered Exposure for DTCC



3.6.1.3 Initial Margin: U.S. Exchange Traded Derivatives



Source: PFMI Quantitative Disclosures, Clarus FT

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

On September 3, 2021, DTCC increased NSCC's minimum clearing fund deposit from \$10,000 to \$250,000. NSCC stated that the purpose of the change was to address the risk that NSCC becomes under-margined in circumstances where a member is subject to the minimum required fund deposit amount and experiences an abrupt increase in clearing activity following a period of low or no clearing activity.

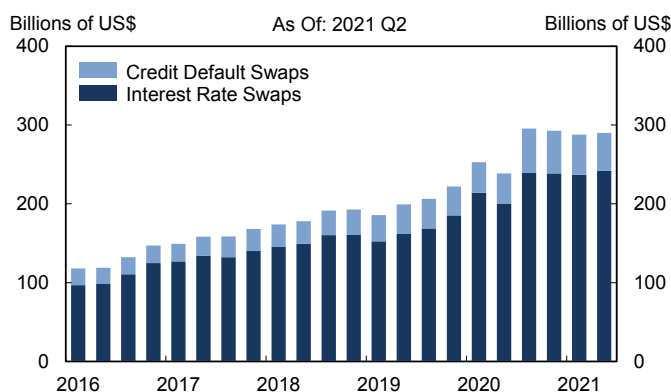
Derivatives CCPs

The vast majority of U.S. exchange-traded derivatives are cleared through CME, ICE Clear US, and the Options Clearing Corp. CME and ICE Clear US provide clearing services for futures and options on futures while Options Clearing Corp. mostly provides clearing services for exchange-traded equity options. Within the OTC derivatives markets, most U.S. dollar (USD) interest rate swaps are cleared through LCH Ltd. or CME, while most CDS are cleared through ICE Clear Credit, ICE Clear Europe, or LCH SA.

On an aggregate basis, initial margin posted against derivatives positions peaked at the onset of the pandemic, totaling \$619 billion at the end of the first quarter of 2020. Initial margin posted against derivatives has since fallen slightly but remains elevated relative to pre-pandemic levels (**Charts 3.6.1.3, 3.6.1.4**). The size and speed of initial margin changes is highly dependent on the relative shifts of underlying product volatility, calibrations of margin models relative to that volatility, and changes in the size and composition of clearing member portfolios. Over the last five years, the share of initial margin attributed to clearing members' house accounts has slowly decreased, from 35 percent in the second quarter of 2016 to 30 percent in the second quarter of 2021 (**Chart 3.6.1.5**).

Analysis continues on the events of March 2020, including the impact of volatility upon margin during the stressed period, as well as potential interactions between margined markets and the financial system as a whole. International work on this topic was spurred by analysis by

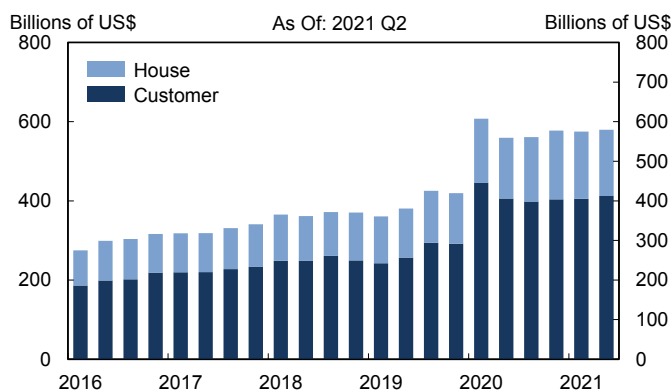
3.6.1.4 Initial Margin: Centrally Cleared OTC Derivatives



Source: PFMI Quantitative Disclosures, Clarus FT

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

3.6.1.5 Initial Margin by Segregation Type



Source: PFMI Quantitative Disclosures, Clarus FT

Note: Initial margin required as reported in quantitative disclosures; includes exchange-traded derivatives (Options Clearing Corp., CME, and ICUS), interest rate swaps (LCH Ltd. and CME), and CDS (CME, ICC, ICEU, and LCH SA). CME ceased clearing CDS in March 2018.

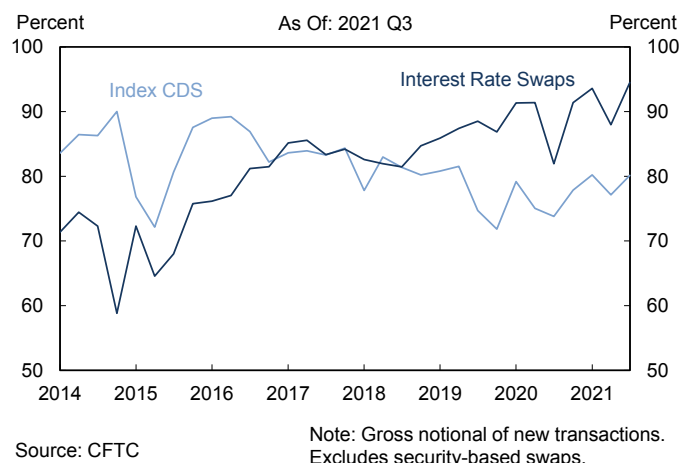
the Financial Stability Board which, late in 2020, published a [Holistic Review of the March Market Turmoil](#) and recommended further work in a number of areas. Reports based on this additional analysis are scheduled to be released near the end of this year.

Clearing Rates for OTC Derivatives

Clearing rates in the United States were broadly similar to global clearing rates. In the third quarter of 2021, 94 percent of new interest rate swaps were centrally cleared, while 80 percent of CDS on credit indexes were centrally cleared (**Chart 3.6.1.6**). Central clearing has become prevalent throughout the world as clearing mandates have been introduced in a number of jurisdictions for the most standardized products, including interest rate swaps and CDS on credit indexes. In recent years, margin requirements for uncleared swaps have, in some cases, made cleared swaps more cost-efficient.

Over the last several years, clearing rates on new CDS on credit indexes trended downwards. The decline in clearing rates between 2016 and 2019 can primarily be attributed to an increase in the volume of credit swaptions, total return swaps on credit indexes, and other exotic credit products for which clearing is not widely available.

3.6.1.6 Average Clearing Rates for OTC Trading



Box E: LIBOR Transition

The Council continues to support an orderly transition from USD LIBOR to alternative reference rates, in order to mitigate risks and ensure smooth market functioning. The Council recommends that market participants only utilize alternative reference rates with robust underlying transaction volumes and in a way that is fit for the purpose of the rate's design. The ARRC has recommended the use of SOFR, as it provides a robust rate which is suitable for use in a wide array of products and is based on a large volume of underlying transactions.

Since the Council's 2020 annual report, there have been several important developments in the transition from USD LIBOR. With LIBOR's end dates now certain, market participants should act with urgency to address their existing LIBOR exposure and transition to robust and sustainable alternative rates.

Greater Certainty on LIBOR's Cessation

LIBOR cessation dates were proposed in December 2020 by the ICE Benchmark Administration (IBA). The cessation date of December 31, 2021 was proposed for all tenors of LIBOR calculated in EUR, CHF, JPY, GBP and for one-week and two-month USD LIBOR. The cessation date of June 30, 2023 was proposed for the remaining tenors of USD LIBOR (overnight, one-month, three-months, six-months, and 12-months).

IBA confirmed these LIBOR cessation dates, after a consultation period, on March 5, 2021, and the UK Financial Conduct Authority (FCA) issued a formal statement that announced, "the future cessation or loss of representativeness of the 35 LIBOR benchmark settings." The FCA's announcement was considered an index cessation event by International Swaps and Derivatives Association (ISDA) and resulted in the determination of the fixed spread adjustment between LIBOR and SOFR for all currency tenors. This adjustment is to be used for the transition of legacy derivatives adhering to ISDA's interbank offer rate (IBOR) Fallbacks Protocol, or

new derivatives using ISDA's revised definitions. The ARRC adopted the use of ISDA's spread adjustments for fallbacks to legacy cash instruments. For legacy contracts where SOFR is selected as the transition rate, the setting of the fixed spread adjustment to SOFR will allow the transition to a uniform spread adjustment and provides greater clarity to market participants on the performance of these legacy LIBOR contracts at LIBOR's cessation.

The Federal Reserve, FDIC, and OCC issued guidance in November 2020, in anticipation of the setting of cessation dates for LIBOR. This guidance stated that entering into new contracts that use USD LIBOR as a reference rate after December 31, 2021 would create safety and soundness risks. In October 2021, a Joint Statement on Managing the LIBOR Transition was issued by the Federal Reserve, FDIC, OCC, CFPB, and NCUA, in conjunction with state bank and state credit union regulators. The statement emphasized the expectation that supervised institutions with LIBOR exposure continue to progress toward an orderly transition away from LIBOR. The statement also provided clarification on the meaning of new LIBOR contracts, considerations when assessing appropriateness of alternative reference rates, and expectations for fallback language.

Utilization of Alternative Rates

The Council has continued to advise lenders, borrowers, and other market participants to consider SOFR-based rates and conduct a comprehensive evaluation before adopting any alternative reference rate. Such an evaluation would, at a minimum, review any alternative rate's fitness for the purpose of its use, ensure that the rate is based on a sufficiently active market with sufficient transaction volumes, assess the adequacy of the representativeness of the underlying interest, and evaluate the resilience of the rate during times of stress. Individual institutions should review how alternative rates fit into their internal risk management guidelines, business strategies, and risk appetite. In a public meeting of the Council in June

Box E: LIBOR Transition (continued)

2021, several Council members emphasized their concerns about credit-sensitive rates being used as reference rates in capital and derivatives markets. Similarly, the International Organization of Securities Commissions (IOSCO) Board in September 2021 called attention to the importance of assessing the size of the market underlying a rate in relation to the volumes traded on it and noted that IOSCO would closely monitor the IOSCO compliance of credit-sensitive rates.

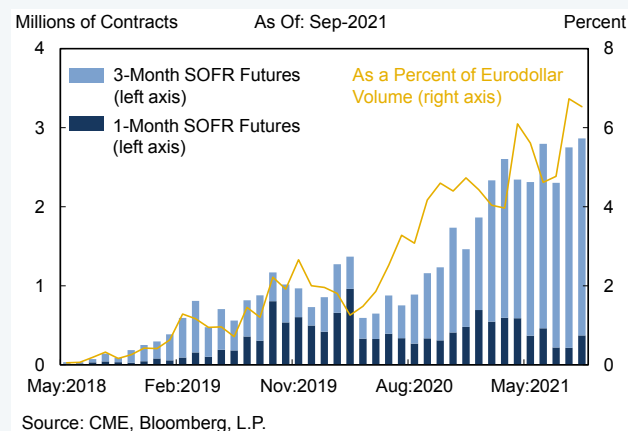
Adoption of SOFR as a reference rate has increased over the past year. The amount of activity in SOFR futures has risen substantially, as measured by volume and open interest (**Charts E.1, E.2**). However, SOFR futures volumes still only equal a small proportion of the volume of Eurodollar futures (which are LIBOR-based derivatives). In other markets, a small number of leveraged loan agreements benchmarked against SOFR were announced for the first time in September 2021. Earlier in the year, trade groups representing corporate borrowers had expressed demand for greater availability of loan agreements based on SOFR, as noted in an exchange of public letters between those groups and the Treasury, Federal Reserve, FRBNY, CFTC, and SEC.

In interdealer trading, the “SOFR First” initiative was announced in June by a subcommittee of the CFTC. This initiative encouraged a prioritization of interdealer trading in SOFR rather than LIBOR and set July 26, 2021 as a date when it would be appropriate for interdealer brokers to adopt SOFR.

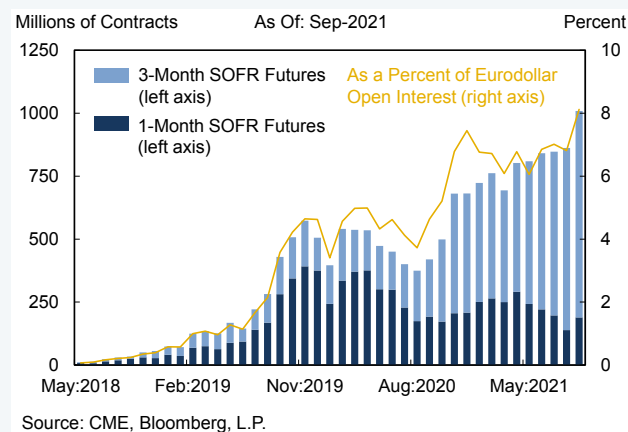
Following the adoption of this change in interdealer trading conventions, the ARRC formally recommended the CME’s SOFR term rates. In endorsing the CME’s Term SOFR Rate, the ARRC has set out a limited set of recommended use cases. To protect against the outsized growth of term SOFR derivatives, CME’s licensing agreement for the rate restricts its use to cash products and derivatives that hedge those cash products, and certain securitizations with underlying assets tied to SOFR

term rates. ARRC continues to recommend that market participants use overnight SOFR and SOFR averages where possible and appropriate.

E.1 SOFR Futures Volume



E.2 SOFR Futures Open Interest



Legacy Contracts Without Robust Fallback Provisions

Legacy contracts that lack robust fallback provisions may be silent on the transition of the interest rate benchmark or contain fallback language that is considered infeasible. Market participants have received greater clarity about the treatment of these contracts. On April 7, 2021, New York State enacted ARRC-endorsed legislation to help transition contracts governed by New York law to a SOFR-based rate after LIBOR’s cessation or in the event

Box E: LIBOR Transition (continued)

LIBOR is declared unrepresentative by the regulatory supervisor for the administrator of LIBOR, the FCA. The state of Alabama also passed legislation substantively identical to the New York bill the same month. However, it is unclear how effective such laws will be in fully addressing the transition for contracts subject to their requirements, and legal issues may remain for contracts governed by the laws of other jurisdictions. Congress has deliberated federal legislation to address these issues.

Accounting Considerations

FASB is monitoring the global reference rate reform initiatives to identify areas of generally accepted accounting practices (GAAP) that may need to be amended in response to those initiatives. In March 2020, FASB issued ASU 2020-04, Reference Rate Reform (Topic 848): Facilitation of the Effects of Reference Rate Reform on Financial Reporting, and in January 2021, issued ASU 2021-01 on SCOPE.

The guidance provides temporary optional relief from existing accounting requirements related to contracts and other transactions where the reference rate is expected to be discontinued. This guidance is meant to simplify evaluations of high-volume contract modifications, and transition hedge accounting relationships that would otherwise be required to be terminated. The guidance is generally effective from March 12, 2020 to December 31, 2022. FASB is evaluating whether to extend the sunset date of Topic 848 in response to the new expected cessation date (June 30, 2023) for certain tenors of USD LIBOR. The guidance also allows eligible held-to-maturity (HTM) debt securities that reference an eligible reference rate to be sold and or transferred to available-for-sale or trading categories if they were classified as HTM before January 1, 2020.

3.6.2 Financial Innovation

3.6.2.1 Digital Assets

Investor interest in digital assets in the United States has continued to increase, although high volatility in the prices of these assets may be limiting wider adoption. There are indications that institutional investor interest has risen over the past several years, including increased open interest in digital-asset-linked futures and investor statements to the media, though data remain incomplete. Access to digital assets has continued to expand in 2021 as several large online and mobile payment platforms enabled users to maintain exposure to a limited number of digital assets alongside dollar-based activity. Two U.S. listed bitcoin futures exchange-traded funds launched in October 2021, with one product attracting the fastest billion-dollar fundraising on record. However, the use of digital assets as an investment instrument remains limited. The prices of many digital assets are far more volatile than the prices of traditional assets and may not be appropriate for many investors. It appears that speculation continues to drive the majority of digital asset activity, though it is unclear what percentage of transactions may directly tie to economic activity given the pseudonymous nature of many transactions. Finally, growing awareness of the energy demands of proof-of-work protocols, which continue to power the majority of digital assets as measured by market capitalization, have shaped conversations around sustainability and future developments.

Digital assets continued to evolve over the course of 2021, with significant development occurring in projects that are broadly described as “DeFi,” a term derived from so-called decentralized finance. DeFi applications generally claim to replace central financial intermediaries in traditional financial infrastructure with automatic code execution, though degrees of centralized project control may vary. Users of these services face risk of loss due to market value fluctuations, operational issues, and cybersecurity threats, among other risks. Participants who use DeFi to borrow additional digital assets to leverage their exposure face considerable market risk from volatile market prices. Price volatility amplifies the potential risk that borrowers may need to liquidate their positions

to meet minimum margin calls. There is currently uncertainty about whether such liquidations of assets could be broadly correlated across many accounts and the extent to which liquidations in one digital asset could lead to spillover effects across other digital assets. Varying collateralization standards and operational standards exacerbate these market and liquidation risks, warranting additional scrutiny from lenders.

Stablecoins are digital assets that are designed to maintain a stable value relative to a national currency or other reference assets ([see Box G](#)). The market capitalization of stablecoins issued by the largest stablecoin issuers exceeded \$127 billion as of October 2021. This amount reflects a nearly 500 percent increase over the preceding twelve months. At the time of publication of this report, stablecoins are predominantly used in the United States to facilitate trading, lending, and borrowing of other digital assets. For example, stablecoins allow market participants to engage in speculative digital asset trading; to move value easily between digital asset platforms and applications; and to store and transfer value associated with digital asset trading, lending, and borrowing within the distributed ledger environment. Stablecoins that are generally created, or “minted,” in exchange for fiat currency are often advertised as being supported or backed by a variety of “reserve assets.” The reserves of these stablecoins, however, may not be subject to rigorous audits and the quality and quantity of collateral may not, in some cases, correspond to the issuer’s claims. Likewise, stablecoins that maintain their value through algorithmic mechanisms are potentially subject to failure due to market pressures, operational failures, and other risks.

DeFi projects and stablecoin arrangements may implicate the jurisdiction of the SEC, the CFTC, and other authorities. Depending on their structure, stablecoins, or certain parts of stablecoin arrangements, may be one or a combination of securities, commodities, and derivatives. Moreover, much of the trading, lending, and borrowing activity currently fueled by stablecoins on digital asset trading platforms and within DeFi similarly may constitute either or both of securities and derivatives transactions that must be conducted in compliance

with federal securities laws and the Commodity Exchange Act (CEA), including applicable regulations. To the extent that a given stablecoin activity falls within the jurisdictions of the SEC and CFTC, it must be conducted in compliance with applicable provisions of the federal securities laws, the CEA, and associated regulations, as applicable.

3.6.2.2 Peer-to-Peer Payments

Consumers continue to embrace peer-to-peer payment services, and the COVID-19 pandemic has further highlighted the potential benefits of mobile contactless payment options. Peer-to-peer payment services allow for the transfer of funds between two parties using mobile apps. Some peer-to-peer payment services have expanded capabilities beyond simply facilitating transactions between peers, which has allowed them to, for example, help facilitate government assistance payments. The apps are typically linked to debit or credit card accounts and other types of bank accounts, thereby allowing the funding transfers to proceed through bank-maintained payment networks. Although some service providers are relatively new companies, banks and other financial service providers are also entering the market and have reported significant consumer participation and transaction volume.

3.6.2.3 Digital Lending

The pandemic further accelerated the adoption of digital lending, which involves the provision of loans through online, electronic platforms. Health concerns and public health restrictions caused many banks and credit unions to temporarily close or restrict access to branches. Some smaller institutions, in particular, expanded their online services to meet customer needs and to compete with large banks and fintech lenders. While online applications and automated credit decisions have been common in lending to retail customers, loans to small and medium-sized businesses had lagged in this regard. The need to rapidly process PPP applications accelerated digital lending to small and medium-sized businesses. According to data released by the Small Business Administration on May 31, 2021, approximately 95 percent of PPP lenders were banks with less than \$10 billion in assets and credit unions, demonstrating a role for smaller, traditional financial institutions in digital lending.

Recent years have witnessed significant growth in point-of-sale financing services, also known as “buy now, pay later” (BNPL) services. These unsecured loans permit consumers to finance an online purchase and repay the loan through an installment plan. The loan is an integrated payment option on a retailer’s website and is often offered at zero interest. Merchants and service providers report that the product increased conversion from cart to purchase, increased order values, and lowered the number of abandoned carts. For some consumers, the loan may offer cheaper and more readily available financing than a credit card but present the risk of taking on too much debt in small increments or incurring late fees. McKinsey & Company estimates that BNPL financing generated 10 percent of unsecured loan balances in 2020 and grew by 15 percent during 2020, despite a decline of 11 percent in other unsecured consumer lending balances over the same period. This market share is forecasted to continue growing. Early entrants to the market emerging with significant market share have largely been nonbank financial technology companies, though some banks and at least one major card network have announced plans to launch their own competing products.

3.6.2.4 Use of Technology in Financial Services

Technological capabilities are a significant differentiator in the highly competitive market for financial services. Over recent years, several large technology and e-commerce firms entered, or explored entering, the financial services market, often through business relationships with banks. Some of these technology and e-commerce companies have characteristics that could allow them to grow quickly in the financial services market, including large customer networks, broad name recognition, and access to client data. In other cases, new firms may seek to use technology as a competitive advantage to achieve rapid growth in an area traditionally dominated by banks. Banks and traditional financial services companies may also seek to develop or acquire similar advances to their existing offerings through in-house development or through relationships with third parties.

The integration of new technology improves products and services by some measures but may also present new risks. For example, new technology

and systems can help to evaluate and determine the creditworthiness of potential borrowers, benefiting financial institutions and customers by expanding access to credit and shortening the approval process. At the same time, automated processing of loan applications may introduce algorithmic biases when evaluating creditworthiness. In this case, lenders may need to manage new risks, including operational changes from the implementation of the new technology and its impact on credit evaluation models. This includes consideration of compliance risks to ensure that new technologies reliant on algorithmic methods adhere to fair lending laws.

3.6.2.5 Reliance of Financial Institutions on Third-Party Service Providers

Financial institutions have increased their use of third-party service providers to supplement or increase capabilities. This dynamic has accelerated during the COVID-19 pandemic, as institutions are utilizing third parties to support widespread remote work capabilities, increase technological capacity, and maintain operations. These business relationships may be with entities that specialize in the use of technology in financial services ([see Section 3.6.2.4](#)).

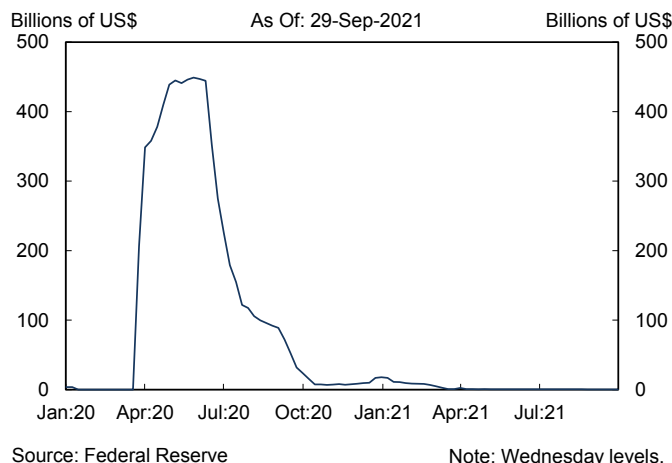
While the use of third-party service providers can have advantages, financial institutions that contract with a third-party service provider may expose themselves to additional risks if the third party is not appropriately managed when performing services on behalf of the financial institution. As large service providers gain market share and some service providers become more specialized, concentration risk may increase. This is of particular concern where many institutions rely on the same third-party provider for key services and may introduce hidden concentration risk into the supply chain. Additional challenges to effective risk management can occur as third-party service providers further subcontract services, which may make oversight more complex for both the financial institution and regulatory agencies.

Some regulators, including the FHFA and NCUA, continue to have limited authority to regulate or supervise third-party service providers. The NCUA, for example, continues to have no authority to supervise credit union service organizations (CUSOs) for compliance with federal consumer

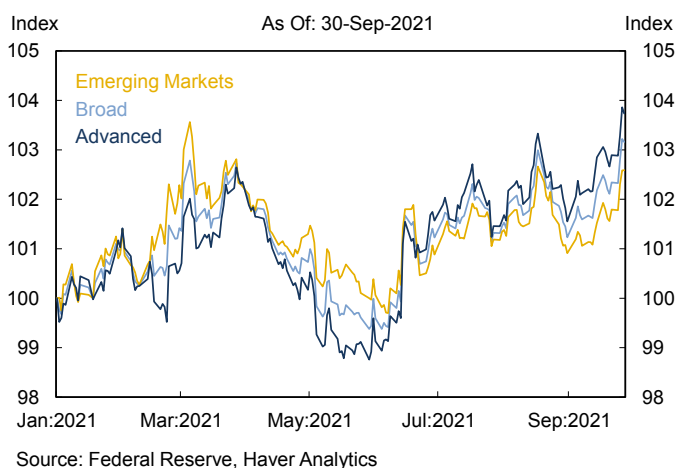
financial protection laws and regulations, the Bank Secrecy Act and other anti-money laundering laws, or with prudential standards. As discussed in [Section 4.4.2](#), the NCUA issued a final rule in October 2021 expanding the lending activities permitted by CUSOs.

Financial institutions are expected to appropriately manage and evaluate the risks associated with each third-party relationship, as engaging a third party to perform functions does not relieve a financial institution of its own legal and regulatory obligations. Financial institutions should conduct appropriate due diligence before entering into a third-party relationship and exercise effective oversight and management throughout the life of the relationship.

