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Nonbank Financial Intermediation (NBFI or "Shadow Banking") and Capital Markets Policy

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SUMMARY

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Nonbank Financial Intermediation (NBFI or "Shadow Banking") and Capital Markets Policy

Nonbank financial intermediation (NBFI)—sometimes known as "shadow banking"—generally refers to funding sources outside the banking system. NBFI has been an area of policy contention because of its size, importance, and complexity. Total financial assets at nonbank financial intermediaries (NBFIs) are more than 2.5 times that of the banks in the United States. While banking regulation has traditionally placed a greater emphasis on financial stability compared to the regulation of NBFI, financial crises and market events have revealed that banks are not the only financial entities capable of threatening the stability of the financial system. NBFI issues have attracted ongoing congressional efforts, including congressional hearings and letters from Members of Congress.

The Financial Stability Board, an international financial authority, broadly defines NBFI as financial activities facilitated by institutions other than central banks, banks, or public financial institutions. While policy discussions often reference NBFI as a single concept, NBFI is neither a single entity nor a uniform system. NBFI includes market-based financing that is mainly facilitated through capital markets operations. It may also involve financial activities carried out by other nonbank entities, such as insurance companies. The focus of this report is on capital markets NBFI, which represents the core component of NBFI.

Vulnerabilities affecting financial stability are present in capital markets NBFI, including in certain money-like instruments that face potential "runs," leverage levels, interconnectedness between nonbanks and banks, data and transparency issues, liquidity mismatch at certain open-end funds, and concentration risk at market intermediaries. Some observers believe NBFI is a source of financial stability concern and thus warrants increased policy action to address its vulnerability. Others argue that current regulation is generally sufficient to address the risks posed by these activities and markets, and so additional action is unnecessary. Another area of debate is whether, as the banking system increasingly faces tightened regulatory requirements, more fundraising activities and their related risks may have migrated to NBFI. This interconnectedness has also led researchers to argue that instead of viewing businesses and risks as having migrated from banks to nonbanks, it resembles an interwoven relationship that has evolved over time.

Capital markets activities that facilitate fundraising operate separately from traditional banking and are governed by distinct securities regulation largely overseen by the Securities and Exchange Commission. The capital markets regulatory philosophy is different than that of banking regulation. Banking regulators focus more on safety and soundness to avoid bank failure, because bank depositors want their funds to be safe and accessible, and deposits are often ultimately guaranteed by the taxpayers given implicit and explicit government backstops. Conversely, in capital markets, investors generally assume all the risk of loss due to changes in market valuation. The traditional view holds that prudential banking regulations may not be compatible with NBFI because, unlike banks, NBFI traditionally does not benefit from the government safety net and thus may not lead to the same type of risk-sharing with taxpayers. While some prudential tools—such as capital requirements, liquidity restrictions, and stress tests—are already part of capital markets regulation, they are applied on a smaller scale compared to their use in banking regulation. Recent policy discussions have increasingly focused on the potential application of banking regulation tools to NBFI. While supporters of the approach contend that the enhanced regulation could reduce vulnerability and enable preemptive mitigation of risks, opponents argue that banking regulation tools may not necessarily be the most appropriate approach for NBFI, which faces different risks and already has long-established nonbank regulatory frameworks.

The policy issues and related policy options discussed in this report are not an exhaustive account of all potential risks and solutions, nor do they endorse specific policy measures. Each policy option presented comes with inherent limitations and trade-offs and can carry unintended consequences. A comprehensive analysis of both direct and indirect impacts, along with greater understanding of how NBFI functions within its unique context and in interactions with the broader financial system, can lead to more informed and effective policy decisions.

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Introduction

Nonbank financial intermediation (NBFI)—sometimes known as "shadow banking"—generally means fundraising outside of the banking system.[1] This report starts with the background of NBFI, including its definition, composition, and growth trends. It then discusses examples within NBFI that have displayed signs of vulnerability. The report further explains policy options for Congress and new policy developments to address these vulnerabilities.

NBFI has been an area of congressional focus because of its size, importance, and complexity. Within the United States' financial system, total financial assets at nonbank financial intermediaries (NBFIs)[2] were around 2.8 times that of banks as of 2023.[3] Although banking regulation has traditionally placed a greater emphasis on financial stability compared to the regulation of NBFI,[4] financial crises and market events have revealed that banks are not the only financial entities capable of threatening the stability of the financial system. Notable market events associated with money market mutual funds (MMFs), hedge funds, and prime brokers (among other events mentioned in this report) have illustrated the extent of NBFI-related federal government interventions to curtail market disruptions.[5] The selected examples of market events are not inclusive of all relevant events, nor do they represent the likely frequency and scale of future NBFI-related market developments that could continue to draw policy concerns.

