2020

ANNUAL REPORT

FSOC

FINANCIAL STABILITY OVERSIGHT COUNCIL

Financial Stability Oversight Council

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

1. To identify risks to the financial stability of the United States 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 Chairman 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 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 unanimously approved by the voting members of the Council on December 3, 2020.

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)

Contents

1 Member Statement

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

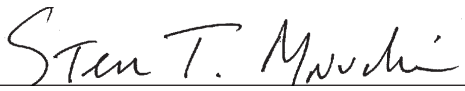
The Honorable Kevin McCarthy
Republican Leader
United States House of Representatives

The Honorable Michael R. Pence
President of the Senate
United States Senate

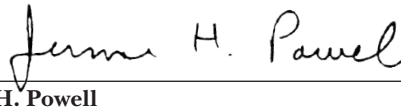
The Honorable Mitch McConnell
Majority Leader
United States Senate

The Honorable Charles E. Schumer
Democratic Leader
United States Senate

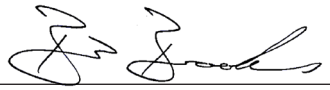
In accordance with Section 112(b)(2) of the Dodd-Frank Wall Street Reform and Consumer Protection Act, for the reasons outlined in the annual report, I believe that additional actions, as described below, should be taken to ensure financial stability and to mitigate systemic risk that would negatively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



Steven T. Mnuchin
Secretary of the Treasury
Chairperson, Financial Stability Oversight Council



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



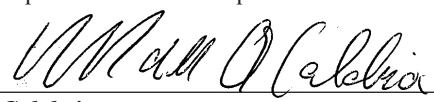
Brian P. Brooks
Acting Comptroller of the Currency
Office of the Comptroller of the Currency

Kathleen Kraninger
Director
Bureau of Consumer Financial Protection

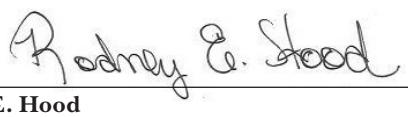
Jay Clayton
Chairman
Securities and Exchange Commission

Jelena McWilliams
Chairman
Federal Deposit Insurance Corporation

Heath P. Tarbert
Chairman
Commodity Futures Trading Commission



Mark A. Calabria
Director
Federal Housing Finance Agency



Rodney E. Hood
Chairman
National Credit Union Administration

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

2 Executive Summary

The U.S. economy was in the midst of the longest post-war economic expansion, with historically low levels of unemployment, prior to the onset of the COVID-19 pandemic earlier this year. The global pandemic not only brought about a public health crisis but also caused a contraction of economic activity at an unprecedented pace. Initially, the pandemic reduced consumer spending, slowed manufacturing production, and led to widespread business closures. The unemployment rate surged from 3.5 percent in February to a record high of nearly 15 percent in April. Since then, extraordinary measures undertaken by policymakers have succeeded in arresting the decline in economic conditions, initiating a recovery and lowering the unemployment rate to 7.9 percent as of September. However, a protracted virus outbreak poses downside risks that can slow the recovery and even prolong the economic downturn.

Financial Stress from the COVID-19 Pandemic and the Policy Response

The COVID-19 outbreak led to substantial financial stress in the first quarter of 2020. While economic activity was disrupted in March, investors fled riskier assets for the safety and liquidity of cash and short-term government securities. A broad-based selloff in equities and commodities resulted in sharp declines in both spot and futures prices. The sectors most affected by the pandemic, such as airlines, energy, transportation, hotels, and restaurants, recorded the sharpest declines. The flight to safety and liquidity also created disruptions in short-term and global dollar funding markets. Meanwhile, trading conditions for Treasuries and agency mortgage-backed securities (MBS), generally considered safe and liquid assets, were also strained. Moreover, credit conditions tightened in the commercial paper (CP), corporate bond, and municipal debt markets.

With the stress in funding markets in March, precautionary draws by nonfinancial businesses on existing lines of credit with banks increased sharply, as firms tried to cover shortfalls in revenues and reductions in the availability of short-term funding. Substantially increased liquidity and capital requirements imposed after the 2008 financial crisis helped banks meet the large, unanticipated drawdowns. Large deposit inflows from investors fleeing to the safety of deposit insurance and borrowings at the Federal Reserve's discount window also helped in meeting this surge in liquidity demand.

Meanwhile, policymakers acted to minimize the health and economic effects of the pandemic. On March 27, the Coronavirus Aid, Relief, and Economic Security (CARES) Act was signed into law. The CARES Act authorized approximately $2.6 trillion in funding to address COVID-19 and to support the economy, households, businesses, and other entities. In addition, the Federal Reserve and Treasury undertook a series of extraordinary measures beginning in March to contain the financial fallout from the pandemic. The Federal Reserve also lowered the target federal funds rate to near zero and substantially increased purchases of Treasuries and agency MBS to ease trading pressures. In a bid to stabilize short-term funding markets (STFMs), the Federal Reserve launched a series of facilities to provide liquidity to foreign central banks, primary dealers, depository institutions, and money market funds. In light of these exigent circumstances, the Federal Reserve and Treasury also enacted a series of unprecedented measures to support corporate bonds, bank loans, longer-term municipal debt, and asset-backed securities. These credit and lending facilities were developed with the goal of relieving strains in longer-term debt markets through the pandemic.

These policy actions have substantially improved market conditions and investor sentiment in financial markets. Federal Reserve purchases of Treasuries and agency MBS reduced bid-ask spreads and relieved the stress in trading conditions for these securities. The announcement of liquidity facilities not only succeeded in lowering spreads on CP and short-term municipal securities but also

reversed the heavy redemptions from prime and tax-exempt money funds. The creation of new credit facilities lowered spreads on corporate bonds and revived new issuance in both the investment grade and high-yield bond segments. Overall, these policy measures have restored the orderly functioning of financial markets and improved investor sentiment, as reflected in the rebound in corporate financing and equity prices.

The Council provided an important venue for facilitating coordination and analysis of risks across member agencies at the onset of the pandemic and throughout the year. Council members regularly identified key risks and shared information regarding their policy responses. The Council also increased the frequency of staff-level meetings to allow important analyses of major market developments to be shared in a timely manner with all Council member agencies. In addition, the Council's previous identification of vulnerabilities and analysis that it had performed leading up to the financial stress helped ensure that policymakers' responses were more coordinated, well informed, and effective.

Implications for Financial Stability

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.

The COVID-19 pandemic was an extraordinary shock to the global financial system. As discussed above, it led to a significant disruption in the provision of liquidity and the availability of credit, reflecting increasing pessimism and uncertainty about the economic outlook as major portions of the economy began to shut down.

Though policy actions to minimize the effects of the pandemic have been effective at improving market conditions, risks to U.S. financial stability remain elevated compared to last year. In addition, the global outlook for economic recovery is uncertain, depending on the severity and the duration of the ongoing pandemic.

Corporate Credit

The corporate debt-to-gross domestic product (GDP) ratio was at historic highs when the pandemic hit the United States. As economic activity contracted in March, there were serious concerns about the sustainability of corporate debt. Since then, the corporate debt-to-GDP ratio has reached new record highs, and, despite the turmoil in credit markets, the policy-aided rebound in business financing has been strong.

The potential risk to financial stability from nonfinancial business borrowing depends 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 valuations in U.S. equities and corporate bonds make these markets vulnerable to a major repricing of risk, increasing volatility, and weakening balance sheets of financial and nonfinancial businesses. Sharp reductions in the valuations of different assets could negatively impact liquidity, increase borrowing costs, and heighten rollover risk.

With cash flows impaired due to the COVID-19 pandemic, many businesses may be challenged to service their debt. Since March, nearly $2 trillion in nonfinancial corporate debt has been downgraded, and default rates on leveraged loans and corporate bonds have increased considerably. The growing number of bankruptcy filings could stress resources at courts and make it harder for firms to obtain critical debtor-in-possession financing. It could also prevent many firms from restructuring their debt in a timely fashion, potentially forcing them into liquidation.

The Council recommends that 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

The short-term funding market provides essential funding to businesses, local governments, and other financial intermediaries and can have implications for financial stability and the implementation of monetary policy. Recent events, including the financial fallout from the pandemic, have confirmed that potentially significant structural vulnerabilities remain in STFMs.

Money market funds (MMFs) offer shareholders redemptions on a daily basis while holding many short-term assets that are less liquid, especially in times of stress. Stresses on prime and tax-exempt money funds in March revealed continued structural vulnerabilities, which led to increased redemptions and, in turn, likely contributed to the stress in STFMs. Among institutional and retail prime MMFs, outflows as a percentage of fund assets exceeded that of the September 2008 crisis. Outflows abated after the Federal Reserve announced support for the CP market and MMFs.

Liquidity demand from leveraged participants, such as hedge funds using Treasury collateral and mortgage real estate investment trusts (mREITs) using agency MBS collateral, may have also played a significant role in the recent market volatility. Some of these leveraged participants are vulnerable to funding risks because of their reliance on funding in repurchase agreement (repo) markets. When such leveraged participants face margin calls (either because of an external shock to the repo market or investor concerns about their profitability), it creates incentives for them to deleverage. Since the assets on their balance sheets are the same assets used as collateral in their repo funding, the need to deleverage can increase selling pressures and lead to more margin calls. The complexity of interactions involving leveraged participants raises concerns as to their role in amplifying funding stresses.

The Council recommends that regulators review these structural vulnerabilities, including the vulnerability of large-scale redemptions in prime and tax-exempt MMFs, and the role leveraged nonbank entities may have played in the repo market. The Council also recommends that, if warranted, regulators take appropriate measures to mitigate these vulnerabilities.

Residential Real Estate Market: Nonbank Mortgage Origination and Servicing

As the shock from the pandemic hit U.S. households, federal and state governments enacted a series of public assistance policies to aid households, such as suspending foreclosures, discouraging evictions, and offering flexibilities in home purchase and mortgage acquisition processes. The disruption in mortgage payments has focused attention on nonbank mortgage origination and servicing.

While the business models of nonbank mortgage companies vary, many are subject to certain fragilities, such as a heavy reliance on short-term funding, obligations to continue to make servicing advances for certain delinquent borrowers, and limited resources to absorb adverse economic shocks. The surge in refinancing due to low rates has provided servicers with an additional source of liquidity to help sustain operations. An increase in forbearance and default rates, however, has the potential to impose significant strains on nonbank servicers.

The Council encourages relevant state and federal regulators to take additional steps to coordinate, collect and share data and information, identify and address potential risks, and strengthen the oversight of nonbank companies involved in the origination and servicing of residential mortgages.

Commercial Real Estate Market

The impact of COVID-19 has adversely affected several components of the commercial real estate (CRE) market, including the hotel, retail, and office segments. A prolonged downturn leaves

the CRE sector vulnerable to mortgage defaults and declines in valuations, with spillovers to the broader economy. While there is variation in different institutions' exposures to pandemic-driven CRE stress, a sizeable proportion of CRE loans is currently held on bank balance sheets, with small and mid-sized banks more likely to be concentrated in CRE. Distress in CRE properties makes these creditor banks vulnerable to losses and write-downs, with the potential to tighten credit and dampen the economic recovery.

The Council recommends that regulators continue to monitor volatility in CRE asset valuations, the level of CRE concentration at banks and other entities that hold CRE loans, and the performance of CRE loans. The Council recommends that regulators continue to encourage banks and other entities, such as REITs and insurance companies, 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 banking system has been able to withstand the financial fallout of the pandemic in part because of the stronger capital and liquidity positions built up over the last decade. Large bank holding companies (BHCs) have also benefitted from the extraordinary policy measures and other supervisory and regulatory relief provided under these exigent circumstances.

A severe and prolonged economic deterioration, however, can affect the resilience of the banking system. Financial distress at a large, complex, interconnected BHC has the potential to affect global financial markets and amplify the negative impact on economic growth by further tightening credit conditions.

The Council is closely monitoring the resilience of large BHCs and remains vigilant about their willingness and ability to provide credit should economic conditions deteriorate further. Member agencies use a wide range of tools to identify and address risks to these institutions, including supervisory and company-run stress tests, supervisory review and feedback on the resolution plans of large banking organizations, on-site examinations and off-site monitoring, and economic analysis.

The Council recommends that financial regulators ensure that the largest financial institutions maintain sufficient capital and liquidity to ensure their resiliency against economic and financial shocks. In particular, the Council recommends that regulators continue to monitor the capital adequacy for these banks and, when appropriate, phase out the temporary capital relief currently provided.

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 large BHCs are appropriately monitored based on their size, risk, concentration of activities, and offerings of new products and services.

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 also identified potential vulnerabilities relating to redemption risk in certain open-end funds. For example, though both equity and fixed-income oriented 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 risk than funds holding mostly equities. 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.

During the mid-March financial turmoil, credit spreads increased to levels not seen since the 2008 financial crisis, and corporate bond issuance came to a near halt. Meanwhile, bond funds experienced historically high levels of outflows that some research has suggested contributed to stress in corporate and municipal bond markets. Interventions by the Federal Reserve and Treasury

ultimately restored orderly functioning in the primary and secondary markets. Nonetheless, these events demonstrate the need for additional analysis to assess broader market structure dynamics that may have contributed to the stress, including whether investors redeeming shares from bond funds may have affected the extent of selling pressure in the bond market differently than if those investors had held and sold bonds directly.

In addition to the potential vulnerability associated with redemption risk in mutual funds, the Council has also previously highlighted the use of leverage by investment funds. Leverage introduces counterparty risk, and in a period of stress, if leveraged investment funds are forced to sell assets on a significant scale, it could exacerbate asset price movements.

The Council recommends that the SEC and other relevant agencies consider whether additional steps should be taken to address these vulnerabilities. The Council also supports initiatives by the SEC and other agencies to address risks in investment funds through various measures, including data collection efforts and additional reporting requirements.

Financial Market Structure

The extreme volatility in financial markets early in the pandemic 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: In the decade since the last 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: The financial fallout from the pandemic was disruptive in the markets for critical securities such as Treasury securities, MBS, and corporate bonds. Traditionally, market-making and arbitrage mechanisms involving securities dealers have helped in the orderly functioning of the secondary markets for Treasury securities and MBS. However, with the increase in issuance volumes (especially for Treasury securities) and the implementation of Basel III regulations on capital and leverage, major bank-affiliated broker-dealers have reduced the amounts of their balance sheets allocated to trading and repo transactions. Together, these developments may have contributed to episodes of illiquidity in Treasury security and MBS markets in March 2020.

Nontraditional 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 risk. 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 concerning how these firms might behave during periods of market stress.

The Council recommends that member agencies conduct an interagency operational review of 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. 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.

Central Counterparties

Although central counterparties (CCPs) provide significant benefits to market functioning and financial stability, the inability of a CCP to meet its obligations arising from one or more clearing member defaults could potentially introduce strains on the surviving members of the CCP and, more broadly, the financial system. At the same time,

CCPs' 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 an important tool in the assessment of risks.

In response to the market volatility in March 2020, aggregate margin levels increased significantly, but the markets served by the CCPs continued to function in an orderly fashion. While the cleared derivatives markets functioned as designed, there is continued concern about the impact of contingent liquidity demands on clearing members and their clients related to margin requirements.

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 risk management expectations for CCPs are sufficiently robust to mitigate potential threats to financial stability. 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 their 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.

Alternative Reference Rates

In March 2020, the UK Financial Conduct Authority (FCA) stated publicly that, despite the COVID-19 pandemic, the assumption that firms cannot rely on LIBOR (formerly known as the London Interbank Offered Rate) being published after the end of 2021 had not changed. The failure of market participants to adequately analyze their exposure to LIBOR and transition ahead of LIBOR's anticipated cessation or degradation could expose market participants to significant legal, operational, and economic risks that could adversely impact U.S. financial markets.

The Alternative Reference Rates Committee (ARRC), a group of private-market participants convened by the Federal Reserve and the Federal Reserve Bank of New York (FRBNY) in 2014, has released the *Recommended Best Practices* for completing the transition from LIBOR. Market participants that have determined that the Secured Overnight Financing Rate (SOFR) is an appropriate rate for their LIBOR transition should not wait for the possible introduction of the forward-looking SOFR term rates to execute the transition.

The Council commends the efforts of the ARRC and recommends that the ARRC continue its work to facilitate an orderly transition to alternative reference rates. The Council recommends that market participants formulate and execute transition plans so that they are fully prepared for the anticipated discontinuation or degradation of LIBOR. Federal and state regulators should determine whether further guidance or regulatory relief is required to encourage market participants to address legacy LIBOR portfolios. Council member agencies should also 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.

Cybersecurity

Financial institutions continue to invest in and expand their reliance on information technology and cloud-based computing to reduce costs and to increase efficiency and resiliency. The COVID-19 pandemic may accelerate this trend as financial institutions have implemented business continuity plans through increased use of teleworking systems and dual-work locations. At the same time, financial institutions have increased their reliance on third-

party service providers for teleworking systems. Greater reliance on technology, particularly across a broader array of interconnected platforms, increases the risk that a cybersecurity incident may have severe consequences for financial institutions. For example, recent FRBNY analysis details how the impairment of payment systems at any of the five most active U.S. banks would result in significant spillovers to other banks. Meanwhile, the rapid shift towards working from home has also increased cybersecurity risks in the financial sector. Market participants have observed malicious actors' use of COVID-19 themed phishing attacks to increase their success at compromising less secure home networks.

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. At the same time, the unique and complex threats posed by cyber risks 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 cybersecurity risks and to mitigate them. The Council also supports agency efforts to increase the efficiency and effectiveness of cybersecurity examinations across the regulatory authorities.

Data Gaps and Challenges

The 2008 financial crisis revealed gaps in the data needed for effective oversight of the financial system and in internal firm risk management and reporting capabilities. Since the crisis, important steps have been taken, including developing and implementing new identifiers for financial data. Significant gaps remain, however, as some market participants continue to use legacy processes that rely on data that are not aligned to definitions from relevant consensus-based standards. Gaps and legacy processes 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 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 trade repository data needed to fulfill their mandates.

Financial Innovation

Financial innovation can offer substantial benefits to consumers and businesses by meeting unfulfilled or emerging needs or by reducing costs, but it may also create new risks and vulnerabilities. For example, there has been an increase in the number and type of digital assets with many increasing in value. Much like traditional assets, digital assets can also be subject to operational and counterparty risks that could prove disruptive to users and the digital asset ecosystem as a whole.

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

The Council encourages agencies to continue to monitor and analyze 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, promote consistent regulatory approaches, as well as to identify and address potential risks that arise from such innovation.

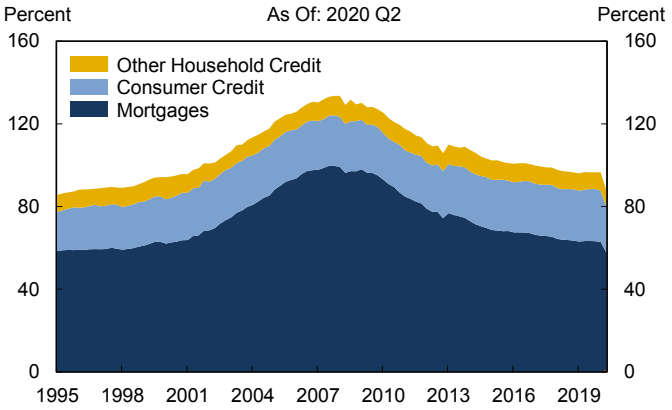
3 Financial Developments

3.1 Household Finance

Prior to the onset of the COVID-19 pandemic, households were generally in sound financial condition. In contrast to the lead up to the 2008 financial crisis, debt levels, both in real terms and as a percentage of disposable income, were relatively low, and household credit growth was concentrated in prime borrowers. Additionally, household debt service ratios and delinquency rates were low. Disruptions to economic activity caused by the pandemic introduced considerable stress to households, however. The unemployment rate surged from 3.5 percent in February to a record high of nearly 15 percent in April. Since then, extraordinary measures undertaken by policymakers have succeeded in arresting the decline in economic conditions, initiating a recovery and lowering the unemployment rate to 7.9 percent as of September. While considerable uncertainty remains concerning the path of the economic recovery, delinquencies may increase significantly as federal aid packages and forbearance programs phase out.

Following a sharp decline between 2008 and 2011, household debt has since grown moderately, totaling $14 trillion in the second quarter of 2020. While nominal household debt is at record levels, it remains approximately $1 trillion below 2009 levels when adjusted for inflation. In addition, the ratio of household debt to disposable personal income has trended downward in recent years, as disposable income growth has outpaced household debt growth. As of the fourth quarter of 2019, household debt as a percentage of personal income stood at 97 percent, well below the peak of 134 percent in the fourth quarter of 2007 (**Chart 3.1.1**). By the second quarter of 2020, household debt as a percentage of disposable income declined by eight percentage points as consumer spending

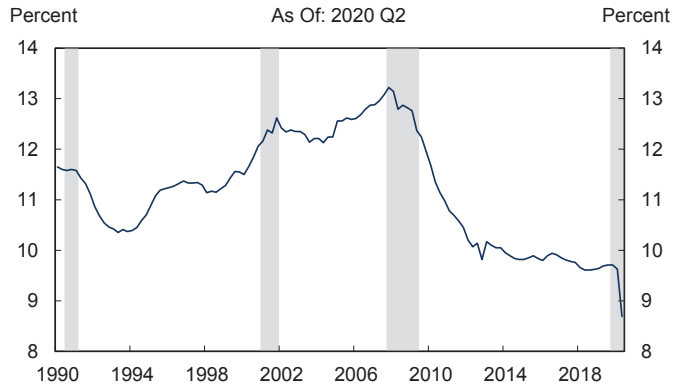
3.1.1 Household Debt as a Percent of Disposable Personal Income



Source: BEA, Federal Reserve, Haver Analytics

Note: Other Household Credit includes debts of both households and nonprofits.

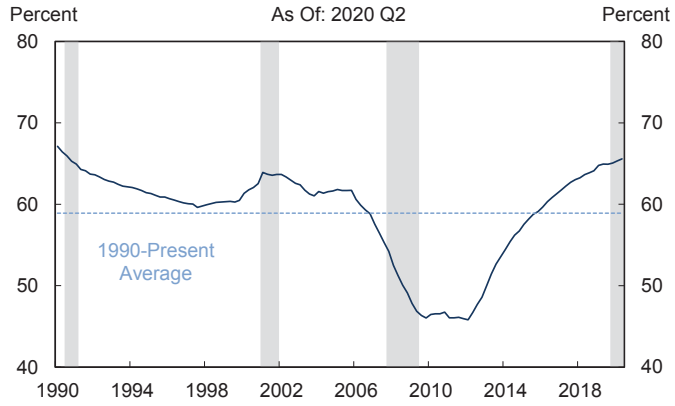
3.1.2 Household Debt Service Ratio



Source: Federal Reserve, Haver Analytics

Note: Ratio of debt-service payments to disposable personal income. Seasonally adjusted. Gray bars signify NBER recessions.

3.1.3 Owners' Equity as Share of Household Real Estate



Source: Federal Reserve, Haver Analytics

Note: Gray bars signify NBER recessions.

fell dramatically and federal aid helped support incomes. The personal saving rate—a measure of personal savings as a percentage of disposable personal income—spiked to 34 percent in April 2020, exceeding the previous record of 17 percent established in 1975. While the personal saving rate has since declined to 14 percent as of September 2020, it remains well above the 30-year average of 6.7 percent.

Rising incomes and years of low interest rates helped keep the household debt service ratio—the ratio of debt service payments to disposable personal income—near 30-year lows through the first quarter of 2020 and little changed since 2018, before falling to record lows in the second quarter of 2020 (**Chart 3.1.2**). The share of owners' equity in household real estate continued to increase from its lows in 2012 and has returned to the range that prevailed in the early 2000s (**Chart 3.1.3**).

On net, 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 -income households. Between the fourth quarter of 2009 and the fourth quarter of 2019, households above the 80th percentile saw their net worth increase by an annualized rate of 7.4 percent, while households below the 80th percentile saw their net worth increase by an annualized rate of 4.1 percent. Households below the 20th percentile experienced a decrease in their household net worth at an annualized rate of -1.2 percent. While household net worth declined by 5.5 percent in the first quarter of 2020, it has since rebounded to pre-pandemic levels, as stock prices recovered from pandemic-related economic and financial market uncertainty.

In the last decade, consumer credit—which primarily consists of credit card debt, student loans, and auto loans—has grown at a faster pace than mortgage debt, and now accounts for about one-quarter of household debt. This growth can be attributed to increases in student loan and auto loan debt over credit card and other household debt. However, in the midst of the pandemic, total consumer credit declined

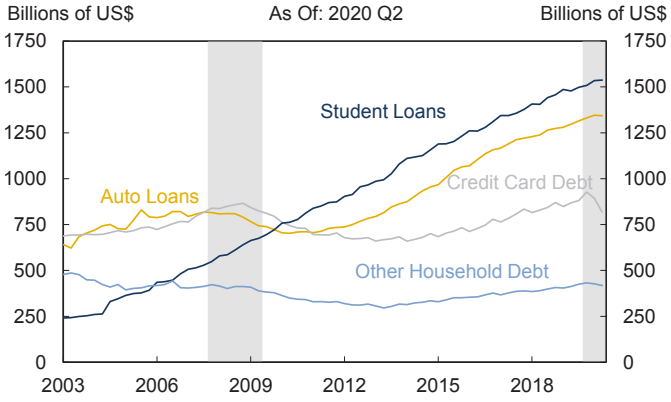
as credit card balances fell by an unprecedented $110 billion between the fourth quarter of 2019 and the second quarter of 2020. By contrast, auto and student loan balances were little changed during this period (**Chart 3.1.4**).

Borrowers with prime credit scores have driven increases in loan balances over the last ten years. As of June 2020, subprime borrowers accounted for 12 percent of loan balances, well below the fourth quarter of 2009 peak when subprime borrowers accounted for 21 percent of loan balances. Total loan balances for prime borrowers continued to increase throughout the pandemic, as the steady growth in mortgages more than offset the notable second quarter decline in credit card debt for this group. Alternatively, total loans for subprime borrowers ticked down in the second quarter of 2020, with mortgages, auto loans, and credit card debt all decreasing.

Credit standards have tightened since the start of the pandemic, impeding credit markets access for some. According to the April and July 2020 Senior Loan Officer Opinion Survey (SLOOS), banks have, on balance, tightened standards and terms on all types of consumer loans since the onset of the pandemic, and the July survey indicated that the levels of standards were reportedly at the tighter end of the 2005-2020 range. In addition, according to a Federal Reserve survey of finance companies performed in early May, consumer auto lending standards at finance companies tightened somewhat relative to before the pandemic outbreak. At the same time, banks also reported that demand for credit weakened substantially in the April and July 2020 SLOOS.

Credit inquiries for new mortgages fell dramatically starting in the second week of March relative to both the first week and the trend in previous years. Inquiries for new auto loans and credit cards also fell considerably. While auto and new mortgage inquiries have largely recovered, credit card inquiries remain substantially below pre-pandemic levels (**Chart 3.1.5**).

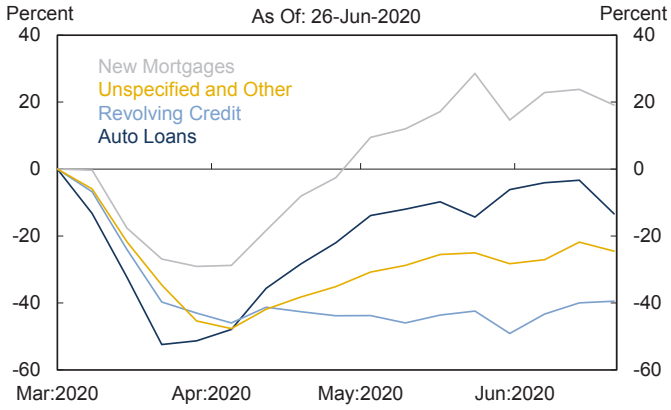
3.1.4 Components of Consumer Credit



Source: FRBNY Consumer Credit Panel/Equifax, Haver Analytics

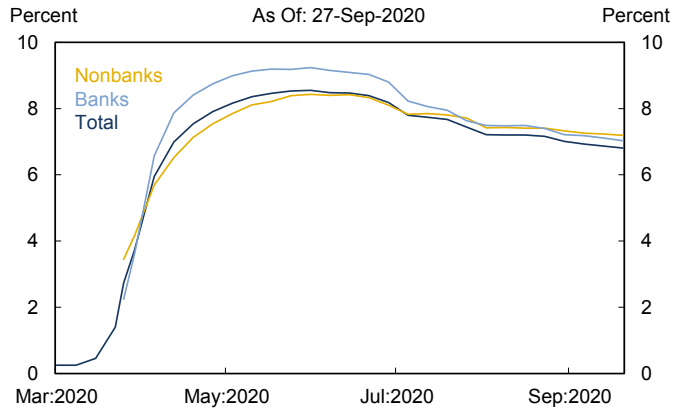
Note: Gray bars signify NBER recessions.

3.1.5 Change in Inquiries Relative to First Week of March 2020



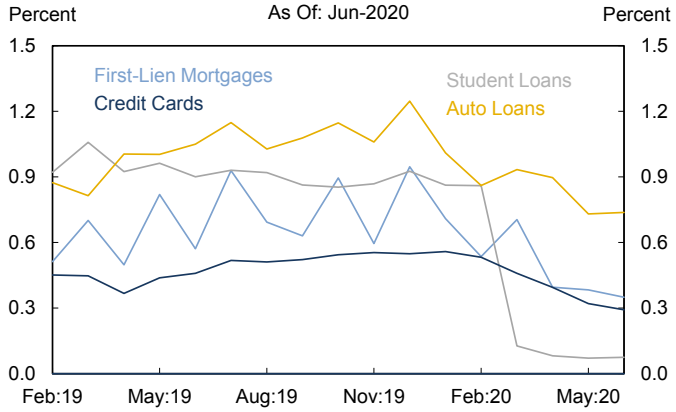
Source: CFPB

3.1.6 Percentage of Mortgages in Forbearance



Source: Mortgage Bankers Association

3.1.7 Share Of Open Accounts that Transitioned to Delinquent



Source: CFPB

The economic impact of COVID-19 caused strains on household finances that several government actions, including stimulus payments, extended unemployment benefits, and mortgage payment forbearance, aimed to alleviate. The share of mortgage loans in forbearance increased sharply at the start of the second quarter before flattening and even declining in recent months (**Chart 3.1.6**).

As of June 2020, credit record data did not show evidence of increasing delinquencies on major forms of household credit during the early months of the pandemic, in contrast to the U.S. experience in the Great Recession. In fact, delinquencies on household debt declined between February and June. Policy interventions at the federal, state, and local levels, which counteracted income and employment shocks, likely contributed to this decline in delinquencies. Beyond direct income supports such as higher unemployment insurance benefits, these policies include programs aimed specifically at providing payment assistance to consumers with certain types of credit. At the same time, the stable delinquency rates can be attributed to temporary provisions within the CARES Act mandating that loans enrolled in forbearance be reported at the level of delinquency as of the time of the accommodation (**Chart 3.1.7**).

The COVID-19 pandemic has led to a sharp increase in consumers seeking forbearance or loss mitigation assistance from lenders. The approximately 17,000 furnishers of information to the nationwide consumer reporting agencies vary meaningfully in their level of sophistication and ability to accurately report consumer data through this period of financial stress. In addition, as discussed in **Section 3.4.5**, credit scores have not generally been negatively affected by COVID-19 as a result of certain forbearance provisions in the CARES Act. Accurate information on consumer creditworthiness is important for the functioning of consumer credit markets and the broader economy. Inaccurate information in consumer credit files may impair the

functioning of consumer lending and other markets reliant on consumer credit report information. It may be costly for furnishers to improve the accuracy of their reporting, however, especially given the stress caused by the pandemic.

In the coming months, federal aid and forbearance assistance programs are set to expire, with forbearance assistance on federal student loans held by the Department of Education expiring in December 2020 and forbearance assistance for federally backed mortgages expiring in the first quarter of 2021. These programs, along with analogous state government programs and voluntary programs set up by private lenders, have helped keep delinquencies low in the immediate aftermath of the COVID-19 pandemic. The elevated rates of forbearance on mortgages and other forms of household credit, however, indicate that delinquencies may increase significantly as programs expire.

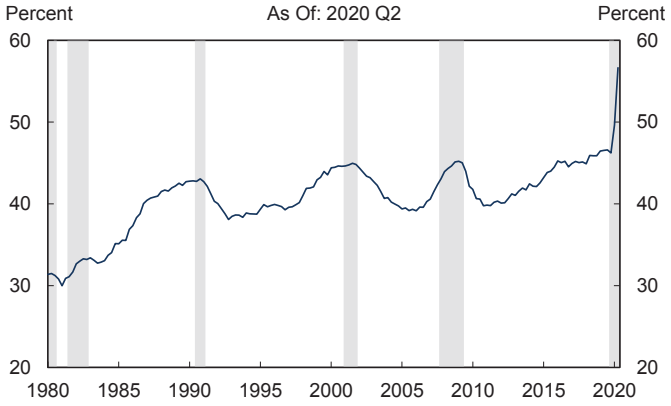
3.2 Nonfinancial Business Finance

3.2.1 Corporate Debt

Nonfinancial firms entered 2020 with increasingly high levels of debt, pushing the corporate debt-to-GDP ratio to record high levels (**Chart 3.2.1.1**). Debt levels were also high when compared to corporate earnings (**Chart 3.2.1.2**). As the economic effects of COVID-19 unfolded, corporate credit quality deteriorated as debt levels increased further and earnings declined.

Financial market conditions deteriorated sharply after the onset of the COVID-19 outbreak. Many firms accessed their lines of credit to preserve cash and liquidity given the heightened uncertainty of future revenues. These actions sharply increased bank credit exposures to nonfinancial firms in the first half of 2020. Several government relief programs have helped many businesses obtain credit and maintain operations, though considerable credit risk remains given the uncertain economic outlook. Bank lending increased

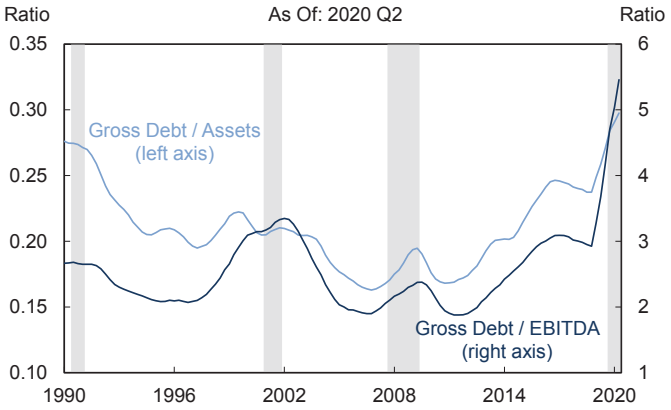
3.2.1.1 Nonfinancial Corporate Credit as Percent of GDP



Source: Federal Reserve, Haver Analytics

Note: Gray bars signify NBER recessions.

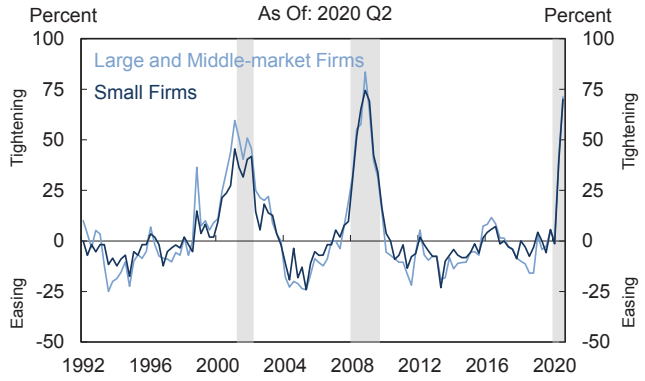
3.2.1.2 U.S. Nonfinancial Business Leverage



Source: Compustat, Haver Analytics

Note: Four-quarter moving average of the median ratio. Includes rated and unrated nonfinancial businesses. Gray bars signify NBER recessions.

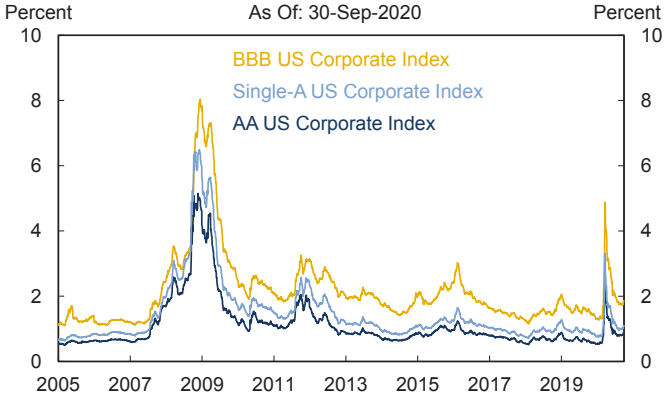
3.2.1.3 Bank Business Lending Standards



Source: Federal Reserve Senior Loan Officer Opinion Survey

Note: Represents net percentage of banks reporting tightening standards for C&I loans. Large and middle-market firms are those with annual sales of $50 million or more. Gray bars signify NBER recessions.

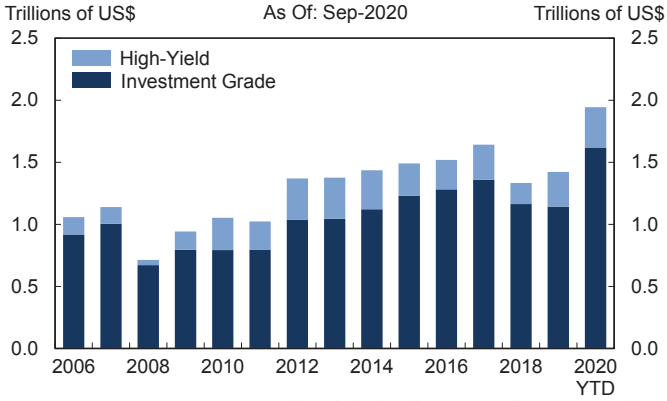
3.2.1.4 Investment Grade Corporate Bond Spreads



Source: Ice Data Indices, ICE BofA US, FRED

Note: The ICE BofA Option-Adjusted Spreads (OASs) are the calculated spreads between a computed OAS index of all bonds in a given rating category and a spot Treasury curve.

3.2.1.5 Gross Issuance of Corporate Bonds



Source: Refinitiv, SIFMA

Note: Includes all non-convertible corporate debt, MTNs, and Yankee bonds, but excludes all issues with maturities of 1 year or less and CDs.

in the second quarter of 2020 because of the increase in small business lending under the Small Business Administration's (SBA's) Paycheck Protection Program (PPP), which offset the decline in lending under lines of credit. Outside of the PPP, however, the supply of bank credit appears to have decreased as indicated by the Federal Reserve's SLOOS. The percent of respondents reporting a tightening of standards reached the highest level since 2008 (**Chart 3.2.1.3**).

At the height of the March 2020 COVID-19 market stress, corporate bond issuance came to a near-halt as secondary market liquidity dried up and investment grade corporate credit spreads surged to levels not seen since the 2008 financial crisis (**Chart 3.2.1.4**). However, market conditions improved following the announcement of the Federal Reserve's Primary Market and Secondary Market Corporate Credit Facilities. These facilities led to a significant tightening in credit spreads and bid-ask spreads for investment grade corporates. Financing conditions were further supported by the Federal Open Market Committee's (FOMC's) decision to reduce the target federal funds rate to near zero percent, allowing investment grade firms to issue new debt at historically low yields.

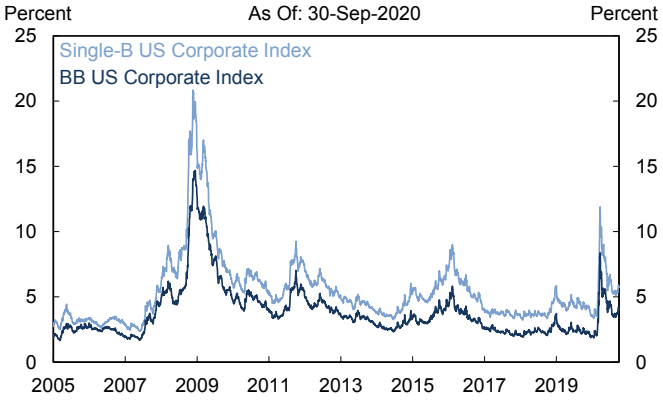
Consistent with more accommodative financing conditions, issuances of investment grade corporate bonds hit a record $298 billion in April, and in the first nine months of 2020, gross issuance of investment grade corporate bonds totaled $1.6 trillion compared to $1.1 trillion for all of 2019 (**Chart 3.2.1.5**). Corporations raising cash buffers, paying down drawn revolving credit lines, and refinancing existing debt at more favorable interest rates were primarily responsible for the record level of issuances. While share repurchases and dividend distributions still account for a sizeable portion of corporations' use of proceeds, during the first half of 2020, nonfinancial corporations increased their holdings of domestic bank deposits (checking and time deposit accounts) and currency by $580 billion,

a 40 percent increase relative to the fourth quarter of 2019.

Spreads on high-yield corporate bonds, which were at very low levels prior to the COVID-19 pandemic, increased significantly during the March 2020 market stress (**Chart 3.2.1.6**). The stress observed in the high-yield corporate bond market effectively shut down the primary market and according to Standard & Poor's Leveraged Commentary & Data (S&P LCD), only five bonds were priced in March, raising a total of $4.2 billion. This represents a decline of 86 percent from February 2020, when approximately $30 billion was raised, and a decline of 81 percent from March 2019, when $22 billion was raised. High-yield spreads have since compressed considerably but remain above pre-pandemic levels. Nevertheless, the decline in risk-free rates has meant that effective yields on high-yield corporate bonds are now at or near pre-pandemic levels. As of September 30, 2020, the effective yield on the ICE BofA US High Yield Index was 5.8 percent compared to 5.7 percent on September 30, 2019. With the return of more normal market conditions, high-yield borrowers returned to the market and in the first nine months of 2020, gross issuance of high-yield corporate bonds totaled $325 billion compared to $279 billion for all of 2019. Although most high-yield bonds are not eligible for the Federal Reserve's programs or facilities, much of the improvement in pricing is attributed to the implementation of these programs and to the low interest rate environment.

After a few years of robust growth, issuance of leveraged loans came to a halt in March, and spreads widened significantly, peaking at over 1,000 basis points in late March. Since then, spreads have compressed by over 500 basis points to 493 basis points as of September 30, 2020 (**Chart 3.2.1.7**). In contrast to the record level of issuance in the investment grade and high-yield corporate bond markets, issuance in the leveraged loan market remains subdued relative to pre-pandemic levels (**Chart 3.2.1.8**). Demand from collateralized loan obligations

3.2.1.6 High-Yield Corporate Bond Spreads



Source: Ice Data Indices, ICE BofA US, FRED

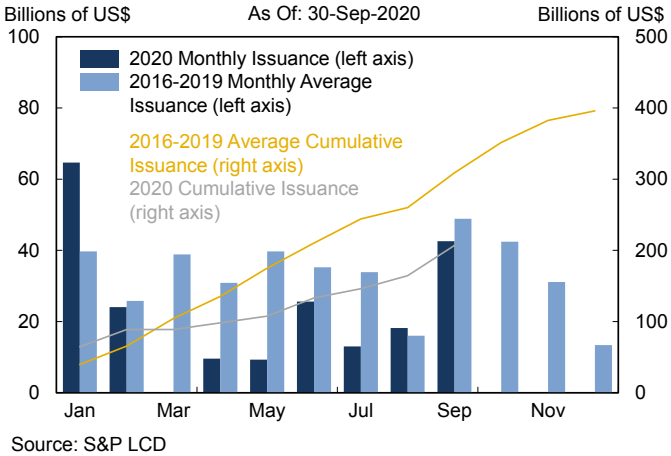
Note: The ICE BofA Option-Adjusted Spreads (OASs) are the calculated spreads between a computed OAS index of all bonds in a given rating category and a spot Treasury curve.

3.2.1.7 Leveraged Loan Spreads

Source: S&P LCD

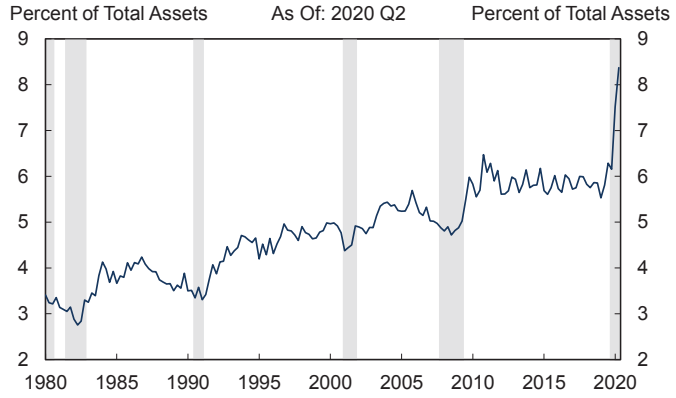
Note: Spread-to-maturity for syndicated loans included in the S&P LCD Leveraged Loan Index.

3.2.1.8 Institutional Leveraged Loan Issuance



Source: S&P LCD

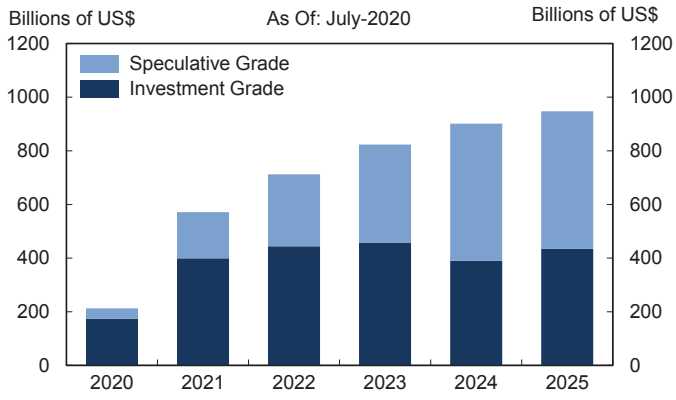
3.2.1.9 Nonfinancial Corporations Liquid Assets



Source: Federal Reserve, Haver Analytics

Note: Liquid assets includes foreign deposits, checkable deposits and currency, time and savings deposits, money market fund shares, security repurchase agreements, debt securities, and mutual fund shares. Gray bars signify NBER recessions.

3.2.1.10 Maturity Profile of U.S. Nonfinancial Corporate Debt



Source: S&P Global Ratings Research

Note: Includes bonds, loans, and revolving credit facilities that are rated by S&P Global Ratings.

(CLOs), which purchased approximately 60 percent of the syndicated loan issuances in 2019, waned in 2020. As of September 30, 2020, CLO volumes totaled $60 billion year-to-date, a 33 percent decline compared to the first nine months of 2019.

Some factors mitigate the burden of the debt accumulated by corporations. Low interest rates support interest coverage ratios for nonfinancial firms. In addition, firms have accumulated record levels of liquid assets which they can use as a buffer against the drop in revenues (**Chart 3.2.1.9**). The immediate refinancing risk is limited, and the high-yield debt accounts for 27 percent of U.S. nonfinancial debt maturing through 2021 compared to 56 percent of U.S. nonfinancial debt maturing in 2024 (**Chart 3.2.1.10**). However, nonfinancial corporations with lower revenues and additional debt outstanding may face increased constraints in deleveraging as higher debt servicing requirements may constrain future expansion.

Despite these mitigating factors, the COVID-19 pandemic has led to a contraction in economic activity and corporate profits. This contraction has resulted in a sharp deterioration in the credit quality of nonfinancial businesses. During the first nine months of 2020, approximately $2 trillion of U.S. nonfinancial corporate debt was downgraded by Standard & Poor's (S&P), with the majority of these downgrades occurring in March, April, and May. The COVID-19 pandemic has also negatively impacted credit performance. Default rates on leveraged loans and corporate bonds have increased notably from the pre-crisis lows, though they are still below those observed during the 2008 financial crisis. Amid uncertainty about the pandemic and future economic growth, downside risks for business credit quality and solvency remain.

Box A: Nonfinancial Corporate Credit: Financial Market Fragilities and the COVID-19 Pandemic

Prior to the COVID-19 pandemic, U.S. corporate debt ratios were elevated, leaving firms more vulnerable to an earnings shock. During the early phase of the crisis, debt ratios increased even further as corporations drew down revolving credit facilities to cover emergency liquidity and operating needs, while earnings declined.

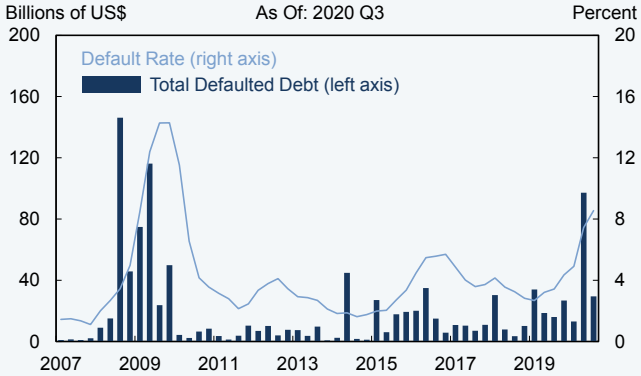
In response to the crisis, the Federal Reserve and Treasury launched a series of corporate lending facilities to enable markets to function more effectively. Following these extraordinary actions, corporate bond issuance surged to record levels, credit spreads narrowed, and bid-ask spreads tightened (**see Section 3.2.1**). Looking forward, there is significant uncertainty in the corporate sector outlook. In an adverse scenario, corporate defaults and bankruptcies could increase significantly. Additionally, significant debt overhang and an acceleration in credit rating downgrades could lead to increased debt servicing costs, limiting efficient allocation of capital and dragging on the economic recovery.

Rising defaults and bankruptcies among high-yield borrowers

In 2020 an increasing number of high-yield firms defaulted on debt obligations and filed for bankruptcy. This adverse trend is expected to continue as corporate fundamentals weaken further for companies in industries that have been particularly challenged by COVID-19, such as the retail, airline, travel, and hospitality industries.

The trailing four quarter U.S. high-yield corporate default rate rose to 8.5 percent in the third quarter of 2020, from 3.4 percent a year ago (**Chart A.1**). In October 2020, Moody's forecasted that the trailing twelve month default rate will peak at 10 percent in March 2021 under its baseline scenario, lower than the 15 percent peak in November 2009. U.S. corporate bond and syndicated loan defaults surged in the second quarter of 2020, when defaults totaled $97 billion, the highest since 2009. These numbers do not include defaults of small and medium-sized enterprises (SMEs), which employ close to 50 percent of U.S. workers, have limited access to capital markets, and are more vulnerable to economic shocks.

A.1 U.S. Corporate Defaults

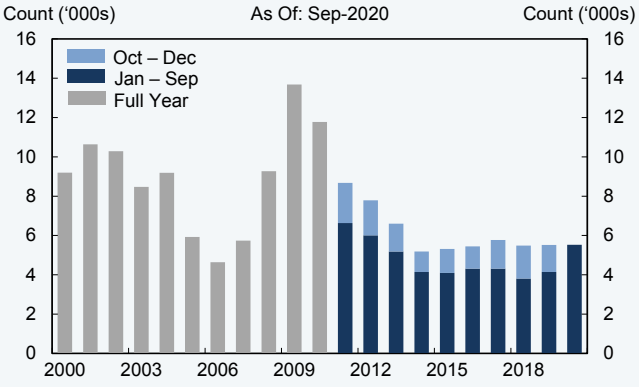


Source: Moody's Investors Service, OFR

Note: Issuer weighted four quarter trailing default rate for speculative grade U.S. corporates.

Business bankruptcy filings are also increasing, with Chapter 11 business filings exceeding 5,500 year-to-date through September, compared to 4,100 over the same period in 2019 (**Chart A.2**). While the path of the economic recovery remains uncertain, the pace of filings may accelerate going forward as some federal assistance programs begin to roll-off.

A.2 Chapter 11 Bankruptcy Filings



Source: ABI, AACER

Note: Annual bankruptcy filings from 2000 – 2010. Monthly bankruptcy filings from 2011 – 2020.

Box A: Nonfinancial Corporate Credit: Financial Market Fragilities and the COVID-19 Pandemic

The U.S. bankruptcy system provides important benefits, including enabling borrowers to continue operating during the bankruptcy process while debts are restructured. However, a sudden wave of bankruptcy filings could overwhelm the bankruptcy system, resulting in congested courts and limited access to debtor-in-possession (DIP) financing. In the event of a protracted restructuring process, firms without access to DIP financing may have insufficient cash flows to cover day-to-day operations. A sudden spike in liquidations could impede the economic recovery through various channels, including increased job cuts, reduced capital spending, and a tightening in lending standards for business loans due to increased creditor losses.

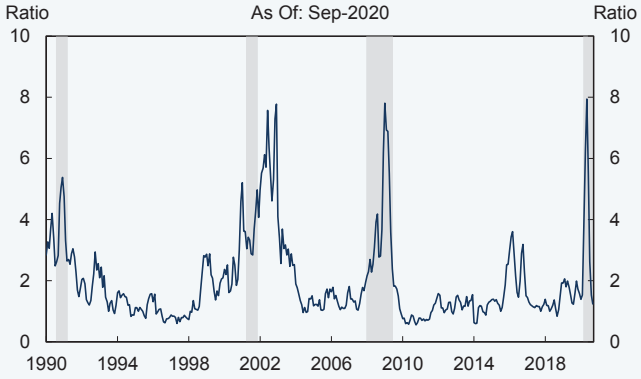
In response to these challenges, the Federal Reserve and Treasury established the Main Street Lending Program, a series of business lending facilities, to support small and medium-sized businesses. As of September 30, 2020, the total amount of loans outstanding under this facility was $2.2 billion.

Credit rating downgrades further stress corporate bond and CLO markets

Credit ratings downgrades accelerated in the spring as corporate credit fundamentals deteriorated. By May 2020, the rolling 3-month ratio of nonfinancial corporate downgrades to upgrades hit 7.9, the highest level on record (**Chart A.3**). Ratings actions stabilized in the summer of 2020, and the ratio of downgrades to upgrades fell to slightly above one for the three months ending September 2020.

A large percentage of these recent downgrades pertain to "fallen angels," issuers downgraded from investment grade to high-yield. According to the ICE BofA U.S. Corporate Index, fallen angels totaled $250 billion year-to-date as of September, significantly exceeding annual levels over all prior years (**Chart A.4**). The Federal Reserve and Treasury established the Primary and Secondary Market Corporate Credit Facilities to provide a funding backstop for eligible corporate debt and to support market liquidity for

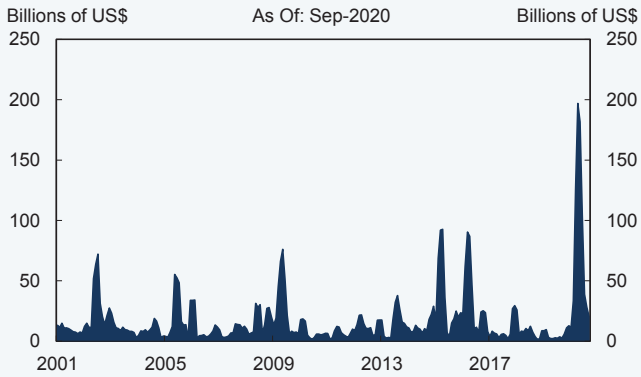
A.3 U.S. Nonfinancial Corporate Downgrade-Upgrade Ratio



Source: Moody's, Haver Analytics, OFR

Note: Ratio is trailing 3-month downgrades divided by upgrades. Gray bars signify NBER recessions.

A.4 Fallen Angel Debt



Source: BofA Global Research, ICE Data Services, OFR

Note: Rolling three months beginning in March 2020. Includes financial issuers. Fallen angels above refer to issuers previously included in the BofA U.S. Corporate Index.

corporate debt. These facilities were subsequently expanded to include certain fallen angel debt, which has helped restore investor confidence and mitigate disruptions resulting from credit rating downgrades.

Another concern regarding downgrades involves corporate borrowers that rely on the syndicated leveraged loan market. Loan-only issuers represented 63 percent of 2019 syndicated loan issuance, according to S&P LCD. In recent years, CLOs have been the major purchaser of leveraged loans, accounting for approximately 60 percent of primary issuance according to S&P LCD. Demand from CLOs waned in the spring, however, as performance metrics for existing CLOs such as over-collateralization ratios, weighted average rating factors, and triple-C buckets, have been adversely affected by the recent wave of loan downgrades. As of June 2020, over 20 percent of CLOs were failing junior over-collateralization tests, according to Moody's. Even so, the trailing twelve month default rate for syndicated loan issuers totaled 4.6 percent as of September 2020, well below the 8.2 percent default rate seen in November 2009. While issuers that can access funding via the corporate bond market may be less adversely impacted, issuers that rely exclusively on the syndicated loan market may face a tightening in financing conditions.

3.2.2 Equities

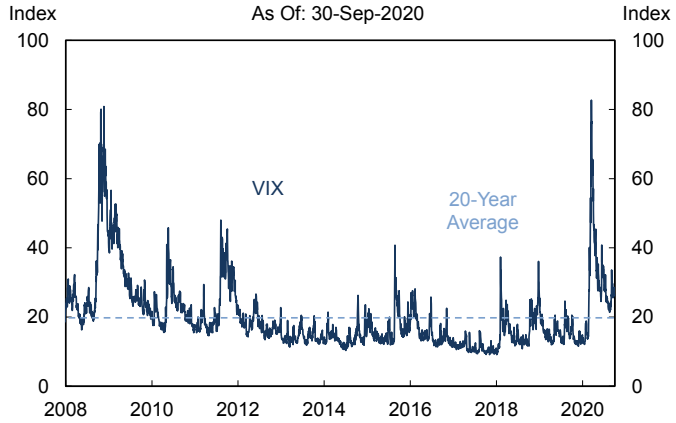
The U.S. equity market entered 2020 on the heels of one of its best annual gains in the last two decades. Despite investor concern over global trade policy and the sustainability of the longest U.S. economic expansion on record, the S&P 500 climbed 29 percent in 2019. Led by a sharp rise in tech stocks, the U.S. index outpaced most of its global peers, with benchmarks in Japan, Europe, and China rising 18 percent, 25 percent, and 22 percent in 2019, respectively. Emerging market stocks also gained 15 percent on average. By the end of 2019, market analysts widely expected U.S. and global equity markets to climb higher, albeit at a slower pace, with anticipated support from accommodative Federal Reserve policy and progress towards the U.S.-China Phase One trade agreement.

Indeed, U.S. stocks continued to hit new highs at the start of 2020, with markets reacting positively to the official signing of a U.S.-China Phase One trade agreement on January 15. However, investors grew increasingly attentive to press reports describing a novel coronavirus outbreak originating in Wuhan, China. With investors citing new risks to global demand and supply chains, global stock markets endured substantial volatility, beginning in Asia. As COVID-19 intensified and spread to Europe—and the economic impact of sustained lockdown measures became apparent—risk sentiment took a sharply negative turn.

Selling pressure in global equity markets intensified in March as energy producers suffered from a global collapse in demand and Saudi Arabia and Russia failed to reach an agreement on oil output cuts, sending commodity prices sharply lower. Between February 19 and March 23, the S&P 500 fell by 34 percent, with industries most directly affected by the virus, such as air carriers, cruise lines, and energy producers, leading the decline in U.S. stocks.

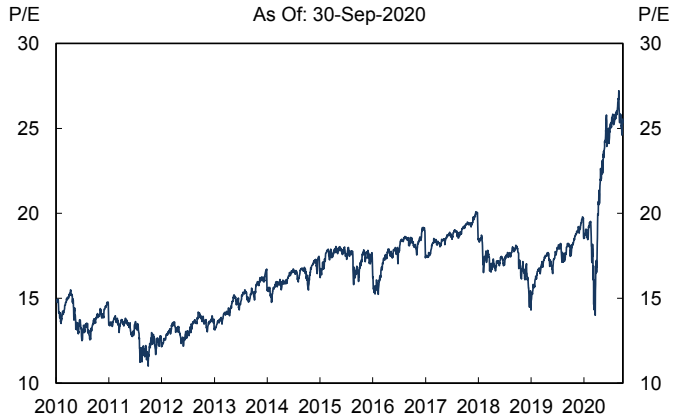
During the March 2020 sell-off, the Chicago Board Options Exchange Volatility Index (VIX)—a measure of implied stock market volatility conveyed by options prices—spiked to a level exceeding that which was seen during the 2008 financial crisis, reaching 83 in mid-March after entering the year at 14 (**Chart 3.2.2.1**). Realized stock market volatility also exceeded 2008 levels, with the S&P 500 falling by nearly 12 percent on March 16, its largest one-day drop since 1987.

3.2.2.1 S&P 500 Volatility



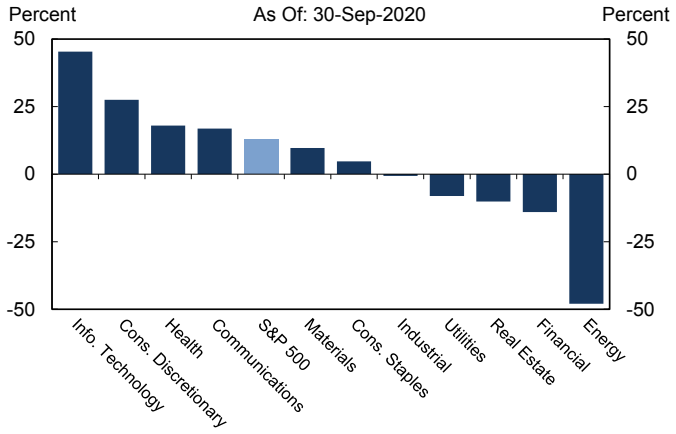
Source: Bloomberg, L.P.

3.2.2.2 S&P 500 Forward Price-to-Earnings Ratio



Source: Bloomberg, L.P.

3.2.2.3 S&P 500 1-Year Price Returns by Sector



Source: Bloomberg, L.P.

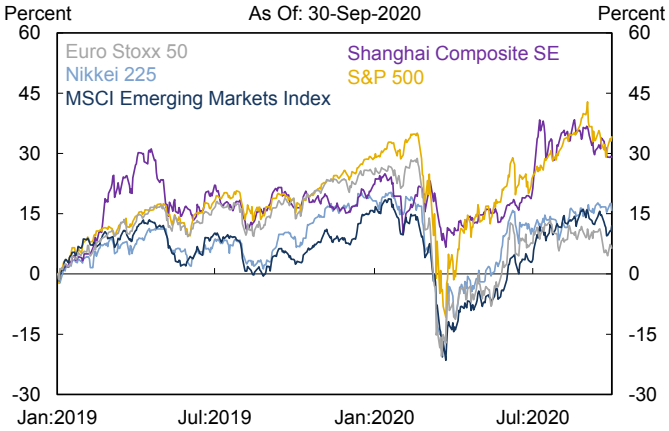
The velocity of the selloff triggered market-wide circuit breakers for the first time since 1997. These circuit breakers, revised in the aftermath of the 2010 flash crash, were designed to halt trading if price declines reached a level that could exhaust market volatility. Under Level 1 and Level 2 circuit breakers—which are set at 7 percent and 13 percent of the closing price for the previous day—trading pauses for 15 minutes. Under the Level 3 circuit breaker—which is set at 20 percent—trading will halt for the remainder of the day. Between March 9 and March 18, the Level 1 circuit breaker was triggered four times, three of which occurred in the opening minutes of trading. In each instance, the resumption of trading after the halt was relatively orderly, and the Level 2 and Level 3 circuit breakers were not breached.

During the March 2020 equity market sell-off, the S&P 500's 12-month forward price-to-earnings ratio—a popular valuation metric—fell to a low of 14x, even as analysts penciled in sharp downward revisions to expected corporate profits (**Chart 3.2.2.2**). By the end of March, risk sentiment began to improve amid unprecedented policy easing. In terms of monetary policy, the Federal Reserve announced open-ended purchases of Treasury and MBS and the purchase of corporate bonds, among other extraordinary measures, after cutting the target federal funds rate to near zero. Regarding fiscal policy, Congress passed fiscal packages totaling approximately $2.6 trillion to support the economy and boost investor sentiment. Improved market functioning and a rebound in economic activity in the third quarter of 2020 helped propel the broad-based recovery in global stocks. As of September 30, the S&P 500 was up 4.1 percent on the year and its forward price-to-earnings ratio had risen above 25x. At the sector level, the recovery was driven primarily by large-cap tech stocks, which analysts viewed as among the main beneficiaries of changing consumer and business behaviors (**Chart 3.2.2.3**).

Outside of the U.S., the aggressiveness of countries' economic and health policy

responses to COVID-19 helped drive differentiated price action (**Chart 3.2.2.4**). For example, Asian stock markets generally outperformed their global peers, which analysts have attributed to the relatively swift containment of COVID-19. As of September 30, Chinese, South Korean, and Taiwanese indices were 5.5 percent, 5.9 percent, and 4.3 percent higher, respectively, year-to-date. Meanwhile, the benchmark euro area stock index (Euro Stoxx 50) was 15 percent lower on the year as of September 30, and bourses in Latin America—where the COVID-19 outbreak has generally proved more widespread and economic activity remains relatively subdued—have underperformed.

3.2.2.4 Performance of Global Stock Indices



Source: Bloomberg, L.P.

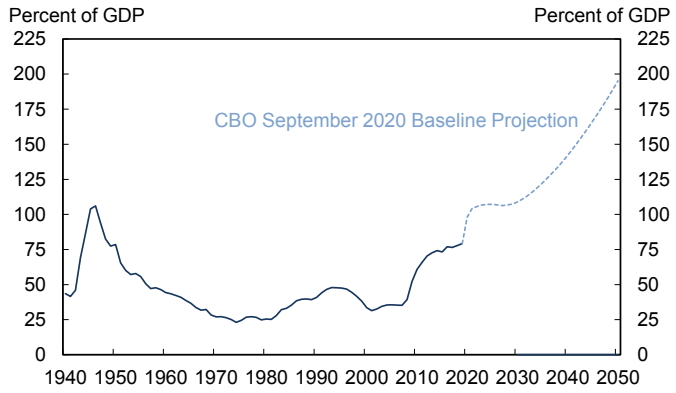
Note: Indexed to 01-Jan-2019.

3.2.3 Nonfinancial Non-Corporate Debt

Small businesses were hit particularly hard by COVID-19. In the industries most affected by COVID-19 (such as restaurants, food and beverage, and retail), roughly half of small businesses that operated in January were not open by mid-April due to shut-down orders, according to Homebase. While the share of firms in these industries that remain closed has declined substantially since then, more than 20 percent of them are still not open. The share of hourly workers working over that same period is even lower, suggesting that even among open businesses, operations remain reduced relative to their pre-COVID-19 levels.

As the uncertainty surrounding COVID-19 began and small business funding needs increased, lenders began tightening standards, increasing spreads on loans to small businesses. As a result, the SBA's PPP was essential for the survival of many small businesses. PPP has been the COVID-19-related relief program most utilized by small businesses, and approximately two-thirds of PPP loans were originated by small and mid-sized banks. According to the SBA's data, the PPP program supported an estimated 51 million American jobs, covering over 80 percent of small business payrolls. The funding was only designed to cover two and a half months of payroll, however. Needs are likely to increase further as many businesses remain

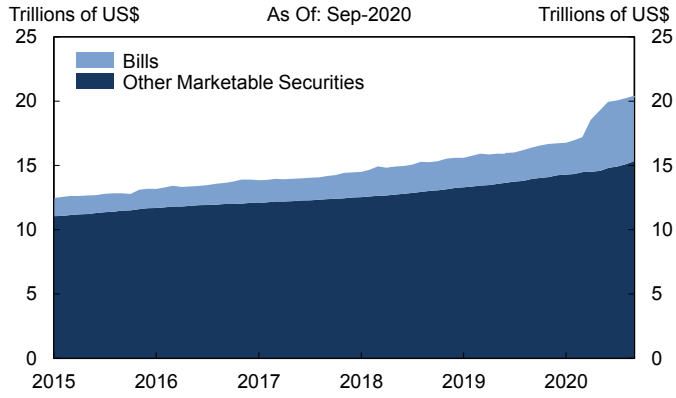
3.3.1.1 Federal Debt Held by the Public



Source: CBO, Haver Analytics

Note: Data for fiscal years. Years after 2019 are projected.

3.3.1.2 Publicly Held Treasury Securities Outstanding



Source: Federal Reserve, Haver Analytics

Note: Other marketable securities includes notes, bonds, TIPs, and FRNs.

closed or operate at reduced capacity. Recent surveys of small businesses indicate that at least a quarter of small businesses believe they will need additional financial assistance in the next six months in order for their business to survive, with about a third of firms holding less than one month of cash on hand.

Small business loan performance has deteriorated through the pandemic. As of September 2020, PayNet's measure of short and long-term delinquencies was 18 percent higher than in February and stood at levels last seen in 2011. Similarly, PayNet's measure of small business defaults was 43 percent higher in September than in February. Most lenders have indicated that they have modified and extended terms for many of their small business borrowers; thus, these numbers could understate the difficulties that small businesses are having in staying current.

3.3 Government Finance

3.3.1 Treasury Market

In early 2020, the United States was facing its deepest recession since the Great Depression. In light of this, Congress enacted four rounds of fiscal assistance, totaling $2.6 trillion. These fiscal packages provided much-needed support to households, businesses, municipalities, and other entities through the initial lockdowns and recovery. However, the additional spending is expected to push the 2020 primary deficit to 16 percent of GDP, a 70-year high. This will lead to a sharp increase in the amount of debt outstanding. In September 2020, the Congressional Budget Office projected that public debt will rise to approximately 110 percent of GDP in 2030 and 195 percent of GDP in 2050 (**Chart 3.3.1.1**).

The amount of U.S. Treasury securities outstanding grew from $17 trillion in February to $20 trillion in September, following the additional fiscal spending (**Chart 3.3.1.2**). New issuance has been primarily in the form of Treasury bills, which now account for 25 percent of outstanding debt compared to 15 percent

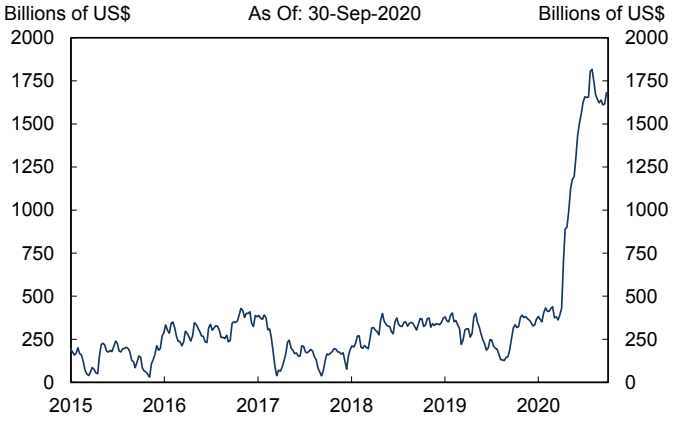
at year-end 2019. In addition, the weighted average maturity of marketable debt has fallen from 70 months at year-end 2019 to 63 months as of September 30, 2020. The Treasury General Account (TGA) at the Federal Reserve swelled to $1,679 billion as of September 30, compared to $370 billion at year-end 2019 (**Chart 3.3.1.3**). The record-high TGA balance was driven by several factors, including the unprecedented size and ongoing uncertainty regarding the timing of COVID-19-related outlays.

Between August 2019 and August 2020, foreign holdings of U.S. sovereign debt increased by 2.3 percent to $7.1 trillion. Over this period, Japan overtook China as the largest foreign holder of U.S. sovereign debt, with $1.3 trillion in holdings as of August 2020. While China has reduced its holdings of U.S. Treasury securities in recent years, they remained fairly stable year-over-year, totaling $1.1 trillion as of August 2020.

Treasury yields declined considerably in 2020 as investors rapidly reassessed the economic outlook in light of the COVID-19 pandemic (**Chart 3.3.1.4**). Between December 31, 2019 and September 30, 2020, the yield on the 2-year Treasury decreased by 145 basis points and the yield on the 10-year Treasury decreased by 123 basis points. Yields fell most dramatically in the early days of the COVID-19 market stress, with the yield on the 10-year Treasury falling by 98 basis points between February 20 and March 9. While the yield on the 10-year Treasury stabilized in the following months, it closed at a record low of 0.52 percent on August 4, 2020. The spread between the 2-year and 10-year Treasury yields, which briefly inverted in August 2019, remained positive in 2020, which can largely be attributed to the FOMC's March 2020 decision to cut the target range for the federal funds rate to the zero lower bound.

Over the past two years, the yield on 10-year Treasury Inflation-Protected Securities (TIPS) has fallen considerably, from a high of 1.17 percent in November 2018 to -0.94 percent as of September 30, 2020 (**Chart 3.3.1.5**). The 10-year breakeven inflation rate, which

3.3.1.3 Treasury General Account Balance

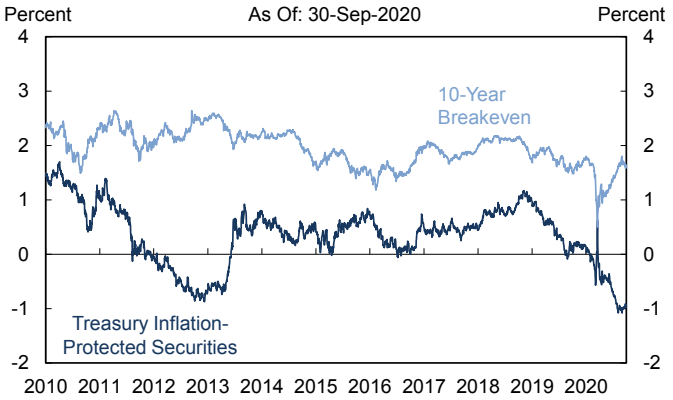


Source: Federal Reserve, Haver Analytics

3.3.1.4 U.S. Treasury Yields

Source: U.S. Department of the Treasury

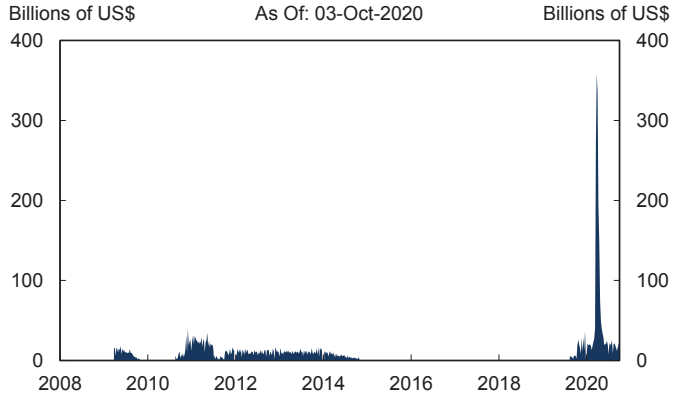
3.3.1.5 10-Year TIPS Yield and 10-Year Break Even



Source: U.S. Department of the Treasury

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

3.3.1.6 FRBNY Open Market Operations: Treasury Purchases



Source: FRBNY

Note: Weekly amount of Treasury securities purchased by the Federal Reserve Bank of New York in accordance with the FOMC directive.

is calculated as the difference between the nominal 10-year Treasury yield and the 10-year TIPS yield, is widely used to assess financial market participants' inflation expectations. This measure of inflation expectations, however, is imperfect given that the breakeven inflation rate is also influenced by liquidity and inflation risk premia. Prior to the COVID-19 market stress, breakeven inflation rates had been trending downwards, with the 10-year breakeven inflation rate falling from 2.1 percent in September 2018 to 1.6 percent in mid-February 2020. During the COVID-19 market stress, the breakeven inflation rate fell sharply, hitting a low of 0.50 percent on March 19, 2020. The breakeven inflation rate has since rebounded, rising to 1.63 percent as of September 30, 2020, which can be primarily attributed to the continued decline of the 10-year TIPS yield along with improved market functioning.