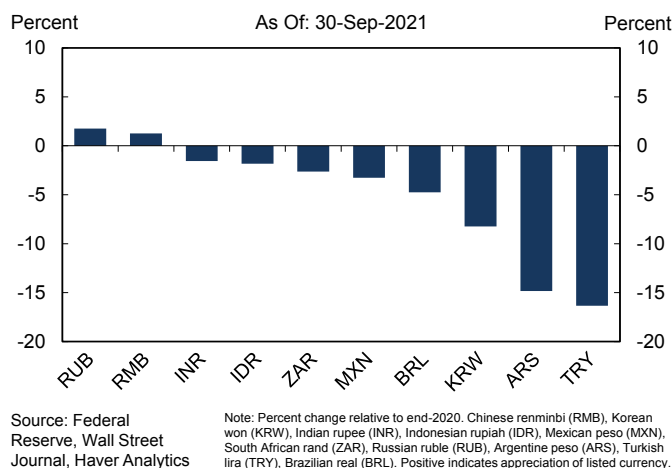
3.7.1.1 Federal Reserve Swap Lines



3.7.1.2 Nominal U.S. Dollar Trade-Weighted Index



3.7.1.3 YTD Change in USD Exchange Rates, EMEs



3.7 Global Economic and Financial Developments

3.7.1 Foreign Exchange Market

Following sudden financial market strains in early 2020 and subsequent extraordinary actions taken by central banks and governments, pressure on the dollar subsided for the remainder of the year. The nominal broad trade-weighted dollar depreciated by 7.3 percent in the second half of 2020, weakening against both advanced economy and emerging market currencies. Dollar funding markets experienced significant strains in March 2020 as investors sought the safety of the dollar and the premium to obtain dollar funding increased. Expansion and enhancement of dollar liquidity swap lines by the Federal Reserve and other central banks led to a stabilization in these markets and retracement of dollar funding premiums. After reaching almost \$450 billion at the end of May, outstanding drawings on all Federal Reserve swap lines declined to about \$18 billion at the end of 2020 and fell further to \$340 million as of September 29, 2021 (**Chart 3.7.1.1**). Meanwhile, the FX swap basis for major currencies have narrowed to pre-pandemic levels.

The dollar has strengthened 3.1 percent on a nominal trade-weighted basis over the first nine months of 2021. In the first quarter of 2021, the dollar appreciated by 0.9 percent against a basket of advanced economy currencies and 1.8 percent against a basket of emerging market currencies. The dollar briefly weakened against advanced economy currencies in June, but subsequent appreciation in July more than offset the second quarter fall (**Chart 3.7.1.2**). The dollar generally appreciated against emerging market economies, although modestly depreciating against a few year-to-date (**Chart 3.7.1.3**). Continued pressures on emerging market currencies have reflected in part a lack of vaccination progress, developments regarding new COVID-19 variants, relative utilization of policy support, and pre-existing macroeconomic strains in a few specific instances.

The real broad dollar index is 3.2 percent stronger on net in 2021 through the end of September and remains relatively strong from a historical perspective. Notably, the real trade-weighted dollar stands 7.2 percent above its 20-year average in this same period, having moderated since its peak in April of last year (**Chart 3.7.1.4**).

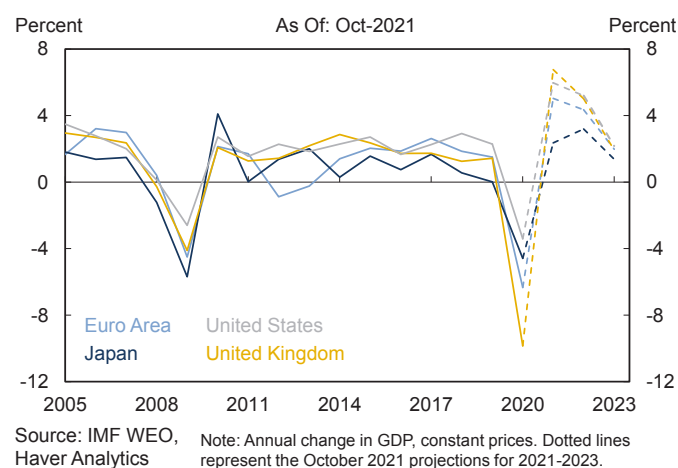
3.7.2 Advanced Economies

Economic activity in advanced economies, which fell sharply at the onset of the COVID-19 pandemic, rebounded in 2021, and the International Monetary Fund (IMF) projects that advanced economies will grow by 5.2 percent in 2021. The rebound in economic growth can be attributed to COVID-19 mitigation efforts, including vaccination programs and continued policy support. Real GDP in the UK, U.S., euro area, and Japan is projected to rise by 6.8 percent, 6.0 percent, 5.0 percent, and 2.4 percent, respectively (**Chart 3.7.2.1**). Despite this rebound in economic activity, the emergence of more virulent COVID-19 variants, as well as persistent supply chain effects and a potential earlier than projected central bank liftoff, introduce significant downside risks.

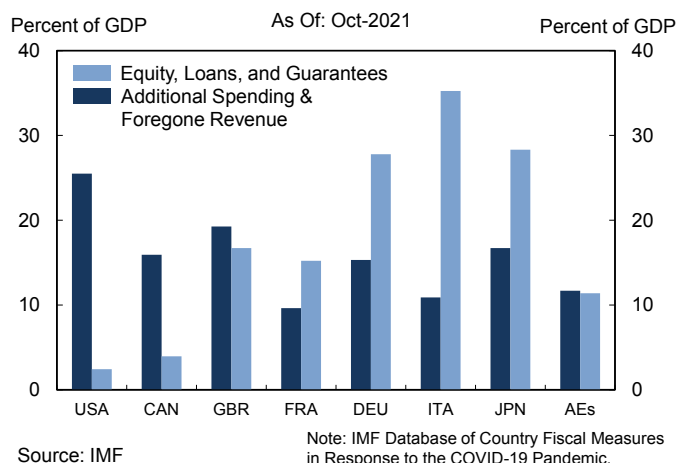
3.7.1.4 Real U.S. Dollar Trade-Weighted Index



3.7.2.1 Advanced Economies Real GDP Growth

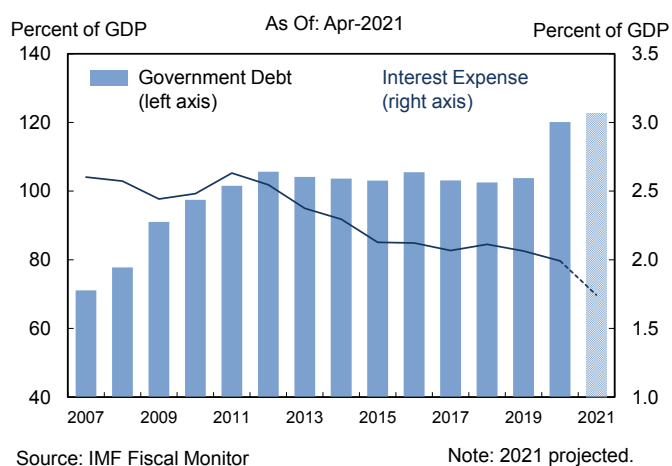


3.7.2.2 Discretionary Fiscal Response to the COVID-19 Pandemic



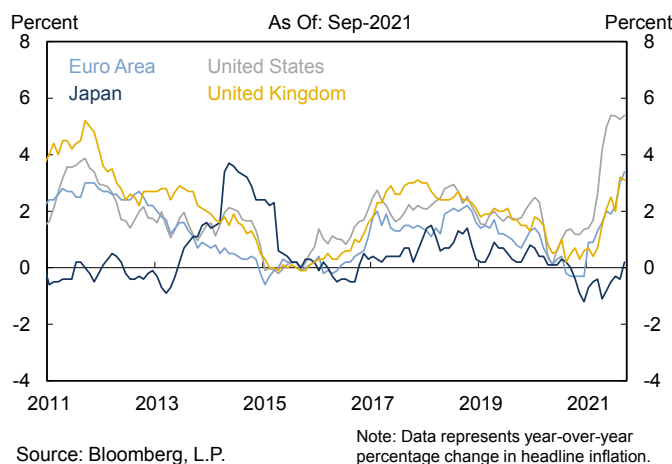
Advanced economies have taken significant measures to support long-term economic recovery, relying on a combination of direct fiscal stimulus programs, such as wage subsidies and cash payments, and liquidity support in the form of loans, asset purchases, and guarantees (**Chart 3.7.2.2**). While direct fiscal spending programs have increased headline government debt levels meaningfully, interest expense has remained stable given the low interest rate environment (**Chart 3.7.2.3**). In addition, the economic recovery was supported by unprecedented easing by major central banks, which helped keep global financial conditions historically accommodative in the first nine months of 2021.

3.7.2.3 Advanced Economy Interest Expense and Government Debt



Headline inflation rates were elevated in most advanced economies through the first nine months of 2021 (**Chart 3.7.2.4**). This increase was driven by a variety of factors, including an increase in commodity prices, supply chain disruptions, and labor shortages. In September, concerns over inflationary pressures pushed nominal yields higher.

3.7.2.4 Advanced Economy Headline Inflation Rate



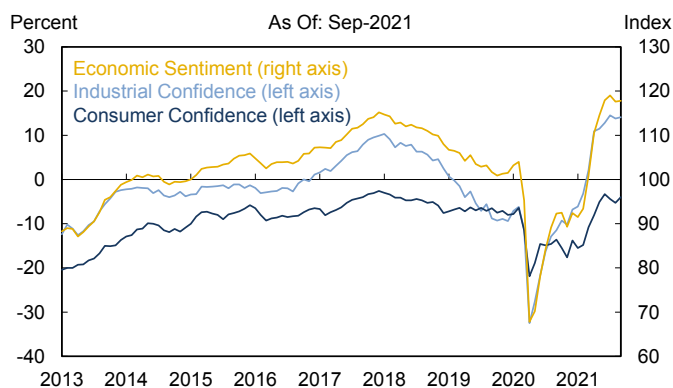
Euro Area

Euro area output fell slightly in the fourth quarter of 2020 and the first quarter of 2021, as the surge of COVID-19 cases and reimposition of restrictions hindered the economic recovery. However, euro area economic sentiment quickly recovered over the winter and now stands well above pre-pandemic levels (**Chart 3.7.2.5**). The recovery resumed in the second quarter of 2021, and euro area real GDP growth rose by 2.2 percent quarter-over-quarter in the third quarter. Nevertheless, economic activity remains hindered, with third quarter output trailing pre-pandemic levels in most Euro area countries (**Chart 3.7.2.6**).

The ECB continues to deploy a range of unconventional monetary tools to help support the euro area economy. As part of the Pandemic Emergency Purchase Programme, the ECB has purchased €1.4 trillion of public and private sector securities through September 2021 and is expected to purchase an additional €550 billion until at least the end of March 2022. On September 9, the ECB announced it would move to a “moderately lower pace” from the €80 billion per month level it had conducted since March. The program, which supplements the continued asset purchase programme, has helped preserve favorable financing conditions and support the smooth transmission of monetary policy. At the same time, the ECB has maintained a bank deposit rate of -0.5 percent and conducted a monetary policy strategic review, agreeing to a symmetric inflation target of 2.0 percent over the medium term. As a result, the ECB revised its forward guidance in July 2021, noting that it expects key interest rates to remain at current or lower levels, until it sees inflation reaching 2.0 percent, well ahead of the end of its projection horizon. However, according to September ECB staff projections, the projection horizon reading for inflation is 1.5 percent, well below the 2.0 percent target.

In July 2021, the EU began disbursing funds to member states under its historic NextGenerationEU (NGEU) plan. The plan, which was officially proposed in May 2020, was

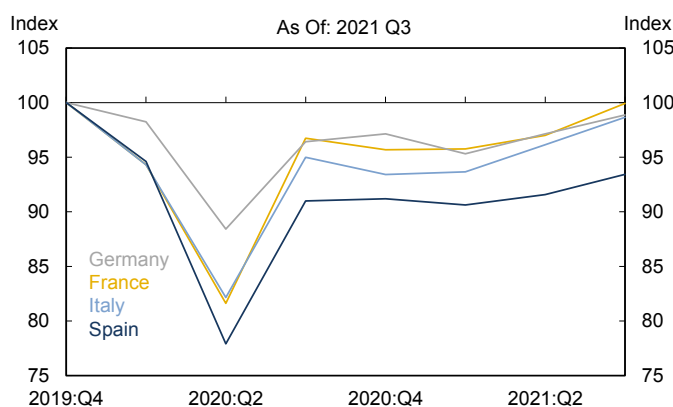
3.7.2.5 Euro Area Business and Consumer Surveys



Source: European Commission, Haver Analytics

Note: Confidence surveys calculated by subtracting the percentage of negative responses from the percentage of favorable responses. For economic sentiment index, 100 = long-term average.

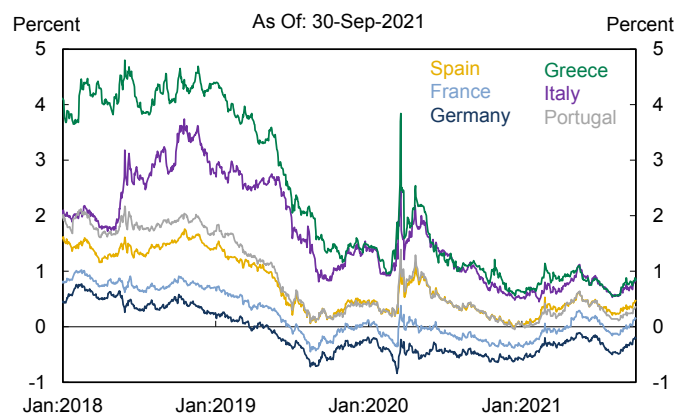
3.7.2.6 Real GDP for Select Euro Area Economies



Source: European Commission, Haver Analytics

Note: Seasonally adjusted real GDP. Indexed to 100 as of 2019:Q4.

3.7.2.7 Euro Area 10-Year Sovereign Yields



established to help member states' economic recovery from COVID-19 while also supporting the green and digital transition. In total, the European Commission is permitted to borrow up to €806.9 billion on behalf of member states. The EU's Recovery and Resilience Facility accounts for the bulk of the NGEU spending, with €338 billion allocated to be dispersed as grants and €385.8 billion to be dispersed as loans. The facility should provide heavily indebted member states additional fiscal space to support economic recovery from the COVID-19 pandemic. As of October 2021, the European Commission had approved 19 member state plans.

In the second quarter of 2021, the euro area general government debt totaled €11.6 trillion, a 6 percent increase year-over-year. While the euro area debt-to-GDP decreased from 101 percent to 98.3 percent in the second quarter, it exceeds the 94.4 percent recorded one year prior. This increase in debt can be attributed to the financing needs of the policy measures adopted to mitigate financial fallout from the pandemic. Core and periphery euro area sovereign bond yields remain historically low, and as of September 30, all 10-year euro area sovereign bonds were trading with yields below one percentage point (**Chart 3.7.2.7**). The continued low yields and tight sovereign credit spreads can be primarily attributed to accommodative monetary policy and the introduction of the EU-wide fiscal relief package, in addition to low rates of inflation, expected inflation, and economic growth.

United Kingdom

UK activity rebounded strongly in the spring and summer of 2021, as the government made progress on its vaccination program and lifted COVID-19 restrictions. UK real GDP rose by 1.3 percent in the third quarter, following a 5.5 percent increase in the second quarter of 2021. A pickup in consumer spending drove much of that growth, with household consumption rising by 7.3 percent and 2.0 percent in the second and thirds quarter of 2021, respectively.

The UK government launched a series of programs, which largely ended this year, to support households and businesses through the COVID-19 pandemic. As of May 31, 2021, aggregate lending under the UK's three business loan schemes totaled £79 billion and as of September 14, total claims under the UK's Coronavirus Job Retention Scheme totaled £69 billion. These programs have helped support employment, and as of September 2021, the UK unemployment rate stood at 4.3 percent.

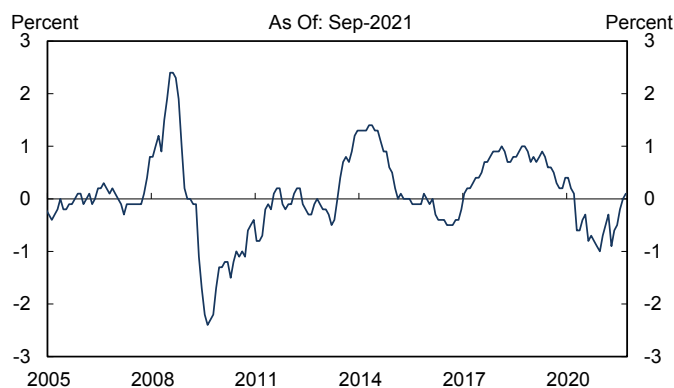
Similar to other advanced economies, UK inflation has risen above 2 percent in recent months. While the pickup in inflation was primarily attributed to higher goods prices, the UK has experienced an increase in service sector inflation. In October 2021, the Bank of England (BOE) warned that it would have to act to curb inflationary pressure, causing markets to anticipate a potential November rate hike. The BOE also announced that it has lowered the level of the Bank Rate at which it would begin to reduce its stock of purchased assets, thereby allowing its balance sheet to start shrinking earlier than market participants had expected.

Japan

While Japanese economic activity has rebounded, the recovery has been more subdued relative to other advanced economies, with real GDP by just 0.4 percent in the second quarter of 2021 before declining by 0.8 percent in the third quarter of 2021. The relative underperformance of the Japanese recovery may be partly attributed to the reintroduction of emergency measures to stem the spread of the virus and the delayed vaccination program, in addition to the economy's lower potential growth due to its rapidly aging and falling population. Japanese inflation has picked up in recent quarters but remains well below 2.0 percent ([Chart 3.7.2.8](#)).

Prior to the pandemic, the Bank of Japan (BOJ) eased its monetary stance by switching from date-based forward guidance to open-ended policy, noting that it expected to keep policy

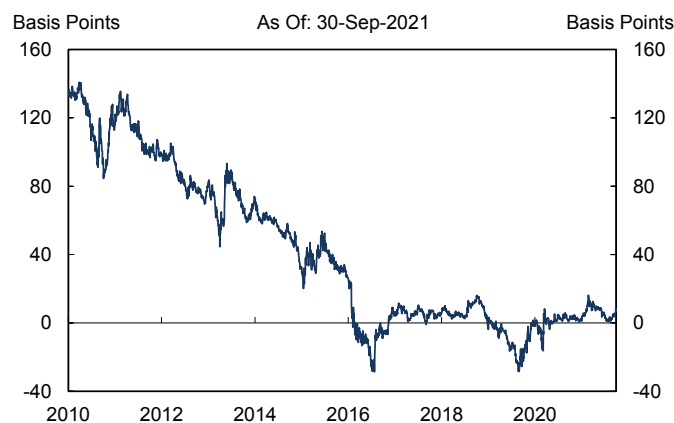
3.7.2.8 Japanese Consumer Price Inflation



Source: Bank of Japan, Haver Analytics

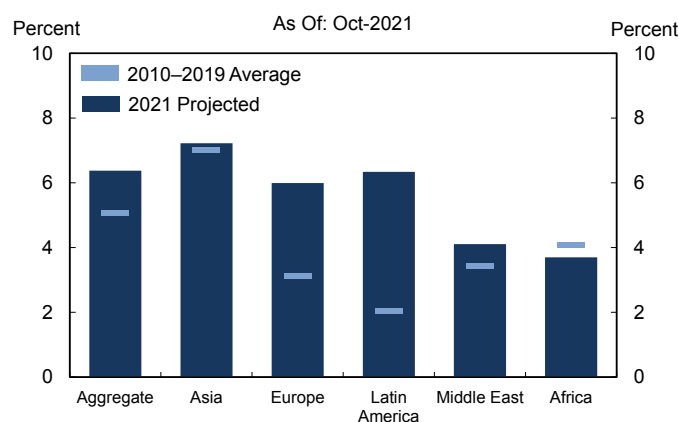
Note: Data represents year-over-year percentage change. CPI excludes fresh food and is adjusted for the consumption tax increase that took effect in April 2014.

3.7.2.9 Japan 10-Year Government Bond Yield



Source: Bloomberg, L.P.

3.7.3.1 EME GDP Growth



Source: IMF WEO

rates at current levels or to reduce them so long as uncertainties remained regarding reaching the 2 percent inflation target. The BOJ has maintained its policy rate at -0.1 percent since January 2016. In addition, the BOJ continued to follow its policy of yield curve control whereby the BOJ will purchase Japanese government bonds (JGBs) so that the 10-year JGB yield remains at around zero percent. Since the introduction of the BOJ's yield curve control policy in 2016, the yield on 10-year JGBs has remained little changed (**Chart 3.7.2.9**).

On March 26, 2020, the BOJ announced that it would enhance monetary easing through a number of policy measures, including increasing purchases of JGBs, easing access to U.S. dollar funds, purchasing CP and corporate bonds, establishing a new operation to provide loans against corporate debt, and actively purchasing exchange-traded funds and Japanese REITs.

At subsequent meetings, the BOJ announced the expansion of its CP and corporate bond purchase programs along with the introduction of a new operation to support bank lending to small and medium-sized enterprises. In addition, the BOJ has announced it will launch a climate change scheme by the end of 2021, which is expected to last until 2030. Under this scheme, the BOJ will offer funds to banks that extend green and sustainability-linked loans, as well as invest in green bonds and sustainability-linked bonds.

3.7.3 Emerging Market and Developing Economies

Emerging market economies, which experienced a sharp contraction in economic output in the first half of 2020, are projected to rebound sharply in 2021. According to the IMF's October 2021 WEO update, emerging and developing economies are projected to grow by 6.4 percent in 2021 (**Chart 3.7.3.1**). In aggregate, emerging Asian economies are projected to continue to outperform other emerging market economies, with the region projected to grow by 7.2 percent in 2021. Despite significant COVID-19 outbreaks in

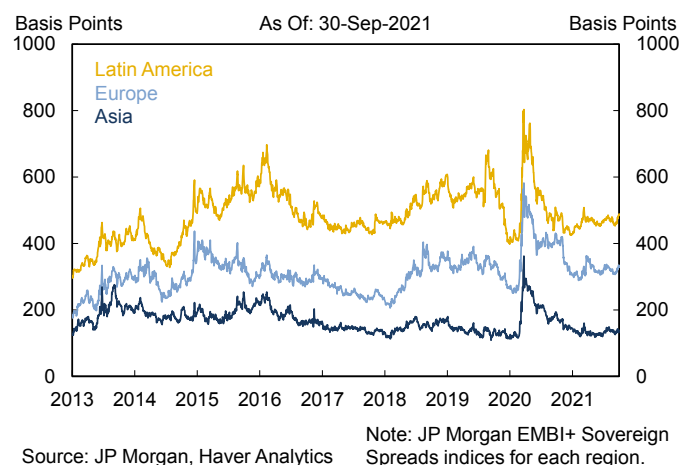
Latin America, the region is expected to rebound sharply in 2021, with projected GDP growth reaching 6.3 percent compared to an average of 2.0 percent between 2010 and 2019.

While headline emerging market GDP has rebounded strongly, the economic recovery has not been uniform. Commodity producers, which were particularly hard hit in the early stages of the pandemic, have rebounded with the increased demand for raw materials. In contrast, emerging market economies reliant on tourism continue to struggle and have seen a deterioration in external balances. Additionally, limited vaccine access in certain emerging market economies may weigh on growth prospects, particularly if the spread of more virulent COVID-19 variants stresses local health infrastructure. Inflationary pressures have prompted some central banks to raise policy rates, which, combined with a potential tightening of global financial conditions, could introduce additional stress in emerging economies.

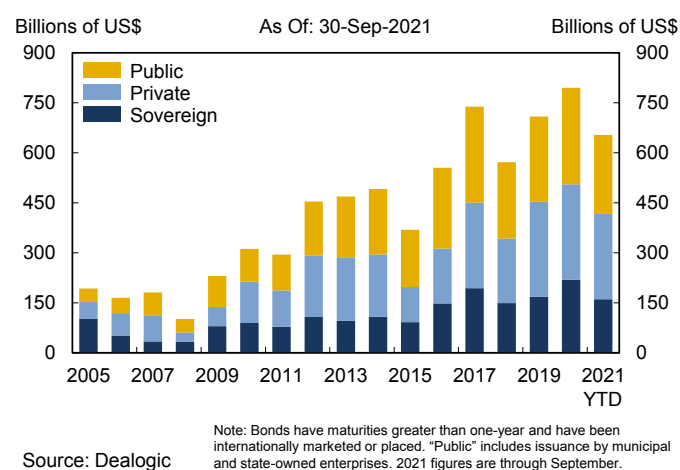
Spreads on USD-denominated sovereign bonds have compressed markedly since the March 2020 market stress, with Latin American, Asian, and European spreads returning to pre-pandemic levels (**Chart 3.7.3.2**). The compression of sovereign bond spreads, which can be attributed to improved risk sentiment and accommodative financial conditions, has helped support emerging market global bond issuances. In 2020, non-local emerging market bond issuances totaled \$795 billion, up from \$709 billion the previous year. The strong pace of issuances continued in 2021, with year-to-date issuances totaling \$654 billion as of September 30, 2021 (**Chart 3.7.3.3**).