Some observers believe NBFI is a source of financial stability concern, thus warranting increased policy actions to address its vulnerability.[6] Others argue that current regulation is generally sufficient to address the risks posed by these activities and markets, and so additional significant policy action is unnecessary, and, potentially in some areas, regulation could be safely relaxed.[7] Another area of debate is whether, as the banking system increasingly faces tightened regulatory requirements, more fundraising activities and their related risks may have migrated toward NBFI.[8] Evidence of the interconnectedness between banks and NBFIs has also led some researchers to contend that instead of viewing businesses and risks as having migrated from banks to NBFIs, the interactions between the two resemble an interwoven relationship that has evolved

[1] The term *shadow banking* does not have a standardized legal definition. While some observers view shadow banking as narrowly including nonbanks that engage in traditional bank-like activities, others apply the term more broadly to include all NBFI activities. For example, the Financial Stability Board (FSB) and some congressional and media statements cited in this report use the term to generally describe all NBFI activities. NBFI(s) can refer to nonbank financial intermediation, nonbank financial institutions, or nonbank financial intermediaries interchangeably.

[2] Some sources refer to nonbank financial *institutions*. This report will treat the two terms as synonymous.

[3] FSB, "Global Monitoring Report on Non-Bank Financial Intermediation: Data," https://www.fsb.org/work-of-the-fsb/financial-innovation-and-structural-change/non-bank-financial-intermediation/global-nbfi-monitoring-report-data.

[4] Daniel Schwarcz and David Zaring, "Regulation by Threat: Dodd-Frank and the Nonbank Problem," *University of Chicago Law Review* (2017), https://lawreview.uchicago.edu/print-archive/regulation-threat-dodd-frank-and-nonbank-problem. For an overview of the U.S. regulatory framework addressing systemic risk, see CRS Report R47026, *Financial Regulation: Systemic Risk*, by Marc Labonte.

[5] See "Policy Issues" section of this report for details on multiple examples of NBFI market events.

[6] Antonio Pascual et al., "Nonbank Financial Sector Vulnerabilities Surface as Financial Conditions Tighten," *IMF Blog*, April 4, 2023, https://www.imf.org/en/Blogs/Articles/2023/04/04/nonbank-financial-sector-vulnerabilities-surface-as-financial-conditions-tighten.

[7] For example, letter from nine Members of the House Financial Services Committee to Treasury Secretary Scott Bessent, March 31, 2025, https://financialservices.house.gov/uploadedfiles/2025-03-31_letter_to_fsoc.pdf.

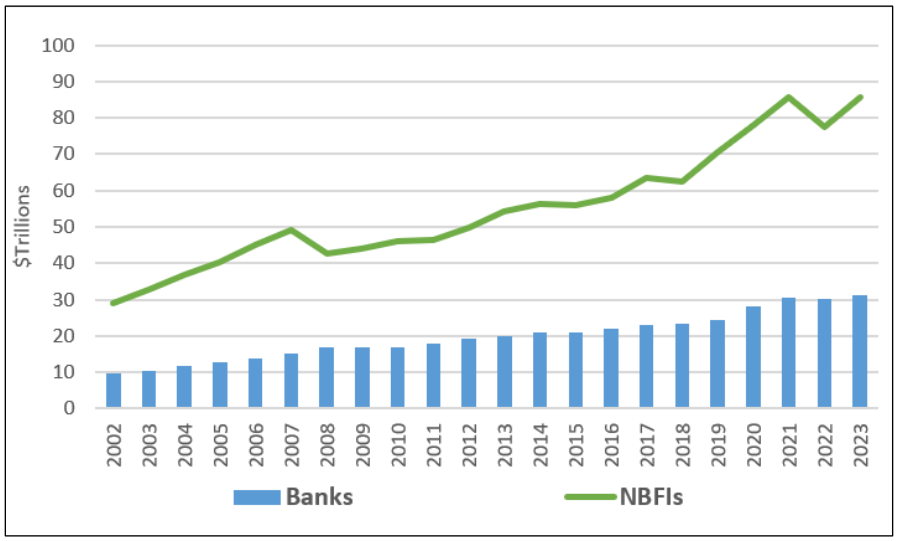
[8] *Financial Times*, "Taming the Shadow Banks," April 13, 2023, https://www.ft.com/content/cf05babb-b184-4dfd-b5fd-81705b66edbd.

over time.[9] Some observers consider NBFI issues "the most urgent question in financial regulation today."[10] NBFI issues have attracted ongoing congressional efforts, including congressional hearings and letters and statements from Members of Congress.[11]

What Are NBFIs' Size and Trends?

The term NBFIs generally refers to private entities providing financial services that are not banks, such as broker-dealers, asset managers, insurance companies, nonbank lenders, investment funds, among others, as discussed in more detail in the next section. Collectively, this broad set of financial institutions holds almost half of global financial assets, depending on the measure used. The Financial Stability Board (FSB) has a broad measure of total global NBFI assets that has grown from around $67 trillion in 2004 to $238 trillion in 2023, and the sector has become more diverse over this period.[12] Within the broader measure of NBFI are the nonbank funding sources, including MMFs, other public and private investment management companies, broker-dealers, and structured finance vehicles. The FSB also tracks a *narrow measure* of NBFI that generally comprises of economic functions mimicking bank-like credit intermediation.[13]

Figure 1. Total Financial Assets at NBFIs vs. Banks in the United States



Source: CRS using data from Financial Stability Board, "Global Monitoring Report on Non-Bank Financial Intermediation: Data," https://www.fsb.org/work-of-the-fsb/financial-innovation-and-structural-change/non-bank-financial-intermediation/global-nbfi-monitoring-report-data, accessed December 26, 2024.