In March 2020, liquidity in the U.S. Treasury market deteriorated rapidly, severely impairing market functioning in what is typically the deepest and most liquid fixed income market in the world (**see Box B**). In response to this extreme stress, the FOMC directed the Open Market Trading Desk (the Desk) at FRBNY to increase the System Open Market Account holdings of Treasury securities to support the smooth functioning of markets for Treasury securities. The pace of purchases was unprecedented, with the Desk purchasing nearly $800 billion of Treasury securities in the second half of March (**Chart 3.3.1.6**). The Desk has since scaled back its purchases, and since mid-June, the Desk has purchased approximately $80 billion of Treasury securities per month, generally in line with the pace of previous large-scale asset purchase programs.

The credit ratings for U.S. sovereign debt published by the three largest credit rating agencies were unchanged from the previous year at AA+, Aaa, and AAA. While Fitch reaffirmed its AAA rating of U.S. sovereign debt, it revised its outlook from stable to negative, citing the deterioration in U.S. public finances and the absence of a credible fiscal consolidation plan.

Box B: U.S. Treasury Market Liquidity at the Onset of the COVID-19 Pandemic

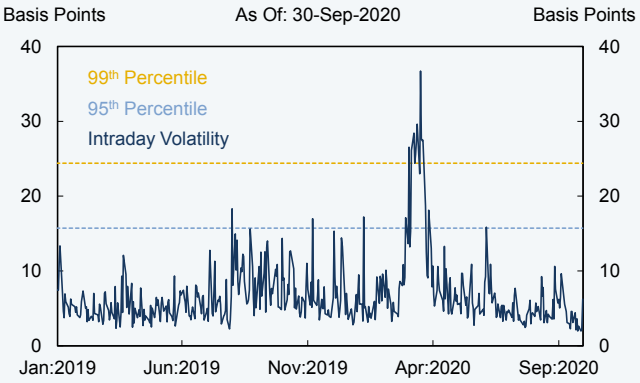
As the deepest and most liquid market in the world, the U.S. Treasury market plays a critical role in global financial markets. In addition to financing the U.S. federal government, Treasury securities are used as risk-free benchmarks for other financial instruments, to manage interest rate risk, and by the Federal Reserve when implementing monetary policy. Given the important role of U.S. Treasury markets, smooth market functioning is critical to broader financial market stability and the provisioning of credit to corporations, households, and other borrowers.

Beginning in late February, increased concerns about the macroeconomic consequences of the COVID-19 pandemic drove Treasury yields sharply lower, with the 10-year end-of-day yield plunging from 1.59 percent on February 14 to 0.54 percent on March 9. In the first few days of the market reaction, the rapid decline in Treasury yields appeared relatively orderly. However, by mid-March liquidity conditions had deteriorated rapidly as market depth collapsed, volatility surged, and bid-ask spreads widened (**Charts B.1, B.2**).

The deterioration in liquidity conditions was particularly acute for longer-dated and off-the-run Treasury securities, which led yields on off-the-run securities to deviate significantly from a fitted curve. In less than two weeks, liquidity conditions in Treasury markets had deteriorated to levels not seen since the 2008 financial crisis. In addition, the extreme volatility triggered circuit breakers for Treasury futures, extreme deviations between Treasury Exchange-Traded Fund (ETF) prices and their underlying net asset values, and deleveraging by some hedge funds. In sum, compressed and massive selling across a broad spectrum of Treasury investors strained intermediaries' ability to smoothly handle record trading volumes, resulting in a sharp deterioration in market functioning and liquidity.

On March 15, the FOMC announced it would increase its holdings of Treasury securities by at least $500 billion over the coming months to support smooth functioning in Treasury markets. In light of the continued strains in Treasury markets, the FOMC announced on March 23 that it would purchase Treasury securities in the amounts needed to support smooth market functioning.

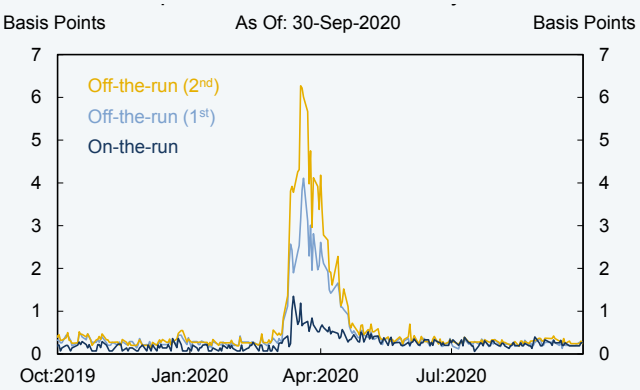
B.1 Intraday Volatility for 10-Year Treasury Yields



Source: Bloomberg, L.P.

Note: Intraday volatility calculated as daily high yield minus daily low yield on 10-year Treasury notes. Percentiles based on January 2005 – September 2020.

B.2 Bid-Ask Spread for 30-Year Treasury Bonds



Source: Bloomberg, L.P.

Note: Represents the bid YTM minus the ask YTM for on- and off-the-run U.S. Treasury bonds.

Subsequently, the Federal Reserve provided temporary supervisory relief to help incentivize dealer intermediation and to alleviate frictions in Treasury markets (**see Section 4.1.1**). Finally, the FOMC amended permanent central bank swap lines, reintroduced temporary central bank swap lines, and established the Foreign and International Monetary Authority (FIMA) repo facility to help relieve selling pressure from foreign accounts seeking to raise dollar liquidity (**see Section 3.7.1**). These steps were taken to restore Treasury market functioning and avoid exacerbating disruptions in credit markets, which could, in turn, impact access to credit

Box B: U.S. Treasury Market Liquidity at the Onset of the COVID-19 Pandemic

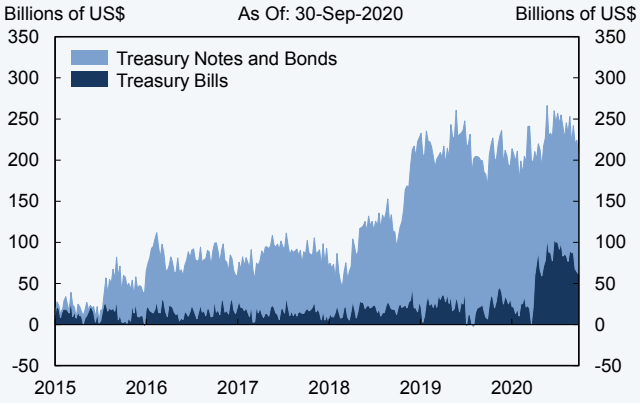
for corporations, households, and other borrowers. The speed and scale of Federal Reserve intervention stabilized Treasury market functioning by the end of spring, and continued purchases have sustained this improvement with liquidity conditions returning to more normal levels.

Treasury Market Intermediaries

Bank affiliated broker-dealers are a key source of liquidity provision in U.S. Treasury markets. These dealers have traditionally acted as short- to medium-term liquidity providers, often buying or selling from customers in large amounts, holding a portion of these positions across days, and maintaining a large balance sheet to support such positions. In addition to traditional dealers, principal trading firms (PTFs) and other high-frequency traders (HFTs) play a significant role in providing intraday liquidity to U.S. Treasury markets, with PTFs accounting for roughly 60 percent of trading volume on electronic interdealer broker platforms, which are the primary sources of price discovery for the critical on-the-run segment of the Treasury market.

Both traditional dealers and PTFs were under stress during March 2020. Traditional dealers entered the month with already high inventory levels, making it difficult for them to absorb customer sales of off-the-run Treasury securities (**Chart B.3**). Additionally, traditional dealers reportedly reduced market-making activities in both on- and off-the-run securities after hitting internal risk management limits under the sudden and intense selling of off-the-run Treasury securities from their customers. At the same time, PTFs significantly reduced their market-making activities in on-the-run securities. The extreme volatility, combined with a breakdown in typical cross-asset correlations, caused PTFs, in aggregate, to lower order book replenishment rates, which lowered market depth in Treasury futures and on-the-run or benchmark nominal coupon markets. Ultimately, the pullback by PTFs in aggregate and dealers' inability or unwillingness to absorb record Treasury overflows caused liquidity conditions in Treasury markets to deteriorate sufficiently to result in disorderly market conditions, necessitating the first official intervention to restore Treasury market functioning since 1970.

B.3 Primary Dealer Inventories



Source: FRBNY

Real Money Investors and Leveraged Hedge Funds

In early March, real money investors began selling off-the-run Treasury securities to either raise cash balances or rebalance portfolios. Notably, foreign investors (including central banks) sold Treasuries to raise dollar liquidity, while pension funds and other asset managers sold longer-dated securities to rebalance after large price gains in Treasury securities and losses in equities. This heavy selling pressure by real money investors, in addition to putting pressure on the Treasury cash market, likely served as a catalyst for the widening in the cash-futures basis, which may have precipitated the unwinding of the positions of some leveraged investors.

As described in **Section 3.6.2.5**, hedge funds increased their exposures to Treasury securities in the lead up to the COVID-19 pandemic. A significant proportion of this growth has been concentrated in relative value hedge funds that seek to exploit pricing discrepancies between similar products or securities. A popular relative value strategy has been the "cash-futures basis trade," whereby funds try to capture the spread between the implied repo rate and general collateral repo rates over the term of the trade. Once the basis began to widen in March and Treasury volatility spiked, some leveraged investors unwound their positions due to internal risk-management stop-outs, increased margin requirements for futures, and tightening in financing conditions. Leveraged hedge funds employing other trading strategies may have amplified long-dated Treasury yield volatility through positive feedback.

Given the rapid decline in market liquidity, the selling by central banks and real money investors, in conjunction with the unwind of certain hedge fund positions, contributed to "one-way" pressure on the cash market and the widening of the cash-futures basis until late March, when the Federal Reserve began to aggressively purchase off-the-run Treasury securities, including cheapest-to-deliver securities, which are typically excluded from purchase operations.

Further Study Needed

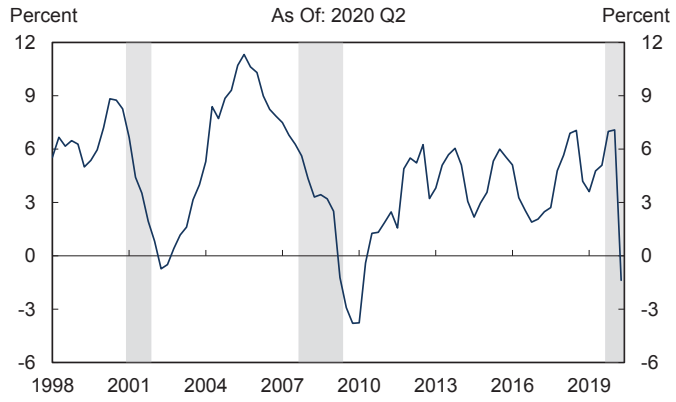
The Federal Reserve's actions restored market functioning, yet the events of March 2020 exposed fragilities in Treasury markets that will require further study with an eye toward making future official interventions less likely. Factors that likely contributed to the breakdown in market functioning include massive selling by real and levered investors, dealer risk management and balance sheet constraints, and the rapid decline in liquidity provisioning by PTFs.

3.3.2 Municipal Bond Market

Municipal bond markets continued to experience strong retail investor demand at the start of the year, which helped drive steady net inflows into municipal bond funds and sent bond prices upward. This changed in March 2020 with the onset of the COVID-19 pandemic, as individual investors pulled money out of bonds in a flight to cash. Pricing became unstable and issuers responded by delaying planned bond issuances.

On April 9, 2020, the Federal Reserve announced the launch of its Municipal Liquidity Facility (MLF) to buy municipal notes from eligible state and local issuers. On August 11, 2020, the Federal Reserve extended the termination of the MLF from September 30, 2020 to year-end 2020. While some investors had already begun to return to the municipal market, the April announcement helped improve investor confidence, resulting in stabilized pricing and increased issuance.

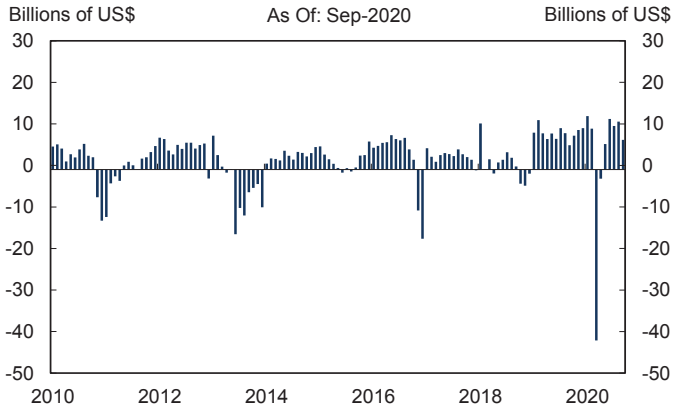
3.3.2.1 Changes in State and Local Government Tax Revenues



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.

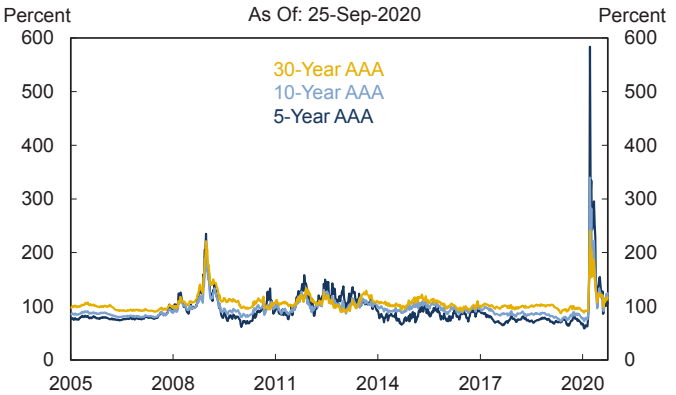
3.3.2.2 Municipal Bond Mutual Fund Flows



Source: ICI, Haver Analytics

Note: Net fund flows.

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.

State and local government tax revenues were strong in 2019 and the first quarter of 2020 compared to 2018. Total state and local government tax revenues in the second half of 2019 were 6.0 percent higher than in the second half of 2018 (**Chart 3.3.2.1**). However, delayed tax filings and business closures due to COVID-19 negatively affected tax revenues in the second quarter of 2020, with economic contraction expected to hold down tax revenues for the rest of the year.

Municipal bond ratings continued to improve in 2019, and state and local tax revenues for the full year were 7.0 percent higher than in 2018. State reserve fund balances across the country increased in 2019, with the median rainy-day fund balance as a share of general fund expenditures rising to 7.8 percent, based on data aggregated from all 50 state budget offices. However, by the second quarter of 2020, states began to draw down rainy-day balances to offset falling revenues.

Municipal bond funds experienced record net inflows in 2019 and the first two months of 2020. In 2019, net fund inflows totaled $93 billion, compared to $4.2 billion of net inflows for 2018 (**Chart 3.3.2.2**). In March and April, however, investors responded to the COVID-19 pandemic by withdrawing $45 billion from municipal bond funds, with market analysts pointing to a substantial flight into money market funds. This was followed by a net inflow of $43 billion between May and September 2020 as market conditions stabilized. Cumulative net flows totaled $18 billion for the first nine months of 2020, a decline of 74 percent compared to the first nine months of 2019.

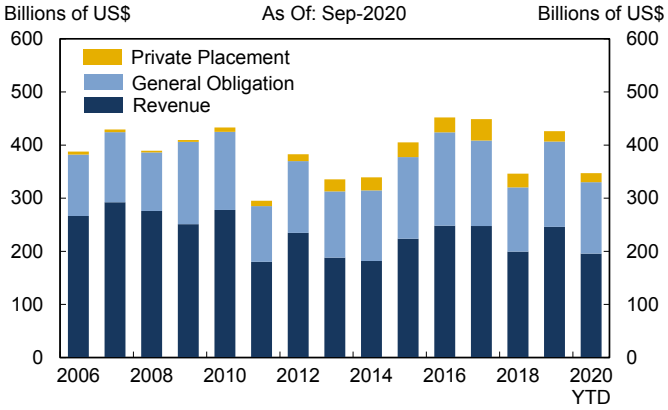
During the market displacement from mid-March through April, diverging municipal bond and Treasury bond prices resulted in the ratio of 10-year AAA-rated general obligation to 10-year Treasury yields spiking to 340 percent (**Chart 3.3.2.3**). By September 25, 2020, this municipal-to-Treasury ratio dropped to 124 percent—still well above the historical norm of 98 percent.

Annual municipal debt issuance was up 23 percent in 2019 over 2018, and monthly municipal bond sales continued at above average levels at the start of 2020 (**Chart 3.3.2.4**). In March, however, primary market issuance fell 53 percent from the previous month as issuers withdrew scheduled bond sales in response to significantly lower retail demand. Municipal debt issuance recovered in the following months and as of September 2020, year-to-date issuances totaled $347 billion, a 24 percent increase relative to the same period in 2019. In particular, taxable issuance increased sharply, driven by overall low interest rates and changes in the tax code that no longer allow tax-exempt advance refundings.

Over the medium-term, expected impacts of the COVID-19 crisis include lower state and local revenues and increased debt obligations and debt service. Longer-term credit weaknesses in the area of pension and retiree health care liabilities remain concerns in the municipal market. Despite these challenges, credit rating agencies have taken relatively few negative rating actions against municipal debt. S&P and Moody's only downgraded approximately one percent of the municipal borrowers they rate in the second quarter of 2020.

The fiscal crisis of Puerto Rico remains distinctive in a sector with few defaults historically. The Puerto Rico Oversight, Management, and Economic Stability Act (PROMESA), enacted in June 2016, provided for the establishment of the Financial Oversight and Management Board for Puerto Rico (the FOMB) and a resolution process for Puerto Rico's $74 billion in public sector debt (excluding pension liabilities). In 2017, the Commonwealth and four of its instrumentalities filed to pursue debt restructuring under Title III of PROMESA, followed by a Title III filing of the Puerto Rico Public Buildings Authority (PBA) in September 2019. The Puerto Rico Urgent Interest Fund Corporation—a government-owned corporation created to securitize Puerto Rican sales and use tax

3.3.2.4 Municipal Bond Issuance



Source: Thomson Reuters, SIFMA

Note: Excludes maturities of less than 13 months.

proceeds—is the only Commonwealth entity to have reached a resolution of its debt obligations.

In May 2019, the Puerto Rico Electric Power Authority (PREPA) entered into a restructuring support agreement to restructure $8.9 billion of the authority's bonded debt. As of November 2020, court confirmation of the agreement is pending. PREPA's 2020 Fiscal Plan requires it to cede its main operating assets to private service providers by the second half of 2022.

In February 2020, the FOMB filed an amended Plan of Adjustment to restructure more than $50 billion of pension liabilities and $35 billion of debt and other claims against the Commonwealth, PBA, and the Employee Retirement System. If approved, the plan would reduce $35 billion of debt and other claims by almost 70 percent to approximately $11 billion. Weak structural reform execution and revenue impacts of COVID-19, however, have substantially reduced the Commonwealth's forecasted surplus from the 2019 Fiscal Plan, a key input to the Plan of Adjustment. The Commonwealth's 2020 Fiscal Plan requires fiscal measures and structural reforms expected to contribute to an average annual pre-debt service surplus of $578 million over five years, down from an expected $2.1 billion in the 2019 Fiscal Plan

In fiscal year 2020, the Commonwealth's annual general fund collections fell 22 percent from the previous year. The 2020 Fiscal Plan forecasts that a lack of robust structural reforms, rising healthcare costs, and the phase-out of federal aid will lead to annual deficits starting in 2032—six years earlier than projected in the 2019 plan.

While federal disaster-related funds are having an ameliorative effect, Hurricane Maria highlighted weaknesses in the island's electric, water, and transport infrastructure that undermine the island's manufacturing base and feed outmigration.

Box C: Finances of State and Local Authorities and the COVID-19 Pandemic

Most state and local governments entered 2020 with increased reserves and record-high rainy-day funds. Despite these strengths, municipal markets became increasingly volatile as the pandemic worsened in March. Mutual fund investors pulled over $41 billion of assets out of the market in less than three weeks. Withdrawals were accompanied by widening spreads, hindering state and local governments' ability to borrow in a time of delayed and lower tax revenue. Between March 9 and March 20, state and local governments sold only $6 billion of the $16 billion in bonds they sought to issue, and most new issues were canceled due to collapsed investor demand. Market functioning deteriorated to the point where buyers and sellers had difficulty determining prices, and state and local authorities were effectively shut out of the primary market.

In response to stressed markets, the Federal Reserve extended asset eligibility for the Money Market Mutual Fund Liquidity Facility (MMLF) and the Commercial Paper Funding Facility (CPFF) to include certain short-term municipal securities on March 23. On April 9, the Federal Reserve announced the establishment of the MLF, which would purchase up to $500 billion of short-term notes directly from eligible state and local issuers. Markets responded positively to this announcement; outflows slowed in April and municipal mutual funds have received consecutive weeks of positive inflows since early May. Participation in the MLF remains limited, however, with only the state of Illinois and the Metropolitan Transportation Authority of New York tapping the facility for a total outstanding amount of $1.7 billion as of September 30, 2020.

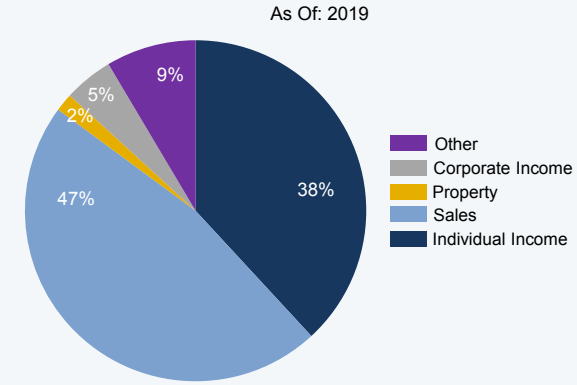
Challenges in the current environment

Despite improved primary and secondary market conditions, municipal fundamentals remain stressed. In particular, declining tax revenues and increased pandemic-related spending pose challenges for state governments. States derive the bulk of their tax revenue from individual income and sales taxes, and the Tax Policy Center estimates total tax revenue shortfalls of $75 billion and $125 billion for fiscal years 2020 and 2021, respectively. Tourism-dependent and oil-producing states face additional headwinds given lower tax revenues. Ongoing fiscal negotiations also add uncertainty, as federal aid is a significant source of state budget funds. Most states have balanced budget requirements, making it difficult to fund spending obligations and investment during times of decreased tax revenue. Pension liabilities, which were already underfunded, are under pressure as investment portfolios try to recoup losses from market volatility. In light of the deteriorating outlook for revenues, many states are already looking to cut expenditures, tap reserves, and issue debt/notes to bridge deficits and address short-term liquidity needs.

Box C: Finances of State and Local Authorities and the COVID-19 Pandemic

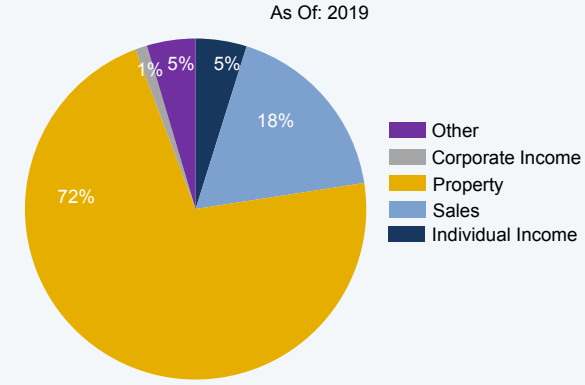
In contrast to state governments, local governments generate the majority of revenue through property taxes, insulating them from immediate declines in sales and income tax revenues (**Charts C.1, C.2**).

C.1 Breakdown of State Tax Revenues



Source: U.S. Census Bureau

C.2 Breakdown of Local Tax Revenues

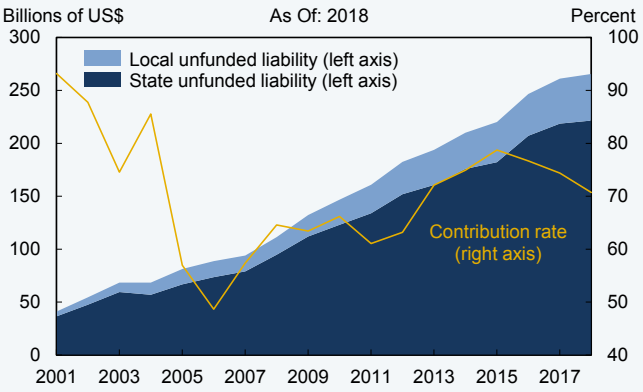


Source: U.S. Census Bureau

Nevertheless, the potential for declines in property tax revenues, as well as potential reductions in federal and state aid, constitute a risk for local authorities in the coming years, given the inherent lag in property tax assessment and collections. Moreover, municipalities that are reliant on sales and income taxes, such as New York City, are expected to see material declines in revenues for fiscal years 2020 and 2021. According to the National League of Cities and the National Association of Counties, localities (such as cities, towns, and villages) are estimated to see total revenue losses of $134 billion and $117 billion in fiscal years 2020 and 2021, respectively, while counties are estimated to lose $114 billion in revenue from fiscal year 2020 to 2021. While the estimated $365 billion in lost revenues does not take into account offsets from CARES Act funding, it also does not consider additional expenditures or the impact of deferring pension contributions.

Some state and local governments are deferring or reducing scheduled pension payments in 2020 to cover budget shortfalls caused by constrained budgets. Deferring pension contributions may not materially impact creditworthiness or future pension payments for those municipalities with well-funded pension plans; however, a number of pension funds were in materially underfunded positions prior to the COVID-19 pandemic, and deferring contributions could have serious implications for the sustainability of these plans. As of fiscal year 2018, 16 pension funds in seven states were less than 50 percent funded, with unfunded liabilities totaling nearly $270 billion (**Chart C.3**).

C.3 Liabilities of Severely Underfunded Public Pension Plans



Source: publicplansdata.org

Note: Includes state and local pension plans with UAAL below 50 percent as of 2018. Contribution rate calculated as the weighted average contribution as a percent of actuarially required contribution.

3.4 Financial Markets

3.4.1 Wholesale Funding Markets: Unsecured Borrowing

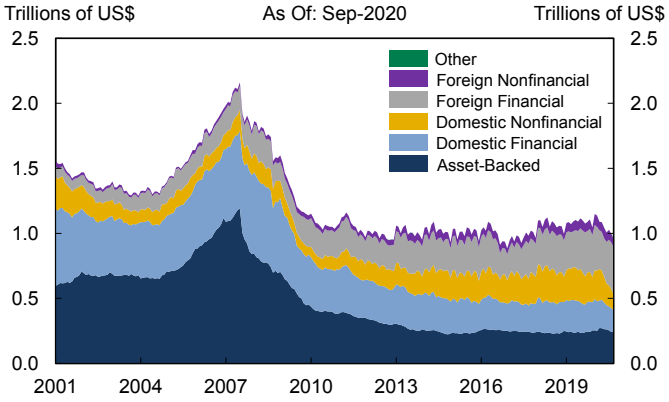
Commercial Paper

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, and firms generally rollover outstanding balances. Thus, companies relying on the CP market for funding are susceptible to changing market conditions during the rollover period.

Total CP outstanding was $957 billion at the end of September 2020, down from $1,075 billion in September 2019 (**Chart 3.4.1.1**). CP outstanding issued by financial firms declined to $533 billion in September 2020, from $552 billion in September 2019. These issuers represent 56 percent of the amount outstanding compared to 51 percent outstanding the year prior. Nonfinancial firm issuers, which include industrial firms, service firms, and public utilities, among others, account for 19 percent of the balances outstanding as of September 2020. Nonfinancial issuers saw a $100 billion decline, or 35 percent, in CP balances over the one-year period. Most of the decline occurred in the second quarter of 2020 when nonfinancial CP balances fell by $69 billion. ABCP, which accounted for the remaining 25 percent of CP outstanding, rose 0.5 percent over the past year, totaling to $241 billion at the end of September 2020. Unlike 2007-2009, ABCP issuers were able to issue new CP or rollover CP balances during the COVID-19 market stress (**Chart 3.4.1.2**).

Nonfinancial companies have few options other than CP and bank revolving credit facilities for short-term financing. A freezing of the CP market for nonfinancial companies is a risk for these firms and for the banks that provide revolving credit facilities that backstop CP programs.

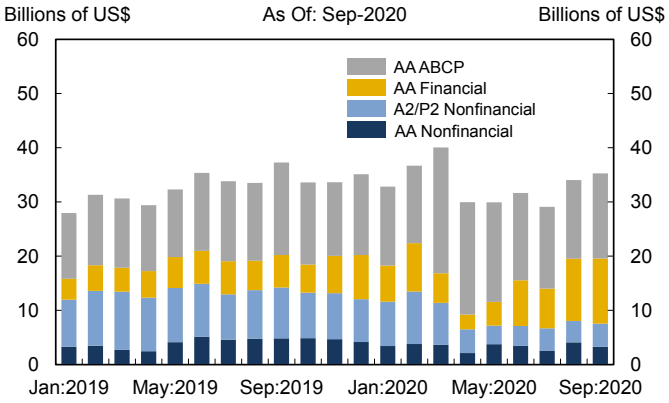
3.4.1.1 CP Outstanding by Issuer Type



Source: Federal Reserve, Haver Analytics

Note: Not seasonally adjusted; domestic includes CP issued in the U.S. by entities with foreign parents.

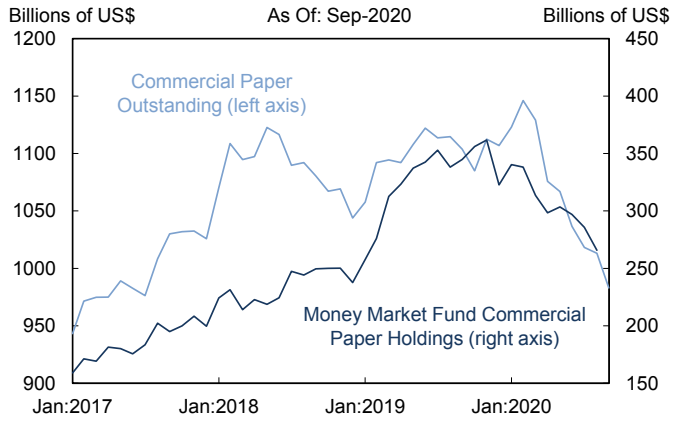
3.4.1.2 CP Issuance by Issuer Type and Rating



Source: Federal Reserve, Haver Analytics

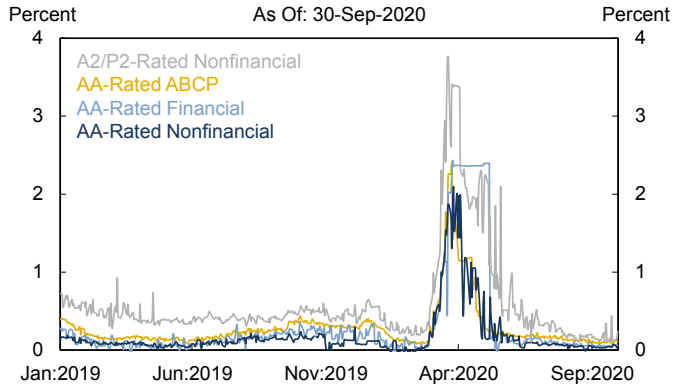
Note: Monthly average.

3.4.1.3 CP Outstanding & MMF Holdings



Source: Federal Reserve, SEC Form N-MFP, Haver Analytics

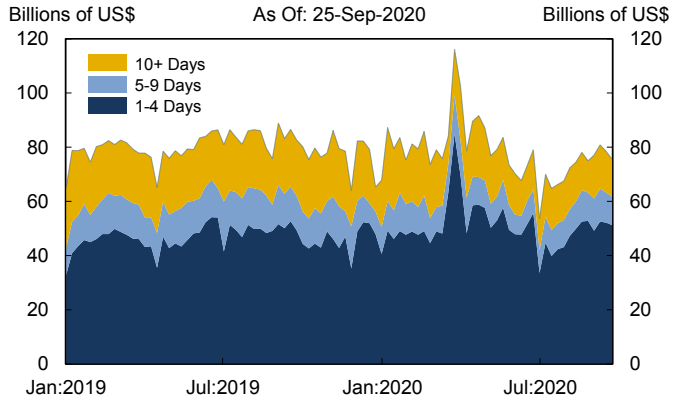
3.4.1.4 Three Month CP Interest Rate Spreads



Source: FRBNY, Bloomberg L.P., Haver Analytics, OFR

Note: Spread to 3-Month Overnight Index Swap (OIS) rate.

3.4.1.5 Weekly CP Issuance by Tenor



Source: Federal Reserve, Haver Analytics

Note: Weekly average.

In mid-March, the U.S. CP market was severely disrupted amid economic uncertainty arising from the COVID-19 pandemic. Prime MMFs—which are significant purchasers of CP—sought to reduce CP holdings to raise cash in response to actual and expected investor redemptions (**Chart 3.4.1.3**). Dealers faced balance sheet limits and were unable or unwilling to intermediate in the secondary market. In addition, the Risk Management Association's Quarterly Aggregate Data Survey shows that securities lending cash collateral reinvestment accounts—which are also significant purchasers of CP—reduced their holdings by 29 percent in the first quarter of 2020 (**see Section 3.4.2**). Survey data does not provide information concerning the amount of ABCP held by these accounts.

The resulting lack of demand for new unsecured exposures, and the forced selling of short-term assets, propelled credit spreads and absolute yields to rise relative to less-risky benchmarks, such as the effective federal funds rate, the overnight index swap (OIS) rate, and SOFR. LIBOR also widened relative to less-risky benchmark rates. The spread between the 90-day AA Nonfinancial CP rate and the OIS rate reached a peak of 210 basis points on March 26, a level not seen since the 2008 financial crisis. The spread on the 90-day A2/P2 Nonfinancial CP rate peaked at 376 basis points on March 20 (**Chart 3.4.1.4**).

Many firms reportedly were unable to issue CP or to only issue at a very high yield, thus increasing their rollover risk and reducing the ability of CP to support their short-term funding and liquidity needs. Issuances with tenors of less than four days also markedly increased in March (**Chart 3.4.1.5**).

In mid-March, the Federal Reserve took a series of actions to address the dislocation in the wholesale funding markets by announcing the establishment of lending facilities under section 13(3) of the Federal Reserve Act, including the CPFF on March 17 and the MMLF on March 18. The former allows highly rated U.S.

CP issuers to sell CP to the Federal Reserve's special purpose vehicle. The latter makes loans available to U.S. depository institutions and BHCs to finance their purchases of certain types of assets from MMFs (**see Section 4.1**). The MMLF helped support liquidity in the markets for the assets held by MMFs.

Outflows from prime MMFs gradually reversed following the announcement of the MMLF and CPFF, contributing to improvements in CP market condition and potentially reducing the usage of the bank backstop facilities. Outstanding amounts under the MMLF and the CPFF were $7.1 billion and $.03 billion, respectively, at the end of September 2020. This is down from a peak of $54.1 billion on April 6, 2020, under the MMLF and $4.3 billion on May 13, 2020, under the CPFF.

Bank Deposits

Deposits can form a stable source of funding for banks, although the stability of different types of deposits can vary. Brokered certificates of deposit and large denominated deposits are considered riskier sources of funding because they can be more vulnerable to changes in short-term interest rates if the customer finds a more appealing rate elsewhere.

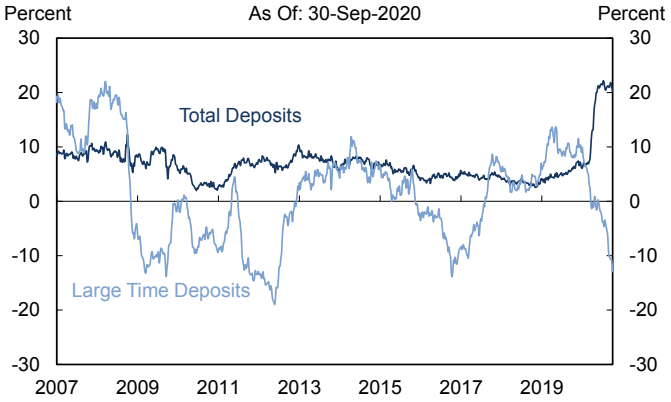
In the first nine months of 2020, total deposits at U.S. commercial banks grew by $2.5 trillion to $16 trillion at the end of September. Large time deposits, which include wholesale certificates of deposit (CDs), declined 15 percent in the first nine months of 2020 to $1.6 trillion and 11 percent on a year-over-year basis (**Chart 3.4.1.6**). In the first half of 2020, estimated insured deposits at domestic office banks increased by over $1 trillion, and stood at $8.8 trillion at the end of June 2020.

3.4.2 Wholesale Funding Markets: Secured Borrowing

Repo Markets

The repo market is an integral part of the STFMs, providing secured, short-term, marked-to-market funding against various forms of securities collateral. SOFR, the ARRC's

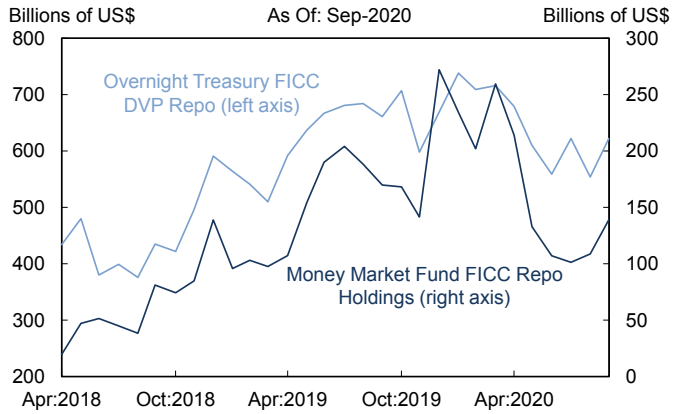
3.4.1.6 Commercial Bank Deposit Growth



Source: Federal Reserve, Haver Analytics

Note: Year-over-year percentage change.

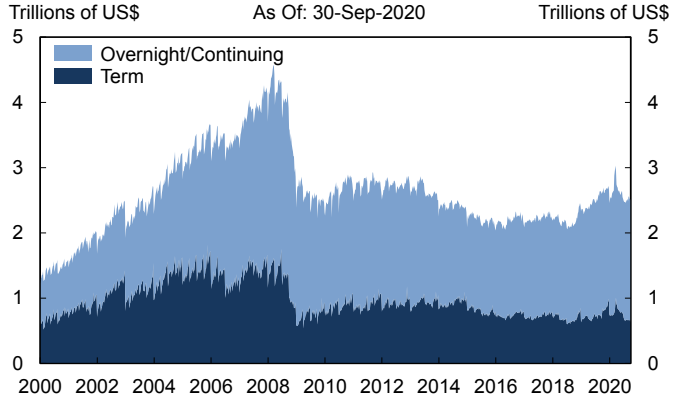
3.4.2.1 FICC Repo Balances and MMF Holdings



Source: FRBNY, SEC Form N-MFP, Bloomberg L.P.

Note: FICC cleared bilateral excludes term repo and repo backed by agency collateral.

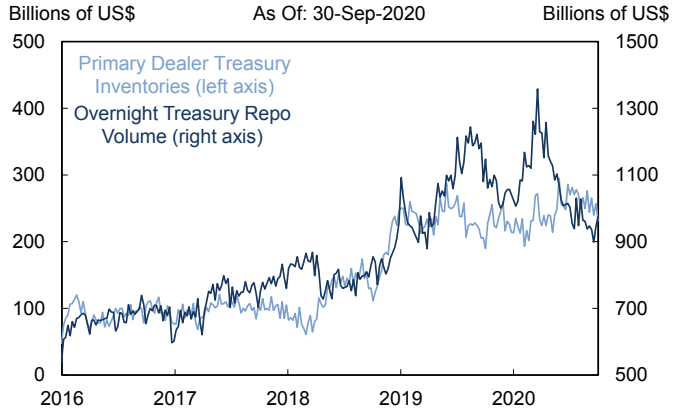
3.4.2.2 Primary Dealer Repo Agreements



Source: FRBNY, Haver Analytics

Note: Aggregation method removes missing data when occurs due to disclosure edits or non-trading days for specific security repo agreements.

3.4.2.3 Overnight Repo Volumes and Dealer Inventories



Source: FRBNY, Staff Calculations, Haver Analytics

Note: Overnight Treasury repo volume includes published volumes for SOFR.

preferred alternative to LIBOR, is a broad measure of overnight Treasury repo rates, furthering the importance of this market.

Repo borrowing, as reported in the Financial Accounts of the United States, totaled nearly $4.1 trillion as of the second quarter of 2020, down from $4.3 trillion a year earlier. The market consists of two segments: tri-party repo, in which settlement occurs within the custodial accounts of a clearing bank, and bilateral repo, which typically refers to all activity not settled within the tri-party system, includes repo transactions cleared through the Fixed Income Clearing Corporation (FICC). Primary dealers, which are trading counterparties of FRBNY, are active in both segments of the market. Tri-party collateral balances declined 9.2 percent from a year earlier to $2.2 trillion in September 2020. Most of the decline occurred in the second quarter of 2020.

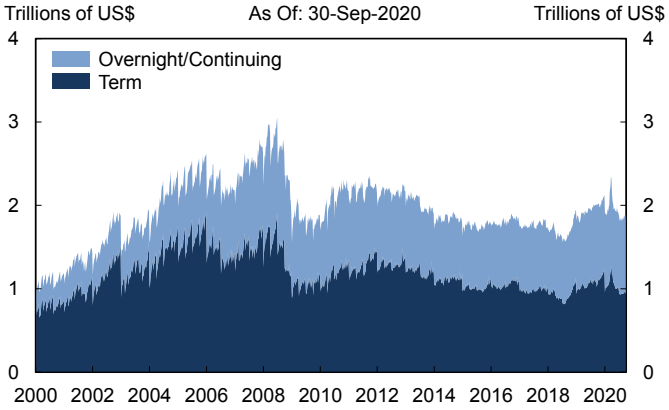
Recently, cleared bilateral repo transaction volume has become comparable to, if not larger than, the tri-party volume. This is partly due to the growth of sponsored repo, which allows sponsoring members to minimize balance sheet usage by netting their repo lending and borrowing. Sponsored repo allows MMFs as cash lenders, on one side of the transaction, and repo borrowers, on the other side, to participate in the FICC-cleared segment, but it also increases overall market exposure to FICC as a central counterparty (**Chart 3.4.2.1**).

Primary dealer cash borrowing in the repo market, including borrowing from FRBNY's temporary open market operations, stood at $2.5 trillion as of September 30, 2020, relatively flat compared to a year earlier but down from a peak of $3.0 trillion in the third week of March (**Chart 3.4.2.2**). Increased overnight cash borrowing through the first quarter can be attributed to, among other things, primary dealers' elevated financing of Treasury inventories (**Chart 3.4.2.3**). The total repo volumes reference all tenors and collateral types.

Similarly, cash lending by primary dealers in the repo market (reverse repo) decreased slightly over the past year, from $2.0 trillion on September 26, 2019 to $1.9 trillion on September 30, 2020, after reaching $2.3 trillion on March 18, 2020. The share of overnight reverse repo compared to term reverse repo has increased over the past several years, accounting for 50 percent of repo lending in September 2020, up from 39 percent in September 2016 (**Chart 3.4.2.4**). Lending at maturities of one month or longer continues to account for approximately two-thirds of term reverse repo lending.

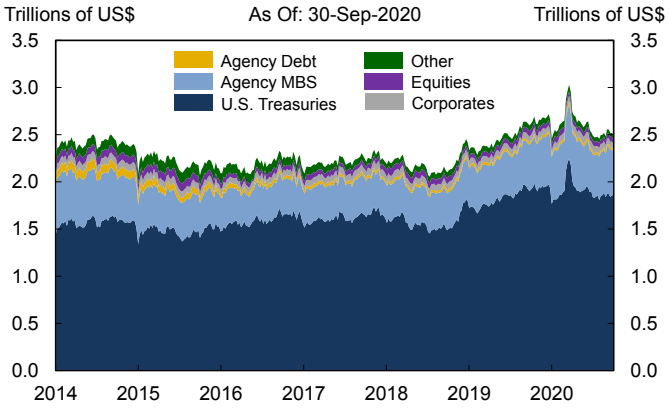
As of September 2020, 93 percent of primary dealer repo transactions were collateralized by Treasuries or agency MBS, up from 92 percent in September 2019 and 86 percent five years prior (**Chart 3.4.2.5**). Within the tri-party market, 82 percent of repo transactions were backed by Treasuries or agency MBS as of September 2020 compared to 83 percent in September 2019 and 71 percent in September 2015 (**Chart 3.4.2.6**). Median haircuts on collateral used in tri-party repo transactions were relatively flat for the year across most collateral classes.

3.4.2.4 Primary Dealer Reverse Repo Agreements



Source: FRBNY, Haver Analytics

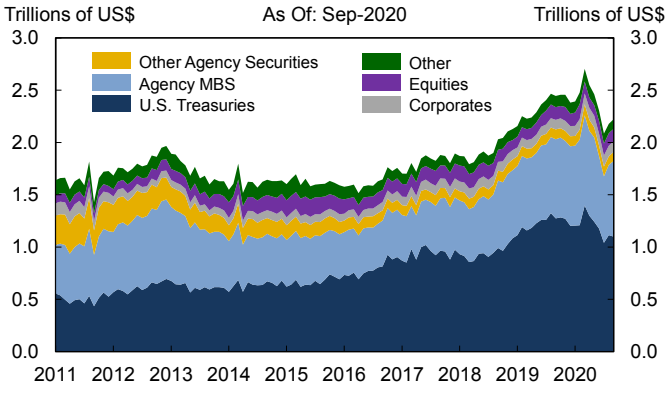
3.4.2.5 Primary Dealer Repo Collateral



Source: FRBNY, Haver Analytics

Note: U.S. Treasuries includes TIPS.

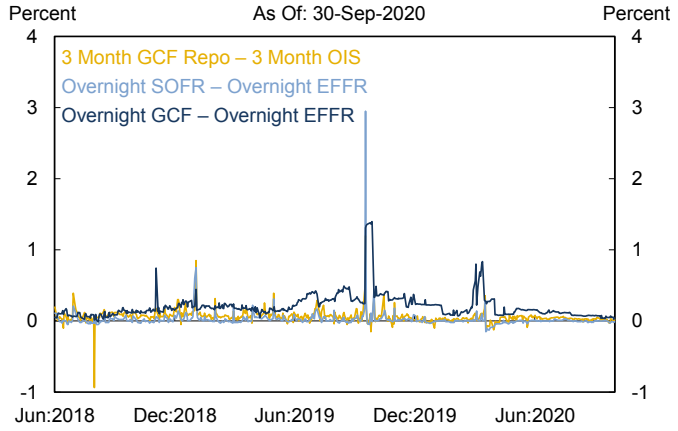
3.4.2.6 Collateral in the Tri-Party Repo Market



Source: FRBNY, Haver Analytics

Note: Other includes ABS, CDOs, private label CMOs, international securities, money markets, municipal debt, and whole loans.

3.4.2.7 Repo Rate Spreads



Source: FRBNY, Bloomberg, L.P.

The repo market has experienced two recent periods of unexpected major volatility. The first was when overnight repo rates spiked in mid-September 2019, with SOFR increasing by approximately 300 basis points (**Chart 3.4.2.7**). The unexpectedly high volatility in September 2019 appeared to be attributed to technical factors, including an increase in demand for funds (for example, to finance new Treasury settlements), and a decline in funds available from banks and MMFs that was tied to outflows as corporations paid taxes in mid-September. While the spillover to the fed funds market was relatively modest, repo market pressure pushed the effective federal funds rate slightly above the Federal Reserve's target range.

Certain dealers may adjust their activity at quarter ends to meet regulatory requirements, a practice referred to as window-dressing, which can result in temporary increases in repo rates and may have contributed to repo market stress. Balance sheet constraints may also factor into repo rate increases observed on some Treasury settlement and tax dates, but these periodic increases have been small compared to the September 2019 spike.

In accordance with the FOMC's directive, on September 17, 2019, FRBNY began to conduct a series of overnight and term repo operations to help maintain the federal funds rate within the target range by adding reserves to the banking system. The operations were effective in stabilizing conditions in funding markets. Additionally, the Federal Reserve commenced reserve management purchases of Treasury bills in October 2019, at the pace of $60 billion per month, in order to rebuild reserves to a level that is commensurate with policy implementation.

The repo market was strained again because of the market dislocations caused by the COVID-19 pandemic, with SOFR increasing by 29 basis points above the effective federal funds rate on March 17. Overnight and term repo rates against Treasury collateral spiked and term repo market functioning deteriorated

amid increased dealer holdings and short-term policy uncertainty. Investors also began selling less-liquid securities to raise cash. To address this strain in the market, the Federal Reserve stepped in again to purchase Treasury securities – initially at a pace of $75 billion per day. The Federal Reserve also increased available tenors and offering amounts of its repo operations, which increased the supply of bank reserves and countered some of the pressure in repo rates. Federal Reserve purchases of Treasury securities reduced the supply of Treasuries in the market and alleviated dealer balance sheet pressure so dealers could better intermediate across all asset classes and between the cash and repo markets. Repo rates have been well contained since March.

Securities Lending

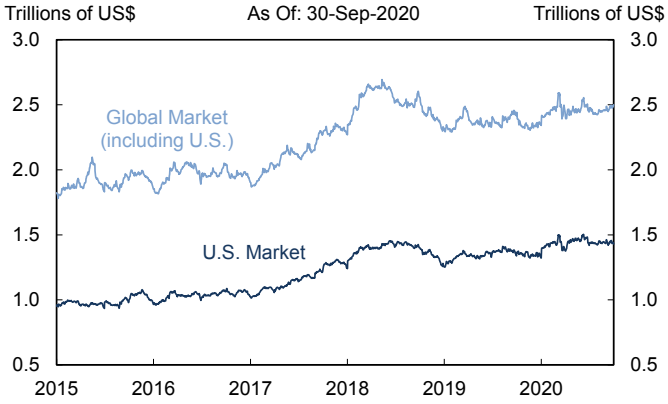
Securities lenders generally engage in securities lending to earn additional income, but securities lending may also be used as a source of funding by some financial institutions. It is an unstable source of funding, however, as most arrangements allow the borrower to return the borrowed securities on short notice in exchange for the collateral posted. Data on the securities lending market are estimated based on surveys.

The estimated value of securities on loan globally was $2.5 trillion as of the end of September, 2020, up from $2.4 trillion in the end of September 2019 but down from $2.6 trillion in early March (**Chart 3.4.2.8**). The estimated U.S. share of the global activity grew to 57 percent at the end of September 2020 from 55 percent a year earlier.

Government bonds and equities continue to account for the majority of the estimated securities on loan globally. As of September 30, 2020, the share represented by equities was estimated at 40 percent, while government securities were estimated to account for approximately 47 percent of the total securities on loan.

While shares of ETFs were estimated to only account for 3.1 percent of securities on loan

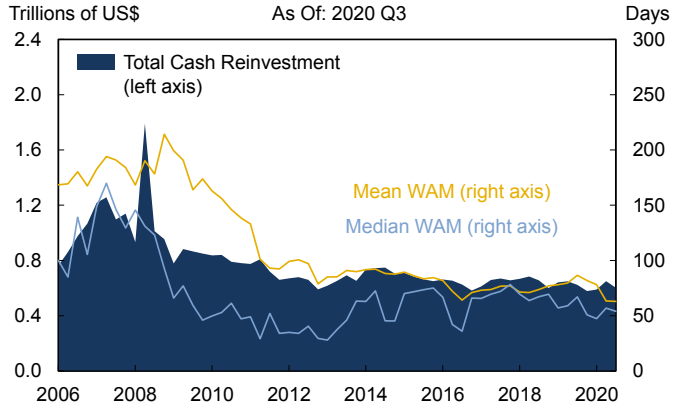
3.4.2.8 Value of Securities on Loan



Source: Markit

Note: Data is based on a survey of agent-based lenders.

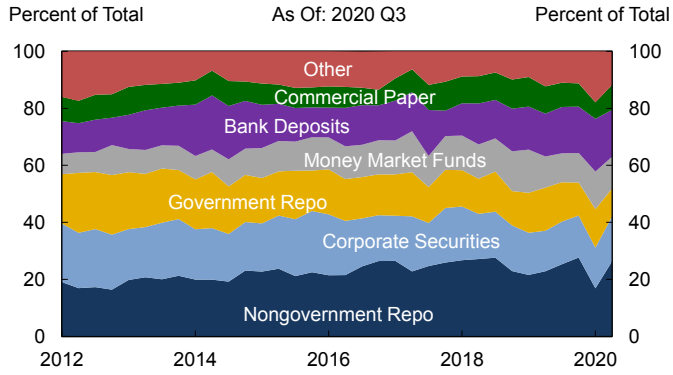
3.4.2.9 U.S. Securities Lending Cash Reinvestment



Source: The Risk Management Association

Note: Data is based on a survey of agent-based lenders.

3.4.2.10 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.

globally, the amount of shares of ETFs on loan has increased by approximately 40 percent for the twelve months ended September 30, 2020. One potential reason for this increase in demand could be that ETFs are an efficient way for hedge funds to gain short exposure. As with the trend for securities lending overall, however, the estimate of the value of ETF shares on loan decreased after peaking in early March.

Reinvestment of cash collateral from securities lending in the U.S. was estimated at approximately $600 billion as of the third quarter of 2020, down $20 billion from the previous year (**Chart 3.4.2.9**). A growing number of the cash reinvestment managers surveyed have shortened portfolio duration amid market uncertainty. The median weighted average maturity (WAM) of cash reinvestment portfolios decreased to 54 days in the third quarter of 2020 compared to 67 days in the third quarter of 2019, while the mean WAM dropped from 86 days to 63 days over the same period.

As noted in **Box D**, cash collateral is often invested in the short-term funding markets (STFMs). The estimated share of cash reinvestment portfolios allocated to repos backed by non-government collateral recorded a decline during the first quarter of 2020 from 28 percent to 17 percent, before increasing to 27 percent during the third quarter of 2020. The share of bank deposit and government repo rose to 18 percent and 13 percent respectively before declining to 16 percent and 11 percent in the third quarter. The share of CP used as collateral in repo transactions declined to 5.8 percent in the first quarter, before increasing to 9.2 percent in the third quarter (**Chart 3.4.2.10**).

Box D: Recent Stress in Short-Term Wholesale Funding Markets

STFMs are the $10 trillion network of markets and entities that help provide short-term credit for corporations, governments, and financial institutions. These include secured borrowing markets such as those for repos and securities lending, as well as unsecured borrowing markets such as bank deposits and CP. Since some of the intermediaries that participate in the federal funds market also participate in other STFMs, well-functioning STFMs are critical not only for financial stability but also for the implementation of monetary policy.

Amid escalating concerns about the economic impact of the COVID-19 pandemic, market participants rapidly reduced their tolerance for risk and generally shifted their risk preferences toward cash and other highly liquid instruments. This rapid shift in investor sentiment placed stress on both the secured and unsecured components of STFMs and the intermediaries operating in these markets.

Unsecured Funding

Bank Funding

With sources of market liquidity drying up, businesses drew heavily on bank lines of credit. Several factors have helped banks meet this surge in liquidity demand. First, post-crisis regulation has required that banks maintain strong capital and liquidity positions while reducing their reliance on short-term wholesale funding. Second, deposit inflows surged because businesses deposited their precautionary credit-line withdrawals, businesses and consumers deposited government stimulus payments, and investors moved away from risky illiquid assets into cash. Third, some banks increased discount window borrowing and Federal Home Loan Bank (FHLB) advances to manage the surge in liquidity demand. The FHLBs generally expanded eligible categories of collateral to reflect the new funding programs and facilities of the SBA and Federal Reserve, reduced rates, extended grants to members, and waived fees for certain products. For its part, the Federal Reserve lowered the discount rate by 150 basis points and was successful in encouraging and destigmatizing the use of its discount window.

Money Market Mutual Funds

Market conditions for unsecured short-term debt instruments, such as CP and negotiable certificates of deposit (NCDs), began to deteriorate rapidly in the second week of March. Spreads for money market instruments began widening sharply, and new issuance of CP and NCDs declined markedly and shifted to short tenors. Stress among MMFs likely contributed to these problems, as prime funds reduced their holdings of CP disproportionately compared to other holders. At the end of February 2020, prime MMFs offered to the public owned approximately $215 billion of CP, or about 19 percent of the $1.1 trillion outstanding CP at that time. From March 10 to March 24, these funds cut holdings of CP by $35 billion, and this reduction accounted for 74 percent of the $48 billion overall decline in outstanding CP over those two weeks.

Conditions in the short-term municipal debt markets also worsened rapidly in mid-March. On March 18, the Securities Industry and Financial Markets Association (SIFMA) Municipal Swap Index yield—a benchmark rate in these markets—rose to 520 basis points, a 392 basis point increase from the prior week. The spike in the SIFMA index yield caused drops in market-based net asset values (NAVs) of tax-exempt MMFs (which mostly still have stable, rounded NAVs) and likely contributed to outflows from these funds. Stress among tax-exempt MMFs also likely contributed to worsening market conditions. A period of unusually heavy redemptions from tax-exempt MMFs began on March 12, and outflows accelerated over the next week. Tax-exempt funds reduced their holdings of variable-rate demand notes (VRDNs) by about 16 percent ($15 billion) in the two weeks from March 9 to 23. Primary dealer VRDN inventories nearly tripled in the week ending March 18. Stress in

Box D: Recent Stress in Short-Term Wholesale Funding Markets

municipal markets also contributed to strains on tax-exempt MMFs.

As part of the general deterioration in STFM conditions, prime and tax-exempt MMFs experienced heavy redemptions beginning in the second week of March 2020. Outflows increased quickly, peaking on March 17 for prime funds (the day the Federal Reserve announced the CPFF) and on March 23 for tax-exempt funds (one business day after the MMLF was expanded to include tax-exempt securities).

Among institutional prime MMFs offered to the public, outflows as a percentage of fund assets exceeded those in the September 2008 crisis. Over the two-week period from March 11 to 24, net redemptions from publicly offered institutional prime funds totaled 30 percent (about $100 billion) of the funds' assets. For comparison, in September 2008, the worst outflows from these funds over a two-week period were about 26 percent (about $350 billion) of assets.

For retail prime funds, outflows as a share of assets in March 2020 exceeded those that occurred during the 2008 crisis, although heavy redemptions began a couple of days after those for institutional funds. Net redemptions totaled 9 percent (just over $40 billion) of assets over the two weeks from March 13 to 26. In September 2008, the heaviest retail outflows over a two-week period totaled 5 percent of assets. Retail prime funds had about 60 percent more assets in 2008 than earlier this year, so outflows were similar in dollar terms in both crises.

Outflows from tax-exempt MMFs, which are largely retail funds, were 8 percent ($11 billion) of assets during the two weeks from March 12 to 25. In 2008, when tax-exempt MMF assets were more than four times larger than earlier this year, such funds had outflows of 7 percent (almost $40 billion) of assets in one two-week period.

Outflows from MMFs abated fairly quickly after the Federal Reserve's announcement of its support for the STFMs, including support for MMFs in mid-March. Market conditions began to improve after the launch of the MMLF. The share of CP issuance with overnight maturity began falling on March 24, and spreads to OIS for most types of term CP began falling a few days later. After the expansion of the MMLF to include municipal securities on March 20 (and VRDNs on March 23), tax-exempt MMF outflows eased and conditions in the short-term muni markets improved. While stress affected a variety of money-market instruments and investment vehicles, the availability of secondary-market liquidity for MMFs' assets via the MMLF appears to have had a broad calming effect on STFMs. For example, although assets of other funds, including European dollar-denominated MMFs, could not be financed through MMLF loans, outflows from these funds abated shortly after the MMLF began operations on March 23.

Secured Funding

Repurchase Agreements

The market for repos consists of many different participants that provide or demand secured short-term funding against securities (typically Treasury and agency MBS) posted as collateral. It is a critical source of liquidity for a variety of market participants, many of whom depend predominantly on this market for their funding.

Broker-dealers, many of whom are subsidiaries of large BHCs, play a key role in the U.S. repo market as they intermediate funds between ultimate cash lenders, such as MMFs, and ultimate cash borrowers (such as hedge funds). Other market participants include asset managers, such as mutual funds and ETFs, who borrow from as well as lend to the repo market. Certain leveraged participants, such as hedge funds and mortgage REITs, typically fund themselves using short-term repo funding.

With economic prospects declining at the onset of the pandemic, many investors and market participants increased their demand for liquidity. Investors sought to sell traditionally liquid securities with minimal credit risk, such as Treasuries and agency MBS, to obtain cash. In

the case of Treasuries, there had been significant selling pressure from foreign investors and foreign central banks (**see Box B**). As noted in **Section 5.5**, these selling pressures likely stressed balance sheets of the securities dealers that intermediate in the repo market.

Securities Lending

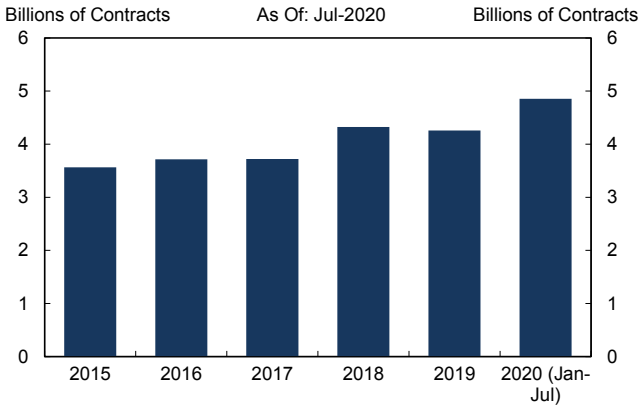
Securities lending supports the orderly operation of capital markets, principally by enabling the establishment of short positions and thereby facilitating price discovery and hedging. This lending typically is secured by cash or other securities. As noted in **Section 3.5.2**, it is estimated that at the end of September 2020 the global securities lending volume outstanding was $2.5 trillion, with around 57 percent of it attributed to the U.S.

The key interconnection between this market and the broader financial system stems from the fact that a large portion of cash collateral is reinvested in the STFMs. The fall in asset prices in March 2020 led to deleveraging by market participants that typically borrow securities, and the lower asset prices and lower demand for new securities lending in general reduced the amount of cash collateral reinvested in the STFMs. This deleveraging limited the supply of capital available in the STFMs, making it more difficult for issuers in the real economy to access capital.

Interconnection of STFMs and Other Financial Markets

The STFMs are a complex ecosystem that involve significant daily flows through a network of highly interconnected market segments and the economy more generally. Depository institutions can participate in the secured (repo) and the unsecured (federal funds) market. For example, depository institutions have participated as cash lenders in the repo market when the repo rates exceeded the interest on excess reserves. In addition, other market participants, such as the FHLBs, also participate in both markets. While MMFs cannot participate in the federal funds market, some MMFs invest in closely related certificates of deposit issued outside the U.S., known as Eurodollar instruments. Similarly, securities dealers are major participants in the secured (repo) market. Given these interconnections, stress in one market can be readily transmitted to another and more generally, to the broader financial markets.

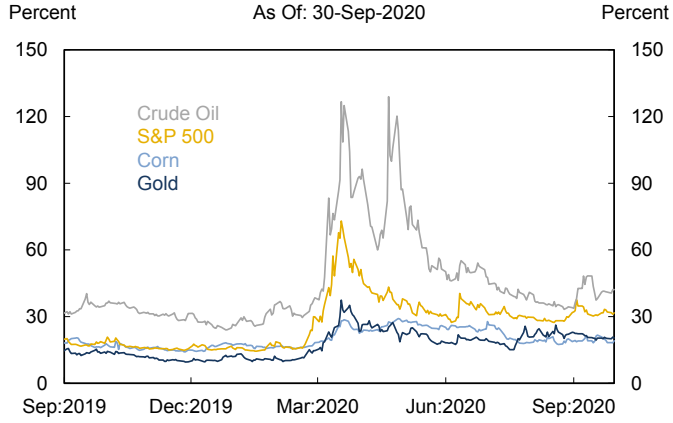
3.4.3.1 U.S. Futures Markets: Volume



Source: CFTC

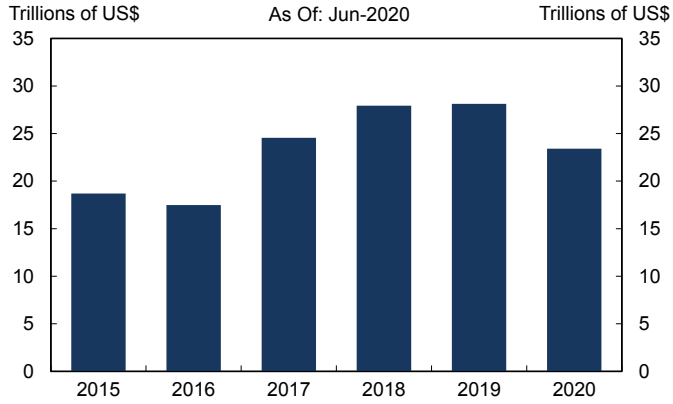
Note: 2020 volume annualized.

3.4.3.2 3-Month Implied Volatility



Source: Bloomberg, L.P., CFTC

3.4.3.3 U.S. Futures Markets Open Interest



Source: CFTC

Note: Futures contracts are dollarized using prices from contract definitions and other relevant data.

3.4.3 Derivatives Markets

3.4.3.1 Futures

U.S. futures markets generally performed well through the March and April COVID-19 market stress, providing price formation, price discovery, and risk management functions for market participants during a period of increased uncertainty. Commercial participants such as farmers, ranchers, producers, service providers, and intermediaries as well as non-commercial participants such as asset managers, hedge funds, market makers, and various retail and other investors contributed to record levels of activity across multiple futures markets. During the first seven months of 2020, volume levels across U.S. futures exchanges rose by over 15 percent on an annualized basis compared to 2019, due to higher volatility, an increase of short-term trading activities, and significant hedging and investment needs (**Chart 3.4.3.1**).

The pandemic's impact on the U.S. futures markets was most significant during March and April when various fundamental and market risk factors drove implied volatility to extreme levels (**Chart 3.4.3.2**). At the same time, futures liquidity, as represented by top-of-book depth, declined and the steep drop in asset prices drove volumes higher, while the notional amount of open interest decreased (**Chart 3.4.3.3**). The pace of the global news flow and the accompanying sell-offs triggered limit down in various asset classes. For example, e-mini S&P 500 futures hit the 5 percent limit down band in five overnight sessions in March and hit the 5 percent limit up band in another three overnight sessions.

Exchanges took various emergency actions to address operational concerns and enable efficient price discovery and price transparency. The CFTC also issued no-action letters providing temporary, targeted relief to futures commission merchants (FCMs), introducing brokers, floor brokers, certain designated contract markets, and other market participants to help facilitate orderly trading and liquidity while market participants operated away from their normal business sites.

Over the past year, open interest in "micro" futures contracts has increased significantly, totaling $3 billion as of June 2020 (**Chart 3.4.3.4**). Micro contracts are designed to make futures trading more accessible to retail investors and are typically one-tenth of the size of benchmark futures contracts. Micro equity futures, which were first introduced in May 2019, have driven much of the recent growth in micro contracts. Micro metals contracts have also driven the recent growth, and open interest in micro metals has more than quadrupled since 2018. Despite this growth, micro futures account for a small share of open interest. For example, the notional amount outstanding for the micro e-mini S&P 500 index is less than 1 percent of that for the benchmark e-mini futures contract.

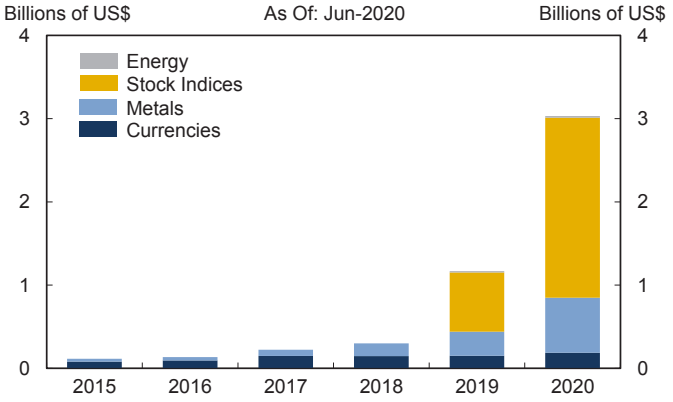
As discussed in **Box B**, open interest in U.S. Treasury futures indicated a significant shift in positioning by asset managers and leveraged funds (**Chart 3.4.3.5**). The asset managers, which include pension and other long-only unleveraged funds, are long futures across the Treasury curve, while leveraged funds are short futures across the curve. In 2018 and the first half of 2019, leveraged funds and asset managers significantly increased their net exposures in Treasury futures, peaking at around $600 billion in the third quarter of 2019. Since the pandemic and given the current interest rate environment and outlook, the aggregate level of open interest across all Treasury futures contracts has nearly halved. This reduction in net positions has primarily been in the 2-year and 10-year Treasury futures.

3.4.3.2 Options

Equity Options

In early 2020, the COVID-19 pandemic impacted the operations of the five equity options exchanges that maintain a physical trading floor, causing each of them to transition to fully-electronic trading as social distancing restrictions came into effect. Trading returned to the physical floors as they began to reopen at the end of the second quarter of 2020, but floor volumes remain below pre-pandemic

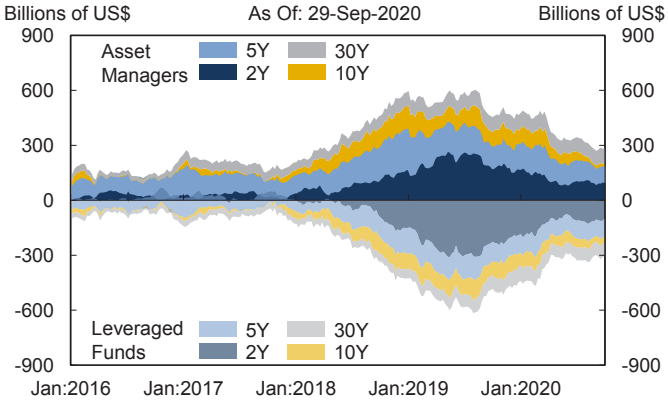
3.4.3.4 Micro Futures: Open Interest



Source: CFTC

Note: Futures contracts are dollarized using prices from contract definitions and other relevant data.

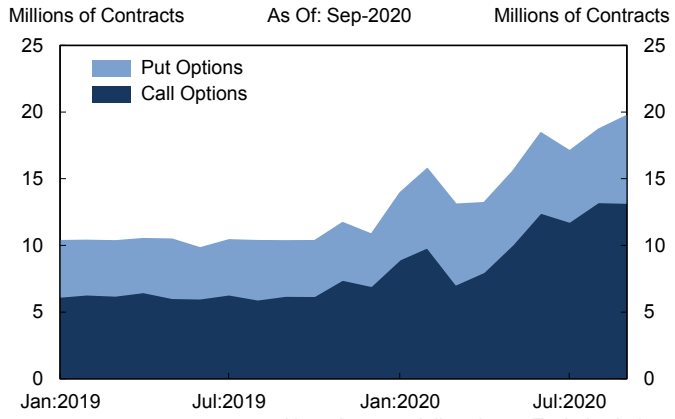
3.4.3.5 U.S. Treasury Futures: Open Interest



Source: CFTC

Note: Net notional amount of open interest by trader type. 10Y includes 10Y and 10Y Ultra Treasury Note Futures; 30Y includes Treasury Bond and Ultra Treasury Bond Futures.

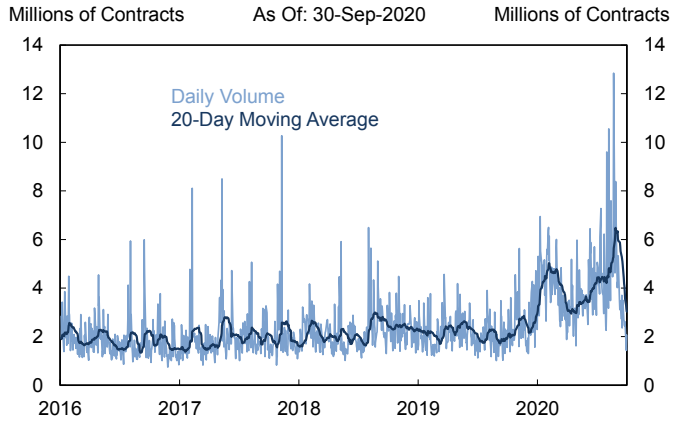
3.4.3.6 Exchange-Traded Equity Option Volume



Source: The OCC

Note: Average daily volume. Excludes index and ETF options.