Similarly, emerging market economies experienced strong foreign investor portfolio inflows in the second half of 2020 (**Chart 3.7.3.4**). By the fourth quarter, portfolio flows hit a record \$201 billion, with equity inflows totaling \$82 billion and debt inflows totaling \$120 billion. As of the second quarter of 2021, portfolio flows and foreign direct investment made up 24 percent and 37 percent of foreign

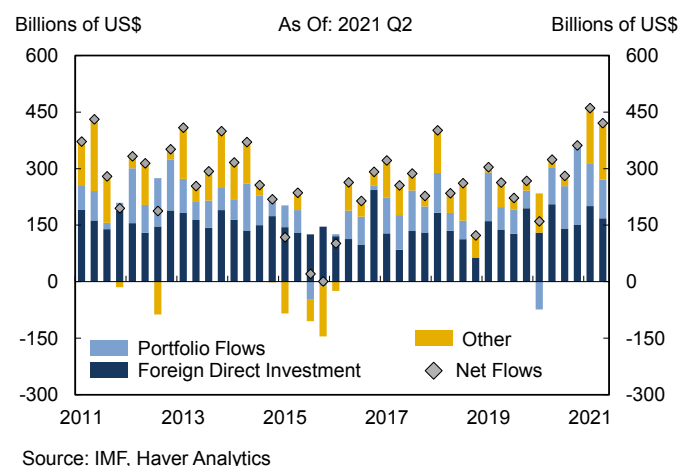
3.7.3.2 Emerging Market Sovereign Bond Spread



3.7.3.3 Emerging Market Non-Local Bond Issuance



3.7.3.4 Foreign Investor Inflows to EMEs



3.7.3.5 Foreign Investor Portfolio Inflows to EMEs, by Region



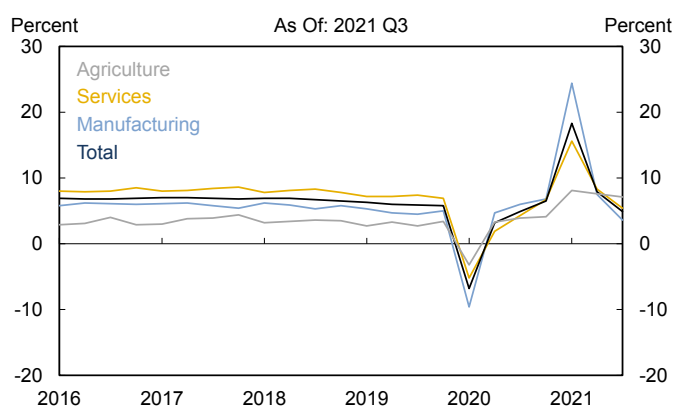
Source: IMF, Haver Analytics

investor flows into emerging market economies, respectively. Portfolio flows into China have driven the recent increase in foreign investor inflows, accounting for approximately two thirds of total foreign investor portfolio inflows for the three quarters ended December 31, 2020 (**Chart 3.7.3.5**).

China

At the onset of the pandemic, Chinese authorities imposed strict containment measures, which led to a sharp decline in economic activity. These containment efforts helped mitigate the spread of COVID-19 and ultimately allowed for a full reopening of the Chinese economy. At the same time, an increase in external demand for goods allowed for a sharp rebound in Chinese manufacturing, and Chinese economic growth outpaced global economic growth in 2020 (**Chart 3.7.3.6**). However, household consumption lagged the broader recovery, and in 2020, Chinese household consumption fell by 4 percent despite the increase in overall GDP. In September 2021, China's official producer price index climbed nearly 11 percent from a year earlier, exceeding forecasts and reaching the highest level since November 1995, as coal prices and other commodity costs soared.

3.7.3.6 Chinese Real GDP Growth and its Components



Source: China National Bureau of Statistics, Haver Analytics

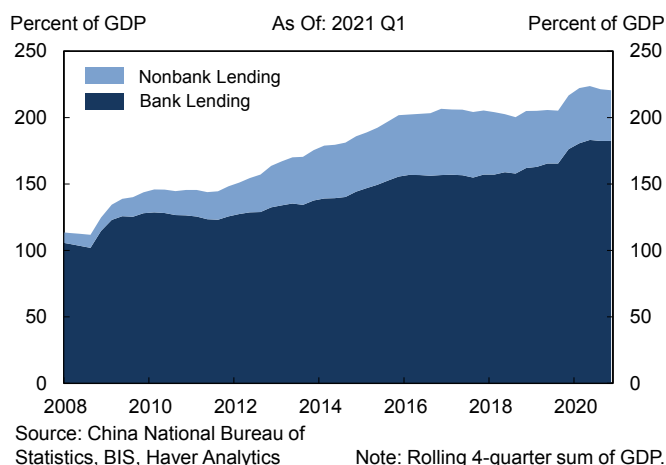
Note: Year-over-year percentage change.

Prior to the COVID-19 pandemic, Chinese authorities were taking steps to encourage financial deleveraging, leading to a stabilization in the level of credit provided to the nonfinancial private sector as a percent of GDP (**Chart 3.7.3.7**). Chinese regulators paused this deleveraging campaign as authorities tried to balance COVID-19-related credit support with longer-term financial stability goals. With the stabilization of the Chinese economy, regulators have since normalized their monetary policy and credit growth has returned to pre-pandemic levels (**Chart 3.7.3.8**).

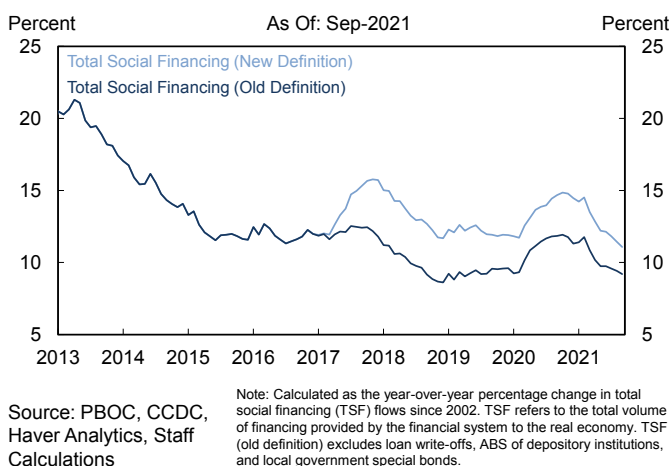
Recent events have highlighted the tensions Chinese regulators face in introducing market discipline. In the spring, reports emerged of a potential default by China Huarong Asset Management Co., the largest of China's four "bad banks" established in 1999 to manage nonperforming loans in the aftermath of the Asian Financial Crisis. In light of this, Huarong's \$21 billion of dollar bonds traded at a significant discount despite the fact that the firm carried an A and A- rating from Fitch and S&P in the first quarter, which raised investor uncertainty around government support for state-linked firms. Ultimately, Huarong announced in August that it would be recapitalized by state investors, which reversed the effect of contagion to other state-owned enterprises.

Additionally, China Evergrande Group, the world's most indebted property developer, has experienced significant distress in recent months, with the firm warning that it "has risks of defaults on borrowings." Evergrande had about \$20 billion in dollar denominated bonds outstanding and in early September, its 2022 dollar bonds were trading at less than 30 cents on the dollar. On September 16, Evergrande's main unit applied to suspend trading of its onshore corporate bonds following a downgrade. Stress has spilled over into the broader offshore dollar bond market, with yields spiking past levels seen at the onset of the COVID-19 pandemic. Additionally, the event has highlighted fears over China's

3.7.3.7 Credit to the Chinese Nonfinancial Private Sector



3.7.3.8 Chinese Credit Growth



heavily leveraged real estate sector, which, by some estimates, amount to almost 30 percent of its economy. A slowdown in China's real estate market could also trigger spillover effects in global commodity markets, where China accounts for almost half or more than half of steel, copper, and iron ore consumption.

Chinese authorities have launched a crackdown on various industries in recent months, with particular focus on the “platform economy”, or internet companies operating a range of services; cryptocurrency; and for-profit education. In November 2020, Chinese technology company Ant Group's initial public offering in Shanghai and Hong Kong was suspended, with the Shanghai Stock Exchange citing as the cause Ant's inability to meet listing conditions and information disclosure requirements. Since then, authorities have introduced anti-monopoly legislation against multiple technology companies, including the e-commerce company Alibaba and the ride-hailing firm Didi. Financial regulators subsequently barred banks and online payment firms from using cryptocurrency for payment or settlement in May 2021 and banned cryptocurrency transactions and mining in September. Moreover, in its July “double reduction policy”, the government ordered private businesses to suspend online and offline tutoring classes for children from kindergarten through ninth grade.

4

Council Activities and Regulatory Developments

4.1 Council Activities

4.1.1 Risk Monitoring and Regulatory Coordination

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

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

Regulation and Resolution Committee (RRC) also supports the Council in its duties to identify potential gaps in regulation that could pose risks to U.S. financial stability.

As part of its responsibility to identify risks to U.S. financial stability, the Council has considered climate-related financial risks over the past year. The Council first discussed these risks at its March 2021 meeting, at which members highlighted a broad set of work beginning or underway at individual agencies and organizations. In October 2021, the Council published a [Report on Climate-Related Financial Risk](#), issued in response to the directive in Executive Order 14030, Climate-Related Financial Risk, to the Secretary of the Treasury to engage Council members on this topic and report on the Council's activities. The report details the Council's finding that climate change is an emerging threat to the financial stability of the United States ([see Box F](#)).

Box F: Climate-Related Financial Risk

There is broad scientific consensus that climate change is driven by greenhouse gas (GHG) emissions caused by human activity. According to the Intergovernmental Panel on Climate Change, climate change is impacting every region of the Earth's climate, these impacts are intensifying, and some of these impacts, such as sea-level rise, are likely to be irreversible. Increasing adverse effects from climate change to households, communities, and businesses will likely exacerbate climate-related risks to the U.S. and global financial systems if not addressed.

Climate-related financial risks can be grouped into two broad categories: physical risks and transition risks.

Physical risks refer to the harm to people and property arising from acute, climate-related disaster events such as hurricanes, wildfires, floods, and heatwaves, as well as longer-term chronic phenomena such as higher average temperatures, changes in precipitation patterns, sea level rise, and ocean acidification.

Transition risks refer to stresses to certain institutions or sectors arising from the shifts in policy, consumer and business sentiment, or technologies associated with the changes necessary to limit climate change. One key category of policy changes associated with transition risks are those directed at incentivizing or requiring reductions in GHG emissions. A

Box F: Climate-Related Financial Risk (continued)

variety of economic mechanisms could be used to lower GHG emissions. These mechanisms could include regulation, such as a Clean Electricity Standard, carbon taxation, or subsidization of green products. Depending on the stringency of the standard and related incentives, subsidies, or penalties, such regulatory mechanisms would raise the implicit price of carbon by varying degrees. This can incentivize the transition of GHG-intensive production processes, products, or services to lower-GHG states. While these regulatory tools can facilitate the achievement of climate-related goals, there may be associated climate-related financial risks.

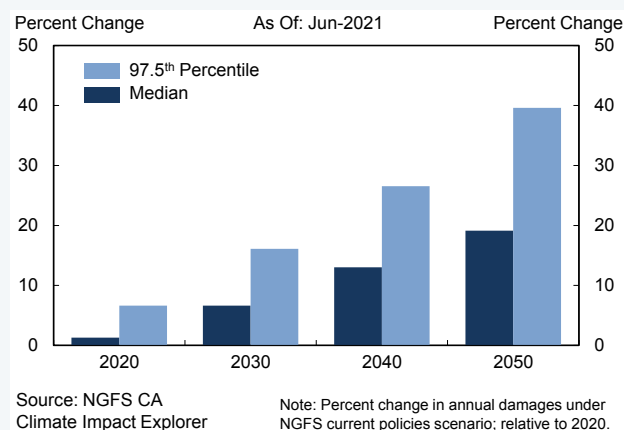
As the United States and other countries undertake the transition to a less GHG-intensive economy, changing public policies, adoption of new technologies, and shifting consumer and investor preferences have the potential to impact the allocation of capital in their economies. If these changes occur in a disorderly way owing to substantial delays in action or abrupt unanticipated changes in policy, their impact on households, communities, businesses, and other entities is likely to be more sudden and disruptive.

From Climate-Related Physical Risks to Financial Risks

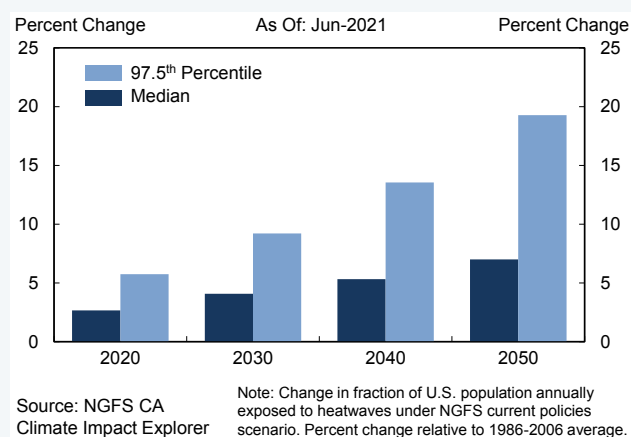
Increased frequency and severity of acute physical risk events and longer-term chronic phenomena associated with climate change are expected to lead to increased economic and financial costs. For example, the Network of Central Banks and Supervisors for Greening the Financial System (NGFS), an international organization of which the FRB and OCC are members, has developed scenarios that the private and public sectors can use in their analysis of climate-related financial risks. The NGFS scenario for potential outcomes under current policies shows a substantial increase in the segment of the U.S. population annually subject to heatwaves, with consequent potential effects on productivity and other factors, and shows a sizable increase in the annual damages associated with tropical storms

(Charts F.1, F.2).

F.1 Annual Expected Damage from Tropical Cyclones



F.2 Fraction of Population Exposed to Heatwaves



Physical risks have direct effects on households, communities, businesses, and other entities where those risks are realized, as well as to the financial institutions and investors to which they are linked, thereby creating a variety of climate-related financial risks. For example, insurers of property, hazard, flood, and other property-related risks are directly exposed to these risks. To reduce their potential losses, insurers may seek to increase premiums or withdraw from at-risk markets, which may lead to reduced affordability or availability of insurance coverage in

Box F: Climate-Related Financial Risk (continued)

vulnerable regions of the country. Such responses by insurers may affect the economic and financial health of households, businesses, and governments in these communities.

In addition, increased actual damages to properties associated with physical risks may lower the value of collateral or the income generated by such properties, posing credit and market risks to banks, insurers, pension plans, and others. Increased legal, operational, and liquidity risks may also occur. In response, creditors may pull back from impacted regions, amplifying the initial harmful impact of the climate-related disaster events and creating further financial and economic strains. Further, if investors' expectations about physical risks shift suddenly, this could contribute to an abrupt repricing event in certain asset classes. If leveraged institutions are exposed to that repricing event, that could transmit risk more broadly through the financial system.

From Climate-Related Transition Risks to Financial Risks

As countries transition to a low-GHG economy, the underlying drivers of transition risk—changes in public policy, adoption of new technologies, and shifting consumer and investor preferences—all have the potential to impose added costs on some households, communities, businesses, and other entities even as they reduce overall climate risks. As a result, impacted firms may have less ability to meet their financial obligations. Economic sectors that produce the majority of GHG emissions—the transportation sector (including household and business motor vehicles), electricity generation, and heavy manufacturing, for example—may witness sizable shifts in modes of production. This process may lead some businesses to experience losses and decline, while other businesses may succeed in adapting to new modes of production and expand. The shifts in economic and financial risks will likely be broadly felt, as, for example, sectors most directly affected by reductions in GHG emissions pass

on increased costs through supply chains and to consumers.

As a result, the economic effects associated with transitions may be transmitted through the financial sector and the economy in ways that could challenge the resilience of financial institutions or the financial sector if firms do not manage the risk appropriately. Financial risks associated with transitions to a low-GHG economy likely increase if such transitions are delayed and occur in an unanticipated, abrupt manner. In such a scenario, financial markets could experience dramatic movements in response to unexpected changes, potentially resulting in a large decline in the values of assets.

Financial Risks Associated with a Disorderly Transition

A disorderly transition to a low-GHG economy increases risks to financial stability. A disorderly transition could occur because of delays in mitigating the drivers of climate change, large and unpredictable policy changes, or sharp differences in approaches across countries, among other possibilities. To highlight potential considerations, the NGFS has developed disorderly transition scenarios. For example, one scenario involves delays in policy steps to mitigate climate change, which may boost uncertainty regarding the ultimate impact of possible policy changes on economic activity and asset values. Moreover, delays and years of complacency eventually require larger, more disruptive policy adjustments in the scenario, which would likely have more dramatic effects on economic activity and asset values. Risks to financial stability would likely be most contained if policies to facilitate the transition begin early, are communicated clearly, and follow an orderly, predictable path, thereby assisting a smooth transition for economic and financial actors, as well as households and businesses. It is considerably more difficult to judge the magnitude of risks to financial stability in a disorderly transition in which the economy and markets are forced to react to large, unanticipated changes in policy.

Box F: Climate-Related Financial Risk (continued)

Analysis and preparation for such a scenario are needed in light of the current lack of international or even domestic agreement on a coherent set of policies for achieving stated climate objectives. Financial authorities around the world have recognized the need to consider a disorderly transition in analyzing climate-

related financial risks. For example, the French Autorité de Contrôle Prudentiel et de Résolution considered two disorderly scenarios in its 2021 assessment, and the Bank of England's 2021 Biennial Exploratory Scenario on financial risks from climate change included a late transition that highlighted the attendant risks.

The Council is also evaluating the vulnerabilities posed by three types of NBFIs: open-end mutual funds, hedge funds, and MMFs. Over the past year, the Council has established an open-end fund working group and re-established a hedge fund working group in order to better share data and identify risks associated with both kinds of nonbanks. The structural vulnerabilities of MMFs were the subject of a statement by the Council on June 11, 2021, which emphasized the importance of reforms to improve the resilience and functioning of short-term funding markets. The Council expressed support for the SEC's engagement on this critical issue and will continue to monitor this initiative.

4.1.2 Determinations Regarding Nonbank Financial Companies and Activities-Based Approach

One of the Council's statutory authorities is to subject a nonbank financial company to supervision by the Federal Reserve and enhanced prudential standards if the company's material financial distress—or nature, scope, size, scale, concentration, interconnectedness, or mix of its activities—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 requires the Council to consider ten specific considerations and any other risk-related factors that the Council deems appropriate when evaluating those companies. The Council's final interpretive guidance, issued in 2019, makes modifications to the processes the Council intends to follow if it were to consider making a determination to subject a nonbank financial

company to supervision by the Federal Reserve. The guidance also describes the approach the Council intends to take in prioritizing its work to identify and address potential risks to U.S. financial stability using an activities-based approach.

As of the date of this report, no nonbank financial companies are subject to a final determination by the Council under Section 113 of the Dodd-Frank Act or are under review in Stage 1 or Stage 2 of the Council's designation process.

4.1.3 Operations of the Council

The Dodd-Frank Act requires the Council to convene no less than quarterly. The Council held seven meetings in 2021, 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 four of its meetings in 2021. Approximately every two weeks, the Council's Deputies Committee, which is composed of senior representatives of Council members, convenes to discuss the Council's agenda and to coordinate and oversee the work of the Council's five other committees. The other committees are the Data Committee; the Financial Market Utilities and Payment, Clearing, and Settlement Activities

Committee; the Nonbank Financial Companies Designations Committee; the RRC; and the SRC. The Council is forming two additional committees in connection with its work on climate-related financial risk. The Council adopted its twelfth budget in 2021.

4.2 Safety and Soundness

4.2.1 Enhanced Capital and Prudential Standards and Supervision

On December 8, 2020, the Federal Reserve issued a final rule to amend the Federal Reserve's assessment rule, Regulation TT, pursuant to Section 318 of the Dodd-Frank Act to address amendments made by section 401 of the Economic Growth, Regulatory Relief, and Consumer Protection Act (EGRRCPA). The final rule raises the minimum threshold for being considered an assessed company from \$50 billion to \$100 billion in total consolidated assets for BHCs and savings and loan holding companies, and adjusts the amount charged to assessed companies with total consolidated assets between \$100 billion and \$250 billion to reflect changes in supervisory and regulatory responsibilities resulting from EGRRCPA.

On January 6, 2021, the OCC, Federal Reserve, and FDIC issued a final rule that applies to advanced approaches banking organizations with the aim of reducing both interconnectedness within the financial system and systemic risks. As a general matter, the final rule requires deduction from a banking organization's regulatory capital for certain investments in unsecured debt instruments issued by foreign or U.S. G-SIBs for the purposes of meeting minimum total loss-absorbing capacity requirements and, where applicable, long-term debt requirements, or for investments in unsecured debt instruments issued by G-SIBs that are *pari passu* or subordinated to such debt instruments.

On February 3, 2021, the Federal Reserve issued a final rule tailoring the requirements in the Federal Reserve's 2011 capital plan rule based on risk. Specifically, as indicated in the Federal Reserve's October 2019 rulemaking that updated the prudential framework for large BHCs and U.S. IHCs of FBOs (tailoring rules), the final rule modifies the capital planning, regulatory reporting, and

stress capital buffer requirements for firms subject to "Category IV" standards under that framework. To be consistent with recent changes to the Federal Reserve's stress testing rules, the final rule makes other changes to the Federal Reserve's stress testing rules, Stress Testing Policy Statement issued in 2019, and regulatory reporting requirements, such as the assumptions relating to business plan changes and capital actions and the publication of company-run stress test results for savings and loan holding companies. The final rule also applies the capital planning and stress capital buffer requirements to covered saving and loan holding companies subject to Category II, Category III, and Category IV standards under the tailoring rules.

On February 11, 2021, the OCC, the Federal Reserve, and the FDIC issued a final rule that implements a stable funding requirement, known as the net stable funding ratio (NSFR), for certain large banking organizations. The final rule establishes a quantitative metric, the NSFR, to measure the stability of the funding profile of certain large banking organizations and requires these banking organizations to maintain minimum amounts of stable funding to support their assets, commitments, and derivatives exposures over a one-year time horizon. The NSFR is designed to reduce the likelihood that disruptions to a banking organization's regular sources of funding will compromise its liquidity position, promote effective liquidity risk management, and support the ability of banking organizations to provide financial intermediation to businesses and households across a range of market conditions. The NSFR supports financial stability by requiring banking organizations to fund their activities with stable sources of funding on an ongoing basis, reducing the possibility that funding shocks would substantially increase distress at individual banking organizations. The final rule applies to certain large U.S. depository institution holding companies, depository institutions, and U.S. IHCs of FBOs, each with total consolidated assets of \$100 billion or more, together with certain depository institution subsidiaries (together, covered companies). Under the final rule, the NSFR requirement increases in stringency based on risk-based measures of the top-tier covered company. U.S. depository institution

holding companies and U.S. IHCs subject to the final rule are required to publicly disclose their NSFR and certain components of their NSFR every second and fourth calendar quarter for each of the two immediately preceding calendar quarters. In addition, the final rule amended certain definitions in the agencies' liquidity coverage ratio rule that are also applicable to the NSFR.

On May 10, 2021, the OCC, the Federal Reserve, and the FDIC issued a proposed rule under section 39 of the Federal Deposit Insurance Act that would establish requirements for tax allocation agreements between institutions and their holding companies in a consolidated tax filing group. The proposal is intended to promote safety and soundness by preserving depository institutions' ownership rights in tax refunds and ensuring equitable allocation of tax liabilities among entities in a holding company structure. Under the proposal, national banks, state banks, and savings associations that file tax returns as part of a consolidated tax filing group would be required to enter into tax allocation agreements with their holding companies and other members of the consolidated group that join in the filing of a consolidated group tax return. The proposal also describes specific mandatory provisions in these tax allocation agreements, including provisions addressing the ownership of tax refunds received.

Actions Relating to CARES Act and Federal Reserve Facilities

On December 31, 2020, the NCUA issued a final rule amending its regulation governing assessment of an annual operating fee to federal credit unions (FCUs). First, for purposes of calculating the annual operating fee, the final rule made amendments to exclude from total assets any loan an FCU reports under the Small Business Administration's PPP or similar future programs approved for exclusion by the NCUA. Second, the final rule eliminates regulatory references to the Credit Union System Investment Program and the Credit Union Homeowners Affordability Relief Program, both of which no longer exist. Third, the final rule amends the period used for the calculation of an FCU's total assets. Under the final rule, total assets will be calculated as the average total assets reported on the FCU's previous four Call Reports available at

the time the NCUA approves the agency's budget for the upcoming year, adjusted for any excludable programs as determined by the NCUA.

On March 24, 2021, in response to the enactment of the Consolidated Appropriations Act of 2021 (CAA), the NCUA issued an interim final rule to conform the NCUA's regulations to the statutory changes made by the CAA. Specifically, the CAA extended several enhancements to the NCUA's Central Liquidity Facility (CLF), which were first enacted by the CARES Act. This rule amended the NCUA's CLF regulation to reflect these extensions. It also extends the withdrawal from CLF membership provisions that the NCUA included in the April 2020 interim final rule that made the aforementioned regulatory changes related to the CARES Act.

On April 17, 2020, the Federal Reserve issued an interim final rule to except certain loans made through June 30, 2020, which are guaranteed under the PPP, from the requirements of the Federal Reserve Act and the associated provisions of the Federal Reserve's Regulation O. The Federal Reserve issued two additional interim final rules to extend the exception when Congress approved extensions to the PPP. On May 21, 2021, to reflect a further extension approved by Congress and to automatically capture any further extensions, the Federal Reserve issued an interim final rule to extend this exception to such loans made through March 31, 2022.

Additional Regulatory Actions in Response to COVID-19

On December 2, 2020, the OCC, Federal Reserve, and the FDIC issued an interim final rule to mitigate temporary transition costs on banking organizations related to COVID-19. The rule permits national banks, savings associations, state banks, BHCs, savings and loan holding companies, and U.S. branches and agencies of foreign banking organizations with under \$10 in total assets as of December 31, 2019, to use asset data as of December 31, 2019, in order to determine the applicability of various regulatory asset thresholds during calendar years 2020 and 2021. For the same reasons, the Federal Reserve temporarily revised the instructions to a number of its regulatory reports to provide that

community banking organizations may use asset data as of December 31, 2019, in order to determine reporting requirements for reports due in calendar years 2020 or 2021.

On December 4, 2020, the NCUA issued a proposed rule to amend its regulations by removing the prohibition on the capitalization of interest in connection with loan workouts and modifications. The NCUA determined that the prohibition on authorizing additional advances to finance unpaid interest may be overly burdensome and, in some cases, hamper a federally insured credit union's (FICU's) good-faith efforts to engage in loan workouts with borrowers facing difficulty because of the economic disruption that the COVID-19 pandemic has caused. It further determined that advancing interest may avert the need for alternative actions that would be more harmful to borrowers. The proposed rule would establish documentation requirements to help ensure that the addition of unpaid interest to the principal balance of a mortgage loan does not hinder the borrower's ability to become current on the loan. The proposed change would apply to workouts of all types of member loans, including commercial and business loans.