Note: The NBFI sector includes all financial institutions that are not central banks, banks, or public financial institutions.

[9] Viral Acharya et al., *Where Do Banks End and NBFIs Begin?*, National Bureau of Economic Research, April 2024, https://www.nber.org/papers/w32316.

[10] *The Economist*, "America's Searing Market Rally Brings New Risks," December 11, 2024, https://www.economist.com/leaders/2024/12/11/americas-searing-market-rally-brings-new-risks.

[11] For example, items discussed in "Policy Debates" under "FSOC Nonbank Designation" section of this report.

[12] See interactive chart at FSB, "Non-Bank Financial Intermediation," https://www.fsb.org/work-of-the-fsb/financial-innovation-and-structural-change/non-bank-financial-intermediation/#nbfi-modal, and FSB, "Global Monitoring Report on Non-Bank Financial Intermediation: Data."

[13] FSB, *Global Monitoring Report on Non-Bank Financial Intermediation: 2023*, December 18, 2023, p. 7, https://www.fsb.org/wp-content/uploads/P181223.pdf#page=7.

In the United States, NBFI assets have experienced a long-term trend of growth in the past two decades (**Figure 1**). While total financial assets at U.S. banks represent 114% of gross domestic product (GDP), the total financial assets at U.S. NBFIs reached 313% of GDP in 2023.[14] As of 2023, the broad-measure total financial assets and narrow-measure assets at NBFIs reached $85.7 trillion and $22.2 trillion, respectively, in the United States.[15] These compare to total financial assets of $31.1 trillion at banks for the same period (**Figure 1**).[16]

What Is Included in NBFI?

While policy discussions often reference NBFI as a single concept, NBFI is neither a single entity nor a uniform system. Instead, NBFI encompasses a variety of markets and participants, and each may function in distinct ways and face different types of risks. NBFI includes market-based financing that is mainly facilitated through capital markets.[17] It may also include financial activities at other nonbanks such as insurance companies.[18] Discussions of insurance companies are outside of the scope of this report. See CRS In Focus IF10043, *Introduction to Financial Services: Insurance*, by Baird Webel for more detail.

Specifically, this report follows NBFI terminology set forth by the FSB, which defines NBFI as financial activities facilitated by institutions other than central banks, banks, or public financial institutions.[19] Using FSB terminology, examples of major NBFI activities include

- collective investment vehicles susceptible to runs, such as *money market mutual funds*, and *hedge funds* focusing on credit assets that are susceptible to liquidity crunches[20];
- lending activities that are dependent on short-term funding, such as *nonbank finance companies* that provide loans to individuals and businesses;
- market intermediation that is dependent on short-term funding, such as *broker-dealers* and *securities lending companies*;
- facilitators of credit intermediation, such as *financial guarantors* and *credit insurance companies*, and securitization-based credit intermediation, such as *securitization vehicles* and *asset-backed securities*.[21]

[14] FSB, "Global Monitoring Report on Non-Bank Financial Intermediation: Data."

[15] FSB, *Monitoring Aggregates by Jurisdiction from the FSB's Global Monitoring Report on Non-Bank Financial Intermediation*, https://www.fsb.org/work-of-the-fsb/financial-innovation-and-structural-change/non-bank-financial-intermediation/global-monitoring-report-data.

[16] Ibid.

[17] For an overview of capital markets, see CRS In Focus IF11062, *Introduction to Financial Services: Capital Markets*, by Eva Su.

[18] For more on insurance, see CRS In Focus IF10043, *Introduction to Financial Services: Insurance*, by Baird Webel. In aggregate, U.S. insurance corporations held $13 trillion in financial assets, representing 47% of GDP as of 2023. These compare to total U.S. NBFI financial assets of $85.7 trillion. FSB, "Global Monitoring Report on Non-Bank Financial Intermediation: Data."

[19] FSB, "Non-Bank Financial Intermediation," https://www.fsb.org/work-of-the-fsb/financial-innovation-and-structural-change/non-bank-financial-intermediation.

[20] Hedge funds are technically generally subject to lock-up periods and thus are less susceptible runs, but they may still face redemption pressure and liquidity crunch during financial crisis.

[21] FSB, *Global Monitoring Report on Non-Bank Financial Intermediation*.

Main Categories of Market-Based NBFIs and Their Risk Concerns

The scope of this report focuses on NBFI operations within capital markets and securities regulation framework, which is a main component of NBFI.[22] In aggregate, capital markets NBFIs provide the largest sources of financing—more than 70% of all financing versus 11% for bank loans—for U.S. nonfinancial companies.[23] As **Table 1** illustrates, main categories of market-based NBFIs include institutional investors and asset managers, market intermediaries, and financial market infrastructure.[24] The table presents some examples of specific entities under each category. **Table 1** also includes systemic risk considerations associated with the entities and examples of market events that demonstrated the respective NBFI's vulnerability.