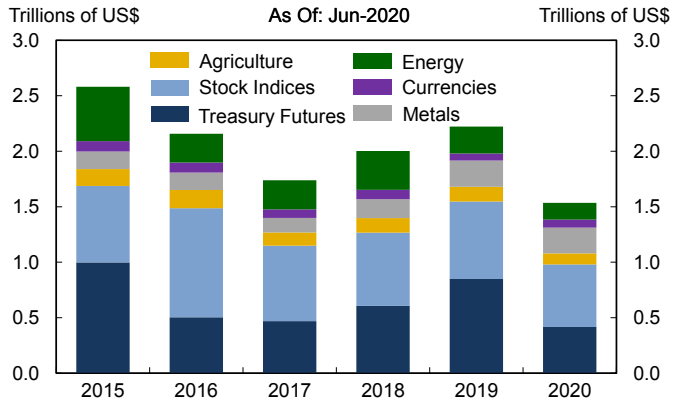
3.4.3.7 Call Option Volume for Select Technology Stocks



Source: Bloomberg, L.P.

Note: Includes daily call option volume for TSLA, AAPL, NFLX, GOOG, FB, and MSFT.

3.4.3.8 Options on Futures: Open Interest



Source: CFTC

Note: Excludes Eurodollar futures on options.

levels. At the same time, overall options volume has dramatically increased, with average daily volumes for exchange-traded equity options reaching a record 20 million contracts in September 2020 (**Chart 3.4.3.6**).

The recent growth of option volumes has been concentrated in call options on technology stocks. For example, the average daily volume for call options on six large technology stocks has roughly tripled over the past year, peaking at over 6 million contracts in August (**Chart 3.4.3.7**). Some reports indicate that the increase in volume has been driven, in part, by an increase in retail investor participation as broker-dealers have enhanced their options trading offerings and have lowered or eliminated their trading commissions.

Exchange-Traded Options on Futures

Over the past five years, open interest for U.S. exchange-traded options on futures averaged approximately $40 trillion on a non-delta adjusted basis. Notional exposures to options on futures are concentrated in the highly liquid benchmark CME 3-month Eurodollar interest rate contract. Excluding Eurodollars, open interest for options on futures contracts stood at approximately $2.2 trillion in non-delta adjusted notional value in 2019 (**Chart 3.4.3.8**).

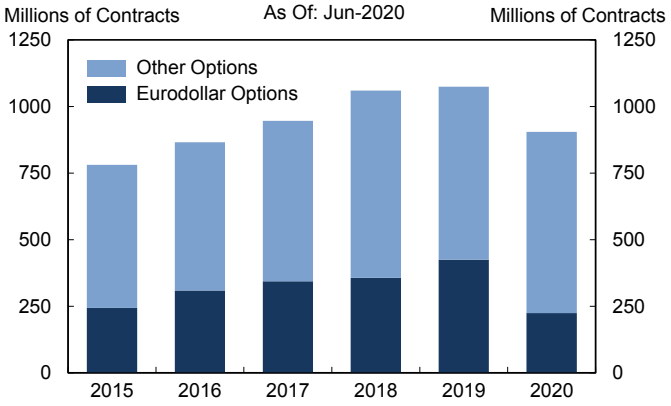
Option volumes across all markets increased between 2014 and 2019; over one billion option contracts traded in 2019 (**Chart 3.4.3.9**). Over the past five years, Eurodollar options volume has accounted for approximately 35 percent of all volume on exchange-traded options on futures.

Between 2015 and 2019, the delta-adjusted notional amount of options on futures nearly tripled, from $6.9 trillion in June 2015 to $18 trillion in June 2019 (**Chart 3.4.3.10**). Much of this growth could be attributed to increased open interest in Eurodollar options contracts. Open interest for options on futures fell to $13 trillion in June 2020 as interest in Eurodollar contracts declined given the reduced uncertainty in the outlook for short-term interest rates.

Excluding Eurodollar instruments, options referencing financial futures account for approximately 58 percent of outstanding, with options on equity indices, Treasury futures, and currencies accounting for 31 percent, 23 percent, and 4.3 percent of delta-adjusted open interest, respectively (**Chart 3.4.3.11**). Within the commodity space, options on metals, energy, and agriculture futures account for 22 percent, 12 percent, and 8 percent of delta-adjusted open-interest, respectively.

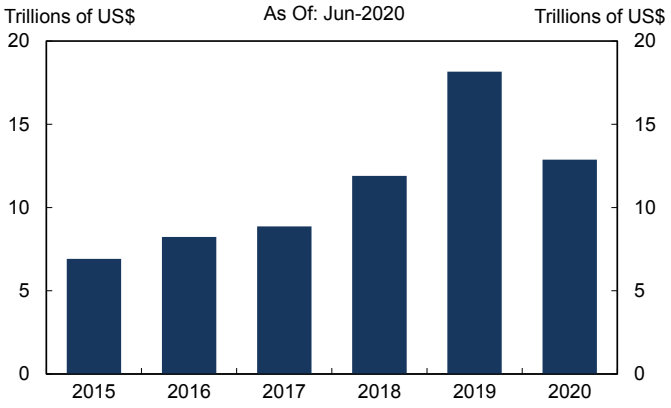
Options on Treasury futures are considered to be among the most liquid options on futures contracts, with significant activity in low-delta, or deep-out-of-the-money options. Low-delta options (less than 0.2) have strike prices far away from prevailing futures prices and provide protection against tail-risk events. Consequently, trading and open interest in low delta options tend to pick up during periods of increased uncertainty or volatility in the rates market. The ratio of puts to calls is a good indicator of the overall bias of the marketplace. Higher puts relative to calls may indicate increased hedges against rising rates (in yield terms) and lower puts relative to calls may indicate a bias towards falling rates. After the put-call ratio on 10-year Treasury futures spiked in March 2020, those

3.4.3.9 Options on Futures: Volume



Source: CFTC

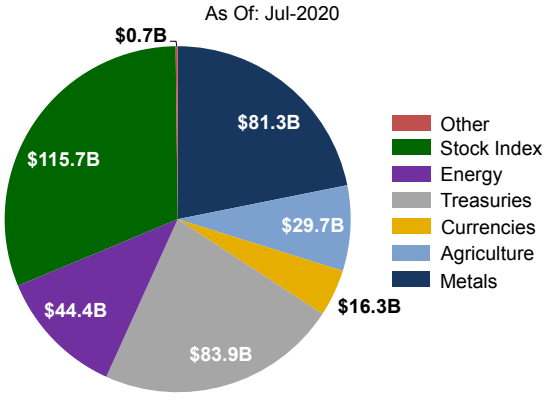
3.4.3.10 Options on Futures: Delta Adjusted Open Interest



Source: CFTC

Note: Delta adjusted open interest as of June 30 of each year. Includes Eurodollar futures on options.

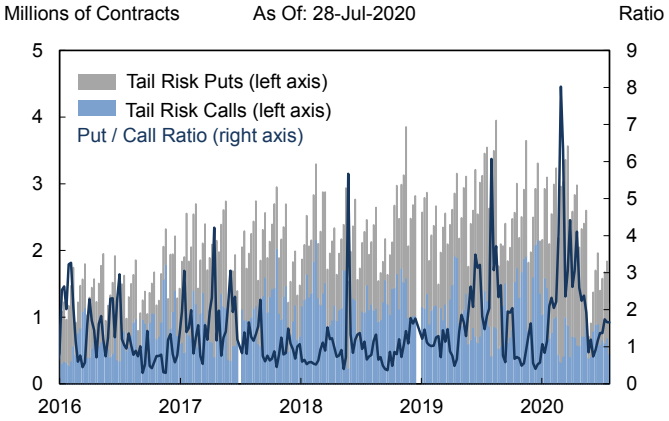
3.4.3.11 Delta Adjusted Options on Futures by Asset Classes



Source: CFTC

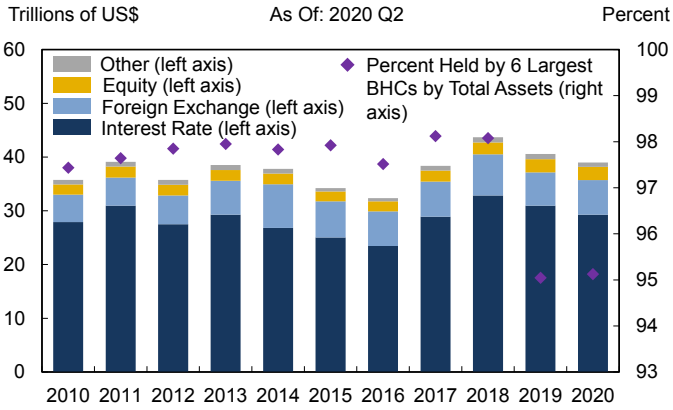
Note: Delta adjusted open interest. Excludes Eurodollar options.

3.4.3.12 Options on 10-Year Treasury Futures



Source: CFTC

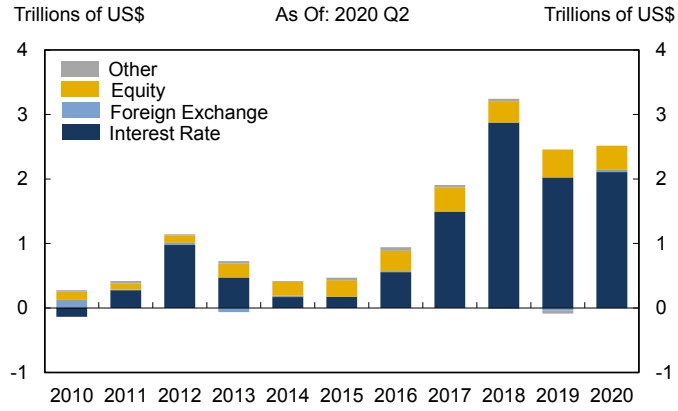
3.4.3.13 OTC Options: BHC Gross Notional Outstanding



Source: FR Y-9C, Staff Calculations

Note: Other includes credit, commodity, and other OTC options.

3.4.3.14 OTC Options: BHC Net Notional Outstanding



Source: FR Y-9C, Staff Calculations

Note: Other includes credit, commodity, and other OTC options.

ratios declined to more normal levels (**Chart 3.4.3.12**).

OTC Options

According to the Bank for International Settlements (BIS), the global gross notional amount outstanding of over-the-counter (OTC) options remained relatively steady at around $56 trillion as of December 2019. Interest rate option contracts represent the bulk of that figure, ending 2019 at just under $40 trillion in notional outstanding, which is down slightly from 2018. The notional amount of OTC equity options as of the fourth quarter of 2019 was approximately $3.7 trillion, remaining below the peak of $8.5 trillion in the second quarter of 2008.

At the end of the second quarter of 2020, BHCs held $39 trillion in OTC options, a decline from earlier years (**Chart 3.4.3.13**). This decrease is primarily attributable to a reduction in exposures at certain large BHCs. As a result, the share of option exposures attributed to the six largest BHCs fell from 98 percent in the fourth quarter of 2018 to 95 percent in the second quarter of 2020. Over the same period, BHC net notional exposures to options—as measured by written minus purchased options—fell from $3.2 trillion to $2.5 trillion, though they are still well above levels observed between 2011 and 2016 (**Chart 3.4.3.14**).

3.4.3.3 OTC Derivatives

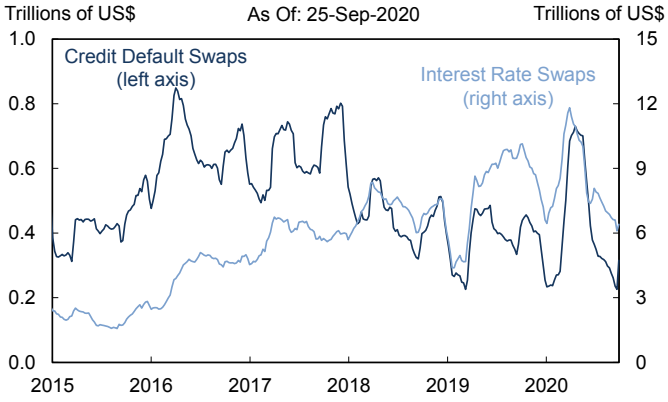
Activity in the OTC derivatives market increased sharply during the March 2020 market stress. In March 2020, interest rate swap trading volumes hit record levels, with weekly volumes peaking at over $20 trillion for the week ending March 6, 2020. Volumes in CDS markets roughly doubled from the previous year but remained below their peak weekly volume in 2016. The increase in trading volumes is largely related to market participants repositioning portfolios in response to central bank interest rate cuts and increased economic uncertainty. Additionally, some reports suggest that institutional investors relied on CDS markets due to the rapid deterioration of liquidity conditions in the underlying corporate

bond markets. OTC activity has since decreased to pre-pandemic levels (**Chart 3.4.3.15**).

Concurrently, the notional amount of OTC derivatives outstanding rose during the COVID-19 market stress but have since returned to pre-pandemic levels (**Chart 3.4.3.16**). The notional amount of index CDS outstanding peaked at $5.7 trillion in the last week of March, a nearly 50 percent increase from year-end 2019; interest rate swaps outstanding peaked at over $300 trillion in the first week of March, a 20 percent increase from year-end 2019. By the end of September 2020, the notional amount of index CDS and interest rate derivatives declined to $4.4 trillion and $250 trillion, respectively.

As discussed in Box A of the Council's 2018 annual report, the size of the interest rate swaps market can also be expressed on an entity-netted notional (ENN) basis, which attempts to risk-adjust notional amounts by (1) expressing the notional amount of each swap in 5-year equivalents; and (2) netting offsetting positions for every pair of counterparties. While the notional amount of interest rate swaps has decreased to pre-pandemic levels, risk-adjusted ENN exposures remain elevated, indicating the increased market risk transfer in the interest rate swaps markets (**Chart 3.4.3.17**).

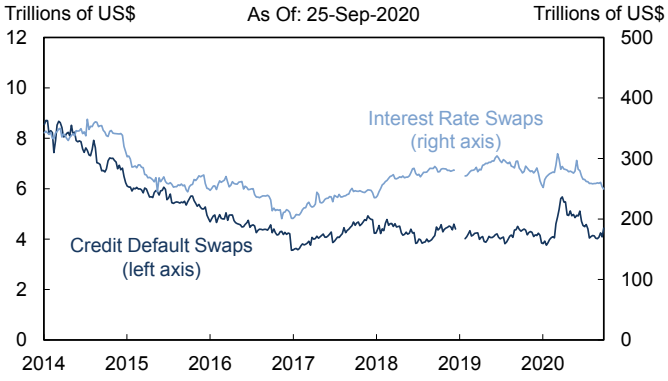
3.4.3.15 Derivatives Notional Volume



Source: CFTC

Note: 12-week moving-averages. Excludes security-based swaps.

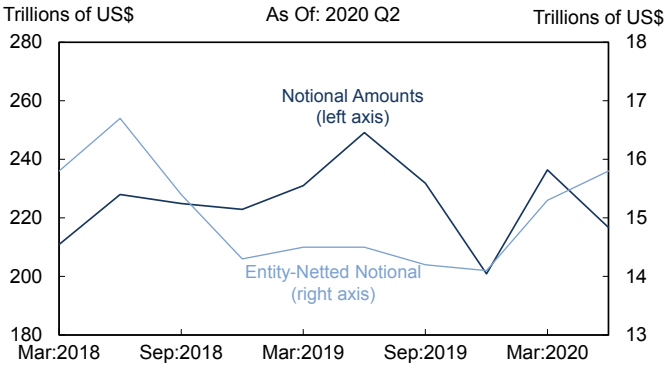
3.4.3.16 Derivatives Notional Amount Outstanding



Source: CFTC

Note: Weekly Swaps Report not issued between Dec. 22, 2018 and Jan. 26, 2019 due to a lapse in government funding. Excludes security-based swaps.

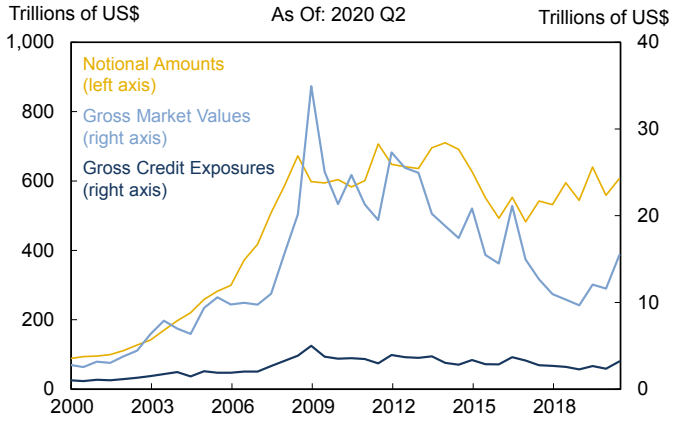
3.4.3.17 Size of Interest Rate Swap Market



Source: CFTC Office of Chief Economist

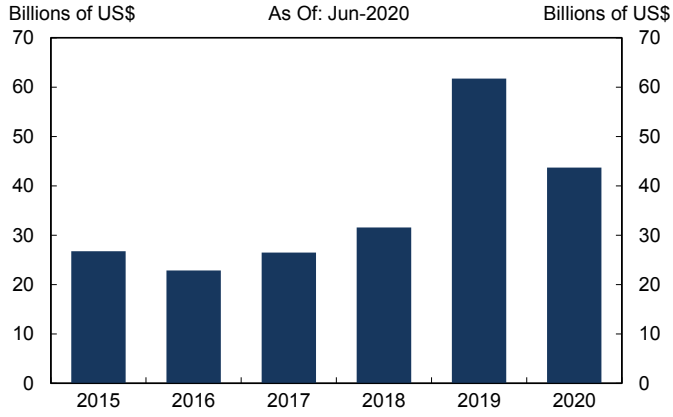
Note: Total notional amount and entity-netted notional amount as reported in "Introducing ENNs: A Measure of the Size of Interest Rate Swap Markets."

3.4.3.18 Global OTC Positions



Source: BIS, Haver Analytics

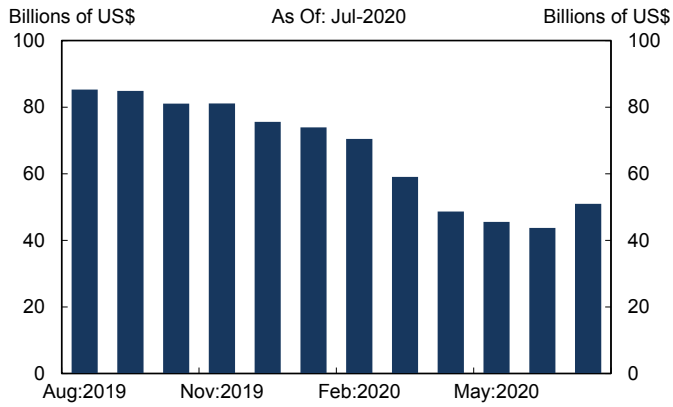
3.4.3.19 Commodity Index Swaps: Annual Open Interest



Source: CFTC

Note: Notional exposure of commodity index swaps.

3.4.3.20 Commodity Index Swaps: Monthly Open Interest



Source: CFTC

Note: Month-end notional exposure of commodity index swaps.

The notional amount of global OTC derivative positions totaled $607 trillion as of June 2020, a 5.2 percent decrease compared to June 2019 (**Chart 3.4.3.18**). This decline was largely driven by a decline in the amount of outstanding OTC interest rate and FX derivatives contracts, which fell by $29 trillion and $4.8 trillion respectively. In contrast, the gross market value of outstanding OTC derivatives, which provides a measure of amounts at risk, rose to $15 trillion as of June 2020, a $3.4 trillion increase over the year. Interest rate derivatives saw the largest increase in gross market value, as the decline in central bank policy rates lifted the market value of outstanding interest rate derivatives. Gross credit exposures, which adjust gross market values for legally enforceable bilateral netting agreements (but not for collateral), also increased, from $2.7 trillion as of June 2019 to $3.2 trillion as of June 2020.

Commodity Index Swaps

During the past five years, the use of commodity index swaps has expanded significantly, with approximately $62 billion outstanding in 2019 versus $27 billion in 2015 (**Chart 3.4.3.19**). The overall exposure of commodity index swaps, however, declined during the pandemic months as investors reduced exposures to commodities. Commodity index swap exposures, which fell to as low as $35 billion, have since rebounded to $50 billion as of June 2020 (**Chart 3.4.3.20**).

Similarly, the use of single commodity swaps has increased significantly over the past five years (**Chart 3.4.3.21**). This growth can be attributed largely to an increase in commercial-driven activity, particularly with customization of commodity swaps. Energy-based swaps are the most popular category of single commodity swaps, with natural gas- and crude oil-based swaps accounting for 31 percent and 28 percent of total single commodity swaps outstanding over the past five years, respectively (**Chart 3.4.3.22**).

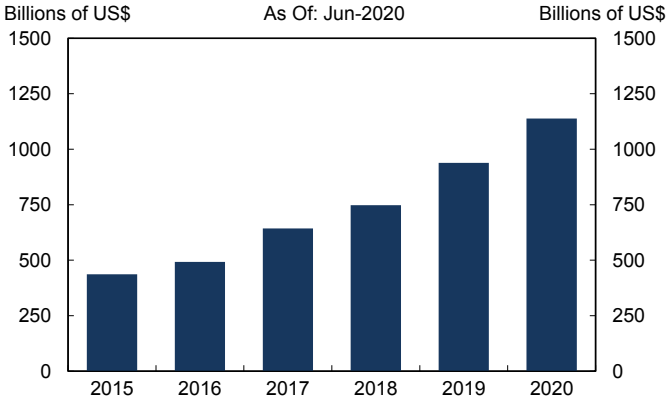
3.4.3.4 Futures Commission Merchants

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 performance of their customers to the CCP.

Concerning centrally cleared futures and options on futures, the level of customer margin funds held by FCMs remained fairly flat prior to the pandemic, but has since increased significantly (**Chart 3.4.3.23**). In March 2020, the amount of required client margin for U.S. and foreign futures spiked to $318 billion, a $104 billion increase from February 2020. Similarly, the amount of required client margin for swaps increased by $33 billion to $153 billion in March. Increased trading volumes, along with increases in CCP and FCM margin requirements, caused a sharp increase in required client margin. While market volatility has since subsided, the total amount of required client margin held by FCMs remained elevated through the summer, totaling $439 billion in September 2020.

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 53 as of September 2020; 26 of these are bank-affiliated. The number of FCMs that report holding segregated client funds for the centrally cleared swaps business decreased from 23 at year-end 2014 to 16 (of which 14

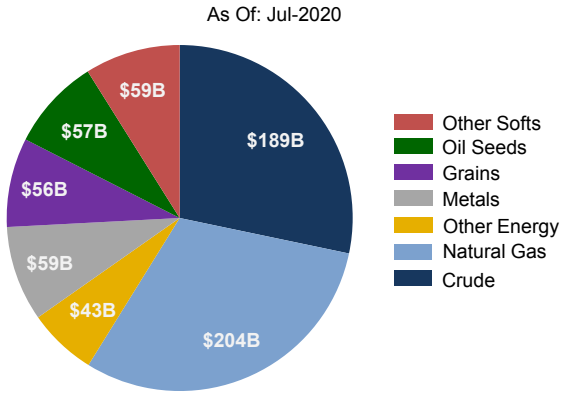
3.4.3.21 Commodity Swaps: Open Interest



Source: CFTC

Note: Average month-end notional exposure across 25 key contracts.

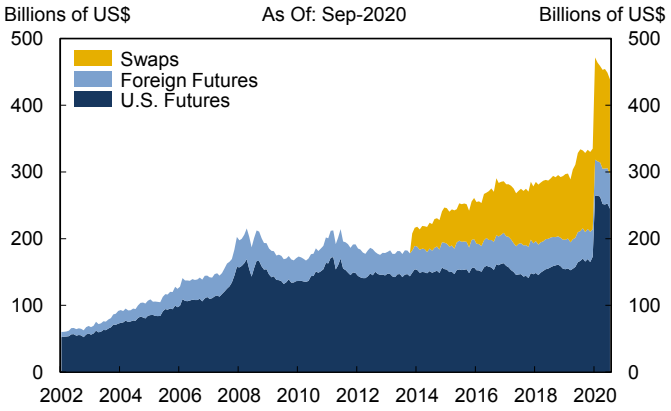
3.4.3.22 Commodity Swaps by Asset Class



Source: CFTC

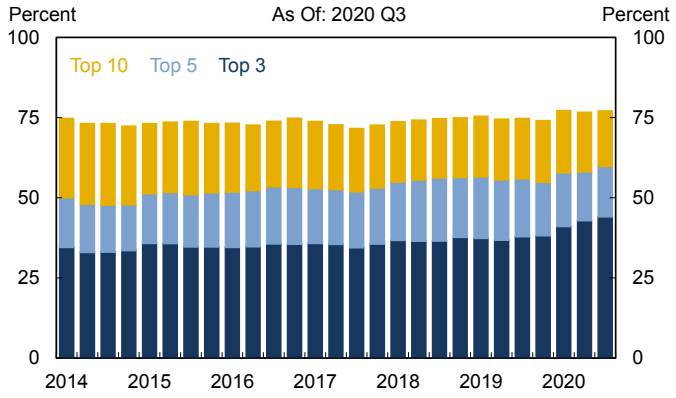
Note: 5-year average notional contribution of the major commodity categories.

3.4.3.23 Margin Funds Held at CFTC Registered FCMs



Source: CFTC

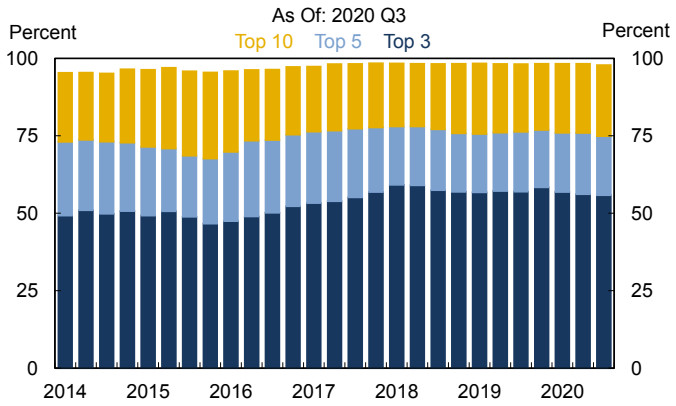
3.4.3.24 FCM Concentration: Customer Futures Balances



Note: Represents total amount of funds that an FCM is required to segregate on behalf of customers who are trading futures and options on futures at US exchanges.

Source: CFTC

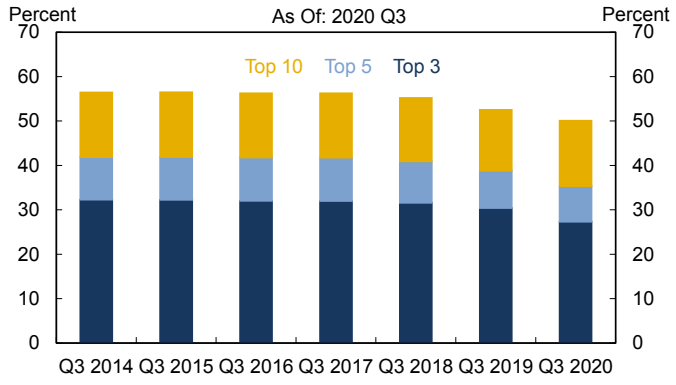
3.4.3.25 FCM Concentration: Customer Swap Balances



Note: Represents the amount of funds an FCM is required to segregate for customers who trade cleared swaps.

Source: CFTC

3.4.3.26 Concentration of Swap Positions for Registered SDs



Note: Positions between two Swap Dealers (SDs) in the same category (*e.g.*, Top 3 or Top 5) are double-counted (*i.e.*, a trade between the #1 SD and #3 SD would be counted twice).

Source: CFTC

are bank-affiliated) as of September 2020. The pace of consolidation in the FCM industry has slowed since 2015, however, and the number of FCMs clearing swaps and futures for customers remained relatively consistent over the last several years.

Between the first quarter of 2014 and the third quarter of 2020, the top five clearing members at futures exchanges held between 48 and 60 percent of client margin for futures products, and the top five swap clearing members held between 68 and 78 percent of client margin for swaps products (**Charts 3.4.3.24, 3.4.3.25**).

3.4.3.5 Swap Dealers

Swap dealers (SDs) began registering with the CFTC in December 2012; as of October 2020, there were 109 registered SDs, an increase from the 80 provisionally registered SDs at the end of 2013. Between 2014 and 2018, registered SD activity remained concentrated, with the top three SDs accounting for over 30 percent of swap positions and the top ten SDs accounting for over 55 percent of swap positions. Since 2018, the concentration of swap contracts with the largest SDs has declined slightly. As of the third quarter of 2020, the share of contracts held by the top three SDs totaled 27 percent, while the share of contracts held by the top ten SDs totaled 50 percent (**Chart 3.4.3.26**).

3.4.3.6 Swap Execution Facilities

Certain interest rate swaps and index CDS have been "made available to trade," and therefore are required to be executed on a Swap Execution Facility (SEF), an exempt SEF, or a designated contract market. Combined with mandatory central clearing, these regulated trading platforms have increased pre-trade price transparency, reduced operational risk, and improved end-to-end processing.

The level of U.S.-regulated swaps executed on SEFs has continued to rise and SEF trade volumes picked up considerably during the COVID-19 market volatility. In March 2020, the notional amount of interest rate swaps traded on-SEFs averaged $689 trillion, down

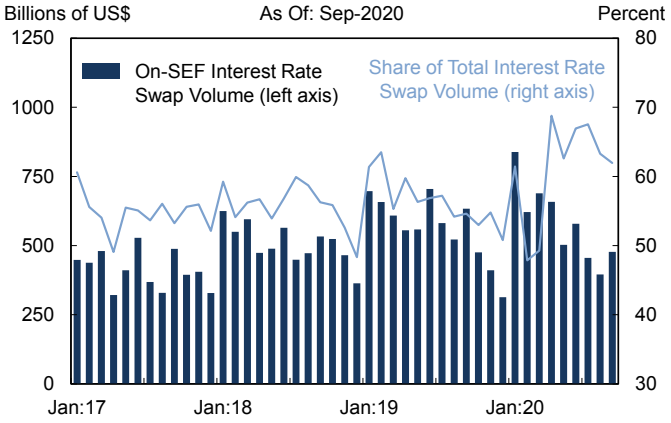
slightly from its January 2020 peak, but 13 percent higher compared to March 2019 (**Chart 3.4.3.27**). Nonetheless, the share of interest rate swaps trading that occurred on SEFs fell to below 50 percent in February and March 2020, as off-SEF trading hit record levels. The share of interest rate swaps traded on SEFs has since rebounded to 62 percent in September 2020.

The average daily volume for index CDS SEF trading surged to $78 billion in March 2020, well above the previous monthly record set in February 2018 and a 115 percent increase from March 2019 (**Chart 3.4.3.28**). In recent years, the share of index CDS swaps trading that occurred on SEFs has remained relatively stable at around 70 to 80 percent. During the COVID-19 market stress, the share of index CDS trading that occurred on SEFs increased slightly to 82 percent in March 2020. SEF trading volumes have since declined, but the share of index CDS executed on SEFs has remained elevated, totaling 81 percent in September 2020.

3.4.4 Commodities Market

The U.S. commodity derivatives markets cover energy, agricultural, and metals industries through various products, including futures, options, swaps (both single commodity and commodity index), and a growing commodity ETF and exchange-traded notes (ETN) market. The U.S. commodity derivatives markets serve important price formation and price discovery functions, allowing both U.S. and global participants to hedge, invest, and manage risk. These markets also provide a basis for global trade to be priced in U.S. dollars, contributing to the U.S. dollar's status as the world's reserve currency.

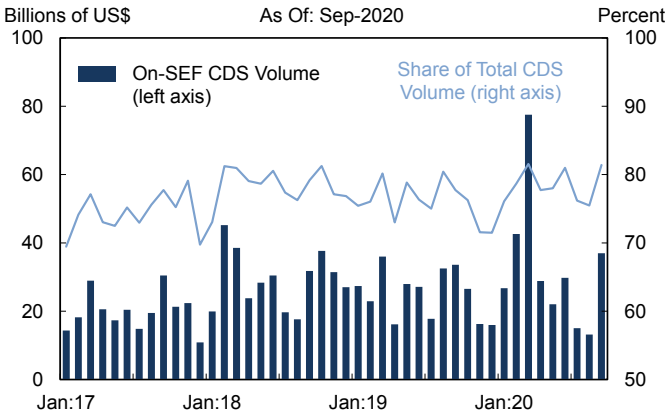
3.4.3.27 Interest Rate Swap SEF Trading Volumes



Source: CFTC

Note: Average daily notional volume.

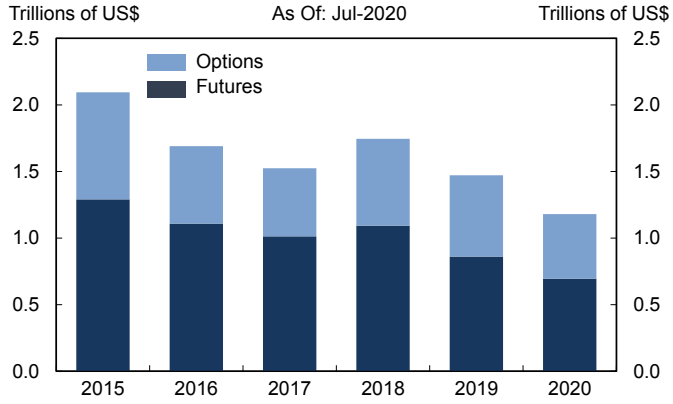
3.4.3.28 Credit Default Swap SEF Trading Volumes



Source: CFTC

Note: Average daily notional volume. Excludes security-based swaps.

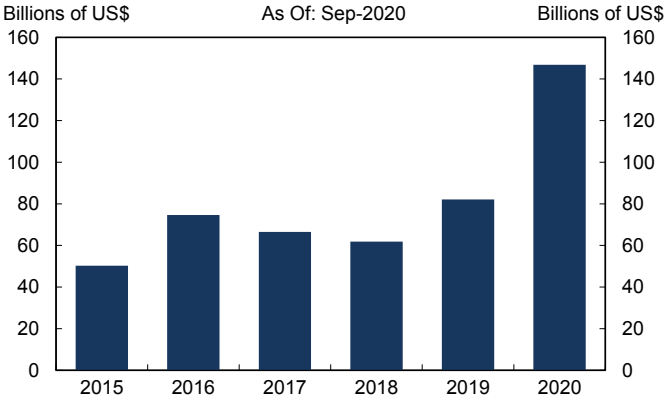
3.4.4.1 Commodities Futures & Options: Open Interest



Source: CFTC

Note: Notional amount outstanding. Options are not delta-adjusted

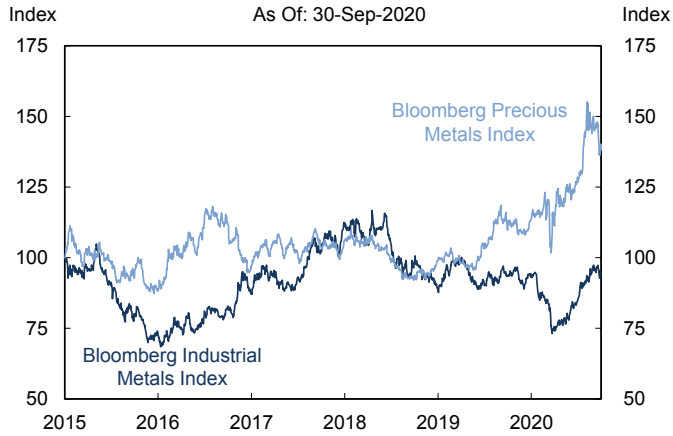
3.4.4.2 Total Net Asset Value – Commodity ETFs



Source: Morningstar, Inc.

Note: Data are as of end of September in each given year.

3.4.4.3 Metals Indices



Source: Bloomberg, L.P.

Note: Indexed to 01-Jan-2015.

Over the past five years, the notional amount of U.S. futures and options outstanding has averaged approximately $1.5 trillion (**Chart 3.4.4.1**). Commodity exchange-traded products (ETPs), which provide retail investors with a vehicle to gain exposures to commodity markets, saw significant growth in net AUM during the first nine months of 2020 (**Chart 3.4.4.2**). Commodity ETP growth has been driven by inflows into bullion-backed gold ETFs, as investors sought to gain portfolio diversification in a low-yield environment.

Precious and Industrial Metals

Between 2015 and 2019, gold and other precious metals traded in a relatively narrow price band. During the extreme volatility observed in March 2020, precious metals sold off substantially. Despite gold's typical position as a safe haven asset, gold prices fell by approximately 12 percent between March 9 and March 19 as investors and central banks sought to raise dollars amid the global flight to liquidity. Since then, precious metals have rallied considerably (**Chart 3.4.4.3**). Gold and silver have driven this recovery in precious metals prices, with gold futures reaching an all-time high of $2,089 per troy ounce on August 7 and silver futures rising to a seven-and-a-half-year high of almost $30 per troy ounce on the same day. Physically-backed ETF holdings for gold and silver have also surged in 2020, as investors use these instruments to gain exposure to rising prices. While platinum and palladium prices have recovered from their March 2020 lows, as of September 30, 2020, they were still 13 percent and 19 percent, respectively, below their pre-pandemic highs, which can be attributed to increased uncertainty around future demand given that these metals are used in automotive catalysts to reduce emissions.

Similar to other commodities, industrial metals prices dropped steeply in March and April 2020 as COVID-19 lockdowns depressed demand from the manufacturing and construction industries. Global markets have since rebounded on strong China demand, government stimulus efforts, and a lower U.S.

dollar. Iron ore prices increased significantly since April due to a reduction of stocks, which were impacted by a slowdown in seaborne supply during the first quarter, and Chinese steelmakers ramping up production in the second quarter. Helping to support aluminum prices, U.S. tariffs were re-imposed on unalloyed, unwrought aluminum imports from Canada on August 16.

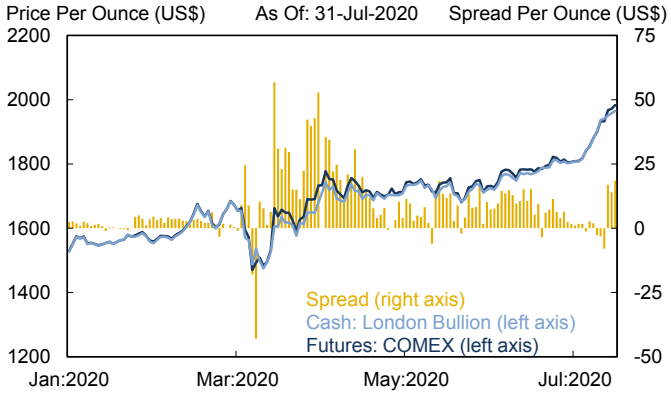
Gold markets experienced significant price dislocations at the height of the COVID-19 market stress. For example, the New York COMEX gold futures price diverged materially from the London spot price, which can largely be attributed to supply chain disruptions and contract specifications. Typically, if there is a shortage of gold at COMEX, gold refineries will recast 400 ounce London bullion bars into the 100-ounce bars that are required to settle futures contacts in New York. Increased demand for gold coupled with disruptions in air travel and shutdowns at major refineries, however, raised concerns that there could be a shortage of 100-ounce COMEX bars at the time of settlement. At the height of the COVID-19 crisis, the spot and futures price spread widened to over $50 per ounce (**Chart 3.4.4.4**).

Agriculture Markets

COVID-19 impacted the agricultural markets in numerous ways, including multiple price distortions, increased volatility, and significant dislocations. Some agricultural products, like milk and bacon, faced a supply glut due to the sharp drop off in purchases from restaurants and other commercial end-users, while others, such as ground beef, saw shortages due to rolling shutdowns of meatpacking factories with COVID-19 infections. Temporary government payment programs have helped stave off farm bankruptcies, but the outlook for the sector is uncertain.

Most agricultural commodity prices fell sharply with the pandemic, declining by anywhere from 10 percent to 35 percent in March and April (**Chart 3.4.4.5**). Agricultural markets were also down before the pandemic due to trade

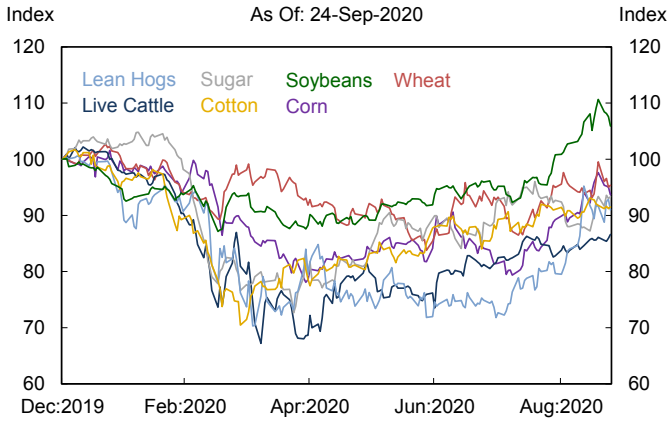
3.4.4.4 Cash-Futures Spread: Gold



Source: Bloomberg, L.P., CFTC

Note: London 4:00pm fix minus COMEX 10:00am volume weighted average price.

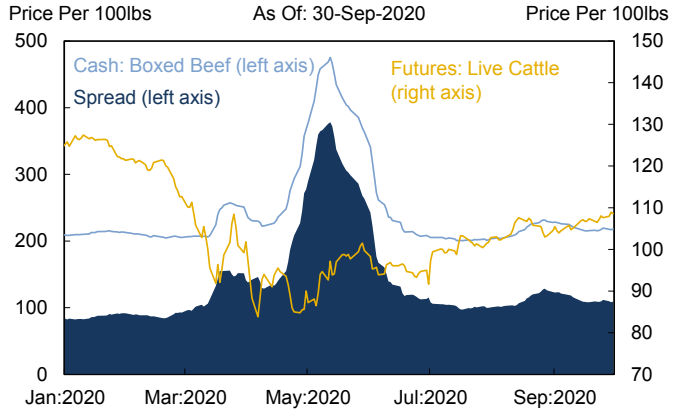
3.4.4.5 Agriculture Prices



Source: Bloomberg, L.P., CFTC

Note: Indexed to year-end 2019.

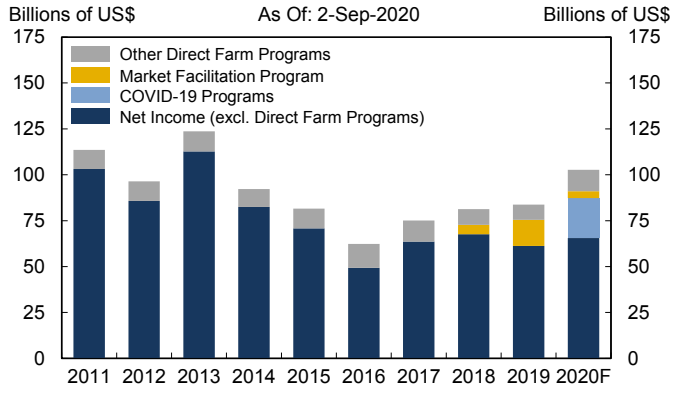
3.4.4.6 Cash-Futures Spread: Cattle



Source: Bloomberg, L.P., CFTC

Note: Box beef choice cut prices minus live cattle front month contract

3.4.4.7 Net Farm Income



Source: USDA

Note: The Market Facilitation Program provides direct payments to help producers who have been directly impacted by illegal retaliatory tariffs. COVID-19 Programs include $16 billion in Coronavirus Food Assistance Program payments and $5.8 billion in PPP payments.

disruptions with China and bearish supply and demand fundamentals. The gradual lifting of virus restrictions, a pick-up in Chinese purchases, and a weaker U.S. dollar relative to the April 2020 peak, have all provided support to most agricultural markets. By the end of September, prices for most agricultural products have returned to pre-pandemic levels. However, livestock prices were still down approximately 10 percent year-to-date through September 30, 2020. Price volatility, which declined over the summer, remained elevated relative to pre-pandemic levels.

In March 2020, the shutdown in economic activity and the rapid change in consumer behavior led to dislocations between futures and underlying cash markets for various commodities. During this period, retail beef and pork prices spiked due to an increase in consumer demand related to stockpiling, coupled with a decline in supply due to COVID-19 outbreaks at meat processing plants. By mid-May, beef and pork production was 40 percent below 2019 levels. As processing plants struggled to remain open, demand for live cattle and lean hogs fell, which pushed futures prices lower, and by mid-May, the spread between choice boxed-beef (cash markets) and live cattle (futures) in particular was driven to historical highs (**Chart 3.4.4.6**). Given the unprecedented challenges facing the livestock industry, the CFTC has formed a Livestock Taskforce to monitor events in the agriculture market.

According to the September 2020 United States Department of Agriculture (USDA) forecast, net farm income is projected to increase to $103 billion in 2020, which can largely be attributed to a significant increase in direct government payments (**Chart 3.4.4.7**). Direct government payments are projected to total $37 billion in 2020, or 36 percent of net farm income. These programs have helped offset the decline in cash receipts for all commodities, which are projected to decrease to $358 billion in 2020, down $12 billion from 2019. The bulk of 2019 and 2020 direct federal government payments

can be attributed to the Market Facilitation Program, which provides temporary assistance to farmers in response to trade disruptions, and COVID-19 disaster assistance programs.

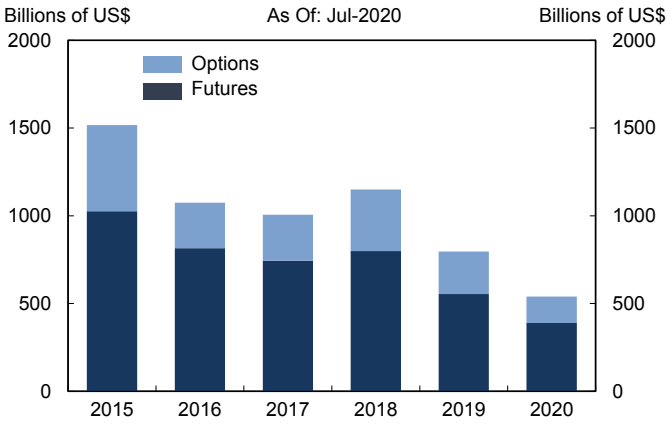
Prior to the COVID-19 pandemic, the agricultural sector faced stress due to low commodity prices, U.S.-China trade tensions, and the severe flooding in the Midwest. Federal assistance programs and forbearance programs have helped keep family farms afloat through the COVID-19 pandemic. In fact, the number of family farms filing for bankruptcy under Chapter 12 fell to 284 in the first six months of 2020 compared to 294 in the first six months of 2019. Nevertheless, the outlook for the sector remains uncertain.

Energy Markets

The U.S energy futures markets are critical for the U.S. economy, spanning petroleum products, natural gas, and electricity (**Charts 3.4.4.8, 3.4.4.9**). These markets are central to price formation and price discovery for various producers, refiners, storage providers, intermediaries, and distributors, and serve as key benchmarks to price-related cash transactions and associated swap, ETF, and commodity index products that attract a broader set of investors.

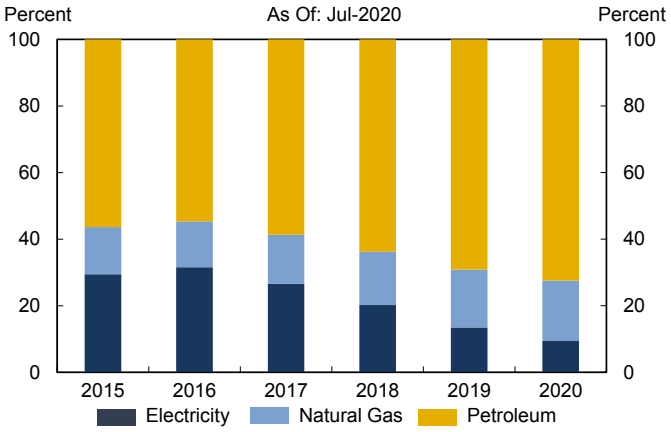
In the months leading up to the COVID-19 pandemic, crude oil prices were trending upwards due to more positive economic conditions and a thawing in global trade tensions. By year-end 2019, the West Texas Intermediate (WTI) spot price was $61 per barrel, up from $54 per barrel on September 30, 2019. In late-January, crude oil prices began trending lower, as investors anticipated lower Chinese demand amid the COVID-19-related lockdowns and travel restrictions. The decline in crude oil prices rapidly accelerated in March as global demand collapsed and Saudi Arabia and Russia failed to reach an agreement on production cuts. By March 30, WTI fell to a seventeen-year low of $14 per barrel. By April 2020, global demand for liquid fuel fell to an estimated 81 million barrels per day, while

3.4.4.8 Energy Futures & Options: Open Interest



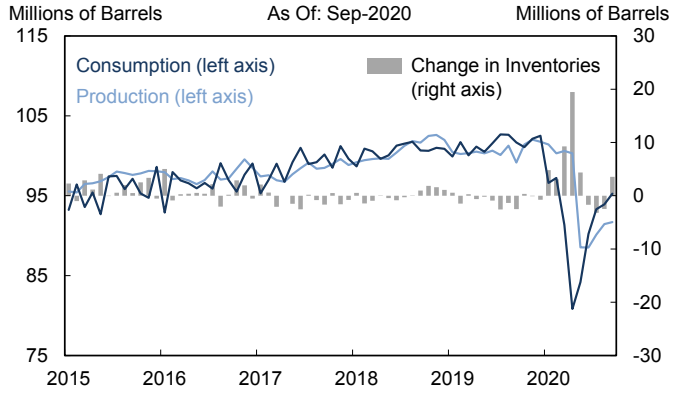
Source: CFTC

3.4.4.9 Energy Futures & Options by Product



Source: CFTC

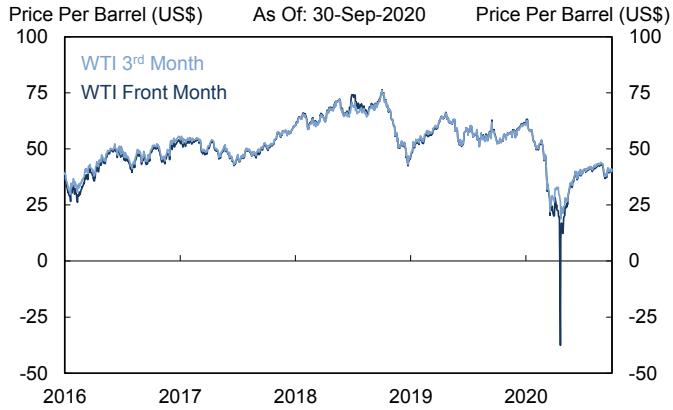
3.4.4.10 Global Petroleum Consumption and Production



Source: U.S. Energy Information Administration

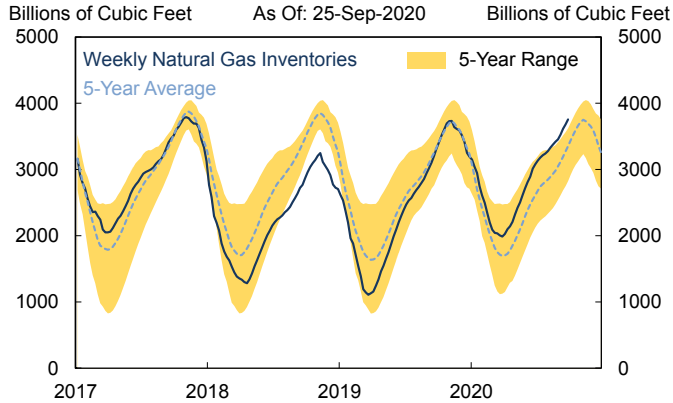
Note: Millions of barrels per day. Change in inventories represents the difference between production and consumption.

3.4.4.11 WTI Crude Oil Futures



Source: U.S. Energy Information Administration

3.4.4.12 Natural Gas Inventories



Source: U.S. Energy Information Administration

Note: The shaded area and dotted line indicate the rolling 5-year range and average.

global production remained fairly constant at 100 million barrels per day (**Chart 3.4.4.10**). The resulting growth in crude oil inventories led to concerns that oil production in the U.S. midcontinent could overwhelm storage capacity in the trading hub of Cushing, Oklahoma. In light of these storage constraints, the front-month WTI oil futures contract began trading negative for the first time in history, settling to a record low -$38 per barrel on April 20, 2020 (**Chart 3.4.4.11**). WTI futures quickly returned to positive levels, however, as it became clear that regional facilities were likely adequate to manage near-term oil storage needs.

In May, WTI oil prices rebounded sharply and have since stabilized around $40 per barrel amid sustained production cuts by the Organization of Petroleum Exporting Countries (OPEC) and its partner countries, declining U.S. crude supplies, and recovering demand. In April 2020, OPEC and Russia (OPEC+) agreed to reduce oil production by about 9.7 million barrels per day from October 2018 production levels in order to address the challenge of global oversupply. OPEC+ has maintained significant cuts into the second half of 2020, with some adjustments. The decline in production while global economies reopened ultimately helped rebalance markets, although demand for refined products remains well below seasonal levels.

Prior to the COVID-19 pandemic, natural gas inventories were elevated as the relatively mild winter led to lower consumption during the 2019-2020 heating season. The pandemic led to a sharp decline in commercial and industrial demand for natural gas, with a delayed production response leading to the highest seasonal inventory levels in five years (**Chart 3.4.4.12**).

Similar to natural gas inventories, the natural gas futures curve typically exhibits seasonality, with summer contracts trading at a discount relative to winter contracts. Beginning in mid-March, this spread widened considerably, as the reduction in demand and high inventory

levels put downward pressure on the front of the futures curve, while anticipated production cuts kept the back end of the curve relatively stable. A summer to winter differential of greater than 60 cents is rarely seen in natural gas, and yet the spread between the July 2020 contract and January 2021 contract exceeded $1.30 per million British thermal units in the week prior to the July 2020 contract expiration (**Chart 3.4.4.13**).

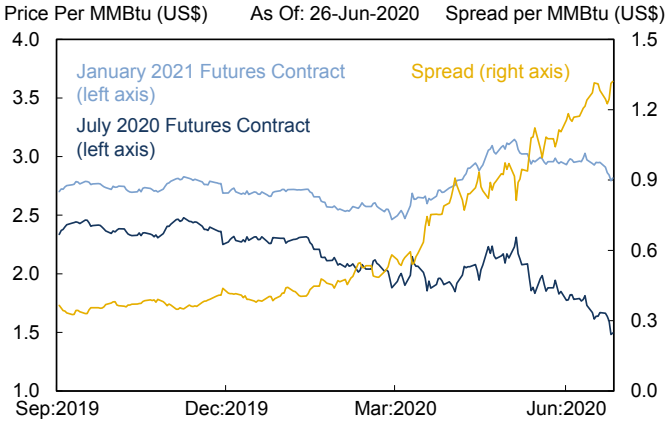
3.4.5 Residential Real Estate Markets

3.4.5.1 Residential Housing Finance

Real estate markets and home prices continued their steady, upward long-run path during the first quarter of 2020, just prior to the COVID-19 crisis. Nationally, house prices rose by 6.1 percent between the first quarter of 2019 and the first quarter of 2020, according to the seasonally adjusted, purchase-only FHFA House Price Index® (HPI). Across census divisions, gains were highest in the Mountain division, which posted an 8.8 percent year-over-year price increase. The majority of the U.S., including all of the top 100 largest metropolitan statistical areas, experienced positive growth. In general, prices were buoyed by a combination of historically low interest rates, a healthy economy characterized by low unemployment (until the spring), and a constrained supply of houses available for sale. Although not unaffected by the COVID-19 pandemic, housing has been remarkably resilient in part due to substantial government support of both renters and homeowners.

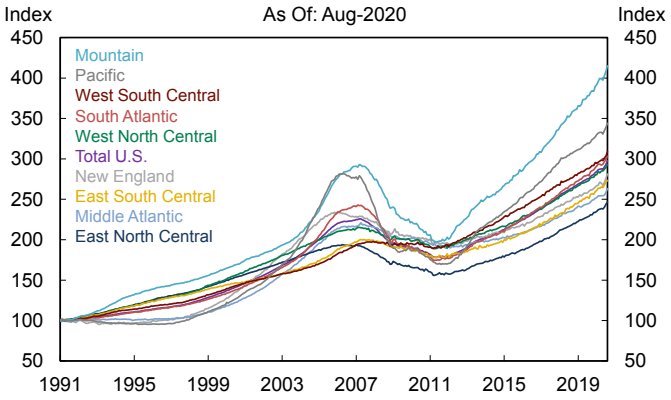
Between August 2019 and August 2020, FHFA's HPI increased 8.0 percent for the nation, while census division gains ranged from a low of 7.2 percent in the West North Central division to a high of 9.7 percent in the Mountain division (**Chart 3.4.5.1**). The monthly decline of 0.2 percent from April to May likely reflected the muted impact of the COVID-19 pandemic on the housing market. During this spring period, many states were under broad stay-at-home orders and many individuals engaged in voluntary social distancing efforts to combat the spread of COVID-19. These actions led

3.4.4.13 Natural Gas Forward Curves



Source: Bloomberg, L.P.

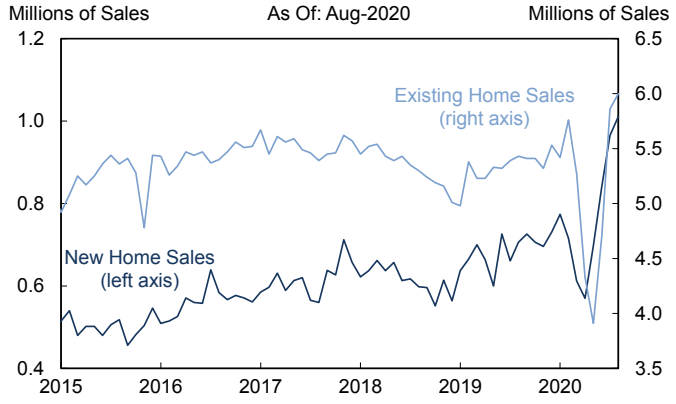
3.4.5.1 House Prices by Census Division



Source: Federal Housing Finance Agency

Note: Purchase-only, seasonally adjusted, nominal, constant-quality price index. January 1991 = 100.

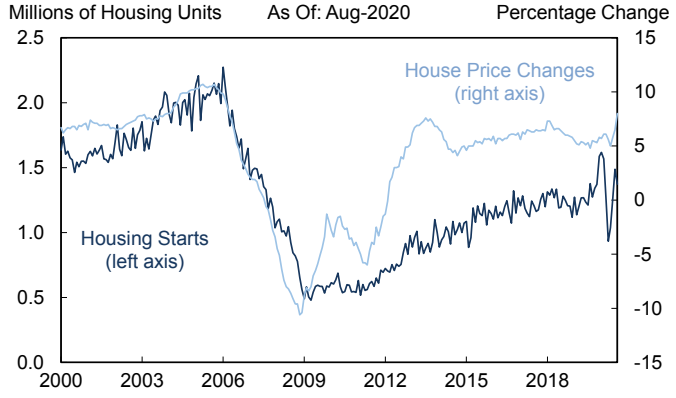
3.4.5.2 Home Sales



Source: NAR, Census Bureau, HUD

Note: Series are seasonally adjusted annual rates and are expressed in millions of single-family housing units.

3.4.5.3 New Housing Starts and Price Changes



Source: U.S. Census Bureau, FHFA, HUD

Note: Data are seasonally adjusted annual rates. House Price Changes series is the year-over-year percentage change of the FHFA National House Price Index.

to a decrease in overall economic activity, including the temporary halting or slowing of many activities like construction, real estate showings, interior appraisals, and in-person closings. Together these factors appear to have temporarily dampened sales activity.

As a result of the pandemic, existing home sales fell from 5.8 million sales in February to 3.9 million in May on a seasonally adjusted, annualized basis. Existing home sales have since rebounded to 6.0 million in August 2020 (**Chart 3.4.5.2**). Similarly, new home sales fell markedly in March and April, but have since rebounded to over 1 million in August 2020, well above pre-pandemic levels. Low interest rates and strong growth in purchase mortgage applications and pending home sales in the third quarter suggest that this rebound will continue in the near term. Beyond this time frame, the path of the employment recovery and limitations on the supply of homes for sale could constrain sales growth.

According to Realtor.com, the inventory of existing homes for sale was lower in September by nearly 40 percent compared to the prior year. In the face of this tight housing supply, new home sales rose to the highest levels observed since 2006 as demand spilled over into new construction. In response, single-family housing starts are expected to increase during the remainder of the year, so long as land for building permits remains available and demand is sustained. Creating new housing supply continues to remain a challenge for the U.S., with new starts only sluggishly responding since the last housing crisis despite persistent increases in home prices (**Chart 3.4.5.3**).

According to the Census Bureau, the national homeownership rate rose from 64 percent in the first quarter of 2019 to 65 percent in the first quarter of 2020. While this is down from the all-time high of 69 percent in 2004, the June reading was above the average homeownership rate for the preceding 30 years. Following the Great Recession, the homeownership rate fell to a low of 63 percent in the second quarter of

2016 – the lowest rate in decades. Rental vacancy rates have also improved, falling from the five-year average of 6.9 percent to 6.6 percent in the first quarter of 2020 (**Chart 3.4.5.4**).

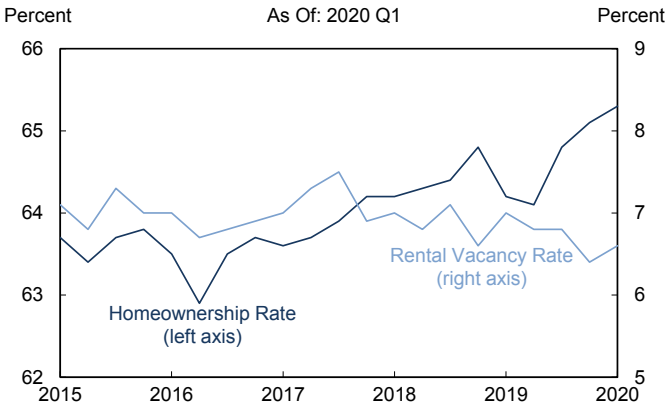
Mortgage Originations, Servicing, and Loan Performance

According to the Freddie Mac Primary Mortgage Market Survey®, the average 30-year fixed mortgage rate dropped 81 basis points during 2019 and has continued to decline through 2020. In the first nine months of 2020, the average 30-year fixed mortgage rate decreased a further 84 basis points to 2.9 percent as of September 2020. This decline in rates has helped to sustain borrower demand and increase the attractiveness of both purchase and refinance mortgages. Primary mortgage rates, which often track 10-year U.S. Treasury yields, have not declined as much as 10-year U.S. Treasury yields, which fell by 123 basis points year-to-date through September 30, 2020. The economic uncertainty surrounding the COVID-19 pandemic and the growth in origination volumes due to lower rates have left primary mortgage to Treasury yield spreads somewhat elevated, though the spread has narrowed compared to early in the COVID-19 crisis as a result of Federal Reserve market interventions.

Based on the National Mortgage Database (NMDB®), refinance originations remained robust in 2020, rising to $396 billion in the second quarter of 2020 as mortgage rates reached their lowest levels in decades (**Chart 3.4.5.5**). This was an increase in refinance originations of $191 billion from the second quarter of 2019. Over the same time period, home purchase originations decreased from $315 billion to $215 billion.

The market share of different types of mortgage originators has changed over time. Non-depository institutions have been expanding their share of the mortgage origination market in recent years. As tracked in Home Mortgage Disclosure Act data, the non-depository share of mortgage originations was approximately 60

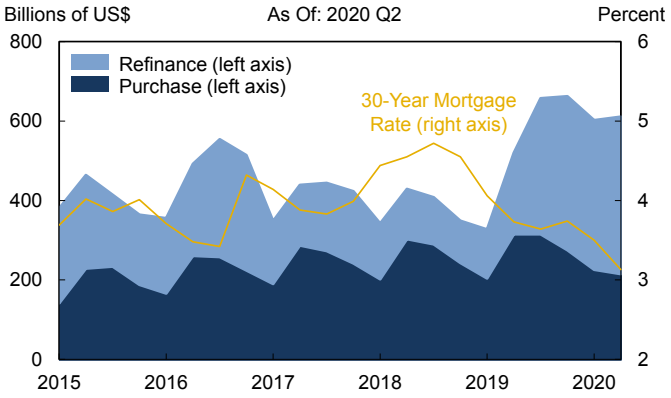
3.4.5.4 Homeownership and Vacancy Rates



Source: U.S. Census Bureau, Current Population Survey/Housing Vacancy Survey

Note: Data are non-seasonally adjusted quarterly percentages.

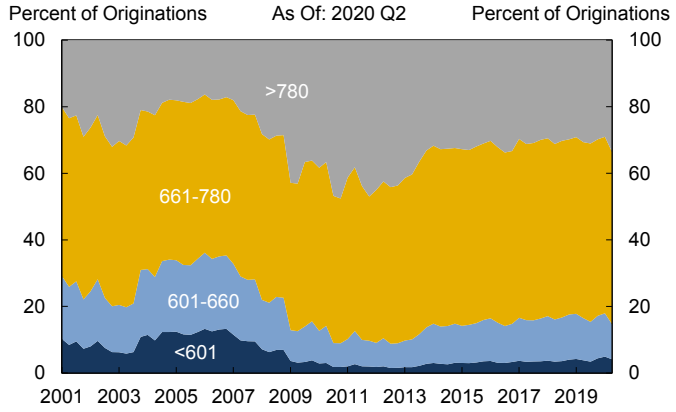
3.4.5.5 Mortgage Originations and Rates



Source: NMDB®, Freddie Mac Primary Mortgage Market Survey®

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

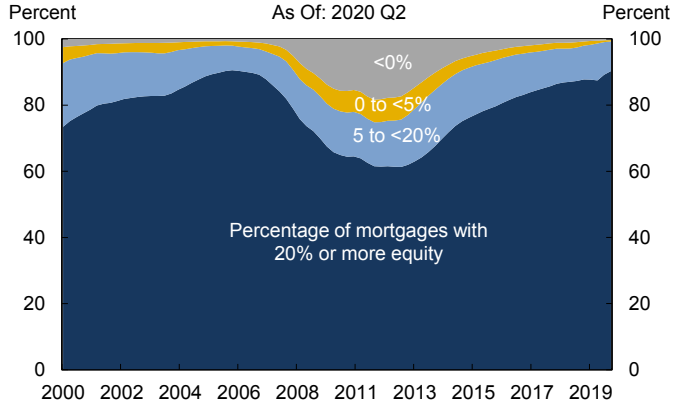
3.4.5.6 Purchase Origination Volume by Credit Score



Source: NMDB®

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

3.4.5.7 Shares of Mortgages by Equity Percentage



Source: NMDB®

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

percent in 2019 compared to approximately 30 percent in the years prior to the 2008 financial crisis. In recent years, depository institutions with assets between $100 billion and $1 trillion have increased their share of originations, from 11 percent of total depository originations in 2016 to 18 percent in the first half of 2020 according to Inside Mortgage Finance. The share of depository institution originations by banks with assets between $10 and $100 billion has increased from 16 percent in 2016 to 26 percent in the first half of 2020. Over that time, the market shares of the largest depositories (over $1 trillion in assets) and the smallest depositories (less than $10 billion in assets) have decreased.

Credit quality of new purchase mortgages remained relatively strong through the first half of 2020 (**Chart 3.4.5.6**). The percentage of borrowers with scores in the middle of the credit spectrum (VantageScore 3.0 scores between 661 and 780) remained relatively stable at approximately 50 percent for the last two decades. The highest credit quality group, borrowers with scores at or above 781, saw their share gain steadily since the 2008 financial crisis, and represented around 30 percent of the market as of the second quarter of 2020. The percentage of borrowers in the lowest score categories (below 661) declined from a high of 36 percent in the first quarter of 2006 to a low of 8.8 percent in the third quarter of 2012 before increasing to 15 percent in the second quarter of 2020.

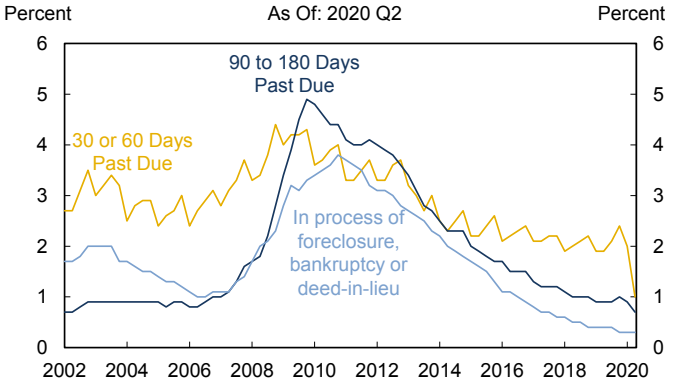
Positive equity continued to strengthen, with 90 percent of active mortgages having 20 percent or more of positive equity in the home, and over 99 percent of mortgages having at least 5 percent of positive equity as of the second quarter of 2020 (**Chart 3.4.5.7**). Recent improvement to borrower equity positions has been driven in part by more than eight years of house price appreciation, providing a stark contrast with the bottom of the last housing cycle. Over the last two decades, positive equity reached its lowest point in the third quarter of

2012, with only 61 percent of borrowers holding equity of 20 percent or more.

In response to the unprecedented level of unemployment claims caused by the pandemic, federal and state governments enacted a series of public assistance policies to support household incomes, suspend foreclosures and evictions, and offer flexibility in home purchase and mortgage acquisition processes. Under the CARES Act, borrowers with a federally backed mortgage are able temporarily to request mortgage payment forbearance, and the CARES Act specifies that loans that were current when they entered forbearance must be subsequently reported as current even when borrowers are not making payments. As a result, mortgage performance, as reported to the credit bureaus and reflected in the NMDB, differs from mortgage performance reported directly by mortgage servicers; for example, in Mortgage Bankers Association surveys, loans in forbearance are reported as delinquent if the payment was not made based on the original terms of the mortgage.

As a potential consequence of these policies, the percentage of borrowers who were reported to the credit bureaus as being in the process of foreclosure, bankruptcy, or deed-in-lieu remained stable at 0.3 percent from the fourth quarter of 2019 to the second quarter of 2020 (**Chart 3.4.5.8**). Following the CARES Act, the percentage of borrowers reported to the credit bureaus as 30 or 60 days past due dropped from 2.0 percent in the first quarter of 2020 to 1.0 percent in the second quarter. Similarly, the percentage of borrowers reported as 90 to 180 days past due dropped from 0.9 to 0.7 percent in the same time period. However, as noted above, some of this decline may be due to the CARES Act reporting requirements, and thus may not be reflective of borrowers' true economic circumstances. The Mortgage Bankers Association's National Delinquency Survey, for example, estimated a 7.7 percent delinquency rate in the third quarter of 2020, an increase of 3.7 percentage points from a year ago.

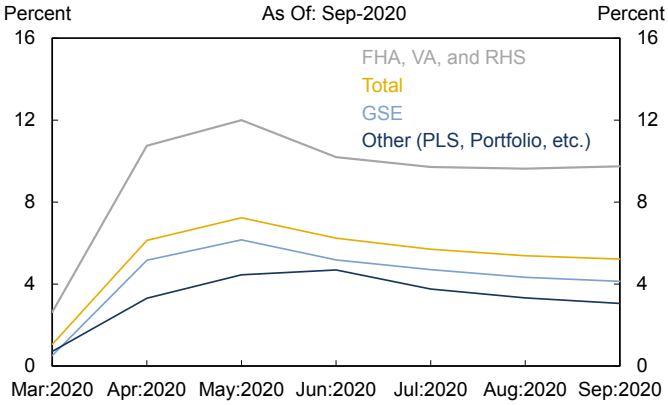
3.4.5.8 Mortgage Delinquency



Source: NMDB®

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

3.4.5.9 Forbearance Rates by Investor Type



Source: NMDB®

Note: Rates are the weekly percentage of servicing portfolio volume in forbearance by investor type over time.

Forbearance rates were relatively low prior to COVID-19, with total single-family forbearance rates at just 1.1 percent in March 2020. After the passage of the CARES Act, forbearance rates jumped quickly to 6.1 percent in April and peaked at 7.2 percent in May (**Chart 3.4.5.9**). Forbearance rates were higher for certain investor products and programs.

Not all borrowers that have requested forbearance have actually missed payments, and not all delinquent borrowers that are eligible for forbearance have entered forbearance programs. Nonetheless, forbearances had an immediate and significant benefit for borrowers; more than half of borrowers in forbearance did not make their June mortgage payment but were reported as current. Overall, this represents about 3.4 percent of all outstanding mortgages which, if treated as being late with payments, would have more than doubled the national mortgage delinquency rate. The path of the economic recovery and the impact on servicers of the additional costs of non-paying loans remains uncertain. The refinance boom, however, has simultaneously provided servicers with a temporary source of liquidity to help sustain operations.

The average credit score (VantageScore 3.0) of mortgage borrowers increased by about 9 points in July 2020 compared to December 2019. Credit score decreases of 20 points or more were only seen in about 10 percent of borrowers. The absence of a negative COVID-effect on credit scores may be in part due to the CARES Act's provision for creditors to continue to report borrowers granted a COVID related workout according to their pre-pandemic payment status. For borrowers with mortgage forbearance, decreasing credit scores may indicate growing problems with their non-mortgage obligations, though forbearance is available in some instances for other credit obligations, such as auto loans.

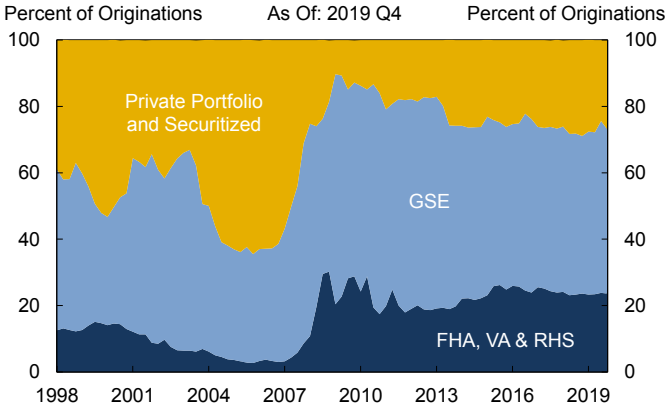
3.4.5.2 Government-Sponsored Enterprises and the Secondary Mortgage Market

The federal government continues to back the majority of new mortgages either directly through the Federal Housing Administration (FHA), the U.S. Department of Veterans Affairs (VA), and the USDA, or indirectly through Fannie Mae and Freddie Mac (the Enterprises). The federal government share of mortgage originations—which averaged 77 percent over the past decade—was 73 percent at the end of 2019 (**Chart 3.4.5.10**). However, this share has increased since the onset of COVID-19, as the government has performed its countercyclical role of maintaining the flow of credit.