On December 16, 2020, the Federal Reserve announced the extension of its temporary U.S. dollar liquidity swap lines and the FIMA repo facility through September 30, 2021. These facilities were temporarily established in March 2020 to ease strains in global dollar funding markets resulting from the COVID-19 shock and mitigate the effect of such strains on the supply of credit to households and businesses, both domestically and abroad. The Federal Reserve indicated that a further extension would help sustain recent improvements in global U.S. dollar funding markets by serving as an important liquidity backstop. The Federal Reserve also indicated that the FIMA repo facility would help continue to support the smooth functioning of the U.S. Treasury market by providing an alternative temporary source of U.S. dollars other than sales of securities in the open market. The FIMA repo facility was made a standing facility on July 28, 2021.

On December 22, 2020, the NCUA extended the effective date of its temporary final rule, issued

in April 2020, which modified certain regulatory requirements to help ensure that federally insured credit unions (FICUs) remain operational and can properly conduct appropriate liquidity management to address economic conditions caused by the COVID-19 pandemic. Specifically, the rule issued in April 2020 temporarily raised the maximum aggregate amount of loan participations that a FICU may purchase from a single originating lender to the greater of \$5,000,000 or 200 percent of the FICU's net worth. The rule also temporarily suspended limitations on the eligible obligations that a federal credit union (FCU) may purchase and hold. In addition, given physical distancing practices necessitated by COVID-19, the rule tolled the required timeframes for the occupancy or disposition of properties not being used for FCU business or that have been abandoned. Unless extended, each of these temporary modifications would expire on December 31, 2020. Due to the continued impact of COVID-19, the NCUA determined it was necessary to extend the effective period of these temporary modifications until December 31, 2021.

On March 22, 2021, the OCC, Federal Reserve, and FDIC issued an interim final rule to support and facilitate the timely implementation and acceptance of the Congressionally authorized Emergency Capital Investment Program (ECIP) for Treasury to make capital investments in low- and moderate-income community financial institutions. The rule provides that preferred stock issued under ECIP qualifies as additional tier 1 capital and that subordinated debt issued under ECIP qualifies as tier 2 capital under the agencies' capital rule.

4.2.2 Dodd-Frank Act Stress Tests and Stress Capital Buffer

Section 165(i)(2) of the Dodd-Frank Act, as revised by EGRRCPA, requires certain large financial companies to conduct periodic stress tests.

On February 12, 2021, the Federal Reserve and OCC released economic and financial market scenarios for use in stress tests for covered institutions. The supervisory scenarios include baseline and severely adverse scenarios, as described in the agencies' final rule that implements stress test requirements of the Dodd-Frank Act. Rules state that the agencies will

provide scenarios to covered institutions by February 15 of each year. Covered institutions are required to use the scenarios to conduct periodic stress tests. The results of the company-run stress tests will assist the agencies in assessing the risk profile and capital adequacy of covered institutions.

In March 2020, the Federal Reserve simplified its capital framework with the stress capital buffer requirement, which integrates the results from the supervisory stress test with its non-stress capital requirements into one forward-looking and risk-sensitive framework. This framework replaced the quantitative portion of the Board's Comprehensive Capital Analysis and Review (CCAR) framework. Stress Capital Buffers resulting from the 2021 stress test went into effect for the largest firms on October 1, 2021.

4.2.3 Resolution Planning and Orderly Liquidation

Under the framework of the Dodd-Frank Act, resolution under the U.S. bankruptcy code is the statutory first option in the event of the failure of a financial company. Section 165(d) of the Dodd-Frank Act requires nonbank financial companies designated by the Council for supervision by the Federal Reserve and certain BHCs—including certain FBOs with U.S. operations—to periodically submit plans to the Federal Reserve, the FDIC, and the Council for their rapid and orderly resolution under the U.S. bankruptcy code in the event of material financial distress or failure. These submissions are also referred to as living wills. The Federal Reserve and FDIC review each plan and may jointly determine that a plan is not credible or would not facilitate an orderly resolution of the company under the U.S. bankruptcy code. Since the resolution planning requirements took effect in 2012, U.S. G-SIBs and certain other firms have improved their resolution strategies and governance, refined their estimates of liquidity and capital needs in resolution, and simplified their legal structures. These changes have made these firms more resilient and resolvable.

On December 9, 2020, the Federal Reserve and FDIC announced several resolution plan actions. First, the agencies confirmed that weaknesses previously identified in the resolution plans for several large foreign banks have been remediated.

Second, the agencies finalized guidance for the resolution plans of certain large foreign banks. This final guidance modifies the proposed guidance, which was issued in March 2020, in several ways. The agencies tailored their expectations around resolution capital and liquidity, derivatives and trading activity, as well as payment, clearing, and settlement activities. The scope of the guidance was also modified to generally cover foreign banks in category II of the agencies' large bank regulatory framework. And third, the agencies provided information for large foreign and domestic banks that will inform the content of their next resolution plans, which are now due December 17, 2021. In particular, these targeted plans will be required to include core elements of a firm's resolution strategy—such as capital, liquidity, and recapitalization strategies—as well as how each firm has integrated changes to, and lessons learned from, its response to COVID-19 into its resolution planning process. The information applies to foreign and domestic banks in categories II and III of the large bank regulatory framework.

As of July 1, 2021, the U.S. G-SIBs submitted public and confidential sections of their resolution plans to the Federal Reserve and FDIC. On July 19, 2021, the Federal Reserve and FDIC released the public sections of these firms' resolution plans on the agencies' respective websites. The agencies will review both the confidential and public portions of the resolution plans.

Furthermore, in 2021, the Federal Reserve and FDIC hosted Crisis Management Group (CMG) meetings for U.S. G-SIBs to discuss home and host resolvability assessments for the firms to facilitate cross-border resolution planning.

4.2.4 Insurance

NAIC/State Developments

On December 9, 2020, NAIC members adopted revisions to existing holding company model legislation to implement the Group Capital Calculation (GCC) and Liquidity Stress Test (LST). The model legislation revisions have since been adopted by at least six states. The GCC is a group-wide capital reporting and assessment framework including insurers, financial, and nonfinancial

businesses within an insurance group. The LST for large life insurance groups meeting the scoping criteria provides lead state regulators with more insights into the groups' liquidity risk. Until adoption of the legislative revisions, states will use existing examination authority to conduct the stress test.

On August 14, 2021, NAIC members voted to expose for comment a requirement that the GCC and LST would become NAIC Accreditation standards, effective January 1, 2026. All states that were the group wide supervisor for a U.S. group operating in either the UK or the EU were encouraged to adopt the model legislation to enable the GCC for year-end 2022. During the summer of 2021, 25 insurance groups participated in a trial implementation of the GCC, reporting their results to lead state supervisors to inform anticipated refinements to GCC reporting in 2022. In 2021, 22 life insurance groups filed an LST using 2020 data.

Throughout 2021, states continued to adopt the NAIC Credit for Reinsurance Model Legislation and Regulation, which modifies state reinsurance rules in light of the U.S.–EU and U.S.–UK Covered Agreements. To facilitate implementation of these models in the states, the NAIC adopted additional changes to the Uniform Application Checklist for Certified Reinsurers and a new Uniform Checklist for Reciprocal Jurisdiction Reinsurers. Similarly, revisions were also adopted to the Process for Evaluating Qualified and Reciprocal Jurisdictions.

The NAIC also adopted several changes impacting regulators' authorities in an insurer receivership, specifically updates to the Insurance Holding Company System Regulatory Act (#440) and the Insurance Holding Company System Model Regulation with Reporting Forms and Instructions (#450) to make explicit the regulatory authority that an insurance commissioner has relative to the continuation of essential services of an insurance company from an affiliate during a receivership, and adopted a Guideline for Administration of Large Deductible Policies in Receivership and a Guideline for Definition of Reciprocal State in Receivership Laws, to clarify regulator authority within the receivership process.

The NAIC also adopted revisions to statutory accounting rules and interpretations, specifically *SSAP No. 25—Affiliates and Other Related Parties* (*SSAP No. 25*), relating to insurer transactions with affiliates, which clarifies that an ownership interest greater than 10 percent in a reporting entity results in a related party designation, regardless of any disclaimer of control or affiliation. Additionally, *SSAP No. 25* now requires identification of an insurer's material controlling party and reporting on a new Schedule Y, Part 3, which captures all entities with ownership greater than 10 percent and denotes the ultimate controlling parties of those entities and entities they in turn control.

The NAIC adopted *Interpretation 21-01* to address statutory accounting for cryptocurrencies to clarify that directly held cryptocurrencies do not meet the definition of either cash or admitted assets. The NAIC also updated Risk Based Capital (RBC) factors to expand the number of different RBC bond factors to allow for more granularity and updated historical data on defaults and recoveries and updated real estate factors and longevity risk-factors. Additionally, the NAIC revised filing requirements to the NAIC Securities Valuation Office to capture private rating letter rationale reports; and the NAIC updated its Financial Condition Examiners Handbook and Financial Analysis Handbook, utilized in all states, relating to long-term care insurance, cyber security assessments, and information technology assessments.

States continue to make progress in adopting new or revised core regulatory standards. As of October 2021, 16 states have adopted the 2020 revisions to the NAIC's Suitability in Annuity Transactions Model Regulation, and it is pending in six states. The revisions clarify that all recommendations by agents and insurers must be in the best interest of the consumer and that agents and carriers may not place their financial interest ahead of the consumer's interest in making the recommendation. As of October 21, 18 states have adopted some form of the NAIC's Insurance Data Security Model Law, which establishes standards for insurer data security and for investigation of and notification to state insurance regulators of a cybersecurity event.

Covered Agreements

The Bilateral Agreement between the U.S. and the EU on Prudential Measures Regarding Insurance and Reinsurance, generally known in the United States as the U.S.–EU Covered Agreement, was signed by the parties in September 2017, and entered into force on April 4, 2018. The U.S.–UK Covered Agreement, substantively similar to the agreement with the EU, was signed by the parties in December 2018, and entered into force on December 31, 2019. Both agreements were negotiated by Treasury’s FIO in coordination with the Office of the United States Trade Representative, pursuant to the Federal Insurance Office Act of 2010 (FIO Act).

The NAIC Credit for Reinsurance Model Law and Regulation, as amended in 2019, provides a basis for U.S. states to revise their credit for reinsurance measures for purposes of achieving consistency with the covered agreements and avoiding a potential preemption determination under the FIO Act. During the past year there has been meaningful state-level progress in adopting such revisions, with over 45 states having now amended their credit for reinsurance frameworks based on the amended Model Law (although fewer have so far completed revisions based on the amended Model Regulation).

Under the covered agreements, if U.S. insurance supervisors do not develop and implement a group capital assessment applicable to U.S. groups with insurance operations in the EU and UK, regulators from those jurisdictions could impose their domestic group capital requirements on such groups. In addition, regulators may not be precluded from imposing collateral requirements on U.S. reinsurers assuming business from insurers in those jurisdictions. In December 2020, the NAIC adopted its GCC through revisions to the Insurance Holding Company System Model Act and Insurance Holding Company System Model Regulation in part to implement the group capital assessment contemplated by the covered agreements.

Climate-Related Financial Risk

Executive Order 14030 on Climate-Related Financial Risk (May 20, 2021) instructed the Secretary of the Treasury to direct FIO “to assess climate-related issues or gaps in the supervision and regulation

of insurers, including as part of the Council’s analysis of financial stability, and to further assess, in consultation with States, the potential for major disruptions of private insurance coverage in regions of the country particularly vulnerable to climate change impacts.”

To this end, FIO issued a request for information (FIO Climate RFI) in August 2021 to solicit public comment on the insurance sector and climate-related financial risks. The FIO Climate RFI seeks public comment on FIO’s three proposed priorities: (1) assessing climate-related issues or gaps in the state insurance regulatory framework; (2) assessing the potential for major disruptions of private insurance coverage in U.S. markets that are particularly vulnerable to climate change impacts, as well as facilitating mitigation and resilience for disasters; and (3) increasing FIO’s engagement on climate-related issues and leveraging the insurance sector’s ability to help achieve climate-related goals. FIO expects that responses to the FIO Climate RFI will help inform its assessment of the implications of climate-related financial risks for the insurance sector and help FIO to better understand: (1) which data elements are necessary to accurately assess climate risk; (2) which data elements remain unavailable; and (3) how FIO could collect this data under its statutory data collection authorities and make it available to stakeholders as needed.

Terrorism Risk Insurance Program

FIO assists the Secretary of the Treasury in administering the Terrorism Risk Insurance Program created under the Terrorism Risk Insurance Act of 2002, as amended.

In June 2021, Treasury published a Study on the Competitiveness of Small Insurers in the Terrorism Risk Insurance Marketplace. In the study, Treasury detailed numerous market differences between small and larger (non-small) insurers and concluded that small insurers are significant participants in the market for terrorism risk insurance in the United States.

International Association of Insurance Supervisors Update

To assess the effects of the COVID-19 pandemic on global insurers and insurance sectors, the International Association of Insurance Supervisors (IAIS) repurposed its 2020 Global Monitoring Exercise (GME), focusing on the resulting economic impact. Data were collected from a pool of 60 insurance groups and regulatory agencies in 28 jurisdictions, for the purpose of assessing the financial impact of the pandemic at both the company and sector level, as well as informing insurance supervisors' responses. Three different data collections provided the IAIS with four quarterly data points for its monitoring and forward-looking analysis. The results of this work were published in a December 2020 special edition of the IAIS Global Insurance Market Report, addressing the effects of the COVID-19 pandemic on the global insurance sector in the first six months of 2020. The IAIS concluded that despite the volatility in the financial markets during this period, "the global insurance sector has remained both financially and operationally resilient," although acknowledging that the pandemic's ultimate impact on the insurance sector and its policyholders remains uncertain.

For 2021, the GME has returned to its primary purpose. The IAIS has completed a two-year (year-end 2019 and 2020) regular sector-wide monitoring and individual insurer monitoring data collection. The Holistic Framework for the Assessment and Mitigation of Systemic Risk in the Insurance Sector collective discussion was held in September 2021, following completion in June of the phase 1 (or baseline) implementation self-assessment of the Holistic Framework. In 2022, the IAIS is still on course to complete the outstanding implementation assessment items and finalize the assessment's findings.

The second year of the International Capital Standard monitoring period is currently underway, and the IAIS will be evaluating submissions that included optional reporting targeted at improving the market adjusted valuation methodology. In May 2021, the IAIS published its definition of comparable outcomes as well as the six high-level

principles applicable to comparability. FIO, the Federal Reserve, and the U.S. states through the NAIC are engaged with the IAIS on development of appropriate criteria for the comparability assessment. The IAIS plans to publish a public consultation on the draft criteria by the second quarter of 2022.

4.3 Financial Infrastructure, Markets, and Oversight

4.3.1 Derivatives, Swap Data Repositories, Regulated Trading Platforms, and Central Counterparties

On November 9, 2020, the CFTC issued a final rule amending the margin requirements (the CFTC margin rule) for bilaterally cleared swaps for SDs and major swap participants (MSPs) for which there is not a prudential regulator. The CFTC margin rule mandated the collection and posting of variation margin and initial margin under a phased compliance schedule extending from September 1, 2016, to September 1, 2020. Pursuant to this final rule, the CFTC amended the compliance schedule to further delay the compliance date for entities with smaller average daily aggregate notional amounts of swaps and certain other financial products from September 1, 2021, to September 1, 2022, to avoid market disruption due to the large number of entities being required to comply by September 1, 2021, as a result of the adoption of a July 2020 interim final rule extending the compliance date for certain groups of entities.

On November 25, 2020, the CFTC issued a final rule amending its regulations for real-time public reporting and dissemination requirements for SDRs, derivatives clearing organizations (DCOs), SEFs, DCMs, SDs, MSPs, and swap counterparties that are neither SDs nor MSPs. The final rule also made revisions that, among other things, change the "block trade" definition and the block swap categories, update the block thresholds and cap sizes, and address issues market participants have had in publicly reporting certain types of swaps.

On November 25, 2020, the CFTC issued a final rule amending its regulations that establish swap data recordkeeping and reporting requirements for SDRs, DCOs, SEFs, DCMs, SDs, MSPs, and swap counterparties that are neither SDs nor MSPs. The

final rule gives the CFTC, for the first time, access to uncleared margin data, thereby significantly improving the CFTC's ability to monitor for systemic risk. The final rule also finalized revisions that, among other things, streamline the requirements for reporting new swaps, define and adopt swap data elements that harmonize with international technical guidance, and reduce reporting burdens for reporting counterparties that are not SDs or MSPs.

On November 25, 2020, the CFTC issued a final rule amending its regulations to improve the accuracy of data reported to, and maintained by, SDRs, and to provide enhanced and streamlined oversight of SDRs and data reporting generally. The final rule also finalized revisions that, among other things, modify existing requirements for SDRs to establish policies and procedures to confirm the accuracy of swap data with both counterparties to a swap and require reporting counterparties to verify the accuracy of swap data pursuant to those SDR procedures. The final rule also updates existing requirements related to corrections for data errors and certain provisions related to SDR governance.

On November 30, 2020, the CFTC issued a final rule amending the regulations governing which swaps are exempt from the clearing requirement set forth in applicable provisions of the Commodity Exchange Act (CEA). These amendments exempt from the clearing requirement swaps entered into by certain central banks, sovereign entities, international financial institutions, BHCs, savings and loan holding companies, and community development financial institutions.

On December 18, 2020, the CFTC issued a final rule amending certain parts of its regulations relating to the execution of package transactions on SEFs and the resolution of error trades on SEFs. These matters were the subject of relief in certain no-action letters from CFTC staff.

On December 22, 2020, the SEC issued a final substituted compliance order for Germany, which provides that certain German firms that are registered with the SEC as security-based swap dealers and major security-based swap participants conditionally may satisfy certain requirements under

the Exchange Act by complying with comparable German and EU requirements. The SEC issued final substituted compliance orders for France on July 26, 2021, and for the UK on July 30, 2021.

On January 11, 2021, the CFTC issued a final rule amending its part 38 regulations to address the potential risk of a DCM's trading platform experiencing a market disruption or system anomaly due to electronic trading. The final rules set forth three principles applicable to DCMs concerning: the implementation of exchange rules applicable to market participants to prevent, detect, and mitigate market disruptions and system anomalies associated with electronic trading; the implementation of exchange-based pre-trade risk controls for all electronic orders; and the prompt notification by DCMs to CFTC staff of any significant market disruptions on their electronic trading platforms. In addition, the final rules include acceptable practices, which provide that a DCM can comply with these principles by adopting and implementing rules and risk controls reasonably designed to prevent, detect, and mitigate market disruptions and system anomalies associated with electronic trading.

On January 14, 2021, the CFTC issued a final rule conforming regulations concerning speculative position limits to the relevant Dodd-Frank Act amendments to the CEA. Among other regulatory amendments, the CFTC adopted: new Federal spot month limits for 16 new physical commodity derivatives and certain associated derivatives; updated single month and all-months-combined limits for the nine agricultural contracts that already were subject to Federal position limits under the previous framework as well as certain associated derivatives; new and amended definitions for use throughout the position limits regulations, including a revised definition of "bona fide hedging transaction or position" and a new definition of "economically equivalent swaps"; amended rules governing exchange-set limit levels and grants of exemptions therefrom; a new streamlined process for bona fide hedging recognitions for purposes of Federal position limits; new enumerated bona fide hedges; and amendments to certain regulatory provisions that would eliminate Form 204 while also enabling the CFTC to leverage and receive

cash-market reporting submitted directly to the exchanges by market participants.

On January 25, 2021, the CFTC issued a final rule amending the CFTC margin rule. The final rule permits the application of a minimum transfer amount of up to \$50,000 for each separately managed account of a legal entity that is a counterparty to an SD or MSP in an uncleared swap transaction and to permit the application of separate minimum transfer amounts for initial margin and variation margin.

On April 13, 2021, the CFTC issued a final rule amending its regulations governing bankruptcy proceedings of commodity brokers. The amendments are intended to update those regulations to reflect current market practices and lessons learned from past commodity broker bankruptcies.

On May 7, 2021, the SEC approved the registration of DTCC Data Repository (U.S.), LLC as a security-based swap data repository (SBSDR). The registration of the first SBSDR is the final condition precedent for the compliance schedule previously established by the SEC for Regulation SBSR, which governs regulatory reporting and public dissemination of security-based swap transactions. Accordingly, security-based swap transaction reporting will commence on November 8, 2021 and public dissemination will begin on February 14, 2022.

In 2021, the FDIC and CFTC continued to host CMG meetings for two U.S. CCPs that are considered systemically important in more than one jurisdiction. In addition, the FDIC and SEC hosted the inaugural CMG meeting for a third U.S. CCP considered systemically important in more than one jurisdiction. The CMGs generally discuss matters relevant to CCP resolution planning. Processes for cooperation and sharing information, both during a crisis and for purposes of resolution planning and resolvability, are set forth in the cooperation arrangements that are specific to the CMG. Cooperation arrangements for the inaugural CMG are underway, and they are complete for the two previously established CMGs.

The FDIC, Federal Reserve, CFTC, and SEC participate in an ongoing program of joint work with the Bank of England to share analyses and discuss policy formulation in relation to the resolution of CCPs. To date, the group's work has been facilitating work towards the development of prototype resolution strategies for these CCPs. Going forward, the group seeks to facilitate progression from the development of resolution strategies to detailed operational planning.

On May 26, 2021, the NCUA issued a final rule amending its rules regarding the use of derivatives by federal credit unions (FCUs). The final rule is intended to modernize the NCUA's derivatives rules and make them more principles-based, while retaining key safety and soundness components. The amendments are intended to provide more flexibility for FCUs to manage interest rate risk through the use of derivatives.

4.3.2 Securities and Asset Management

On December 21, 2020, pursuant to a final rule, the SEC issued a new exemptive rule under the Investment Company Act designed to address the investor protection purposes and concerns underlying section 18 of the Act and to provide an updated and more comprehensive approach to the regulation of funds' use of derivatives and the other transactions addressed by the new rule. In addition, the SEC adopted new reporting requirements designed to enhance the SEC's ability to effectively oversee funds' use of and compliance with the new rule, and to provide the SEC and the public additional information regarding funds' use of derivatives. Finally, the SEC adopted amendments under the Investment Company Act to allow leveraged/inverse ETFs that satisfy the rule's conditions to operate without the expense and delay of obtaining an exemptive order. The SEC, accordingly, rescinded certain exemptive relief that had been granted to these funds and their sponsors.

On January 6, 2021, pursuant to a final rule, the SEC issued a new rule under the Investment Company Act to address valuation practices and the role of the board of directors with respect to the fair value of the investments of a registered investment company or business development company. The rule provides requirements for

determining fair value in good faith for purposes of the Act. This determination involves assessing and managing material risks associated with fair value determinations; selecting, applying, and testing fair value methodologies; and overseeing and evaluating any pricing services used. The rule permits a fund's board of directors to designate certain parties to perform the fair value determinations, who will then carry out these functions for some or all of the fund's investments. This designation is subject to board oversight and certain reporting and other requirements designed to facilitate the board's ability to effectively oversee this party's fair value determinations. The rule includes a specific provision related to the determination of the fair value of investments held by unit investment trusts, which do not have boards of directors. The rule also defines when market quotations are readily available under the Act. The SEC also adopted a separate rule providing the recordkeeping requirements that will be associated with fair value determinations and rescinded previously issued guidance on the role of the board of directors in determining fair value and the accounting and auditing of fund investments.

On February 10, 2021, the SEC published a request for comment on potential reform measures to improve the resilience of MMFs, as PWG issued in December 2020.

On March 5, 2021, the SEC issued a final rule adopting amendments under the Advisers Act to update the rules that govern investment adviser marketing. The amendments create a merged rule to replace both the advertising and cash solicitation rules. These amendments reflect market developments and regulatory changes since the advertising rule's adoption in 1961 and the cash solicitation rule's adoption in 1979. The SEC also adopted amendments to Form ADV to provide the SEC with additional information about advisers' marketing practices.

On March 15, 2021, in light of demand for climate change information and questions about whether current disclosures adequately inform investors, the SEC launched a request for public input from investors, registrants, and other market participants on climate change disclosure.

On April 5, 2021, the SEC issued interim final rules implementing the disclosure and submission requirements of the Holding Foreign Companies Accountable Act (HFCAA). The HFCAA requires that the SEC identify companies in violation of the HFCAA based on fiscal years beginning after December 18, 2020. The SEC anticipates beginning to make such identifications in early 2022 shortly after completion of such companies' fiscal years, which is the soonest the identification can be made under the HFCAA. Securities of companies that are so identified for three consecutive years will be prohibited from trading on an exchange or in the over-the-counter market, beginning as early as 2024.

On April 9, 2021, the SEC issued a final rule amending Regulation National Market System (Regulation NMS) under the Exchange Act to modernize the national market system for the collection, consolidation, and dissemination of information with respect to quotations for and transactions in national market system stocks (NMS information). Specifically, the SEC expanded the content of NMS information that is required to be collected, consolidated, and disseminated as part of the national market system under Regulation NMS and amended the method by which such NMS information is collected, calculated, and disseminated, by seeking to create a competitive environment for the dissemination of NMS information via a decentralized consolidation model with competing consolidators.