Table 1. Examples of NBFIs and Related Financial Stability Risks

Categories	Entities Examples	Systemic Risks	Market Events
Institutional Investors and Asset Managers	Hedge funds	Leverage and liquidity transformation (limited by redemption notices)	See "The Collapse of Long-Term Capital Management" text box
	Exchange-traded funds	Liquidity mismatch	See "ETF Market Irregularities during COVID-19 Induced Stress" text box
	Mutual funds, including money market mutual funds	Run behavior at money market mutual funds, liquidity mismatch at open-end funds	See "MMF Runs in 2008 and 2020" text box
Market Intermediaries	Broker-dealers	Leverage, liquidity transformation	See "The Archegos Fallout" text box
Financial Market Infrastructure	Central Counter Parties	Technical disruptions and pro-cyclicality in market-wide leverage	See "Central Counter Parties" section for general discussions

Source: CRS and Sirio Aramonte et al., "Non-Bank Financial Intermediaries and Financial Stability," Bank for International Settlements, January 2022, https://www.bis.org/publ/work972.pdf.

Notes: See respective text boxes and sections within this report for more details on market events or general discussions. For more details on specific financial intermediaries, see CRS In Focus IF12511, *Hedge Funds: Background and Policy Issues*, by Eva Su; CRS Report R45318, *Exchange-Traded Funds (ETFs): Issues for Congress*, by Eva Su; CRS In Focus IF12594, *Payment for Order Flow (PFOF) and Broker-Dealer Regulation*, by Eva Su; and CRS Report R47309, *Money Market Mutual Funds: Policy Concerns and Reform Options*, by Eva Su.

For more explanations on risk factors and market events within the table, see six individual subsections under "Policy Issues" for separate discussions on (1) runnable behavior, (2) leverage, (3) interconnectedness between nonbanks and banks, (4) data and transparency challenges, (5) liquidity mismatch, and (6) concentration risks.

Why Are NBFIs Regulated Differently Than Banks Are?

Capital markets activities that facilitate fundraising operate separately from traditional banking and are generally governed by distinct securities regulation largely overseen by the Securities and

[22] For more on capital markets and securities regulation, see CRS In Focus IF11062, *Introduction to Financial Services: Capital Markets*, by Eva Su; and CRS In Focus IF11714, *Introduction to Financial Services: The Securities and Exchange Commission (SEC)*, by Eva Su.

[23] Securities Industry and Financial Markets Association, *2024 Capital Markets Fact Book*, July 2024, https://www.sifma.org/wp-content/uploads/2023/07/2024-SIFMA-Capital-Markets-Factbook.pdf.

[24] Sirio Aramonte et al., "Non-Bank Financial Intermediaries and Financial Stability," Bank for International Settlements, January 2022, https://www.bis.org/publ/work972.pdf.

Exchange Commission (SEC).[25] In primary market operations,[26] the SEC is mainly concerned with disclosure, the theory being that investors should have full knowledge to make informed decisions about their investments, including whether to invest and at what price level to compensate for their risks.[27]

The SEC's regulatory philosophy for capital markets is different than that of banking regulators, which, by contrast, focus more on safety and soundness to avoid bank failure. The traditional view holds that prudential banking regulations should not apply to NBFIs because, unlike banks, NBFIs generally do not benefit from the explicit and implicit government safety net.[28] (Additionally, the bank depositors' risk appetite and the needs of the bank loan applicants could be different.) While some prudential tools, such as capital requirements and stress tests, are already part of capital markets regulation, they are applied on a smaller scale compared to their use in banking regulation.[29] Recent policy discussions have increasingly focused on the potential application of banking regulation tools to NBFIs while recognizing the independent and long-established nature of capital markets and securities regulation frameworks. For more specifics on capital markets and banking regulation, see CRS In Focus IF11714, *Introduction to Financial Services: The Securities and Exchange Commission (SEC)*, by Eva Su; and CRS In Focus IF10035, *Introduction to Financial Services: Banking*, by Raj Gnanarajah and Andrew P. Scott.

Policy Issues

The size and growth of NBFI suggest that significant amount of financing is being intermediated and held outside of the banking sector. In contrast to the traditional banking model, where banks normally manage risks (e.g., credit, market, liquidity, and operational risks) on their balance sheets, the market-based NBFI financing model shifts risks toward capital markets investors and intermediaries. This shift has caused financial system resilience to be less directly dependent on risk management of banks and more dependent on the ability of end-investors in capital markets to effectively manage risks, especially during market stress.[30]

Some financial authorities believe that the growth of NBFI enables a broader range of financial intermediaries with diverse expertise and risk profiles. This, in turn, can expand access to funding for the economy, improve efficiency, and diversify risks.[31] At the same time, there are signs of vulnerability, as depicted by a Bank of England analysis in **Figure 2**,[32] caused by NBFI from the perspectives of (1) "micro-financial" vulnerabilities that are inherit in individual firms' business models and are primarily for firms to first manage under the oversight of regulatory agencies (i.e.,

[25] CRS In Focus IF11714, *Introduction to Financial Services: The Securities and Exchange Commission (SEC)*, by Eva Su.