The COVID-19 pandemic resulted in a contraction of both portfolio lending and private-label securitizations. New mortgages not securitized by Ginnie Mae (GNMA) or the Enterprises continue to be held mostly in lender portfolios rather than securitized in the private-label market. Non-agency RMBS issuance totaled $63 billion in 2019, but only $12 billion in the first half of 2020. This is the second consecutive year with an over 60 percent decline compared to the same period during the prior year (**Chart 3.4.5.11**). In contrast, agency RMBS issuance totaled $1.3 trillion in the first six months of 2020, almost double that of the same period in 2019, and reached $2.3 trillion by September 2020.

A notable change in early 2020 has been the early and persistent federal response to the COVID-19 pandemic. The FHFA, CFPB, and HUD have worked together to provide assistance under the CARES Act in the form of temporary mortgage relief, payment suspensions, protection for renters, remittance transfers, and informational resources (see Section 4.5). Also, as it had done during the 2008 financial crisis, the Federal Reserve quickly restarted its open market operations to stabilize financial markets when volatility began to increase in the middle of March 2020. The Federal Reserve's agency MBS purchases totaled approximately $560 billion through the end of April and $1.1 trillion by the end of

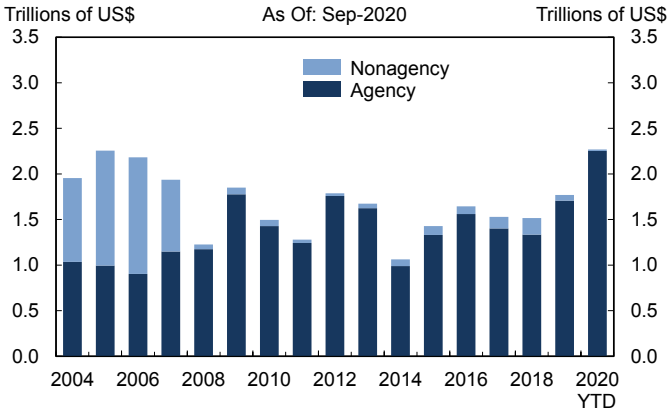
3.4.5.10 Mortgage Originations by Product



Source: NMDB®

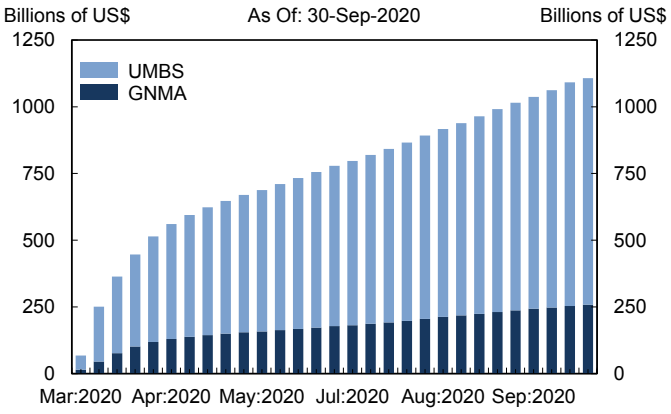
Note: Quarterly data for first-lien, closed-end residential mortgages.

3.4.5.11 RMBS Issuance



Source: FHLMC, FNMA, GNMA, NCUA, FDIC, Bloomberg, L.P., Dealogic, Thomson Reuters, SIFMA

3.4.5.12 Cumulative MBS Purchases by the Federal Reserve



Source: FRBNY

Note: Cumulative 2020 purchases. Weekly series are aggregated from daily Agency MBS operations in the TBA pool.

September 2020 (**Chart 3.4.5.12**). The pace of Federal Reserve purchases has slowed as market functioning stabilized.

Fannie Mae and Freddie Mac

The Enterprises, currently in their thirteenth year of conservatorship, are an important source of liquidity to the mortgage market and of stability to the housing market. After the onset of the pandemic, the Enterprises took numerous actions at the direction of FHFA to support borrowers and renters, such as suspending foreclosures and evictions. While the full costs of the pandemic are yet to be realized, the Enterprises continue to be profitable. The Enterprises reported net income of $3.4 billion during the second quarter of 2020, an increase from $1.1 billion in income during the first quarter of 2020.

The Enterprises' single-family and multifamily books of business increased over the last year. The Enterprises' single-family guaranty book of business increased to $5.1 trillion as of June 30, 2020, a 5 percent increase from June 30, 2019. This was partially driven by the Enterprises' 77 percent increase in new business activity in the second quarter of 2020 compared to the first quarter of 2020. The Enterprises' multifamily portfolios increased to $639 billion, or by 12 percent, in the second quarter of 2020, compared to the same period in 2019.

The Enterprises have been transitioning financial instruments to SOFR and away from LIBOR. LIBOR may not be published after year-end 2021, requiring a transition of all financial instruments referencing the rate. FHFA worked with the Enterprises to develop parameters for a SOFR adjustable-rate mortgage (ARM) along with fallback language for replacement rates. Transition announcements were released in February 2020 and a transition playbook was issued in May. Fannie Mae and Freddie Mac will each cease issuance of single-family and multifamily LIBOR-based credit risk transfer (CRT) transactions in December 2020. LIBOR-based ARMs

will no longer be purchased with maturities beyond 2021.

The Enterprises have continued to transfer risk to private capital in the mortgage market and reduce taxpayer risk through their CRT transactions. Fannie Mae has primarily transferred risk through its issuance of Connecticut Avenue Securities and Credit Insurance Risk Transfer transactions. In 2019, Fannie Mae transferred a portion of the credit risk on single-family mortgages with unpaid principal balance (UPB) of $488 billion and risk-in-force of $15 billion. Since inception of its risk transfer programs, Fannie Mae has transferred a portion of the credit risk on single-family mortgages with UPB of nearly $2.1 trillion through 2019. Fannie Mae has not entered into a new CRT transaction, however, since the first quarter of 2020. Freddie Mac transferred a portion of the credit risk on $220 billion in UPB of single-family mortgage loans in 2019 with risk-in-force of $8.8 billion, primarily through its issuance of Structured Agency Credit Risk securities and through its Agency Credit Insurance Structure transactions. Through the first three quarters of 2020, Freddie Mac has transferred $12 billion of risk-in-force on $309 billion of UPB. Since it began undertaking CRTs, Freddie Mac has executed transactions covering over $1.7 trillion in UPB for single-family mortgages through September 2020.

In September 2019, Treasury and the FHFA agreed to modifications to the Preferred Stock Purchase Agreements (PSPAs) that permit Fannie Mae and Freddie Mac to retain $25 billion and $20 billion in earnings, respectively. Net worth in excess of these limits would be paid out to the Treasury as dividends. Through June 30, 2020, dividends to the Treasury have totaled $301 billion, with cumulative dividends paid by Fannie Mae and Freddie Mac totaling $181 billion and $120 billion, respectively.

Federal Home Loan Banks

The FHLBs continued to serve as an important source of liquidity for the mortgage market and to exhibit strong financial performance. From June 30, 2019 to June 30, 2020, the FHLBs reported aggregate net income of $2.9 billion, which is moderately down compared to recent years.

Total assets decreased $130 billion over the same 12-month period, but there were significant fluctuations in 2020. The total assets of the FHLBs have decreased from $1.3 trillion on March 31, 2020 to $1.0 trillion as of June 30, 2020. Advances, the largest component of FHLB assets, are a loan product FHLBs extend to their members to help them meet short and long-term liquidity and housing finance needs. Advances increased by 26 percent in the first quarter of 2020 and reached their post-2008 crisis peak of $807 billion as a result of the market crisis caused by the pandemic. As market volatility subsided and FHLB members' liquidity needs decreased, advances fell by 31 percent, to $558 billion, by June 30, 2020.

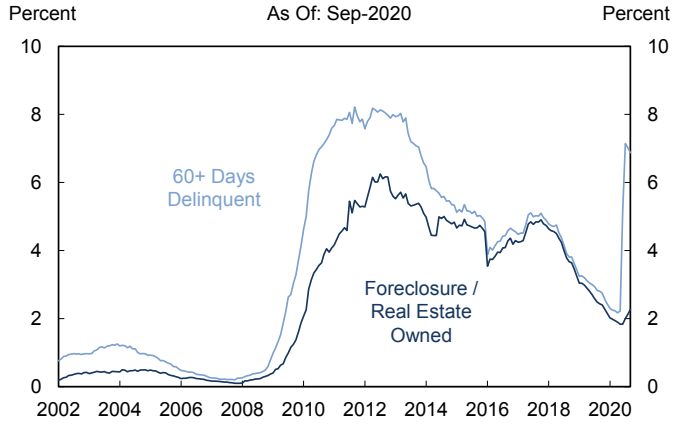
While assets decreased primarily due to a decline in advances, mortgage holdings purchased from FHLB members continued to increase at the FHLBs. From June 30, 2019, to June 30, 2020, mortgages increased $6.4 billion to $73 billion. Additionally, retained earnings continued to grow at the FHLBs, increasing to $21 billion on June 30, 2020, an all-time high for the FHLB System.

3.4.6 Commercial Real Estate Market

With the onset of the global pandemic, commercial real estate (CRE) experienced significant challenges in the first three quarters of 2020 stemming from public health measures taken in response to COVID-19. In particular, pandemic-imposed travel restrictions and mandatory and voluntary social distancing efforts accelerated the decline in brick and mortar retail and adversely impacted occupancy of hotel CRE properties.

The CRE loan delinquency rate has increased significantly for those loans whose underlying properties experienced severe pandemic-induced cash flow disruptions. The percent of seriously delinquent loans in non-agency conduit CMBS deals—as measured by loans that have been delinquent for 60 days or more, as well as those in collateral

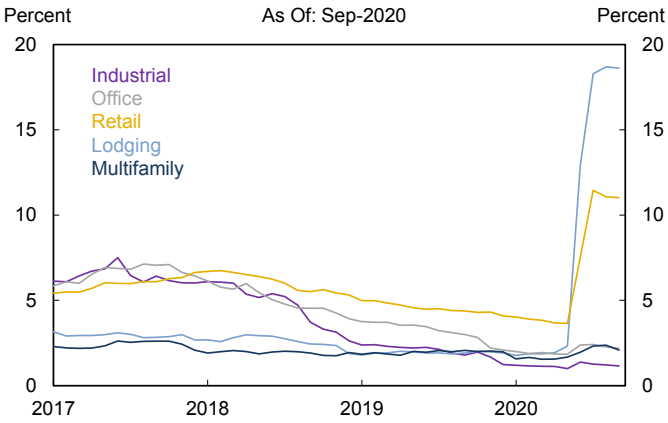
3.4.6.1 Conduit CMBS Delinquency and Foreclosure Rate



Source: JPMorgan, Trepp

Note: Delinquency rate includes FC/REO.

3.4.6.2 Conduit CMBS Delinquency Rates by Industry



Source: JPMorgan, Trepp

Note: 60+ delinquency rate; includes FC/REO.

foreclosure—increased from 2.2 percent in May to 6.9 percent in September. The rate of seriously delinquent loans peaked at 7.1 percent in July, its highest level since 2013 (**Chart 3.4.6.1**).

Loan delinquencies vary widely across property sectors (**Chart 3.4.6.2**). As of September 2020, loans in conduit CMBS deals collateralized by lodging properties, such as hotels, represent the highest percentage of seriously delinquent loans at 19 percent, followed by loans collateralized by retail properties at 11 percent. Industrial, multifamily, and office loans have the lowest CRE delinquency rates of 1.2 percent, 2.1 percent, and 2.2 percent, respectively. Though office loans have relatively low delinquency rates, there is a high degree of uncertainty with respect to the long-term impact of the pandemic on office properties, due to large numbers of people teleworking.

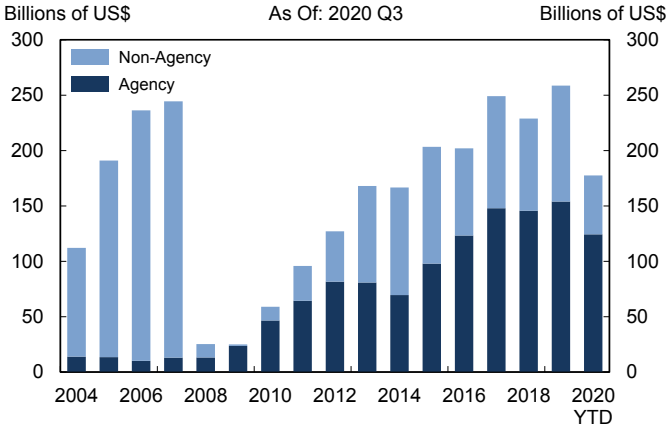
Pursuant to the CARES Act, FHFA and HUD announced that they would offer forbearance to multifamily property owners affected by COVID-19, to help ease the financial burden stemming from public health measures. Lenders may not charge borrowers under a forbearance any late fees or proceed with evictions for tenants for the duration of their forbearance. Not all multifamily renters and owners, however, are eligible for this assistance. Fannie Mae and Freddie Mac have provided explicit guidance that renters are permitted to receive eviction moratoria during the forbearance period, while the property owners can seek temporary mortgage relief if the loan qualifies for forbearance. At the end of September, 95 percent of renters had made their monthly rent payments according to the National Multifamily Housing Council's analysis of data collected on approximately 11 million rental units, compared to 96 percent for September 2019. As of September 2020, the percentage of Enterprise multifamily loans in forbearance remains low—about 1.3 percent for Fannie Mae and 2.2 percent for Freddie Mac. The pace of growth in forbearance appears to have slowed down for both Fannie Mae and

Freddie Mac as the market has improved, but warrants continued monitoring. In addition, student and senior housing properties, as well as multifamily properties with smaller units, have been negatively impacted by the COVID-19 crisis, as evidenced by a higher percentage of loans in forbearance.

According to the Federal Reserve's Financial Accounts of the United States, as of the second quarter of 2020, outstanding CRE loans totaled $4.7 trillion, a 6.6 percent increase year-over-year. The total amount of CRE loans outstanding equates to approximately 24 percent of GDP, and has consistently increased since the fourth quarter of 2013, similar to the high reached in the second quarter of 2009. The government agencies, including Fannie Mae, Freddie Mac, and Ginnie Mae (collectively the agencies) continue to be major players in multifamily lending and fund or guarantee about 46 percent of total outstanding multifamily mortgages. CRE loans held by life insurance companies continued to increase, with year-over-year CRE loan growth at insurance companies outpacing that of banks. As of the second quarter of 2020, CRE loans outstanding at U.S. chartered banks were $2.3 trillion (a 5.7 percent increase year-over-year) and the corresponding total for life insurers was $574 billion (a 6.4 percent increase year-over-year). In the Federal Reserve's July SLOOS, banks reported tightened standards and weaker demand for CRE loans.

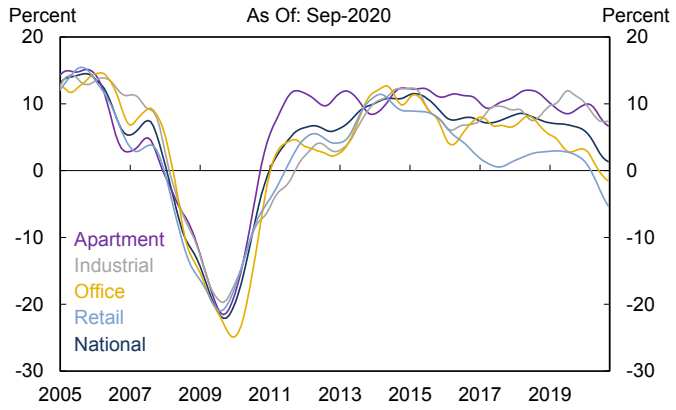
Overall CMBS issuance totaling $178 billion through the third quarter of 2020 was roughly flat compared to the same period in 2019. However, agency and non-agency CMBS issuance trends diverged in 2020, with non-agency CMBS issuance declining by 18 percent and agency CMBS issuance increasing by 27 percent year-to-date through September (**Chart 3.4.6.3**). Non-agency CMBS issuance came to a near halt in the second quarter of 2020, when only $9.5 billion of non-agency CMBS was issued. Non-agency CMBS issuance picked up in the third quarter of 2020, but remained below pre-pandemic levels. Agency CMBS issuance, which is predominantly collateralized by multifamily

3.4.6.3 CMBS Issuance



Source: Inside Mortgage Finance

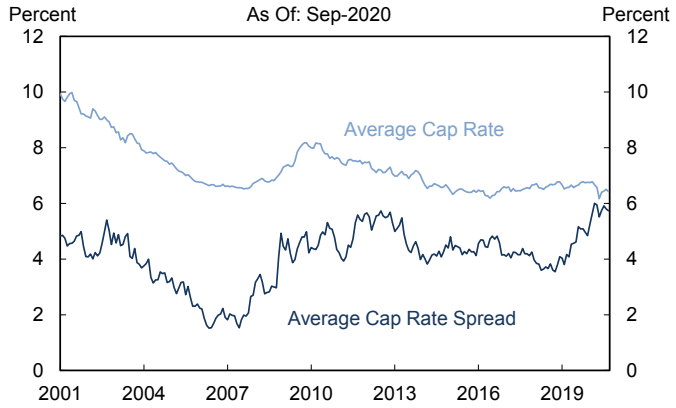
3.4.6.4 Commercial Property Price Growth



Source: Real Capital Analytics, Bloomberg, L.P.

Note: Year-over-year price change.

3.4.6.5 Capitalization Rates and Spreads



Source: Real Capital Analytics, Bloomberg, L.P.

properties, experienced modest disruption in March but issuance resumed subsequently in April, benefiting in part from the agency guarantee. Agency CMBS issuance accounted for 70 percent of total CMBS issuance in the first nine months of 2020 compared to 60 percent of total CMBS issuance in 2019.

The emergency actions taken by the Federal Reserve and Treasury have contributed to the stabilization of CMBS market conditions. In particular, the inclusion of agency CMBS in the Federal Reserve's direct purchase operation has supported the return of normal market conditions. In addition, the establishment of the Term Asset-Backed Securities Loan Facility (TALF) and inclusion of legacy conduit CMBS in the facility appears to have contributed to significant tightening of CMBS spreads, thereby improving market conditions.

As of September 2020, national CRE prices increased by 1.4 percent year-over-year versus 6.7 percent the previous year. Prices of retail and office properties declined for the first time since 2011, while prices of industrial and apartment properties held up relatively well (**Chart 3.4.6.4**). There is a high degree of ongoing uncertainty regarding the long-term impact on office properties as companies re-examine office space needs in the post-pandemic working environment.

CRE capitalization rates—the ratio of a property's annual net operating income to its price—remain low by historical standards (**Chart 3.4.6.5**). However, one measure of the risk premium in CRE—the spread between CRE capitalization rates and the 10-year Treasury yield—increased rapidly in 2020 as the Treasury yield declined by about 125 basis points through September.

According to Real Capital Analytics, the volume of CRE property sales peaked in 2019 at over $550 billion. The strong growth trend was sustained in January and February of 2020. However, the unprecedented speed of the COVID-19-induced economic distress

relative to prior downturns caused a sharp decline in commercial real estate transactions. Transaction volumes declined approximately 40 percent in the first three quarters of 2020 relative to the first three quarters of 2019. The decline in transaction volumes were concentrated in the second and third quarters of 2020, when year-over-year transaction volumes dropped by about 65 percent and 55 percent, respectively. Property types more directly impacted by public health measures in response to the pandemic, such as retail, lodging, and office, experienced larger declines in transaction volumes of 44 percent, 71 percent, and 46 percent, respectively, in the first three quarters of 2020.

Box E: Potential Risks in Commercial Real Estate

The COVID-19 pandemic shock has created significant distress for firms and households throughout the economy, leading to reductions in the cash flows generated by commercial real estate (CRE). The shock to CRE has been large, with the hotel and retail sectors suffering the most significant near-term losses. Considerable uncertainty remains regarding the long-term recovery prospects for a wider range of property types.

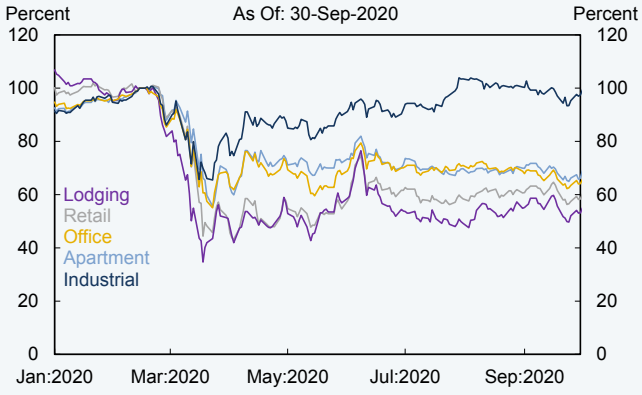
Certain features of the current CRE financing environment may raise the potential for spillovers. Hotel and retail loans are concentrated in non-agency CMBS; servicing frictions may drive distressed property sales, potentially triggering price declines. Additionally, small and mid-sized regional banks are highly exposed to CRE; losses on CRE loans at these banks could drive a broader contraction in credit. Furthermore, potential spillover effects from CRE lending exposures may be greater in areas that are more dependent on local sources of funding.

The Nature of the Shock

If equity REIT indices are broken out by property type (**Chart E.1**), the ordering of the price impact is consistent with the pandemic's impact on cash flows by sector. Industrial properties have generally performed well, as the shift to online retail has increased demand for warehouses. Fiscal policy measures such as extended unemployment benefits supported rent payments for apartments through the summer, mitigating income losses in this sector to date. Although widespread work-from-home policies have driven an increase in office vacancy rates, tenants in long-term leases are largely making their rent payments. The hardest-hit properties have been in the lodging and retail sectors, as travel has sharply contracted and retail stores have closed due to stay-at-home orders. Even as parts of the economy have reopened, COVID-19 has resulted in increased operational costs for hotel and retail sectors due to enhanced focus on cleaning, sanitation, and security measures.

Mortgage delinquency rates across sectors tell a similar story. Based on survey data from the Mortgage Bankers Association, as of August, the share of loans at any stage of delinquency remains near pre-pandemic levels for industrial and office properties. However, mortgage delinquencies on hotels and retail properties have surged to 23 percent and 15 percent, respectively, and the same survey showed 16 percent and 8 percent of respective hotel and retail mortgages in forbearance. As of August, properties on Morningstar's CMBS servicer watchlist, a more forward-looking measure of distress, suggest ongoing stress in the hotel and retail sectors, with 37 percent and 22 percent of loans outstanding on the watchlist compared to 18 percent and 11 percent in August last year.

E.1 Sector Equity REIT Indices



Source: NAREIT, Bloomberg, L.P. Note: Indexed to February 14, 2020.

Spillover Risks from Stress in CRE

Stress in CRE markets can exacerbate economic downturns because CRE debt represents a large source of credit exposure for the financial system – about $4.7 trillion as of the second quarter of 2020, according to data from the Financial Accounts of the United States. Regulations and frameworks regarding capital and liquidity, resolution planning, and stress testing implemented after the 2008 financial crisis have lowered the potential for the failure of large, interconnected banks exposed to CRE. Two additional important pathways may cause spillovers, however. First, declining cash flows in certain CRE sectors could increase distressed property sales, which in turn could reduce property values and create price-spirals, though lenders may work with borrowers to prevent distressed sales during a market downturn. Second, if lenders accrue large losses on CRE loans, they could further tighten CRE underwriting standards, potentially hampering economic growth.

The funding mechanism for CRE carries implications for how likely spillovers are to materialize. Factors influencing spillover risk include institutions' ability to manage losses from CRE and their importance as a source of credit. According to data from the Financial Accounts of the United States, about half of outstanding CRE mortgages are funded by banks; Fannie Mae, Freddie Mac, and other government entities fund or guarantee about 17 percent; life insurance companies fund about 13 percent; and about 9 percent are securitized into non-agency CMBS. These institutions' exposure to pandemic-driven mortgage distress varies widely. For example, retail and lodging loans account for about 40 percent of loans securitized into non-agency CMBS; whereas they make up only about a quarter of CRE loans held by large banks and insurance companies. Small and mid-sized regional banks account for over half of outstanding bank-held CRE loans, but data are limited on sector-specific exposures.

CRE lenders may prevent distressed property sales during downturns and avoid losses from price declines either by modifying the terms of delinquent mortgages or by executing other effective workout plans until CRE markets stabilize. But, institutions vary in their willingness and ability to take these steps. In general, banks, life insurance companies, and government entities have wide discretion over loans' terms and are more likely to offer mortgage modifications than are servicers of non-agency CMBS, which are bound by servicing contracts and who do not directly face losses. Similarly, large banks, large insurance companies, and government entities may manage the timing of property sales to minimize pricing spillovers better than servicers of non-agency CMBS and smaller banks.

Financial institutions can also transmit losses on CRE loans to the broader economy if they are an important source of non-CRE credit. This summer, the Federal Reserve's stress testing regime for large banks included a scenario involving a sharp contraction in the values of retail and lodging properties, and the banks had enough capital to maintain the flow of credit assuming a V-shaped recovery. Several firms, however, would approach minimum capital ratios under a more severe U or W-shaped scenario, which may result in a sustained tightening of underwriting standards or contraction of credit. Small and mid-sized regional banks, however, are more highly exposed to CRE than the stress-tested banks on average. For example, as of the second quarter of 2020, CRE accounts for about 40 percent of non-CCAR banks' loan portfolios and about 10 percent of CCAR banks' loan portfolios, according to bank FR Y9-C or Call Report filings. These smaller banks are also an important source of credit to small business and retail borrowers. Sharp losses on CRE-backed loans at small and mid-sized banks could drive a broad contraction in credit, particularly in the sectors of the economy that rely on local sources of financing.

Box E: Potential Risks in Commercial Real Estate

Temporary vs. Permanent Declines in Cash Flows across Sectors

Considerable uncertainty remains about which CRE sectors may recover completely following the pandemic and which sectors face permanent shifts in demand. Segments of the retail sector have experienced years of decline as consumers have gradually shifted toward online shopping and away from shopping in physical stores; the pandemic may have accelerated this trend. The changes facing office and apartment properties are likewise unclear. A permanent shift toward teleworking may reduce demand for office space, driving economic activity away from city centers where many apartments, retail, restaurants/food outlets, and offices are located. A permanent shift toward teleworking may also shift demand toward single-family housing and away from apartments. Once the shock fully subsides, however, there may be a reversion to pre-pandemic business practices, in which case recent trends in apartment and office vacancies would likely reverse.

Permanent downward changes in cash flows will lead to permanent declines in valuations in certain sectors, and eventually, holders of CRE will realize losses. But, as long as these losses accumulate gradually, they are unlikely to trigger large disruptions to the financial system.

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

BHCs—inclusive of financial holding companies—are companies registered under the Bank Holding Company Act that control at least one commercial bank. Subsidiaries of BHCs may also include nonbanks such as broker-dealers, investment advisers, or insurance companies. According to rules recently adopted by federal banking agencies to tailor the regulatory framework for enhanced prudential standards and the U.S. Basel III capital and liquidity standards to more closely match the risk profiles of domestic and foreign banks (Tailoring rules), the largest BHCs with total consolidated assets above $100 billion are grouped in four risk-based categories for determining the applicability of regulatory capital and liquidity requirements. Under the final rule, such requirements increase in stringency based on measures of size, cross-jurisdictional activity, weighted short-term wholesale funding, nonbank assets, and off-balance sheet exposures. There are currently eight U.S. global systemically important banks (G-SIBs) (Category I BHCs) and two groups of large BHCs: large complex (Category II and III BHCs) and large noncomplex (Category IV BHCs) (**Chart 3.5.1.1**). Other BHCs with total consolidated assets less than $100 billion are not subject to the annual stress test exercise or liquidity requirements. 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 2020, BHCs in the United States (excluding IHCs) held about $20 trillion in assets. U.S. G-SIBs account for 66 percent of this total. Large complex BHCs account for 10 percent. Large noncomplex BHCs account for 7 percent. All other BHCs account for the remaining 17 percent of assets. The 13 IHCs operating in the U.S.—BBVA,

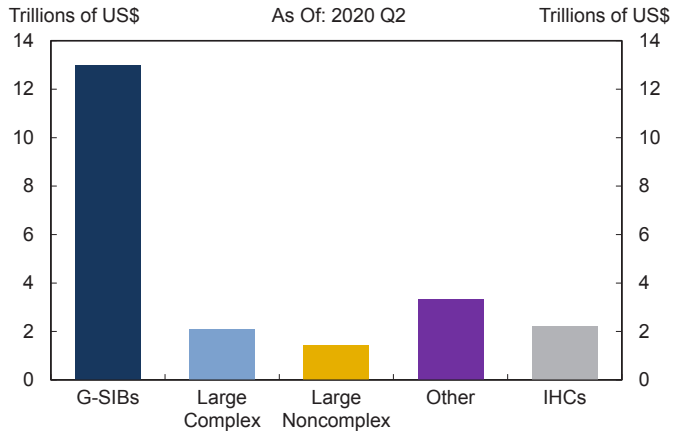
3.5.1.1 Categorization of Large U.S. BHCs

Description	U.S. Domestic Banking Org.	
Category I (U.S. G-SIBs)	Bank of America	JPMorgan Chase
	Bank of New York Mellon	Morgan Stanley
	Citigroup	State Street
	Goldman Sachs	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	Truist Financial
	Charles Schwab	U.S. Bancorp
	PNC Financial	
Category IV (Large noncomplex, other firms with $100b to $250b Total assets)	Ally Financial	Huntington
	American Express	KeyCorp
	Citizens Financial	M&T Bank
	Discover	Regions Financial
	Fifth Third	Synchrony Financial

Source: Federal Reserve

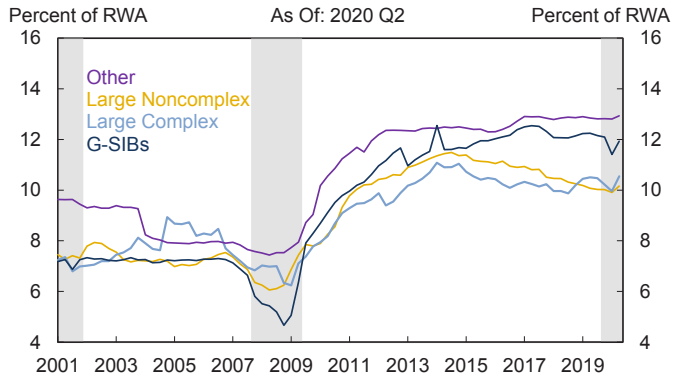
Note: Northern Trust is in Category II due to its cross-jurisdictional activity.

3.5.1.2 Total Assets by BHC Type



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.

BMO, BNP Paribas, MUFG, Credit Suisse, Deutsche Bank, HSBC, TD Group, RBC, Santander, UBS, Barclays, DWS—have more than $2 trillion in consolidated domestic assets (**Chart 3.5.1.2**).

Capital Adequacy

Equity capital provides a buffer to absorb losses from defaulting loans, declines in market value of securities and trading portfolios, counterparty defaults, and operational and legal risks. Capital adequacy in an economic downturn determines banks' ability to continue lending and serve as a source of strength to the rest of the economy. Due to enhanced prudential regulation and robust economic growth, equity capital increased significantly, and the loss-absorbing capacity of the banking sector stood at historically high levels at the end of 2019. Following the disruptions in economic activity caused by the COVID-19 pandemic, the strengthened capital positions allowed BHCs to honor large drawdowns on credit lines and to absorb the significant increases in loan loss provisions in anticipation of deteriorating credit quality.

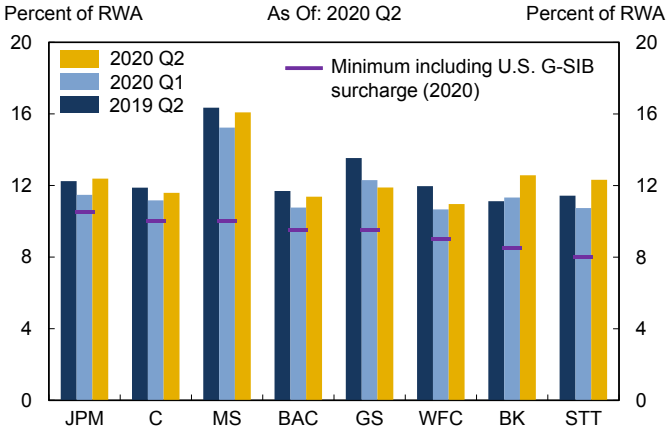
Bank capital adequacy is evaluated using risk-based capital requirements and non-risk-based leverage requirements combined with an annual stress test exercise for Category I-III firms, and biennially for Category IV firms. Common equity tier 1 (CET1) ratio is a risk-based capital requirement, defined as the ratio of CET1 capital to the total risk-weighted assets (RWAs). CET1 ratios decreased for all U.S. G-SIBs as well as for large complex and large noncomplex BHCs in the first quarter of 2020, before rising slightly in the second quarter. The declines in CET1 ratios at U.S. G-SIBs were in large part due to increases in RWAs and to a lesser degree due to contraction in CET1 capital (**Chart 3.5.1.3**). A primary driver for the increases in RWAs were significant drawdowns on credit lines, which materially increased following the onset of the COVID-19 crisis, that became on-balance sheet commercial and industrial (C&I) loans. This resulted in higher risk-weighted assets than an undrawn off-

balance sheet credit line commitment. Market volatility, particularly for trading portfolios, also contributed to the increase in RWAs. CET1 ratios rose for the U.S. G-SIBs in the second quarter as RWA fell on commercial credit line paydowns and reductions in credit card balances.

On net, risk-based regulatory capital ratios declined in the first half of 2020. However, U.S. G-SIBs continue to meet Basel III standards for the minimum risk-based weighted capital requirement ratios including the G-SIB surcharge and capital conservation buffer (**Chart 3.5.1.4**). Furthermore, U.S. G-SIBs as well as other large or small BHCs maintained sizeable voluntary capital buffers above minimum requirements, allowing those banks to continue to lend. The Federal regulatory banking agencies issued a joint statement in March 2020 encouraging banks and other regulated lenders to use their available capital and liquidity to continue to provide credit to consumers and small businesses affected by COVID-19.

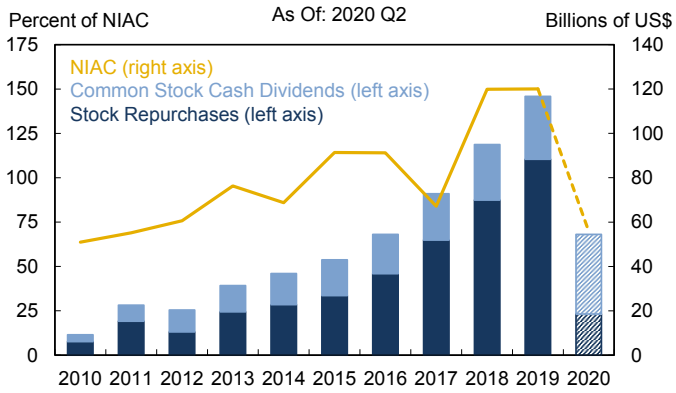
In March 2020, the Federal Reserve adopted the stress capital buffer (SCB) rule that came into effect for the 2020 stress test cycle. The SCB rule simplified the Board's capital framework by integrating non-stress and stress-based capital requirements with the introduction of the SCB requirement. In particular, the SCB replaced the static 2.5 percent capital conservation buffer with an SCB requirement. The SCB requirement is floored at a minimum of 2.5 percent of risk-weighted assets and is calculated as the difference between starting and minimum projected CET1 capital ratios under the severely adverse scenario in the supervisory stress test, plus four quarters of planned common stock dividends as a percentage of risk-weighted assets. The final SCB rule did not include a stress leverage buffer requirement. A BHC or IHC subject to the rule whose regulatory capital ratios are at or below its regulatory minimum plus its SCB requirements, any applicable G-SIB surcharge, or countercyclical capital buffer, would be subject to automatic restrictions on capital distributions and certain discretionary bonus payments.

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



Source: FR-Y9C

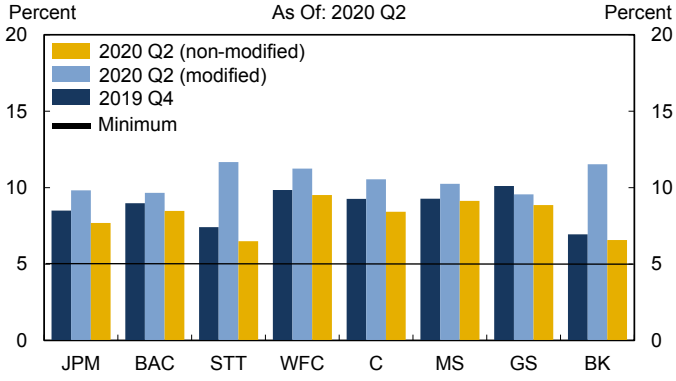
3.5.1.5 Payout Rates at U.S. G-SIBs



Source: FR Y-9C

Note: Payout rates are the ratios of stock repurchases plus cash dividends to net income available to common shareholders (NIAC). NIAC is net income minus preferred dividends. 2020 data represents YTD data through Q2.

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



Source: FR Y-9C, Call Report

Note: Enhanced supplementary leverage ratio is only required for the G-SIBs. The ratio for 2019 Q4 is equal to tier 1 capital divided by total assets plus off-balance sheet exposures. The modified ratio for 2020 Q2 is equal to tier 1 capital divided by total assets minus Treasury securities and reserves.

The overall payout rates at U.S. G-SIBs, defined as the sum of stock repurchases and common stock dividends, were close to 100 percent of the net income available to common equity in 2018 and exceeded 100 percent in 2019. Payouts to shareholders fell slightly in the first quarter of 2020 compared to the 2019 historic highs (**Chart 3.5.1.5**). However, net income available to common shareholders fell sharply in the first quarter of 2020, and, subsequently, payout rates were substantially above 100 percent of net income. At the beginning of the COVID-19 crisis, all U.S. G-SIBs announced voluntary suspension of share buybacks through at least the first half of 2020. Following the release of stress test results in June 2020, the Federal Reserve temporarily halted stock repurchases and capped dividends payments for all BHCs. As a result, firms made dividend payments based on a formula tied to recent net income.

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. Since the start of the COVID-19 pandemic, the depository institution subsidiaries of BHCs have experienced large inflows of deposits and significant balance sheet expansion that reduced leverage ratios of BHCs. In addition, borrowers' drawdowns on credit lines contributed to further balance sheet increases and reductions in leverage ratios. The Federal Reserve, FDIC, and OCC introduced a temporary modification to the SLR rule that allows BHCs to exclude Treasury securities and reserves at the Federal Reserve from the denominator of the ratio until March 31, 2021. Those temporary modifications provide flexibility to certain banks to continue to expand their balance sheets and provide credit to households and businesses. The enhanced SLRs under the temporary rule increased substantially for some U.S. G-SIBs (**Chart 3.5.1.6**).

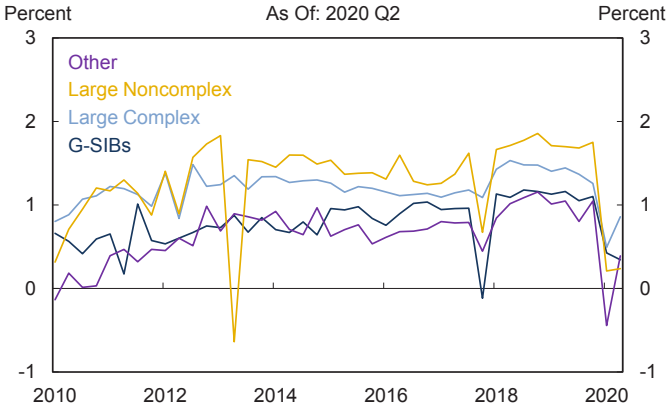
Profitability

Bank profitability as measured by return on assets fell sharply across the four BHC categories in the first half of 2020 and for some BHCs net income became negative (**Chart 3.5.1.7**). This contraction in profitability was mostly driven by increases in loan loss provisions and to a lesser degree by declines in other components of net income. In particular, banks with significant credit card loan portfolios experienced large increases in loan loss provisions—following the change to Current Expected Credit Losses (CECL) accounting and deteriorating economic conditions—and reported large contractions in net incomes in the first half of 2020. Other components of net income, such as net interest margins (NIMs), declined across all four BHC groups that file FR Y-9Cs (**Chart 3.5.1.8**).

Funding Sources

During and prior to the 2008 financial crisis, BHCs relied heavily on short-term wholesale funding, and disruptions in interbank markets exposed BHCs to significant liquidity and solvency risks. Since then, the ratio of such unstable funding to total assets has declined substantially below its 2007 level. At the same time, BHCs attracted large inflows of more stable sources of funding such as core deposits. BHCs also maintained a steady share of long-term debt in recent years, including at U.S. G-SIBs, for purposes of meeting the minimum long-term debt requirement under TLAC (**Chart 3.5.1.9**). As a result of this more stable funding mix, BHCs did not experience significant disruptions in their funding during the COVID-19 crisis. Furthermore, the Federal Reserve established a number of credit and liquidity facilities that helped stabilize STFMs.

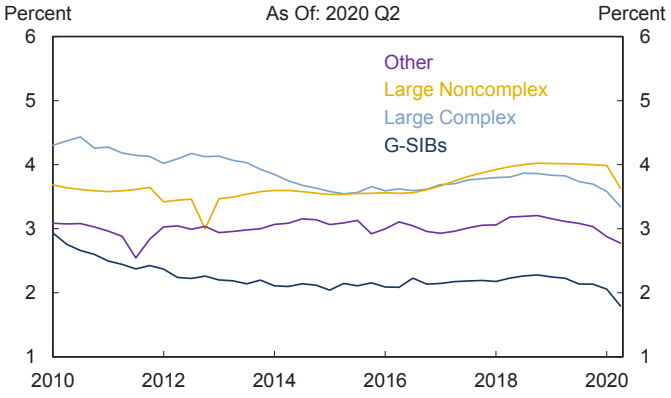
3.5.1.7 Return on Assets



Source: FR Y-9C

Note: Quarterly, seasonally-adjusted annual rate. Return on assets is equal to net income divided by average assets.

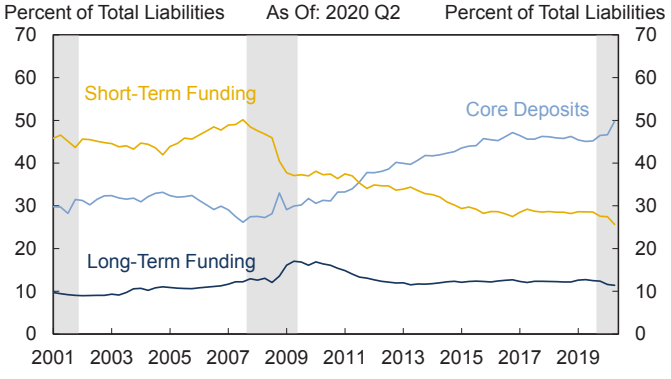
3.5.1.8 Net Interest Margins



Source: FR Y-9C

Note: Quarterly, seasonally-adjusted annual rate. Net interest margin is equal to net interest income divided by the quarterly average of interest-earning assets.

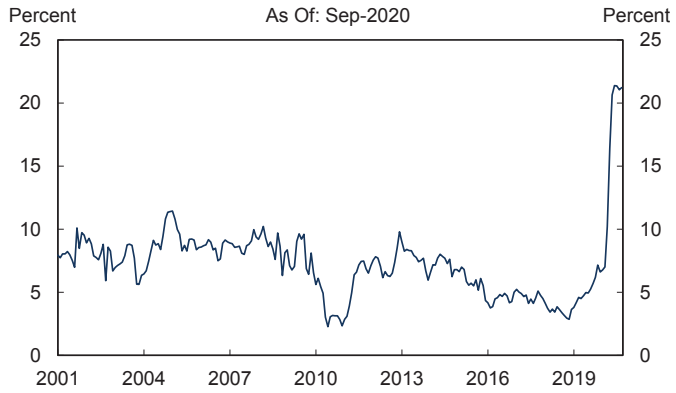
3.5.1.9 Selected Sources of Funding at U.S. G-SIBs



Source: FR Y-9C

Note: ST funding: liabilities with maturities =< 1 yr, trading liabilities, repos, CP, and foreign deposits. LT funding: other borrowed money, subordinated notes and large time deposits with maturities > 1 yr. Core deposits: demand deposits, noninterest-bearing balances, transaction accounts, money market deposits and time deposits <$250,000.Gray bars signify NBER recessions.

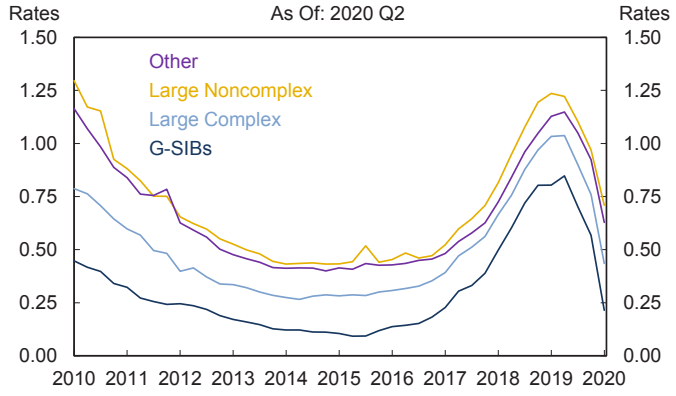
3.5.1.10 Deposit Growth, All Commercial Banks



Source: Federal Reserve, Haver Analytics

Note: Statistical Release H.8, "Assets and Liabilities of Commercial Banks in the United States." Seasonally adjusted values. Year-over-year percentage change.

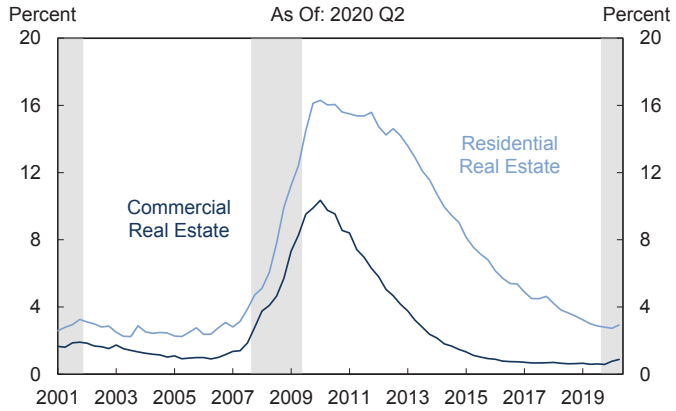
3.5.1.11 Effective Deposit Rates by BHC Category



Source: Call Report

Note: Effective deposit rates are defined as the ratio of the annualized quarterly-average interest expense on deposits and the one-quarter lag of the quarterly-average deposit balances.

3.5.1.12 Delinquency Rates on Real Estate Loans



Source: FR Y-9C

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

The unfolding of the COVID-19 pandemic triggered flight-to-safety dynamics that led to increases in bank deposits, while other sources of funding remained mostly stable (**Chart 3.5.1.10**). A significant share of deposit inflows was also due to corporations drawing on their bank credit lines and depositing the proceeds with banks, as well as payments from fiscal programs.

Following the normalization of monetary policy in December 2015, effective deposit rates gradually increased through 2019 with the rise in federal funds rates. The interest rate cuts in 2019 and the more recent return of the federal funds rate to its effective lower bound resulted in deposit rates nearly falling back to their 2015 levels (**Chart 3.5.1.11**).

Asset Quality

Overall delinquency rates remained low and stable in 2019, in part due to low delinquency rates for real estate loans (**Chart 3.5.1.12**). Mortgage lending following the 2008 financial crisis has been predominantly to households with prime credit scores and lenders have applied significantly more conservative underwriting standards. In

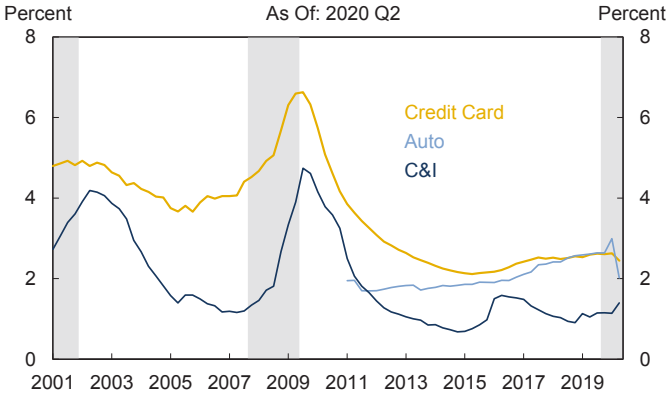
contrast, delinquency rates for consumer loans such as credit cards and auto loans increased slightly in 2019, consistent with higher shares of originations to subprime borrowers (**Chart 3.5.1.13**).

The adverse effects of the COVID-19 pandemic on economic activity resulted in significant deterioration of liquidity positions and debt servicing capacity of household and business borrowers, leading to a reassessment of credit policies by banks. In the responses to the July 2020 SLOOS, banks indicated on balance that the levels of underwriting standards for most loan categories were relatively tighter than the mid-points of the ranges of those standards since 2005. Banks reported weaker demand for all commercial loan categories, and stronger demand for all residential real estate loans categories.

Despite disruptions in economic activity caused by the pandemic, delinquency rates in the first two quarters of 2020 did not increase substantially from their existing trends. Loan forbearance programs, along with government stimulus and deferred tax payments, contributed to better-than-expected credit performance in the first two quarters of 2020. Mortgage forbearance programs provided household borrowers with greater liquidity and increased capacity to pay down other debt such as credit cards and auto loans. However, BHCs significantly increased their loan loss provisions in the first half of 2020 (**Chart 3.5.1.14**).

The introduction of the CECL accounting standard has, for those institutions that have implemented CECL, changed how these institutions provision for loan losses, from using incurred losses under the previous accounting standard to estimating losses over the financial asset's contractual term adjusted for prepayments. Because the adoption of CECL could lead to one-time reductions in regulatory capital ratios, banks were given the option to phase in the regulatory capital effects of the updated accounting standard over a period of three years. In addition, the

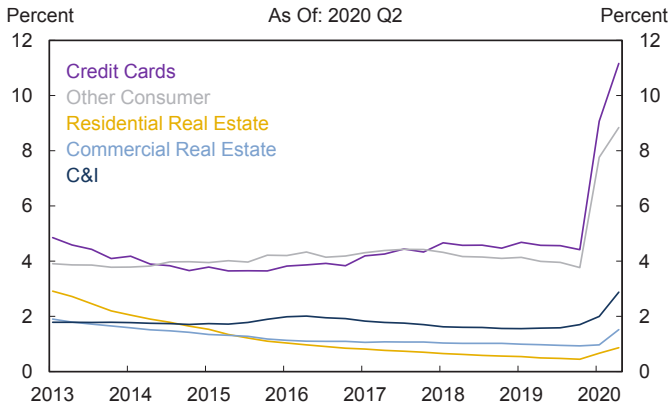
3.5.1.13 Delinquency Rates on Selected Loans



Source: FRY-9C, Call Report

Note: Seasonally adjusted. Includes all loans in domestic and foreign offices. Auto loans became available in 2011 Q1. Gray bars signify NBER recessions.

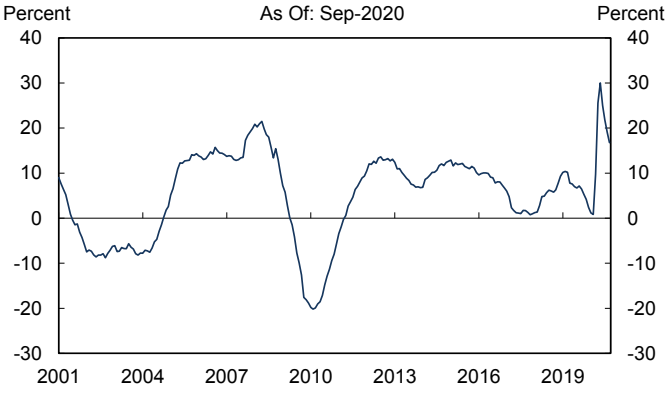
3.5.1.14 Provisions to Loans Ratios at BHCs



Source: FR Y-9C

Note: Excludes Barclays, Credit Suisse, DB, and UBS.

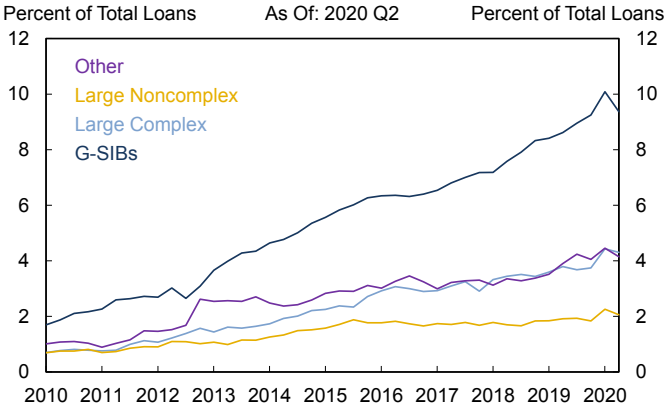
3.5.1.15 C&I Loan Growth, All Commercial Banks



Source: Federal Reserve, Haver Analytics

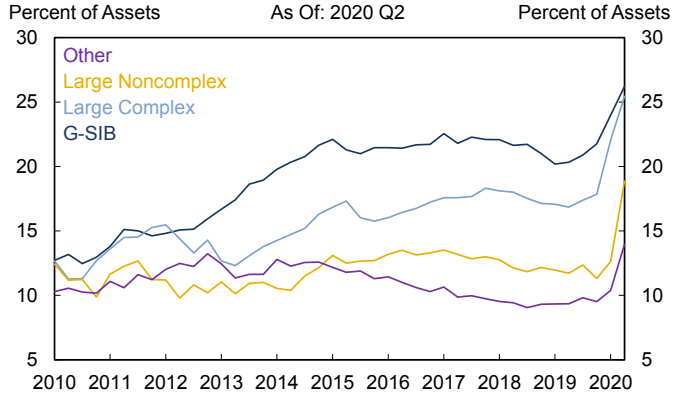
Note: Statistical Release H.8, "Assets and Liabilities of Commercial Banks in the United States." Year-over-year percentage change.

3.5.1.16 Loans to Nondepository Financial Institutions



Source: FR Y-9C

3.5.1.17 High-Quality Liquid Assets by BHC Type



Source: FR Y-9C

Note: HQLA is estimated by adding excess reserves to an estimate of securities that qualify for HQLA. Haircuts and level 2 asset limitations are incorporated into the estimate.

supervisory stress test modeling framework as it relates to projecting loan allowances and provisions would not be revised to account for CECL in the 2020 and 2021 cycles. To allow banking organizations to better focus on supporting lending to creditworthy households and businesses in light of recent strains on the U.S. economy as a result of COVID-19, while also maintaining the quality of regulatory capital, the federal banking regulators issued a final rule on August 26, 2020, that allowed the option to delay for two years an estimate of CECL's effect on regulatory capital, relative to the incurred loss methodology's effect on regulatory capital, followed by a three-year transition period.

Corporate borrowers, especially in industries directly impacted by the pandemic, drew their credit lines to meet current—and hedge against future—liquidity and funding needs. The drawdowns on credit lines resulted in significant increases in outstanding C&I loans. In addition, PPP loans outstanding, which were mostly C&I loans and amounted to $484 billion as of June 30, drove this increase. The average year-over-year growth of C&I loans exceeded 20 percent from April through July 2020 (**Chart 3.5.1.15**).

Lending to nondepository financial institutions has increased since 2010, significantly outpacing the growth rates in commercial loans to nonfinancial firms. The growth in loans to nonbank financials accelerated notably at the end of 2019 and in the first quarter of 2020. A large part of the increase in the first quarter of 2020 was due to drawdowns of credit lines that were subsequently paid down in the second quarter of 2020 (**Chart 3.5.1.16**).

Liquidity Management

In 2019, all BHCs subject to the liquidity coverage ratio (LCR) reduced their holdings of high-quality liquid assets (HQLA) and, in particular, their reserves (**Chart 3.5.1.17**). HQLA began to increase in the last quarter of 2019 mostly due to increases in reserves following interventions of the Federal

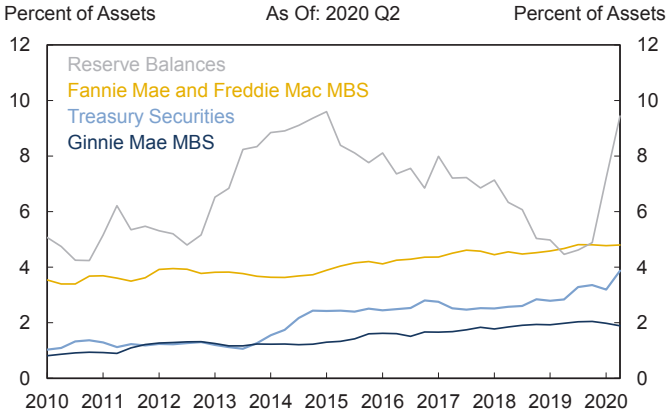
Reserve in repo markets in September 2019. The increase in reserves significantly accelerated with the influx of deposits and the establishment of the asset purchase programs by the Federal Reserve in the first half of 2020 (**Chart 3.5.1.18**).

Deposit inflows and inflows of more stable insured retail deposits helped alleviate liquidity pressures from the large credit line drawdowns. U.S. G-SIBs continued to maintain liquidity ratios well above the 100 percent requirement in the first two quarters of 2020 (**Chart 3.5.1.19**). LCR ratios rose for six of the eight U.S. G-SIBs in the second quarter of 2020. The Tailoring rules exempted BHCs with total consolidated assets below $100 billion from the LCR and reduced LCR requirements for Categories III and IV, based on their reliance on short-term wholesale funding.

There was a large shift of held-to-maturity investment securities to available-for-sale status at the end of 2019, which reflected re-optimization by banks after the Tailoring rules went into effect on December 31, 2019. The rules allowed large complex and large noncomplex BHCs to opt-out of including accumulated other comprehensive income from available-for-sale accounts in their capital calculation. Most large complex and some large noncomplex BHCs shifted their entire holdings of securities from held-to-maturity into available-for-sale accounts (**Chart 3.5.1.20**).

The duration gap between the timing of cash inflows from assets and the timing of cash outflows from liabilities at U.S. G-SIBs and large BHCs remained on balance unchanged in 2020, whereas the duration gap at other BHCs increased slightly. Duration gaps are measures of interest rate risk at BHCs. The flattening of the yield curve and expectations for lower interest rates are likely to negatively impact profitability and capital at BHCs with smaller duration gaps (**Chart 3.5.1.21**).

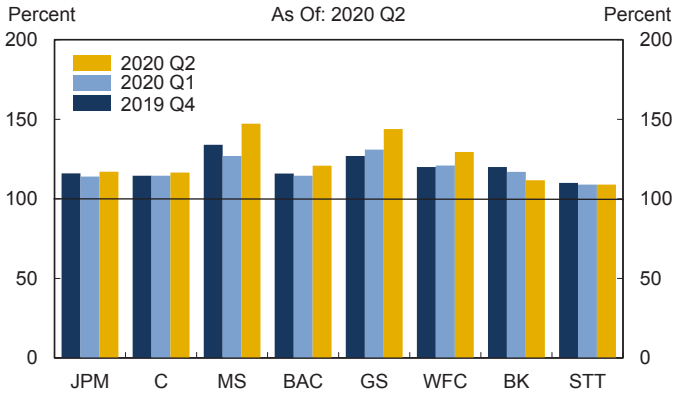
3.5.1.18 Selected Liquid Assets at All BHCs



Source: FR Y-9C, FR 2900

Note: Quarterly, NSA.

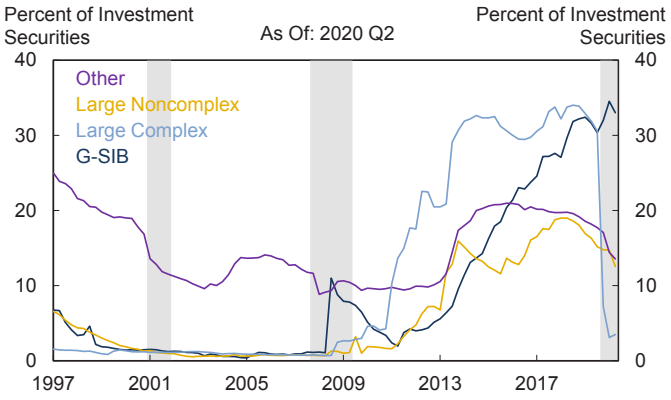
3.5.1.19 Liquidity Coverage Ratios at U.S. G-SIBs



Source: LCR Disclosures from each banks' websites

Note: The solid line represents the regulatory minimum.

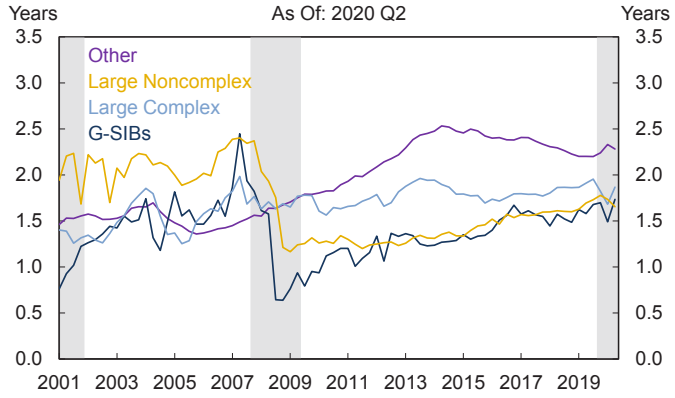
3.5.1.20 Held-to-Maturity Securities



Source: Call Report, Haver Analytics

Note: Investment securities are held-to-maturity securities plus available-for-sale securities. Gray bars signify NBER recessions.

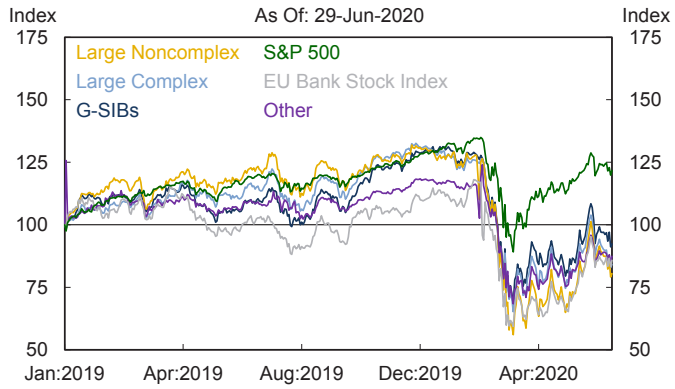
3.5.1.21 Duration Gap



Source: Call Report, Haver Analytics

Note: Duration gap is the approximate weighted-average time of cash inflows less the approximate weighted-average time of cash outflows. Gray bars signify NBER recessions.

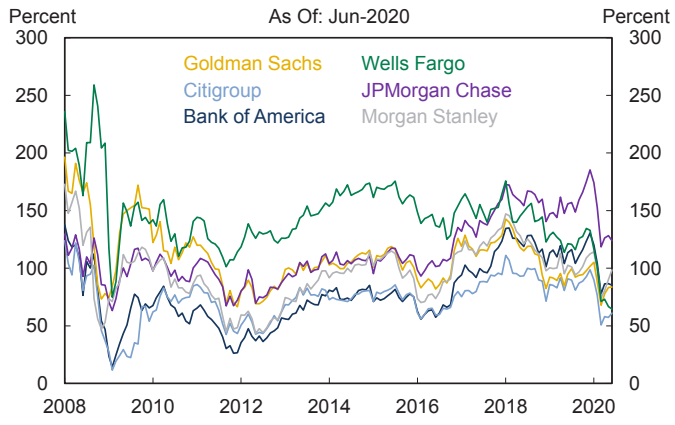
3.5.1.22 Bank Stock Performance



Source: Yahoo Finance!, Bloomberg, L.P.

Note: January 2, 2019 = 100. EU Bank Stock Index created from stock prices for the following banks: BCS, BNPQY, CS, ACA, DB, SAN, UBS. All indexes are created by equally weighting banks.

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



Source: SNL

Note: Month-end values.

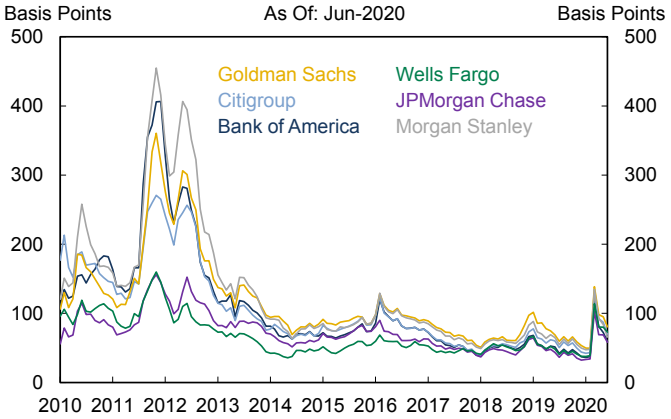
Market Perception of Value and Risk

Investor expectations for significantly lower bank profitability were reflected in sharp declines in bank stock valuations and market capitalization in March 2020. Even though bank stock prices partially recovered in April through June 2020, bank stocks performed notably worse than the S&P 500 stock index (**Chart 3.5.1.22**).

Price-to-book ratios of the U.S. G-SIBs followed similar patterns to their stock performance. Despite the partial recovery of market valuations, most U.S. G-SIBs' price-to-book ratios remained below or around 100 as of June 2020. Low market-based capital and price-to-book ratios limit BHCs' ability to raise equity capital externally (**Chart 3.5.1.23**).

CDS spreads of U.S. G-SIBs, a measure of default risk, increased notably in the spring but have since tightened. Some U.S. G-SIBs' CDS spreads rose by more than 100 basis points, exceeding the increases in CDS spreads observed in February 2016 when markets were concerned about a global economic slowdown and the possibility of a low-for-long interest rate environment. Nonetheless, the increases in CDS spreads in 2020 were significantly smaller than those observed during the 2008 financial crisis. In large part, the lower CDS spreads at the onset of the COVID-19 crisis reflect the much better 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**).

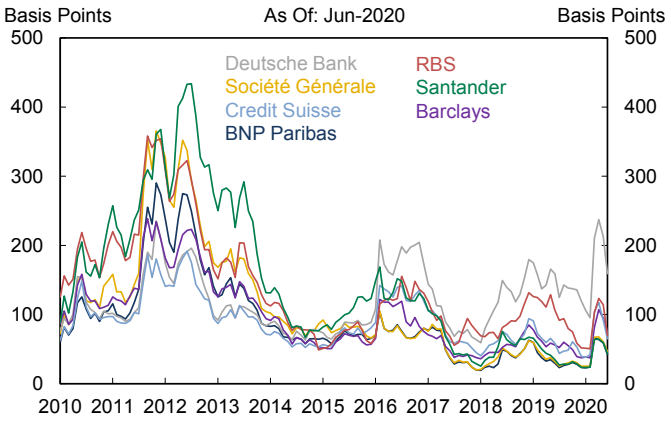
3.5.1.24 5-Year CDS Premiums of Select U.S. G-SIBs



Source: Markit

Note: Monthly averages.

3.5.1.25 5-Year CDS Premiums of Select Foreign Banks



Source: Markit

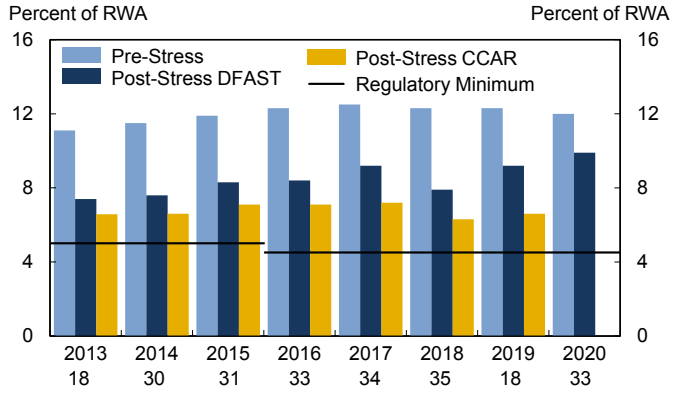
Note: Monthly averages.

Dodd-Frank Act Stress Tests and the Assessment of Bank Capital during COVID-19 Event

The CCAR is an annual exercise by the Federal Reserve to assess whether the largest BHCs operating in the United States have sufficient capital to continue operations throughout times of economic and financial stress and that they have robust, forward-looking capital-planning processes that account for their unique risks.

As part of this exercise, the Federal Reserve evaluates institutions' capital adequacy, internal capital adequacy assessment processes, and their individual plans to make capital distributions, such as dividend payments or stock repurchases. Dodd-Frank Act stress testing (DFAST)—a complementary exercise to CCAR—is a forward-looking exercise that evaluates the capital adequacy of BHCs and IHCs to absorb losses over a nine-quarter period resulting from stressful economic and financial market conditions in hypothetical supervisory scenarios. The stress test is conducted by the Federal Reserve and the supervisory stress scenarios are designed by the Federal Reserve. The Federal Reserve consults

3.5.1.26 Initial and Stressed Capital Ratios



Source: Federal Reserve

Note: Regulatory minimum is 5% pre-2016 and 4.5% from 2016 onwards. For DFAST 2013-2015, bars show Tier 1 Common Capital Ratio. DFAST 2016-2020 bars show Common Equity Tier 1 Ratio. The x-axis labels represent the number of banks tested within a given year.

with the FDIC and OCC on the scenarios, which are also used for company-run stress tests by national banks, state nonmember banks, and federal savings associations. As part of DFAST, the firms must report their company-run stress test results to the Federal Reserve, their primary regulator, and the public.

In the 2020 stress test cycle, 34 BHCs and IHCs were stress tested. The aggregate CET1 ratio would decline from 12 percent in the fourth quarter of 2019 to its minimum of 9.9 percent as part of the severely adverse scenario. The DFAST 2020 results were broadly similar to those of prior year exercises (**Chart 3.5.1.26**). In particular, aggregate loan losses as a percentage of the average loan balances in the severely adverse scenario in DFAST 2020 were comparable to the past several years. Finally, the Board did not object to the five IHCs (Barclays, Credit Suisse, Deutsche Bank, DWS, and UBS), whose capital planning practices were subject to qualitative assessment as part of the stress test.

In June 2020, the Federal Reserve announced that it had conducted a sensitivity analysis of bank capital adequacy taking into account the significant economic uncertainty during the COVID-19 pandemic. The Federal Reserve constructed three alternative downside scenarios to model possible paths for the economy: a rapid V-shaped recession and recovery, a slower U-shaped recession and recovery, and a W-shaped double-dip recession with a short-lived interim recovery. All three alternative downside scenarios featured higher peak unemployment rates and larger declines in GDP than the severely adverse scenario. Furthermore, the sensitivity analysis did not take into account the mitigating effects of government stimulus programs and expanded unemployment insurance.

The results of the sensitivity analysis showed that aggregate loan losses ranged from $560 billion to $700 billion. Most firms remained well-capitalized and aggregate capital ratios declined from 12.0 percent in the fourth quarter of 2019 to minimum values between

9.5 percent and 7.7 percent across the three alternative scenarios. However, several firms would approach minimum capital requirements (**Chart 3.5.1.27**).

The Federal Reserve took several actions to preserve the resilience of the banking system in light of significant economic uncertainty during the pandemic. The Federal Reserve required CCAR applicable banks to temporarily suspend share repurchases and limit dividend payments based on recent earnings. In addition, the Federal Reserve required large banks to re-evaluate and resubmit their long-term capital plans in early November. Results from the CCAR 2020 resubmission and further policy actions, if any, will be disclosed by year-end 2020. On September 17, 2020, the Board released two scenarios featuring severe recessions for a second round of bank stress tests that would reassess banks' resiliency in the face of the continued uncertainty from the COVID-19 pandemic. The Board will release firm-specific results from banks' performance under these scenarios by the end of the year.

3.5.1.2 Insured Commercial Banks and Savings Institutions

As of the second quarter of 2020, the banking industry included 5,066 FDIC-insured commercial banks and savings institutions with total assets of $21.1 trillion. There were 1,010 institutions with assets under $100 million and 903 institutions with assets over $1 billion. During 2019, 226 institutions were absorbed by mergers, while 13 new charters were added. Failures of insured depository institutions are down significantly since the 2008 financial crisis; four institutions failed in 2019 and four had failed at the time of this report in 2020 (**Chart 3.5.1.28**).

As of year-end 2019, the FDIC's "problem bank" list included 51 institutions—1 percent of all institutions—in comparison to 60 banks 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.

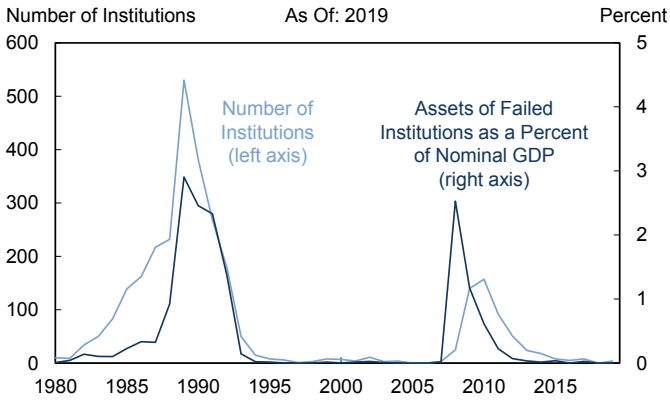
3.5.1.27 Minimum CET1 Capital Ratios in the Severely Adverse and Alternative Downside Scenarios

Scenario	Minimum CET1 Capital Ratio		
	25th Percentile	75th Percentile	Aggregate
Stress Test			
Severely Adverse	8	12.3	9.9
Sensitivity Analysis			
V-shaped	7.5	11.3	9.5
U-shaped	5.5	10.8	8.1
W-shaped	4.8	10.5	7.7

Source: Federal Reserve

Note: Excludes common distributions. Sample consists of the 33 firms participating in DFAST 2020.