On May 26, 2021, the OCC adopted as final a previously released interim final rule on withdrawal periods for collective investment funds (CIFs). Under the final rule, a national bank or federal savings association that administers a CIF invested primarily in real estate or other assets that are not readily marketable may require a prior notice period, not to exceed one year, to withdraw an account from a CIF. A bank that requires a prior notice period for withdrawals must withdraw an account from the CIF within the prior notice period or, if permissible under the CIF's written plan, within one year after the date on which notice was required. As an exception to the above, a bank may request the OCC's approval for extensions to the standard withdrawal period if certain criteria are

met. The final rule revised one of the criteria for OCC approval of an extension under the interim final rule, so that the bank must “represent” that it will act upon the withdrawal request as soon as practicable.

4.3.3 Accounting Standards

Section 4013 (Temporary Relief from Troubled Debt Restructurings) of the CARES Act, enacted on March 27, 2020, was subsequently extended by The Consolidated Appropriations Act of 2021 (CAA), which was signed into law on December 27, 2020. Financial institutions, including insurance companies, that have loan restructurings meeting eligibility requirements under the CARES Act, have an option to suspend the application of accounting and disclosure requirements for troubled debt restructurings (TDRs) set forth in ASC Subtopic 310-40, *Receivables – Troubled Debt Restructurings by Creditors*. A loan restructuring is eligible for an election under Section 4013 if the restructuring is in response to the COVID-19 pandemic, the loan was not more than 30 days past due on December 31, 2019, and the restructuring was executed between the applicable period: March 1, 2020 and the earlier of 60 days after the termination of the COVID-19 national emergency or January 1, 2022.

Initially, on March 22, 2020, various federal financial institution regulatory agencies issued an Interagency Statement on Loan Modifications and Reporting for Financial Institutions Working with Customers Affected by the Coronavirus. On April 7, 2020, the interagency regulators revised their statement on the interaction between Section 4013 of the CARES Act and whether loans restructured by creditors in response to the pandemic are TDRs under ASC 310-40. The election for a non-Section 4013 loan restructuring is available when the modification is short term (not to exceed six months) and made on a good-faith basis as a response to the pandemic, and the loan was not a prior TDR and is less than 30 days past due on contractual payments when the modification was granted or program relief offering was implemented. In addition, a government-mandated modification or a deferral program related to the pandemic does not represent a TDR because the lender did not choose to provide a concession. For example, a state program requiring

institutions to suspend mortgage payments within that state for a specified period does not represent a TDR. If a lender defers payment, this may result in no contractual payments being past due, and such loans would not be considered past due during the period of deferral.

Section 4014 of the CARES Act, *Optional Temporary Relief from Current Expected Credit Losses*, includes provisions that provide optional temporary relief from certain accounting requirements related to application of the CECL methodology by insured depository institutions (as defined in Section 3 of the Federal Deposit Insurance Act), credit unions regulated by the NCUA, and BHCs. Section 4014 states that no financial institution will be required to comply with ASU 2016-13, the CECL methodology for estimating allowances for credit losses, during the period beginning March 27, 2020 to the earlier of: (1) the first day of an eligible financial institution’s fiscal year that begins after the date when the COVID-19 national emergency is terminated; or (2) January 1, 2022 (as amended by the CAA).

On February 25, 2021, the FDIC issued a final rule amending the risk-based deposit insurance assessment system applicable to all large insured depository institutions (IDIs), including highly complex IDIs, to address the temporary deposit insurance assessment effects resulting from certain optional regulatory capital transition provisions relating to the implementation of the CECL methodology. The final rule removes the double counting of a specified portion of the CECL transitional amount or the modified CECL transitional amount, as applicable (collectively, the CECL transitional amounts), in certain financial measures that are calculated using the sum of Tier 1 capital and reserves and that are used to determine assessment rates for large or highly complex IDIs. The final rule also adjusts the calculation of the loss severity measure to remove the double counting of a specified portion of the CECL transitional amounts for a large or highly complex IDI. The final rule does not affect regulatory capital or the regulatory capital relief provided in the form of transition provisions that allow banking organizations to

phase in the effects of CECL on their regulatory capital ratios.

On July 1, 2021, the NCUA issued a final rule to facilitate the transition of federally insured credit unions (FICUs) to the CECL methodology required under GAAP. The final rule provides that, for purposes of determining a FICU's net worth classification under the Prompt Corrective Action regulations, the NCUA will phase-in the day-one adverse effects on regulatory capital that may result from adoption of CECL. Consistent with regulations issued by the other federal banking agencies, the final rule will temporarily mitigate the adverse PCA consequences of the day-one capital adjustments of CECL, while requiring that FICUs account for CECL for other purposes, such as Call Reports. The final rule also provides that FICUs with less than \$10 million in assets are no longer required to determine their charges for loan losses in accordance with GAAP. These FICUs may instead use any reasonable reserve methodology (incurred loss), provided that it adequately covers known and probable loan losses.

4.3.4 Bank Secrecy Act/Anti-Money Laundering Regulatory Reform

Effective January 1, 2021, the Anti-Money Laundering Act of 2020 (AML Act) amended the Bank Secrecy Act (BSA), initiating the most significant revision of the United States' framework for anti-money laundering and countering the financing of terrorism (AML/CFT) since 2001. The Anti-Money Laundering Act requires establishing AML/CFT priorities; improving coordination and sharing of information; encouraging technological innovation; and reinforcing the risk-based approach to AML/CFT. The AML Act also requires the establishment of uniform beneficial ownership reporting requirements and a secure, nonpublic database at the Financial Crimes Enforcement Network (FinCEN) to maintain this information to improve transparency for national security, intelligence, and law enforcement agencies and discourages the use of shell corporations as a tool to disguise and move illicit funds.

The AML Act contains numerous provisions according to which FinCEN, in consultation with other federal agencies (including the

federal banking agencies), must conduct studies, review regulations and guidance, and propose rulemakings. Relevant to the rulemakings, FinCEN must promulgate regulations to carry out national AML/CFT priorities. The federal banking agencies plan to amend their BSA compliance program to conform to changes implemented by FinCEN. In addition, FinCEN, in consultation with the federal banking agencies, must promulgate regulations for beneficial ownership information reporting requirements. Other provisions of the AML Act require FinCEN, in consultation with federal banking agencies, to conduct studies and review regulations and guidance to identify those that may be outdated, redundant or otherwise do not promote a risk-based AML/CFT regime for financial institutions, and propose rulemakings addressing automated system testing procedures, sharing reports with foreign affiliates, no-action letters, whistleblower protections, AML/CFT requirements for art and antiquities dealers and more.

The Financial Action Task Force (FATF) is the inter-governmental body that sets standards and promotes effective implementation of legal, regulatory, and operational measures for combating money laundering, terrorist financing and 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.

Amendments to certain FATF recommendations and interpretive notes were adopted on October 23, 2020, related to identifying, assessing, and mitigating the risks of potential breaches, non-implementation, or evasion of targeted financial sanctions. On September 14, 2020, the FATF published the Virtual Assets Red Flag Indicators of Money Laundering and Terrorist Financing, and on June 29, 2021, the Guidance on Proliferation Financing Risk Assessment and Mitigation.

4.4 Mortgages and Consumer Protection

4.4.1 Mortgages and Housing Finance

On December 17, 2020, the FHFA issued a final rule that establishes risk-based and leverage capital

requirements for the Enterprises. The final rule also makes conforming amendments to definitions in FHFA's regulations governing assessments and minimum capital and removes the Office of Federal Housing Enterprise Oversight's regulation on capital for the Enterprises.

On December 21, 2020, the FHFA issued a final rule on the 2021 housing goals for the Enterprises. The Federal Housing Enterprises Financial Safety and Soundness Act of 1992 requires FHFA to establish annual housing goals for mortgages purchased by the Enterprises. The housing goals include separate categories for single-family and multifamily mortgages on housing that is affordable to low-income and very low-income families, among other categories. The final rule established benchmark levels for each of the housing goals for 2021.

On December 29, 2020, the CFPB issued final rules related to qualified mortgage (QM) loans. Creditors are required under the law to make a determination that consumers have the ability to repay a mortgage loan before extending the loan. Loans that meet legal standards for QM loans are presumed to be loans for which consumers have such an ability to repay. With certain exceptions, Regulation Z (which implements the Truth in Lending Act) requires creditors to make a reasonable, good faith determination of a consumer's ability to repay any residential mortgage loan, and loans that meet Regulation Z's requirements for "qualified mortgages" obtain certain protections from liability. Regulation Z contains several categories of QMs, including the General QM category and a temporary category (Temporary GSE QMs) of loans that are eligible for purchase or guarantee by the Enterprises while they are operating under the conservatorship or receivership of the FHFA. One rule amends the General QM loan definition in Regulation Z by removing the General QM loan definition's 43 percent DTI limit and replacing it with a price-based threshold. The second rule creates a new category of QMs (Seasoned QMs) for first-lien, fixed-rate covered transactions that have met certain performance requirements, are held in portfolio by the originating creditor or first purchaser for a 36-month period, comply with general restrictions on product features and points and fees, and meet

certain underwriting requirements. The CFPB's primary objective in the rulemaking was to ensure access to responsible, affordable mortgage credit by adding a Seasoned QM definition to the existing QM definitions. Earlier, on October 26, 2020, the CFPB issued a final rule extending the sunset date of the Temporary QM until the earlier of the exit from conservatorship or the mandatory compliance date with the amended General QM loan definition.

On February 17, 2021, the CFPB issued a final rule to amend Regulation Z, as mandated by section 108 of EGRRCPA. The amendments exempt certain insured depository institutions and insured credit unions from the requirement to establish escrow accounts for certain higher-priced mortgage loans.

On May 4, 2021, the FHFA issued a final rule that requires the Enterprises to develop plans to facilitate their rapid and orderly resolution in the event FHFA is appointed receiver. A resolution planning rule represents part of FHFA's ongoing effort to develop a robust prudential regulatory framework for the Enterprises, including capital, liquidity, and stress testing requirements, as well as enhanced supervision, which will be critical to FHFA's supervision of the Enterprises, particularly in the event of an exit from conservatorship. Requiring the Enterprises to develop resolution plans is intended to support FHFA's efforts as receiver for the Enterprises to, among other things, minimize disruption in the national housing finance markets by providing for the continued operation of an Enterprise's core business lines by a limited-life regulated entity; and ensure that private-sector investors in Enterprise securities, including Enterprise debt, stand to bear losses in accordance with the statutory priority of payments while minimizing unnecessary losses and costs to these investors. In addition, resolution planning is intended to help foster market discipline in part through FHFA publication of "public" sections of Enterprise resolution plans.

On June 30, 2021, the CFPB issued a final rule to amend Regulation X (the Real Estate Settlement Procedures Act) to assist mortgage borrowers affected by the COVID-19 emergency. The final rule establishes temporary procedural safeguards to help ensure that borrowers have a meaningful

opportunity to be reviewed for loss mitigation before the servicer can make the first notice or filing required for foreclosure on certain mortgages. In addition, the final rule temporarily permits mortgage servicers to offer certain loan modifications made available to borrowers experiencing a COVID-19-related hardship based on the evaluation of an incomplete application. The CFPB also finalized certain temporary amendments to the early intervention and reasonable diligence obligations that Regulation X imposes on mortgage servicers.

On August 25, 2021, FHFA issued a notice of proposed rulemaking that would establish GSE housing goals for 2022-2024. FHFA proposed two new single-family home purchase subgoals to replace the existing low-income areas subgoal. A new minority census tract subgoal is designed to improve access to fair and sustainable mortgage financing in communities of color.

On September 27, 2021, FHFA issued a notice of proposed rulemaking that would amend the Enterprise Regulatory Capital Framework by refining the leverage buffer and the risk-based capital treatment of CRT transactions. The proposed amendments are intended to reduce taxpayer risk by incentivizing the Enterprises to distribute acquired credit risk to private investors through CRT rather than to buy and hold that risk.

4.4.2 Consumer Protection

On January 19, 2021, the CFPB issued a final rule to revise Regulation F, which implements the Fair Debt Collection Practices Act (FDCPA). The final rule addresses certain activities by debt collectors, as that term is defined in the FDCPA. Among other things, the final rule clarifies the information that a debt collector must provide to a consumer at the outset of debt collection communications, prohibits debt collectors from bringing or threatening to bring a legal action against a consumer to collect a time-barred debt, and requires debt collectors to take certain actions before furnishing information about a consumer's debt to a consumer reporting agency.

On April 22, 2021, the CFPB issued an interim final rule to amend Regulation F that addresses certain debt collector conduct associated with an eviction

moratorium issued by the CDC in response to the global COVID-19 pandemic. The interim final rule requires that debt collectors provide written notice to certain consumers of their protections under the CDC eviction moratorium and prohibit misrepresentations about consumers' ineligibility for protection under such moratorium.

On October 27, 2021, the NCUA issued a final rule that amends the NCUA's CUSO regulation. The rule expands the list of permissible activities and services for CUSOs to include originating any type of loan that a federal credit union may originate. The NCUA's authority to regulate or supervise CUSOs has remained unchanged.

4.5 Data Scope, Quality, and Accessibility

4.5.1 Data Scope

Evolution of the LEI and Other Data Standards

Global adoption of the Legal Entity Identifier (LEI) continues to grow. As of October 2021, more than 1.9 million LEIs have been issued by 40 approved operational issuers. Some 32 percent of these were issued in the United States, with 13 percent issued to U.S.-based entities. The total number of LEIs issued represents a year-to-date increase of 10 percent, following a 15 percent increase in 2020.

The increasing adoption of the LEI continues to be driven by its use in financial regulation. In the United States, the LEI is used in regulatory reporting mandated by the OFR, the CFTC, the CFPB, and the SEC, among others. Beginning in January 2018, EU regulators mandated the use of the LEI by entities involved in securities and OTC derivatives transactions, as part of the revised Markets in Financial Instruments Directive (MiFID II) — resulting in the most significant growth in LEI adoption to date.

Future expansion could also be supported by the growing interest of some large financial institutions in utilizing the LEI for purposes other than regulatory compliance and reporting. In the future, such expansion could lead in turn to the LEI being used (or evaluated for use) more extensively outside of the financial industry. Further use of the LEI in financial regulation can be expected to lead to

modest future global increases in the number of LEIs issued.

The Unique Transaction Identifier (UTI), the Unique Product Identifier (UPI), and the harmonized Critical Data Elements (CDE) for OTC derivatives transaction reporting were developed by the FSB and jointly by the Committee on Payments and Market Infrastructures and the International Organization of Securities Commissions (CPMI-IOSCO). These new data standards, when combined with the LEI, improve the ability of market regulators and authorities with financial stability interests to monitor the accumulation of risk in historically opaque OTC derivatives markets.

Reporting of Standardized Derivatives Data

In 2020 and 2021, the Council's members developed and published the technical requirements for the UPI and CDE. Another major milestone was the approval in October 2020 of the UPI as a new International Organization for Standardization (ISO) standard (ISO 4914), with support and input from Council members. It is expected that the UPI will become available for global application sometime in the latter half of 2022.

The UPI allows derivatives regulators and their counterparts to better monitor emerging risks by categorizing different types of derivatives transactions. The Derivatives Service Bureau, a subsidiary of the Association of National Numbering Agencies, is the UPI service provider (i.e., it receives and stores product-specific attributes and assigns UPI codes to each OTC derivatives product).

In May 2021, the integration of the CDE for OTC derivatives reporting into the ISO 20022 repository represented another major achievement. Council members began working on this effort in 2014 with CPMI-IOSCO and continued this work within the FSB. Like the UTI and UPI, the CDE will be used by regulators in multiple jurisdictions in their respective OTC derivative transaction reporting regimes. Council members completed this work in partnership with the Society for Worldwide Interbank Financial Telecommunication (SWIFT), which is the Registration Authority for ISO 20022.

New Industry Standard

Separately, the Financial Instrument Global Identifier was approved by the American National Standards Institute (ANSI) as a U.S. standard, following analysis and approval by the Accredited Standards Committee X9, Inc. (ASC X9), an ANSI-accredited standards development organization. The OFR and CFTC, as Council members and members of ASC X9, were active contributors to the analysis of this new free and open standard, which is now available for industry use.

Role of the ROC

In October 2020, the FSB transferred the role of international governance body for three new sets of financial regulatory reporting data standards to the Regulatory Oversight Committee (ROC) (at which time the committee previously known as the "LEI ROC" became known simply as the "ROC"). The ROC is a group of more than 70 regulatory authorities from around the world that oversee the Global LEI Foundation (GLEIF), with additional authorities acting as observers. The GLEIF is a not-for-profit organization that serves as the Global LEI System's "central operating unit," helping ensure the system's operational integrity by setting standards under which the "local operating units" (i.e., the entities that issue LEIs) work.

4.5.2 Data Quality

Improving LEI Data Quality

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

Council members continued their efforts to review and improve the quality of reference data in the LEI system, particularly with regard to U.S. entities. For example, Council members led ROC efforts to strengthen the front-end edit checks to ensure that reference data on new and renewed LEI registrations meet minimum data quality standards. In particular, the Federal Reserve, OCC and FDIC are working with the GLEIF and state authorities to ensure that the quality of registration authority, legal jurisdiction, and entity legal form

are proper for U.S. commercial and savings banks and certain other banking-related entities. Federal Reserve analysis of U.S. business registry data has identified opportunities to enhance the quality and transparency of LEI reference data for entities whose data corroboration relies on information from those business registries. Such opportunities would also improve the degree to which data corroboration can be done on a ‘straight-through processing’ basis.

One area of particular interest to these Council members is the ongoing work on “Level 2” LEI data. This is data submitted by legal entities acquiring a LEI regarding their “direct accounting consolidating parent” and their “ultimate accounting consolidating parent.” Level 2 LEI data reveals the direct counterparties to a transaction, and affiliated entities, thereby improving the ability of such entities to perform a risk assessment of the transaction counterparties.

This past year, the ROC has continued to focus on improving the quality of Level 2 LEI data, among other elements of LEI reference data. The Council is committed to its members’ participation on the ROC and working with the GLEIF to ensure the quality of LEI data is high enough to make it useful for industry participants and regulators.

5.1 Climate-Related Financial Risk

Climate change is an emerging threat to the financial stability of the United States. Climate-related financial risks can be grouped into two broad categories: physical risks and transition risks.

Physical risks refer to the harm to people and property arising from acute climate-related disaster events such as hurricanes, wildfires, floods, and heatwaves, as well as longer-term chronic phenomena such as higher average temperatures, changes in precipitation patterns, sea level rise, and ocean acidification. Physical risks have direct effects on households, communities, businesses, and other entities where those risks are realized, as well as to the financial institutions and investors they are linked to, thereby creating a variety of climate-related financial risks. For example, property and casualty insurers are directly exposed to these risks. In addition, increased actual damages to properties associated with physical risks may lower the value of collateral or the income generated by such properties, posing credit and market risks to banks, insurers, pension plans, and others. Increased legal, operational, and liquidity risks may also occur. In response, creditors may pull back from impacted regions, amplifying the initial harmful impact of the climate-related disaster event and creating further financial and economic strains.

Transition risks refer to stresses to certain institutions or sectors arising from the shifts in policy, consumer and business sentiment, or technologies associated with the changes necessary to limit climate change. As countries transition to a low-greenhouse gas economy, changes in public policy, adoption of new technologies, and shifting consumer and investor preferences all have the potential to impose added costs on some firms and communities even as they reduce overall climate risks. As a result, impacted firms may have less ability to meet their financial obligations. Therefore, the economic effects associated with a transition

may be transmitted through the financial sector and the economy in ways that could challenge the resilience of financial institutions or the financial sector. If these changes occur in a disorderly way owing to substantial delays in action or abrupt changes in policy, their impact is likely to be more sudden and disruptive.

Recommendations

The Council recognizes the critical importance of taking prompt action to improve the availability of data and measurement tools, improve assessments of climate-related financial risks and vulnerabilities, and incorporate climate-related risks into risk management practices and supervisory expectations for regulated entities, where appropriate. In addition, financial regulators should also promote consistent, comparable, and decision-useful disclosures that allow investors and financial institutions to take climate-related financial risks into account in their investment and lending decisions. Through these actions, Council members can promote financial-sector resilience and support an orderly transition to a net-zero emissions economy. The Council provided more detailed recommendations to Council members in its [Report on Climate-Related Financial Risk](#).

5.2 Nonfinancial Business: Corporate Credit

The average leverage of nonfinancial corporations is elevated relative to historical standards. Since the onset of the pandemic, many firms increased their leverage but have subsequently retraced those increases. However, in some industries leverage remains elevated compared to pre-pandemic averages, including the airline, hospitality and leisure, and restaurant sectors. The potential risks to financial stability from nonfinancial business borrowing depend in part on the ability of businesses to service their obligations. Currently, the vulnerabilities of high leverage are moderated by elevated liquidity buffers at many firms and low debt servicing costs given low interest rates. Still,

businesses with floating rate debt are vulnerable to an increase in servicing costs should interest rates rise.

The risks to financial stability from corporate leverage also depends on the ability of the financial sector to absorb losses from defaults and downgrades, and the continued willingness of market participants to provide intermediation during times of stress. Corporate borrowers may be exposed to changing market conditions when they need to refinance debt as it matures. Another key factor is whether or not the increases in business debt have been raised by corporations that were able to use the additional debt to strengthen their earnings potential, which would reduce debt servicing problems.

Elevated leverage has been accompanied by rising valuations in U.S. equities and corporate bonds. These valuation pressures make these markets vulnerable to a major repricing of risk, increased volatility, and weakening balance sheets of financial and nonfinancial businesses. Sharp reductions in the valuations of different assets could heighten debt rollover risk.

Debt overhang problems could affect the ongoing economic recovery. In extreme situations when debt servicing problems are widespread, credit markets remain vulnerable to a repricing of risk and disruptions to financial stability. A large wave of bankruptcies could stress resources at courts and make it harder for firms to obtain critical debtor-in-possession financing. Such outcomes could preclude timely debt restructuring for many firms, potentially forcing them into liquidation. In comparison to debt restructurings, liquidations typically lead to greater economic losses from the ensuing declines in employment and capital spending. Moreover, creditors may suffer bigger losses from liquidation, potentially contributing to a further tightening in overall credit conditions.

Recommendations

The Council recommends that member agencies continue to monitor levels of nonfinancial business leverage, trends in asset valuations, and potential implications for the entities they regulate in order to assess and reinforce the ability of the financial sector

to manage severe, simultaneous losses. Regulators and market participants should continue to monitor and analyze the exposures, loss-absorbing capacity, and incentives of different types of stakeholders. This includes the direct and indirect exposures of holders of U.S. nonfinancial corporate credit, the potential amplification of liquidation pressures in fixed income markets by open-end mutual funds if a significant episode of stress were to develop, the effects of evolving loan covenant and documentation requirements, and the potential effects of market-to-market losses and credit rating downgrades. Regulators and market participants should also continue to assess ways in which leveraged nonfinancial corporate borrowers and elevated asset prices may amplify stresses in the broader market in the event of a rapid repricing of risk or a slowdown in economic activity.

5.3 Financial Markets

5.3.1 Short-Term Wholesale Funding Markets

In normal times, wholesale funding markets provide essential short-term funding to businesses, local governments, and financial intermediaries. Developments in the short-term wholesale funding markets can have implications for financial stability, and for the implementation of monetary policy.

Money Market Funds

MMFs supply funding to short-term wholesale funding markets by investing in debt issued by both banks and nonbanks. Certain types of MMFs can amplify stress in those markets by liquidating assets in order to meet redemptions. Other short-term funds, including short-term collective investment funds, can amplify stress in similar ways. Many of the short-term instruments held by MMFs, particularly prime MMFs, may have limited liquidity especially during times of stress, constraining their ability to sell assets quickly without losses. At the same time, MMFs offer shareholders daily redemptions. This liquidity gap contributes to a so-called first mover advantage, in which investors have an incentive to be the first to redeem in order to avoid losses, which would be borne by the remaining investors. The heavy redemptions that occurred in 2008 and 2020 led in both instances to extraordinary policy responses, including the establishment of liquidity facilities by the Federal Reserve in both episodes,

and a temporary guarantee of MMFs by the U.S. Treasury in 2008. While post-2008 reforms allow for a fund to impose fees or gates on redemptions if their weekly liquid assets fall below 30 percent of their balance sheet, the experience in March 2020 shows that approaching this threshold may itself spark widespread redemptions.

Repo Market

Repo funding is an important form of short-term wholesale funding, and repo markets are critical not only to financial stability but also to the implementation of monetary policy.

Repo markets have undergone significant structural changes since the 2008 financial crisis. These changes helped streamline some repo operations and reduced exposures to counterparty risk. Nevertheless, recent episodes of stress in repo markets have included large spikes in repo rates in September 2019 and in March 2020, each stemming from a different set of factors. The 2019 episode has been attributed to technical and seasonal factors, including an increase in demand for funds to finance new Treasury settlements and quarterly tax payments by corporations that decreased available funds. The 2020 episode came at the onset of the pandemic. The repo market was affected by intense selling in the cash Treasury market by the official sector and foreign investors, by open-end funds to meet redemptions, and by hedge funds and other leveraged investors adjusting to changes in risks or covering losses and margin calls. These episodes have highlighted the connections that repo markets have to the rest of the financial system and to a broad range of financial actors.

The reliance on repo funding by leveraged participants like hedge funds and mREITs makes them vulnerable to funding risks. When these leveraged participants face margin calls, either because of an external shock to the repo market or investor concerns about their profitability, the need to deleverage can increase pressure on asset prices and lead to more margin calls. Because many of the assets sold at declining prices are the same types of assets used as collateral in repo funding, asset sales also create an adverse feedback loop to further deleverage. The complexity of interactions involving

leveraged participants raises concerns regarding their role in amplifying funding stresses.

In July 2021, the Federal Reserve announced the establishment of a standing domestic repo facility. The facility serves as a backstop in money markets to support the effective implementation of monetary policy and smooth market functioning. As a backstop, the facility addresses pressures in overnight funding markets that could spill over to the federal funds markets and impair the implementation and transmission of monetary policy. Counterparties for this facility include primary dealers and will be expanded over time to include eligible depository institutions.