[26] The primary market is where securities are first created.

[27] See CRS In Focus IF11256, *SEC Securities Disclosure: Background and Policy Issues*, by Eva Su.

[28] Andrew Metrick and Daniel Tarullo, "Congruent Financial Regulation," *Brookings Papers on Economic Activity* (Spring 2021), https://www.jstor.org/stable/pdf/27093823.pdf.

[29] For more on banking regulation and capital requirements, see CRS Report R47447, *Bank Capital Requirements: A Primer and Policy Issues*, by Andrew P. Scott and Marc Labonte.

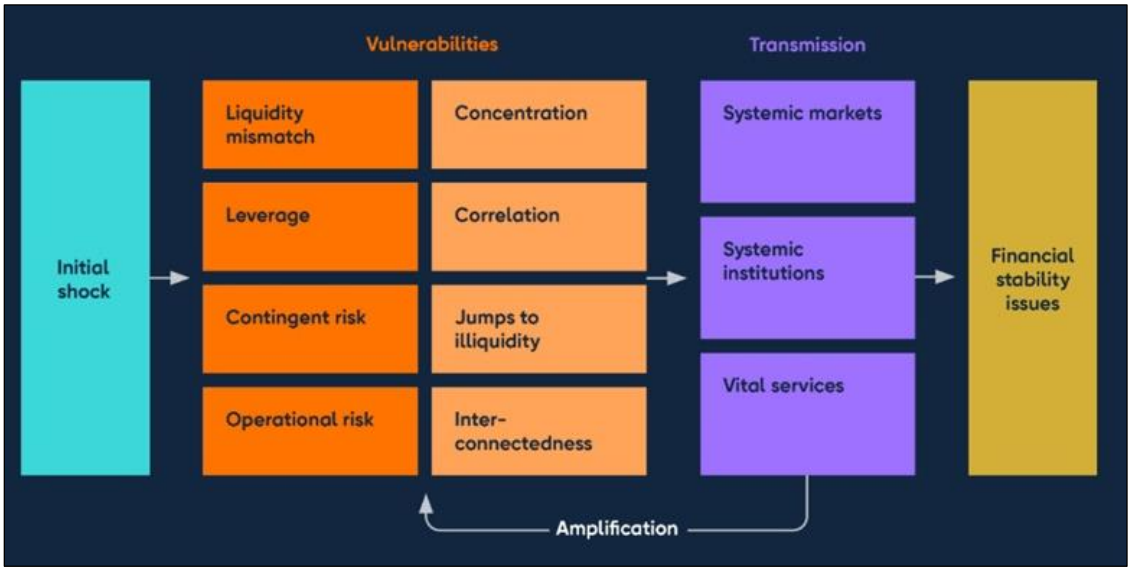
[30] FSB, "Understanding and Addressing Systemic Risks in Non-Bank Financial Intermediation," June 2022, https://www.fsb.org/wp-content/uploads/P020622.pdf.

[31] International Monetary Fund, "Nonbank Financial Intermediaries: Vulnerabilities amid Tighter Financial Conditions," in *Global Financial Stability Report*, April 2023, https://www.imf.org/en/Publications/GFSR/Issues/2023/04/11/global-financial-stability-report-april-2023.

[32] The Bank of England created the chart to illustrate risks and vulnerabilities in UK intermediaries and markets, but the financial stability general concepts are also applicable to U.S. intermediaries and markets.

items in orange boxes) and (2) "macro-financial" vulnerabilities that are inherit in market structures and are reflections of collective behavior of financial market participants (i.e., items in yellow boxes).[33] These vulnerabilities could then transmit through (1) systemic markets, such as securities markets; (2) systemic institutions, such as asset managers, broker-dealers, and banks; and (3) vital services, such as clearing and settlement; to impact financial stability.[34]

Figure 2. NBFI Vulnerabilities and Transmission Channels to Financial Stability



Source: Bank of England.

Note: The chart illustrates NBFI vulnerabilities in market-based finance.

Because NBFI does not refer to one standardized practice, the policy concerns vary by the respective market segments and their analytical perspectives. To illustrate the extent of capital markets NBFI vulnerabilities, instead of drawing assumptions, this section directly presents real market events. It explains policy concerns and options from the perspectives of "run-like" behavior, leverage, liquidity mismatch, data and transparency, concentration, and interconnectedness between nonbanks and banks. This list of examples is neither exhaustive of all potential risks and solutions nor an advocation for specific policy fixes. Every policy option outlined comes with its own set of limitations and trade-offs.