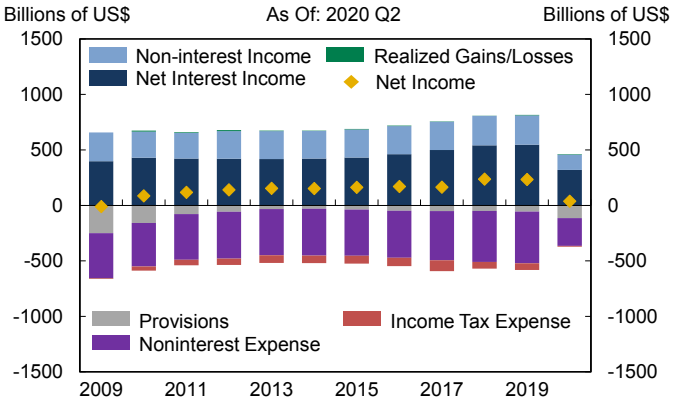
3.5.1.28 FDIC-Insured Failed Institutions



Source: BEA, FDIC, Haver Analytics

Note: No FDIC-insured institutions failed during 2005, 2006, and 2018.

3.5.1.29 Commercial Bank and Thrift Net Income



Source: FDIC

Note: Includes all FDIC-insured commercial banks and thrifts. Values are annualized.

The total assets of U.S. commercial banks and savings institutions increased by $2.9 trillion between the second quarter of 2019 and the second quarter of 2020. Loans and leases increased by $695 billion during that period. While all major loan categories grew, C&I increased the most, up $473 billion or 21 percent. Growth in the C&I portfolio was driven by a combination of draws on lines of credit by businesses and PPP lending. Banks increased their investment securities by $737 billion since the second quarter of 2019, with U.S. Treasury securities balances up by 51 percent and MBS up by 16 percent. Cash and due from accounts also grew $1.3 trillion or 78 percent, driven by a large inflow of deposits, and now represent 14 percent of total assets, up from 9 percent a year ago.

For the first six months of 2020, net income for all U.S. commercial banks and savings institutions totaled $37 billion, a 70 percent decline from the first six months of 2019, driven by a decline in net interest income and rise in loan loss provisions (**Chart 3.5.1.29**). Net interest income fell by 3.5 percent in the first half of 2020 due to interest income declines outpacing interest expense declines. Interest-earning assets grew 17 percent since June 2019; however, the yields on these assets do not compensate for the 150 basis point drop in rates in early 2020. These earnings trends were broad-based throughout the industry, as more than half of commercial banks and savings institutions reported lower earnings in the first half of 2020.

Credit quality has begun to show modest deterioration. The noncurrent ratio rose 15 basis points from the second quarter of 2019 to 1.08 percent of total loans. Loan loss provisions for the first six months of 2020 rose $88 billion, reflecting economic conditions and the implementation of the CECL accounting standard.

The long-term trend of banking industry consolidation continued in 2019 and 2020, as the ten largest institutions continued to hold over 50 percent of total industry assets (**Chart**

3.5.1.30). The 100 largest institutions hold about 82 percent of total industry assets, which is a historical high. As of the second quarter of 2020, the total number of banks and savings associations decreased to 5,066, which is a historical low.

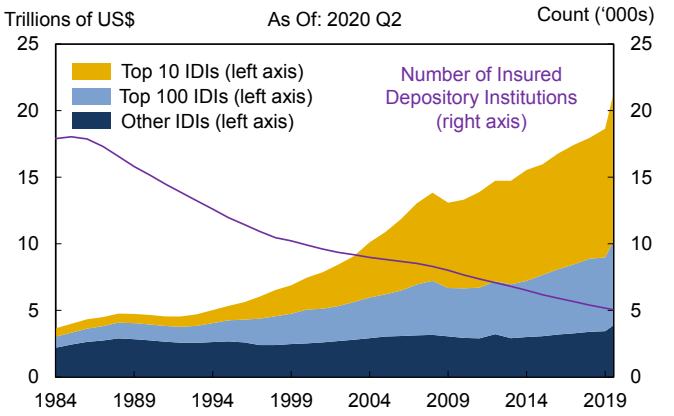
3.5.1.3 U.S. Branches and Agencies of Foreign Banks

As of June 30, 2020, assets of U.S. branches and agencies of foreign banks totaled $2.6 trillion, up nearly six percent from June 30, 2019 (**Chart 3.5.1.31**). Reserve balances for U.S. branches and agencies of foreign banks totaled $640.1 billion, comprising 25 percent of total assets as of June 30, 2020. Reserve balances increased 24 percent year-over-year and accounted for 90 percent of asset growth during the same timeframe. Noted growth in reserve balances is largely attributed to increased borrowings from head offices and related entities of U.S. branches and agencies of foreign banks that were placed on deposit at the Federal Reserve. In addition, deposits of borrowings from the Discount Window and certain Federal Reserve-sponsored liquidity facilities contributed to the increase in reserve balances and the maintenance of excess liquidity at U.S. branches and agencies of foreign banks.

Securities purchased under agreement to resell (reverse repos) and fed funds sold at U.S. branches and agencies of foreign banks decreased by $79 billion or 21 percent from June 30, 2019, to June 30, 2020. Reverse repos represented 12 percent of total assets at U.S. branches and agencies of foreign banks as of June 30, 2020, compared to nearly 16 percent of total assets one year prior. The contraction in reverse repos is consistent with reduced market activity at the point of severe stress toward the beginning of the outbreak and with the intent of U.S. branches and agencies of foreign banks to preserve liquidity at the onset of the pandemic.

As of June 30, 2020, total loan balances accounted for approximately 34 percent of total assets at U.S. branches and agencies of foreign banks. C&I lending remained a significant

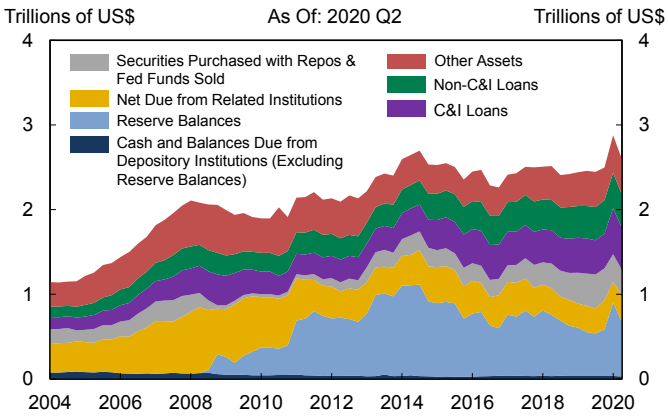
3.5.1.30 Total Assets of Largest Insured Depository Institutions



Source: FFIEC Call Report

Note: Fourth quarter data was used for years 1984 - 2019 and second quarter data was used for 2020.

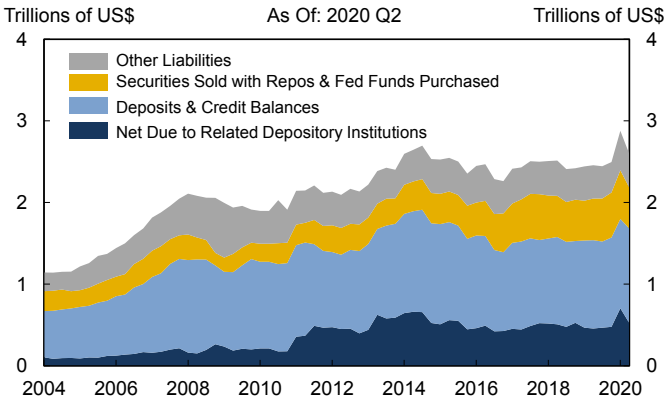
3.5.1.31 U.S. Branches and Agencies of Foreign Banks: Assets



Source: Federal Reserve, Haver Analytics

Note: Other assets includes government securities, ABS, and other trading assets.

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



Source: Federal Reserve, Haver Analytics

Note: Other liabilities includes transaction accounts, non-transaction accounts, and other borrowed money.

portion of overall lending by U.S. branches and agencies of foreign banks, with a ratio of C&I loans to total loans of approximately 56 percent as of June 30, 2020. C&I loan levels rose $78 billion or 19 percent between June 30, 2019 and June 30, 2020. The most significant increases in C&I loans occurred during the first quarter of 2020, driven by corporate draws on revolving and committed lines of credit.

Deposits and credit balances represented 45 percent of total liabilities for U.S. branches and agencies of foreign banks as of June 30, 2020 (**Chart 3.5.1.32**). Net due to related depository institutions increased $60 billion or 14 percent from June 30, 2019 to June 30, 2020. The year-over-year increase in net due to related depository institutions was driven by an uptick in head office borrowings from the Federal Reserve's liquidity swap lines in the first quarter, which returned to more normal levels by the end of the second quarter. This funding was generally downstreamed to U.S. branches and agencies of foreign banks to support local operations and meet dollar liquidity needs. Securities sold with repurchase agreements (repos) and federal funds purchased decreased $10 billion or two percent between June 30, 2019, and June 30, 2020. Repos totaled 35 percent of total liabilities for U.S. branches and agencies of foreign banks as of June 30, 2020, and decreased two percent year-over-year. While this figure initially increased in the first quarter given enhanced participation in the Federal Reserve's emergency lending facilities, particularly with the expansion of the repo facility, it has since fallen.

3.5.1.4 Credit Unions

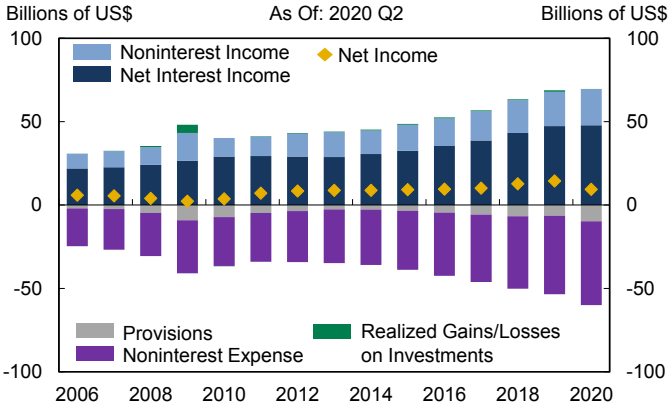
Credit unions are member-owned, not-for-profit, depository institutions. As of the second quarter of 2020, there were 5,164 federally insured credit unions with aggregate assets of $1.75 trillion. Just over two-thirds of credit unions (3,476) had assets under $100 million, with 24 percent having less than $10 million in assets. There were 1,331 credit unions with assets between $100 million and $1 billion, and 357 credit unions with assets over $1 billion.

Consistent with long-running trends among depository institutions, consolidation in the credit union industry has continued recently, particularly at smaller institutions. The number of credit unions with less than $50 million in assets fell to 2,811 in the second quarter of 2020, bringing the cumulative decline over the past five years to 28 percent. At the same time, however, total industry assets have grown at an annual average rate of 8.4 percent over the five years ending in the second quarter of 2020. Membership in federally insured credit unions has grown 21 percent over the past five years, reaching over 122 million members as of the second quarter of 2020.

The COVID-19 pandemic has presented the credit union system and its members with numerous challenges. The data generally show, however, that financial performance at credit unions was relatively solid in the first half of the year, despite the sharp rise in unemployment and a record-setting drop in economic activity. Net income at consumer credit unions amounted to $9.4 billion on an annualized basis in the second quarter of 2020, a sharp decline of 35 percent from the same period in 2019 (**Chart 3.5.1.33**). That fall was largely due to a continued jump in provisioning for loan and lease losses and credit loss expenses as a result of the deterioration in economic conditions.

The amount of outstanding loans at credit unions increased by 6.6 percent over the year ending in the second quarter of 2020, up slightly from the 6.4 percent pace registered during the same period a year earlier. Credit union real estate loans outstanding, which represent roughly half of the industry's loan portfolio, increased a sizeable 10 percent in the most recent four-quarter period. Record-low mortgage rates have fueled strong real estate lending. The industry also posted a large increase in commercial loans, due mainly to Paycheck Protection Program lending. In contrast, auto loans, which represent one-third of the credit union loan portfolio, grew only 1.1 percent over the year ending in the second quarter of 2020, as loans for new autos contracted.

3.5.1.33 Credit Union Income



Source: NCUA

Note: Federally-insured credit unions. Values are annualized.

Overall loan performance remained strong in the first half of 2020 despite the economic stresses and a rising level of unemployment. The system-wide delinquency rate declined to 58 basis points in the latest quarter, nearly matching a 13-year low reached last year. The delinquency rates on fixed-rate real estate loans and auto loans stood at 41 basis points and 47 basis points, respectively. The delinquency rate on credit cards (just over 5 percent of total credit union loans) declined in the second quarter but remained elevated at 101 basis points.

The credit union system experienced a return on average assets (ROAA) of just 57 basis points at an annual rate in the second quarter of 2020, down sharply from 97 basis points a year earlier. Both interest income and non-interest income were up modestly, while the NIM among all credit unions declined to 288 basis points from 318 basis points a year earlier.

Based on various standard measures, smaller credit unions have continued to underperform larger credit unions. These smaller institutions account for the bulk of institutions but a very modest (and shrinking) share of assets and members. For example, credit unions with less than $100 million in assets account for 67 percent of the number of institutions, but only 5.4 percent of assets, while credit unions with more than $1 billion in assets account for 70 percent of system-wide assets and 65 percent of credit union members. ROAA at the smaller institutions averaged 36 basis points on an annualized basis in the second quarter of 2020, while ROAA at credit unions with more than $1 billion in assets was higher at 63 basis points. At the same time, the loan delinquency rate for smaller credit unions was 87 basis points in the second quarter of the year, compared with 55 basis points at the $1 billion-plus institutions.

Interest rates across the maturity spectrum have fallen to historical lows amid the COVID-19 crisis. Credit union interest-sensitive deposits as a share of total deposits have fallen from over 60 percent a decade earlier to less than 50

percent. The share of money market accounts and IRA deposits has also been trending lower (**Chart 3.5.1.34**). A measure of long-term assets—which consists of fixed-rate first mortgages and investments with a term longer than three years—has been relatively steady at just under 28 percent of total assets in recent years. That share remains elevated compared to levels that prevailed 10 to 15 years ago (**Chart 3.5.1.35**).

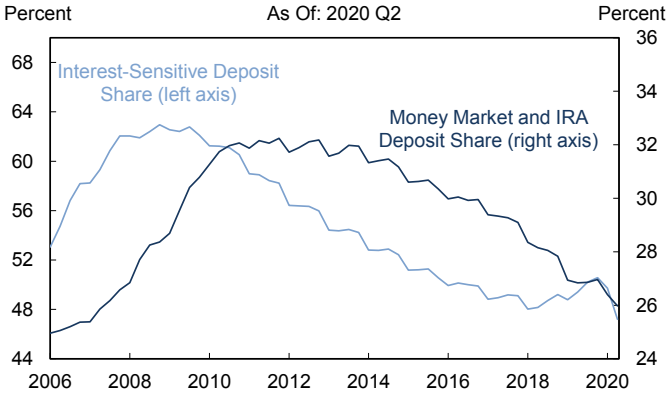
The overall investment share of the asset side of credit union balance sheets has shrunk in recent years, while the loan share has increased. Over the past five years, the share of investments has declined from roughly 24 percent of total assets to 18 percent currently. Over the same period, the share of assets accounted for by loans rose from roughly 64 percent to 65 percent (**Chart 3.5.1.36**).

The loan-to-deposit ratio at credit unions declined in the second quarter to 76.2 percent but remains higher than levels from a decade ago. An elevated loan share has generally helped to support credit union profitability in recent years. Consumers pulled back on spending in the first half of the year, driving the personal savings rate up to an all-time high. As a result, total deposits at credit unions surged by 16.5 percent in the year ending in the second quarter, the largest four-quarter increase in several decades.

The credit union industry remained well-capitalized in the first half of the year. The overall net worth ratio in the second quarter of 2020 was 10.5 percent. In ordinary times, under statutory guidelines, a credit union is considered "well capitalized" if it holds a net worth ratio at or above 7 percent.

While still maintaining the safety and soundness of the credit union system, the NCUA Board has undertaken a number of measures to provide regulatory relief, flexibility, and support for credit unions as they respond to the COVID-19 pandemic. Federal legislation has also provided assistance. For instance, the

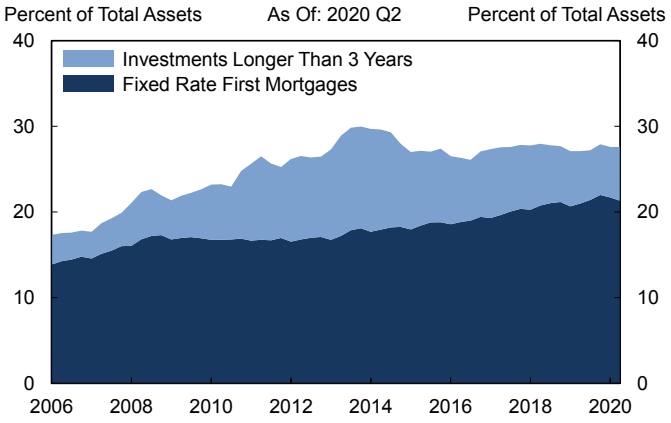
3.5.1.34 Credit Union Deposits



Note: Federally-insured credit unions. Interest-sensitive deposit share includes money market and IRA deposit share, share certificates, and certain other deposits.

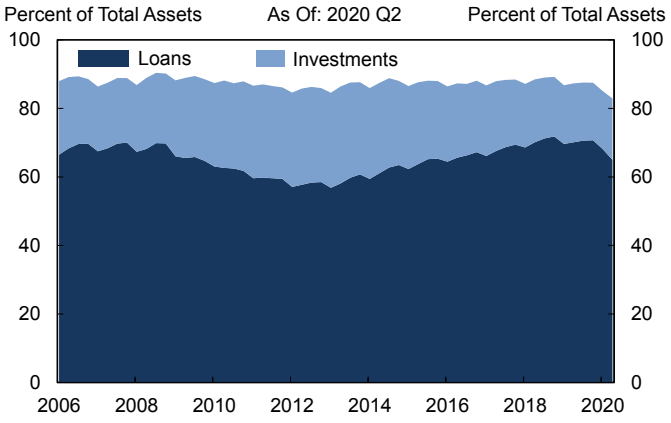
Source: NCUA

3.5.1.35 Credit Union Net Long-Term Assets



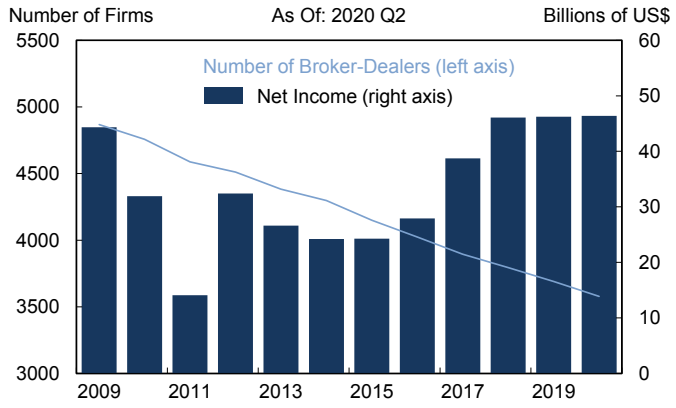
Source: NCUA

3.5.1.36 Credit Union Composition of Assets



Source: NCUA

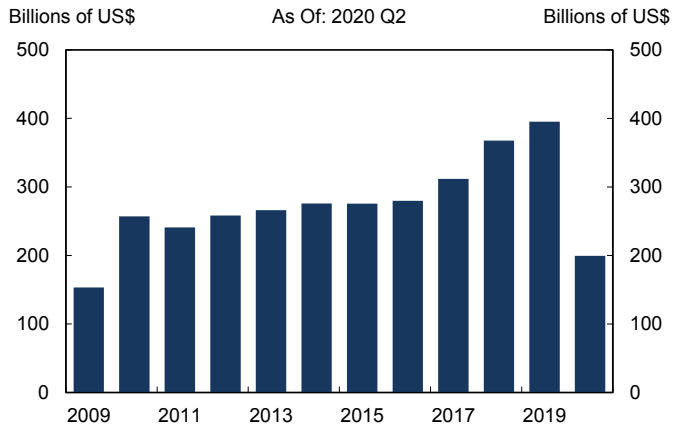
3.5.2.1 Number of Broker-Dealers and Industry Net Income



Source: FINRA

Note: 2009 – 2019 data as of Q4 and 2020 net income is YTD through Q2.

3.5.2.2 Broker-Dealer Revenues



Source: FINRA

CARES Act instituted temporary changes to the Federal Credit Union Act to expand the borrowing authority of the Central Liquidity Facility (CLF). This enhanced an important liquidity backstop for the industry. The NCUA has also awarded $3.7 million in grants and no-interest loans to 162 low-income credit unions, helping them provide affordable financial services to their members and communities during the COVID-19 pandemic.

3.5.2 Nonbank Financial Companies

3.5.2.1 Securities Broker-Dealers

As of June 2020, there were approximately 3,600 securities broker-dealers registered with the SEC, a decline of 3.0 percent from year-end 2019, reflecting a steady decline since 2009 (**Chart 3.5.2.1**). Aggregate revenues in the sector have trended higher in recent years, increasing 7 percent in 2019 relative to 2018 (**Chart 3.5.2.2**).

Broker-dealers were impacted by COVID-19 pandemic-related market volatility and work-from-home restrictions in 2020. In response, the SEC and FINRA have provided targeted regulatory assistance and relief in connection with pandemic-related challenges.

COVID-19 pandemic-related market volatility in 2020 resulted in significant increases in trading volumes across products. The industry experienced some operational issues due to increased volumes, such as website outages. Aggregate receivables from fails-to-deliver at all broker-dealers more than doubled between February and March month-ends but returned to average levels by April month-end.

Aggregate YTD June 2020 net income equaled full-year 2019 net income reflecting increased market activity and lower interest and other expenses. For the largest broker-dealers, gains from interest rate/fixed income products driven by wide bid-ask spreads and increased volatility were offset by losses in equities. Trading commission revenue increased on the rise in market volumes, particularly in equities.

Underwriting revenue rose largely as a result of an increase in debt issuances.

The U.S. broker-dealer sector remains relatively concentrated. The ten largest broker-dealers account for 57 percent of industry assets, 30 percent of industry total revenues, and 40 percent of industry net income.

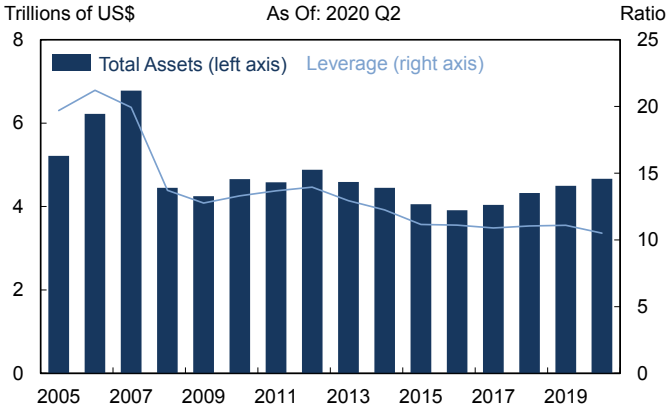
Total assets in the U.S. broker-dealer industry increased to $4.7 trillion as of the second quarter of 2020 but were well below the peak of $6.8 trillion in 2007 (**Chart 3.5.2.3**). Assets of the largest broker-dealers, which act as market makers, increased 12 percent between the fourth quarter of 2019 and the first quarter of 2020, driven by a 20 percent increase in securities and spot commodities owned. Broker-dealers typically obtain leverage through the use of secured lending arrangements such as repos and securities lending transactions. Broker-dealer leverage, measured in various ways, has declined markedly since 2007. For example, leverage measured as total assets over regulatory capital (defined as ownership equity qualified for net capital and allowable subordinated liabilities) declined to 10.5 in aggregate as of June 2020, down from 11.1 as of year-end 2019, but still remains well below the pre-crisis peak of 21 in 2006.

3.5.2.2 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 mortgage REITs (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.

mREITs tend to deploy significantly more leverage than equity REITs, and the amount of leverage used by mREITs is largely dependent

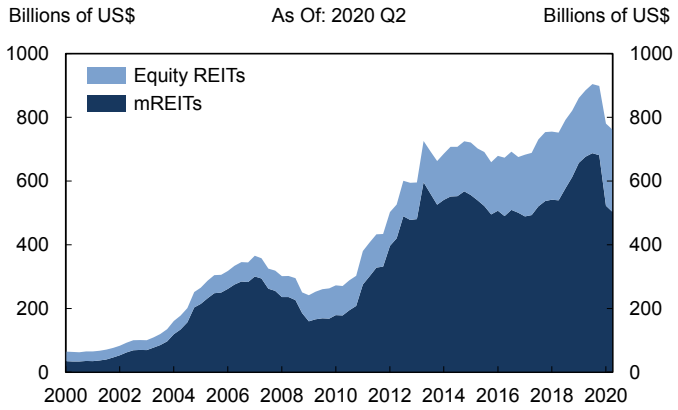
3.5.2.3 Broker-Dealer Assets and Leverage



Source: FINRA

Note: Leverage is the ratio of total assets to total regulatory capital. 2005 – 2019 data as of Q4 and 2020 data as of Q2.

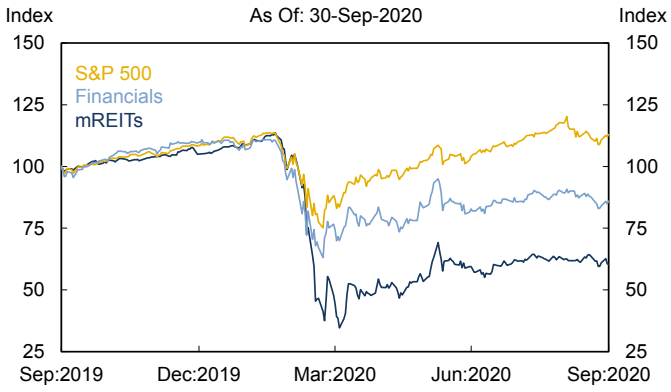
3.5.2.4 REITs Total Assets



Source: Federal Reserve, Haver Analytics

Note: Statistical Release Z.1, "Financial Accounts of the United States."

3.5.2.5 mREIT Stock Performance



Source: Bloomberg, L.P.

Note: Indexed to 100 as of 9/30/2019; mREITs represents the BREIT Mortgage Index; Financials represents the S&P 500 Financials Subindex.

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.

The size of the REIT industry grew considerably prior to the COVID-19 pandemic, which can be primarily attributed to the growth of mREITs. As of the fourth quarter of 2019, mREIT assets totaled $681 billion, a $513 billion increase from the fourth quarter of 2009 (**Chart 3.5.2.4**). Much of this growth has been concentrated in the largest mREITs, and as of the fourth quarter of 2019, three mREITs held a combined $262 billion in agency MBS and TBA securities, or approximately 75 percent of total mREIT agency MBS and TBA securities holdings. The growth of mREITs has been accompanied by an increase in repo financing, which increased from $90 billion as of the fourth quarter of 2009 to $379 billion as of the fourth quarter of 2019.

mREIT assets fell considerably in the first half of 2020, as the sector came under significant pressure during the COVID-19 market stress. As of the second quarter of 2020, mREIT assets totaled $502 billion, a 26 percent decline relative to the fourth quarter of 2019. The stress in the sector was most acute in March, with mREIT stock prices falling by nearly 70 percent between March 4 and April 3 (**Chart 3.5.2.5**). During this period, prices of mortgage-linked assets fell considerably, which triggered margin calls from mREIT lenders. To raise liquidity, mREITs sold mortgage collateral which, similar to Treasury sales, expanded dealer balance sheets and impacted term MBS repo intermediation and pricing. However, given the decline in liquidity provisioning in the MBS market, these sales led to a sharp widening of the MBS-Treasury spread, further straining mREIT

balance sheets and creating a negative feedback loop for market functioning (**Chart 3.5.2.6**).

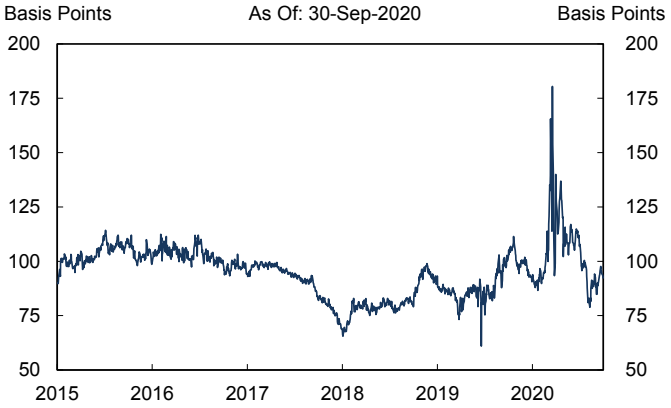
Quarterly changes in mREIT balance sheets can provide insight into the magnitude of this deleveraging campaign. In the first quarter of 2020, mREIT exposures to agency securities fell by $124 billion or 37 percent compared to the previous quarter. Similarly, mREIT repo borrowing fell by $119 billion or 31 percent over the quarter. Ultimately, FOMC actions announced in March, which included purchases of agency MBS and CMBS, gradually improved liquidity conditions and market functioning in these markets.

3.5.2.3 Money Market Mutual Funds

MMFs are a type of mutual fund that are generally used by investors to manage their cash needs. The COVID-19 pandemic caused stress in certain MMFs when, as noted in **Box D**, market participants shifted risk preferences towards cash and other highly liquid instruments. This rapid shift resulted in outflows from prime institutional MMFs, which saw assets decline in March 2020 by $77 billion. During the third week of March alone, prime institutional MMFs saw outflows of around $88 billion, or 8 percent of their net assets. Anecdotally, some of the outflows in March from prime institutional MMFs can be attributed to investors' concerns that prime institutional funds would impose gates and fees if their weekly liquid assets (WLAs), the share of assets convertible to cash within five business days, dropped below 30 percent of total assets. In response to market dislocations, two banks purchased assets from three affiliated prime MMFs to increase the funds' WLAs. One MMF saw its weekly liquid assets decline to 28 percent of total assets.

Shortly after the stress in March, as noted in **Section 3.4.1**, the Federal Reserve announced the establishment of the MMLF, which helped to improve liquidity. Following this announcement, assets in institutional prime MMFs increased in April by roughly the same amount of their decline in March.

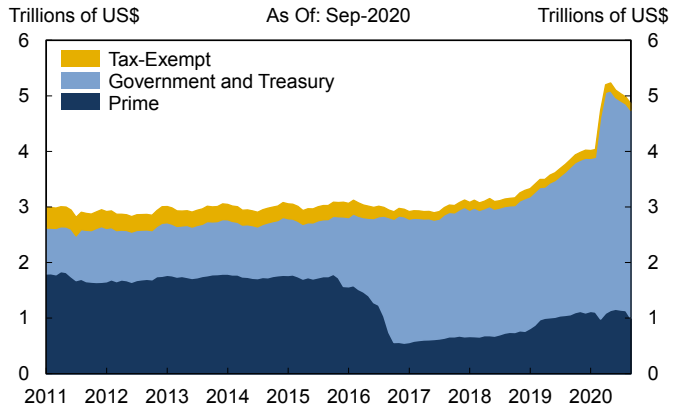
3.5.2.6 Agency MBS Spread to Treasuries



Source: Bloomberg, L.P.

Note: Fannie Mae 30-year current-coupon spread to the 5/10-year Treasury blend.

3.5.2.7 MMF Assets by Fund Type



Source: SEC

Despite the stress in prime institutional MMFs in March 2020, MMF assets in the aggregate have grown significantly over the past year because, among other things, the COVID-19 pandemic increased investors' demand for cash and lower-risk assets. According to the SEC's Money Market Fund Statistics, MMF net assets totaled $4.9 trillion in September 2020, a 26 percent increase year-over-year (**Chart 3.5.2.7**). Inflows were concentrated in government and Treasury MMFs, which saw their assets increase by $1.1 trillion, or 41 percent, from September 2019. Government and Treasury MMFs' collective share of total assets increased to 77 percent in September 2020 from 69 percent in September 2019.

Over the twelve months ended September 2020, prime MMF assets decreased by $70 billion, or 6.6 percent. Prime MMFs' share of total MMF assets declined to 20 percent in September 2020, down from 28 percent in September 2019. Net assets in tax-exempt MMFs have declined by $18 billion over the past twelve months to $121 billion as of September 2020.

The long-term trend since 2016 towards consolidation in the MMF sector, which slowed down in 2019, accelerated in 2020. As of September 2020, there were 352 MMFs, down from 369 funds in September 2019. Similarly, concentration in the MMF industry has gradually increased over the past several years. As of September 2020, the five largest MMF complexes managed 53 percent of total assets, up from approximately 46 percent at year-end 2015. Further, three MMF sponsors have recently closed some of their prime MMFs, potentially resulting in additional concentration. More specifically, two sponsors liquidated three institutional prime funds, which represented 3.6 percent of institutional prime assets as of year-end 2019. One retail prime fund, representing 28 percent of retail prime fund assets as of year-end 2019, was converted into a government fund.

Since the SEC money market fund reforms in October 2016, prime institutional and tax-exempt institutional MMFs have been required to price their shares at market, known as Floating

Net Asset Value (FNAV), rather than at amortized cost, known as Constant Net Asset Value. The portion of assets of prime and tax-exempt institutional MMFs, which are required to transact at FNAV, has declined to 15 percent in September 2020 from 17 percent in September 2019.

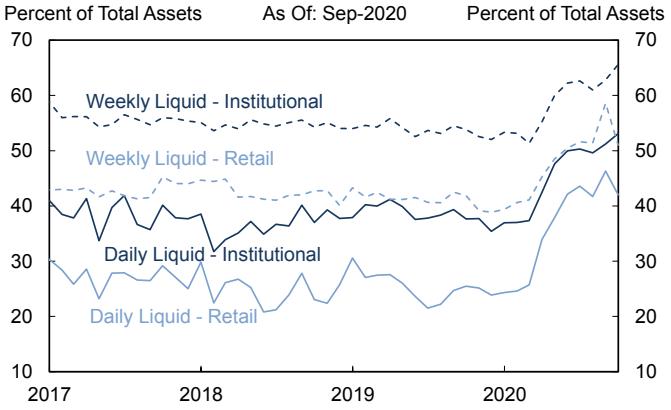
Yields on MMFs declined after the Federal Reserve cut its benchmark rate twice in March 2020. The average gross 7-day yield on prime institutional MMFs dropped to 0.2 percent in September 2020 from 2.1 percent in September 2019. The average gross 7-day yield on Treasury MMFs was 0.2 percent in September 2020, down from 2.0 percent in September 2019. Average gross 7-day yields for tax-exempt institutional MMFs were 0.2 percent in September 2020 down from 1.6 percent in September 2019. These low yields have resulted in many MMF sponsors waiving their fees to keep the yields earned by investors above zero.

Prime institutional MMFs' daily liquidity—the share of assets convertible to cash within one business day—averaged 53 percent of assets in September 2020, up from 38 percent in September 2019. This substantially exceeds the 10 percent required by SEC rules. WLAs for prime institutional MMFs averaged 66 percent in September 2020, also up from 54 percent in September 2019 and well above the 30 percent minimum required under SEC rules (**Chart 3.5.2.8**).

The WAM of fund assets provides an indication of the sensitivity of fund returns to changes in market interest rates. MMF managers tend to maintain a lower WAM during periods of rising rates and extend their WAMs in anticipation of stable or declining rates. Prime institutional MMF WAM averaged 40 days in September 2020 versus 31 days in September 2019. These averages were well below the 60-day maximum permitted under SEC rules (**Chart 3.5.2.9**).

The weighted average life (WAL) of fund assets provides an indication of the credit risk of an MMF's portfolio. MMFs that have higher WALs are subject to increased risk when credit spreads

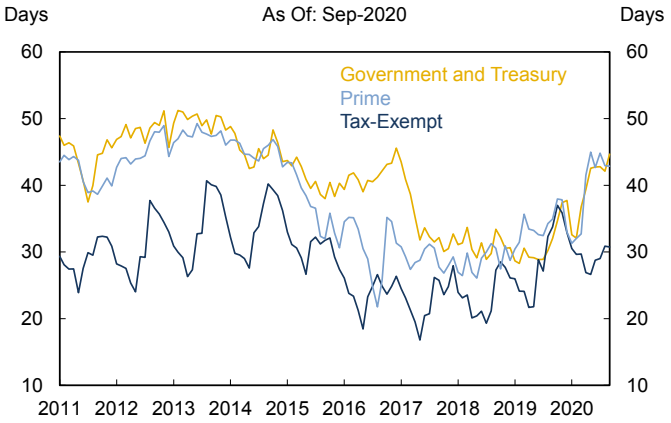
3.5.2.8 Liquid Asset Shares of Prime MMFs



Source: SEC

Note: Weighted by fund size.

3.5.2.9 Weighted Average Maturities by Fund Type



Source: SEC

Note: Weighted by fund size.

rise. Prime institutional MMF WAL averaged 59 days in September 2020 versus 62 days in September 2019. These averages were well below the 120-day maximum permitted under SEC rules.

The Federal Reserve's overnight reverse repurchase agreement facility (ON RRPF) is a supplementary policy tool that it uses to set the floor on rates, to keep the federal funds rate in the target range set by the FOMC. Eligible MMFs have invested in the ON RRPF since regular testing began in September 2013. Given the low rate paid on investments in the ON RRPF, MMFs generally use it when better investment opportunities are not available in the afternoon market. As of the end of September 2020, when the ON RRPF paid a zero percent rate, MMFs' investments in the ON RRPF were low at $850 million. In contrast, MMFs invested around $285 billion in the ON RRPF at the end of March 2020, despite a zero percent rate.

Use of the ON RRPF at the end of March peaked due to a confluence of factors. Among other things, massive inflows into government funds drove repo rates to zero as repo supply outpaced demand, which was further exacerbated by the effects of window-dressing by certain dealers typically seen around quarter-end. Supply of Treasury bills was also light as the passage of the CARES Act occurred only a few days before quarter-end prior to Treasury issuance fully ramping up. These factors led to Treasury bills in the secondary market trading in negative yield territory days before quarter-end, which left government funds with few other investment options than ON RRPF.

Repo holdings in MMFs totaled $1.1 trillion in September 2020 (down from $1.3 trillion in September 2019), or 22 percent of all assets. In 2019, Fixed Income Clearing Corporation (FICC) further expanded its sponsored repo service to include prime brokerage, broker-dealers and non-U.S. based banks in addition to custody banks, which were permitted to sponsor qualified institutional buyers onto the cleared repo platform. Over time, MMF investments in sponsored repos, which are centrally cleared

by FICC, have increased significantly—from less than $1 billion in early 2017 to the all-time high of roughly $275 billion at the end of December 2019. MMFs had just approximately $140 billion invested in sponsored repos at the end of September 2020. MMFs also are holding more Treasury securities than the historical norm, with government funds and prime funds holding 56 percent and 28 percent of their assets in Treasury securities respectively.

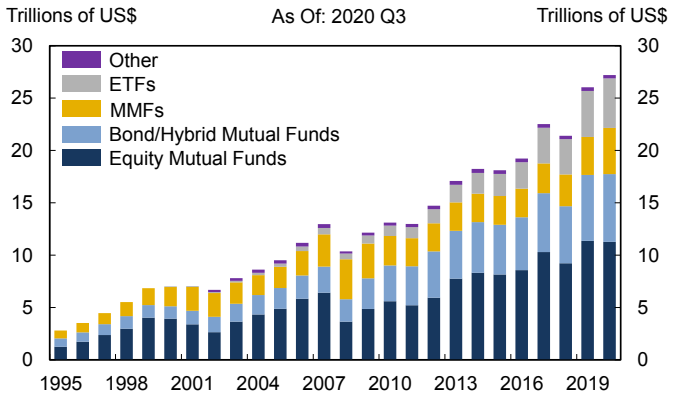
3.5.2.4 Registered Investment Companies Mutual Funds

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 2020, net assets of equity, bond, and hybrid mutual funds totaled $18 trillion, or approximately 65 percent of total U.S. investment company assets. Excluding MMFs, U.S. mutual funds' net assets increased by 0.5 percent in the first nine months of 2020 after increasing 20 percent in 2019 (**Chart 3.5.2.10**).

Prior to the pandemic, fixed income mutual funds saw consistent inflows while equity mutual funds saw consistent outflows. Between January 2018 and February 2020, bond funds experienced net inflows for 23 of the 26 months and equity funds recorded net outflows for 24 of these same 26 months. Over this period, bond funds experienced $384 billion in net inflows while equity funds had $674 billion in net outflows.

Flow patterns changed significantly in March 2020 amid the economic and market disruptions associated with the COVID-19 pandemic. Mutual funds experienced a record monthly outflow in March in terms of both dollar amount ($348 billion) and percentage of assets (2.1 percent). Bond mutual fund outflows were $255 billion, the highest on record, and represented 73 percent of total outflows. Bond mutual fund outflows moderated in April and flows turned positive in May, likely due to improved market-wide risk appetite for those assets following the announcement of various Federal Reserve programs (**Charts 3.5.2.11, 3.5.2.12**).

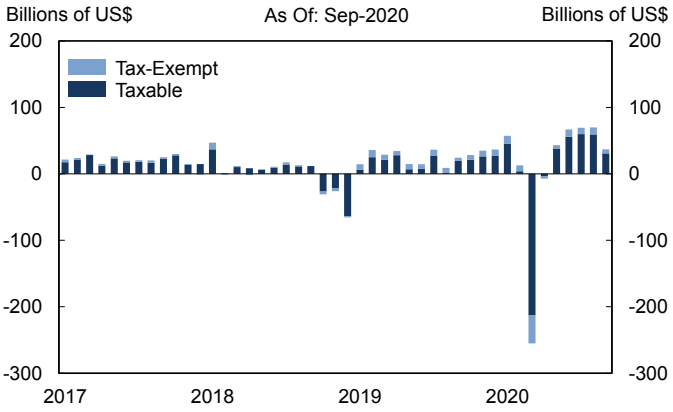
3.5.2.10 Net Assets of the Investment Company Industry



Source: ICI, Haver Analytics

Note: Other is composed of unit investment trusts (UIT) and closed-end funds. Q3 2020 figures include 2019 UIT data, which are reported annually and Q2 2020 closed-end fund data, which are reported on a lag.

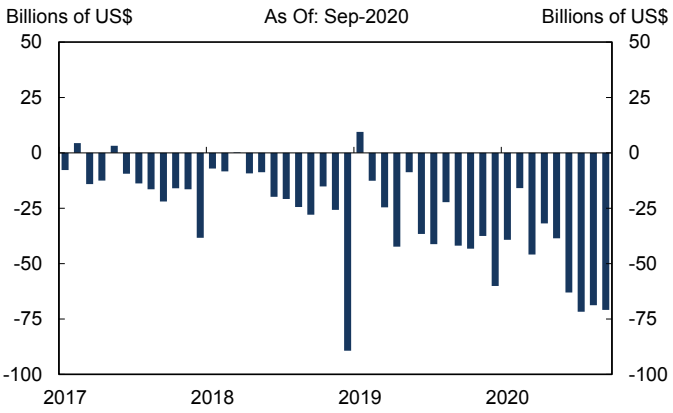
3.5.2.11 Monthly Bond Mutual Fund Flows



Source: ICI, Haver Analytics

Note: Net fund flows.

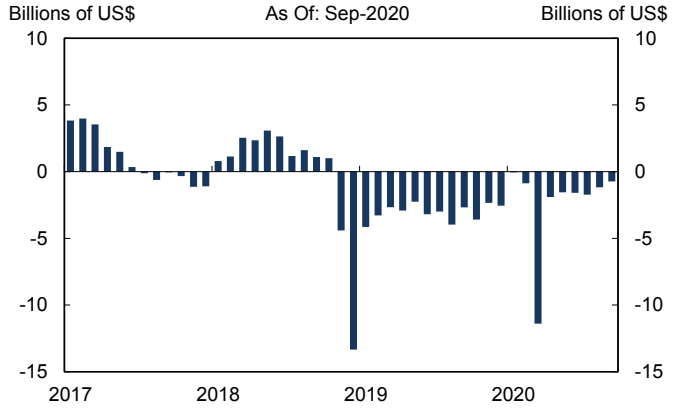
3.5.2.12 Monthly Equity Mutual Fund Flows



Source: ICI, Haver Analytics

Note: Net fund flows.

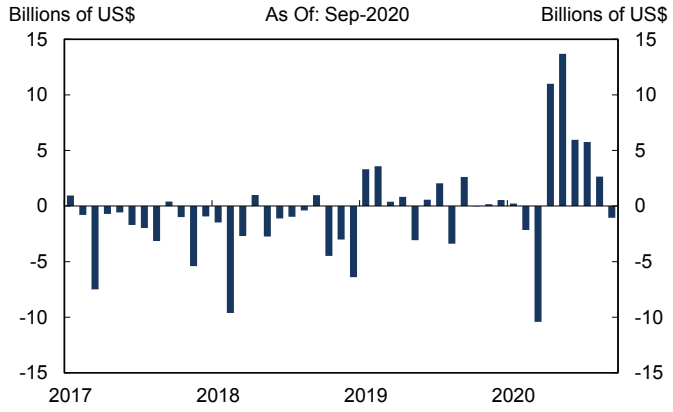
3.5.2.13 Monthly Bank Loan Mutual Fund Flows



Source: Morningstar, Inc.

Note: Net fund flows.

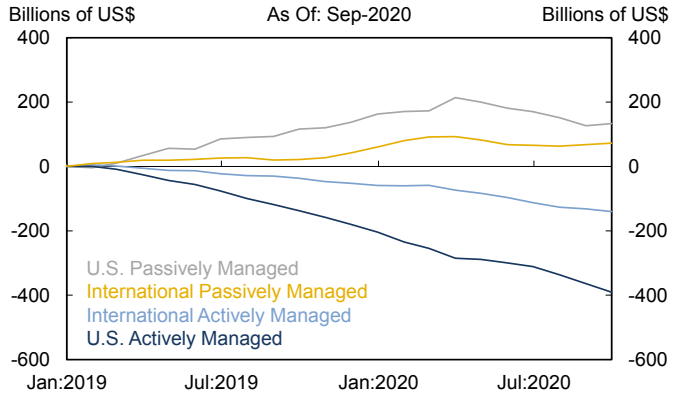
3.5.2.14 Monthly High-Yield Mutual Fund Flows



Source: Morningstar, Inc.

Note: Net fund flows.

3.5.2.15 Cumulative Equity Fund Flows



Source: Morningstar, Inc.

Note: Includes ETFs and mutual funds. Cumulative net fund flows.

During the March 2020 market turmoil, bank loan mutual fund monthly outflows exceeded $11 billion, second only to the December 2018 record of over $13 billion (**Chart 3.5.2.13**). These funds offer investors daily redemptions and hold assets with lengthy settlement periods, some of which may, during times of significant market stress, take longer to sell and settle than the redemption period offered. Bank loan funds have experienced outflows for 23 consecutive months through September 2020, as floating rate notes became less attractive relative to high-yield bonds, given the anticipation for continued stable or falling interest rates. Between November 2018 and September 2020, cumulative outflows from bank loan mutual funds totaled $75 billion, or more than 54 percent of AUM. Bank loan funds met redemptions throughout this period of outflows, including during the significant market stress in March 2020. Over the same period, high-yield bond mutual fund inflows totaled $24 billion, or 9.8 percent of AUM, as modest net outflows for most of the period were more than offset by April-August inflows of $39 billion (**Chart 3.5.2.14**).

Investors continued to gravitate away from actively managed equity mutual funds and towards lower-cost, index-based equity funds. According to Morningstar, index-based mutual funds and ETFs represented 51 percent of U.S. equity fund assets as of September 2020, up from 26 percent at year-end 2009. Between January 2019 and September 2020, inflows to index-based U.S. and international equity funds totaled $205 billion, while their actively managed counterparts saw outflows of $531 billion (**Chart 3.5.2.15**). In taxable bond

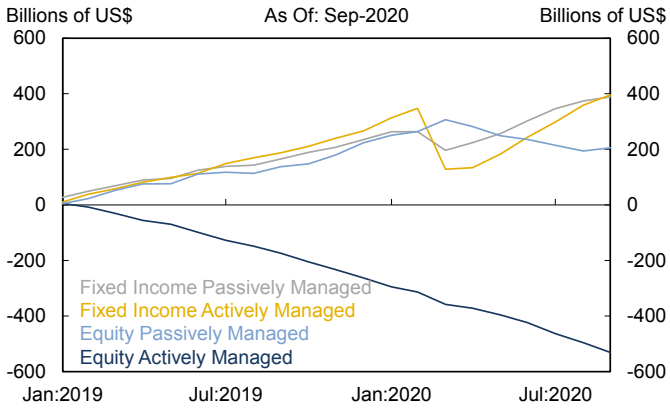
mutual funds, both actively managed and index-based funds have continued to experience inflows (**Chart 3.5.2.16**). Nevertheless, index-based funds are gaining market share and as of September 30, 2020, index-based mutual funds and ETFs represented 35 percent of taxable bond fund assets, up from 15 percent at year-end 2009.

Exchange-Traded Funds

Exchange-traded products (ETPs) include ETFs registered under the Investment Company Act of 1940 ('40 Act), non-'40 Act registered ETPs (such as those that primarily hold commodities or physical metals), and exchange-traded notes. ETFs registered under the '40 Act, which account for over 99 percent of listed ETP assets, continue to grow at a faster pace than mutual funds and other SEC-registered investment vehicles. By the third quarter of 2020, these funds accounted for 17 percent of U.S. investment company assets, up from 12 percent in 2015 and 7.6 percent in 2010.

After rising 30 percent in 2019, ETF assets rose another 7 percent over the first nine months of 2020, settling at $4.7 trillion in September. Recent years' asset growth has been driven primarily by inflows, which totaled $2.8 trillion since 2009, rather than market appreciation (**Charts 3.5.2.17, 3.5.2.18**).

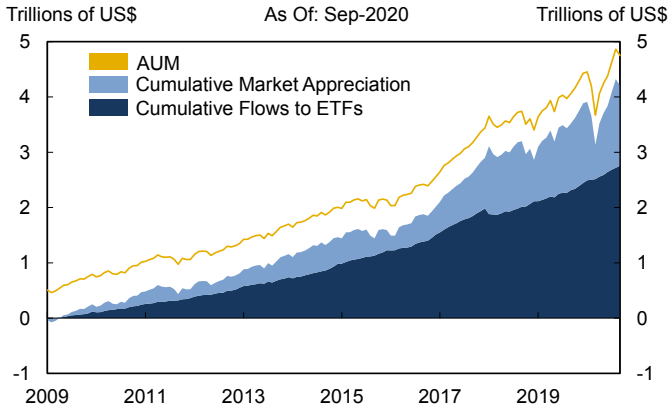
3.5.2.16 Cumulative Equity and Fixed Income Fund Flows



Source: Morningstar, Inc.

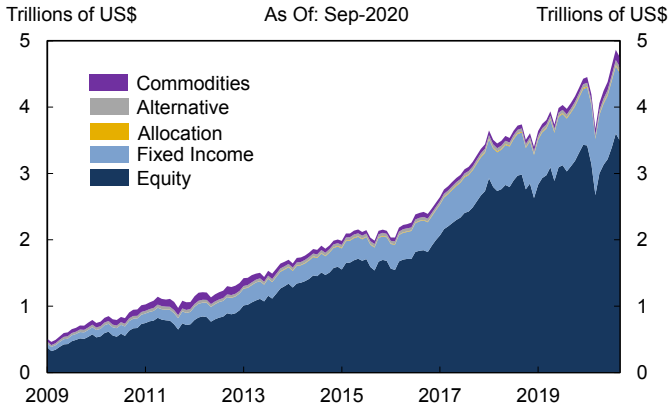
Note: Includes ETFs and mutual funds. Cumulative net fund flows.

3.5.2.17 U.S.-Listed ETF AUM



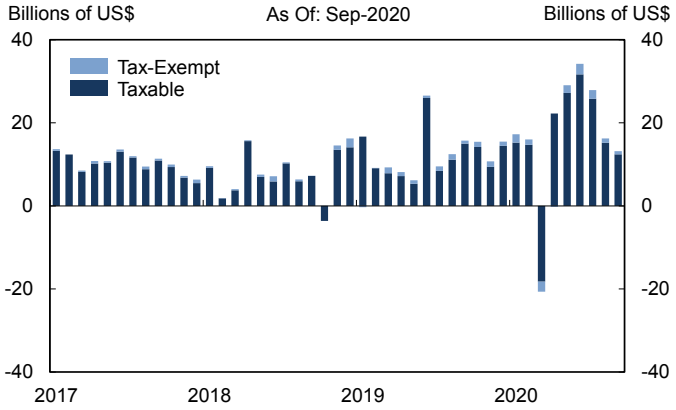
Source: Morningstar, Inc.

3.5.2.18 ETF Assets by Category of Investment



Source: Morningstar, Inc.

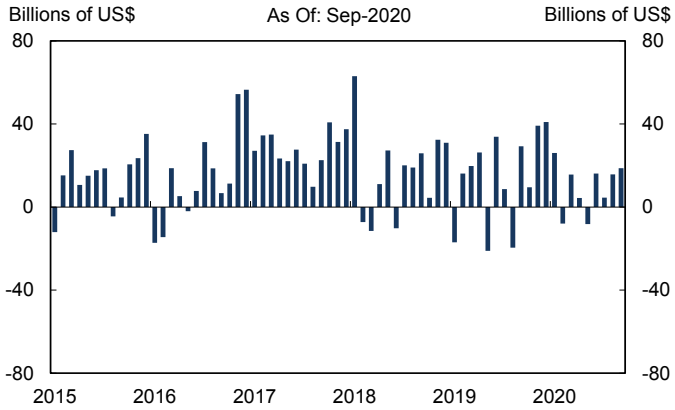
3.5.2.19 Monthly ETF Flows: Fixed Income Funds



Source: Morningstar Direct

Note: Net fund flows.

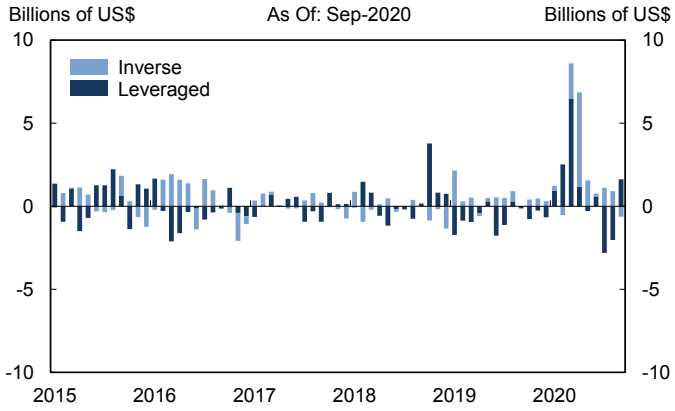
3.5.2.20 Monthly ETF Flows: Equity Funds



Source: Morningstar Direct

Note: Net fund flows.

3.5.2.21 Monthly Inverse and Leveraged ETF Flows



Source: Morningstar Direct

Note: Net fund flows.

Equity and fixed income ETFs experienced inflows for most months in 2019 and early 2020, with equity funds showing more variability. As the COVID-19 pandemic disrupted the economy and financial markets in March 2020, fixed income ETFs experienced record monthly outflows, totaling $21 billion or 2.3 percent of assets. Following the dislocation caused by the COVID-19 pandemic, the market stabilized and bond ETF flows and fixed income ETFs experienced inflows totaling $143 billion between April and September 2020 (**Chart 3.5.2.19**). Despite the March 2020 market turmoil, equity ETF flows remained positive, totaling $16 billion for the month (**Chart 3.5.2.20**).

A number of fixed income ETFs began trading at discounts to their NAV amid the onset of COVID-19 pandemic-related market dislocations, but pricing began to normalize in many bond ETFs following the Federal Reserve's announcement of the Secondary Market Corporate Credit Facility (SMCCF) on March 23. Following this announcement, the discount on bond ETF prices relative to NAV improved in a matter of days, and many bond ETFs traded close to NAV at the end of March. As part of the SMCCF, which was established to support credit to employers by providing liquidity to the market for outstanding corporate bonds, the Federal Reserve began to purchase bond ETFs on May 12. Purchases under the SMCCF in May totaled $3.7 billion, and as of September 30, 2020, the market value of ETF holdings under the SMCCF totaled $8.6 billion.

Inflows to leveraged and inverse ETFs spiked in March and April amid heightened market volatility associated with the onset of the COVID-19 pandemic (**Chart 3.5.2.21**).

The ETF industry remains concentrated, as the three largest managers account for over 80 percent of ETF assets, and the top ten managers account for over 95 percent of ETF assets. Over the first nine months of 2020, the number of available ETFs increased 1.0 percent in addition to the 5.3 percent increase in 2019.

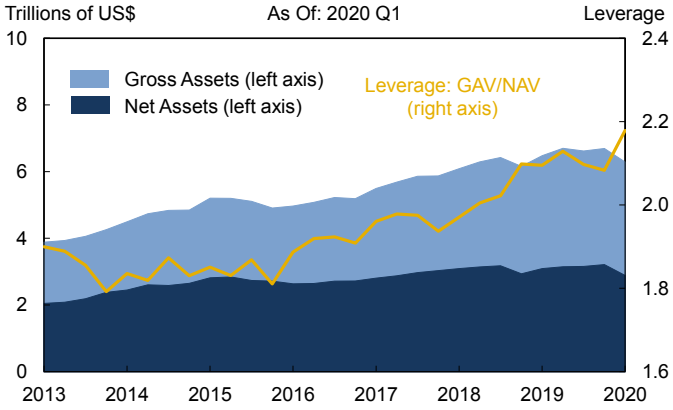
3.5.2.5 Alternative Funds

Hedge Funds

The aggregate NAV of qualifying hedge funds, which are large hedge funds with enhanced reporting requirements on the SEC's Form PF, in the United States was $2.9 trillion in the first quarter of 2020, a 6.7 percent decrease from the prior year. The gross asset value (GAV) of qualifying hedge funds—which reflects the effect of leverage obtained through cash and securities borrowing—totaled $6.3 trillion, a 3.0 percent decrease year-over-year (**Chart 3.5.2.22**). These figures cover the approximately 1,800 hedge funds and 550 hedge fund advisers that have enhanced Form PF reporting requirements with the SEC.

Various measures of leverage for hedge funds overall, including measures of off-balance sheet exposures, show increasing or flat patterns over the course of the past year. GAV divided by NAV showed aggregate qualifying hedge fund leverage of 2.2 as of the first quarter of 2020, up from 2.1 in the first quarter of 2019. The aggregate qualifying hedge fund leverage ratio as measured by gross notional exposure (GNE), which includes the notional amount of derivatives but excludes repurchase agreement exposures, divided by NAV was 6.3 in the first quarter of 2020, unchanged from the previous year. When interest rate derivatives are excluded, the aggregate qualifying hedge fund GNE/NAV leverage ratio was 4.4, up from 4.2 in the first quarter of 2019.

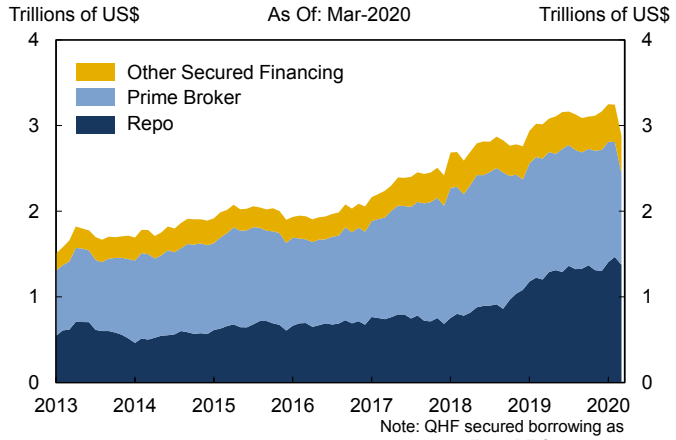
3.5.2.22 Hedge Fund Gross and Net Assets



Source: SEC Form PF, OFR

Note: QHF gross and net assets as reported on Form PF Questions 8 and 9.

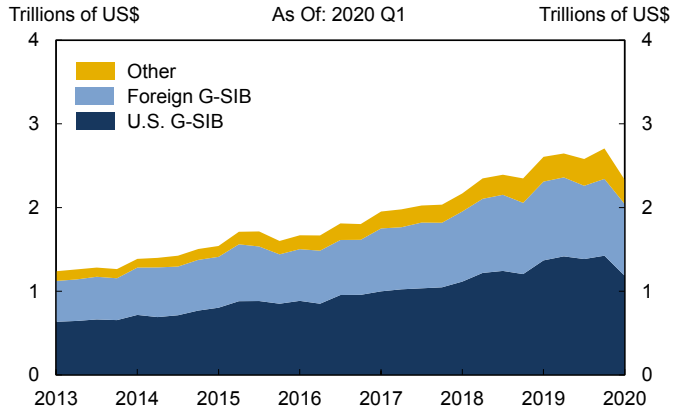
3.5.2.23 Hedge Fund Secured Financing



Source: SEC Form PF, OFR

Note: QHF secured borrowing as reported on Form PF Question 43.

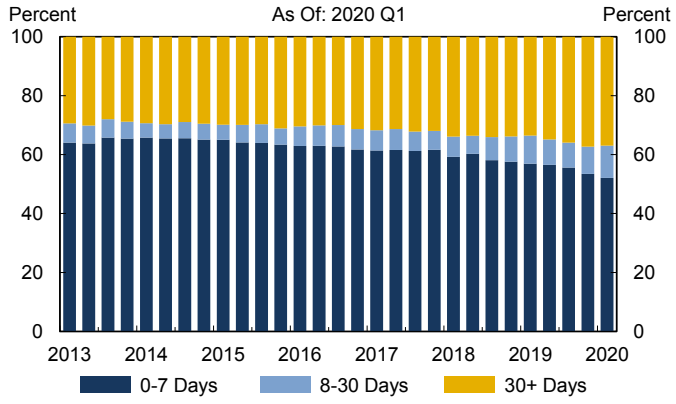
3.5.2.24 Hedge Fund Borrowing: Composition of Creditors



Source: SEC Form PF, OFR

Note: QHF creditors as reported Form PF Question 47.

3.5.2.25 Hedge Fund Financing Liquidity



Source: SEC Form PF, OFR

Note: QHF financing liquidity as reported on Form PF Question 46.

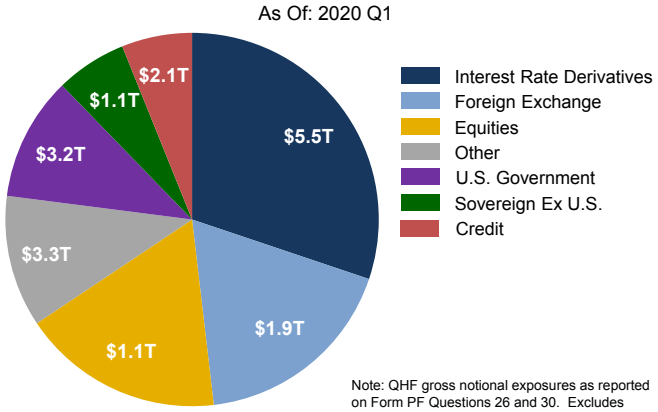
The aggregate level of hedge fund borrowing has increased significantly in recent years. As of year-end 2019, hedge fund borrowing totaled $3.2 trillion, up from $2.1 trillion at year-end 2016 (**Chart 3.5.2.23**). The recent growth in borrowing has been driven primarily by repo borrowing, which grew from $0.7 trillion in December 2016 to $1.3 trillion in December 2019. Over this same time period, prime broker borrowing grew from $1.1 trillion to $1.4 trillion. In March 2020, aggregate hedge fund borrowing contracted by the most in over seven years, with month-over-month repo and prime broker borrowing declining by $90 billion and $275 billion, respectively.

Hedge funds obtain the majority of financing from G-SIBs, with U.S. G-SIBs accounting for approximately 50 percent of funding and foreign G-SIBs accounting for an additional 35 percent of funding (**Chart 3.5.2.24**). While the percent of financing that is subject to significant rollover risk has declined in recent years, over 50 percent of financing is reported on Form PF as being secured for only seven days or fewer (**Chart 3.5.2.25**). Since filers may default to selecting the "1-days or less" bucket on Form PF in certain situations, such as when a creditor is allowed to demand more collateral, the data may be overstating the amount of financing that is truly secured for seven days or fewer.

Hedge funds deploy a wide range of strategies and are invested in a various products and asset classes (**Chart 3.5.2.26**). As of the first quarter of 2020, qualifying hedge funds' GNE totaled $18 trillion, of which $12 trillion, or 65 percent, were attributed to rates products (interest rate derivatives, U.S. government debt, and other sovereign debt) or FX products. Equity and credit products accounted for less than 25 percent of GNE.

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 $102 billion, or roughly 3 percent of AUM, in 2019 and net outflows of $48 billion, or 1.5 percent of AUM, over the first nine months of 2020. Outflows were concentrated in hedge funds that focus on macro, directional credit, managed futures, and long-short equity strategies. These categories of funds saw roughly $86 billion in outflows during 2019 and $50 billion in outflows during the first nine months of 2020. Event-driven funds and convertible arbitrage funds were the only strategy types to see inflows during the first nine months of 2020. 2020 hedge fund returns, as provided by the Hedge Fund Research's HFRI Fund Weighted Composite Index, stood at 0.5 percent through September 30, 2020.

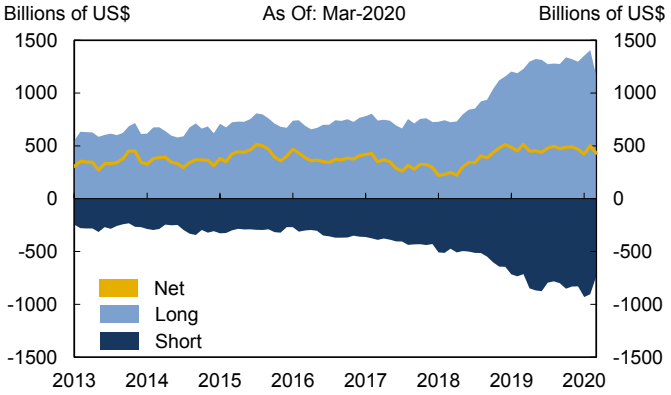
3.5.2.26 Hedge Fund Gross Exposures by Asset Class



Note: QHF gross notional exposures as reported on Form PF Questions 26 and 30. Excludes repurchase agreements. Options reported as delta adjusted notional value. Interest rate derivatives reported as 10-year bond-equivalents.

Source: SEC Form PF, OFR

3.5.2.27 Hedge Fund Treasury Exposures



Source: SEC Form PF, OFR

Note: QHF Treasury exposures as reported on Form PF Questions 26 and 30.

Hedge Fund U.S. Treasury Exposures

Over the past several years, hedge funds have increased their exposures to U.S. Treasuries. A significant proportion of this growth has been concentrated in relative value hedge funds that seek to exploit pricing discrepancies between similar products or securities. A popular relative value strategy has been the "cash-futures basis trade," whereby funds try to capture the spread between the implied repo rate and general repo rates over the term of the trade. Entering into this trade involves selling a Treasury futures contract, buying a Treasury security deliverable into that contract with repo funding from dealer intermediaries, and delivering the security at contract expiry.

Funds often leverage the basis trade several times through overnight or term repo borrowing, leaving those reliant on overnight financing vulnerable to disruptions in repo markets. Without the ability to rollover short-term financing at similar rates, funds can rapidly incur heavy losses, as reportedly occurred during September 2019, when overnight repo rates spiked from less than 2.5 percent to over 6 percent. Similarly, funds are vulnerable to volatility in cash or futures markets and may face unsustainable margin calls in the event of large mark-to-market losses.

Hedge funds' GNE to Treasuries totaled $2.3 trillion in February 2020, up from $1.3 trillion two years earlier (**Chart 3.5.2.27**). During this period, long and short Treasury exposures increased in tandem, resulting in little change in funds' net exposure to Treasuries. As evident through the CFTC's Commitment of Traders Report, the increase in funds' short Treasury exposure has primarily been through futures contracts, consistent with the growth of the basis trade (**see Section 3.4.3.1**). The growth in funds' exposures to Treasuries has coincided with a significant increase in hedge fund repo borrowing. Total repo borrowing peaked at $1.5 trillion in February 2020, a $660 billion increase from two years prior.

During the month of March, hedge funds' gross Treasury exposures declined by over $400 billion, which can be partly attributed to leveraged funds unwinding the basis trade. This unwinding may have exacerbated illiquidity in the Treasury markets (**see Box B**).

Private Equity

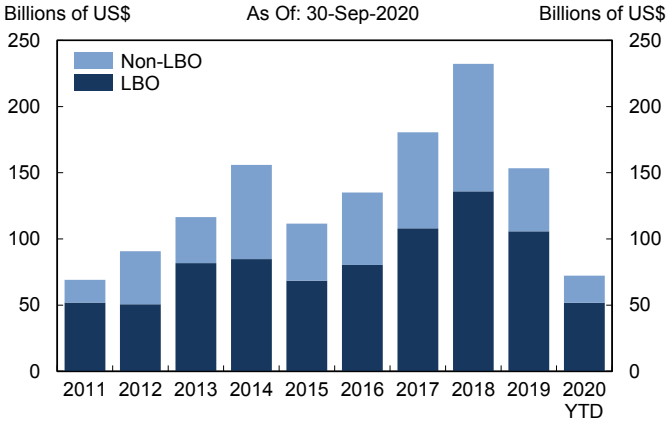
According to the SEC's year-end 2019 Private Funds Statistics Report, the GAV of private equity funds in the United States totaled $3.7 trillion in the fourth quarter of 2019, a 17 percent increase from the fourth quarter of 2018. The funds' NAV totaled $3.3 trillion, a 17 percent increase over that same period. These figures cover over 14,000 private equity funds, for which approximately 1,350 private equity advisers filed information on Form PF.

The private equity industry remains concentrated. Large private equity advisers filing Form PF—which are defined as those with $2 billion or more in AUM—made up 24 percent of all private equity advisers filing Form PF in the fourth quarter of 2019 and managed 74 percent of gross assets. Pension funds are the largest beneficial owners of funds managed by large private equity advisers, accounting for 29 percent of net assets; other private funds account for 19 percent, foreign official sector investors account for 11 percent, and insurance companies account for 6.2 percent.

Acquisition-related activity backed by private equity trended upwards from 2015 to 2018, hitting a record $230 billion in 2018, before slowing in 2019 to $150 billion (**Chart 3.5.2.28**). Private equity merger and acquisition (M&A) activity fell dramatically as the coronavirus pandemic manifested, totaling $72 billion through the end of September 2020. Leveraged buyout (LBO) activity accounted for 71 percent of total private equity M&A activity in the first nine months of 2020, compared to 61 percent for the preceding five years.

While private equity firms have raised 40 percent less in the first half of 2020 than they did for the same period in 2019, these firms are

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



Source: S&P LCD

holding a record amount of uncommitted capital earmarked for buyouts with over $800 billion at the end of 2019, which is up more than $250 billion since 2016. This increase suggests that deal-making activity could pick up once the uncertainty of the current crisis passes. Moreover, despite declines in overall deal-making, COVID-19 has accelerated the growth of buyout firms focused on technology companies, which in general have performed well through the crisis. According to Preqin Ltd., through July 6, 2020, approximately $30 billion, or roughly one-third of private equity fundraising, has gone towards technology company buyouts, up from just more than 10 percent during 2016.

3.5.2.6 Pension Funds

Defined benefit pension plans are significant holders of financial assets. As of the second quarter of 2020, the total pension fund entitlements funded by assets of U.S. private and public defined benefit pensions were $9.9 trillion, 5.5 percent higher than one year earlier. At the same time, defined benefit pension fund entitlements rose to $16 trillion, a 2.2 percent increase compared to the second quarter of 2019.

Sponsors of pension plans strive to keep pace with the benefits owed to beneficiaries. As noted in **Box G**, the low-for-long interest rate environment may therefore result in sponsors needing to increase contributions or act in ways that increase a plan's risk profile. For example, sponsors may use plan assets to assume greater levels of investment risk, such as employing high amounts of leverage or increasing exposure to higher-risk or illiquid asset classes, such as hedge funds, private equity funds, and real estate, in an effort to meet longer-term funding targets. If a pension plan needs to sell assets to raise the cash needed to meet benefit obligations, a plan with significant exposure to illiquid asset classes may be forced to sell its more liquid assets at depressed prices, further stressing its financial position.

It is difficult to analyze the impact of the COVID-19 pandemic on defined benefit pension plans in the aggregate because the disclosure requirements differ between the 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 time period than disclosures concerning similarly situated funds. There are, however, anecdotal reports showing that, while some plans made substantial investment gains in the second quarter of 2020, annual returns have fallen short of longer-term targets.

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 percent as of year-end 2019 compared to 87 percent as of year-end 2018. The funded percentage of a plan is its assets relative to the estimated value of plan liabilities. Milliman estimates that the funded ratio for the 100 largest corporate defined benefit pension plans in the United States had an aggregate funded ratio of 84 percent at the end of September 2020.

Multiemployer Plans

Milliman estimates that the aggregated funded percentage of multiemployer private defined benefit plans as of June 2020 was 82 percent, down from 85 percent at year-end 2019. While the Pension Benefit Guaranty Corporation (PBGC) projects that the majority of multiemployer plans will remain solvent, some plans appear unable to raise contributions sufficiently to avoid insolvency. According to the PBGC 2019 Projections Report, 124 plans have declared that they will likely face insolvency over the next 20 years.

The PBGC projects that its Multiemployer Insurance Program will have insufficient funds to cover the projected future demands from multiemployer plans requiring financial assistance, that there is a very high likelihood that the program will become insolvent by 2026, and that insolvency is a near certainty by the end of fiscal year 2027. The PBGC will be unable to provide financial assistance to pay the full level of guaranteed benefits when the Multiemployer Insurance Program becomes insolvent.