In addition, the Federal Reserve also established in July 2021 the FIMA repo facility. By creating a backstop source of temporary dollar liquidity for FIMA account holders, the facility can help address pressures in global dollar funding markets that could otherwise affect financial market conditions in the United States, including in repo markets. Its role as a liquidity backstop also helps to support the smooth functioning of financial markets more generally.

Recommendations

In response to the redemptions faced by prime MMFs in 2020 and the impacts they had on short-term wholesale funding markets, the PWG released the [PWG Report on MMFs](#) in December 2020. The PWG Report on MMFs emphasized that future reforms should address structural vulnerabilities in MMFs, improve the resilience and functioning of short-term funding markets, and reduce the likelihood that official-sector interventions and taxpayer support will be needed to halt future MMF runs or address stresses in short-term funding markets more generally. On February 4, 2021, the SEC published a request for public comment on the potential policy measures identified in the PWG Report on MMFs and briefed the Council on the comments it received regarding the potential reform options.

The Council commends these steps and will continue to monitor initiatives relating to MMF reform. Keeping in mind the interconnectedness of financial institutions and markets, potential

reforms will be considered in the broader context of efforts by financial regulators to strengthen short-term funding markets and support orderly market functioning, including during periods of heightened market stress.

The Council recommends that regulators consider these structural vulnerabilities, including the vulnerability to large-scale redemptions in prime and tax-exempt MMFs (as well as other short-term funds with similar characteristics, such as short-term collective investment funds), and any role that leveraged nonbank entities may have played in the repo market, and, if warranted, take appropriate regulatory measures to mitigate these vulnerabilities. For example, to the extent that leveraged nonbank entities obtain leverage through uncleared bilateral repos, relevant Council members should consider whether additional data collection is necessary.

5.3.2 Residential Real Estate Market

Nonbank mortgage companies play a significant role in the housing finance system. In recent years, nonbank mortgage companies originated most new mortgages and serviced a large portion of all mortgage debt outstanding. They have a particularly large footprint in the provision of credit to low- and moderate-income borrowers, and they provide competition and liquidity in the market for mortgage servicing rights.

Nonbank mortgage companies heavily rely on short-term funding, making them vulnerable to an abrupt disruption in their ability to operate should lenders re-evaluate their willingness to provide that funding. In addition, many mortgage companies have limited loss absorbing capacity in the face of adverse economic shocks. Disruption to nonbank mortgage companies could interrupt mortgage servicing operations, especially for nonperforming loans, and might have knock-on effects on these servicers' mortgage originations in the residential real estate market.

Concerns about potential strains on nonbank mortgage companies were raised at the beginning of the pandemic, when financial conditions deteriorated, and these companies were obligated to advance payments for borrowers under

forbearance. In response, federal agencies issued guidance and provided clarification on servicer advance obligations that, in some cases, limited the duration of required advances. Ginnie Mae established a liquidity facility for its servicers that provides a last resort financing option, though that facility saw limited uptake. Ultimately, these companies did not experience significant financial stress, but they remain vulnerable to adverse market conditions because a future shock may not be accompanied by the same surge in refinancing that has provided these companies with extra revenue or by extraordinary fiscal support for households that likely relieved some potential stress on servicers.

Looking forward, in light of the valuation increases in residential real estate markets since mid-2020, mortgage companies could come under pressure if housing prices were to decline and contribute to a rise in delinquencies. Mortgage companies may also need to deal with a rise in foreclosures from historically low levels, as forbearance policies roll off in coming months.

Recommendations

The Council recommends that relevant federal and state regulators continue to coordinate closely to collect data, identify risks, and strengthen oversight of nonbank companies involved in the origination and servicing of residential mortgages. Regulators and market participants have taken steps to address the potential risks stemming from nonbanks. In July 2021, Ginnie Mae issued a request for input on eligibility requirements for its mortgage-backed securities issuers, bolstering net worth and liquidity standards, and a minimum risk-based capital ratio for nonbank servicers. In July 2021, the Conference of State Bank Supervisors released model state regulatory prudential standards for nonbank mortgage servicers. The Council supports these recent actions and encourages regulators to take additional steps available to them within their jurisdiction to address the potential risks of nonbank mortgage companies. Relevant regulators should ensure that the largest and most complex nonbank mortgage companies are prepared should foreclosure rates rise as forbearance agreements expire. In addition, the Council recommends that relevant federal and state regulators develop

and establish an information-sharing framework to enable collaboration and communication in responding to distress at a mortgage servicer. Regulators should also develop and implement coordinated resolution planning requirements for large and complex nonbank mortgage companies.

5.3.3 Commercial Real Estate Market

Considerable uncertainty remains about which CRE sectors may recover completely following the pandemic and which sectors face permanent shifts in demand. The pandemic continues to substantially weigh on office occupancy in central business districts. A permanent shift toward teleworking may reduce demand for office space, including in city centers. Such a change would drive economic activity away from city centers and affect other types of properties located in those areas, including apartments, restaurants, and retail spaces. Hotel mortgage delinquencies also continue to be elevated, as business travel remains depressed. Outside of central business districts, the retail sector more generally has experienced years of decline as consumers have gradually shifted toward online shopping. The pandemic may have accelerated this trend, and retail mortgages continue to have elevated delinquency rates.

Permanent downward changes in cash flows will lead to permanent declines in valuations in certain sectors, and eventually, holders of CRE will realize losses. If these losses accumulate gradually, they are unlikely to trigger large disruptions to the financial system. If losses are more rapid, though, stress in CRE markets could spill over to other parts of the financial system through two mechanisms. First, asset sales from financially distressed individual properties can lower valuations, spilling over into adjoining property values, leading to more distress and a general downward spiral on CRE valuations. Second, a significant proportion of CRE loans is currently held on balance sheets of banks, with small and mid-size banks' loan holdings more likely to be concentrated in CRE. Distress in CRE properties makes these banks vulnerable to losses, with the potential to tighten credit and dampen the economic recovery. If these valuation pressures and asset sales do not remain localized, a widespread

decline in the valuation of underlying CRE properties could lead to sluggish economic growth.

Recommendations

The Council recommends that regulators continue to monitor CRE asset valuations, the level of CRE concentration at banks, and the performance of CRE loans. Regulators should also monitor exposures, loss-absorbing capacity, and the incentives of banks and other nonbank entities that hold CRE loans, including mREITs, debt funds, and insurance companies. The Council recommends that regulators continue to encourage banks and other entities to bolster, as needed, their loss absorption capacity by strengthening their capital and liquidity buffers commensurate with the levels of CRE concentration on their balance sheets.

5.4 Financial Institutions

5.4.1 Large Bank Holding Companies

Large BHCs are critical to the U.S. financial system, performing essential banking functions such as the provision of credit to commercial and retail borrowers. Given the central role that BHCs play in retail and wholesale payment systems, strong financial conditions at BHCs help ensure that firms can continue their operations even in times of market stress. Large BHCs also help financial and nonfinancial firms hedge their risk exposures in the derivatives markets. Lastly, several specialized financial services, such as tri-party repo and mutual fund accounting services, are concentrated in the largest BHCs.

Large and complex U.S. financial institutions entered the pandemic more resilient than they were prior to the 2008 financial crisis. This resilience has been achieved, in part, by maintaining higher levels of capital; holding higher levels of liquid assets to meet peak demands for funding withdrawals; implementing better risk management practices; and developing plans for recovery and orderly resolution.

The results of the 2021 Dodd-Frank Act Stress Test show that large firms have sufficient capital levels to absorb losses during stressful conditions. Over the past year, the capital positions of large BHCs have improved. Capital positions have benefited

from a strong recovery in revenue, and a decline in risk-weighted assets as business borrowers have continued to repay credit lines they drew down in the spring of 2020. Capital positions have also benefited from the release of significant portions of the loan loss reserves that banks built after the onset of the pandemic, reflecting an improved outlook for asset quality, and supported to a large degree by fiscal and monetary policy and progress in public health. Nevertheless, some uncertainty for the credit outlook remains, given the unknown path that the pandemic will take, and the ongoing economic recovery.

Banks also face long-run challenges to their ability to build capital through retained earnings. Historically low interest rates are, for the third time in a generation, pushing down net interest margins. On the other hand, if interest rates were to rise sharply, banks and other financial institutions could incur losses on fixed rate assets. Trading operations support profitability at the largest banks but tend to be volatile and trading risks must be managed appropriately. The importance of maintaining adequate counterparty credit risk management and margining practices was highlighted this past year by the failure of Archegos, which led to very large losses at some banks.

Recommendations

The Council recommends that financial regulators continue to require that the largest financial institutions maintain sufficient capital and liquidity to enhance their resilience against economic and financial shocks. The Council recommends that regulators continue to monitor capital adequacy for these banks.

The Council also recommends that regulators continue to monitor and assess the impact of rules on financial institutions and financial markets—including, for example, on market liquidity and capital—and ensure that BHCs are appropriately monitored based on their size, risk, concentration of activities, and offerings of new products and services.

The Council further recommends that the appropriate regulatory agencies continue to review resolution plans submitted by large financial

institutions; provide feedback and guidance to such institutions; and ensure there is an effective mechanism for resolving large, complex institutions.

In reviewing the failure of Archegos, the Council recommends that regulators continue to review counterparty credit risk management, capital practices, and margining policies at financial institutions.

5.4.2 Investment Funds

Investment funds play a critical intermediary role in the U.S. economy, promoting economic growth through efficient capital formation. While recognizing these benefits, the Council has identified certain vulnerabilities related to investment funds.

One vulnerability involves redemption risk at certain open-end funds, which may lead to asset liquidations that contribute to disruptions in important financial markets. The level of this risk is a function of, among other things, the liquidity of the underlying assets, the widespread practice of settling investor redemptions within two days, the effectiveness of the fund's management of its liquidity, and the potential for an investor to enjoy a first-mover advantage. For example, although both equity and fixed income open-end funds offer daily redemptions to investors, some fixed-income markets are less liquid than equity markets and thus funds holding mostly fixed-income instruments may face greater vulnerability to run risks than funds holding mostly equities. During periods of significant financial stress, as investor perception and sentiment about overall economic and market conditions change, these funds—like other investors such as insurance companies, pension funds, and individual investors—may be inclined to directly sell these fixed-income instruments for cash.

The Council has focused in particular on the question of whether the structure of open-end funds results in greater selling pressure than if investors held the fixed-income instruments directly.

This past year, the Council formed the Open-End Fund Working Group to assess potential financial stability risks associated with open-end funds, with a focus on liquidity risks. In particular, the working

group is reviewing the role of open-end funds in the financial stability disruptions of 2020, and the extent to which intense redemptions and asset liquidations by some funds contributed to disruptions in the U.S. Treasury, corporate debt, and municipal debt markets. This working group seeks to evaluate these risks and their impact on the broader financial system, and to consider additional policy options that could further mitigate such risks following the SEC's adoption of liquidity rules in 2016.

A second vulnerability relates to the use of leverage by investment funds. The use of leverage is most widespread among hedge funds but varies significantly among hedge funds of different sizes and investment strategies. Leverage can allow investment funds to hedge risk or increase exposures, depending on the activities and strategies of the fund. However, in a period of stress, leverage can magnify losses or lead to margin calls, which can cause funds to liquidate assets at a size and speed that disrupt the underlying markets.

The Council has re-established a Hedge Fund Working Group this past year in order to better share data and update the Council's assessment of potential financial stability risks from hedge funds. The working group will also seek to establish a risk monitoring framework to identify potential risks to financial stability and communicate these risks to the relevant regulatory agencies. This working group is also reviewing the experience of hedge funds at the onset of the pandemic and the ways in which these funds contributed to Treasury market volatility, including their liquidation of Treasury securities and Treasury derivatives.

Recommendations

The Council plans to review the findings of the hedge fund and open-end fund working groups as they are developed. The Council supports initiatives by the SEC and other agencies to address risks in investment funds. The Council also supports data collection and analytical work by member agencies aimed at the identification of potential emerging risks. The SEC implemented several data collection efforts and has established additional reporting requirements for investment funds. As a result, there is now significantly more data available to

regulators to monitor and analyze developments concerning fund liquidity, leverage, and risk-taking. The Council recommends that the SEC and other relevant regulators consider whether additional steps should be taken to address these vulnerabilities.

5.5 Financial Market Structure, Operational Challenges, and Financial Innovation

5.5.1 Central Counterparties

The benefits of CCPs include improved transparency, the application of centralized risk management and standardized margin methodologies, multilateral netting, and clear, predetermined procedures for the allocation of counterparty credit losses. Central clearing mandates have increased the volume of cleared OTC derivatives trades, both in absolute terms and relative to the size of the markets. As discussed in the November 2021 [Staff Progress Report](#), the IAWG on Treasury Market Surveillance continues to evaluate whether expanded central clearing in Treasury cash or repo markets will enhance Treasury market resilience ([see Box A](#)).

The safety and efficiency of CCPs across a broad set of jurisdictions have been improved by the implementation of the CPMI-IOSCO PFMI—which set forth international principles for CCPs and other types of financial market infrastructures.

There have also been advances in the development of plans for CCP recovery. In connection with those CCPs designated as systemically important FMUs by the Council, the CFTC requires the CCPs that it supervises to maintain recovery and orderly wind-down plans pursuant to CFTC regulations. The CFTC has reviewed and provided guidance on these recovery plans. The SEC has also approved recovery and orderly wind-down plans for the CCPs it supervises.

Although CCPs provide significant benefits to market functioning and financial stability, they can also introduce strains to the financial system. The inability of a CCP to meet its obligations arising from the default of one or more clearing member, or from non-default losses, could strain the surviving members of the CCP and, more broadly, the financial system. The overall market impact of these demands depends on the size of the CCP

and its interconnectedness with other systemically important financial institutions.

CCPs' risk management frameworks are designed to ensure that they have sufficient pre-funded resources to cover a member default and, in the case of systemically important CCPs, multiple member defaults. To mitigate their risk, CCPs impose liquidity and resource requirements on clearing members that can increase with market volatility or other stressors. The first line of defense of the CCP is often through initial margin requirements which, to achieve adequate risk coverage, are inherently procyclical. Initial margin models, however, also have features that mitigate procyclicality, including the use of historical and theoretical stress scenarios even during low volatility periods, to dampen the sensitivity of initial margin to changes in market volatility.

Intraday margin calls may affect the liquidity positions of CCP members, and in extreme cases could affect their capital positions as well. Some recent episodes, including during the March 2020 financial strains, have highlighted liquidity risk management contingencies that CCP members should monitor. For example, in January 2021, the margin requirement of one member of the NSCC increased by \$3.0 billion as a result of a surge of activity related to interest by retail investors in certain securities discussed on social media. NSCC's decision to waive certain margin requirements likely saved this member from default ([see Section 3.6.1](#)).

The Central Counterparty Risk and Governance Subcommittee of the CFTC's Market Risk Advisory Committee published various reports in 2021 on CCP risk management. Members of this subcommittee, which is composed of central counterparties, clearing members and other market participants, generally agreed on the need for credit and liquidity stress testing and on stress testing and margining practices. Subcommittee members indicated that further work is required to understand what steps could be taken to reduce the impact on the financial system if a CCP were to come under financial strain, including capital management practices at CCPs, default management, and CCP transparency. A number of regulatory efforts have focused on monitoring and

quantifying potential systemic risks. Both the CFTC and SEC maintain active risk surveillance programs of CCPs' and intermediaries' risk management and receive daily or weekly reports of positions, risk measures, margins, collateral, and default resources.

In addition to risk surveillance programs, supervisory stress tests involving multiple CCPs can be an important tool in this assessment. Supervisory stress tests can, for example, help shed light on the risks and vulnerabilities related to potential failures of the largest clearing members. Because these clearing members are often active across many markets, such failures could create exposures across multiple CCPs.

Recommendations

The Council recommends that the CFTC, Federal Reserve, and SEC continue to coordinate in the supervision of all CCPs designated by the Council as systemically important FMUs. Relevant agencies should continue to evaluate whether existing standards for CCPs are sufficiently robust to mitigate threats to financial stability from both default and non-default losses. These agencies should pay particular attention to, and seek to balance, the tradeoff between counterparty risk and liquidity risk. Agencies that regulate clearing members should continue to assess those firms' liquidity risk management practices and capabilities.

Member agencies should continue working with global counterparts and international standard-setting bodies to identify and address areas of common concern. The Council encourages continued engagement with foreign regulators to address the potential for inconsistent regulatory requirements or supervision that pose risks to U.S. financial stability. The Council encourages cooperation in the oversight and regulation of FMUs across jurisdictions.

The Council also encourages agencies to continue to monitor and assess interconnections among CCPs, their clearing members, and other financial institutions. While margin requirements have increased significantly in the aftermath of the financial fallout from the COVID-19 pandemic, agencies should continue to analyze and monitor the impact of regulatory risk management frameworks

in cleared, uncleared, and related securities markets and their impact on systemically important intermediaries and clients.

Finally, the Council encourages regulators to continue to advance recovery and resolution planning for systemically important FMUs and to coordinate in designing and executing supervisory stress tests of multiple systemically important CCPs.

5.5.2 Alternative Reference Rates

After years of planning and preparation, the transition away from LIBOR is entering a critical stage. With end dates for LIBOR now set, and with U.S. regulators having issued guidance, market participants should act with urgency to address their existing LIBOR exposures and transition to robust and sustainable alternative rates. The Council has identified certain risks for this critical transition period.

One risk relates to the selection of new reference rates. The ARRC—a group of financial market participants convened by the Federal Reserve and FRBNY—recommends SOFR as the alternative reference rate. SOFR is based on a deep market whereas some other alternative rates are based on a smaller number of transactions. A rate based on a small volume of transactions, especially if much lower than the volume of instruments that reference a given rate, could introduce risks if the rate is susceptible to volatility and disruption during times of market stress. In addition, it is important to consider whether the use of such a rate is fit for the purpose of the rate's design. In a public meeting of the Council in June 2021, several Council members emphasized their concerns about credit-sensitive rates being used as reference rates in capital and derivatives markets.

A second risk relates to the continued issuance of instruments that create or extend LIBOR exposure. With LIBOR cessation dates set, it is important that financial institutions cease issuance of instruments tied to LIBOR as soon as practicable. In November 2020, the FRB, OCC, and FDIC issued guidance that their regulated entities should cease entering into new contracts that use USD LIBOR as a reference rate as soon as practicable and, in any event, no later than December 31, 2021. In October

2021, the Federal Reserve, FDIC, OCC, CFPB, and NCUA, in conjunction with state bank and state credit union regulators, issued a Joint Statement on Managing the LIBOR Transition that emphasized the expectation that supervised institutions with LIBOR exposure continue to progress toward an orderly transition away from LIBOR. The ARRC also recommended in October 2021 that market participants “act now to slow their use of” USD LIBOR before the end of the year. Continued issuance of instruments that create or extend LIBOR exposure—even those that mature prior to cessation of LIBOR including in particular instruments that routinely are rolled over or extended—is inconsistent with guidance from regulators and recommendations from the ARRC, delays the inevitable work required to transition to alternative rates, and unnecessarily increases exposures to a rate that will cease to be published in the future.

A third risk relates to legacy contracts without robust fallback provisions in the event of LIBOR's cessation. Market participants with significant exposure to USD LIBOR maturing after cessation dates will be vulnerable if they do not take action, where feasible, to transition these contracts. The state of New York has enacted legislation to help transition such legacy contracts governed by New York law to SOFR. The state of Alabama also passed legislation substantively identical to the New York bill. However, it is unclear how effective these laws will be in fully addressing the transition for contracts subject to their provisions, and legal issues may remain for contracts governed by the laws of other jurisdictions. Contractual fallback provisions may not contemplate the need for an alternative rate or may include provisions that probably cannot be operationalized in the event of LIBOR's cessation, like the polling of LIBOR panel banks by the issuer. In addition, while new floating rate note issuances have increasingly included more robust contract fallback language, some new issuances in 2021 still did not include these provisions, putting issuers and investors at risk. Securitized products are further complicated, as legacy contracts may require the consent of all parties to amend the transaction and new issuance continues to use legacy language that may not be feasible to implement. Revising the documents for these products would require significant effort and

expense, and in most cases, it may not be possible to contact and obtain the required consent from all parties involved; the slow adoption of more robust fallback language in these instruments, therefore, presents a particular risk.

Consumer exposures to LIBOR, most commonly through adjustable-rate mortgages, present a special set of considerations in addition to those discussed. Noteholders will need to take care in working to ensure that consumers are treated fairly and that the transition is explained clearly. The ARRC is working with consumer groups, lenders, investors, and regulators to achieve a smooth LIBOR transition. On June 4, 2020, the CFPB issued a Notice of Proposed Rulemaking and FAQs relating to the LIBOR transition. The CFPB is continuing work on the final rule, which would amend Regulation Z to address the anticipated expiration of LIBOR and expects to issue it in January 2022. The FAQs pertain to compliance with existing CFPB regulations for consumer financial products and services impacted by the anticipated LIBOR discontinuation and resulting need to transition to other indices.

Recommendations

With the cessation dates for LIBOR set and with U.S. regulators having issued guidance, market participants should execute plans to transition to alternative reference rates. Market participants should understand the exposure of their firms to LIBOR in every business and function, assess the impact of LIBOR's cessation or degradation on existing contracts, and take available steps to remediate risks from existing contracts that do not have robust fallback provisions to transition the contract to an appropriate alternative rate. It is also important that participants consider potential LIBOR exposure in services provided by third parties, such as contract servicing, systems, and models. Market participants should evaluate whether any new agreements contain sufficiently robust fallback provisions, such as those endorsed by the ARRC, to mitigate risk that the contract's interest rate benchmark becomes unavailable. Market participants should monitor legal developments that address the transition of contracts tied to LIBOR that lack fallback provisions or for which parties failed to negotiate an alternative rate. Market

participants that do not execute plans for this transition could face significant legal, operational, and economic risks.

Financial institutions should cease issuing instruments linked to LIBOR as soon as practicable and no later than December 31, 2021. In selecting a reference rate to replace LIBOR, the Council recommends that market participants only utilize alternative reference rates with deep underlying volumes and use alternative reference rates in ways that are fit for the purpose of the rates' designs. The ARRC has recommended SOFR because it provides a robust rate, suitable for use in most products and with underlying transaction volumes that are unmatched by other LIBOR alternatives. The Federal Reserve, OCC, and FDIC previously communicated that a supervised institution may use any reference rate for its loans that the institution's management determines is appropriate based on its funding model and customer needs, while several Council members have emphasized that derivatives and capital markets should move to SOFR given its robustness. The Council advises lenders, borrowers, and other market participants to consider the use of SOFR-based rates. If market participants use a rate other than SOFR, they should ensure that they understand how their chosen reference rate is constructed, be aware of any fragilities associated with that rate, and use strong fallback provisions in their contracts. Market participants should conduct a comprehensive evaluation before adopting any alternative reference rate. Such an evaluation would, at a minimum, review the alternative rate's fitness for purpose, ensure that the rate is based on a sufficiently active market with sufficient transaction volumes, assess the adequacy of the representativeness of the underlying interest, and evaluate the resilience of the rate during times of stress. Individual institutions should review how alternative rates fit into their internal risk management guidelines, business strategies, and risk appetite.

The Council commends the efforts of the ARRC and recommends that it continue to facilitate an orderly transition to alternative reference rates. Council member agencies should determine whether regulatory relief is required to encourage market

participants to address legacy LIBOR portfolios. Council member agencies should also continue to use their supervisory authority to understand the status of regulated entities' transition from LIBOR, including their legacy LIBOR exposure and plans to address that exposure.

5.5.3 Financial Market Structure

Advances in information and communications technologies, as well as regulatory developments, have altered the structure of financial markets over the last decade. The Council and member agencies are closely monitoring how changes in market structure have affected the robustness and efficiency of capital markets and the stability of the financial system. The extreme volatility in financial markets after the onset of the pandemic last year has further emphasized the importance of ensuring that appropriate market structures are in place so that financial markets can function effectively during stress events.

Interlinkages Among Dollar Funding Markets

Some market participants are active in both secured and unsecured short-term funding markets. Commercial banks and the FHLBs operate in the secured repo market as well as the unsecured federal funds market. Other institutions operate only in certain markets: MMFs lend in the repo and the Eurodollar markets but cannot participate in the federal funds market, while borrowing options in dollar funding markets may be limited to the repo market for some entities such as hedge funds. In addition, since the 2008 financial crisis, new regulations on bank capital and liquidity, structural reforms in MMFs, and a new operating environment for bank-affiliated broker-dealers have fundamentally altered how market participants interact and the various interlinkages among the federal funds market, the repo market, and the Eurodollar market. Given the myriad of participants and strong interlinkages between them, disruptions in one market can transmit to another.

There are benefits from interdependencies among markets, including enhanced price discovery and more options for hedging risks. At the same time, interdependencies create transmission risks from

volatile or inaccurate pricing that have the potential to amplify shocks across different markets.

Pressures on Dealer Intermediation

Traditionally, market-making and arbitrage mechanisms involving securities dealers have helped in the orderly functioning of the secondary market for Treasury and MBS. Bank-affiliated broker-dealers are also the principal participants in the tri-party and general collateral finance repo markets that use these securities as collateral.

However, two developments in recent years have raised the volume of transactions relative to dealer intermediation capacity. First, issuance volumes of these marketable securities, especially Treasury securities, have increased significantly, and the pace of issuance has risen further since the onset of the pandemic. Second, large banks have taken action to limit balance sheet growth in light of capital requirements designed to constrain leverage, resulting in major bank-affiliated broker-dealers having reduced the portion of their balance sheet that is allocated to trading and repo transactions. Together, these developments may have contributed to episodes of illiquidity in Treasury, MBS, and corporate bond markets in March 2020. Market disruptions not only have implications for financial stability but also affect the implementation of monetary policy.