"Runnable" Behavior

Run risk refers to the scenario where many investors withdraw their investments nearly simultaneously, triggering spillover events for the broader financial system. While the term *run* is more frequently used by banks, investment funds and certain financial instruments could also face run-like behavior.[35] According to the Federal Reserve (Fed), the total estimated runnable money-like financial instruments reached $21 trillion in 2023. As **Figure 3** illustrates, capital market

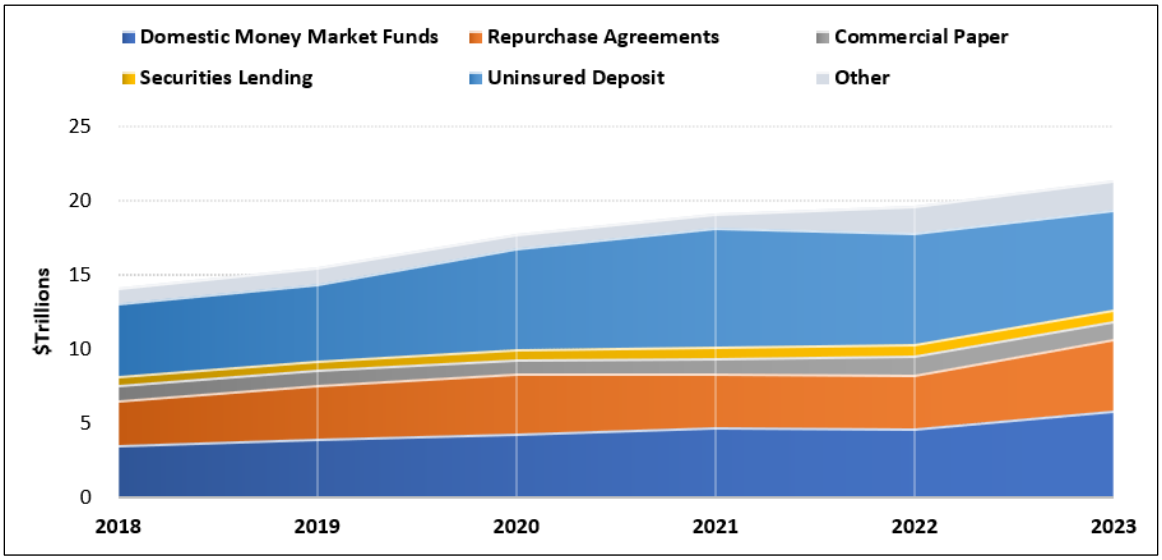
[33] Bank of England, "Non-Bank Risks, Financial Stability and the Role of Private Credit—Speech by Lee Foulger," January 29, 2024, https://www.bankofengland.co.uk/speech/2024/january/lee-foulger-keynote-address-at-the-dealcatalyst-afme-european-direct-lending.

[34] Bank of England, "Non-Bank Risks, Financial Stability and the Role of Private Credit."

[35] Jonathan Rose, "Understanding the Speed and Size of Bank Runs in Historical Comparison," Federal Reserve Bank of St. Louis, May 25, 2023, https://research.stlouisfed.org/publications/economic-synopses/2023/05/26/understanding-the-speed-and-size-of-bank-runs-in-historical-comparison.

NBFIs—such as MMFs, securities lending, commercial paper, and repurchase agreements (repo)—are some of the main components of the market segment.[36] The runnable money-like financial instruments experienced aggregate growth in recent years, with some of the growth attributable to increases in MMFs and repo.

Figure 3. "Runnable" Money-Like Instruments



Source: CRS using data from Federal Reserve, "Financial Stability Report," https://www.federalreserve.gov/publications/financial-stability-report.htm.

Note: For more explanations of the selected instruments, see Jack Bao et al., "The Runnables," *FEDS Notes*, September 3, 2015, https://www.federalreserve.gov/econresdata/notes/feds-notes/2015/the-runnables-20150903.html.

Money Market Mutual Funds (MMFs)

Among all runnable NBFIs, MMFs are the example used most often to illustrate financial stability concerns. During an MMF run, specific funds that have some mismatch between their assets and their repayment or redemption obligations may fail to meet their obligations to their clients. MMFs are susceptible to runs because the shareholders expect to always be able to redeem their funds at a price of $1 per share, while the value of a fund's assets could fall below the value of outstanding shares. As such, shareholders have an incentive to redeem their shares before others do when there is a perception that the fund might experience a loss (i.e., *the first-mover advantage*). During market distress, if a fund indeed suffers a loss (i.e., "*breaking the buck*"), investors who redeem their shares early in the run may get more money for their shares than do other investors who redeem their shares later.

The MMF industry experienced substantial growth in recent decades and reached $7.1 trillion in net assets as of November 2024.[37] MMFs are often viewed as an alternative to bank deposits. During certain recent periods when MMFs experienced growth, there are signs that bank deposits

[36] For more details on each instrument, see Jack Bao et al., "The Runnables," *FEDS Notes*, September 3, 2015, https://www.federalreserve.gov/econresdata/notes/feds-notes/2015/the-runnables-20150903.html. See respective sections of this report for more on MMFs and repo.