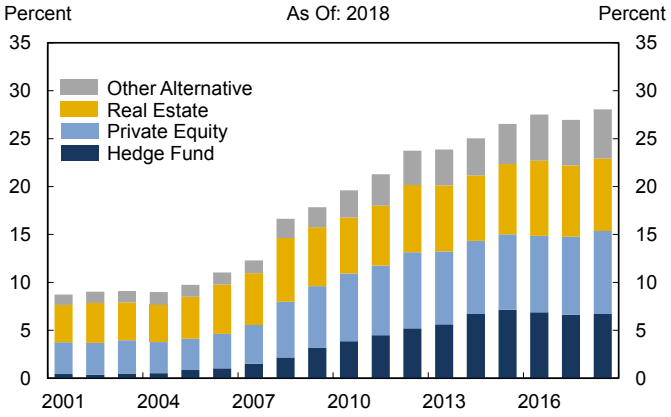
Public Plans

According to Milliman, the aggregate funded status of the 100 largest U.S. public defined benefit plans in June 2020 was 71 percent, up from 66 percent at the end of March 2020, but down from 75 percent at the end of 2019. 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, most public pension plans will close the 12-month period ended June 2020 with an annual return that is less than their expected investment returns. On average, annual returns for state and local plans were higher than their assumed returns for the same period a year earlier, with a return of 8.9 percent compared to the assumed return of 7.2 percent.

As noted in **Box C**, underfunded public pension funds are a significant source of fiscal pressure on several U.S. states, territories, and municipalities. Sixteen pension funds in seven states were less than 50 percent funded as of 2018. To increase expected returns and meet benefit obligations, public pension funds have steadily increased their exposure to alternative assets for years (**Chart 3.5.2.29**). In reaction to the COVID-19 pandemic, some state and local governments deferred or reduced scheduled pension contributions in 2020 to cover operating budget shortfalls pressuring the sustainability of the impacted plans.

3.5.2.29 Public Plan Allocation to Alternative Assets



Source: publicplansdata.org

Note: Includes public plans that reported investment allocations from 2001-2018. Simple average.

3.5.2.7 Insurance Companies

According to S&P Global, there were 4,537 licensed insurance companies operating in the United States during 2019, of which 2,626 were licensed as property and casualty (P&C) carriers, 1,223 were health insurers, and 688 were licensed

as life insurance companies. Many of these are affiliated through common ownership by a holding corporation or parent insurance company.

Taken together, the largest ten P&C insurance groups have a large share of the subsector's profit, premiums, assets, and capital. Measured as a percentage of the aggregate net income, the ten groups with the highest net incomes account for 58 percent of the subsector total. Similarly calculated, those ten groups writing the largest amount of direct premiums make up 47 percent of the market. The top ten holding the largest amount of assets account for 51 percent of all P&C assets, and the ten with the largest amounts of capital (surplus) account for 57 percent of the P&C total.

In addition, the ten largest life insurance groups comprise a large share of that subsector. Measured as a percentage of the subsector's net income, the ten life groups with the highest net incomes make up 63 percent of the total. The ten groups with the greatest amount account for 45 percent of the subsector's aggregate revenue from premiums, considerations, and deposits. The ten life groups with the most capital account for 43 percent of the subsector's aggregate amount.

Measured as a percentage of the subsector's net income, the ten largest health insurance groups with the highest net incomes make up 78 percent of the total. The ten largest groups writing the most direct premiums account for 58 percent of the subsector's aggregate. Additionally, the ten health insurance groups with the greatest amount of capital make up 58 percent of the subsector's total. While the market share of the largest ten firms in the subsectors is substantial in comparison to the remainder, the markets remain competitive with many active carriers.

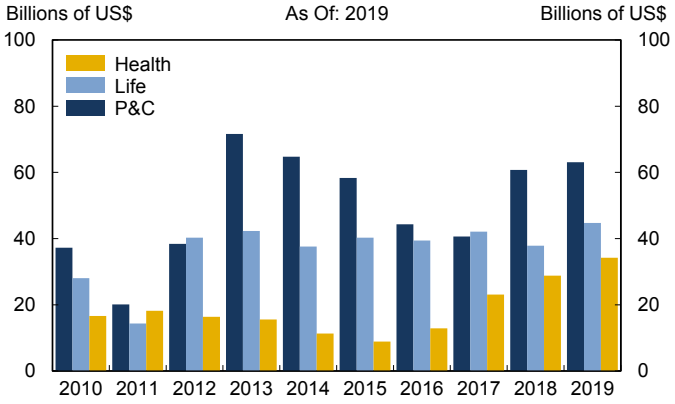
The insurance industry is the largest, or one of the largest, investors in several key asset classes. According to the Financial Accounts of the United States, insurance companies were the

largest investors in corporate and foreign bonds as of the second quarter of 2020 with $4,074 billion or 28 percent of outstanding. Insurance companies were also major investors in mutual funds ($1,522 billion), equities ($1,036 billion), agency securities ($539 billion), municipal securities ($504 billion), and Treasury securities ($420 billion).

The insurance industry experienced growth in profit, capital, total assets, and revenue from premiums in 2019. Health insurers reported net income growth of 19 percent, capital growth of 9.2 percent, total assets growth of 7.8 percent, and direct written premium growth of 6.4 percent. However, 176 out of the 434 health insurers reported a decrease in income in 2019, and 100 reported a decrease in the amount of capital. The P&C carriers reported that net income grew by 3.8 percent, capital grew by 14 percent, total assets grew by 8.9 percent, and direct written premiums increased by 5.1 percent. As these are 2019 end of year figures, they do not reflect any effects of the COVID-19 pandemic (**Charts 3.5.2.30, 3.5.2.31**).

Notwithstanding overall performance measures, some insurers did not perform as well as the aggregate figures would suggest; 534 out of a total of 1,127 P&C insurers reported a decrease in net income for 2019, and 226 reported a decrease in the amount of capital supporting their financial activities. Similarly, the life subsector reported 18 percent growth in net income, 5.5 percent increase in capitalization, 13 percent rise in revenue from premiums, considerations, and deposits, and an 8.4 percent increase in total assets in 2019. However, 184 out of a total of 336 life insurers reported a decline in reported net income and 105 reported a decrease in capital in 2019. The sector as a whole continues to face challenges from the persistently low interest rate environment.

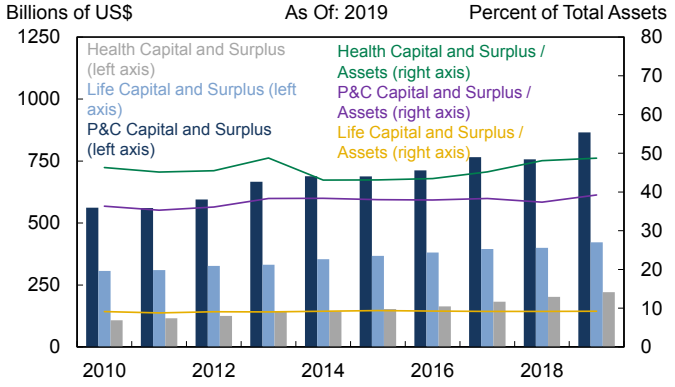
3.5.2.30 Insurance Industry Net Income



Source: NAIC

Note: Life includes accident and health.

3.5.2.31 Insurance Industry Capital and Surplus



Source: NAIC

Note: C&S/Assets is calculated as capital and surplus as a percent of net admitted assets less net admitted separate account assets. Life includes accident and health.

Impact Thus Far from the COVID-19 Pandemic

The COVID-19 pandemic has had wide-ranging effects on the insurance industry. Insurance underwriting has been confronted with potentially greater losses from trade credit guarantees, event cancellations, litigation liability, workers' compensation, higher mortality and morbidity rates, and substantial uncertainty from business interruption claims and questions about potential changes in demand. In addition, the financial markets within which insurers operate experienced price volatility, credit rating downgrades, and unreliable trading liquidity. While many portions of financial markets have recovered, insurance company investments will likely face uncertainty in regard to real estate valuations, the effects of mortgage forbearance, and the impact of escalating business bankruptcies.

Based on forecasts of insured losses and insurers' financial reports through the first half of 2020, insured COVID-19 pandemic-related losses do not appear to threaten the financial stability of the insurance sector. However, the full and actual extent of the impact of the pandemic and the economic downturn are unknown and may exceed current expectations. Over the longer term, the pandemic may have a broad-based impact on industry metrics, stemming from COVID-19-related insurance claims, macroeconomic effects, and financial market trends.

While health insurers have faced increasing claims related to COVID-19, the financial impact has been offset by individuals delaying medical care and procedures, though those delayed claims could impact the sector in 2021. According to S&P Global, through the second quarter of 2020, the health insurance industry reported an increase of only 1.3 percent in benefits paid and cost containment expenses compared to the prior year. The net claim and claim adjustment expense ratio declined to 80 percent from 89 percent for the second quarter. General expenses incurred increased 47 percent through June 30 impacted by the Affordable Care Act health insurance industry tax that was suspended in 2019 and resumed in 2020.

The life insurance subsector faces challenges for both its investments and hedging and underwriting activities. On the asset side, life insurers have felt the effects of the financial markets and credit trends in corporate bonds, commercial real estate, and less conventional investments such as CLOs, though some of the effects of the pandemic on financial markets were alleviated by policy actions, such as the facilities established by the Federal Reserve under section 13(3) of the Federal Reserve Act. Life insurers also face potential reductions in cash inflows and increased derivative collateral requirements in response to higher market volatility. On the liability side, meaningful increases in mortality and morbidity claims from the virus, should they occur among covered individuals, would result in greater underwriting losses. In addition, the low interest rate environment poses a long-term challenge to some insurers by lowering investment yields while increasing reserves held against future claims payments (**see Box G**). The COVID-19 pandemic could also reduce sales across a wide range of insurance products, due to repricing.

The pandemic's impact on the P&C subsector will likely lead to higher-than-expected insured losses in some lines of insurance. This impact may be offset to some extent by social distancing measures and a decline in economic activity, such as transportation and miles driven. The insurance lines most likely to be adversely affected by the pandemic include those providing coverage for business interruption, workers' compensation, professional liability, travel, and credit insurance. Numerous legal filings seeking to resolve disputes over claims for business interruption losses has created additional uncertainty. The drop in government and corporate bond yields could also impact P&C insurers' future investment income.

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 approximately $727 billion of consumer loans and leases and $365 billion of business loans and leases as of September 2020 (**Charts 3.5.2.32, 3.5.2.33**).

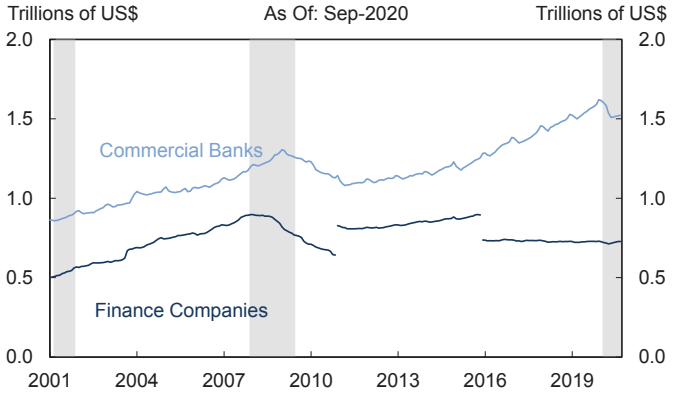
While specialty finance companies account for a relatively small share of overall consumer lending, they have a significant footprint in certain types of consumer lending activities such as auto lending. Compared to banks, which generally have more stable sources of funding such as deposits, specialty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

Asset-Backed Securities

The COVID-19 pandemic disrupted the ABS market, halting the issuance of most ABS asset classes and resulting in higher interest rate spreads on ABS products at its onset. Issuance declined significantly between February and April, and the interest rate spreads on the securities spiked, reflecting heightened credit risk and liquidity risk. Between February 20 and March 19, spreads on AAA-rated tranches of CMBS of 5-year maturity increased by almost 250 basis points to 307 basis points, and spreads on AAA-rated tranches of 3-year maturity prime auto loan ABS widened by almost 180 basis points to 200 basis points. Although yield spreads on ABS spiked in mid-March, they did not quite reach the high levels observed during the 2008 financial crisis.

The Federal Reserve's establishment of the Term Asset-Backed Securities Loan Facility (TALF) appears to have supported securitization market activity and helped normalize ABS spreads. Spreads on ABS categories affected by TALF stopped rising shortly after the facility was announced on March 23 and subsequently fell substantially. Issuance, which halted for all TALF-eligible asset classes in late March, gradually resumed

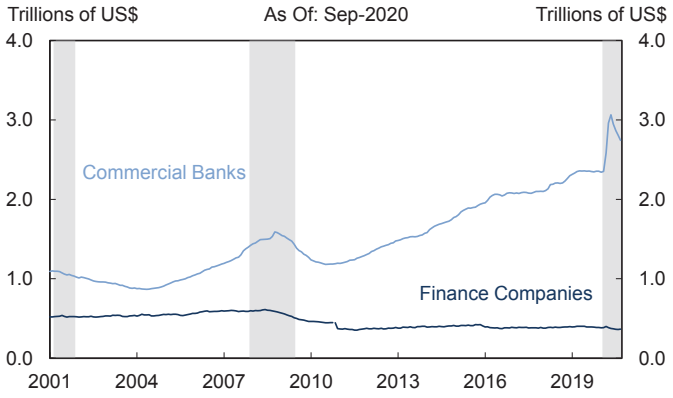
3.5.2.32 Consumer Loans and Leases Outstanding



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.

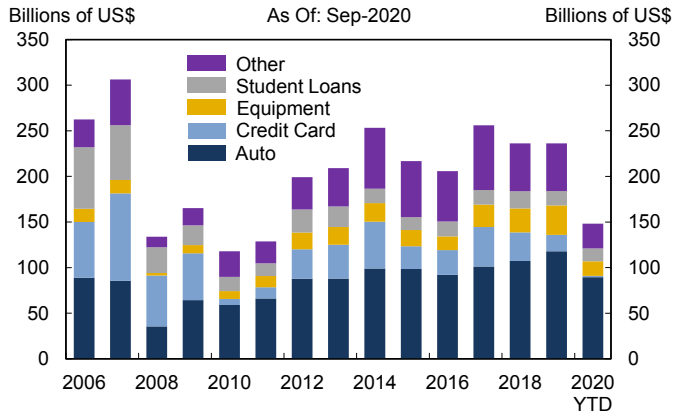
3.5.2.33 Business Loans and Leases Outstanding



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.

3.5.2.34 ABS Issuance



Source: Thomson Reuters, SIFMA

Note: Figures are as of year end through 2019. 2020 figures are through September.

in April. That said, ABS issuance through September 2020 remained significantly lower than the pace of 2019, totaling $148 billion, excluding CDOs and CLOs (**Chart 3.5.2.34**). Finally, issuance under the support of TALF has been very limited since the facility became operational in mid-June, as almost all ABS spreads of eligible asset classes were already lower than TALF funding costs at that time.

Special Purpose Acquisition Companies

Special purpose acquisition companies (SPACs) are companies that are formed through an initial public offering (IPO) to raise funds to purchase businesses or assets to be acquired after the IPO. The IPO funds are placed into an escrow or trust account where they are held until released for predetermined reasons, most commonly when the SPAC identifies a company or assets to purchase. Through the first three quarters of 2020, SPACs completed 118 IPOs, raising $44 billion, which represents more than three times the amount raised by SPACs in 2019.

3.6 Financial Market Structure, Operational Challenges, and Financial Innovation

3.6.1 3.6.1 Market Structure

3.6.1.1 Central Counterparty Clearing

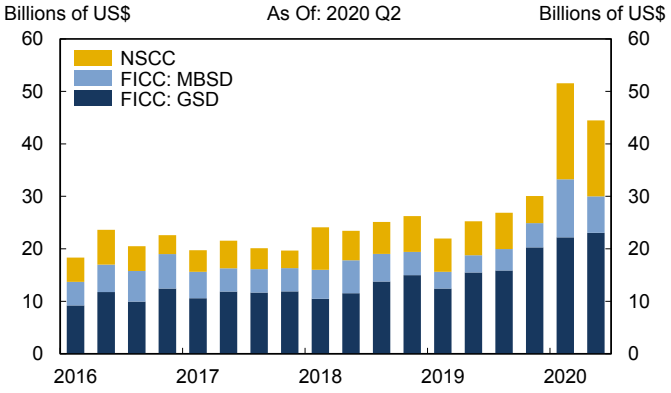
Cash Securities Clearing

In the United States, the Depository Trust & Clearing Corporation (DTCC) is the dominant provider of clearing services for cash securities through its subsidiaries 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, ETFs, and UITs.

During the COVID-19 crisis, DTCC performed without interruption despite facing increased operational challenges and extreme market volatility. Despite the significant increase in initial margin requirements at DTCC's clearinghouses, members generally satisfied intraday margin calls and settlement obligations (**Chart 3.6.1.1**). On March 20, GSD suspended one clearing member, Ronin Capital LLC, after it was unable to meet capital requirements at CME. In conjunction with their cross-margining agreement, FICC and CME jointly liquidated Ronin's portfolio. On March 25, 2020, FICC announced that it completed the liquidation of Ronin's portfolio without allocating losses to other GSD member firms. While FICC and NSCC performed without interruption during the heightened market volatility associated with COVID-19, the clearinghouses reported large margin breaches that could have led to significant losses in the event of a large clearing member default.

In March, the disruptions in fixed income markets led to a breakdown in the historical relationship between TBAs and Treasuries, which materially impacted the performance of FICC's MBSD margin model. The extreme volatility and breakdown in correlations during this time period was beyond the MBSD's Value at Risk (VaR) model calibration. On March 19, 2020, MBSD recorded a maximum backtesting deficiency (i.e., margin below required minimum) of $1.5 billion, which was incurred by a portfolio with a market value greater than $100 billion whose value was sensitive to changes in interest rates. According to PFMI quantitative disclosures, this $1.5 billion margin breach was approximately four times larger than any other breach recorded between 2015 and 2019 (**Chart 3.6.1.2**). MBSD took a number of steps to address backtesting deficiencies, including: (i) lowering the intraday surveillance thresholds; (ii) issuing intraday margin calls for almost $37 billion during the month of March; (iii) applying charges to members with backtesting coverage below 99 percent; and (iv) developing a plan to re-introduce a VaR floor at MBSD.

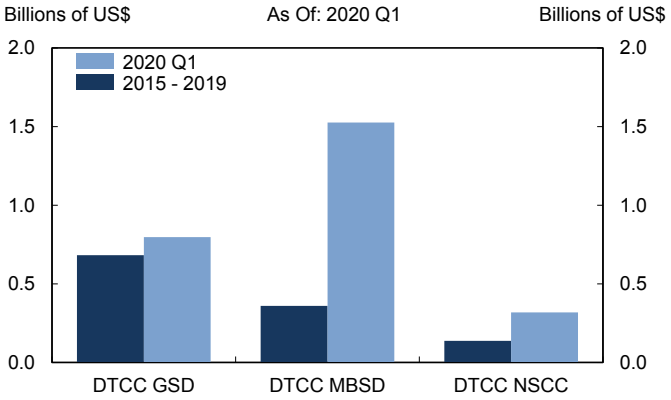
3.6.1.1 Initial Margin Requirements: DTCC



Source: ClarusFT, PFMI Quantitative Disclosures

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

3.6.1.2 Maximum Uncovered Exposure for DTCC



Source: DTCC PFMI Quantitative Disclosures

Note: Peak uncovered exposure between Q3 2015 and Q4 2019 and Q1 2020 as reported on question 6.5.4.

Similar to MBSD, DTCC's GSD clearing service also recorded large backtesting deficiencies and on March 9, 2020, GSD recorded a maximum backtesting deficiency of $797 million, which was incurred by a large dealer portfolio. According to DTCC, GSD's backtesting deficiencies were primarily attributable to the volatility in rates markets along with changes in portfolio size or composition. Given these deficiencies, GSD applied additional margin charges to those members with backtesting coverage below 99 percent. Additionally, GSD supplemented its formal intraday margin collection with additional intraday calls.

NSCC's VaR margin model is constructed to address dynamic changes in equity risk premiums and idiosyncratic risks that could impact equity prices. As a result, volatility charges at NSCC increased 146 percent between February and March 2020. On March 16, 2020, NSCC incurred a maximum backtesting deficiency of $318 million. To address backtesting deficiencies, NSCC made intraday margin calls totaling almost $50 billion in March and applied additional margin charges to members with backtesting coverage below 99 percent.

Derivatives CCPs

The vast majority of U.S. exchange traded derivatives are cleared through CME, ICE Clear US, and the OCC. CME and ICE Clear US provide clearing services for futures and options on futures while the OCC provides clearing services for exchange-traded equity options. Within the OTC derivatives space, most USD interest rate swaps are cleared through LCH Ltd. or CME, while most credit default swaps are cleared through ICE Clear Credit, ICE Clear Europe, or LCH SA.

Derivatives CCPs generally performed as expected during the COVID-19 market stress despite the backdrop of price volatility, record volumes, and the significant operational challenges of working from home. Initial margin requirements increased significantly at derivatives CCPs beginning at the end of

February, with daily increases peaking at $35 billion on March 9. Over the same period, there was also a significant increase in daily variation margin payments, which peaked at $54 billion on March 9, as well (**Chart 3.6.1.3**).

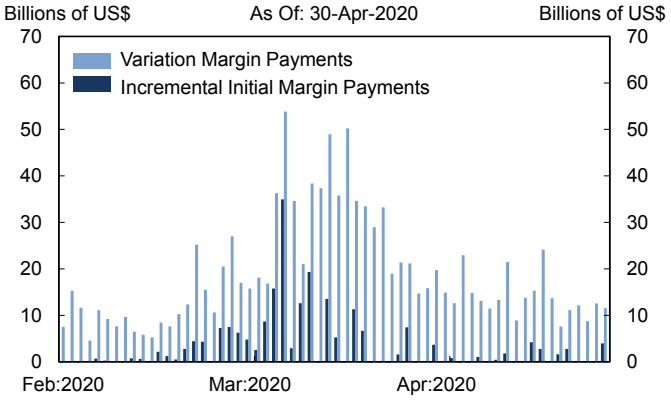
The increases in initial margin requirements were more pronounced for CCPs clearing exchange-traded derivatives, with CME (futures and options), ICE Clear US, and the OCC reporting a combined $131 billion increase in required initial margin, a 72 percent increase between the fourth quarter of 2019 and the first quarter of 2020 (**Chart 3.6.1.4**). Over this same period, initial margin requirements for interest rate swaps at CME and LCH Ltd. increased by a combined $39 billion, or 20 percent, while initial margin requirements for credit default swaps at ICE Clear Credit, ICE Clear Europe, and LCH SA increased by $21 billion, or 46 percent (**Chart 3.6.1.5**). The increase in initial margin requirements can be attributed to both the increase in derivatives activity and the extreme volatility during this period. Initial margin requirements for exchange-traded and OTC derivatives fell slightly in the second quarter but remain elevated compared to historical levels.

In the June 2020 FIA survey, respondents generally believed the industry fared well through the COVID-19 market stress, and a majority believed that post-crisis reforms helped derivatives markets cope with the pandemic. However, 76 percent of respondents identified margin volatility and unpredictability and 40 percent highlighted clearing operations and systems as challenges needing review.

Clearing Rates for OTC Derivatives

Over the past year, the share of outstanding OTC interest rate derivatives that were centrally cleared remained stable. Measured by gross notional outstanding, approximately 78 percent of outstanding global interest rate derivatives were centrally cleared as of June 2020, unchanged from June 2019. In contrast, the share of outstanding single- and multi-named credit default swaps that were centrally

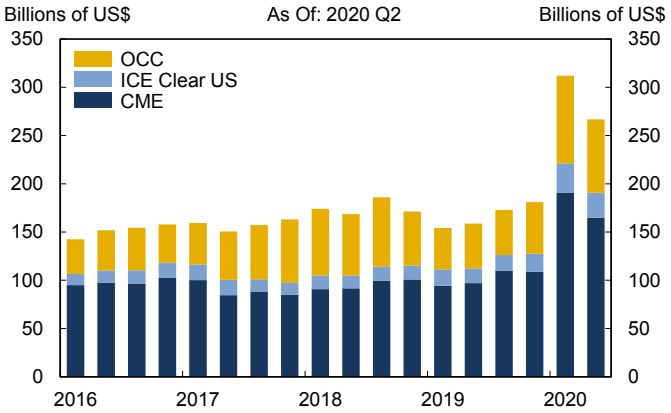
3.6.1.3 Liquidity Demand at Derivatives Clearing Organizations



Source: CFTC

Note: Light blue represents aggregate variation margin payments and dark blue represents net initial margin payments. Series covers February 3, 2020 through April 30, 2020. Excludes OCC.

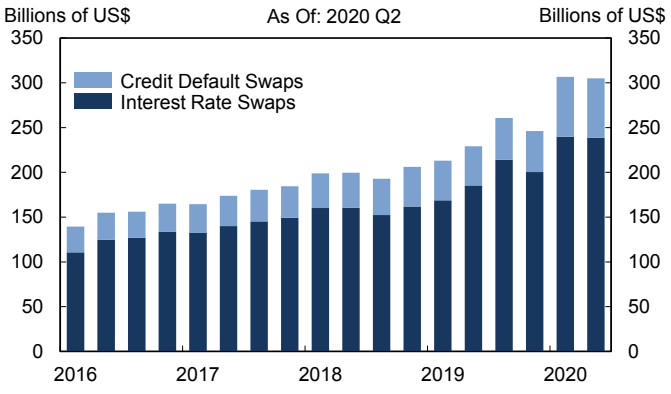
3.6.1.4 Initial Margin: U.S. Exchange Traded Derivatives



Source: ClarusFT, PFMI Quantitative Disclosures

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

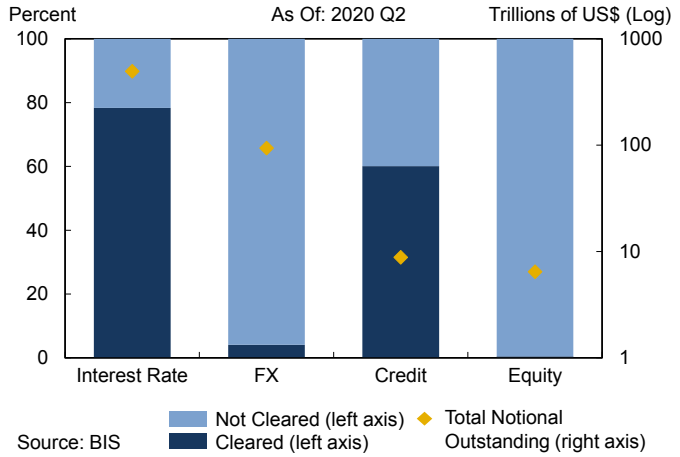
3.6.1.5 Initial Margin: OTC Derivatives



Source: ClarusFT, PFMI Quantitative Disclosures

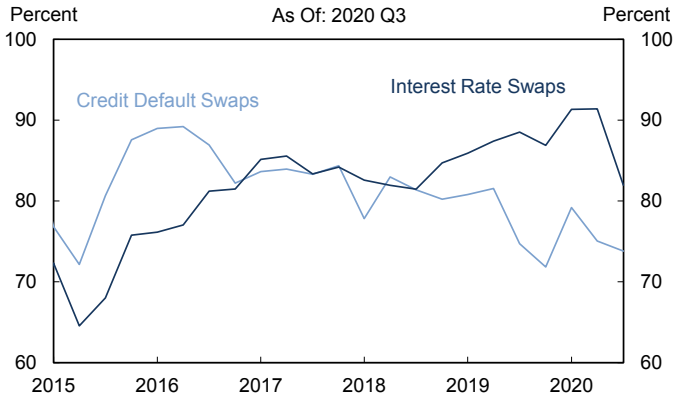
Note: Total initial margin required as reported in PFMI quantitative disclosures; includes house and client accounts. Interest rate swaps margin includes LCH Ltd. and CME. Credit default swaps margin include CME, ICC, ICEU, and LCH SA). CME ceased clearing credit default swaps in Mar. 2018.

3.6.1.6 Global OTC Central Clearing Market Share



Source: BIS

3.6.1.7 Average Clearing Rates for OTC Trading



Source: CFTC

Note: Gross notional of new transactions. Excludes security-based swaps.

cleared increased markedly, from 54 percent as of June 2019, to 60 percent as of June 2020. This increase can be attributed largely to an increase in the amount of multi-named CDS that were centrally cleared. As of June 2020, 65 percent of multi-named CDS outstanding were centrally cleared, up from 60 percent in June 2019. OTC equity and FX derivatives continue to have lower clearing rates. As of June 2020, 4.1 percent of outstanding OTC FX derivatives and 0.4 percent of OTC equity derivatives were centrally cleared globally (**Chart 3.6.1.6**).

Clearing rates in the United States were broadly similar to global clearing rates, and as of September 25, 2020, over 80 percent of outstanding OTC interest rate derivatives were centrally cleared, while 65 percent of credit index swaps were centrally cleared. Clearing rates on new U.S. interest rate swap transactions peaked in the second quarter of 2020, when over 90 percent of new U.S. interest rate swap volumes were centrally cleared (**Chart 3.6.1.7**). Clearing rates on new credit index swap transactions fell below 75 percent in the third quarter of 2020. This decline can primarily be attributed to an increase in the volume of credit swaptions, credit total return swaps, and other exotic credit products for which clearing is not widely available, resulting in low clearing rates. New index CDS products that are offered for clearing continue to report higher clearing rates, often above 95 percent.

Central clearing has become more prevalent throughout the world as clearing mandates have been introduced in a number of jurisdictions for the most standardized products, including fixed-float rate swaps and index-based CDS. In addition, and more recently, margin requirements for uncleared swaps have led some market participants to centrally clear swaps voluntarily in cases where central clearing is more cost-efficient. As a result, clearing rates and the amount of margin posted for centrally clearable, but not mandated, products like inflation swaps and non-deliverable forwards are significantly higher than they were a few years ago, prior to the uncleared margin

requirements; in some cases, these rates continued to rise in 2020.

Central Clearing & Brexit

While lawmakers in the EU and UK have made progress in mitigating the impact that Brexit will have on the derivatives markets and market participants, the cliff-effect of the current Brexit transition period increases uncertainty concerning how certain transactions will be handled. Specifically, both UK-based entities and third-country-based entities relying on UK-based personnel to support existing transactions that novate derivative contracts to EU-based affiliates would be subject to EU regulations on clearing and margin requirements. Such transactions would otherwise avoid these requirements due to grandfathering provisions.

Currently, the relief provided by the EU does not apply to novations that occur before the end of the Brexit transition period. Many EU counterparties with UK-based counterparties or operations have been unwilling to novate those contracts because the novation would trigger clearing or margin requirements for the EU counterparty under European law. Given the global nature of derivative markets, such dislocations may impact U.S.-based entities and markets. Derivatives markets could experience dislocations if neither UK nor EU authorities provide permanent relief.

3.6.1.2 Alternative Reference Rates

In 2020, the transition from USD LIBOR continued to advance in preparation for LIBOR's anticipated cessation after year-end 2021. Market participants, index providers, vendors, the ARRC, and U.S. and foreign regulators all took significant steps to address known transition issues.

In March, COVID-19-related market dislocations caused few transactions to occur in the wholesale unsecured funding markets that LIBOR is designed to measure. The lack of transactions forced LIBOR's publication to increase reliance on expert judgment from LIBOR panel banks, further highlighting LIBOR's vulnerabilities and the need to move forward with the LIBOR transition by year-end 2021. Over the same time period, the transaction volume underlying SOFR increased.

In response to disruptions related to the pandemic, the UK FCA, which regulates LIBOR's administrator and maintains the agreements with LIBOR panel banks for continued submissions, released a statement reiterating the year-end 2021 target date for transition from LIBOR. Given that voluntary agreements to continue panel bank submissions through 2021 were arranged by the UK FCA, U.S. regulators cannot extend or modify the timeline for the transition.

On June 23, 2020, the UK Chancellor of the Exchequer made a statement that the UK government intends to propose legislation. In particular, the UK government intends to amend the UK's existing regulatory framework for benchmarks to ensure it can be used to manage different scenarios prior to a critical benchmark's eventual cessation, to withstand circumstances in which the FCA may require an administrator to change the methodology of a critical benchmark, and to clarify the purpose for which the FCA may exercise this power. New regulatory powers would enable the FCA to direct a methodology change for a critical benchmark, in circumstances where the regulator has found that the benchmark's representativeness will not be restored and where action is necessary to protect consumers and/or to ensure market integrity.

Work of the ARRC

In the U.S., the Federal Reserve and FRBNY convened the ARRC to identify alternative reference rates to USD LIBOR and implement an orderly transition plan to its recommended rate, SOFR. In the last year, the ARRC made significant progress in developing contract fallback language, conventions for SOFR's use in a variety of financial instruments, and best practices to facilitate the adoption of SOFR.

The ARRC continued to address contract robustness through the publication of recommended contract fallback language for use in new issuance of variable rate private student loans and updated its recommended language for bilateral business

loans and syndicated loans. Previously, the ARRC published recommended fallback language for other asset classes, including adjustable-rate mortgages, floating-rate notes, and securitizations. The ARRC also identified best practices and recommended timelines for transitioning away from USD LIBOR across asset classes.

In a significant step, the ARRC published its spread adjustment methodology for cash products following a consultation process and began the process of acquiring a vendor for the publication of the spread adjustment. It also began a separate acquisition process for a vendor for the potential publication of a SOFR term rate. Notwithstanding these industry-wide transition efforts, the market acceptance of SOFR is progressing at various paces due to challenges such as structural differences of SOFR vs USD LIBOR, lower liquidity in SOFR derivatives markets and cash markets, as well as various operational challenges. With respect to a challenge associated with the lack of a credit spread, the FRBNY, FDIC, Federal Reserve, OCC, and Treasury met with representatives of a number of U.S. regional banks to discuss ways to support the transition of loan products away from LIBOR, including by holding a series of working sessions to explore the development of a credit risk sensitive spread. The agencies involved determined the official sector is not well positioned to develop a credit-sensitive spread to SOFR, and shared a letter with industry participants expressing the official sector's support for the continued innovation in, and development of, suitable reference rates, including those that may have credit sensitive elements. Separately, in October 2020, the Financial Stability Board (FSB) published a "global transition roadmap" that sets out a timetable of actions for financial and non-financial sector firms to take in order to ensure a smooth LIBOR transition by end-2021.

Regulatory Actions to Facilitate Transition

Council member agencies continued to monitor and facilitate the transition through discussions with stakeholders and the provision of broad regulatory relief. The CFPB released a notice of proposed rulemaking (NPRM) concerning the anticipated discontinuation of LIBOR, including, among other things, proposed examples of replacement indices that meet Regulation Z standards. The CFTC issued relief from certain rules related to margin, business conduct, trade execution, and clearing for legacy swaps referencing LIBOR that are amended as a result of the transition. The prudential regulators finalized regulations for margin and capital that permitted non-cleared legacy swaps and security-based swaps to retain their legacy status if amended to replace an interbank offered rate. State insurance regulators, through the NAIC, are monitoring the effect of the transition from LIBOR on insurer derivatives positions, life insurance reserving, and accounting standards. Insurers will receive basis swaps for some of their derivative positions as a result of the transition from LIBOR that may not be permissible under most state investment laws. The NAIC issued letter guidance to state insurance departments recommending that any basis swaps received as part of the LIBOR transition be deemed permissible investments under state investment laws for up to one year past the transition.

In July 2020, the FFIEC published a "Joint Statement on Managing the LIBOR Transition." The joint statement highlighted the risks of the transition away from LIBOR and encouraged supervised institutions to prepare for the transition in order to mitigate these risks. In addition to communicating the FFIEC statement, the OCC provided additional guidance to OCC-regulated institutions for identifying applicable risks, planning, and successfully transitioning from LIBOR within OCC Bulletin 2020-68, "FFIEC Statement on Managing the Libor Transition and Guidance for Banks."

In October 2020, the Federal Reserve issued a supervision and regulation letter that encourages supervised institutions that are active in the derivatives market—particularly those with large LIBOR denominated derivatives exposures—to give strong consideration to adhering to ISDA's fallback protocol.

In October, Treasury and the Internal Revenue Service issued guidance to provide clarification for taxpayers that modifying certain contracts to incorporate the ARRC's and ISDA's recommended fallback language will not result in a tax realization event.

On November 6, 2020, the Federal Reserve, FDIC, and OCC issued a statement on reference rates for loans. The statement reiterated that agencies are not endorsing a specific replacement rate for LIBOR for loans. The statement also indicated that a bank may use any reference rate for its loans that the bank determines to be appropriate for its funding model and customer needs, and should include fallback language in its lending contracts that provides for use of a robust fallback rate if the initial reference rate is discontinued.

Derivatives Markets

The derivatives markets achieved some of the most significant milestones toward the transition. In October, two major derivative CCPs, CME and LCH, modified the rates used in their discounting and price alignment interest methodology to replace the effective federal funds rate with SOFR. The change in methodology affected approximately $120 trillion notional of contracts at LCH alone, increasing exposure to SOFR and liquidity in SOFR derivatives markets. Immediately following the transition, SOFR swap volumes tripled in longer-dated tenors and experienced their highest rate of daily turnover. Continued liquidity across the SOFR curve will be essential for a smooth transition from USD LIBOR.

Separately, on October 23, 2020, the International Swaps and Derivatives Association (ISDA) published an updated protocol that would allow market participants to incorporate contract fallbacks into legacy derivatives in the event that LIBOR is found by the UK FCA to be non-representative of underlying market conditions or LIBOR's publication ceases. Voluntary adherence to the protocol is an important step for the smooth transition of legacy instruments in the derivatives markets. ISDA also modified its definitions to incorporate the same contract fallbacks into new instruments. Both the protocol and revised definitions will go into effect on January 23, 2021.

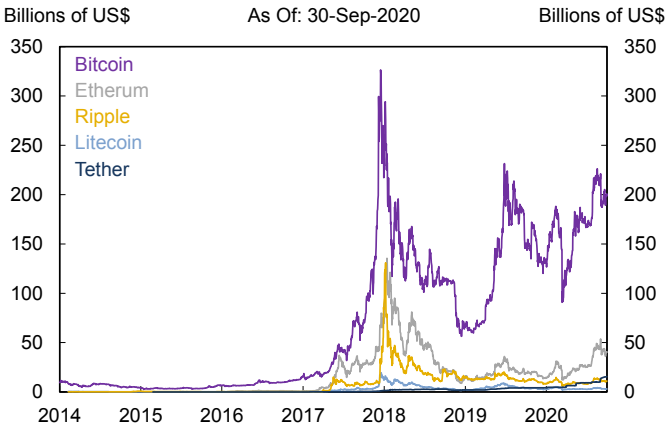
3.6.2 Operational Challenges Related to COVID-19

Financial institutions performed business functions relatively seamlessly during the COVID-19 pandemic, in part due to investments in operational and technology capabilities that were made prior to March. The industry also benefited from shifting customer support from in-person to online or automated processes. Banks have taken steps to protect customers and employees by consolidating branch operations and limiting walk-in traffic, leveraging multiple production sites to separate operational staff, and employing staggered work schedules. Financial institutions have also adopted safety measures for their employees, including transitioning to a mostly remote working environment and implementing similar protection measures for the critical staff who remained onsite.

These processes have allowed financial institutions to maintain operations while adhering to social distancing guidelines, but also have the potential to introduce new sources of risk. For example, the implementation of teleworking strategies using virtual private networks, virtual conferencing services, and other remote telecommunication technologies can increase cybersecurity vulnerabilities, insider risks, and other operational exposures. Cyber attackers are taking advantage of the pandemic to create campaigns designed to leverage individuals' fear and uncertainty, potentially increasing their rate of success under these circumstances. Ransomware is also proliferating and harming financial institutions and their third-party service providers.

Similarly, the use of online and mobile systems by customers, bank staff, and third-party service providers may stress or adversely affect telecommunications capacity and management processes. Sensitive processes performed outside of institution-owned or authorized properties and devices can increase the potential for exposure of customer sensitive information.

3.6.3.1 Market Capitalization of Blockchain-Based Digital Assets



Source: Coinmarketcap.com; OFR

3.6.3 Financial Innovation

3.6.3.1 Digital Assets and Distributed Ledger Technology

The market capitalization of digital assets, such as Bitcoin, Ethereum, XRP, and Litecoin, has increased greatly in recent years though it has also been highly volatile (**Chart 3.6.3.1**). Data regarding the trading of digital assets is sparse and may be unreliable. CoinMarketCap.com estimated that after reaching $800 billion in early 2018, the market capitalization of the digital assets that it tracks declined precipitously to $100 billion in late 2018 before rising to $342 billion as of September 30, 2020. Stablecoins—digital assets designed to maintain a stable value, usually relative to another asset (typically a unit of fiat currency or commodity) or a basket of assets—continued to grow in market capitalization in 2020 following robust growth in 2019, with some experiencing a five-fold increase during that period. While the growth rate of stablecoins in 2020 has eclipsed that of other digital assets, the total market capitalizations of other types of digital assets remains substantially larger.

Digital assets are generally enabled by blockchains or other distributed ledger technologies. Such systems share data across a network, creating identical copies of their ledger that are then often stored at and synchronized across multiple locations. Distributed ledger technology has applications that extend well beyond the simple transfer of value. In recent years, an increasing number of financial institutions have initiated proof of concept or pilot projects to evaluate the potential for applications of distributed ledger technology in areas such as interbank and intrabank settlement, derivatives processing, repo clearing, and trade finance. While the ultimate value of a new technology is not always clear when it is first introduced, interest in distributed ledger technologies remains high.

3.6.3.2 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.

3.6.3.3 Marketplace Lending

Marketplace lending involves the provision of loans through online, electronic platforms. Initially, marketplace lending focused on retail investors providing funding to individual borrowers and was called peer-to-peer lending. This model has evolved into one that uses significant capital from institutional investors to finance primarily consumer and small business loans. Some of the largest marketplace lenders in the consumer finance area concentrate on providing debt consolidation loans and refinancing existing student loans. During the COVID-19 pandemic, marketplace lenders played a role in government assistance to small businesses. For example, their lending platforms enabled some small business owners' participation in the PPP by providing a means to apply for PPP loans.

3.6.3.4 Large Technology Firms in Financial Services

Prior to the pandemic, several large technology and e-commerce firms entered, or explored entering, financial services markets. These firms offer financial products or services, such as the provision of loans to small businesses or individuals. Some of these technology and e-commerce companies have characteristics that could allow them to grow quickly in the financial services space, including large customer networks, broad name recognition, and access to client data. Additionally, while these firms are subject to regulations that may limit the activities in which they engage, they are generally not subject to the same range of regulations and oversight applicable to financial institutions. These technology firms can promote the development of new products and services but could also increase risks. For example, new technology and systems to evaluate and determine the creditworthiness of potential borrowers may create benefits for financial institutions and customers, but may also add complexity, limit transparency, and create different consumer protection risks than those of traditional credit evaluation methods if lenders do not identify and address potential issues in a proactive manner.

3.6.3.5 Reliance of Financial Institutions on Third-Party Service Providers

Financial institutions are increasing their use of third-party service providers to supplement or increase their capabilities. This dynamic has accelerated during the COVID-19 pandemic, as institutions are utilizing third parties to support widespread remote work capabilities, increased technological capacity, and solutions to maintain operations under elevated operational volumes. The financial services industry has generally succeeded in transitioning to a remote working environment without significant operational problems, to date.

Relationships with external providers often allow an institution to take advantage of advanced or proprietary technologies, including recent fintech innovations. Due to economies of scale or access to lower-cost labor, external providers are often able to perform services at a lower cost than institutions can perform them in-house. In addition, as specialists, external providers may be able to perform functions for a financial institution more efficiently, more accurately, or at a higher quality than if they were performed internally.

While the use of third-party service providers can have advantages, it can also introduce risk if not appropriately managed. The reliance of many institutions on a single vendor creates concentration risk, as a service interruption or cyber event at that vendor could result in widespread disruption in access to financial data and could impair the flow of financial transactions. Third-party service providers

may further subcontract services to other third parties, which may make oversight more complex for both the financial institution and regulatory agencies. To control for risks associated with outsourcing to third parties, financial institutions should conduct appropriate due diligence before entering the third-party relationship and exercise effective oversight and controls afterward.

For instance, many institutions have increased their use of cloud computing services to supplement existing data storage capacity, to provide redundancy, and to gain access to additional computational capacity. While cloud providers may offer superior cost or technological solutions, there have also been recent instances of unauthorized access to client data at cloud providers. As with all third-party outsourcing relationships, effective risk control is important when a financial institution engages third-party cloud providers.

3.7 Global Economic and Financial Developments

3.7.1 Foreign Exchange Market

As COVID-19 spread in early 2020 and financial market strains intensified, investors sought the safety of the dollar, generating a sharp rise in the value of the nominal trade-weighted dollar. The nominal trade-weighted dollar appreciated 10 percent from the beginning of the year to its peak on March 23—with the bulk of this move occurring in March as countries imposed sweeping restrictions on their national economies. Among the currencies weakening sharply against the dollar during this period, the British pound depreciated 13 percent, the Australian dollar 18 percent, the Brazilian real 22 percent, and the Mexican peso 25 percent.

At the same time, the premium to obtain dollar funding increased to levels not seen since the 2008 financial crisis. The dollar funding strains could be primarily attributed to lenders reducing intermediation activities as a precaution amid the heightened uncertainty, increased demand for dollars as some foreign banks faced significant drawdowns of corporate credit lines, and increased dollar hedging demand given the significant market volatility. Dollar funding strains were particularly evident in the steep increase in the premium to borrow U.S. dollars as reflected in the foreign exchange (FX) swap basis. The FX swap basis compares the cost of borrowing a currency in the money market and the cost of borrowing the same currency through an FX swap, effectively posting foreign currency as collateral. When financial markets are operating smoothly, the FX swap basis is relatively close to zero for major currency pairs, as arbitrageurs can trade off gaps between the two. But during February and March, the FX swap basis for key U.S. dollar currency pairs spiked toward levels last observed during 2008. As a result, foreign banks and corporations, which were experiencing a surge in funding costs given the stress in CP markets, found it more expensive to borrow against their currencies for dollars. The dollar shortage threatened to exacerbate liquidity strains on corporates, contribute to widening defaults, and deepen the economic downturn stemming from the pandemic.

Beginning in mid-March, the Federal Reserve took several actions to help address the strains in dollar funding markets. First, it eased the terms of the swap lines with standing counterparties (the Bank of Canada, Bank of England, Bank of Japan, European Central Bank, and Swiss National Bank), reducing the cost of swap pricing to OIS + 25 basis points, extending the maturity of the swaps through the introduction of 84-day operations, and increasing the frequency of auctions from weekly to daily. Additionally, the Federal Reserve re-established temporary swap lines with nine other central banks, including some emerging market central banks. Finally, in late March, the Federal Reserve introduced a new temporary Foreign and International Monetary Authority (FIMA) repo facility, which allowed a broader range of foreign official entities to obtain dollars against U.S. Treasury collateral. Central banks immediately availed themselves of the swap lines to make dollars available to financial institutions in their jurisdictions. Swaps outstanding went from under $50 million in early March to a peak of $449 billion in late May (**Chart 3.7.1.1**). While notable, this was

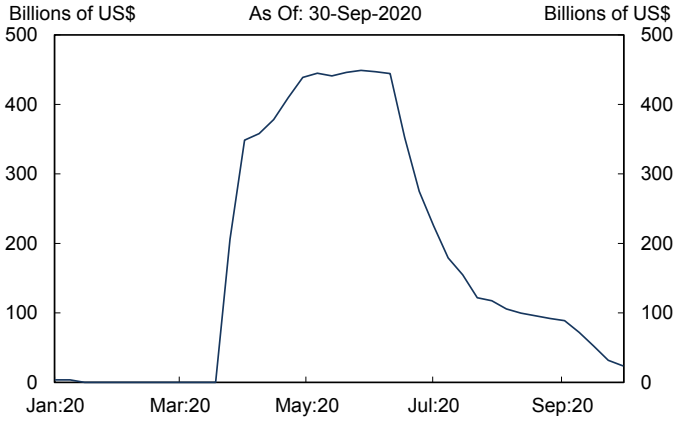
lower than during the 2008 financial crisis, where the peak reached $583 billion.

In combination with the extraordinary actions by central banks and governments to support the global economy, the expansion of Federal Reserve facilities helped calm dollar funding markets. Dollar appreciation pressures eased, and the FX swap basis decreased for many dollar currency pairs, returning to normal historical ranges by May. As strains in dollar funding markets dissipated, outstanding drawings on the swap lines gradually declined, falling to less than $25 billion as of September 30, 2020.

As financial market strains eased, the sharp moves in FX rates seen in the first three months of the year generally reversed, particularly across advanced economies. Between March 23 and September 30, 2020, the dollar depreciated 7.2 percent on a nominal, trade-weighted basis. The euro appreciated 8.9 percent against the dollar, the pound 12 percent, and the Australian dollar 24 percent. By September, advanced economy currencies had appreciated on net against the dollar year-to-date or had made up nearly all of the decline from earlier in the year (**Chart 3.7.1.2**). Emerging market currencies, on the other hand, had seen more limited recovery or had even continued to depreciate against the dollar. As of the end of September, this left many emerging market currencies still substantially weaker against the dollar on net year-to-date (**Chart 3.7.1.3**). Continued pressures on emerging market currencies have reflected in part large COVID-19 outbreaks across some major emerging markets, combined with pre-existing macroeconomic strains in a few specific instances.

While the real broad dollar index is only 0.8 percent stronger on net in 2020 through the end of September, it remains relatively strong from a historical perspective. Notably, the real trade-weighted dollar stands 8.2 percent above its 20-year average as of the end of September, having recently peaked at its strongest level

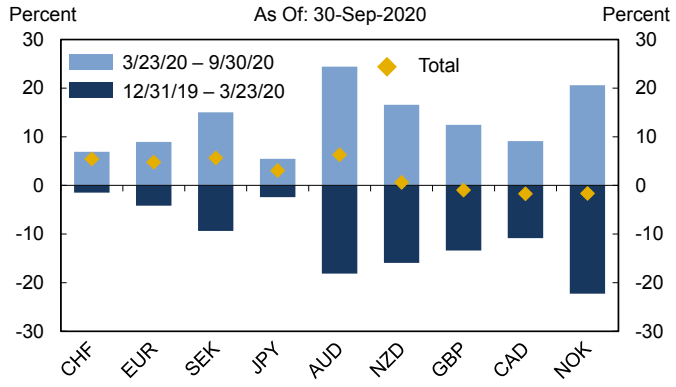
3.7.1.1 Federal Reserve Swap Lines



Source: Federal Reserve

Note: Wednesday levels.

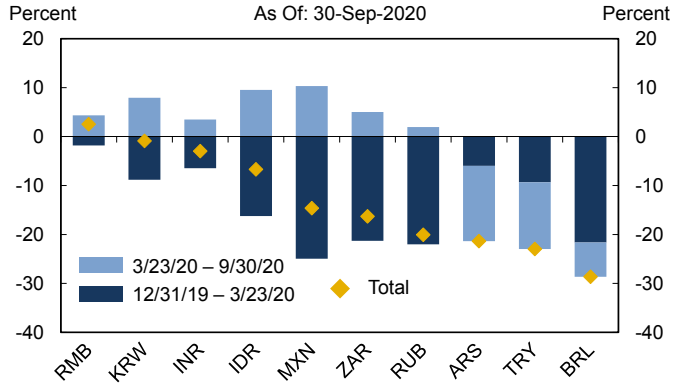
3.7.1.2 Change in USD Exchange Rates, Advanced Economies



Source: Federal Reserve, Haver Analytics

Note: Percent change relative to end-2019. Positive indicates appreciation of listed currency. Swiss Franc (CHF), Euro (EUR), Swedish Krona (SEK), Japanese Yen (JPY), Australian Dollar, (AUD) New Zealand Dollar (NZD), British Pound (GBP), Canadian Dollar (CAD), and Norwegian Krone (NOK).

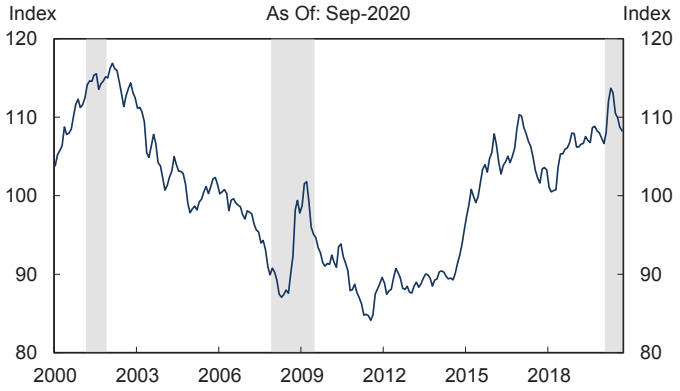
3.7.1.3 Change in USD Exchange Rates, Emerging Markets



Source: Federal Reserve, Wall Street Journal, Haver Analytics

Note: Percent change relative to end-2019. Chinese renminbi (RMB), Korean won (KRW), Indian rupee (INR), Indonesian rupiah (IDR), Mexican peso (MXN), South African rand (ZAR), Russian ruble (RUB), Argentine peso (ARS), Turkish lira (TRY), Brazilian real (BRL). Positive indicates appreciation of listed currency.

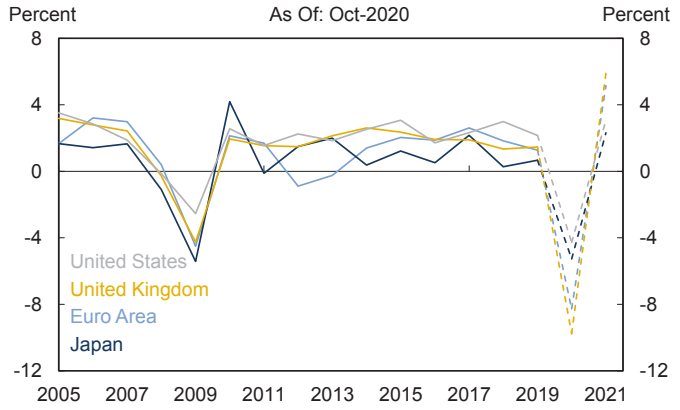
3.7.1.4 Real U.S. Dollar Trade-Weighted Index



Source: Federal Reserve, Haver Analytics

Note: Index shown as a share of its 20-year average. Real USD Trade-Weighted Index is a weighted average of the FX value of the USD against the currencies of a broad group of major U.S. trading partners. Gray bars signify NBER recessions.

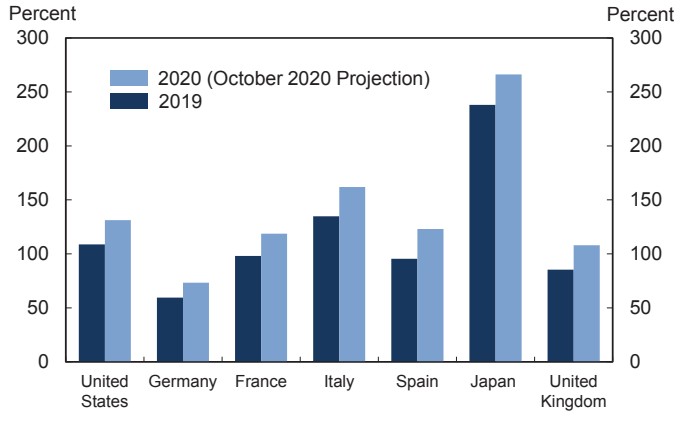
3.7.2.1 Advanced Economies Real GDP Growth



Source: IMF WEO, Haver Analytics

Note: Annual change in GDP, constant prices. Dotted lines represent the IMF's most recent projections for 2020 and 2021.

3.7.2.2 General Government Gross Debt to GDP



Source: IMF WEO

since 2002 (**Chart 3.7.1.4**).

3.7.2 Advanced Economies

The COVID-19 pandemic has led to a dramatic decline in global economic activity. According to the International Monetary Fund (IMF) October 2020 World Economic Outlook (WEO), advanced economies are projected to contract by 5.8 percent in 2020. Despite the steep decline in U.S. economic activity, the U.S. is projected to outperform other advanced economies, with real GDP projected to decline by 4.3 percent in 2020. In comparison, real GDP in the euro area, the United Kingdom (UK), and Japan is projected to decline by 8.3 percent, 9.8 percent, and 5.3 percent, respectively (**Chart 3.7.2.1**). Real GDP for advanced economies is projected to rebound sharply in 2021, but remain below its 2019 level. The rapidly evolving nature of the pandemic, however, introduces significant uncertainty into any forecast, and the depth and duration of the contraction is dependent on a number of factors, most notably authorities' ability to limit the spread of COVID-19 without imposing lockdown measures, the development of a vaccine and therapeutics, and fiscal and monetary economic support.

Advanced economies have taken significant fiscal measures to help mitigate the impact of COVID-19 and support long-term economic recovery. They have relied on a combination of direct fiscal stimulus programs, such as wage subsidies and cash payments, along with liquidity support in the form of loans, asset purchases, and guarantees. Direct fiscal spending programs have increased headline government debt levels meaningfully in 2020 (**Chart 3.7.2.2**). In contrast, liquidity support is largely off-balance sheet and could lead to significant growth in government debt if these public interventions incur losses.

In 2019, negative interest rate policies, coupled with increased economic uncertainty, pushed the amount of negative-yielding debt in the Bloomberg Barclays Global Aggregate Negative Yielding Debt Index up significantly, hitting a record $17 trillion in August 2019 (**Chart**

3.7.2.3). While the amount outstanding in the index declined in the months following, the value of negative-yielding debt represented by the index remained well above historical levels. During the March 2020 market stress, however, the index value of negative-yielding debt fell sharply to less than $8 trillion. Since then, the index value of negative-yielding debt has steadily risen, and by the end of September, the amount outstanding again reached $16 trillion, slightly below the August 2019 record.

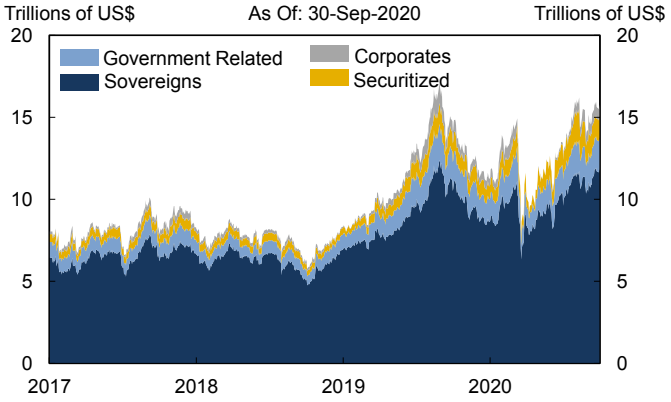
Euro Area

Even prior to the COVID-19 pandemic, the economic outlook in the euro area was deteriorating. In the fourth quarter of 2019, euro area real GDP growth was flat, industrial confidence had fallen to its lowest level since 2013, and inflation expectations were at record lows. While economic data improved somewhat in January and February 2020, economic activity collapsed in March as COVID-19 spread through Europe, and major European Union (EU) member states imposed national lockdown policies. Euro area GDP growth fell by a cumulative rate of 15 percent in the first half of 2020 (**Chart 3.7.2.4**). The decline in GDP was particularly pronounced in economies that imposed severe measures to control widespread outbreaks, with Spanish, French, and Italian GDP falling by 22 percent, 19 percent, and 18 percent, respectively.

Euro area economic activity rebounded considerably in the summer, and in the third quarter of 2020, euro area real GDP increased by nearly 13 percent compared to the previous quarter. Despite this rebound, economic sentiment remained below pre-pandemic levels through September 2020, and the recent resurgence of COVID-19 cases and partial reimposition of national lockdowns will likely weigh on the economic recovery going forward (**Chart 3.7.2.5**).

To help limit the economic impact of COVID-19, the ECB deployed a range of unconventional monetary tools while maintaining its deposit rate at -0.5 percent.

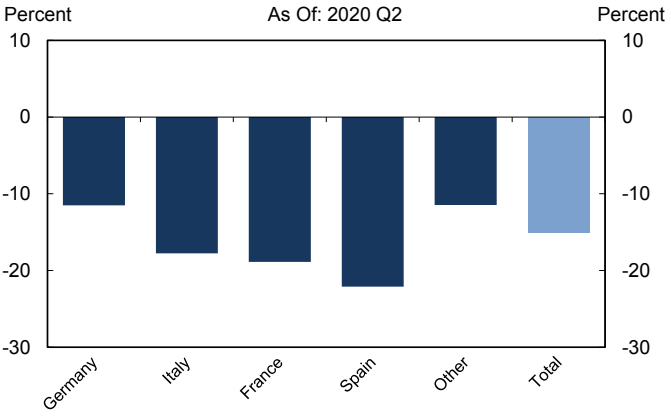
3.7.2.3 Outstanding Negative Yielding Debt



Source: Bloomberg, L.P.

Note: Market value of Bloomberg Barclays Global Aggregate Negative Yielding Debt Index, which is a sub-index of the Bloomberg Barclays Aggregate Index. In 2017, SIFMA estimated that the aggregate index covers approximately half of the value of global bonds outstanding.

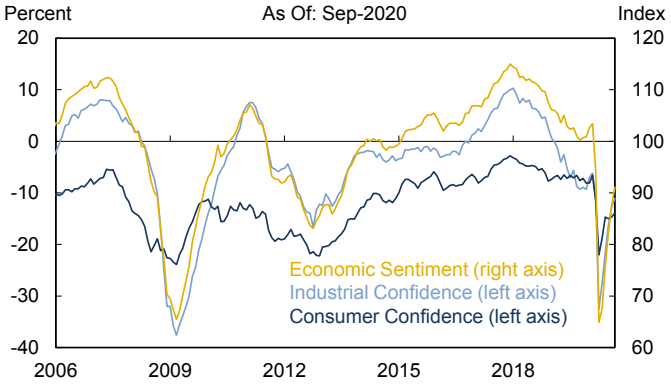
3.7.2.4 Euro Area H1 2020 Real GDP



Source: Eurostat, Haver Analytics

Note: Percentage change in real GDP Q2 2020 compared with Q4 2019. Seasonally adjusted.

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.

Among other programs, the ECB launched a further round of asset purchases under its Pandemic Emergency Purchase Programme (PEPP). The PEPP supplements the ECB's Asset Purchase Programme (APP) and allows the ECB to purchase assets currently eligible under the APP along with Greek government debt and nonfinancial CP. As of September 30, 2020, the ECB had purchased €567 billion of securities under PEPP and is expected to purchase a further €783 billion through June 2021. Additionally, the ECB eased conditions for its third series of targeted long-term refinancing operations (TLTRO III) and new series of pandemic emergency longer-term refinancing operations. Participation in TLTRO III has been robust, and the amount of funds allotted in June and September 2020 totaled a combined €1.5 trillion, up from €0.2 trillion in March 2020.

In addition, the ECB has introduced a range of supervisory measures in response to COVID-19. First, the ECB provided capital relief measures, which are estimated to temporarily free up roughly €120 billion of CET1 capital. The ECB has also provided supervisory flexibility regarding the treatment of non-performing loans (NPLs), provided guidance to limit the procyclical effects of loss provisioning under International Financial Reporting Standards (IFRS) 9, and recommended that banks refrain from making dividends payments until 2021. In combination, these countercyclical measures could act as shock absorbers and mitigate the tightening of financing conditions for households and businesses.

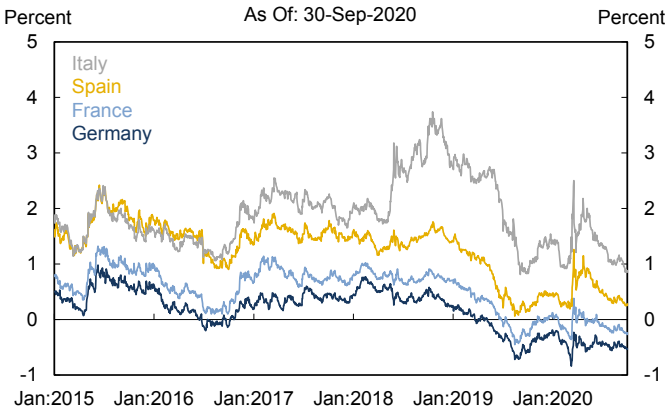
On the fiscal front, the EU announced a historic plan to help aid member states' economic recovery from COVID-19. The recovery plan, which was agreed upon by EU leaders on July 21, 2020, permits the European Commission to borrow up to €750 billion on behalf of member states. Of this amount, €390 billion would be dispersed as grants, while the remaining €360 billion would be dispersed as loans. The plan should provide heavily indebted member states additional fiscal space to support economic recovery from the COVID-19 pandemic. To participate, member states must prepare national recovery and resilience plans, and a large portion of the funds is expected to support investment in green and digital transitions. While the plan has yet to be ratified by national parliaments, it is expected that the majority of resources will be allocated between 2021 and 2023 and that the maximum volume of the loans for each member state will not exceed 6.8 percent of its gross national income.

At the national level, euro area member states have also instituted a broad set of fiscal measures to help mitigate the direct economic impact of the COVID-19 pandemic. Importantly, several euro area economies have implemented job retention schemes in order to limit households' loss of income and firms' wage costs during the pandemic. In addition, euro area member states have supported businesses through loan guarantee programs and have introduced active tax and spending measures to support the recovery.

As of the end of the second quarter of 2020, the euro area general government debt totaled €11 trillion, up from €10 as of the second quarter of 2019. Within the euro area, Italian, French, and German debt outstanding totaled €2.5 trillion, €2.6 trillion, and €2.3 trillion, respectively, or 149 percent, 114 percent, and 67 percent of GDP. Debt outstanding for all euro area economies is projected to rise in the coming quarters as fiscal relief efforts to tackle COVID-19 take hold.

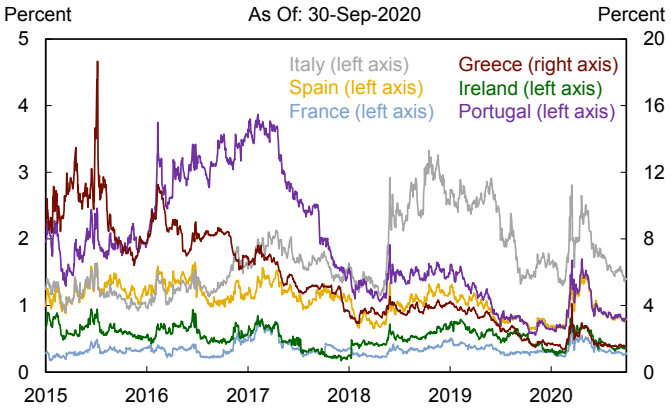
Yields on European sovereign bonds, which fell to record lows in mid-2019, rose slightly in late 2019 and early 2020 (**Chart 3.7.2.6**). However, during the March 2020 market stress, yields on highly-rated European sovereign bonds plunged again, and by mid-March, the 10-year German bond (Bund) fell to a record -84 basis points. At the same time, spreads across European sovereigns widened. Beginning in late February, the spread between Italian (BTP) and Bund yields widened as investors grew concerned about the outbreak in northern Italy (**Chart 3.7.2.7**). The spread between BTPs and Bunds topped out at around 2.8 percent in mid-March and has since more than retraced its gains following the ECB's launch of PEPP and the announcement of the EU-wide fiscal relief package.

3.7.2.6 Euro Area 10-Year Sovereign Yields



Source: Reuters, Haver Analytics

3.7.2.7 Euro Area 10-Year Spreads



Source: Reuters, Haver Analytics

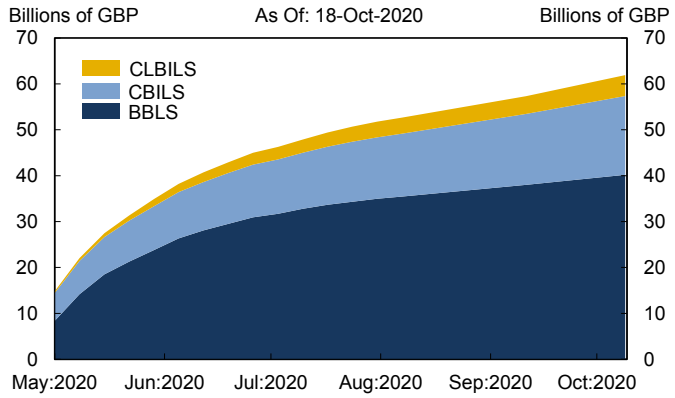
Note: Calculated as the weekly average spread between local 10Y and German 10Y.

United Kingdom

On January 31, 2020, the UK officially exited the EU under the Withdrawal Agreement. As part of the Withdrawal Agreement, the UK and EU agreed to a transition period until December 31, 2020, during which the UK is not in the EU but retains all of the rights and obligations of an EU member. While the focus has since shifted to handling the COVID-19 pandemic, the post-Brexit transition period has not been extended and, absent any agreement, UK-EU trade will revert to World Trade Organization rules at year-end.

Similar to other European countries, the UK was severely impacted by COVID-19. UK GDP fell by a cumulative 21 percent in the first half of 2020, rivaling Spain as the economy most negatively impacted by the pandemic. To help keep workers employed during the COVID-19 related lockdowns, the UK government instituted a policy to cover 80 percent of furloughed workers' monthly salaries up to a ceiling. Given that furloughed workers are considered employed, the UK unemployment rate has remained relatively stable and was reported at 4.8 percent between July and September 2020.

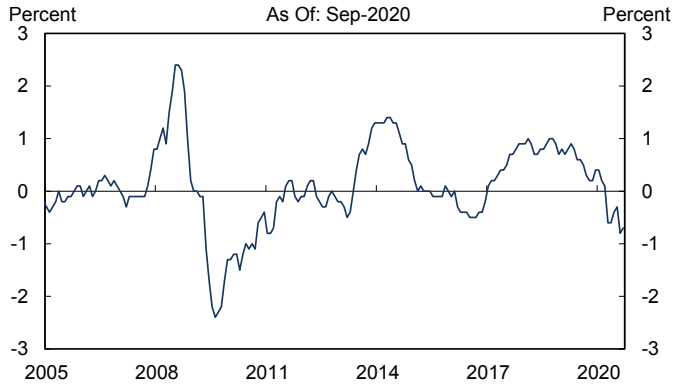
3.7.2.8 UK COVID-19 Business Loan Schemes



Source: HM Treasury

Note: Bounce Back Loan Scheme (BBLS), Coronavirus Large Business Interruption Loan Scheme (CLBILS), Coronavirus Business Interruption Loan Scheme (CBILS). Data reported monthly instead of weekly after August 16, 2020.

3.7.2.9 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.

At the same time, the UK government has launched three separate loan schemes to facilitate businesses' access to credit (**Chart 3.7.2.8**). The Bounce Back Loan Scheme is aimed at micro businesses and includes a 100 percent government guarantee, while the Coronavirus Business Interruption Loan Scheme and Coronavirus Large Business Interruption Loan Scheme, which are aimed at small and medium-sized enterprises (SMEs) and larger businesses, are backed by an 80 percent government guarantee. As of October 18, aggregate lending under these three schemes totaled £62 billion.

The Bank of England (BOE) has also introduced a range of measures to respond to the economic shock from COVID-19. On March 10, the BoE Monetary Policy Committee voted to reduce its bank rate from 75 basis points to 25 basis points and to introduce a new Term Funding Scheme with additional incentives for SMEs, financed by the issuance of central bank reserves. In addition, the BOE Financial Policy Committee reduced the UK countercyclical capital buffer rate to 0 percent and the BOE Prudential Regulation Authority set out its supervisory expectation that banks should not increase dividends or other distributions, such as bonuses.

Japan

Japanese economic activity fell significantly due to COVID-19 related lockdowns. In the third quarter of 2020, Japanese real GDP fell by 5.9 percent compared to the third quarter of 2019. Between 2017 and 2019, inflation in Japan remained positive but has since turned negative and stood at -0.7 percent as of September 30, 2020 (**Chart 3.7.2.9**).

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

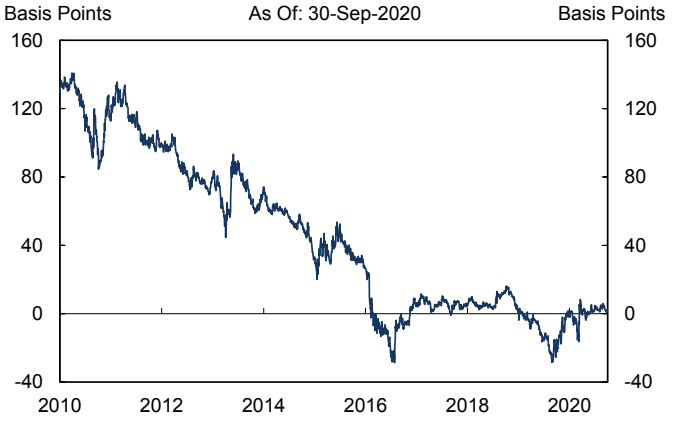
at -0.1 percent since January 2016. In addition, the BOJ continued to follow its policy of yield curve control whereby the BOJ will purchase JGBs so that the 10-year JGB yield remains at around zero percent. Since the introduction of the BOJ's yield curve control policy in 2016, the yield on 10-year JGBs has been little changed (**Chart 3.7.2.10**).

On March 26, 2020, the BOJ announced that it would enhance monetary easing through a number of policy measures, including increasing purchases of Japanese government bonds (JGBs), easing access to U.S. dollar funds, purchasing CP and corporate bonds, establishing a new operation to provide loans against corporate debt, and by 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 SMEs. In total, the BOJ's COVID-19 support programs amount to ¥110 trillion, or approximately $1 trillion. Of this amount, ¥20 trillion is in the form of CP and corporate bond buying programs while the remaining ¥90 trillion is in the form of lending programs.