Role of Non-Traditional Market Participants

Non-traditional market participants, including principal trading firms, play an increasingly important role in securities and other markets. These firms may improve liquidity and investor outcomes under normal circumstances, but they may also introduce new potential risks. For instance, the trading strategies that non-traditional market participants employ and the incentives and constraints that they operate under may not be as well understood, leading to uncertainty about how these firms might behave during periods of market stress.

Disruptive Events in Securities Markets

An episode of stress in the Treasury market in February 2021 is a recent example of occasional abrupt disruptions to asset prices and liquidity

conditions in securities markets. Other examples include but are not limited to episodes in the Treasury market in March 2020 and October 2014, in the equity market in May 2010, and some other less serious episodes more recently in gold and OTC markets. Trading strategies may have contributed to these episodes, though assessing these contributions is difficult because the details of trading strategies and operations are generally proprietary. The continued occurrence of these episodes may signal a vulnerability regarding the resilience of key financial markets.

Consideration of Central Clearing in the U.S. Treasury Market

Significant parts of the Treasury market are not centrally cleared, including transactions between dealers and their customers, and transactions on market platforms involving principal trading firms. Expansion of central clearing could have a range of benefits, including reducing chains of settlement failures and counterparty risk concerns in times of stress. In addition, to the extent that dealers hold more capital against bilaterally cleared trades than centrally cleared trades, central clearing could improve their ability to provide liquidity particularly for repos. Whether more widespread central clearing would benefit Treasury market resilience is a question that must be studied carefully, like any significant change in market structure. Study of these questions should include understanding the factors that have limited central clearing to date, including concerns regarding increased costs and operational burdens.

Recommendations

The Council recommends that member agencies continue to review market structure issues that may contribute to market volatility in key markets, including short-term funding, Treasuries, MBS, and corporate bond markets, and study the interlinkages between them. Market participants should also regularly assess how market developments affect the risk profile of their institutions. The Council recommends that financial regulators continue to monitor and evaluate ongoing changes that might have adverse effects on markets, including on market integrity and liquidity, or that might underly flash events. In the Treasury market, the Council

recommends that agencies consider whether an increase in central clearing would enhance the resilience of the market and assess the potential impact on liquidity of such an increase.

5.5.4 Cybersecurity

The financial sector, like other critical sectors, is vulnerable to ransomware and other malware attacks, denial of service attacks, data breaches, and other events. Such incidents have the potential to impact tens or even hundreds of millions of Americans and result in financial losses of billions of dollars due to disruption of operations, theft, and recovery costs.

Ransomware attacks continue to rise worldwide, with cyber criminals targeting critical infrastructure, small businesses, hospitals, and schools. Over the past year, firms victimized by ransomware attacks include Colonial Pipeline and the meat processing firm JBS. The ongoing drumbeat of these cyberattacks is evidence of the danger they present to the U.S. economy and financial system. While the attacks on Colonial and JBS only briefly affected commodity markets, a destabilizing cybersecurity incident could potentially threaten the stability of the U.S. financial system through at least three channels:

First, the incident could disrupt a key financial service or utility for which there is little or no substitute. This could include attacks on central banks; exchanges; sovereign and sub-sovereign creditors, including U.S. state and local governments; custodian banks, payment clearing and settlement systems; or other firms or services that lack substitutes or are sole service providers.

Second, the incident could compromise the integrity of critical data. Accurate and usable information is critical to the stable functioning of financial firms and the system; if such data is corrupted on a sufficiently large scale, it could disrupt the functioning of the system. The loss of such data also has privacy implications for consumers and could lead to identity theft and fraud, which in turn could result in a loss of confidence.

Third, a cybersecurity incident that causes a loss of confidence among a broad set of customers

or market participants could cause customers or participants to question the safety or liquidity of their assets or transactions, and lead to significant withdrawal of assets or activity.

Looking ahead, a greater prevalence of teleworking compared with the pre-pandemic period could result in vulnerabilities from that source remaining elevated. The implementation of teleworking strategies using virtual private networks, virtual conferencing services, and other technologies can increase cybersecurity vulnerabilities, insider risks, and other operational exposures. Firms have increased their reliance on third-party service providers to implement these strategies, and for a variety of other services as well ([see Section 3.6.2.5](#)). The interdependency of networks and technologies supporting critical operations magnifies cyber risks, threatening the operational capabilities of individual institutions and the financial sector as a whole. Rapid adoption of new technologies and interconnected platforms used to support hybrid work models have enhanced the efficient provision of financial services but have simultaneously increased complexity of information technology and operations.

Recommendations

Improving the cybersecurity and operational resilience of the financial sector requires continuous assessment of cyber vulnerabilities and critical connections across firms. Sustained senior-level commitment to mitigate cybersecurity risks and their potential systemic implications is necessary at both member agencies and private firms.

The Council recommends that federal and state agencies continue to monitor cybersecurity risks and conduct cybersecurity examinations of financial institutions and financial infrastructures. These actions aim to ensure, among other things, robust and comprehensive cybersecurity monitoring, incident response and recovery processes, considering new risks posed by the pandemic, ransomware incidents, and supply chain attacks.

The Council encourages continued cooperation across government agencies and private firms to improve cybersecurity and operational resilience. Controls that may help organizations improve

include adoption of immutable backups and stronger authentication and authorization controls. Controls such as these help organizations mitigate the risk of cybersecurity incidents at any one organization, and enhance the financial sector's cybersecurity posture overall.

The Council supports the ongoing work of partnerships between government agencies and private firms, including the Financial and Banking Information Infrastructure Committee (FBIIC), the Financial Services Sector Coordinating Council, and the Financial Services Information Sharing and Analysis Center (FS-ISAC). These partnerships focus on improving the financial sector's ability to rapidly respond to and recover from significant cybersecurity incidents, thereby reducing the potential for such incidents to threaten the stability of the financial system and the broader economy.

The Council recommends that the FBIIC continue to promote processes to strengthen response and recovery efforts, including efforts to address the systemic implications of significant cybersecurity incidents. The FBIIC should continue to work closely with the Department of Homeland Security, law enforcement, and industry partners to carry out regular cybersecurity exercises recognizing interdependencies with other sectors, such as telecommunications and energy.

The Council further recommends that agencies work to improve information sharing among private firms and government partners. Sharing timely and actionable cybersecurity information can reduce the risk that cybersecurity incidents occur and can mitigate the impacts of those that do occur. Treasury and relevant agencies should carefully consider how to appropriately share information and, where possible, continue efforts to declassify (or downgrade classification of) information on incidents, consistent with national security imperatives. The Council encourages efforts to enhance information sharing with the FS-ISAC and its growing community of financial sector institutions.

Financial institutions are rapidly adopting new technologies, including cloud computing and artificial intelligence. The Council supports the

efforts of the FBIIC Technology Working Group, which examines the extent to which financial services firms using emerging technologies introduce new cyber vulnerabilities into the financial services critical infrastructure. The Council recommends agencies consider how such emerging technologies change the sector's risk profile and consider the need for any corresponding change to supervision and regulation. The growing use of artificial intelligence by financial institutions was the subject of a joint request for information by the Federal Reserve, CFPB, FDIC, NCUA, and OCC in March 2021 to gain input from stakeholders including financial institutions, trade associations, consumer groups, and others.

5.5.5 Data Gaps and Challenges

Episodes of acute financial stress in 2008 and 2020 have exposed several major gaps and deficiencies in the range and quality of data available to financial regulators to identify emerging risks in the financial system. These gaps and shortcomings include firm-level structure and ownership information; transaction data in certain important financial markets, including short-term funding, securities lending arrangements, repo contracts, Treasury securities, and OTC derivatives; and limitations in financial statement reporting for certain types of institutions. Areas of financial innovation are often not well captured by existing data, particularly if they involve firms that are subject to limited or no oversight by financial regulators. In addition, this past year, the failure of the family investment fund Archegos has raised questions about whether there is adequate transparency to assess the market impacts of private investment vehicles, including family funds. Financial institutions may benefit from collecting more granular and higher-frequency disclosures, as available measures may not be capturing important risks. Often, the usefulness of existing data is limited by institutional or jurisdictional differences in reporting requirements. These types of inconsistencies can create challenges for data sharing and increase the reporting burden on market participants.

Data gaps can present vulnerabilities to the financial system. For example, incomplete data on Treasury market developments can cause market participants

to pull back out of uncertainty in volatile market conditions, reducing liquidity provision and amplifying volatility. Progress has been made on this front. Treasury market data are now reported to TRACE by broker-dealer FINRA members, though publicly available information is still limited and other participants such as banks do not yet report data.

Council member agencies have worked with each other, regulators in other jurisdictions, and financial companies on developing standards and protocols and carrying out data collection initiatives. Staff of the OFR, CFTC, SEC, Federal Reserve, FDIC, OCC, and CFPB, as members of the Regulatory Oversight Committee, meet regularly with their international regulatory counterparts on the ROC to oversee implementation of the LEI, UTI, UPI, and CDE standards. Member agencies have also been working to facilitate the adoption of LEIs and Universal Loan Identifiers for mortgage loans.

Recommendations

High-quality financial data is an essential input into the financial regulatory process. The Council and member agencies rely on data collected from market participants to monitor developments in the financial system, identify potential risks to financial stability, and prioritize and execute supervisory and examination work. The Council encourages member agencies to collaborate and expand their data resources and analytical capabilities to assess interconnectedness and concentration risks in their respective areas of responsibility.

The establishment of uniform market standards for digital reporting, assurance, and collection enhances the usefulness of market data and reduces the reporting, access, and analysis burdens on market participants. The failure to adopt broadly shared granular data standards for financial products, transactions, and entities can lead to unnecessary costs and inefficiencies, such as duplicate reporting, and may impede the ability to aggregate data for risk-management and reporting purposes. The Council recommends that regulators and market participants continue to partner to improve the scope, quality, and accessibility of financial data, as well as data sharing among

relevant agencies. These partnership efforts include implementing new standardized identifiers such as the UTI, UPI, and CDE; developing and linking data inventories; and implementing industry standards, protocols, and security for secure data sharing.

Broader adoption of the LEI by financial market participants continues to be a Council priority. The LEI enables unique and transparent identification of legal entities participating in financial transactions. ULIs will make it possible to track loan records through a loan's life cycle. The Council recommends that member agencies update their regulatory mortgage data collections to include LEI and ULI fields. The Council also recommends that member agencies promote adoption and use of standards in mortgage data, including consistent terms, definitions, and data quality controls, which will make transfers of loans or servicing rights less disruptive to borrowers and investors. Finally, the LEI remains under consideration for a role in authenticating digital identities.

Important initiatives are underway at member agencies that will improve the functioning of financial markets. Among these is the collection of repo transaction data, which is used to create SOFR benchmark rates for use by market participants. The Council recommends that member agencies continue to work to harmonize domestic and global derivatives data for aggregation and reporting and ensure that appropriate authorities have access to trade repository data needed to fulfill their mandates.

The Council encourages pension regulators and FASB to improve the quality, timeliness, and depth of disclosures of pension financial statements and portfolio holdings.

The Council recommends that member agencies review steps that could be taken to improve transparency about the activities of leveraged investment vehicles including family offices and determine any financial stability implications of those activities. The Council commends the steps taken by the SEC to implement new rules related to security-based swaps.

Finally, as noted in [Section 5.1](#), the Council recognizes the critical importance of taking prompt

action to improve the availability of data and measurement tools pertaining to climate-related financial risks.

5.5.6 Financial Innovation

Financial innovation can offer considerable benefits to consumers and providers of financial services by reducing the cost of certain financial services, increasing the convenience of payments, and potentially increasing the availability of credit. But innovation can also create new risks that need to be understood.

5.5.6.1 Digital Assets

The development of digital assets and the use of associated distributed ledger technology may present the opportunity to promote innovation and further modernization of financial infrastructure. Regulatory attention and coordination are critically important in light of the quickly evolving market for digital assets. As with all technological advances, the advances associated with digital assets are accompanied by both benefits and risks, and regulation should seek to balance innovation with the risks it presents, including those to financial stability.

Digital asset arrangements vary widely. The risk posed by each depends, among other things, on the structure of the asset's consensus mechanism, and the risk management practices of participants. Digital assets have garnered interest as a potential tool for developing new products, services, and infrastructures; however, it appears that speculation drives the majority of digital asset activity at this time. Like all highly speculative investments, the prices of some digital assets may be highly volatile. In general, digital assets may also be subject to the risk of fraud and market manipulation. Digital asset networks can be international in scope and include a diverse set of participants, including non-traditional financial service providers, heightening illicit financing and national security risks related to anti-money laundering, tax compliance, sanctions, and use of digital assets in ransomware attacks. The significant number of counterparties could introduce complexities in governance structures and incentives, as well as transfer risk to other components of the system. Digital asset networks may also be subject to operational risks, including disruptions to the technologies that underlie the

platform and cybersecurity. These events could prove disruptive to users and, in an extreme case, undermine confidence in the system as a whole.

The use of leverage to obtain exposure to highly volatile digital assets increases the risk of a fire sale in the underlying asset: a decrease in asset values could trigger a cycle of sales to meet margin calls and further price declines, possibly spilling into other digital assets. Participants may use various arrangements to obtain leveraged investments in digital assets, including through some decentralized finance (DeFi) arrangements. Links between traditional financial institutions, markets, and infrastructure to various digital assets and DeFi projects may create a channel for a risk event in digital assets to spread to the broader financial system.

Stablecoins have been an important part of digital asset development over the past few years. Some stablecoin arrangements are already sizeable, and many stablecoins are growing. A run on stablecoins during strained market conditions may have the potential to amplify a shock to the economy and the financial system. Today, stablecoins are predominantly used in the United States to facilitate trading, lending, and borrowing of other digital assets. There could also be various risks from the use of a stablecoin as a payment system, including operational, settlement, and liquidity risks ([see Box G](#)). Risks to payment systems, if not properly managed, can present financial stability risks, given the importance of a well-functioning payments system in facilitating commercial activities.

Recommendations

The Council recommends that federal and state regulators continue to examine risks to the financial system posed by new and emerging uses of digital assets, including risks from connections with banking services, financial markets, and financial intermediaries, arising directly or indirectly; risks to consumers, investors, and businesses associated with potential losses or instability in market prices; illicit financing risks; risks to national security; cybersecurity and privacy risks; and risks to international monetary and payment system integrity. The Council encourages coordination

among U.S. financial regulators to address risks arising from digital assets.

The Council has reviewed the [Report on Stablecoins](#) published by the PWG, the FDIC, and the OCC on November 1, 2021, and recommends that its member agencies consider the recommendations in that report. The Council will further assess and monitor the potential risks of stablecoins and recommends that its members consider appropriate actions within each member's jurisdiction to address those risks while continuing to coordinate and collaborate on issues of common interest. The Council will also be prepared to consider steps available to it to address risks outlined in the PWG Report on Stablecoins in the event comprehensive legislation is not enacted. The Council recommends that state and federal regulators review available regulations and tools that could be applied to digital assets and their experience to date in using those tools.

Box G: Stablecoins

The PWG, along with the FDIC and the OCC, recently issued an interagency [Report on Stablecoins](#) to examine the current regulation of stablecoins, identify risks posed by stablecoins, and develop recommendations for addressing those risks.

Stablecoins are digital assets that are designed to maintain a stable value relative to a national currency or other reference assets. As discussed in [Section 3.6.2.1](#), the market capitalization of stablecoins issued by the largest stablecoin issuers exceeded \$127 billion as of October 2021, reflecting a nearly 500 percent increase over the preceding twelve months. Today, stablecoins are predominantly used in the United States to facilitate trading, lending, and borrowing of other digital assets.

Proponents of stablecoins believe that stablecoins could become widely used by households and businesses as a means of payment. If well-designed and appropriately regulated, stablecoins could support faster, more efficient, and more inclusive payments options. The transition to broader use of stablecoins as a means of payment could occur rapidly due to network effects or relationships between stablecoins and existing user bases or platforms. The potential for the increased use of stablecoins as a means of payment raises a range of prudential concerns, in addition to concerns regarding market integrity, investor protection, and illicit finance.

A stablecoin requires users' confidence in order to serve as a reliable store of value or means of payment. This confidence could be undermined by factors including the use of reserve assets that fall in price or become illiquid; a failure to appropriately safeguard reserve assets; a lack of clarity regarding the redemption rights of stablecoin holders; and operational risks related to cybersecurity and the collecting, storing, or safeguarding of data.

The failure of a stablecoin to perform according to expectations would harm users of that stablecoin and could pose systemic risk. The mere prospect of a

stablecoin not performing as expected could result in a "run" on the stablecoin, i.e., a self-reinforcing cycle of redemptions and fire sales of reserve assets. Moreover, failures or disruptions may not be isolated. For example, where stablecoin arrangements rely on digital asset trading platforms for various functions—such as to distribute stablecoins, enable conversion into national currency, and facilitate arbitrage mechanisms—failures or disruptions to the digital asset trading platform could disrupt the stablecoin, and vice versa. Fire sales of reserve assets could disrupt critical funding markets, depending on the type and volume of reserve assets involved. Risks to the broader financial system could rapidly increase as well, particularly in the absence of prudential standards.

The transfer mechanisms used in stablecoin arrangements (and potentially other aspects of the arrangements' activities) can provide opportunities for efficient payment processing but also can pose risks to their participants and the broader financial system. Payment stablecoins face many of the same basic risks as traditional payment systems, including credit risk, liquidity risk, operational risk, risks arising from improper or ineffective system governance, and settlement risk. These risks may remain inadequately addressed for stablecoin arrangements due to the lack of consistent risk-management standards, the number of key parties that may be involved, and operational complexity. When not managed comprehensively, these risks can make payment systems less available and less reliable for users, and they can create financial shocks or operate as a channel through which financial shocks spread.

The potential for an individual stablecoin to scale rapidly raises additional sets of policy concerns regarding concentration of economic power. First, a stablecoin issuer or a key participant in a stablecoin arrangement (e.g., a custodial wallet provider) could pose systemic risk if widely adopted at rapid scale. This means that the failure or distress of such an

Box G: Stablecoins (continued)

entity could adversely impact financial stability and the real economy. Second, the combination of a stablecoin issuer or wallet provider and a commercial firm could lead to an excessive concentration of power to the detriment of broader market competition. Third, a stablecoin that becomes widely adopted as a means of payment could present concerns about anti-competitive effects. For example, users of a widely adopted stablecoin might face undue frictions or costs in the event that they choose to switch to other payment services or products. Concerns about anti-competitive effects are thus likely to be greater absent interoperability standards for stablecoins and stablecoin arrangements.

Today, stablecoins are not subject to a consistent set of prudential regulatory standards that address their risks. The number of different key parties that may be involved in an arrangement and the

operational complexity of these arrangements pose challenges for supervisory oversight. Critical creation, governance, and payment functions could be widely distributed among the jurisdictions of different domestic and international regulators. In such fragmented systems and under conditions of rapid growth and change, regulation and supervision are more complex, less efficient, and more susceptible to arbitrage.

Altogether, the benefits and potential risks associated with stablecoins and other digital assets underscore the importance of U.S. regulators adopting an approach to digital assets that will provide for responsible innovation in a manner that is safe and fair and complies with all applicable laws. A comprehensive regulatory framework promotes responsible innovation and functional payment systems, regardless of the underlying technology.

5.5.6.2 Use of Technology in Financial Services

Technology companies providing financial services are another source of innovation in financial markets (see Section 3.6.2.4). Innovative technology companies may offer benefits to the financial system such as fostering inclusion and improving small business access to credit. These companies may seek to compete directly with incumbent financial service providers, and their market presence could grow significantly. Currently, these firms may not be subject to the same types of financial services regulations that govern incumbent financial service providers.

One area in which technology companies have been active is in the provision of third-party services for financial firms. In general, financial institutions that contract with a third-party service provider are exposed to risk that a third-party service provider is unable to perform as intended. Concentration in the use of technological innovations may increase operational risks associated with financial institutions' use of third-party service providers.

When technology innovations rely on relatively few companies to provide supporting infrastructure, the risk grows that financial or operational failures or faults at companies providing supporting infrastructure could disrupt the activities of multiple financial institutions or financial markets. In addition, business relationships with technology firms, depending on the products and services offered, may introduce other risks relating to compliance, BSA/AML, and reputation that require a commensurate risk management framework.

Finally, technology has increasingly enabled retail investors to participate at higher rates in U.S. equity markets, particularly in day trading and self-directed trading. This trend has accelerated during the COVID-19 pandemic. Innovations that democratize access to trading markets and increase the diversity of participants can have positive benefits. However, some emerging vulnerabilities may have been highlighted by the January 2021 episode of market volatility, which involved heavy trading in certain equities, including GameStop

Corp., that were discussed widely on social media. In this episode, asset price movements do not appear to have had any systemic impacts. However, sudden asset price movements unrelated to fundamental news could represent a vulnerability if they lead to cascading impacts by causing asset liquidations or putting stress on financial institutions. This episode raises the question of how social media coordination compares to other more traditional forms of coordination that existing policy tools are designed to address.

Recommendations

The Council encourages financial regulators to continue to be proactive in evaluating new products and services and in monitoring how responsible innovation can benefit investors and consumers, regulated entities, and financial markets. The Council also encourages relevant authorities to evaluate the potential effects of new financial products and services on financial stability, including risks relating to operations, compliance, BSA/AML, and reputation. Agencies should ensure that their supervision, including monitoring and data collection systems, identifies risks associated with financial innovations. To ensure comprehensive visibility into innovation across the financial system and avoid regulatory fragmentation, regulators should share relevant information on financial innovation as appropriate with the Council and other agencies.

The authority to supervise third-party service providers varies across financial regulators. To further enhance third-party service provider information security and address other critical regulatory challenges, the Council recommends that Congress pass legislation that ensures that the FHFA, NCUA, and other relevant agencies have adequate examination and enforcement powers to oversee third-party service providers. The importance of ensuring adequate powers of this kind was underscored this past year by the expansion of lending activities permitted by credit union service organizations. 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.

The Council encourages continued coordination among federal and state regulators to support responsible financial innovation and competitiveness, promote consistent regulatory approaches, and identify and address potential risks that arise from such innovation.

5.6 Managing Vulnerabilities amid Uneven and Volatile Global Growth

Global economic activity in the COVID-19 era has been unusually volatile, with periods of economic shutdowns followed by rapid growth amid reopening. Looking forward, the outlook for global growth is characterized by elevated uncertainty, with the potential for continued volatility and unevenness of growth across countries and sectors. Financial institutions may need to manage the exposure of their businesses to vulnerabilities that could arise in this uncertain macroeconomic environment.

Amid the rapid pace of the global economic recovery over the past year, supply constraints and labor shortages have become widespread and particularly severe in some sectors such as auto production and have led to higher inflation in many countries. This experience raises the risk that the recent surge in inflation will continue to be higher than expected, particularly if supply constraints are more severe and persist longer than currently anticipated. The advent of higher inflation also raises the question of whether longer-term inflation expectations of households and businesses will rise or become unanchored. If higher inflation or inflation expectations were to lead to higher policy rates and longer-term yields, borrowing costs for households and businesses could rise, while financial institutions might experience losses on their existing asset holdings. As a result, the global economic recovery could lose momentum. A rapid or unexpected rise in interest rates could induce particularly sharp contractionary forces.

Overall, financial vulnerabilities in China are high. China's increased use of macroprudential regulations have tightened liquidity conditions—

especially for property developers, many of whom are overleveraged. Over the past year, the required recapitalization of China Huarong Asset Management Co. and the rapidly deteriorating financial condition of China Evergrande Group, one of China's largest and most indebted property developers, have highlighted the tensions that Chinese regulators face in balancing the need to reduce medium- and long-term financial stability risks while limiting spillovers to the real economy and the financial system. Given the ample resources available to the Chinese authorities, there is a good chance that the Chinese authorities will be successful in limiting spillovers. However, were a hard landing to occur in China, it could be expected to include a decline in Chinese asset valuations and stress in the Chinese banking sector. Such developments would likely have substantial negative impacts on the global economy and financial system, given the size of the Chinese economy, its demand for commodities, and its centrality to global supply chains.

The pandemic also continues to directly shape the global growth outlook. The potential development of more virulent strains of the COVID-19 carries the risk of further volatility in economic activity, including economic shutdowns and reopenings, possibly in a piecemeal fashion, or further supply chain disruptions. Many advanced foreign economies have used fiscal powers to help smooth out the effects of this volatility so far in the pandemic but may face difficulty balancing the appropriate level and duration of further support against longer-run debt sustainability. The global vaccination campaign will limit the likelihood of further shutdowns, but vaccination has been uneven across countries. The generally weaker vaccination rates in emerging market economies (EMEs) pose greater risks to the outlook for their recoveries. EMEs may also experience stresses as they deal with potentially volatile capital flows against the backdrop of uneven global growth and possible policy spillovers from large, advanced economies.

Volatile or uneven global growth could affect the U.S. financial system in a few ways. Losses at financial institutions in advanced foreign economies caused by slow or interrupted growth, or from long-

run debt sustainability issues, could spill over to the U.S. financial system through direct exposures and counterparty risks. Direct U.S. exposures to the Chinese financial sector are more limited, and therefore the direct consequences of a Chinese hard landing for U.S. financial stability appear manageable. However, U.S. economic performance could be affected indirectly if developments in China or other countries weigh on the global economy or global market confidence. Finally, with nonbank financial institutions playing an increasing role in financing foreign activity, the toolkits for addressing risks related to these institutions and their effect on the U.S. may not be as well developed as those for dealing with the risks stemming from banks.

Recommendations

The Council recommends that member agencies ensure that the financial institutions they oversee are attentive to the risks posed by uneven or volatile global growth, including higher levels of inflation and interest rates, stress at foreign financial institutions including banks and nonbanks, and changes in global economic activity and market confidence. Supervisors should review in particular the risks faced by large banks with global footprints and trading operations. Market regulators should review available steps that could be taken in anticipation of potential volatility in global funding flows that might increase stress in funding markets or engender deleveraging or large-scale asset sales.