[37] SEC, "Money Market Fund Statistics," https://www.sec.gov/data-research/data-visualizations/money-market-fund-statistics.

declined or grew at a slower pace than did MMFs.[38] As of July 2024, while interest rates on bank deposits have persistently averaged less than 50 basis points,[39] MMFs have offered rates exceeding 5%,[40] which is substantially more attractive than bank deposits. MMFs increased $1.1 trillion between March 2022 and November 2023, while bank deposits decreased $708 billion during the same period.[41]

[38] Federal Reserve Bank of St. Louis, "Deposits, All Commercial Banks," https://fred.stlouisfed.org/series/DPSACBW027SBOG.

[39] Federal Reserve Bank of St. Louis, "National Deposit Rate: Savings," https://fred.stlouisfed.org/series/SNDR.

[40] Federal Reserve Bank of St. Louis, "Treasury Yield: Money Market," https://fred.stlouisfed.org/series/MMTY.

[41] BlackRock, "A Fast-Changing U.S. Financial Landscape," https://www.blackrock.com/corporate/insights/blackrock-investment-institute/publications/mega-forces/future-of-finance.

Market Events: MMF Runs in 2008 and 2020

MMFs experienced runs multiple times during past financial market distress. The two examples below illustrate the extent of the risk and the scale of policy concerns.

2008 Financial Crisis

On September 15, 2008, Lehman Brothers Holdings, an investment bank, filed for bankruptcy. The next day, one prominent MMF—Reserve Management's Reserve Primary Fund—saw its per share price fall from $1.00 to $0.97 after writing off its Lehman debt. When the Reserve Primary Fund broke the buck, MMF investors elsewhere also rushed to exit their positions. This spillover effect illustrated that MMFs, and even the broader financial system, were vulnerable regardless of whether large actual losses occurred. The Reserve Primary Fund event triggered an array of market reactions, including investors' redemptions of more than $250 billion throughout the MMF industry within a few days of the Lehman bankruptcy filing.

The consequences of these actions were potentially so dire to U.S. financial stability that the Treasury Department provided explicit temporary guarantees to all MMF investors. Treasury announced this program without seeking specific congressional authorization. After the fact, Congress addressed the guarantee in the Emergency Economic Stabilization Act (P.L. 110-343), reimbursing the Exchange Stability Fund, which backed the guarantee, but also forbidding the future use of the fund to provide such a guarantee.[42] The Fed also established multiple emergency liquidity facilities under its statutory authority invoked by "unusual and exigent circumstances" in September and October 2008 to provide a backstop through funding to MMFs and commercial paper as part of a broader crisis response.[43]

2020 Pandemic-Induced "Dash for Cash"

In March 2020, the economic and financial uncertainties surrounding the COVID-19 pandemic induced a "dash for cash" that involved extensive market selloffs of assets across a wide spectrum, including stocks, bonds, and investment funds.[44] Faced with the pandemic-induced uncertainty, market participants allocated more assets toward cash and short-term instruments that receive federal government backing. As a result, MMFs that invest primarily in federal-government-backed debt (i.e., government MMFs) experienced substantial inflows, while MMFs investing primarily in private or municipal debt (i.e., prime and tax-exempt MMFs) suffered sudden outflows. Rapid volume shifts like this also occurred in other short-term markets linked to MMFs, including the commercial paper market and the short-term municipal securities market.[45] Some observers believe that the structural vulnerabilities at MMFs might have led to the increased redemptions and potentially escalated the stress at the overall short-term funding markets.[46] The Fed took action again in March 2020 to address the MMF market disruption, including establishing emergency lending facilities for MMF and commercial paper markets.[47]

Policy Options

The SEC adopted MMF reforms in July 2023 that could (1) increase minimum liquidity requirements to provide a more substantial buffer in the event of rapid redemptions, (2) remove current provisions that permit temporary redemption gates and the tie between the weekly

[42] For more on related Treasury Department actions, see CRS Report R43413, *Costs of Government Interventions in Response to the Financial Crisis: A Retrospective*, by Baird Webel and Marc Labonte.

[43] Michael Fleming, "Federal Reserve Liquidity Provision During the Financial Crisis of 2007-2009," Federal Reserve Bank of New York, July, 2012, https://www.newyorkfed.org/medialibrary/media/research/staff_reports/sr563.pdf.

[44] For more details, see CRS Report R46424, *Capital Markets Volatility and COVID-19: Background and Policy Responses*, by Eva Su.

[45] Commercial paper is a type of short-term corporate debt that facilitates short-term financing for businesses and households. They generally have minimum denominations of $100,000 and terms less than 270 days. For more background, see Tobias Adrian et al., "The Federal Reserve's Commercial Paper Funding Facility," *FRBNY Economic Policy Review* (May 2011), https://www.newyorkfed.org/medialibrary/media/research/epr/11v17n1/1105adri.pdf.

[46] Antoine Bouveret et al., "Money Market Fund Vulnerabilities: A Global Perspective," Federal Reserve Bank of New York, March 2022, https://www.newyorkfed.org/medialibrary/media/research/staff_reports/sr1009.pdf.