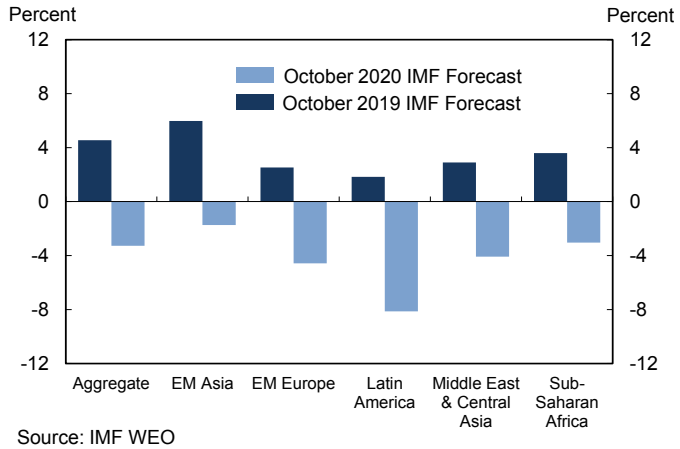
In addition to the BOJ's monetary response, the Japanese Financial Services Agency (JFSA) has provided guidance with regard to bank capital requirements in light of the COVID-19 pandemic. Specifically, the JFSA confirmed that banks can use capital buffers when necessary to maintain lending volume. The JFSA has also confirmed that certain rescue lending activity would be risk weighted at 0 percent, that it would take a flexible approach to banks breaching the liquidity coverage ratio, and that the JFSA and BOJ would temporarily exclude central bank deposits from the leverage ratio exposure measure. Finally, the Japanese government announced a series of fiscal packages to support its economy, including cash handouts to individuals, subsidies to affected

3.7.2.10 Japan 10-Year Government Bond Yield



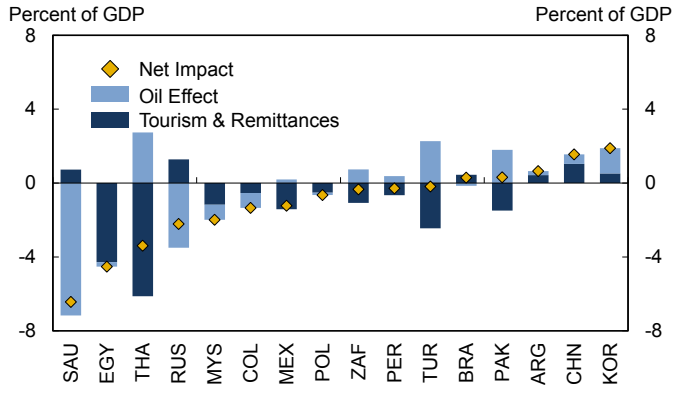
Source: Bloomberg, L.P.

3.7.3.1 2020 Real GDP Revisions for Developing Economies



Source: IMF WEO

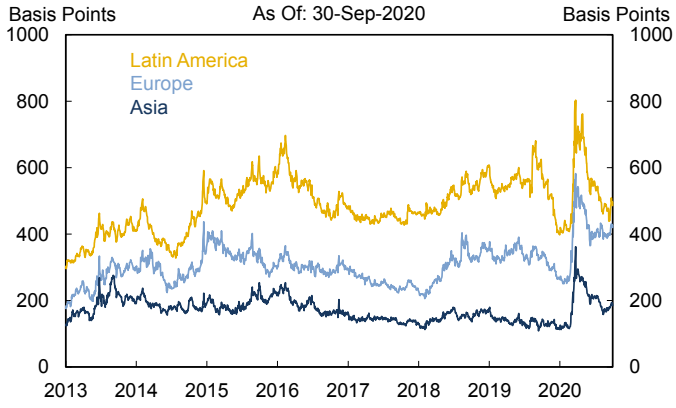
3.7.3.2 COVID-19 Impact on 2020 Current Account Balances



Source: IMF July 2020 External Sector Report

Note: Estimated net direct impact of specific factors on current account balances for select EMEs.

3.7.3.3 Emerging Market Sovereign Bond Spreads



Source: JP Morgan, Haver Analytics

Note: JP Morgan EMBI+ Sovereign Spreads indices for each region.

firms, and the introduction of loan guarantee programs.

3.7.3 Emerging Market and Developing Economies

Similar to advanced economies, EMEs experienced a sharp contraction in economic output in the first half of 2020. According to the IMF's October 2020 WEO update, emerging and developing economies, which were projected to grow by approximately 4.6 percent in 2020, are now projected to contract by 3.3 percent (**Chart 3.7.3.1**). Latin American economies, which are sensitive to commodity price fluctuations and have been hard hit by the COVID-19 pandemic, are projected to contract by 8.1 percent in 2020. In aggregate, emerging Asian economies have had more success in containing the spread of COVID-19, permitting authorities to lift lockdowns relatively quickly. Comparatively, emerging Asian economies are projected to contract by 1.7 percent in 2020.

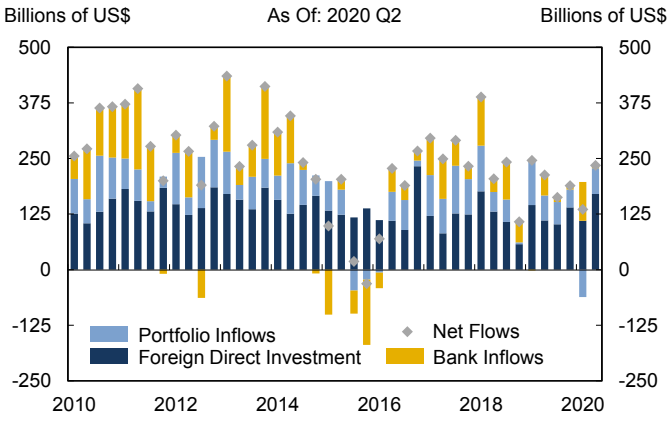
In the years following the 2013 Taper Tantrum, most EMEs narrowed current account deficits and built up reserves. Nevertheless, certain EMEs remained vulnerable to external shocks, and those reliant on remittances, tourism, or higher commodity prices are likely to see a deterioration in their external balances (**Chart 3.7.3.2**). Additionally, EMEs typically have less fiscal capacity relative to advanced economies to respond to the economic fallout associated with the COVID-19 pandemic, complicating both the health response and the economic recovery.

Spreads on USD-denominated sovereign bonds in all emerging market regions spiked sharply in March 2020 as investors repriced risk assets given the dimming global economic outlook (**Chart 3.7.3.3**). Latin American spreads surged to 800 basis points, while spreads for emerging Asia and emerging Europe roughly doubled to 340 basis points and 580 basis points, respectively. Spreads on USD-denominated bonds have since compressed as foreign investor capital outflows subsided amid improved investor sentiment, in part due

to aggressive policy responses and optimism around the development of a COVID-19 vaccine and treatment methods, as well as expectations that full-scale lockdowns may be avoided. At the same time, local currency bond spreads have also compressed amid the launch of local currency bond purchase programs by some emerging market central banks aimed at providing liquidity and supporting local bond markets. Despite this compression in spreads, the outlook for emerging market credit has deteriorated over the past year, and Fitch downgraded a record number of sovereigns in the first half of 2020.

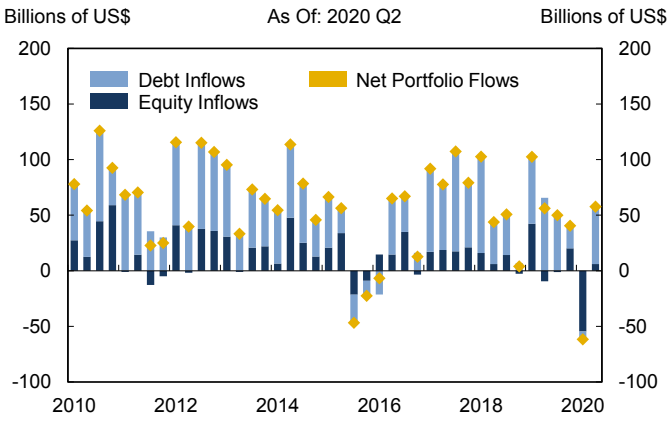
While net capital flows to EMEs remained positive in the first quarter of 2020, portfolio flows turned negative for the first time since 2015 (**Chart 3.7.3.4**). During this period, EMEs witnessed over $50 billion of equity portfolio outflows, the largest recorded quarterly outflow in over 15 years, with China and Korea accounting for nearly half (**Chart 3.7.3.5**). In aggregate, equity flows stabilized in the second quarter of 2020, which can largely be attributed to sizable inflows into China. Foreign direct investment (FDI) and bank flows, which tend to be less volatile, remained positive in the first quarter of 2020 at $116 billion and $84 billion, respectively. While EMEs continued to see robust FDI inflows in the second quarter of 2020, bank inflows fell to $5 billion, as Brazil reported large bank outflows.

3.7.3.4 Foreign Investor Capital Inflows to EMEs



Source: IMF, Haver Analytics

3.7.3.5 Foreign Investor Portfolio Inflows to EMEs

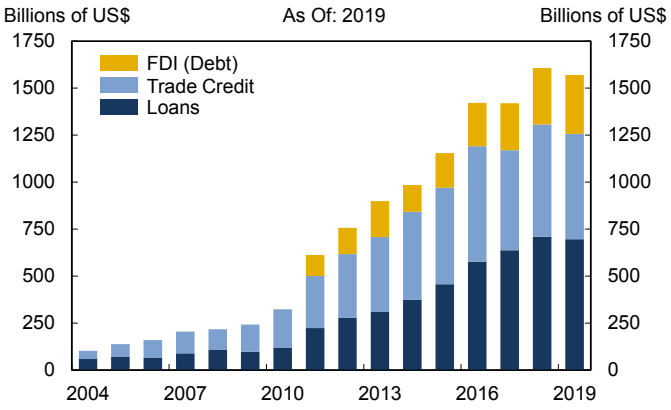


Source: IMF, Haver Analytics

Low-Income Countries

The G20 and other organizations took action to relieve credit stress on low-income countries in response to the COVID-19 crisis. In May 2020, the G20 and Paris Club initiated the Debt Service Suspension Initiative (DSSI), whereby official bilateral creditors were encouraged to postpone debt service payments to eligible low-income countries through the end of 2020. In October, the G20 and Paris Club extended the DSSI through June 2021, with possible extensions through the end of 2021. As of September 30, 2020, 43 countries have requested forbearance under the DSSI, freeing up $5 billion in fiscal space to fund social,

3.7.3.6 Chinese Overseas Lending



Source: State Administration of Foreign Exchange, Haver Analytics

Note: FDI (Debt) reported from 2011 onwards.

health, and economic measures to respond to the pandemic. Additionally, the IMF has doubled access to its emergency financing facilities, allowing it to meet increased demand for financial assistance during the pandemic. These measures should help support low-income countries that do not have access to the same monetary and fiscal policy tools as advanced economies. Nevertheless, additional debt relief measures may be necessary, and any restructuring could be complicated due to the increasing reliance on non-Paris Club creditors.

Over the past decade, non-Paris Club creditors have become a significant source of external financing for low-income countries. In particular, China has significantly increased overseas lending as part of its Belt and Road Initiative. According to the People's Bank of China (PBOC), Chinese overseas lending in the form of direct loans, trade credit, and FDI debt exceeded $1.5 trillion as of year-end 2019 (**Chart 3.7.3.6**). However, there is limited transparency regarding the destination and terms of Chinese overseas lending, and the actual amount of lending may significantly exceed what is reported. While China has agreed to participate in the G20's temporary DSSI, the full scope of participation in unclear. For example, China has not suspended debt payments due to China Development Bank (CDB) as part of the official sector DSSI, instead classifying CDB as a commercial creditor. The lack of transparency on Chinese overseas lending and on its participation in the current DSSI potentially complicates any future debt relief initiatives.

At the same time, low-income countries have increasingly relied on commercial creditors as a source of financing via the Eurobond market. According to the IMF, the issuance of foreign currency-denominated bonds by low-income countries has almost tripled from an average of $6 billion between 2012 and 2016 to an average of $16 billion between 2017 and 2018. While the G20 has called upon private creditors to participate in debt relief efforts, private sector participation has been limited.

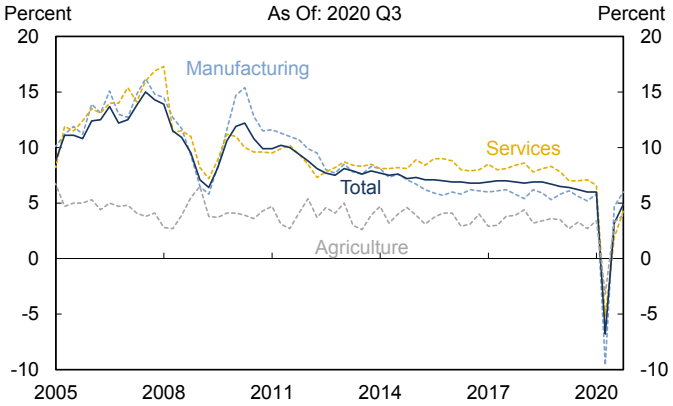
China

In response to the COVID-19 outbreak, Chinese authorities imposed strict containment measures, which led to a sharp drop in economic activity. Chinese economic growth, which has been slowing in recent years, contracted by 6.8 percent year-over-year in the first quarter of 2020 (**Chart 3.7.3.7**). To support the Chinese economy through the COVID-19 pandemic, the Chinese government announced RMB 4.6 trillion of discretionary fiscal spending, worth roughly 5 percent of GDP. Concurrently, the PBOC provided moderate stimulus and acted to safeguard financial market stability.

In mid-February, Chinese authorities began to lift strict lockdown measures outside of Hubei Province, and by the third quarter of 2020, real GDP growth rebounded to 4.9 percent year-over-year. Despite the robust rebound in Chinese manufacturing, the domestic consumption recovery was muted, and household consumption remained below pre-pandemic levels.

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. Nevertheless, the stock of nonfinancial private sector debt continued to increase and nonfinancial debt remained above 200 percent of GDP as of the fourth quarter of 2019 (**Chart 3.7.3.8**). In 2020, Chinese regulators paused their deleveraging campaign as authorities try to balance COVID-19 related credit support with longer-term financial stability goals. As a result, Chinese credit growth, which had been trending downward in recent years, accelerated considerably between March and September 2020 (**Chart 3.7.3.9**). A significant portion of recent credit growth may be attributed to authorities calling on commercial banks to forgo upwards of RMB 1.5 trillion in profits in 2020 to support firms and the real economy by offering lower lending rates, cutting fees, deferring loan repayments, and granting more

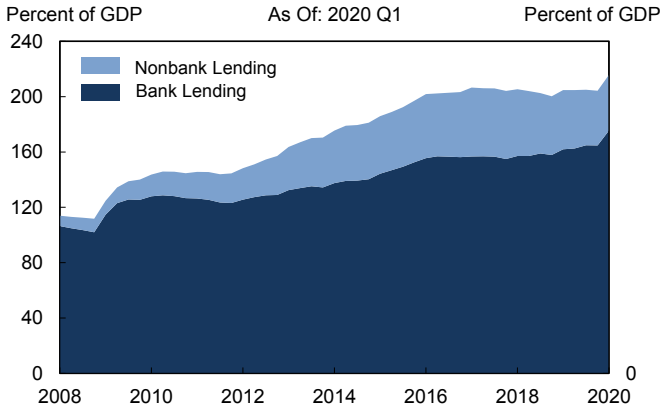
3.7.3.7 Chinese Real GDP Growth and its Components



Source: China National Bureau of Statistics, Haver Analytics

Note: Year-over-year percentage change.

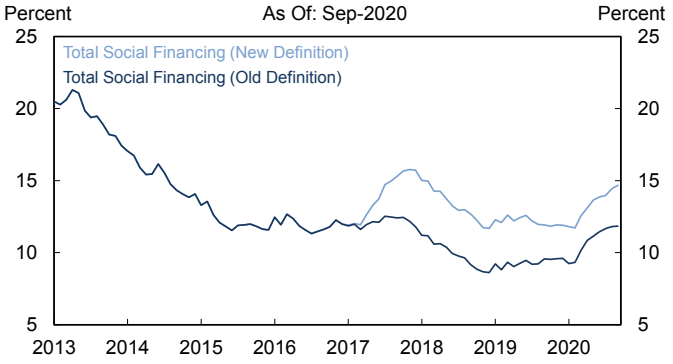
3.7.3.8 Credit to the Chinese Nonfinancial Private Sector



Source: China National Bureau of Statistics, BIS, Haver Analytics

Note: Rolling 4-quarter sum of GDP.

3.7.3.9 Chinese Credit Growth



Source: PBOC, CCDC, Haver Analytics, Staff Calculations

Note: Calculated as the year-over-year percentage change in total social financing (TSF) flows since 2002. TSF refers to the total volume of financing provided by the financial system to the real economy. TSF (old definition) excludes loan write-offs, ABS of depository institutions, and local government special bonds.

unsecured loans. Additionally, the cut in reserve requirements and a seeming commitment by the PBOC to provide liquidity may be helping banks to boost lending. At the same time, the government is supporting small and midsize banks to replenish their capital through various channels, including issuing ordinary shares, preferred shares, and perpetual bonds, in addition to the new special local government bonds.

Prior to the COVID-19 pandemic, the official NPL ratio at Chinese commercial banks stood at 1.9 percent, although many market observers believe that the true NPL ratio was materially higher. Relief efforts to help support SMEs during the COVID-19 pandemic may have further exacerbated any underreporting of NPLs as current rules allow banks to book interest payments even though the loans were in forbearance. Consequently, the aggregate NPL ratio for Chinese commercial banks is little changed through the second quarter of 2020.

In June 2020, Chinese authorities stated that they will accelerate the settlement of NPLs in the second half of 2020, urging banks to make a bona fide classification of their assets. At the same time, China Banking and Insurance Regulatory Commission authorities stated that some small- and medium-sized financial institutions are facing deteriorating asset quality and NPLs are estimated to increase by approximately 50 percent by year-end. Chinese central authorities will also allow local governments to recapitalize small and medium banks by issuing new special local government bonds.

On January 15, 2020, the United States and China signed the Phase One trade agreement, whereby China agreed to increase purchases of American products and services in 2020 and 2021 by at least $200 billion above 2017 levels, and the United States agreed to lower some tariffs on Chinese goods. In addition, China committed to provide improved access to China's financial services market for U.S. companies and provide stronger legal protections for U.S. companies operating in China, particularly concerning intellectual property rights and technology transfer.

In May 2020, Chinese authorities introduced a national security law for Hong Kong in an attempt to quell anti-government protests. The law, which was passed by the National People's Congress in June, bypasses Hong Kong's Legislative Council and criminalizes any act of secession, subversion, terrorism, or collusion with foreign or external forces. The broad nature of the National Security Law gives Beijing additional control over Hong Kong's judicial system, eroding the city's rule of law, and threatens the city's status as a global financial center.

While the Hong Kong dollar initially came under pressure in the forward markets, fears of significant capital outflows have not materialized, as investors are still assessing the impact of the National Security Law. Instead, possibly at the direction of Chinese authorities, inflows from mainland investors into Hong Kong equity markets have supported financial markets, and the Hong Kong dollar has been trading at the strong end of its trading band in recent months.

4 Council Activities and Regulatory Developments

4.1 Select Policy Responses to Support the Economy

As parts of the economy shut down and stress spread through financial markets, policymakers acted to minimize the health and economic effects of the pandemic.

CARES Act

On March 27, the CARES Act was signed into law. The CARES Act authorized over $2 trillion to address COVID-19 and to support the economy, households, businesses, and other entities. The CARES Act supported businesses through programs such as the PPP, which provides a direct incentive for small businesses to keep their workers on the payroll, along with significant additional funding for existing loan programs. The CARES Act also supported households and businesses through expanded unemployment benefits, cash payments to certain eligible households, several types of tax relief, forbearance for certain homeowners, and foreclosure and evictions moratoria for certain households. The statute also provided financial assistance to airlines and related firms and businesses critical to maintaining national security; financial regulatory relief for community banks and certain other financial institutions; and appropriated $454 billion to Treasury to support certain facilities and programs established by the Federal Reserve. In addition, the CARES Act provided significant funding for state and local governments and health care providers.

Monetary Policy

The FOMC lowered rates on March 3 and again on March 15 to the current level close to zero. The FOMC stated that it would keep rates low until it was confident that the economy had weathered recent events and was on track to achieve its maximum employment and price stability goals. It also stated that it was prepared to use its full range of tools to support the flow of credit to households and businesses in support of its policy mandates. In addition, the FOMC engaged in Treasury and agency MBS purchases to support smooth market functioning.

Liquidity Facilities and Programs

To address the liquidity squeeze associated with investors' shift to cash and liquid assets, the Federal Reserve established liquidity facilities and programs under section 13(3) of the Federal Reserve Act, with Treasury's approval.

On March 17, the Federal Reserve announced the establishment of the Commercial Paper Funding Facility (CPFF) to ensure the functioning of the commercial paper market so that a broad range of companies would have access to credit and funding to meet their operational needs. Treasury provided $10 billion of credit protection to the Federal Reserve. The CPFF is scheduled to expire on March 17, 2021.

Also on March 17, the Federal Reserve announced the establishment of the Primary Dealer Credit Facility (PDCF) to offer overnight and term funding to primary dealers so that they may support market functioning and facilitate credit availability. The PDCF is scheduled to expire on December 31, 2020.

On March 18, the Federal Reserve announced the establishment of the MMLF to support market functioning and credit provision to the economy by helping money market funds meet redemption demands by investors. The Treasury Department provided $10 billion of credit protection to the Federal Reserve. The MMLF is scheduled to expire on December 31, 2020.

On April 9, the Federal Reserve announced the establishment of the Municipal Liquidity Facility (MLF) to assist eligible state and local governments manage cash flow issues by offering up to $500 billion in lending. Treasury provided $35 billion of credit protection to the Federal Reserve. The MLF is scheduled to expire on December 31, 2020.

Credit Market Facilities and Programs

The Federal Reserve also established several facilities and programs under section 13(3) of the Federal Reserve Act to ensure the flow of credit to households, nonprofits, and businesses.

On March 23, the Federal Reserve announced the establishment of the Term Asset-Backed Securities Loan Facility (TALF) to support the flow of credit by enabling the issuance of asset-backed securities backed by certain types of loans. Treasury provided $10 billion of credit protection to the Federal Reserve. The TALF is scheduled to expire on December 31, 2020.

On March 23, the Federal Reserve also announced the establishment of the Primary Market Corporate Credit Facility (PMCCF) and the Secondary Market Corporate Credit Facility (SMCCF). The PMCCF supports credit to larger employers for bond and syndicated loan issuance, and the SMCCF supports credit to large employers by supporting liquidity for outstanding corporate bonds. Both facilities were initially open to investment grade companies and, on April 9, extended to include certain high-yield, rated companies that were investment grade as of March 22, 2020. Treasury provided $50 billion of credit protection to the Federal Reserve for the PMCCF and $25 billion for the SMCCF. Both facilities are scheduled to expire on December 31, 2020.

On April 9, the Federal Reserve announced the establishment of the Paycheck Protection Program Lending Facility (PPPLF) to increase the effectiveness of the SBA's PPP by supplying liquidity to financial institutions participating in PPP. The PPPLF extends credit to eligible financial institutions that pledge PPP loans as collateral. The PPPLF is scheduled to expire on December 31, 2020.

On April 9, the Federal Reserve also announced the establishment of the Main Street Lending Program (MSLP) to support lending to small and medium-sized businesses. The Federal Reserve expanded the MSLP to include nonprofits in July. The MSLP operates through five facilities. Treasury provided $75 billion in credit protection to the Federal Reserve for the MSLP. The facilities are scheduled to expire on December 31, 2020.

Offshore Dollar Funding Markets

The Federal Reserve also acted to provide liquidity to offshore dollar funding markets that were under stress.

On March 15, the Federal Reserve, in coordination with the Bank of Canada, Bank of England, Bank of Japan, the European Central Bank, and the Swiss National Bank, announced two changes to enhance standing U.S. dollar swap arrangements: pricing was lowered to OIS +25 basis points and 84-day maturity auctions commenced.

On March 19, the Federal Reserve announced the establishment of temporary U.S. dollar liquidity arrangements with the Reserve Bank of Australia, the Banco Central do Brasil, the Danmarks Nationalbank (Denmark), the Bank of Korea, the Banco de Mexico, the Norges Bank (Norway), the Reserve Bank of New Zealand, the Monetary Authority of Singapore, and the Sveriges Riksbank (Sweden). Like the existing arrangements with other central banks, the facilities help address strains in global U.S. dollar funding markets.

On March 20, the Federal Reserve, again in coordination with the Bank of Canada, Bank of England, Bank of Japan, the European Central Bank, and the Swiss National Bank, announced that one-week swaps would be offered daily.

On March 31, the Federal Reserve announced the establishment of the temporary FIMA Repo Facility. The FIMA Repo Facility allows certain central banks and other international monetary authorities to enter into repurchase agreements with the Federal Reserve. In addition to supporting global U.S. dollar funding markets, the facility is intended to support the smooth functioning of the U.S. Treasury market by offering an alternative source of U.S. dollars to sales of Treasury securities in the open market.

Federal Reserve Balance Sheet

As a result of its policy actions, the Federal Reserve's balance sheet has increased significantly, totaling over $7 trillion in assets as of September 30, 2020

(**Chart 4.1.1**). Most of the increase in 2020 is due to its Treasury and MBS purchases. After peaking at approximately $130 billion early in the crisis, the Federal Reserve's purchases in support of its liquidity and credit facilities were approximately $100 billion as of September 1, 2020 (**Chart 4.1.2**). The peak amount outstanding for the current facilities is significantly below the peak amount outstanding for similar facilities that were created during the 2008 financial crisis; many of the credit facilities, however, were not created in the 2008 financial crisis.

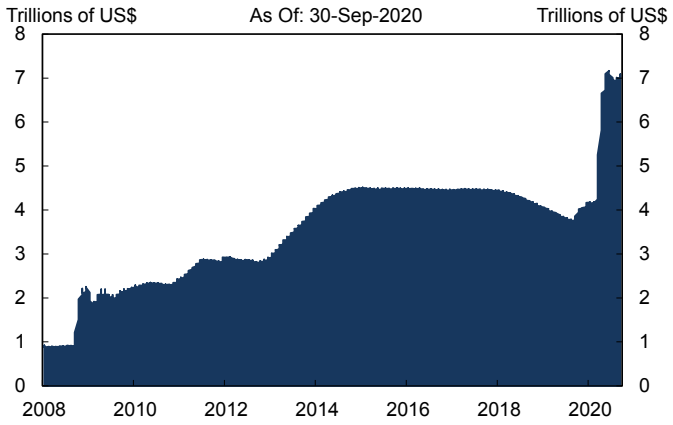
4.2 Council Activities

4.2.1 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.

The Council leveraged this infrastructure to respond to the COVID-19 pandemic. With the onset of the market stresses in March, the frequency of SRC meetings was increased from monthly to weekly or bi-weekly for the next

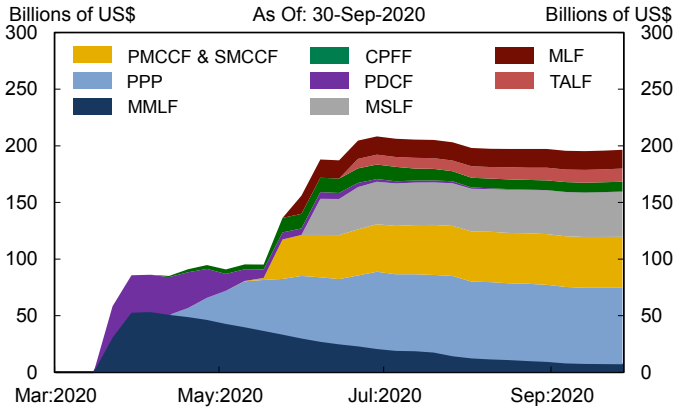
4.1.1 Total Assets of the Federal Reserve



Source: Federal Reserve, FRED

Note: Wednesday level.

4.1.2 Net Portfolio Holdings of 13(3) Facilities



Source: Federal Reserve, Haver Analytics

Note: Wednesday level.

six months to facilitate coordination, information-sharing, and analysis of key risk topics.

On March 30, 2020, the Council also convened a principals-level task force on nonbank mortgage liquidity to assess potential liquidity strains on nonbank originators and servicers. Following up on the task force discussion, the Council formed a staff-level working group that included non-Council agencies to facilitate interagency coordination, additional market monitoring, and enhanced default planning for the possible failure and resolution of nonbank mortgage companies.

In July 2020, the Council established a working group composed of staff from Treasury, the Federal Reserve, and FHFA to assess potential risks related to the provision of secondary mortgage market liquidity. The working group focused in particular on the activities of Fannie Mae and Freddie Mac as the dominant private secondary market providers of liquidity through their purchase of mortgages for securitization and sale as guaranteed MBS. The working group assessed potential financial stability risks in the secondary market, as well as whether those risks are appropriately addressed by regulatory mitigants. The working group's analysis informed the September 25, 2020 Council statement discussed below.

4.2.2 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 take into account ten specific considerations and any other risk-related factors that the Council deems appropriate when evaluating those companies.

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.

On December 4, 2019, the Council issued final interpretive guidance replacing the Council's prior interpretive guidance on nonbank financial company determinations, which was issued in 2012. The new interpretive guidance 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 and enhances the analytical rigor and transparency in the processes the Council intends to follow if it were to consider making a determination to subject a nonbank financial company to supervision by Federal Reserve.

On September 25, 2020, the Council approved a statement summarizing its review of the secondary mortgage market and presenting its key findings. As noted above, the Council's review focused in particular on the activities of the Enterprises. In conducting the review, the Council applied the framework for an activities-based approach described in the December 2019 final interpretive guidance.

The Council's review noted the central role the Enterprises continue to play in the national housing finance markets, and found that any distress at the Enterprises that affected their secondary mortgage market activities, including their ability to perform their guarantee and other obligations on their MBS and other liabilities, could pose a risk to financial stability, if risks are not properly mitigated. The Council's review also considered whether the regulatory framework of the FHFA would adequately mitigate this potential risk posed by the Enterprises.

FHFA's recent capital proposal was central to the Council's analysis. The Council considered whether the proposed capital rule is appropriately sized and structured, given the Enterprises' risks and their key role in the housing finance system, and also whether the proposed capital rule promotes stability in the broader housing finance system (**see Box F**).

4.2.3 Operations of the Council

The Dodd-Frank Act requires the Council to convene no less than quarterly. The Council held [five] meetings in 2020, 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 [three] of its meetings in 2020. 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 adopted its eleventh budget in 2020.

4.3 Safety and Soundness

4.3.1 Enhanced Capital and Prudential Standards and Supervision

On January 24, 2020, the OCC, Federal Reserve, and FDIC issued a final rule implementing a new approach—the standardized approach for counterparty credit risk (SA-CCR)—for calculating the exposure amount of derivative contracts under these agencies' regulatory capital rule. Under the final rule, an advanced approaches banking organization may use SA-CCR or the internal models methodology to calculate its advanced approaches total risk-weighted assets, and must use SA-CCR, instead of the current exposure methodology, to calculate its standardized total risk-weighted assets. A non-advanced approaches banking organization may use the current exposure methodology or SA-CCR to calculate its standardized total risk-weighted assets. The final rule also implements SA-CCR in other aspects of the capital rule. The final rule requires an advanced approaches banking organization to use SA-CCR to determine the exposure amount of derivative contracts included in the banking organization's total leverage exposure, the denominator of the supplementary leverage ratio. In addition, the final rule incorporates SA-CCR into the cleared transactions framework and makes other amendments, generally with respect to cleared transactions. The final rule requires advanced approaches banking organizations to use SA-CCR beginning January 1, 2022 and permits the option of using SA-CCR as early as March 31, 2020.

On January 27, 2020, the OCC, Federal Reserve, and FDIC issued a final rule to implement section 402 of the Economic Growth, Regulatory Relief, and Consumer Protection Act (EGRRCPA). Section 402 directs these agencies to amend the regulatory capital rule to exclude from the supplementary leverage ratio certain funds of banking organizations deposited with central banks if the banking organization is predominantly engaged in custody, safekeeping, and asset servicing activities.

Actions Relating to CARES Act and Federal Reserve Facilities

Agencies issued a number of regulations pertaining to the CARES Act and facilities that were established by the Federal Reserve pursuant to section 13(3) of the Federal Reserve Act, in response to economic disruptions caused by COVID-19 and volatility in U.S. financial markets.

On March 23, 2020, the Federal Reserve, OCC, and FDIC issued an interim final rule to allow banking organizations to neutralize the regulatory capital effects of participating in the MMLF. The MMLF, established on March 18, 2020, authorized the Federal Reserve Bank of Boston to extend non-recourse loans to eligible financial institutions to purchase certain types of assets from money market mutual funds in order to provide liquidity to the money market sector to help stabilize the financial system. This treatment would extend to the community bank leverage ratio.

On April 13, 2020, the OCC, Federal Reserve, and FDIC issued an interim final rule to allow banking

organizations to neutralize the regulatory capital effects of participating in the PPPLF. Under the PPPLF, established on April 9, 2020, each of the Federal Reserve Banks would extend non-recourse loans to eligible financial institutions to fund loans guaranteed by the SBA under the PPP. This treatment is similar to the treatment extended previously by the agencies in connection with the MMLF. In addition, as mandated by section 1102 of the CARES Act, loans originated under the PPP will receive a zero percent risk weight under the agencies' regulatory capital rule, regardless of whether the lender participates in the PPPLF.

Beginning on April 2, 2020, the SBA issued a number of interim final rules and guidance documents to implement the PPP, a new forgivable loan program created by the CARES Act. The CARES Act provides for forgiveness of up to the full principal amount of PPP loans, which are also guaranteed by the SBA. The PPP provided economic relief to small businesses nationwide adversely impacted by the economic effects of COVID-19.

On April 23, 2020, the OCC, Federal Reserve, and FDIC issued an interim final rule making temporary changes to the community bank leverage ratio framework, pursuant to section 4012 of the CARES Act. Under the temporary change, a banking organization with a leverage ratio of 8 percent or greater (and that meets other qualifying criteria) may elect to use the community bank leverage ratio framework. The statutory interim final rule also established a two-quarter grace period for a qualifying community banking organization whose leverage ratio falls below the 8-percent community bank leverage ratio requirement, so long as the banking organization maintains a leverage ratio of 7 percent or greater. The temporary changes to the community bank leverage ratio framework would cease to be effective as of the earlier of December 31, 2020, or the termination date of the national emergency concerning COVID-19.

Also on April 23, 2020, the OCC, Federal Reserve, and FDIC issued an interim final rule that provides a graduated transition to a community bank leverage ratio requirement of 9 percent from the temporary 8-percent community bank leverage ratio requirement (transition interim final rule). The transition interim final rule provides that the community bank leverage ratio will be 8 percent through December 31, 2020, in the event the statutory interim final rule terminates before December 31, 2020, 8.5 percent through calendar year 2021, and 9 percent thereafter. The transition interim final rule also maintains a two-quarter grace period for a qualifying community banking organization whose leverage ratio falls no more than 1 percentage point below the applicable community bank leverage ratio requirement. The agencies issued the transition interim final rule to provide community banking organizations with sufficient time and clarity to meet the 9 percent leverage ratio requirement under the community bank leverage ratio framework while they also focus on supporting lending to creditworthy households and businesses given the recent strains on the U.S. economy caused by COVID-19.

On April 27, 2020, the NCUA issued an interim final rule to make a conforming amendment to its capital adequacy regulation following the enactment of the CARES Act. The CARES Act requires that PPP loans receive a zero percent risk weighting under the NCUA's risk-based capital requirements. To reflect the statutory requirement, the interim final rule amends the NCUA's capital adequacy regulation to provide that covered PPP loans receive a zero percent risk weight. The rule provides that if the covered loan is pledged as collateral for a non-recourse loan that is provided as part of the PPPLF, the covered loan can be excluded from a credit union's calculation of total assets for the purposes of calculating its net worth ratio. The rule also makes a conforming amendment to the definition of commercial loan in the NCUA's member business loans and commercial lending rule. In an additional interim final rule issued on April 29, the NCUA made further amendments conforming to the CARES Act, and introduced changes intended to make it easier for credit unions to join the NCUA's Central Liquidity Facility.

On May 6, 2020, the OCC, Federal Reserve, and FDIC issued an interim final rule to require banking organizations to neutralize the effect under the LCR rule of participating in the MMLF and PPPLF. The

rule was issued to facilitate the use of these Federal Reserve facilities, and to ensure that the effects of their use are consistent and predictable under the LCR rule.

On June 26, 2020, the FDIC issued a final rule that mitigates the deposit insurance assessment effects of participating in the PPPLF, MMLF, and PPP. Specifically, the rule removes the effect of participation in the PPP and borrowings under the PPPLF on various risk measures used to calculate the assessment rate of an insured depository institution; removes the effect of participation in the PPP and MMLF program on certain adjustments to an insured depository institution's assessment rate; provides an offset to an insured depository institution's assessment for the increase to its assessment base attributable to participation in the PPP and MMLF; and removes the effect of participation in the PPP and MMLF when classifying insured depository institutions as small, large, or highly complex for assessment purposes.

Additional Guidance and Regulatory Actions in Response to COVID-19

Finally, agencies issued numerous additional guidance statements and regulatory changes in response to the economic and financial impact of COVID-19, including temporary relaxations of prudential standards and supervisory requirements and modifications of compliance deadlines.

In the second week of March 2020, the Federal Reserve encouraged financial institutions to review its SR letter 13-6 / CA letter 13-3, published in March 2013, entitled "Supervisory Practices Regarding Banking Organizations and their Borrowers and Other Customers Affected by a Major Disaster or Emergency." On March 13, the FDIC issued Financial Institution Letter 17-2020, encouraging financial institutions supervised by the FDIC to take prudent steps to assist customers and communities affected by COVID-19. Agencies encouraged banking organizations to use the Federal Reserve discount window and the capital and liquidity buffers designed to enable banking organizations to continue to serve households and businesses and support the economy in adverse situations.

On March 20, 2020, the Federal Reserve, OCC, and FDIC issued an interim final rule revising the definition of eligible retained income for all depository institutions, BHCs, and savings and loan holding companies subject to the agencies' capital rule. The revised definition would make any automatic limitations on capital distributions that could apply under the agencies' capital rules more gradual. The definition was revised again by an interim final rule issued the following week to make any automatic limitations on capital distributions that could apply under the total loss-absorbing capacity (TLAC) rule more gradually.

On March 22, 2020, the Federal Reserve, CSBS, CFPB, FDIC, NCUA, and OCC issued an interagency statement encouraging financial institutions to offer prudent loan modification programs to mitigate adverse impacts of COVID-19 on borrowers, improve loan performance, and reduce credit risk. Agencies noted that banks may presume that borrowers are not experiencing financial difficulty when short-term loan modifications (for example, six months) are made on a good faith basis in response to COVID-19. If those borrowers were current prior to any relief provided, the loan modifications are not considered troubled debt restructurings (TDRs). Such modifications include payment deferrals, fee waivers, extensions of repayment terms, or other insignificant delays in payment. Agencies said examiners would not automatically adversely risk rate credits that are affected by loan modifications, and regardless of whether or not modifications are considered TDRs, or are adversely classified, examiners would not criticize prudent loan modification efforts. In the same week, the Federal Reserve outlined adjustments to its supervisory approach that would prioritize outreach and monitoring while temporarily reducing examination activities, particularly for smaller banks. Large banks were instructed to submit their capital analysis plans, while additional time would be granted to resolve non-critical, existing supervisory findings.

On March 25, 2020, the OCC issued an interim final rule revising the agency's short-term investment fund (STIF) rule for national banks acting in a fiduciary capacity. The rule allowed the OCC to authorize banks to temporarily extend the maturity

limits of STIFs in light of a period of significant stress negatively affecting the ability of banks to operate in compliance with the maturity limits identified in the rule. The OCC simultaneously announced an order temporarily extending the maturity limits for STIFs affected by the market effects of COVID-19 upon certain conditions, including a determination by the bank that it would be acting in the best interests of the STIF under applicable law. The order extended the weighted average maturity and weighted average life of STIF investment portfolios to allow national banks to operate affected STIFs on a limited-time basis with increased maturity limits until July 20, 2020.

On March 27, 2020, the Federal Reserve, OCC, and FDIC announced that institutions were permitted to adopt early the SA-CCR rule for the reporting period ending March 31, on a best-efforts basis, to help improve market liquidity. SA-CCR was previously set to go into effect on April 1, 2020. On April 7, the Federal Reserve, FDIC, NCUA, OCC, and CFPB issued the "Interagency Statement on Loan Modifications and Reporting for Financial Institutions Working with Customers Affected by the Coronavirus (Revised)" to clarify the interaction between the March 22, 2020, interagency statement and section 4013 of the CARES Act. Section 4013 created a forbearance program for federally backed mortgage loans, protected borrowers from negative credit reporting due to loan accommodations related to the National Emergency, and provided financial institutions the option to temporarily suspend certain requirements under the U.S. generally accepted accounting principles (GAAP) related to TDR for a limited period of time to account for the effects of COVID-19.

On April 14, 2020, the Federal Reserve issued an interim final rule that revises, on a temporary basis for BHCs, savings and loan holding companies, and U.S. intermediate holding companies of foreign banking organizations, the calculation of total leverage exposure, the denominator of the supplementary leverage ratio in the Federal Reserve's capital rule, to exclude the on-balance sheet amounts of U.S. Treasury securities and deposits at Federal Reserve Banks. This exclusion has immediate effect and will remain in effect through March 31, 2021. The rule was adopted to allow BHCs, savings and loan holding companies, and intermediate holding companies subject to the supplementary leverage ratio increased flexibility to continue to act as financial intermediaries. The tier 1 leverage ratio is not affected by this rulemaking.

On April 17, 2020, the FDIC, OCC, and Federal Reserve issued an interim final rule that allows institutions supervised by the agencies to defer obtaining an appraisal or evaluation for up to 120 days after the closing of certain residential and commercial real estate loans.

On April 21, 2020, the NCUA issued a temporary final rule temporarily raising the maximum aggregate amount of loan participations that a federally insured credit union (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 NCUA also temporarily suspended limitations on the eligible obligations that a federal credit union (FCU) may purchase and hold. In addition, given physical distancing policies implemented in response to the crisis, the agency tolled the required timeframes for the occupancy or disposition of properties not being used for FCU business or that have been abandoned. These temporary modifications were set in place until December 31, 2020, unless extended.

On May 28, 2020, the Federal Reserve issued a final rule that amends compliance dates related to Single-Counterparty Credit Limits for BHCs and Foreign Banking Organizations (final SCCL rule), regarding the SCCL applicable to a foreign banking organization's combined U.S. operations only. The rule changed initial compliance dates of January 1, 2020, for a foreign banking organization that has the characteristics of a global systemically important banking organization (G-SIB), and July 1, 2020, for any other foreign banking organization subject to the final SCCL rule, to July 1, 2021 and January 1, 2022, respectively.

Also on May 28, 2020, the NCUA issued an interim final rule that temporarily modifies its prompt corrective action (PCA) regulations to help ensure that FICUs would remain operational

and liquid during the COVID-19 crisis. The first temporary change enables the agency to issue an order applicable to all FICUs to waive the earnings retention requirement for any FICU that is classified as adequately capitalized. The second modifies its regulations with respect to the specific documentation required for net worth restoration plans for FICUs that become undercapitalized. These temporary modifications were set in place until December 31, 2020.

On June 1, 2020, the OCC, Federal Reserve, and FDIC issued an interim final rule temporarily revising the supplementary leverage ratio calculation for depository institutions. Under the interim final rule, any depository institution subsidiary of a U.S. global systemically important BHC or any depository institution subject to Category II or Category III capital standards may elect to exclude temporarily U.S. Treasury securities and deposits at Federal Reserve Banks from the supplementary leverage ratio denominator. Additionally, under this interim final rule, any depository institution making this election must request approval from its primary federal banking regulator prior to making certain capital distributions so long as the exclusion is in effect. The interim final rule, like the related rule issued on April 14, was adopted to allow depository institutions that elect to opt into this treatment additional flexibility to act as financial intermediaries during this period of financial disruption. The rule will remain in effect through March 31, 2021 and does not affect the tier 1 leverage ratio.

Also on June 1, 2020, the OCC, Federal Reserve, FDIC, and NCUA issued final guidance for credit risk review. This guidance is relevant to all institutions supervised by the agencies and replaces Attachment 1 of the 2006 Interagency Policy Statement on the Allowance for Loan and Lease Losses. The final guidance discusses sound management of credit risk, a system of independent, ongoing credit review, and appropriate communication regarding the performance of the institution's loan portfolio to its management and board of directors.

On June 5, 2020, the OCC issued a final rule to strengthen and modernize the Community Reinvestment Act (CRA) by clarifying and expanding the activities that qualify for CRA credit; updating where activities count for CRA credit; creating a more consistent and objective method for evaluating CRA performance; and providing for more timely and transparent CRA-related data collection, recordkeeping, and reporting. In addition, the OCC, Federal Reserve, and FDIC released a statement in March noting that the agencies would favorably consider retail banking services and retail lending activities that meet the needs of low- and moderate-income individuals, small businesses, and small farms affected by COVID-19 and that are consistent with safe and sound banking practices and applicable laws, including consumer protection laws. Such activities could include offering short-term, unsecured credit products for creditworthy borrowers.

On June 15, 2020, the Federal Reserve announced that it would resume examination activities for all banks, after having reduced examination activity in March. Also in June, the Federal Reserve, FDIC, NCUA, OCC, and state regulators published examiner guidance to promote consistency and flexibility in the supervision and examination of financial institutions affected by the COVID-19 pandemic. Examiners will continue to assess institutions in accordance with existing agency policies and procedures and may provide supervisory feedback or downgrade an institution's composite or component ratings, when conditions have deteriorated. In conducting their supervisory assessment, examiners will consider whether institution management has managed risk appropriately, including taking appropriate actions in response to stresses caused by COVID-19 impacts. The agencies have issued numerous statements related to supervisory policy since the emergence of the pandemic.

On June 24, 2020, the OCC issued an interim final rule to lower assessments for most banks under its jurisdiction. Under the new rule, assessments due on September 30, 2020 for national banks, federal savings associations, and federal branches and agencies of foreign banks will be calculated using

the December 31, 2019 "Consolidated Reports of Condition and Income" (Call Report) for each institution, rather than the June 30, 2020 Call Report. In the event a bank's assets as reported on the June 30, 2020 Call Report are lower than on the December 31, 2019 Call Report, the OCC would calculate the assessment due on September 30, 2020 for the institution using the June 30, 2020 Call Report.

On August 3, 2020, the Federal Financial Institutions Examination Council on behalf of its members issued a statement setting forth prudent risk management and consumer protection principles for financial institutions to consider while working with borrowers as initial coronavirus-related loan accommodation periods come to an end and they consider additional accommodations.

On August 13, 2020, the OCC published an interim final rule that revised OCC regulations applicable to OCC-regulated banks administering collective investment funds (CIFs) invested primarily in real estate or other assets that are not readily marketable. The rule codified the time period generally available to a bank for withdrawing accounts from these CIFs and created an exception allowing a bank to extend the time period for withdrawals with OCC approval. The exception established by this rule was intended to enable a bank to preserve the value of a CIF's assets for the benefit of fund participants during unanticipated and severe market conditions, such as those resulting from COVID-19.

4.3.2 Dodd-Frank Act Stress Tests and Comprehensive Capital Analysis and Review

Section 165(i)(2) of the Dodd-Frank Act requires certain financial companies to conduct annual stress tests.

On February 6, 2020, the Federal Reserve and OCC, followed by the FDIC on February 14, released economic and financial market scenarios for use in upcoming 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 annual stress tests. The results of the company-run stress tests will assist the agency in assessing the company's risk profile and capital adequacy.

On March 18, 2020, the Federal Reserve issued a final rule intended to simplify its capital framework while preserving strong capital requirements for large firms. The final rule integrates the regulatory capital rule (capital rule) with CCAR, as implemented through the capital plan rule. The final rule makes amendments to the capital rule, capital plan rule, stress test rules, and Stress Testing Policy Statement. Under the final rule, the Federal Reserve will use the results of its supervisory stress test to establish the size of a firm's stress capital buffer requirement, which replaces the static 2.5 percent of risk-weighted assets component of a firm's capital conservation buffer requirement. Through the integration of the capital rule and CCAR, the final rule removes redundant elements of the current capital and stress testing frameworks that currently operate in parallel rather than together, including the CCAR quantitative objection and the assumption that a firm makes all capital actions under stress. The final rule applies to BHCs and U.S. intermediate holding companies of foreign banking organizations that have $100 billion or more in total consolidated assets.

On March 24, 2020, the FHFA issued a final rule amending its stress testing rule, pursuant to section 401 of EGRRCPA. These amendments adopt the proposed amendments without change to modify the minimum threshold for the regulated entities to conduct stress tests from $10 billion to $250 billion; remove the requirements for Federal Home Loan Banks subject to stress testing; and remove the adverse scenario from the list of required scenarios. These amendments align FHFA's rule with rules adopted by other financial institution regulators that implement the Dodd-Frank Act stress testing requirements, as amended by EGRRCPA.

4.3.3 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 17, 2019, the Federal Reserve and FDIC jointly announced that their review of the 2019 resolution plans of the eight largest and most complex domestic banking organizations did not find any "deficiencies," which are weaknesses that could result in additional prudential requirements if not corrected. However, plans from six of the eight banking organizations had "shortcomings," which are weaknesses that raise questions about the feasibility of a firm's plan but are not as severe as a deficiency. The shortcomings related to the ability of the firms to reliably produce, in stressed conditions, data needed to execute their resolution strategy.

Action plans to address the shortcomings were due to the agencies by April 30, 2020. The action plans demonstrated progress towards addressing the shortcomings. The agencies will review whether the shortcomings have been addressed adequately, in connection with their review of the 2021 targeted resolution plans for these firms.

On March 18, 2020, the FDIC and Federal Reserve invited comments on proposed guidance for the 2021 and subsequent resolution plan submissions by certain foreign banking organizations (FBOs). The proposed guidance is meant to assist these firms in developing their resolution plans. It would impact FBOs that are triennial filers and whose intermediate holding companies have a score of 250 or more under the second methodology of the G-SIB surcharge framework. The proposed guidance, which is largely based on prior guidance, describes the agencies' expectations regarding a number of key vulnerabilities in plans for a rapid and orderly resolution under the U.S. Bankruptcy Code (i.e., capital, liquidity, governance mechanisms, operational, legal entity rationalization and separability, and derivatives and trading activities). The proposed guidance also updates certain aspects of prior guidance based, in part, on the agencies' review of certain FBOs' most recent resolution plan submissions and changes to the resolution planning rule.

On May 6, 2020, in light of the challenges arising from the coronavirus response, the FDIC and the Federal Reserve extended the 2020 resolution plan submission deadline by 90 days to September 29, 2020 for four foreign banks, and the 2021 targeted resolution plan submission deadline by 90 days to September 29, 2021 for the large foreign and domestic banks in Category II and Category III of the agencies' large bank regulatory framework.

On July 1, 2020, the FDIC and the Federal Reserve provided information to the eight largest and most complex domestic banking organizations that will guide their next resolution plans, which are due by July 1, 2021. The 2021 plans will be required to include core elements of a firm's resolution plan—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 July 2021 submission will be the first targeted resolution plan, a type of plan introduced in the revisions to the agencies' resolution plan rule finalized last year.

Additionally, on July 1, 2020, the FDIC and the Federal Reserve announced that they recently completed a review of "critical operations," which are operations at certain firms whose failure or discontinuance would threaten U.S. financial stability, and informed the firms of their findings.

The agencies also announced their plan to complete another such review by July 2022, which will include a further, broader evaluation of the framework used to identify critical operations.

Furthermore, in 2020, 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.

On August 31, 2020, the FDIC and SEC issued a final rule required by the Dodd-Frank Act, which clarifies and implements provisions relating to the orderly liquidation of certain brokers or dealers (covered broker-dealers) in the event the FDIC is appointed receiver under Title II of the Dodd-Frank Act. The FDIC and SEC developed the final rule in consultation with the Securities Investor Protection Corporation (SIPC).

Among other things, the final rule clarifies that, upon the appointment of the FDIC as receiver, the FDIC would appoint SIPC to act as trustee for the broker-dealer. SIPC, as trustee, would determine and satisfy customer claims in the same manner as it would in a proceeding under the Securities Investor Protection Act of 1970. The treatment of the covered broker-dealer's qualified financial contracts would be governed in accordance with Title II. In addition, the final rule describes the claims process applicable to customers and other creditors of a covered broker-dealer and clarifies the FDIC's powers as receiver with respect to the transfer of assets of a covered broker-dealer to a bridge broker-dealer.

4.3.4 Volcker Rule

On July 31, 2020, the OCC, Federal Reserve, FDIC, SEC, and CFTC issued a final rule that amends the regulations implementing section 13 of the BHC Act. Section 13 (commonly known as the Volcker Rule) contains certain restrictions on the ability of a banking entity or nonbank financial company supervised by the Board to engage in proprietary trading and have certain interests in, or relationships with, a hedge fund or private equity fund. Like the proposal published in February, the final rule modifies three areas of the rule by streamlining the covered funds portion of the rule; addressing the extraterritorial treatment of certain foreign funds; and permitting banking entities to offer financial services and engage in other activities that do not raise concerns that the Volcker Rule was intended to address.

4.3.5 Insurance

NAIC / State Developments

In response to the COVID-19 pandemic, state insurance regulators and the NAIC provided guidance to insurers in several areas and sought information to better understand the pandemic's scope and potential coverage issues. States removed consumer cost-sharing for COVID-19 testing in most health insurance policies and continue to work with federal officials to implement additional measures enacted by Congress. States also issued bulletins that provided guidance to health insurers on prescription drug refills, prior authorization, grace periods, and coverage of telemedicine. Regulators also took steps to ease administrative burdens on carriers and agents and expand the pool of health providers in some states by relaxing licensing or credentialing requirements.

Some states have required or encouraged insurers to defer premium payments for consumers experiencing financial hardship due to COVID-19. Regulators in several states also issued directives on policy cancellations and non-renewals in several lines of insurance including health insurance, life insurance, auto insurance, and homeowners' insurance. Several states have mandated or encouraged auto insurance companies to institute premium rebates to drivers, who have significantly reduced miles driven during the pandemic, and several major auto insurers also provided rebates voluntarily.

The NAIC and state insurance regulators took several actions to identify the potential risks that COVID-19 might present to the insurance sector. Earlier this year, state insurance regulators through the NAIC issued an industry data call to assess the potential impacts of COVID-19 on insurance company solvency as well as a data call for information specifically relating to business interruption insurance. An initial set of this data was shared with FIO to assist it in exercising its statutory

authorities, including monitoring all aspects of the insurance industry and advising the Secretary of the Treasury on major domestic insurance policy issues.

The NAIC also issued accounting and reporting guidance to temporarily help mitigate the balance sheet impacts of COVID-19, including guidance relating to troubled debt restructuring, mortgage loan impairments, and nonpayment of premiums. Following up on stress tests that the NAIC conducted in late 2019 relating to the insurance industry's $158 billion in CLO holdings, the NAIC ran additional stress tests in spring 2020 that found senior tranches might be protected from widespread losses in a deep recession.

In addition to work relating to the COVID-19 response, state insurance regulators continued work on their Group Capital Calculation (GCC), which began in 2015. The GCC is designed to be an analytical tool that will give regulators information relating to the capital across certain insurance groups. Adoption of a model, including proposed legislative language for states that would protect GCC confidentiality, is expected in late 2020. Adoption by U.S. insurance supervisory authorities of a GCC is also necessary for purposes of implementation of the covered agreements described below.

The NAIC has continued to make progress on its Macroprudential Initiative, including the development of a liquidity stress test for large life insurers. Work on this initiative was placed on hold due to COVID-19 and, in its place, COVID-19 liquidity data calls were conducted on the largest life insurers to gauge the liquidity and capital impact of the pandemic on such insurers.

Covered Agreements

The Bilateral Agreement between the United States of America and the European Union 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. It entered into force on April 4, 2018. In anticipation of the withdrawal of the United Kingdom (UK) from the EU, in 2018 the United States and the UK entered into a substantively similar agreement, known as the U.S.-UK Covered Agreement, which is expected to enter into force shortly. Both agreements were negotiated by Treasury in coordination with the Office of the United States Trade Representative, pursuant to the Federal Insurance Office Act of 2010 (FIO Act).

In June 2019, in response to the covered agreements with the EU and the UK, the NAIC adopted changes to the Credit for Reinsurance Model Law and Credit for Reinsurance Model Regulation. The changes are intended to provide states with a model law and regulation that, upon adoption, aligns state law with the U.S. obligations under the agreements. In August 2020, the NAIC designated these revisions under its accreditation program, to take effect September 1, 2022. Pursuant to the terms of the covered agreements, this is the date by which the United States must complete any necessary preemption determination in accordance with the FIO Act. Some states have already completed the adoption of necessary amendments. Not later than March of 2021, as required under the covered agreements, FIO will begin reviewing the progress of each of the states and evaluating a potential preemption determination.

Cybersecurity

In July 2020, the New York Department of Financial Services (NYDFS) filed its first-ever enforcement action under its 2017 cybersecurity regulation against a title insurer for alleged exposure of hundreds of millions of documents, many of which were said to contain sensitive personal information.

As of June 30, 2020, eleven states—Alabama, Connecticut, Delaware, Indiana, Louisiana, Michigan, Mississippi, New Hampshire, Ohio, South Carolina, and Virginia—had adopted the NAIC's Insurance Data Security Model Law or similar law.

Terrorism Risk Insurance Program

The Federal Insurance Office assists the Secretary of the Treasury in administering the Terrorism Risk Insurance Program (TRIP) created under the Terrorism Risk Insurance Act of 2002, as amended (TRIA). Under the Terrorism Risk Insurance Program Reauthorization Act of 2019, TRIP has been reauthorized for an additional seven-year

period, ending December 31, 2027. Since 2016, Treasury has been required under TRIA to collect terrorism risk insurance information from insurers.

In June 2020, Treasury published a Report on the Effectiveness of the Terrorism Risk Insurance Program. In the report, Treasury concluded that TRIP has remained effective in making terrorism risk insurance available and affordable in the insurance marketplace and that the market for terrorism risk insurance has been relatively stable, with few observable changes over time in the relevant benchmarks.

IAIS Update

In November 2019, the International Association of Insurance Supervisors (IAIS) advanced version 2.0 of the International Capital Standard (ICS) into a five-year monitoring period from 2020 through 2024. The IAIS agreement consisted of three parts: (1) the design of the reference ICS being developed by the IAIS; (2) the parameters around the operationalization of the ICS monitoring period; and (3) the IAIS's approach to the comparability assessment of the Aggregation Method. The November 2019 IAIS meetings also resulted in the adoption of the holistic framework for the assessment and mitigation of systemic risk in the insurance sector, leveraging an activities-based approach to assessing potential systemic risks arising from products and activities. In October 2020, FIO published a notice in the Federal Register seeking public comment on a planned FIO study to assess the potential effects of the ICS on the U.S. insurance market, including the implications for product cost and availability for U.S. consumers, the global competitiveness of U.S. insurers, and insurer investment behavior in the capital markets.

In response to the onset of the COVID-19 global pandemic, the IAIS refocused its activities and projects on the impact of COVID-19. In addition, the IAIS issued a data call that focused on the effects of the COVID-19 global pandemic on the global insurance sector. The IAIS has also been monitoring supervisory responses to the pandemic and assessing the implications on the global insurance sector.

4.4 Financial Infrastructure, Markets, and Oversight

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

On September 19, 2019, the SEC issued a final rule, in accordance with the Dodd-Frank Act and pursuant to the Securities Exchange Act of 1934 (Exchange Act) which adopts recordkeeping, reporting, and notification requirements applicable to security-based swap dealers (SBSDs) and major security-based swap participants (MSBSPs), securities count requirements applicable to certain SBSDs, and additional recordkeeping requirements applicable to broker-dealers to account for their security-based swap and swap activities. The agency also made substituted compliance available with respect to recordkeeping, reporting, and notification requirements under Section 15F of the Exchange Act and the rules thereunder.

In January 2020, the CFTC finalized amendments to Part 39 of its regulations as part of its ongoing review of regulations applicable to CCPs. The amendments address certain risk management and reporting obligations, clarify the meaning of certain provisions, simplify processes for registration and reporting, and codify existing staff relief and guidance.

On February 4, 2020, the SEC issued a final rule that requires the application of specific risk mitigation techniques to portfolios of uncleared security-based swaps. In particular, the final rule establishes requirements for each registered SBSD and each registered MSBSP regarding, among other things, reconciling outstanding security-based swaps with applicable counterparties on a periodic basis, engaging in certain forms of portfolio compression exercises, as appropriate, and executing written security-based swap trading relationship documentation with each of its counterparties prior to, or contemporaneously with, executing a security-based swap transaction. The SEC also issued an interpretation addressing the application of the portfolio reconciliation, portfolio compression, and trading relationship documentation requirements to cross-border security-based swap activities,

and amended its regulations to address the potential availability of substituted compliance in connection with those requirements. Lastly, the final rule includes corresponding amendments to the recordkeeping, reporting, and notification requirements applicable to SBSDs and MSBSPs.

The same day, the SEC issued separate rule amendments pursuant to a final rule and provided guidance to address the cross-border application of certain security-based swap requirements under the Exchange Act that were added by Title VII of the Dodd-Frank Act. The SEC also issued a statement regarding compliance with rules for security-based swap data repositories and Regulation SBSR, a regulation that addresses regulatory reporting and public dissemination of security-based swaps. The compliance date for the registration and substantive regulation of SBSDs and MSBSPs is October 6, 2021. In addition, these entities are required to begin counting their security-based swap transactions towards the de minimis thresholds for registration on August 6, 2021.

On March 18, 2020, the CFTC issued a final rule that amends its regulations governing the offer and sale of foreign futures and options to customers located in the U.S. The amendment codifies the process by which the agency may terminate exemptive relief issued pursuant to its regulations.

On March 24, 2020, the SEC proposed to amend 17 CFR 242, Rules 600 and 603 and to adopt new Rule 614 of Regulation National Market System (NMS) under the Exchange Act to update the national market system for the collection, consolidation, and dissemination of information with respect to quotations for and transactions in NMS stocks (NMS information). This would expand the content of NMS information that is required to be collected, consolidated, and disseminated as part of the NMS under Regulation NMS and proposes to amend the method by which such NMS information is collected, calculated, and disseminated by introducing a decentralized consolidation model where competing consolidators replace the exclusive securities information processors.

The CFTC has adopted several modifications to its rules imposing margin requirements on uncleared swap transactions during the past year. On April 9, 2020, the CFTC issued a final rule revising its margin rules by establishing an additional compliance phase-in period (phase 6) and setting a September 1, 2021, compliance date for phase 6 entities. This amendment is intended to help ensure continued access to the swaps markets for certain entities with relatively smaller levels of swaps trading activities that may have difficulty meeting all of the operational conditions to exchange initial margin and is consistent with revisions adopted by the Basel Committee on Banking Supervision and the International Organization of Securities Commission (BCBS/IOSCO) to their joint international framework for margin requirements for non-centrally cleared derivatives. On May 11, 2020, the CFTC issued a final rule amending its margin rules to exclude the European Stability Mechanism from the scope of the rules.

On July 1, 2020, the Federal Reserve, FDIC, FCA, FHFA, and OCC issued a final rule that amends the agencies' regulations requiring swap dealers (SDs), SBSDs, major swap participants (MSPs), and MSBSPs under the agencies' respective jurisdictions to exchange margin with their counterparties for swaps that are not centrally cleared (Swap Margin Rule). The Swap Margin Rule as adopted in 2015 takes effect under a phased compliance schedule spanning from 2016 through 2020, and the entities covered by the rule continue to hold swaps in their portfolios that were entered into before the effective dates of the rule. Such swaps are grandfathered from the Swap Margin Rule's requirements until they expire according to their terms. The final rule permits swaps entered into prior to an applicable compliance date (legacy swaps) to retain their legacy status in the event that they are amended to replace an interbank offered rate or other discontinued rate, modifies initial margin requirements for non-cleared swaps between affiliates, introduces an additional compliance date for initial margin requirements, clarifies the point in time at which trading documentation must be in place, permits legacy swaps to retain their legacy status in the event that they are amended due to technical amendments, notional reductions, or portfolio

compression exercises, and makes technical changes to relocate the provision addressing amendments to legacy swaps that are made to comply with the Qualified Financial Contract Rules. In addition, the final rule addresses comments received in response to the agencies' publication of the interim final rule that would preserve the status of legacy swaps meeting certain criteria in the case of a Brexit without a negotiated settlement agreement. The same day, the agencies issued an interim final rule, with request for comment, extending the implementation deadlines of phase 5 and phase 6 by one year, to September 1, 2021, and September 1, 2022, respectively.

On July 10, 2020, the CFTC issued an interim final rule further amending its initial margin compliance schedule to address operational challenges as a result of the coronavirus pandemic. The interim final rule deferred the compliance date for phase 5 entities to September 1, 2021. The CFTC in October 2020 also extended the phase 6 compliance date to September 1, 2022. The CFTC's actions were consistent with revisions made by the BCBS/IOSCO to the implementation schedule of the international framework for margin requirements for non-centrally cleared derivatives.

On July 22, 2020, the CFTC issued a final rule amending regulation 50.52, which exempts certain affiliated entities within a corporate group from the swap clearing requirement under Section 2(h) of the Commodity Exchange Act. These amendments concern the anti-evasionary condition to the inter-affiliate exemption from the swap clearing requirement. Under this condition, affiliates electing the exemption must ensure that swaps subject to the clearing requirement entered into with unaffiliated counterparties either be cleared or be eligible for an exception to or exemption from the clearing requirement. The amendments make permanent certain temporary alternative compliance frameworks intended to make this anti-evasionary condition workable for international corporate groups in the absence of foreign clearing regimes determined to be comparable to CFTC requirements.

On July 24, 2020, the CFTC issued a final rule to prohibit post-trade name give-up for swaps executed, pre-arranged, or pre-negotiated anonymously on or pursuant to the rules of a swap execution facility and intended to be cleared. The final rule provides an exception for package transactions that include a component transaction that is not a swap intended to be cleared, including but not limited to U.S. Treasury swap spreads.

On September 14, 2020, the CFTC issued a final rule that addresses the cross-border application of the SD registration threshold and certain requirements applicable to SDs and MSPs, establishes a formal process for requesting comparability determinations for the requirements from the CFTC, and defines key terms for the purpose of applying the Commodity Exchange Act's swaps provisions to cross-border transactions. This approach considers international comity principles and the CFTC's interest in focusing its authority on potential significant risks to the U.S. financial system. This final rule supersedes the CFTC's 2013 cross-border guidance with respect to the CFTC requirements covered by the final rule.

On September 15, 2020, the CFTC issued a final rule imposing capital and financial reporting requirements on SDs and MSPs that are not subject to a banking regulator. The adoption of the capital requirements completes the CFTC's obligations under Title VII of the Dodd-Frank Act to adopt rules imposing both capital and margin requirements on SDs and MSPs. The capital rules recognize the diversity of organizations registered with the CFTC as SDs, which includes global financial institutions, small SDs that engage primarily in swaps with commercial end-users, and agricultural or energy firms, by permitting the SDs to elect one of three capital approaches: (1) a bank-based capital approach that is consistent with the capital rules of the prudential regulators; (2) a capital approach that is consistent with the CFTC's existing FCM and the SEC's existing securities broker-dealer capital requirements; and, (3) for SDs predominantly engaged in nonfinancial activities, a capital requirement based on the SD's tangible net worth. The CFTC's final capital rules also require MSPs to maintain positive tangible net worth. The

financial reporting requirements require SDs and MSPs to file with the CFTC, among other reports, periodic unaudited financial statements and annual audited financial statements. The CFTC capital and financial reporting rules have a compliance date of October 6, 2021.

On September 22, 2020, the CFTC issued an NPRM proposing amendments to the CFTC margin rules to permit the application of a minimum transfer amount of up to $50,000 for each separately managed account of a counterparty to a CFTC-regulated SD or MSP, and the application of separate minimum transfer amounts for initial and variation margin. In addition, on September 23, 2020, the CFTC issued an NPRM proposing amendments to the definition of the term "material swaps exposure" by revising the method for calculating the average aggregate notional amount of swaps and other financial derivatives products (AANA). The proposed amendment would change the period for calculating AANA from June, July, and August of the prior year to March, April, and May of the current year, and the data points for calculating AANA, by utilizing month-end dates rather than daily figures during the three-month calculation period. The proposed amendment would also establish September 1 of each year as the date for determining material swaps exposure. These proposed changes would align the CFTC's approach with the BCBS/IOSCO's margin framework. The proposal would also permit an SD or MSP subject to the CFTC margin rule to use the risk-based model calculation of initial margin of a counterparty that is a CFTC-registered SD or MSP rather than its own initial margin calculation.

CMGs continued to coordinate resolution planning for two U.S. CCPs that are considered systemically important in more than one jurisdiction, consistent with international standards. The CMGs discussed how the two U.S. CCPs navigated the operational and financial challenges posed by the COVID-19 pandemic. Processes for cooperation and sharing information, both during a crisis and for purposes of resolution planning, are set forth in cooperation arrangements finalized in September 2020 that are specific to the CMG.

4.4.2 Securities and Asset Management

On March 10, 2020, the SEC issued a final rule amending the definition of the term "venture capital fund" and the private fund adviser exemption under the Investment Advisers Act of 1940 (Advisers Act) to reflect exemptions from registration for investment advisers who advise rural business investment companies (RBICs). These exemptions were enacted as part of the RBIC Advisers Relief Act, which amended Advisers Act sections 203(l) and 203(m), among other provisions. Specifically, the RBIC Advisers Relief Act amended Advisers Act section 203(l), which exempts from investment adviser registration any adviser who solely advises venture capital funds, by stating that RBICs are venture capital funds for purposes of the exemption. Accordingly, the new rule amended the definition of the term "venture capital fund" to include RBICs. The RBIC Advisers Relief Act also amended Advisers Act section 203(m), which exempts from investment adviser registration any adviser who solely advises private funds and has AUM in the United States of less than $150 million, by excluding RBIC assets from counting towards the $150 million threshold. Accordingly, the final rule amends the definition of AUM in the private fund adviser exemption to exclude the assets of RBICs.

On March 26, 2020, the SEC issued a final rule that amends the accelerated filer and large accelerated filer definitions to tailor the types of issuers that are included in the categories of accelerated and large accelerated filers and promote capital formation, preserve capital, and reduce unnecessary burdens for certain smaller issuers while maintaining investor protections. The amendments exclude from the accelerated and large accelerated filer definitions an issuer that is eligible to be a smaller reporting company and that had annual revenues of less than $100 million in the most recent fiscal year for which audited financial statements are available. The amendments also include a specific provision excluding business development companies from the accelerated and large accelerated filer definitions in analogous circumstances. In addition, the amendments increase the transition thresholds for accelerated and large accelerated filers becoming non-accelerated filers from $50 million to $60

million, and for exiting large accelerated filer status from $500 million to $560 million.

On March 31, 2020, the SEC issued temporary final rules for Form ID filers and for issuers subject to reporting obligations pursuant to Regulation Crowdfunding and Regulation A in order to address the needs of companies directly or indirectly affected by COVID-19. The temporary final rules provide temporary relief from the Form ID notarization process for certain filers and extend the filing deadlines for specified reports and forms due pursuant to Regulation Crowdfunding and Regulation A for certain issuers. On the same day, the SEC proposed amendments to facilitate capital formation and increase opportunities for investors by expanding access to capital for entrepreneurs across the United States. Specifically, the proposed amendments are intended to simplify, harmonize, and improve certain aspects of the exempt offering framework to promote capital formation while preserving or enhancing important investor protections. The proposed amendments seek to address gaps and complexities in the exempt offering framework that may impede access to investment opportunities for investors and access to capital for issuers.

On April 20, 2020, the SEC issued a final rule that amends the financial disclosure requirements for guarantors and issuers of guaranteed securities registered or being registered, and issuers' affiliates whose securities collateralize securities registered or being registered in Regulation S-X to improve those requirements for both investors and registrants. The changes are intended to provide investors with material information regarding the specific facts and circumstances, make the disclosures easier to understand, and reduce the costs and burdens to registrants. In addition, by reducing the costs and burdens of compliance, issuers may be encouraged to offer guaranteed or collateralized securities on a registered basis, thereby affording investors protection they may not be provided in offerings conducted on an unregistered basis. Finally, by making it less burdensome and less costly for issuers to include guarantees or pledges of affiliate securities as collateral when they structure debt offerings, the revisions may increase the number of registered offerings that include these credit enhancements, which could result in a lower cost of capital and an increased level of investor protection.

On May 7, 2020, the SEC issued a temporary final rule to facilitate capital formation for small businesses impacted by COVID-19. Specifically, the rule is intended to expedite the offering process for smaller, previously established companies directly or indirectly affected by COVID-19 that are seeking to meet their funding needs through the offer and sale of securities pursuant to Regulation Crowdfunding. The temporary final rule is designed to facilitate this offering process by providing tailored, conditional relief from certain requirements of Regulation Crowdfunding relating to the timing of the offering and the availability of financial statements required to be included in issuers' offering materials, while retaining appropriate investor protections.

On May 13, 2020, the SEC issued a proposed new rule (rule 2a-5) under the Investment Company Act of 1940 (Investment Company Act) that would 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 proposed rule would provide requirements for determining fair value in good faith with respect to a fund for purposes of section 2(a)(41) of the Investment Company Act. This determination would involve assessing and managing material risks associated with fair value determinations; selecting, applying, and testing fair value methodologies; overseeing and evaluating any pricing services used; adopting and implementing policies and procedures; and maintaining certain records. The proposed rule would permit a fund's board of directors to assign the fair value determination to an investment adviser of the fund, who would then carry out these functions for some or all of the fund's investments. This assignment would be subject to board oversight and certain reporting, recordkeeping, and other requirements designed to facilitate the board's ability to effectively oversee the adviser's fair value determinations. The proposed rule would include 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

proposed rule would also define when market quotations are readily available under section 2(a)(41) of the Investment Company Act. If rule 2a-5 is adopted, the SEC would rescind previously issued guidance on the role of the board of directors in determining fair value and the accounting and auditing of fund investments.

On June 1, 2020, the SEC issued a final rule that modifies the registration, communications, and offering processes for business development companies (BDCs) and other closed-end investment companies under the Securities Act of 1933. As directed by Congress, the SEC adopted rules that allow these investment companies to use the securities offering rules that are already available to operating companies. These rules will extend to closed-end investment companies offering reforms currently available to operating company issuers by expanding the definition of "well-known seasoned issuer" to allow these investment companies to qualify; streamlining the registration process for these investment companies, including the process for shelf registration; permitting these investment companies to satisfy their final prospectus delivery requirements by filing the prospectus with the SEC; and permitting additional communications by and about these investment companies during a registered public offering. In addition, the SEC amended certain rules and forms to tailor the disclosure and regulatory framework to these investment companies. These amendments also modernize the SEC's approach to securities registration fee payment by requiring closed-end investment companies that operate as "interval funds" to pay securities registration fees using the same method as mutual funds and exchange-traded funds and extend the ability to use this payment method to issuers of certain continuously offered, exchange-traded products. The final rule expands the ability of certain registered closed-end funds or BDCs that conduct continuous offerings to make changes to their registration statements on an immediately effective basis or on an automatically effective basis after a set period of time after filing. The final rule also sets forth certain structured data reporting requirements, including for filings on the form providing annual notice of securities sold pursuant to the rule under the Investment Company Act that prescribes the method by which certain investment companies (including mutual funds) calculate and pay registration fees.