ABCP	Asset-Backed Commercial Paper
ABS	Asset-Backed Security
Advisers Act	Investment Advisers Act of 1940
AML	Anti-Money Laundering
AML Act	Anti-Money Laundering Act of 2020
ANSI	American National Standards Institute
ARP Act	American Rescue Plan Act of 2021
ARRC	Alternative Reference Rates Committee
ASC X9	Accredited Standards Committee X9, Inc.
AUM	Assets Under Management
BHC	Bank Holding Company
BIS	Bank for International Settlements
BNPL	Buy Now, Pay Later
BOE	Bank of England
BOJ	Bank of Japan
BSA	Bank Secrecy Act
C&I	Commercial and Industrial
CAA	Consolidated Appropriations Act of 2021
CARES Act	Coronavirus Aid, Relief, and Economic Security Act of 2020
CBD	Central Business District
CCAR	Comprehensive Capital Analysis and Review
CCP	Central Counterparty
CD	Certificate of Deposit
CDC	Center for Disease Control
CDE	Critical Data Elements
CDS	Credit Default Swap
CEA	Commodity Exchange Act
CECL	Current Expected Credit Losses
CET1	Common Equity Tier 1
CFPB	Consumer Financial Protection Bureau
CFT	Countering the Financing of Terrorism
CFTC	Commodity Futures Trading Commission
CIF	Collective Investment Funds
CLF	Central Liquidity Facility
CLO	Collateralized Loan Obligation
CMBS	Commercial Mortgage-Backed Security
CME	Chicago Mercantile Exchange Inc.
CMG	Crisis Management Group
Council	Financial Stability Oversight Council
CP	Commercial Paper
CPFF	Commercial Paper Funding Facility
CPMI	Committee on Payments and Market Infrastructures

CRE	Commercial Real Estate
CUSO	Credit Union Service Organizations
DCM	Designated Contract Market
DFAST	Dodd-Frank Act Stress Tests
Dodd-Frank Act	Dodd-Frank Wall Street Reform and Consumer Protection Act
DTCC	Depository Trust & Clearing Corporation
DTI	Total Monthly Debt to Total Monthly Income
EBITDA	Earnings Before Interest, Taxes, Depreciation, and Amortization
ECB	European Central Bank
ECIP	Emergency Capital Investment Program
EGRRCPA	Economic Growth, Regulatory Relief, and Consumer Protection Act
EME	Emerging Market Economy
Enterprises	Fannie Mae and Freddie Mac
ESG	Environmental, Social, and Governance
ETF	Exchange-Traded Fund
ETN	Exchange-Traded Note
ETP	Exchange-Traded Product
EU	European Union
Exchange Act	Securities Exchange Act of 1934
Fannie Mae	Federal National Mortgage Association
FASB	Financial Accounting Standards Board
FATF	Financial Action Task Force
FBII	Financial and Banking Information Infrastructure Committee
FBO	Foreign Banking Organization
FCA	Financial Conduct Authority
FCM	Futures Commission Merchant
FCU	Federal Credit Union
FDCPA	Fair Debt Collection Practices Act
FDIC	Federal Deposit Insurance Corporation
Federal Reserve	Board of Governors of the Federal Reserve System
FHA	Federal Housing Administration
FHFA	Federal Housing Finance Agency
FHLB	Federal Home Loan Bank
FICC	Fixed Income Clearing Corporation
FICO	Fair Isaac Corporation
FICU	Federally Insured Credit Union
FIMA Repo Facility	Repo Facility for Foreign and International Monetary Authority
FinCEN	Financial Crimes Enforcement Network
FIO	Federal Insurance Office
FIO Act	Federal Insurance Office Act of 2010
FMU	Financial Market Utility
FOMB	Financial Oversight and Management Board for Puerto Rico
FOMC	Federal Open Market Committee
FRBNY	Federal Reserve Bank of New York
Freddie Mac	Federal Home Loan Mortgage Corporation

FSB	Financial Stability Board
FS-ISAC	Financial Services Information Sharing and Analysis Center
FSOC	Financial Stability Oversight Council
FX	Foreign Exchange
G-SIB	Global Systemically Important Bank
GAAP	Generally Accepted Accounting Principles
GAV	Gross Asset Value
GCC	Group Capital Calculation
GDP	Gross Domestic Product
GHG	Greenhouse Gas
Ginnie Mae	Government National Mortgage Association
GLEIF	Global LEI Foundation
GME	Global Monitoring Exercise
GNE	Gross Notional Exposure
GSE	Government-Sponsored Enterprise
GSD	Government Securities Division
HFCAA	Holding Foreign Companies Accountable Act
HFWG	Hedge Fund Working Group
HTM	Held-to-maturity
IAIS	International Association of Insurance Supervisors
IAWG	Inter-Agency Working Group for Treasury Market Surveillance
IBA	ICE Benchmark Administration
IBOR	Interbank Offer Rate
IDIs	Insured Depository Institutions
IHC	Intermediate Holding Company
IMF	International Monetary Fund
Investment Company Act	Investment Company Act of 1940
IPO	Initial Public Offering
IOSCO	International Organization of Securities Commissions
ISDA	International Swaps and Derivatives Association
ISO	International Organization for Standardization
JGB	Japanese Government Bond
LCR	Liquidity Coverage Ratio
LEI	Legal Entity Identifier
LEI ROC	Legal Entity Identifier Regulatory Oversight Committee
LIHTC	Low-Income Housing Tax Credit
LST	Liquidity Stress Test
M&A	Merger and Acquisition
MBS	Mortgage-Backed Security
MBSD	Mortgage-Backed Securities Division
MiFID II	Markets in Financial Instruments Directive
MLF	Municipal Liquidity Facility
MMLF	Money Market Mutual Fund Liquidity Facility
MMF	Money Market Mutual Fund
mREIT	Mortgage REITs

MSP	Major Swap Participant
NAIC	National Association of Insurance Commissioners
NAV	Net Asset Value
NBFI	Nonbank Financial Institution
NCUA	National Credit Union Administration
NGEU	NextGenerationEU
NGFS	Network of Central Banks and Supervisors for Greening the Financial System
NMDB®	National Mortgage Database
NMS	National Market System
NSCC	National Securities Clearing Corporation
NSFR	Net Stable Funding Ratio
OCC	Office of the Comptroller of the Currency
OFR	Office of Financial Research
OIS	Overnight Index Swaps
ON-RRP	Overnight Reverse Repurchase Agreement Facility
OPEC	Organization of Petroleum Exporting Countries
OPEC+	OPEC and non-OPEC Participating Countries
OTC	Over-the-Counter
P&C	Property and Casualty
PBGC	Pension Benefit Guaranty Corporation
PFMI	Principles for Financial Market Infrastructures
PPP	Paycheck Protection Program
PROMESA	Puerto Rico Oversight, Management, and Economic Stability Act
PWG	President's Working Group on Financial Markets
PWG Report on Stablecoins	PWG, FDIC, and OCC Report on Stablecoins
QM	Qualified Mortgage
RBC	Risk Based Capital
REIT	Real Estate Investment Trust
Repo	Repurchase Agreement
RMBS	Residential Mortgage-Backed Security
ROAA	Return on Average Assets
RRC	Regulation and Resolution Committee
RWA	Risk-Weighted Asset
S&P	Standard & Poor's
SA-CCR	Standardized Approach for Counterparty Credit Risk
SBSDR	Security-Based Swap Data Repository
SCB	Stress Capital Buffer
SD	Swap Dealer
SDR	Swap Data Repository
SEC	Securities and Exchange Commission
SEF	Swap Execution Facility
SIFMA	Securities Industry and Financial Markets Association
SLOOS	Senior Loan Officer Opinion Survey
SLR	Supplementary Leverage Ratio
SOFR	Secured Overnight Financing Rate

SRC	Systemic Risk Committee
SRF	Standing Repo Facility
SPAC	Special Purpose Acquisition Company
SWIFT	Society for Worldwide Interbank Financial Telecommunications
TALF	Term Asset-Backed Securities Loan Facility
TBA	To Be Announced
TDR	Troubled Debt Restructurings
TGCR	Tri-party General Collateral Rate
TIPS	Treasury Inflation-Protected Securities
Treasury	U.S. Department of the Treasury
UK	United Kingdom
ULI	Universal Loan Identifier
UPB	Unpaid Principal Balance
UPI	Unique Product Identifier
USD	U.S. Dollar
USDA	U.S. Department of Agriculture
UTI	Unique Transaction Identifier
VA	U.S. Department of Veterans Affairs
WAL	Weighted Average Life
WAM	Weighted Average Maturity
WEO	World Economic Outlook
WTI	West Texas Intermediate
YTD	Year-to-Date

Accumulated Other Comprehensive Income

Accumulated Other Comprehensive Income typically includes unrealized gains and losses in available for sale securities; actuarial gains and losses in defined benefit plans; gains and losses on derivatives held as cash flow hedges; and gains and losses resulting from translating the financial statements of foreign subsidiaries.

Additional Tier 1 Capital

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

Advanced Approaches Capital Framework

The Advanced Approaches capital framework requires certain banking organizations to use an internal ratings-based approach and other methodologies to calculate risk-based capital requirements for credit risk and advanced measurement approaches to calculate risk-based capital requirements for operational risk. The framework applies to large, internationally active banking organizations—generally those that are G-SIBs or with at least \$700 billion in total consolidated assets or at least \$75 billion in cross-jurisdictional activity with at least \$250 billion in total consolidated assets or at least \$10 billion in total on-balance sheet foreign exposure—and includes the depository institution subsidiaries of those firms.

Affiliate

In general, a company is an affiliate of another company if: (1) either company consolidates the other on financial statements prepared in accordance with U.S. Generally Accepted Accounting Principles, the International Financial Reporting Standards, or other similar standards;

(2) both companies are consolidated with a third company on financial statements prepared in accordance with such principles or standards; (3) for a company that is not subject to such principles or standards, consolidation as described above would have occurred if such principles or standards had applied; or (4) a primary regulator determines that either company provides significant support to, or is materially subject to the risks or losses of, the other company.

Asset-Backed Commercial Paper (ABCP)

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

Asset-Backed Security (ABS)

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

Backwardation

Backwardation is when the current spot price is trading higher than the futures price. It is most easily identified by a downward sloping forward curve. Backwardation, sometimes called inversion for other commodities, is the opposite of contango. Contango is when the back end of the futures curve is priced higher than the nearby months and when spot prices rise to converge to futures prices. Crude oil is normally in backwardation while natural gas is normally in contango.

Bilateral Repo

A repo between two institutions in which negotiations are conducted directly between the participants 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 non-cleared trades and trades cleared

through Fixed Income Clearing Corporation's delivery versus payment repo service.

Central Counterparty (CCP)

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

Clearing Bank

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

Collateral

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

Collateralized Loan Obligation (CLO)

A securitization vehicle backed predominantly by commercial loans.

Commercial Mortgage-Backed Security (CMBS)

A security which is collateralized by a pool of commercial mortgage loans and makes payments derived from the interest and principal payments on the underlying mortgage loans.

Commercial Paper (CP)

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

Commercial Paper Funding Facility (CPFF)

A funding backstop established by the Federal Reserve under section 13(3) of the Federal Reserve Act to facilitate the issuance of term commercial paper by eligible issuers. The CPFF is structured as a credit facility to a special purpose vehicle.

Common Equity Tier 1 Capital (CET1)

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

Common Equity Tier 1 Capital Ratio

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

Comprehensive Capital Analysis and Review (CCAR)

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

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.

Defined Benefit Plan

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

Defined Contribution Plan

A retirement plan in which the cost to the employer is limited to the specified annual contribution. In defined contribution plans, the investment risk is borne by the plan participant.

Digital Asset

A digital asset is an electronic representation of value that may be issued or transferred using distributed ledger technology, including blockchain technology. Ownership may be established through cryptographic means. Digital assets include instruments that may qualify under applicable U.S. laws as securities, commodities, and security- or commodity-based instruments such as futures or

swaps. Other industry terms used for these assets include cryptocurrencies, crypto assets, virtual currencies, digital currencies, stablecoins, and crypto tokens.

Dodd-Frank Act Stress Tests (DFAST)

Annual stress tests required by the Dodd-Frank Act for national banks and federal savings associations with total consolidated assets of more than \$10 billion.

Dry Powder

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

Duration

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

Emerging Market Economy (EME)

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

Exchange-Traded Product (ETP)

An investment fund or note that is traded on an exchange. ETPs offer continuous pricing—unlike mutual funds, which offer only end-of-day pricing. ETPs are often designed to track an index or a portfolio of assets. ETPs include: (1) exchange-traded funds (ETFs), which are registered as investment companies under the Investment Company Act of 1940 ('40 Act); (2) non-'40 Act pooled investment vehicles, which are generally trust or partnership vehicles that do not invest in securities; and (3) exchange-traded notes (ETNs), which are senior debt instruments issued by financial institutions that pay a return based on the performance of a "reference asset."

Federal Funds Rate

The interest rate at which depository institutions lend reserve balances to other depository institutions overnight. The FOMC sets a target range for the level of the overnight federal funds rate. The Federal Reserve Bank of New York then uses open market operations to influence the rate so that it trades within the target range.

FICO Score

A measure of a borrower's creditworthiness based on the borrower's credit data; developed by the Fair Isaac Corporation.

Financial and Banking Information Infrastructure Committee (FBIIC)

The FBIIC consists of 18 member organizations from across the financial regulatory community, both federal and state. It 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 Infrastructure (FMI)

A multilateral system among participating financial institutions, including the operator of the system, used for the purposes of recording, clearing, or settling payments, securities, derivatives, or other financial transactions. Under the Dodd-Frank Act, certain FMIs are recognized as FMUs.

Financial Market Utility (FMU)

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

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: (1) at a price that is determined at initiation of the contract; (2) that obligates each party to the contract to fulfill the contract at the specified price; (3) that is used to assume or shift price risk; and (4) that may be satisfied by delivery or offset.

General Collateral Finance (GCF)

An interdealer repo market in which the Fixed Income Clearing Corporation plays the role of CCP. Trades are netted at the end of each day and settled at the tri-party clearing bank. See *Tri-party Repo*.

Government-Sponsored Enterprise (GSE)

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

Gross Domestic Product (GDP)

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

Gross Notional Exposure (GNE)

The sum of the absolute values of long and short notional amounts. The "notional" amount of a derivative contract is the amount used to calculate payments due on that contract, just as the face amount of a bond is used to calculate coupon payments.

Haircut

The discount, represented as a percentage of par or market value, at which an asset can be pledged as collateral. For example, a \$1,000,000 bond with a 5 percent haircut would collateralize a \$950,000 loan. The purpose of a haircut is to provide a collateral margin for a secured lender.

High-Quality Liquid Asset

An asset—such as a government bond—which is considered eligible as a liquidity buffer in the U.S. banking agencies' liquidity coverage ratio. High-quality liquid assets should be liquid in markets during times of stress and, ideally, be central bank eligible.

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.

Initial Public Offering (IPO)

The first time a company offers its shares of capital stock to the general public.

Institutional Leveraged Loan

The term portion of a leveraged loan that is sold to institutional investors.

Interest Rate Swap

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

Intermediate Holding Company (IHC)

A company established or designated by an FBO under the Federal Reserve Board's Regulation YY. Regulation YY requires that an FBO with U.S. non-branch assets of \$50 billion or more must hold its entire ownership interest in its U.S. subsidiaries, with certain exclusions, through a U.S. IHC.

Legal Entity Identifier (LEI)

A 20-character alpha-numeric code that connects to key reference information which 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; expedition of orderly resolution; containment of market abuse and financial fraud; and provision of higher-quality and more accurate financial data.

Leveraged Buyout (LBO)

An acquisition of a company financed by a private equity contribution combined with borrowed funds, with debt constituting a significant portion of the purchase price.

Leveraged Loan

While numerous definitions of leveraged lending exist throughout the financial services industry, generally a leveraged loan is understood to be a type of loan that is extended to companies that already have considerable amounts of debt and/or have a non-investment grade credit rating or are unrated and/or whose post-financing leverage significantly exceeds industry norms or historical levels.

LIBOR

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

Liquidity Coverage Ratio (LCR)

A standard to ensure that covered companies maintain adequate unencumbered, high-quality liquid assets to meet anticipated liquidity needs for a 30-day horizon under a standardized liquidity stress scenario.

Loan-to-Value Ratio

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

Major Swap Participant

A person that is not a swap dealer and maintains a substantial position in swaps, creates substantial counterparty exposure, or is a financial entity that is highly leveraged and not subject to federal banking capital rules.

Margin

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

Money Market Mutual Fund Liquidity Facility (MMLF)

A facility established by the Federal Reserve under section 13(3) of the Federal Reserve Act that provides funding to U.S. depository institutions and bank holding companies to finance their purchases of certain types of assets from MMFs under certain conditions. The MMLF is intended to assist MMFs in meeting demands for redemptions by investors and to foster liquidity in the markets for the assets held by MMFs.

Money Market Mutual Fund (MMF)

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

Mortgage-Backed Security (MBS)

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

Mortgage Servicing Company

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

Mortgage Servicing Right (MSR)

The right to service a mortgage loan or a portfolio of mortgage loans.

Municipal Bond

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

Net Asset Value (NAV)

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

Net Interest Margin (NIM)

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

Net Stable Funding Ratio (NSFR)

A liquidity standard to promote the funding stability of internationally active banks, through the maintenance of stable funding resources relative to assets and off-balance sheet exposures.

Open Market Operations

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

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 an equity call option, which provides the right but not the obligation to buy a block of shares at a fixed price for a fixed period, and an equity put option, which similarly grants the right to sell a block of shares.

Overnight Reverse Repurchase Agreement Facility (ON RRP)

A supplementary policy tool that the Federal Reserve uses to set the floor on rates to keep the federal funds rate in the target range set by the FOMC.

Over-the-Counter (OTC)

A method of trading which does not involve a registered exchange. An OTC trade could occur on purely a bilateral basis or could involve some degree

of intermediation by a platform that is not required to register as an exchange. An OTC trade could, depending on the market and other circumstances, be centrally cleared or bilaterally cleared. The degree of standardization or customization of documentation of an OTC trade will depend on whether it is cleared and whether it is traded on a non-exchange platform (and, if so, the type of platform).

Primary Dealer

A financial institution that is a trading counterparty of the Federal Reserve Bank of New York. Primary dealers are expected to make markets for the Federal Reserve Bank of New York on behalf of its official accountholders as needed, and to bid on a pro-rata basis in all Treasury auctions at reasonably competitive prices.

Prudential Regulation

Regulation aimed at ensuring the safe and sound operation of financial institutions, set by both state and federal authorities.

Private Debt

Private debt markets refers to direct lending, mostly to middle-market borrowers, by non-depositories such as hedge funds, private equity funds, insurance companies, business development companies, and other alternative asset managers. Key private debt categories include direct lending, distressed debt, mezzanine, special situations, and venture debt.

Public Debt

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

Qualifying Hedge Fund

A hedge fund advised by a Large Hedge Fund Adviser that has a net asset value (individually or in combination with any feeder funds, parallel funds, and/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. Large Hedge Fund Advisers are advisers that have at least \$1.5 billion in hedge fund AUM.

Real Estate Investment Trust (REIT)

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

Repurchase Agreement (Repo)

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

Residential Mortgage-Backed Security (RMBS)

A security which is collateralized by a pool of residential mortgage loans and makes payments derived from the interest and principal payments on the underlying mortgage loans.

Risk-Weighted Assets (RWAs)

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

Rollover Risk

The risk that as an institution's debt nears maturity, the institution may not be able to refinance the existing debt or may have to refinance at less favorable terms.

Run Risk

The risk that investors lose confidence in an institution—stemming from concerns about counterparties, collateral, solvency, or related issues—and respond by pulling back their funding.

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 GCF Repo transaction data and data on bilateral Treasury repo transactions.

Securities Lending/Borrowing

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

Securitization

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

Security-Based Swap Dealer

A person that holds itself out as a dealer in security-based swaps, makes a market in security-based swaps, regularly enters into security-based swaps with counterparties, or engages in any activity causing it to be known as a dealer or market maker in security-based swaps; does not include a person entering into security-based swaps for such person's own account.

Short-Term Wholesale Funding

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

Special Purpose Acquisition Company (SPAC)

Companies formed through an IPO to raise funds to purchase businesses or assets to be acquired after the IPO.

Stablecoins

Stablecoins are digital assets that are designed to maintain a stable value relative to a national currency or other reference assets.

Supplementary Leverage Ratio (SLR)

Tier 1 capital of an advanced approaches banking organization divided by total leverage exposure. All advanced approaches banking organizations must maintain an SLR of at least 3 percent. The SLR is effective January 1, 2018, and organizations must calculate and publicly disclose their SLRs beginning March 31, 2015.

Swap

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

Swap Data Repository (SDR)

A person that collects and maintains information or records with respect to transactions or positions in, or the terms and conditions of, swaps entered into by third parties for the purpose of providing a centralized recordkeeping facility for swaps. In certain jurisdictions, SDRs are referred to as trade repositories. The Committee on Payments and Settlement Systems and IOSCO describe a trade repository as “an entity that maintains a centralized electronic record (database) of transaction data.”

Swap Dealer

Section 1a(49) of the Commodity Exchange Act defines the term “swap dealer” (SD) to include any person who: (1) holds itself out as a dealer in swaps; (2) makes a market in swaps; (3) regularly enters into swaps with counterparties as an ordinary course of business for its own account; or (4) engages in any activity causing the person to be commonly known in the trade as a dealer or market maker in swaps.

Swap Execution Facility (SEF)

Section 1a(50) of the Commodity Exchange Act defines the term “swap execution facility” as a trading system or platform in which multiple

participants have the ability to execute or trade swaps by accepting bids and offers made by multiple participants in the facility or system, through any means of interstate commerce, including any trading facility, that: (a) facilitates the execution of swaps between persons; and (b) is not a designated contract market.

Swaption

An option granting the right to enter into a swap. See *Option* and *Swap*.

Syndicated Loan

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

Tier 1 Capital

A regulatory capital measure comprised of common equity tier 1 capital and additional tier 1 capital. See *Common Equity Tier 1 Capital* and *Additional Tier 1 Capital*.

Tier 2 Capital

A regulatory capital measure which includes subordinated debt with a minimum maturity of five years and satisfies the eligibility criteria in the Revised Capital Rule.

Time Deposits

Deposits that the depositor generally does not have the right to withdraw before a designated maturity date without paying an early withdrawal penalty. A certificate of deposit (CD) is a time deposit.

Total Capital

A regulatory capital measure comprised of tier 1 capital and tier 2 capital. See *Tier 1 Capital* and *Tier 2 Capital*.

Tri-Party Repo

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

Total Return Swap

A derivative contract in which one counterparty receives the total return (interest payments and any capital gains or losses) from a specified reference asset and the other counterparty receives a specified fixed or floating cash flow that is not related to the creditworthiness of the reference asset.

Underwriting Standards

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

Variation Margin

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

VIX (Chicago Board Options Exchange Market Volatility Index)

A standard measure of market expectations of short-term volatility based on S&P 500 option prices.

Weighted Average Life (WAL)

A weighted average of the maturities of all securities held in a MMF's portfolio.

Weighted Average Maturity (WAM)

A weighted average of the time to maturity on all loans in an asset-backed security.

Yield Curve

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

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Endnotes

- 1 SOFR is a blended rate that measures overnight Treasury repo rates in the tri-party and FICC-cleared segments. TGCR, which is also published by FRBNY, measures overnight Treasury repo rates only in the non-cleared tri-party segment.
- 2 In mid-September 2019, overnight money market rates spiked and exhibited significant volatility, amid a large drop in reserves due to the corporate tax date and increases in net fcounter issuance. See Sriya Anbil, Alyssa Anderson, and Zeynep Senyuz, *What Happened in Money Markets in September 2019?*, FEDS Notes, (Feb. 27, 2020), available at: <https://www.federalreserve.gov/econres/notes/feds-notes/what-happened-in-money-markets-in-september-2019-20200227.html>
- 3 See Eliot Anenberg and Daniel Ringo, *Housing Market Tightness During COVID-19: Increased Demand or Reduced Supply?*, FEDS Notes, (Jul. 8, 2021), available at: <https://www.federalreserve.gov/econres/notes/feds-notes/housing-market-tightness-during-covid-19-increased-demand-or-reduced-supply-20210708.htm>.
- 4 The Dodd-Frank Act amended the Advisers Act to exclude family offices from regulation under the Advisers Act. The exclusion is limited to a family office that: 1) provides investment advice only to “family clients”; 2) is wholly owned by family clients and is exclusively controlled by family members and/or family entities; and 3) does not hold itself out to the public as an investment adviser.
- 5 See Paul, Weiss, Rifkind, Wharton & Garrison LLP, *Credit Suisse Group Special Committee of the Board of Directors Report on Archegos Capital Management*, (Jul. 29, 2021), p. 123, available at: <https://www.credit-suisse.com/about-us/en/reports-research/archegos-info-kit.html>
- 6 Ibid, p. 40-43.
- 7 Ibid, p. 22.
- 8 Ibid, p. 20.
- 9 For example, Robinhood saw its clearing fund requirement rise from \$0.7 billion at end of day January 27 to \$3.7 billion at start of day January 28. Robinhood attributed \$2.2 billion of this \$3.0 billion margin call to the capital premium charge. See Vladimir Tenev, CEO of Robinhood Markets, Inc., *Game Stopped? Who Wins and Loses When Short Sellers, Social Media, and Retail Investors Collide: Testimony before the House Committee on Financial Services*, (Feb. 18, 2021), p. 9, available at: <https://financialservices.house.gov/uploadedfiles/hhrg-117-ba00-wstate-tenev-20210218.pdf> .



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