On October 9, 2020, the SEC issued a final rule amending the definition of "accredited investor" in its rules to add new categories of qualifying natural persons and entities, and to make certain other modifications to the existing definition. The amendments are intended to update and improve the definition to identify more effectively investors that have sufficient knowledge and expertise to participate in investment opportunities that do not have the rigorous disclosure and procedural requirements, and related investor protections, provided by registration under the Securities Act of 1933. The SEC also adopted amendments to the "qualified institutional buyer" definition in Rule 144A under the Securities Act to expand the list of entities that are eligible to qualify as qualified institutional buyers.

4.4.3 Accounting Standards

On June 1, 2020, the OCC, Federal Reserve, FDIC, and NCUA issued a joint policy statement on allowances for credit losses (ACLs), in response to changes to the U.S. generally accepted accounting principles (GAAP), as promulgated by the Financial Accounting Standards Board (FASB) Accounting Standards Update 2016-13 (CECL) and subsequent amendments issued since June 2016. These changes are codified in Accounting Standards Codification (ASC) Topic 326. This interagency policy statement describes the measurement of expected credit losses under the CECL methodology and the accounting for impairment on available-for-sale debt securities in accordance with ASC Topic 326; the design, documentation, and validation of expected credit loss estimation processes, including the internal controls over these processes; the maintenance of appropriate ACLs; the responsibilities of boards of directors and management; and examiner reviews of ACLs.

On September 15, 2020, Treasury released a study on the need, if any, for changes to regulatory capital requirements necessitated by CECL as required by Congress. The study found that a definitive assessment of the impact of CECL on regulatory

capital is not currently feasible, in light of the state of CECL implementation across financial institutions and current market dynamics. Treasury also stated it will continue to actively monitor CECL implementation and consult with relevant stakeholders, including the prudential regulators, FASB, and the SEC.

On September 30, 2020, the OCC, Federal Reserve, and FDIC issued a final rule delaying the estimated impact on regulatory capital stemming from the implementation of CECL. The final rule provides banking organizations that implement CECL during the 2020 calendar year the option to delay for two years an estimate of CECL's effect on regulatory capital, relative to the incurred loss methodology's effect on regulatory capital, followed by a three-year transition period. The agencies provided this relief to allow these banking organizations to better focus on supporting lending to creditworthy households and businesses while also maintaining the quality of regulatory capital.

4.4.4 Bank Secrecy Act/Anti-Money Laundering Regulatory Reform

On February 21, 2020, the Financial Action Task Force (FATF), an international intergovernmental organization that developed international standards for combating money laundering and the financing of terrorism and proliferation of weapons of mass destruction, released guidance on the issue of digital identity for customer identification and verification. This guidance explains how digital ID systems could meet FATF's customer due diligence standards and will assist governments and financial institutions worldwide to apply a risk-based approach to using digital ID systems. The FATF also discussed the changes made by the United States to improve the anti-money laundering (AML)/countering the financing of terrorism (CFT) system since the 2016 Mutual Evaluation Report, including Treasury's Customer Due Diligence rulemaking and beneficial ownership requirements that went into effect in 2018.

In July 2020, the FATF completed a 12-month review on the state of implementation of standards that were revised in June 2019 to explicitly impose AML/CFT obligations on virtual assets and virtual asset service providers. The United States had joined Switzerland as one of the first countries to voluntarily submit to an assessment of its compliance with the new standards. The results of the FATF's findings will be published after they go through the FATF's quality and consistency process. FATF announced a second 12-month review for completion in 2021 and committed to providing updated guidance on virtual assets, including AML/CFT and counter-proliferation financing implications of so-called "stablecoins." FATF also called on its members to tackle new threats and vulnerabilities posed by criminals during the COVID-19 crisis.

4.5 Mortgages and Consumer Protection

4.5.1 Mortgages and Housing Finance

On April 3, 2020, the CFPB, Federal Reserve, FDIC, NCUA, OCC, and CSBS issued a joint policy statement providing regulatory flexibility to enable mortgage servicers to work with struggling consumers affected by COVID-19. Under the CARES Act, borrowers in a federally backed mortgage loan experiencing financial hardship due, directly or indirectly, to COVID-19, may submit a forbearance request to their mortgage servicer. In response, servicers must provide a CARES Act forbearance that allows borrowers to defer their mortgage payments for up to 180 days with the possibility of an extension of up to another 180 days. The policy statement states that the agencies do not intend to take supervisory or enforcement action against mortgage servicers for delays in sending certain early intervention and loss mitigation notices, provided that servicers make good faith efforts to do so within a reasonable time. The joint statement clarifies the application of the Regulation X (which implements the Real Estate Settlement Procedures Act) mortgage servicing rules to CARES Act forbearance and describes the agencies' flexible approach to supervision and enforcement with respect to certain Regulation X provisions that require consumer notices and loss mitigation provisions. The CFPB released a set of FAQs to provide additional compliance guidance.

On April 17, 2020, the OCC, Federal Reserve, and FDIC issued an interim final rule to temporarily

amend the agencies' regulations requiring appraisals and evaluations for certain real estate loan transactions. The interim final rule defers the requirement to obtain an appraisal or evaluation for up to 120 days following the closing of a transaction for certain residential and commercial real estate transactions, excluding transactions for acquisition, development, and construction of real estate. The rule states that regulated institutions should make best efforts to obtain a credible valuation of real property collateral before the loan closing, and otherwise underwrite loans consistent with the principles in the agencies' Standards for Safety and Soundness and Real Estate Lending Standards. The agencies provided this relief to allow regulated institutions to expeditiously extend liquidity to creditworthy households and businesses in light of recent strains on the U.S. economy due to COVID-19. The provisions of the interim final rule expire on December 31, 2020. The agencies finalized the interim final rule by issuing a final rule on October 16, 2020. The final rule adopted the interim final rule without substantive changes. The final rule became effective on October 16, 2020. The NCUA issued a substantially similar interim final rule on April 21, and together the agencies issued a joint statement outlining additional flexibilities around appraisal standards.

On May 12, 2020, the CFPB issued a final rule amending Regulation C, which implemented the Home Mortgage Disclosure Act (HMDA), to increase the threshold for reporting data about closed-end mortgage loans, so that institutions originating fewer than 100 closed-end mortgage loans in either of the two preceding calendar years do not have to report such data effective July 1, 2020. The CFPB also set the threshold for reporting data about open-end lines of credit at 200 open-end lines of credit effective January 1, 2022, upon the expiration of the current temporary threshold of 500 open-end lines of credit.

On June 25, 2020, the FHFA issued a final rule amending the existing Federal Home Loan Bank Housing Goals regulation. The final rule replaces the existing regulation's four separate retrospective housing goals with a single prospective mortgage purchase housing goal with a target level of 20 percent. The final rule also establishes a separate small member participation housing goal with a target level of 50 percent. It provides that a bank may request FHFA approval of alternative target levels for either or both of the goals. The final rule also establishes that housing goals apply to each bank that acquires any Acquired Member Assets mortgages during a year, eliminating the existing $2.5 billion volume threshold that previously triggered the application of housing goals for each Bank. Enforcement of the final rule will phase in over three years.

On June 26, 2020, the CFPB published a final interpretive rule on Regulation Z. The CFPB produces annually a list of rural and underserved counties and areas that is used in applying various Regulation Z provisions, such as the exemption from the requirement to establish an escrow account for a higher-priced mortgage loan and the ability to originate balloon-payment qualified mortgages. Regulation Z states that an area is "underserved" during a calendar year if, according to HMDA data for the preceding calendar year, it is a county in which no more than two creditors extended covered transactions, as defined in Regulation Z, secured by first liens on properties in the county five or more times. The official commentary provides an interpretation relating to this standard that refers to certain data elements from the previous version of the CFPB's Regulation C, which implements HMDA, which were modified or eliminated in the 2015 amendments to Regulation C. The CFPB issued this interpretive rule to specifically describe the HMDA data that will instead be used in determining that an area is "underserved."

On June 30, 2020, the FHFA issued a revised NPRM and request for comment on a new regulatory capital framework for Fannie Mae and Freddie Mac that would amend definitions in FHFA's regulations for assessments and minimum capital. The proposed rule would also remove the Office of Federal Housing Enterprise Oversight's previous regulation on capital for the Enterprises.

On June 30, 2020, the CFPB issued an interim final rule amending Regulation X to temporarily permit mortgage servicers to offer certain loss mitigation

options based on the evaluation of an incomplete loss mitigation application. Eligible loss mitigation options, among other things, must permit borrowers to delay paying certain amounts until the mortgage loan is refinanced, the mortgaged property is sold, the term of the mortgage loan ends, or, for a mortgage insured by the FHA, the mortgage insurance terminates. These amounts include, without limitation, all principal and interest payments forborne through payment forbearance programs made available to borrowers experiencing financial hardships due, directly or indirectly, to the COVID-19 emergency, including the payment forbearance program offered pursuant to section 4022 of the CARES Act. These amounts also include principal and interest payments that are due and unpaid by these borrowers.

On July 10, 2020, the CFPB issued two NPRMs that would amend certain definitions of qualified mortgages (QMs) in Regulation Z. Regulation Z generally 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 QMs obtain certain protections from liability. There are several different categories of QMs, including Temporary Government Sponsored Enterprise (GSE) QM loans and General QM loans. Temporary GSE QM loans include loans that are eligible for purchase or guarantee by either of the Enterprises, while operating under the conservatorship or receivership of the FHFA. The Enterprises are currently under Federal conservatorship. The CFPB established the Temporary GSE QM loan definition as a temporary measure that is set to expire no later than January 10, 2021 or when the Enterprises exit conservatorship, whichever occurs first.

In one NPRM released on July 10, 2020, the CFPB proposed to extend the Temporary GSE QM loan definition to expire upon the effective date of final amendments to the General QM loan definition (or when the Enterprises cease to operate under the conservatorship of the FHFA, if that happens earlier). The final rule extending the Temporary QM loan definition was issued October 26, 2020. The other NPRM issued on July 10, 2020 proposed amendments to the General QM loan definition. For General QM loans, the ratio of the consumer's total monthly debt to total monthly income (DTI ratio) must not exceed 43 percent. In the NPRM related to the General QM loan definition, the CFPB proposed, among other things, to remove the General QM loan definition's 43 percent DTI limit and replace it with price-based thresholds. The objective of the NPRMs is to facilitate a smooth and orderly transition away from the Temporary GSE QM loan definition and to ensure access to responsible, affordable mortgage credit upon its expiration.

On July 22, 2020, the CFPB issued an NPRM that would amend Regulation Z to exempt certain insured depository institutions and insured credit unions from the requirement to establish escrow accounts for certain higher-priced mortgage loans.

On August 28, 2020, the CFPB issued an NPRM proposing to create a new category of QMs (Seasoned QMs) for first-lien, fixed-rate covered transactions that have met certain performance requirements over a 36-month seasoning period, are held in portfolio until the end of the seasoning period, comply with general restrictions on product features and points and fees, and meet certain underwriting requirements. The CFPB's primary objective with this NPRM is to ensure access to responsible, affordable mortgage credit by adding a Seasoned QM definition to the existing QM definitions.

In September 2020, CSBS issued for public comment proposed regulatory prudential standards for nonbank mortgage servicers subject to licensing and supervision by state financial regulators. The proposed standards include baseline prudential standards that cover eight areas, including capital, liquidity, risk management, data standards and integrity, data protection (including cyber risk), corporate governance, servicing transfer requirements, and change of control requirements. The capital and liquidity components of the baseline standards would be consistent with the minimum financial eligibility requirements imposed on nonbank seller/servicers by the Enterprises. Additionally, the proposed standards include enhanced prudential standards which would apply

higher capital and liquidity requirements as well stress testing and resolution planning requirements on certain, large complex servicers.

4.5.2 Consumer Protection

On May 21, 2020, the CFPB extended the comment period for a supplemental NPRM regarding time-barred debt. The CFPB proposed to prohibit debt collectors from using non-litigation means (such as calls) to collect on time-barred debt unless collectors disclose to consumers during the initial contact and on any required validation notice that the debt is time-barred. Consumer research conducted by the CFPB found that a time-barred debt disclosure helps consumers understand that they cannot be sued if they do not pay, helping consumers make better informed decisions about whether to pay the debt.

On May 22, 2020, the CFPB issued a no-action letter (NAL) template that insured depository institutions can use to apply for a NAL covering their small-dollar credit products. The NAL template includes protections for consumers who seek small-dollar loan products.

On June 5, 2020, the CFPB issued a final rule amending the remittance rule. The Electronic Fund Transfer Act, as amended by the Dodd-Frank Act, establishes certain protections for consumers sending international money transfers, or remittance transfers. The CFPB's remittance rule in Regulation E implements these protections. The CFPB amended Regulation E and the official interpretations of Regulation E to provide tailored exceptions to address compliance challenges that insured depository institutions may face in certain circumstances upon the expiration of a statutory exception that allows insured depository institutions to disclose estimates instead of exact amounts to consumers. The amendments to Regulation E became effective on July 21, 2020, the same day the statutory exception expired. The CFPB also increased a safe harbor threshold related to whether a person makes remittance transfers in the normal course of its business. On April 10, 2020, the CFPB issued a policy statement that for international remittance transfers that occur on or after July 21, 2020 and before January 1, 2021, the CFPB will neither cite supervisory violations nor initiate enforcement actions against insured institutions for continuing to provide estimates to consumers under the temporary exception, instead of actual amounts.

On July 21, 2020, the CFPB issued a final rule amending its regulations governing payday, vehicle title, and certain high-cost installment loans. Specifically, the CFPB revoked several provisions of those regulations, including ones that provide that it is an unfair and abusive practice for a lender to make a covered short-term or longer-term balloon-payment loan, including payday and vehicle title loans, without reasonably determining that consumers have the ability to repay those loans according to their terms; prescribe mandatory underwriting requirements for making the ability-to-repay determination; and exempt certain loans from the mandatory underwriting requirements. The CFPB made these amendments to the regulations based on its re-evaluation of the legal and evidentiary bases for these provisions. The final rule did not amend the provisions of the regulations that impose certain requirements on providers that obtain authorization to initiate payment withdrawals, including prohibiting such withdrawals after two failed attempts without a new and specific authorization, and disclosures related to payment practices.

4.6 Data Scope, Quality, and Accessibility

4.6.1 Data Scope

Expansion of LEI Adoption

During the past year, global adoption of the Legal Entity Identifier (LEI) of the Global LEI System continued to expand. As of September 30, 2020, more than 1.7 million LEIs had been issued by 36 approved operational issuers. Approximately 34 percent of these were issued in the United States, and approximately 13 percent were issued to U.S.-based entities. The total number of LEIs issued represents a year-to-date increase of 9 percent, which follows the 9 percent increase in 2019.

This expansion continues to be driven primarily by the LEI's use in financial regulation, particularly in the European Union. Beginning in January 2018, EU regulations under the revised Markets in

Financial Instruments Directive (MiFID II) required entities involved in securities and Over-the-Counter (OTC) derivatives transactions to have an LEI and to use that LEI when reporting these transactions. 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.

Improving LEI Data Quality

Improving the quality of LEI data is important to building market confidence and the utility of the LEI. Therefore, considerable attention is directed to this challenge by the Council members that are represented on the Legal Entity Identifier Regulatory Oversight Committee (LEI ROC), including the OFR, SEC, CFTC, CFPB, FDIC, OCC, and the Federal Reserve. The LEI ROC is a group of more than 60 regulatory authorities from around the world that oversee the Global LEI Foundation (GLEIF). The GLEIF is a not-for-profit organization that serves as the Global LEI System's central operating unit and ensures the system's operational integrity.

One area of particular interest to these Council members is the ongoing work on "Level 2" LEI data – i.e., data submitted by legal entities acquiring an LEI regarding their "direct accounting consolidating parent" and their "ultimate accounting consolidating parent." Level 2 LEI data allows parties to a financial transaction to use LEIs to identify not just the counterparties with whom they are transacting, but also affiliated entities, thereby improving the ability of such entities to perform a risk assessment of the transaction counterparties.

This past year, the LEI ROC continued to focus on improving the quality of Level 2 LEI data, as well as other elements of LEI reference data. The Council is committed to serving on the LEI ROC and working with the GLEIF to ensure the quality of LEI data is sufficient for use by industry participants and regulators.

Updated LEI Standard

This past year, the International Organization for Standardization (ISO) completed a five-year systematic review of ISO 17442 (i.e., the ISO standard on which the Global LEI System is based) and published an updated version of this standard. Council members contributed to this review in a variety of ways.

Expanded Role of the LEI ROC

This past year, the LEI ROC conducted due diligence and related work that led to its decision to take on the role of international governance body for new regulatory financial data standards for OTC derivative transaction reporting, which standards had earlier been promulgated by the Committee on Payments and Market Infrastructures-International Organization of Securities Commissions (CPMI-IOSCO) and the FSB. These standards are the Unique Transaction Identifier (UTI), the Unique Product Identifier (UPI), and the Critical Data Elements (CDE). The LEI ROC agreed to take on this new role following the review of the work of its Working Group on Governance of Unique Identifiers and Data Elements. That work, in key parts, was performed in collaboration with the Working Group on UTI and UPI Governance (GUUG) of the FSB. On October 1, 2020, after having obtained the approval of the LEI ROC and FSB, the LEI ROC assumed the role of international governance body for the UTI, UPI, and CDE.

4.6.2 Data Quality

Reporting of Standardized Derivatives Data

In 2020, Council members continued to participate in the development of international regulatory and industry standards for the reporting of OTC derivatives transactions. A key milestone reached during the year was the approval of the UTI as a new ISO standard (ISO 23897), with support and input from Council members. This industry standard is now available for global application. Because this industry standard is expected to be used by regulators in multiple jurisdictions in their respective OTC derivative transaction reporting regimes, the UTI will improve the abilities of

firms and regulators to monitor these financial transactions across borders.

Another milestone reached during 2020 was an agreement by ISO to initiate development work on a new ISO standard for the UPI. Council members contributed to the submission to ISO on UPI. This development work is expected to continue into 2021. The UPI will allow derivatives regulators and other government agencies to better monitor emerging financial risks by categorizing different types of derivatives transactions. The Derivatives Service Bureau (DSB), a subsidiary of the Association of National Numbering Agencies, will act as the UPI Service Provider (i.e., it will receive and store product attributes and assign UPI codes to OTC derivatives products).

In 2020 Council members participated in a Joint Small Group of FSB GUUG and LEI ROC to refine DSB governance and to continue refinement of regulatory technical standards for CDE beyond those developed by CPMI-IOSCO. Like the UTI and UPI, the CDE are expected to be used by regulators in multiple jurisdictions in their respective OTC derivative transaction reporting regimes. It is expected these data elements will be submitted to ISO as business concepts or business elements within the 'data dictionary' of the ISO 20022 standard. Council members are participating in preparatory work for this submission, which is being conducted in partnership with the Society for Worldwide Interbank Financial Telecommunications (SWIFT), the Registration Authority for ISO 20022.

5 Potential Emerging Threats, Vulnerabilities, and Council Recommendations

The outbreak of the COVID-19 pandemic is the biggest external shock to hit the post-war U.S. economy. As businesses and establishments shut down in March and April, private-sector employment declined by almost a fifth. The implementation of the CARES Act and a series of policy measures taken by the Federal Reserve and Treasury helped stabilize financial markets. Although these policy measures have rejuvenated credit markets, a protracted outbreak can adversely affect any recovery and prolong the downturn. This section presents a general discussion of identified vulnerabilities in the context of the COVID-19 stress, highlights key actions taken to mitigate risks, and makes recommendations for addressing the risks.

5.1 Nonfinancial Business: Corporate Credit

Low interest rates after the 2008 financial crisis fueled a prolonged credit expansion in nonfinancial business. Since 2011, the rate of growth in corporate borrowing has exceeded the growth in nominal GDP, pushing the corporate debt-to-GDP ratio to historic highs when the pandemic hit the United States (**see Section 3.2.1**). As credit conditions deteriorated in March, market financing dried up significantly. Bank credit lines became the principal source of funding for most businesses, especially those adversely affected by the pandemic (**see Section 3.5.1**).

Rapid and decisive intervention by the Federal Reserve and Treasury in March helped generate a rebound in debt financing and revived investor sentiment. Since then, principal equity indices have broken through to historic highs, while spreads in commercial paper and bond financing have also returned to near pre-pandemic lows.

Meanwhile, banks have tightened standards on new lending. Since March, nearly $2 trillion in nonfinancial corporate debt has been downgraded and default rates on leveraged loans and corporate bonds have increased considerably. Business bankruptcy filings are approaching cyclical highs and are likely to increase until a full recovery takes hold (**see Box A**).

A large wave of bankruptcies could stress resources at courts and make it harder for firms to obtain critical debtor-in-possession financing, which 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.

Elevated valuations in U.S. equities and corporate bonds make these markets vulnerable to a major repricing of risk, increasing volatility, and weakening balance sheets of financial and nonfinancial businesses. Sharp reductions in the valuations of different assets could negatively impact liquidity, increase borrowing costs, and heighten rollover risk.

Despite the turmoil in credit markets, the policy-aided rebound in business financing has been strong and the ratio of corporate debt-to-GDP has reached new record highs. The potential risk to financial stability from nonfinancial business borrowing depends 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. In the years prior to the pandemic, the increase in business debt did not fuel increased investments to strengthen corporations' earnings potential, leaving them vulnerable to debt servicing problems. Moreover, debt overhang problems could lead to a sluggish recovery. In extreme situations when debt servicing problems are widespread, credit markets remain vulnerable to a repricing of risk and disruptions to financial stability.

Recommendations

The Council recommends that 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 effects of potential liquidity risks in certain mutual funds, the effects of evolving loan covenant and documentation requirements, and the potential effects of mark-to-market losses and credit rating downgrades, among other considerations. 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.

5.2 Financial Markets

5.2.1 Short-Term Wholesale Funding Markets

In normal times, wholesale funding markets provide essential short-term funding to businesses, local governments, and other financial intermediaries (**see Sections 3.4.1 and 3.4.2**). In addition to government entities and the Federal Reserve, domestic participants in these markets include broker-dealers, banks, money funds, hedge funds, and securities lenders (**see Box D**). Developments in the STFMs can have implications for financial stability, as well as for the implementation of monetary policy.

Money Market Mutual Funds

Stresses on prime and tax-exempt MMFs revealed continued structural vulnerabilities that led to increased redemptions and, in turn, contributed to and increased the stress in short-term funding markets (**see Section 3.5.2.3**). MMFs offer shareholders redemptions on a daily basis (and retail at a stable NAV), while many of the short-term instruments that the MMFs hold may not be liquid in times of stress. This liquidity difference contributes to redemption incentives including a so-called "first-mover advantage," where investors believe they will be better off if they redeem faster than other investors.

As prime MMFs experienced heavy redemptions, their WLAs dropped notably, and some funds' WLAs (which must be disclosed publicly each day) approached or fell below the 30 percent minimum threshold required by SEC rules. When a fund's WLA falls below 30 percent, the fund board can impose fees or gates on redemptions. Market participants reported concerns that the imposition of a fee or a gate by one fund could spark widespread redemptions from others. Preliminary research indicates that prime fund outflows accelerated as WLAs fell close to 30 percent.

Among institutional and retail prime MMFs, the scale of the outflows as a percentage of fund assets exceeded those that occurred during the September 2008 crisis, while the scale for tax-exempt funds was similar to that in the 2008 financial crisis (**see Box D**). Outflows abated after the Federal Reserve's announcement of support for MMFs in mid-to-late March.

Repo Market

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. Repo markets remain critical not only to financial stability but also to the implementation of monetary policy, and these linkages were highlighted by the turmoil in repo markets in mid-September 2019.

Overnight repo rates spiked in mid-September 2019, with SOFR increasing by approximately 300 basis points (**see Section 3.4.2**). This unexpected high volatility has been attributed to technical factors (for example, to finance new Treasury settlements) and a decline in funds available from banks and MMFs, as corporations made quarterly tax payments. However, the repo volatility spilled over to other short-term rates, including the effective federal funds rate. The Federal Reserve restored control of the policy rate by injecting reserves, and the FOMC announced its intention to maintain an ample supply of reserve

balances to aid the orderly functioning of funding markets.

Repo rates on Treasuries and agency MBS spiked once again in mid-March 2020. Selling pressures in Treasuries likely originated from foreign central banks and foreign investors seeking dollar funding during the pandemic. Liquidity demand from leveraged participants, such as hedge funds using Treasury collateral (**see Section 3.5.2.5 and Box B**), and mREITs using agency MBS collateral (**see Section 3.5.2.2**), may have also played a significant role. These leveraged participants are vulnerable to funding risks because of their reliance on short-term repo funding. 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 selling pressures and lead to more margin calls. Since the assets on their balance sheet are the same assets used as collateral in their repo funding, the pressure to deleverage can create an adverse feedback loop of increased selling pressures and more margin calls. The complexity of interactions involving leveraged participants raises concerns as to their role in amplifying funding stresses.

Recommendations

Recent market stresses, including the financial fallout from the pandemic, have confirmed that there remain potentially significant structural vulnerabilities in short-term funding markets. Market participants that rely predominantly on short-term debt are vulnerable to funding risks. For banks and other depository institutions, this risk is mitigated by deposit insurance and liquidity backstops, such as the Federal Reserve's discount window. However, non-depository institutions are also important participants in these markets. Leveraged nonbank participants that depend on short-term funding also can pose a challenge to financial stability. If their short-term funding is not rolled over, these entities can be forced to deleverage, and that can create an adverse feedback loop of asset sales and margin calls.

The Council recommends that regulators review these structural vulnerabilities, including the vulnerability of 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.

5.2.2 Residential Real Estate Market: Nonbank Mortgage Origination and Servicing

Nonbank mortgage companies play a significant role in the housing finance system (**see Section 3.4.5**). Nonbanks originated nearly 60 percent of new mortgages in 2019 and service nearly half of all mortgage debt outstanding. They are particularly important for helping extend credit to low- and moderate-income borrowers and have provided competition and liquidity in the market for mortgage servicing rights. While the business models of nonbank mortgage companies vary, many are subject to certain fragilities, such as a heavy reliance on short-term funding, obligations to continue to make servicing advances for certain delinquent borrowers, and limited resources to absorb adverse economic shocks. Given these fragilities and their connections to other markets and market participants, nonbanks could transmit risk to the broader financial system should they experience financial stress.

As the shock from the pandemic hit the United States, federal and state governments enacted a series of public assistance policies to aid homeowners, such as suspending foreclosures, placing a moratorium on evictions, and offering flexibilities in home purchase and mortgage acquisition processes. Under the CARES Act, borrowers with a federally backed mortgage are able to request mortgage payment forbearance.

An increase in forbearance and default rates has the potential to impose significant strains on nonbank servicers, but nonbanks have generally continued to meet their servicing obligations. Increased originations, beneficial policy actions, and fiscal stimulus have mitigated nonbanks' potential credit and liquidity pressures. The surge in refinancing due to low rates has provided servicers with an additional source of liquidity to help sustain

operations. In addition, federal agencies have 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 has seen limited uptake. Government stimulus programs and expanded unemployment insurance may have averted additional delinquencies and limited forbearance requests, relieving some potential stress on servicers. As the economy recovers, the Council will continue to monitor closely the origination and servicing markets and the condition of nonbank mortgage companies.

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, including additional collaboration and the proposed strengthening of prudential requirements. The Council encourages regulators to take additional steps available to them within their jurisdictions to address the potential risks of nonbank mortgage companies. While nonbank mortgage originators have experienced enhanced profitability during the refinance boom, relevant regulators should ensure that the largest and most complex nonbank mortgage companies are prepared should refinances decrease or forbearance rates increase. 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.

Box F: Council Statement on Activities-Based Review of Secondary Mortgage Market Activities

On September 25, the Council issued a statement on its activities-based review of secondary mortgage market activities. The Council's review focused in particular on the activities of Fannie Mae and Freddie Mac as the dominant private secondary market providers of liquidity through their purchase of mortgages for securitization and sale as guaranteed MBS. In assessing potential risks to financial stability, the Council applied the framework for an activities-based approach described in the interpretive guidance on nonbank financial company determinations issued by the Council in December 2019.

The 2008 financial crisis demonstrated that financial stress at the Enterprises could limit their ability to provide reliable liquidity to the secondary market or perform their guarantee and other obligations on their MBS and other liabilities, with significant implications for the national housing finance markets, financial stability, and the broader economy. The Enterprises continue to play a central role in the national housing finance markets—acquiring nearly 50 percent of newly originated mortgages in both single-family and multifamily markets—and are two of the largest U.S. financial institutions, with significant interconnectedness with financial markets and other financial institutions.

If the Enterprises were unable to provide liquidity to the secondary market, other market participants may be unable in the near- or medium-term to provide liquidity at the scale and pricing needed to ensure smooth market functioning and financial intermediation. As a result, any distress at the Enterprises that affected their secondary mortgage market activities, including their ability to perform their guarantee and other obligations on their MBS and other liabilities, could pose a risk to financial stability, if risks are not properly mitigated.

Capital is a core component of FHFA's regulatory framework. Therefore, in assessing potential risk mitigants, much of the Council's analysis focused on a new capital regulation recently proposed by FHFA. This proposal is intended to enhance the quality and quantity of required capital, so as to ensure that each Enterprise is capitalized to remain a viable going concern both during and after a severe economic downturn and also to mitigate the potential risk to national housing finance markets posed by the Enterprise.

In conducting its review, the Council considered the following two questions, among others:

1) Is the proposed capital rule appropriately sized and structured given the Enterprises' risks and their key role in the housing finance system?

2) Does the proposed capital rule promote stability in the broader housing finance system?

Based on its assessment of the proposed rule, the statement issued by the Council contained the following key findings:

First, with respect to Risk-Based Capital Requirements: The proposed rule includes a risk-sensitive capital framework that results in a granular calibration of credit risk capital requirements. It would require aggregate credit risk capital on mortgage exposures that, as of September 2019, would lead to a substantially lower risk-based capital requirement than the bank capital framework, and likely be lower than other credit providers across significant portions of the risk spectrum during much of the credit cycle. This would create an advantage that could maintain significant concentration of risk with the Enterprises.

The Council encouraged FHFA and other regulatory agencies to coordinate and take other appropriate action to avoid market distortions that could increase risks to financial stability by generally taking consistent approaches to the capital requirements and other regulation of similar risks across market participants, consistent with the business models and missions of their regulated entities.

Second, on Capital Buffers: The proposed rule includes a stress capital buffer and a stability capital buffer that would require the Enterprises to hold capital above their regulatory requirements. The inclusion of such capital buffers is an important step to mitigating the risks the Enterprises pose to the

Box F: Council Statement on Activities-Based Review of Secondary Mortgage Market Activities

broader system. The calibration of the buffers in the proposed rule might help achieve certain policy goals, such as reducing the buffers' impact on higher risk exposures, but is based on total adjusted assets, not risk-weighted assets, and thus may be relatively risk-insensitive.

For that reason, the Council encouraged FHFA to consider the relative merits of alternative approaches for more dynamically calibrating the capital buffers. The capital buffers should be tailored to mitigate the potential risks to financial stability and otherwise ensure that the Enterprises have sufficient capital to absorb losses during periods of severe stress and remain viable going concerns, while balancing other policy objectives.

Third, on Total Capital Sufficiency: The proposed rule would increase the quality and quantity of capital that the Enterprises would be required to hold. Significant high-quality capital would mitigate risks to financial stability by making it more likely that the Enterprises will be able to perform their countercyclical function and maintain market confidence as viable going concerns through the economic cycle. Similarly, a meaningful leverage ratio requirement that is a credible backstop to the risk-based requirements would address potential risks to financial stability.

The proposed rule, by relying on definitions of regulatory capital that are similar to that of the U.S. banking framework, would ensure that high-quality capital is the predominant form of regulatory capital.

With respect to the quantity of regulatory capital, the Council considered the proposed capital requirements in light of a number of relevant benchmarks, such as: (1) losses during the 2008 financial crisis; (2) a comparison of the proposed capital requirements to those of other large, complex financial institutions, taking into account differences in business models and risk profiles; and, (3) the capital requirements implied by a conservative mortgage stress test model.

The proposed rule requires a meaningful amount of capital for the Enterprises, and is a significant step towards ensuring that the Enterprises would be able to provide liquidity to the secondary mortgage market and satisfy their obligations during and after a period of severe stress. However, the Council's analysis using benchmark comparisons suggested that risk-based capital requirements and leverage ratio requirements that are materially less than those contemplated by the proposed rule would likely not adequately mitigate the potential stability risk posed by the Enterprises. Moreover, it is possible that additional capital could be required for the Enterprises to remain viable concerns in the event of a severely adverse stress, particularly if the Enterprises' asset quality were ever to deteriorate to levels comparable to the experience leading up to the 2008 financial crisis.

The Council thus encouraged FHFA to ensure high-quality capital by implementing regulatory capital definitions that are similar to those in the U.S. banking framework. The Council also encouraged FHFA to require the Enterprises to be sufficiently capitalized to remain viable as going concerns during and after a severe economic downturn.

In addition to a capital framework, FHFA is also implementing significant additional enhancements to the Enterprises' regulatory framework that would help mitigate the potential risk to financial stability, thereby enabling the Enterprises to provide secondary market liquidity throughout the economic cycle. These enhancements include efforts to strengthen Enterprise liquidity regulation, stress testing, supervision, and resolution planning.

The Council supported FHFA's commitment to developing its broader prudential regulatory framework for the Enterprises, and will continue to monitor the secondary mortgage market activities of the Enterprises and FHFA's implementation of the regulatory framework to ensure potential risks to financial stability are adequately addressed. If the Council determines that such risks to financial stability are not adequately addressed by FHFA's capital and other regulatory requirements or other risk mitigants, the Council may consider more formal recommendations or other actions, consistent with the December 2019 guidance.

5.2.3 Commercial Real Estate Market

The COVID-19 pandemic led to the closure of many business establishments. While some of these closures have been temporary (such as restaurants), others have been more long-lasting (such as entertainment parks and movie theaters). Although the intensity and impact of closures depends on the duration and strength of the pandemic, it raises concerns about the viability of several types of business establishments and their ability to pay rent or generate income from commercial properties. A prolonged downturn leaves the commercial real estate (CRE) sector vulnerable to mortgage default and decline in valuations, with spillovers to the broader economy (**see Section 3.4.6**).

There are two reasons why CRE is important to financial stability in the United States (**see Box E**). 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 more likely to be concentrated in CRE. Distress in CRE properties makes these creditor banks vulnerable to losses and write-downs, 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 volatility in 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 entities that hold CRE loans, including REITs 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.

5.3 Financial Institutions

5.3.1 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. As the shock from the pandemic has shown, bank credit lines provide a lifeline to business, especially in times when nonbanks and other market sources of finance tighten credit (**see Section 3.5.1.1**).

The central role that large BHCs play in retail and wholesale payment systems ensure that operational failures do not disrupt commercial activity even in times of market stress. Large BHCs also help financial and nonfinancial firms to hedge their risk exposures in the derivatives markets. Lastly, several specialized financial services, such as tri-party repo and custody services for asset managers, are concentrated in the largest BHCs.

The onset of the pandemic dried up funding from market and nonbank sources. Bank credit lines became the principal source of funding for corporations adversely affected by the pandemic. The strengthened capital positions following the 2008 financial crisis helped banks withstand large emergency credit drawdowns. Liquidity pressures were also eased when the Federal Reserve lowered the discount rate by 150 basis points, encouraged discount borrowing, and announced facility programs to aid banks and markets. Most corporations drew on their bank credit lines as a precautionary measure and deposited the proceeds with banks. Bank deposits grew sharply not just from credit line withdrawals and payments from fiscal programs, but also because investors fleeing risky assets sought the safety of insured deposits. These events underlined the critical role that the banking system plays in the provision of credit during episodes of financial distress.

The pandemic has significantly impaired the ability of some households and businesses to repay debt. However, mortgage forbearance, interagency guidance on troubled debt restructurings, and various liquidity support programs have helped mitigate some of these pressures. As a result,

delinquency rates on bank loans for the first half of 2020 remain low and have yet to reveal a significant deterioration in loan performance. Meanwhile, large BHCs have significantly increased loan loss provisions in anticipation of the impending deterioration in asset quality. Loan loss provisions were also affected by the adoption of the CECL framework, though regulators have allowed a delayed capital phase-in to reduce the burden during the pandemic.

The credit line withdrawals and the increase in loan loss provisions have put downward pressure on both leverage and risk-based capital ratios. As credit and equity markets rebounded from their March lows, broker-dealers and trust banks have also benefited from significant increases in trading revenues and underwriting income. However, for banks with larger credit footprints, the impending declines in credit quality have led to voluntary and involuntary restrictions on their capital distributions.

In light of the financial fallout from the COVID-19 pandemic, regulatory authorities have provided temporary capital relief as many large banks voluntarily suspended share repurchases in mid-March. Following the release of the 2020 stress test results conducted by the Federal Reserve, large banks are required to preserve capital by suspending stock repurchases, capping dividend payments, and limiting dividends according to a formula tied to recent income. In spite of these policy measures, the largest banks remain vulnerable to a protracted downturn that is more severe than currently envisaged. These outcomes have been discussed under the 2020 Stress Test Results conducted by the Federal Reserve in their *Assessment of Bank Capital during the Recent Coronavirus Event* (**see Chart 3.5.1.27**).

Recommendations

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

The Council recommends that financial regulators ensure that the largest financial institutions maintain sufficient capital and liquidity to ensure their resiliency against economic and financial shocks. The Council recommends that regulators continue to monitor the capital adequacy for these banks and, when appropriate, phase out the temporary capital relief currently provided.

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.

5.3.2 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 also identified a potential vulnerability relating to redemption risk in certain open-end funds. The level of this risk is a function of, among other things, the liquidity of the underlying assets, 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-oriented 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 sentiment about overall economic and market conditions changes, these funds – not unlike 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. The SEC has taken several steps to address this potential vulnerability, including the adoption in October 2016 of rules intended to enhance liquidity risk management by mutual funds and ETFs.

During the mid-March financial turmoil, credit spreads increased to levels not seen since the 2008 financial crisis, and corporate bond issuance came to a near halt. As discussed in **Section 3.5.2.4**, bond funds experienced historically high levels of outflows that some research has suggested contributed to stress in corporate and municipal bond markets. Interventions by the Federal Reserve and Treasury, including a commitment to purchase up to $250 billion of bonds, ultimately restored orderly functioning in the primary and secondary markets. Nonetheless, these events demonstrate the need for additional analysis to assess broader market structure dynamics that may have contributed to the stress, including whether investors redeeming shares from bond funds may have affected the extent of selling pressure in the bond market differently than if those investors had held and sold bonds directly.

In addition to the potential vulnerability associated with redemption risk in mutual funds, the Council has also previously highlighted 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 (**see Section 3.5.2.5**). Leverage can allow investment funds to hedge risk or increase exposures, depending on the activities and strategies of the fund. However, leverage introduces counterparty risk, and in a period of stress, if leveraged investment funds are forced to sell assets on a significant scale, it could exacerbate asset price movements. As discussed in Box B, hedge funds may have also contributed to Treasury market volatility.

Recommendations

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 there are additional steps that should be taken to address these vulnerabilities.

5.4 Financial Market Structure, Operational Challenges, and Financial Innovation

5.4.1 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 orderly management 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.

The introduction of the CPMI-IOSCO Principles for Financial Market Infrastructures (PFMI) sets forth international principles for CCPs and other types of financial market infrastructures. The implementation of the PFMI worldwide, as well as other risk-management-focused policies, has improved the safety and efficiency of CCPs across a broad set of jurisdictions.

There have also been advances in the development of plans for CCP recovery. Regarding those CCPs designated as systemically important FMUs by the Council, the CFTC has regulations requiring such CCPs it supervises to maintain recovery and orderly wind-down plans, and 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, the inability of a CCP to meet its obligations arising from one or more clearing member defaults could potentially introduce strains on 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. In order to mitigate their risk, CCPs impose liquidity and resource requirements on clearing members that can increase with market volatility. The first line of defense of the CCP is often through initial margin requirements which, in order 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.

In response to the market volatility in March 2020, aggregate margin levels increased significantly. However, the markets served by the CCPs continued to function in an orderly fashion (**see Section 3.6.1.1**). While the cleared derivatives markets functioned as designed, there is continued concern about the impact on clearing members and their clients of liquidity demands related to margin requirements. Similar concerns exist in the context of uncleared swaps and the collateral flows between swap dealers and their clients. Relevant authorities are engaged in efforts to examine the performance of CCPs' and dealers' margin frameworks and the potential strains placed on intermediaries and clients.

A number of regulatory efforts have focused on monitoring and quantifying potential systemic risks. Many authorities regularly monitor risk exposures at CCPs and clearing members or broker-dealers pursuant to their regulatory regime. 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 risk management expectations for CCPs are sufficiently robust to mitigate potential threats to financial stability. Member agencies should continue working with global counterparts and international standard-setting bodies to identify and address areas of common concern. During the last year, EU authorities and the CFTC have taken a number of steps to provide greater clarity to the regulation and supervision of CCPs operating in their markets. The Council encourages continued engagement by Treasury, CFTC, Federal Reserve, and SEC with foreign counterparts to address the potential for inconsistent regulatory requirements or supervision to pose risks to U.S. financial stability and 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.

5.4.2 Alternative Reference Rates

The UK FCA continues to urge firms and regulators to prepare for a transition away from LIBOR on a global scale by year-end 2021. With more than $200 trillion of USD LIBOR-based contracts outstanding, the transition from LIBOR, given its anticipated cessation or degradation, will require significant effort from market participants. The failure of market participants to adequately analyze their exposure to LIBOR and transition ahead of LIBOR's anticipated cessation or degradation could expose market participants to significant legal, operational, and economic risks that could adversely impact U.S. financial markets.

In March, the FCA stated publicly that, despite the COVID-19 pandemic, the assumption that firms cannot rely on LIBOR being published after the end of 2021 has not changed (**see Section 3.6.1.2**). Currently, the FCA has voluntary agreements with LIBOR panel banks to continue submissions for publication of LIBOR through year-end 2021. The FCA expects some banks to stop submissions around that time. If a bank leaves the LIBOR submission panel, the FCA must assess whether LIBOR continues to be representative of the underlying market. The FCA could deem LIBOR "unrepresentative," at which time EU-regulated financial institutions would no longer be able to rely on the rate for new transactions. Additionally, if enough banks leave the LIBOR panel, LIBOR may cease to be published. Even if LIBOR continues for some period with diminished submissions, its performance may become increasingly unpredictable and unstable.

In the U.S., the ARRC has made significant progress toward analyzing and adopting an alternative rate (SOFR), creating robust contract fallback language for a variety of products, and building the infrastructure for the development of SOFR markets. Broadly speaking, the pandemic has not materially slowed the progress, but progress has been faster in derivatives cleared on CCP platforms and floating-rate note (FRNs) markets, and relatively slower in bilateral markets with bespoke contract terms, such as bank loans to businesses (**see Section 3.5.3.2**). Despite this progress, market participants with significant exposure to USD LIBOR remain vulnerable if they do not sufficiently prepare prior to the end of 2021.

Legacy cash products and new transactions without robust fallback language present a particular difficulty for transition. 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. While many new FRN issuances include more robust contract fallback language, some new issuances still do 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. Re-documenting these products will 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 vulnerability.

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.

Recommendations

The ARRC has released the Recommended Best Practices for completing the transition from LIBOR. Market participants should analyze their exposure to USD LIBOR, assess the impact of LIBOR's cessation or degradation on existing contracts, and remediate risk from existing contracts that do not have robust fallback arrangements to transition the contract

to an alternate rate. Market participants should consider participation in ISDA's protocol, which takes effect in 2021, as it will be especially important in remediating risks to existing derivatives contracts referencing LIBOR. Market participants that do not sufficiently prepare for this inevitable transition could face significant legal, operational, and economic risks. Market participants that have determined that SOFR is an appropriate rate for their LIBOR transition should not wait for the possible introduction of the forward-looking SOFR term rates to execute the transition. The Council recommends that market participants formulate and execute transition plans so that they are fully prepared for the anticipated discontinuation or degradation of LIBOR. Because of the uncertainty around the exact timing of the cessation of LIBOR, including the potential of LIBOR to be deemed non-representative by the FCA under UK regulations, market participants should formulate and execute plans to transition prior to year-end 2021, taking into account their business requirements. Market participants must understand the exposure of their firm to LIBOR in every business and function, assess the impact of LIBOR's cessation or degradation on existing contracts, and remediate risks from existing contracts that do not have robust fallback provisions to transition the contract to an alternate 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.

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 further guidance or regulatory relief is required to encourage market participants to address legacy LIBOR portfolios. Council member agencies should also 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.

5.4.3 Financial Market Structure

The extreme volatility in financial markets early in the pandemic further emphasized the importance of ensuring that appropriate market structures are in place so that financial markets can function effectively during stress events. 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.

Interlinkages among dollar funding markets: In the decade 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.

Some market participants are active in both secured and unsecured short-term funding markets. Commercial banks, affiliated broker dealers, and the FHLBs operate in the secured repo market as well as the unsecured federal funds market. While money funds lend in the repo and the Eurodollar market, they cannot participate in the federal funds market. Meanwhile, borrowing options in the dollar funding market for some entities, such as hedge funds, are limited to the repo market. Given the myriad of participants and strong interlinkages between them, disruptions in one market can transmit to another (**see, for example, Box D**).

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: The financial fallout from the pandemic was disruptive in the markets for critical securities such as Treasuries (**see Box B**), MBS (**see Section 3.3.5**), and corporate

bonds (**see Box A**). Market disruptions not only have implications for financial stability but also affect the implementation of monetary policy.

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 GCF repo markets that use these securities as collateral.

However, two developments in the post-crisis financial landscape have imposed significant pressures on dealer intermediation. First, issuance volumes of these marketable securities, especially Treasury securities, have increased significantly. Second, the post-crisis regulatory framework has also imposed balance sheet constraints at bank-affiliated broker-dealers. With the implementation of Basel III regulations on capital and leverage, major bank-affiliated broker-dealers have reduced the amount 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 (**see Box B and Section 3.4.2.2**).

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.

Recommendations

Episodes of volatility in wholesale funding markets over the past two years have highlighted the importance of interdependencies across the different dollar funding markets. Policy measures to address imbalances in one funding market can potentially create imbalances in another funding market. For example, the volatility experienced in September 2019 and March 2020 has renewed attention on the dealers' traditional role of direct liquidity provision through market-making. To the extent that dealers have reduced their market footprint over time, this could contribute to market volatility, particularly during stress events. The significant role of non-traditional market participants may have also amplified market volatility. The temporary solution has been to provide more balance sheet space to BHCs in the form of relief on capital and liquidity regulation so that affiliates of the BHCs are better positioned to intermediate investors' demands for liquidity. In addition, the Federal Reserve has increased the size of its balance sheet to absorb selling pressures on Treasury and MBS to a significant degree.

In light of these developments, there should be active collaboration among regulators across jurisdictions to ensure coordination of efforts. The Council recommends that member agencies conduct an interagency operational review of 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.

5.4.4 Cybersecurity

Financial institutions continue to invest in and expand their reliance on information technology and cloud-based computing to reduce costs and to increase efficiency and resiliency. The COVID-19 pandemic may accelerate this trend as financial institutions have implemented business continuity plans through increased use of teleworking systems and dual work locations, for example. However, greater reliance on technology, particularly across a broader array of interconnected platforms, increases the risk that a cybersecurity incident may have severe consequences for financial institutions. In fact, a recent analysis by economists at the FRBNY details how impairment of payment systems at any

of the five most active U.S. banks would result in significant spillovers to other banks.

The financial sector, like other critical sectors, is vulnerable to malware attacks, ransomware 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.

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 (**see Section 3.6.2**). Market participants have observed a spike in COVID-19 related phishing attacks, as attackers seek to exploit less secure home networks. 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 capabilities not just at individual institutions, but also of the financial sector as a whole.

A destabilizing cybersecurity incident could potentially threaten the stability of the U.S. financial system through at least three channels:

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.

The incident could cause a loss of confidence among a broad set of customers or market participants. If it causes customers or participants to question the safety of their assets or transactions and leads to significant withdrawal of assets or activity, the effects could be destabilizing to the broader financial system.

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.

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 to ensure, among other things, robust and comprehensive cybersecurity monitoring, especially in light of new risks posed by the pandemic. However, the authority to supervise third-party service providers varies across financial regulators. To further enhance third-party service provider information security, the Council recommends that Congress pass legislation that ensures that FHFA, NCUA, and other relevant agencies have adequate examination and enforcement powers to oversee third-party service providers. The Council also recommends that federal banking regulators continue to coordinate third-party service provider examinations, work collaboratively with states, and also work with the State Liaison Committee to identify additional ways to support information sharing among state and federal regulators.

The Council encourages continued cooperation across government agencies and private firms to improve cybersecurity through the adoption of authenticable digital identities that offer agencies and firms the ability to mitigate the risk of cybersecurity incidents through digital authentication of parties (e.g. trading partners, vendors, customers) to enhance the financial sector's strong cybersecurity posture.

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) to the extent practicable, 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.

5.4.5 Data Gaps and Challenges

The 2008 financial crisis 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, and OTC derivatives; and limitations in financial statement reporting for certain types of institutions. The usefulness of data was often limited by institutional or jurisdictional differences in reporting requirements. These types of inconsistencies created challenges for data sharing and increased the reporting burden on market participants.

Progress has been made on these fronts. Reporting of centrally cleared repurchase rate agreements initiated by the OFR in 2019 incorporates the use of the LEI. Trade Information Warehouse data on credit derivatives provided to OFR is currently being revised to also include the LEI.

Council member agencies have been actively engaged with each other, regulators in other jurisdictions, and firms in the financial sector to develop standards and protocols and to execute on data collection initiatives. Staff of the OFR, CFTC, SEC, and Federal Reserve meet regularly with their international regulatory counterparts from the FSB to implement UTIs, UPIs, and CDE standards for OTC derivatives and have recently developed a governance structure for oversight. Member agencies have also been working to facilitate the adoption of LEIs and Universal Loan Identifiers (ULIs) 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 standards for reporting and collection enhances the usefulness of market data and reduces the reporting 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 identifiers such as the UTI, Unique Product Identifier (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 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.

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.

5.4.6 Financial Innovation

Financial innovation offers 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, which are still a new and relatively small sector of the financial market, are a particularly good example of both the benefits and potential risks associated with innovation. Digital assets may present a new means of conducting real-time payment activities. Some nations have begun exploring or, in some cases, using central bank digital currencies to enhance the global standing of their own currencies and enable faster payments. Likewise, several nations have begun assessing whether and how privately-issued stablecoins may serve a role in facilitating faster and more efficient payments, provided that such activities are subject to appropriate regulation and oversight.

However, if a stablecoin became widely adopted as a means of payment or store of value, disruptions to the stablecoin system, as with any payment or value system, could affect the financial system and the wider economy, warranting greater regulatory scrutiny. A decline in the value of assets involved in a traditional or new payment or value system can result in the transmission of risk to the financial sector through financial institution exposures, risks to the payment system involved, wealth effects and confidence effects. 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.

The benefits and potential risks associated with 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, fair, and complies with all applicable laws. Clear guidance will support the development of a payment system that is consistent with the changing needs of institutions and consumers within the U.S. and that is competitive with payment systems abroad. This is particularly important given the European Commission's recently revealed draft framework for cryptoassets and stablecoins.

The continued evolution of the market for digital assets highlights the importance of coordinated engagement and leadership by relevant U.S. regulators. Digital asset arrangements vary widely (**see Section 3.6.3.1**). The risk each digital asset poses depends, among other things, on its overall usage in the market, the structure of the asset and its consensus mechanism, and the risk management practices of participants. The potential risks presented by different stablecoin systems may vary according to the mechanism by which they are made stable and the governance policies of the administrator.

As discussed in **Section 3.6.3.4**, large technology and e-commerce companies providing financial services may increasingly seek to compete directly with incumbent financial service providers, and their market presence could grow significantly. These firms currently may not be subject to the same type of financial services regulation with which incumbent financial service providers are required to comply.

Financial firms' rapid adoption of fintech innovations in recent years may increase operational risks associated with financial institutions' use of third-party service providers. Third-party service providers may create financial stability risks if financial institutions outsource critical services because operational failures or faults at a key service provider could disrupt the activities of multiple financial institutions or financial markets.

Recommendations

The Council encourages financial regulators to continue to be proactive in identifying new products and services; in evaluating how innovation is used; 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 operational risk. Agencies should ensure that their monitoring and data collection systems identify 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 Council recommends that federal and state regulators continue to support responsible innovation by examining the benefits of, and potential risks to the financial system posed by, new and emerging uses of digital assets and distributed ledger technologies. Financial regulators should review existing and planned digital asset arrangements and their risks as appropriate.

The Council encourages continued coordination among federal and state regulators to support responsible financial innovation and competitiveness, promote consistent regulatory approaches, as well as to identify and address potential risks that arise from such innovation.

5.5 Global Economic and Financial Developments

Downside risks to global economic growth have increased significantly since the outbreak of the COVID-19 pandemic. In response to the collapse of global economic activity in the first half of 2020, national authorities in advanced and many emerging economies implemented rapid and decisive fiscal and monetary policy actions. Although these measures helped support incomes and employment and eased global financial conditions in the initial phase of the pandemic, the path of the economic recovery will be dependent on continued fiscal and monetary support along with health policy responses, including authorities' ability to limit the spread of COVID-19 without re-imposing lockdown measures along with the development of therapeutics and a vaccine.

At the onset of the pandemic, many European countries introduced lockdowns to reduce the spread of the disease. These lockdowns led to a sharp contraction in real activity and employment that could lead to significant losses in the banking system. As part of their response to the crisis, European governments undertook fiscal policy actions that increased government spending and tax relief and likely reduced financial stability risks (**see Section 3.7.2**). Over the longer run, however, additional expansionary policies may result in sizable increases in government debt and a further increase in sovereign risk. If debt sustainability were to worsen in the highly indebted countries, it could stress European financial institutions and lead to political tensions within the euro area. This distress has the potential to spill over to the U.S. financial system through direct exposures and counterparty risks.

Although somewhat overshadowed by the COVID-19 crisis, the prospect of a no-trade-deal Brexit represents an ongoing risk to both the European and U.S. financial systems. On January 31, 2020, the United Kingdom left the EU but remains under EU trade rules through the transition period, which is set to expire at the end of 2020 (**see Section 3.7.2**). Regulators in Europe and the United States have taken steps to lessen potential disruptions to the financial system of a disorderly Brexit. On September 28, 2020, the European Securities and Markets Authority granted time-limited equivalence to three UK CCPs, which allows them to continue providing their services in the EU until mid-2022. While this development has reduced financial stability risks, risks remain elevated as other UK financial services will lose passporting rights under MiFD II at the end of the transition period absent any agreement. Additionally, the failure of the two parties to reach a trade agreement at the end of the transition period poses significant downside risks to both the UK and the EU because of the disruptions it would cause to cross-border supply chains. A no-trade-deal Brexit could lead to financial market stress through several channels – disruptions in cross-border trade, reductions in investor confidence in the UK economy, increased FX volatility, and a decline in UK asset values.

The size of the Chinese economy and its centrality to global supply chains also makes it a potential source of risk. After a rapid increase in debt and leverage following the 2008 financial crisis, Chinese authorities began taking steps to encourage financial deleveraging in 2016. In 2020, Chinese regulators paused the deleveraging campaign as authorities try to balance COVID-19 related credit support with longer-term financial stability goals (**see Section 3.7.3**). More significantly, the PBOC provided guidance to banks that they should sacrifice profits to help stabilize growth. Although this guidance is likely to stabilize the Chinese economy in the short run, it comes at the expense of leaving the banking sector weaker and less likely to rebuild capital margins over the medium run. At present, U.S. exposures to the Chinese financial sector are limited, and financial stability risks associated with a potential decline in Chinese asset valuations or stress in the Chinese banking sector appear manageable. Indirect effects on global economic and market confidence, however, could adversely impact U.S. economic performance.

Similarly, EMEs represent another indirect source of risk to the U.S. financial system. The COVID-19 shock affected EMEs initially through a reduction in Chinese demand and later through the spread of the virus globally. In response, many EME central banks broke with their usual policy of raising rates

in the face of currency depreciation and massive portfolio outflows. Instead, they addressed the market stress by easing monetary policy, with many implementing bond purchase programs. Since the initial period of volatility and massive portfolio outflows in March and April, flows to EMEs have broadly stabilized, with risks to the external sector remaining moderate because many EMEs have relatively large foreign reserves. The current risks EMEs pose to the U.S. financial system are related to the build-up of sovereign and nonfinancial debt. The accumulation of sovereign debt creates the risk that it is not sustainable over the long run and that the necessary fiscal space will be unavailable to deal with additional contingencies, such as a renewed wave of COVID-19 infections. The rise in nonfinancial debt levels creates vulnerabilities because of a reduced repayment capacity during the recession. Although the direct exposures of the U.S. financial system to EMEs are limited, spillovers to the U.S. economy could manifest themselves in the form of shifts in market confidence or increases in market stress that lead to a tightening of U.S. financial conditions.

Box G: "Low-For-Long" Interest Rates and Implications for Financial Stability

The Federal Reserve's initial policy response to the COVID-19 pandemic and later shift to average-inflation targeting both imply that monetary policy will be accommodative for the foreseeable future. Although a looser monetary policy stance is warranted by the need for immediate support to the real economy and the achievement of the Federal Reserve's maximum employment mandate, it also raises questions about the medium-term financial stability implications of long periods of low short-term rates and a potentially flatter yield curve. For example, there is an inherent tradeoff between the evident need for low rates to stimulate economic activity now and the possibility that persistently low rates may distort risk-taking over a longer time horizon. Understanding how such a "low-for-long" environment reshapes market participants' and financial institutions' incentives to borrow, lend, and take excessive risk is critical for understanding its financial stability implications.

To that end, recent historical experience provides some guidance on the possible effects of a low-for-long interest-rate environment. After the 2008 financial crisis, a combination of forces created conditions under which interest rates were also expected to remain low for an extended period, reducing yields on many assets and providing market participants with the incentive to assume more financial risk – the so-called "reach for yield." This reach-for-yield behavior led to increases in asset prices in a range of markets, a portfolio reallocation to riskier and less liquid asset classes, and an increase in corporate leverage. In today's environment, it is possible that we will observe similar types of changes in market participants' behavior.

Key Implications of Low-for-Long and Potential Vulnerabilities

Low rates for an extended period will have broad implications for several key market participants. At the same time, the types of behavior low interest rates will induce, and therefore the extent to which that behavior may lead to the build-up of risks, are likely to vary across market participants.

Retail investors

One of the main effects on retail investors of persistently low rates is a decrease in their interest income. As a result, retirees and other fixed-income dependent investors may face a decline in their primary source of income, which, in principle, incentivizes them to reallocate their portfolio to riskier assets, as it does for other market participants. But predicting the precise effect of how retail investors respond is difficult because their balance sheets are smaller and their portfolios less diversified than institutions, and hence their behavior is more sensitive to risk. Empirical studies show that household savings are positively related to interest rates, though the size of the effect varies widely. In addition, there is little systematic evidence on how low rates for a prolonged period affect the portfolio allocation decisions of individual investors. Thus, while it is prudent to monitor possible reach-for-yield behavior by retail investors, it is not clear that it has the same broad financial stability implications that the decisions of larger financial institutions do.

Banks

Low interest rates are generally expected to reduce banks' profitability: Both low short-term rates and a flatter yield curve reduce banks' interest income and compress their net interest margin. How damaging this deterioration in profitability will be remains an open question. Banks are well capitalized today as a result of the post-crisis financial reforms and can draw on this capital buffer to absorb losses. Nevertheless, the resulting decline in banks' profitability, in principle, gives them an incentive to increase fees and other charges, make riskier loans, and shift the composition of their balance sheets to generate other sources of income.

The evidence that banks' behavior in a low-for-long environment leads to an increase in systemic risk is more mixed, however. A retrospective analysis of

the post-financial crisis period conducted by the Committee on the Global Financial System (CGFS) suggests that while low interest rates and flatter yield curves reduce net interest margins, as expected, banks in the United States and elsewhere adjusted in ways that mitigated the effects on their overall return on assets. What is more, the study found no systematic correlation between the level of interest rates, on the one hand, and measures of bank soundness and excessive risk-taking, on the other. In terms of evidence for the United States specifically, research shows that while a low interest rate environment is generally associated with narrower net interest margins and reduced profitability, especially for small banks, these negative effects may be offset by the positive effects of low rates on profits through increased economic activity. Thus, while net interest margins do narrow when interest rates are lower, the overall effects on profitability and excessive risk-taking seem to be more muted than might be expected, and the broader effects on systemic risk in the banking sector modest.

Corporations

For corporations, low rates affect both their borrowing behavior and the willingness of investors to supply credit to them. Even before we entered the current low-for-long environment, the level of corporate indebtedness was high by historical standards, driven, in part, by the growth in the leveraged loan market to lower-rated borrowers. This growth was itself a consequence of a prolonged period of low rates after the 2008 financial crisis. Today, low yields are encouraging borrowers to lock in rates with fixed-rate corporate bonds, as opposed to leveraged loans, which are floating-rate instruments. As a result, high-yield corporate bond issuance is at a record level in 2020. Moreover, firms that successfully weather the current COVID crisis will have easier access to financing because of lower credit spreads in the future. These easier financing conditions are likely to fuel the same trend in debt accumulation that pre-dated the current period of low interest rates, creating a potential vulnerability in the form of excessive corporate debt levels.

Pension funds

Low interest rates also affect the demand for risky assets through their effect on pension funds and insurance companies, which face similar issues because of the structure of their balance sheets. Both types of institutions have long-lived liabilities that make them vulnerable to declining or low interest rates. For pension funds, low rates increase the present value of their assets and liabilities, but the duration of their liabilities is higher than that of their assets. As a result, the duration effect implies that low interest rates have a net negative effect on their balance sheets. To meet their expected return targets, pension funds can respond in several ways -- by increasing contribution requirements, by switching to alternative investments such as private equity, by issuing pension obligation bonds to increase leverage, or by increasing the duration of their assets. These adjustments are likely to happen gradually because pension funds have long liability maturities and are hence unlikely to pose an immediate risk to financial stability.

The combined effect of low expected returns and state and local budget shortfalls also creates a set of risks for public pensions. These two factors may force state and local governments to make tradeoffs between meeting their public pension liabilities, which have strong legal protections, and current spending demands that will stress public finances. Because most states have balanced-budget requirements, these tradeoffs could be especially stark. The reconciliation of these underlying tensions may manifest themselves in the municipal bond market if investors begin to question the long-term ability of states and localities to meet their existing obligations.

Insurance companies

Insurance companies could face greater challenges with their balance sheets. Low interest rates compress insurers' investment margins, reduce their ability to meet their product guarantees, and weaken their earnings

Box G: "Low-For-Long" Interest Rates and Implications for Financial Stability

and capital. For example, life insurance product reserves are generally determined using a long-run interest rate assumption in order to match assets and liabilities. However, life insurers' net investment portfolio yields have been declining due to the reinvestment of maturing assets at lower rates. The industry's net investment portfolio yield has fallen from 6.0 percent in 2007 to 4.6 percent in 2019, and this trend can be expected to continue. It provides an incentive to increase allocations to riskier debt and less liquid assets to achieve the guaranteed returns on in force insurance policies. As in the case of pension funds, the challenges related to a protracted period of low interest rates confronting insurance companies manifest themselves over time, giving insurance companies some latitude in how they adapt to the low-rate environment. This flexibility reduces the likelihood of a broader financial disruption.

Longer-Term Risks Related to Future Rate Increases

The discussion thus far has focused on current or medium-term implications of low-for-long. A longer-term risk is how the market participants' exposures to greater levels of duration risk affect financial stability when rates eventually increase. The 2013 Taper Tantrum is an example of this potential dynamic, although the wider financial stability implications of that episode were limited. The potential risk here is that unexpected increases in rates negatively affect the balance sheets of financial institutions in such a way that leads to financial instability. Banks without adequate capital buffers could face solvency issues, while pension funds and insurance companies could experience liquidity problems related to losses on derivatives positions or increases in early liquidations.

Additionally, with valuations in both equity and credit markets relatively high by historical standards and likely to become further stretched in a low-for-long environment, the risk of a sharp correction becomes more likely, especially in conjunction with high levels of leverage or excessive reliance on short-term wholesale funding. Even small changes to expectations of far-in-the-future cash flow may have a disproportionate effect on current valuations when interest rates are low. As a result, such rate changes can lead to sharp adjustments in valuations. The potential negative effects that an unexpected increase in rates would have across a variety of market participants make this longer-term risk worth monitoring. Adequate guidance on the timing and pace of any such policy-related increase will likely reduce this risk.

6 Abbreviations

AANA	Average Aggregate Notional Amount
ABS	Asset-Backed Security
ACL	Allowances for Credit Losses
Advisers Act	Investment Advisers Act of 1940
AML	Anti-Money Laundering
ANPR	Advance Notice of Proposed Rulemaking
APP	Asset Purchase Programme
ARM	Adjustable Rate Mortgage
ARRC	Alternative Reference Rates Committee
AUM	Assets Under Management
BCBS	Basel Committee on Banking Supervision
BDC	Business Development Company
BHC	Bank Holding Company
BIS	Bank for International Settlements
BOE	Bank of England
BOJ	Bank of Japan
BTP	Italian Government Bond
Bund	German Government Bond
C&I	Commercial and Industrial
CARES	Coronavirus Aid, Relief, and Economic Security
CCAR	Comprehensive Capital Analysis and Review
CCP	Central Counterparty
CD	Certificate of Deposit
CDB	China Development Bank
CDE	Critical Data Elements
CDO	Collateralized Debt Obligation
CDS	Credit Default Swap
CECL	Current Expected Credit Losses
CEM	Current Exposure Method
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
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
CPI	Consumer Price Index
CPMI	Committee on Payments and Market Infrastructures
CRA	Community Reinvestment Act
CRE	Commercial Real Estate
CSBS	Conference of State Bank Supervisors
Desk	Open Market Trading Desk
DFAST	Dodd-Frank Act Stress Tests
DIP	Debtor-in-Possession
Dodd-Frank Act	Dodd-Frank Wall Street Reform and Consumer Protection Act
DSB	Derivatives Service Bureau
DSSI	Debt Service Suspension Initiative
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
EGRRCPA	Economic Growth, Regulatory Relief, and Consumer Protection Act
EME	Emerging Market Economy
ENN	Entity-Netted Notional
Enterprises	Fannie Mae and Freddie Mac
ETF	Exchange-Traded Fund
ETN	Exchange-Traded Note
ETP	Exchange-Traded Product
EU	European Union
Euro Stoxx	50 Euro Area Stock Index
Exchange Act	Securities Exchange Act of 1934
Fannie Mae	Federal National Mortgage Association
FASB	Financial Accounting Standards Board
FATF	Financial Action Task Force
FBIIC	Financial and Banking Information Infrastructure Committee
FBO	Foreign Banking Organization
FCA	Financial Conduct Authority

FCM	Futures Commission Merchant
FCU	Federal Credit Union
FDI	Foreign direct investment
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	Foreign and International Monetary Authority
FinCEN	Financial Crimes Enforcement Network
FIO	Federal Insurance Office
FMI	Financial Market Infrastructure
FMU	Financial Market Utility
FOMB	Financial Oversight and Management Board
FOMC	Federal Open Market Committee
FNAV	Floating Net Asset
FRBNY	Federal Reserve Bank of New York
Freddie Mac	Federal Home Loan Mortgage Corporation
FRN	Floating Rate Notes
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
GLEIF	Global LEI Foundation
GNMA	Government National Mortgage Association (Ginnie Mae)
GSE	Government-Sponsored Enterprise
GSD	Government Securities Division
GUUG	FSB's Working Group on UTI and UPI Governance
HFT	High-Frequency Trader
HQLA	High-Quality Liquid Asset
HMDA	Home Mortgage Disclosure Act
IAIS	International Association of Insurance Supervisors
ICS	International Capital Standard
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
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 Fund Liquidity Facility
MMF	Money Market Mutual Fund
mREIT	Mortgage REITs
MSLP	Main Street Lending Program
MSP	Major Swap Participant
MSR	Mortgage Servicing Right
NAIC	National Association of Insurance Commissioners
NAL	No-Action Letter
NAV	Net Asset Value
NCD	Negotiable Certificates of Deposit
NCUA	National Credit Union Administration
NIM	Net Interest Margin
NMDB	National Mortgage Database
NMS	National Market System
NPL	Non-Performing Loan
NPRM	Notice of Proposed Rulemaking
NSCC	National Securities Clearing Corporation
NYDFS	New York Department of Financial Services
OCC	Office of the Comptroller of the Currency
OFR	Office of Financial Research

OIS	Overnight Index Swap
ON RRPF	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
PBA	Puerto Rico Public Buildings Authority
PBGC	Pension Benefit Guaranty Corporation
PBOC	People's Bank of China
PDCF	Primary Dealer Credit Facility
PEPP	Pandemic Emergency Purchase Programme
PFMI	Principles for Financial Market Infrastructures
PMCCF	Primary Market Corporate Credit Facility
PPP	Paycheck Protection Program
PPPLF	Paycheck Protection Program Lending Facility
PREPA	Puerto Rico Electric Power Authority
PROMESA	Puerto Rico Oversight, Management, and Economic Stability Act
PSPA	Preferred Stock Purchase Agreement
PTF	Principal Trading Firm
QM	Qualified Mortgage
RBIC	Rural Business Investment Companies
REIT	Real Estate Investment Trust
Repo	Repurchase Agreement
RMB	Renminbi
RMBS	Residential Mortgage-Backed Security
ROAA	Return on Average Assets
RRC	Regulation and Resolution Committee
RWA	Risk-Weighted Asset
S&P	Standard & Poor's
S&P LCD	Standard & Poor's Leveraged Commentary & Data
SA-CCR	Standardized Approach for Counterparty Credit Risk
SBA	Small Business Administration
SBSD	Security-Based Swap Dealer
SD	Swap Dealer
SDR	Stressed Default Rate
SEC	Securities and Exchange Commission
SEF	Swap Execution Facility
SIFMA	Securities Industry and Financial Markets Association
SIPC	Securities Investors Protection Corporation
SLOOS	Senior Loan Officer Opinion Survey
SLR	Supplementary Leverage Ratio
SMBs	Small and Mid-Sized Regional Banks
SMCCF	Secondary Market Corporate Credit Facility
SME	Small and Medium-Sized Enterprises
SOFR	Secured Overnight Financing Rate
SRC	Systemic Risk Committee
SPAC	Special Purpose Acquisition Company
STFM	Short-Term Funding Market
STIF	Short-Term Investment Fund
SWIFT	Society for Worldwide Interbank Financial Telecommunications
TALF	Term Asset-Backed Securities Loan Facility
TBA	To Be Announced
TDR	Troubled Debt Restructurings
TIPS	Treasury Inflation-Protected Securities
TLAC	Total Loss Absorbing Capital
TLTRO	Targeted Long-Term Refinancing Operations
Treasury	Department of the Treasury
TRIA	Terrorism Risk Insurance Act of 2002, as Amended
TRIP	Terrorism Risk Insurance Program
UK	United Kingdom
ULI	Universal Loan Identifier
UMBS	Uniform Mortgage-Backed Security
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
VaR	Value at Risk
VRDN	Variable-Rate Demand Notes
VIX	Chicago Board Options Exchange Volatility Index
WAL	Weighted Average Life
WAM	Weighted-Average Maturity
WEO	World Economic Outlook
WLA	Weekly Liquid Assets
WTI	West Texas Intermediate
YTD	Year-to-Date

7 Glossary

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.

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 which 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.

Consumer Price Index (CPI)

A monthly index containing data on changes in the prices paid by urban consumers for a representative basket of goods and services.

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

Digital asset is an asset that is issued/transferred using distributed ledger or blockchain technology. A cryptocurrency is a digital asset designed to work as a medium of exchange. 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.

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.

Entity-Netted Notional (ENN)

A risk-based measure of size for the interest rate swap market. To describe ENNs intuitively, imagine that each pair of swap counterparties established its net interest rate risk position with bonds instead of swaps. More precisely, within each pair of counterparties, the counterparty that is net long has purchased a 5-year equivalent risk position in bonds from the counterparty that is net short. Then, the sum of those hypothetical bond positions across all pairs of counterparties is a measure of the size of the market and is equal to ENNs.

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 resiliency 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."

Fire Sale

The disorderly liquidation of assets to meet margin requirements or other urgent cash needs. Such a sudden sell-off drives down prices, potentially below their intrinsic value, when the quantities to be sold are large relative to the typical volume of transactions. Fire sales can be self-reinforcing and lead to additional forced selling by some market participants which, subsequent to an initial fire sale and consequent decline in asset prices, may also need to meet margin or other urgent cash needs.

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 (HQLA)

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.

Index Tranche Credit Default Swap (CDS)

A synthetic collateralized debt obligation (CDO) based on a CDS index where each tranche (equity, mezzanine, senior, and super senior) references a different segment of the loss distribution of the underlying CDS index.

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.

Limit (Up or Down)

The maximum price advance or decline from the previous day's settlement price permitted during one trading session, as fixed by the rules of an exchange. Effective October 12, 2020, S&P 500 e-mini futures are subject to a hard upside and downside limit of 7 percent during non-U.S. trading hours. Prior to that, S&P 500 e-mini futures were subject to a hard upside and downside limit of 5 percent during non-U.S. trading hours.

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 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 RRPF)

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 the whether it is cleared and whether it is traded on a non-exchange platform (and, if so, the type of platform).

Paris Club

An informal group of official creditors whose role is to find coordinated and sustainable solutions to the payment difficulties experienced by debtor countries

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.

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.

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)

A term defined in the Dodd-Frank Act as a trading system or platform which market participants use to execute and trade swaps by accepting bids and offers made by other participants, through any means of interstate commerce.

Swap Future

A futures contract which mimics the economic substance of a swap.

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 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.

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 equity index 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.

Window-Dressing

Period-ending transactions that are reflected on a statement or report.

Yield Curve

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

8 List of Charts

FINANCIAL STABILITY
OVERSIGHT COUNCIL

1500 PENNSYLVANIA AVENUE, NW | WASHINGTON, D.C. 20220