[47] For more details, see CRS Insight IN11340, *COVID-19: Selected Capital Markets Segments Supported by Federal Government Liquidity Interventions*, by Eva Su; CRS Insight IN11327, *Federal Reserve: Emergency Lending in Response to COVID-19*, by Marc Labonte; and CRS Report R46424, *Capital Markets Volatility and COVID-19: Background and Policy Responses*, by Eva Su.

liquidity asset threshold and liquidity fees, (3) require some MMFs to implement liquidity fees when funds experience daily redemptions exceeding a certain level to better allocate the costs of providing liquidity to redeeming investors, and (4) enhance reporting requirements.[48] While some argue that the reform could enhance MMF market resilience, others assert that the enhanced compliance could harm the viability of MMFs.[49]

Policy proposals to address MMF run risk center around several main categories, including[50]

- rolling back certain earlier MMF reform provisions that critics assert failed to address the run risk—specifically, the removal of regulatory provisions (e.g., *liquidity fees* and *redemption gates*) that appear to have produced unintended consequences of the threshold effects, also called the cliff effect, referring to investors' preemptive actions to avoid consequences of funds crossing certain thresholds;
- addressing the first-mover advantages through mechanisms that could spread the risks more broadly and reduce incentives to run (e.g., *swing pricing* and *minimum balance at risk*);
- increasing transparency through additional disclosures and visibility into price movements (e.g., *disclosure requirements* and *floating net asset value*);
- addressing MMF liquidity needs through higher liquidity requirements; and
- reducing MMF portfolio risks through further risk reduction and risk sharing (e.g., *sponsor support*, a *capital buffer*, and *limits on eligible assets*).

Leverage

Leverage generally refers to an entity's capability to use borrowed funds or derivatives to amplify possible risks and returns. Although leverage is a common practice for the financial services sector, in certain circumstances, it could create and amplify vulnerabilities in the financial system and bring harm to both investors and the financial system as a whole. Leverage's attributes that amplify vulnerabilities include interconnectedness, concentration, liquidity imbalances, and other contagion effects.[51]

The specific calculations of leverage vary. The leverage in investment funds, for example, is typically calculated using a fund's market exposure divided by its net asset value.[52] Other calculation methods include debt to assets and debt to equity, to name a few. Market exposure could be created through *financial leverage* using borrowed money or through *synthetic leverage* using derivatives (which derive value from other underlying assets).[53]

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[48] SEC, "Open-End Fund Liquidity Risk Management Programs and Swing Pricing; Form N-PORT Reporting," 87 *Federal Register* 77172, November 2, 2022, https://www.sec.gov/files/rules/proposed/2022/33-11130.pdf.

[49] Josh Weinberg and Jeff Naylor, "Sold Under False Pretenses: The SEC's Money Market Fund Reform Is Causing Damage," Investment Company Institute, February 5, 2025, https://www.ici.org/viewpoints/25-view-mmf-reforms.

[50] For more detailed discussions on the specifics of the options, see "Reform Options" section of CRS Report R47309, *Money Market Mutual Funds: Policy Concerns and Reform Options*, by Eva Su.

[51] FSB, *The Financial Stability Implications of Leverage in Non-Bank Financial Intermediation*, September 6, 2023, https://www.fsb.org/uploads/P060923-2.pdf.

[52] International Organization of Securities Commissions (IOSCO), "Recommendations for a Framework Assessing Leverage in Investment Funds," December 2019, https://www.iosco.org/library/pubdocs/pdf/IOSCOPD645.pdf.

[53] For more on derivatives, see CRS In Focus IF10117, *Introduction to Financial Services: Derivatives*, by Rena S. Miller. For more on synthetic financing, see Christian McNamara and Andrew Metrick, "Basel III E: Synthetic (continued...)

Figure 4. Leverage Ratio at Different Types of Hedge Funds

Net-Asset-Weighted Average Ratio of Gross Notional Exposure to Net Asset Value

Strategy	2022Q1	2022Q2	2022Q3	2022Q4	2023Q1	2023Q2	2023Q3	2023Q4	2024Q1
Macro	33.8	30.1	29.3	34.4	35.2	39.5	40.6	40.8	46.0
Relative Value	25.4	24.8	23.8	21.3	23.1	25.5	25.4	27.4	26.5
Managed Futures/CTA	15.0	16.5	14.0	14.3	12.1	17.1	18.6	14.8	22.1
Multi-Strategy	14.9	13.2	11.0	14.0	14.1	14.8	15.6	14.1	16.5
Credit	3.2	3.1	3.2	3.2	3.4	3.5	3.4	3.4	3.6
Equity	2.9	2.9	3.4	3.5	3.6	3.1	3.1	3.1	3.2
Investment in other funds	2.8	4.1	4.0	3.0	3.7	3.8	3.8	3.6	3.0
Other	3.1	2.9	2.9	2.9	2.7	2.7	2.7	2.7	2.6
Event Driven	1.9	2.0	1.8	1.8	2.1	2.1	1.9	1.8	1.7

Source: SEC, *Private Funds Statistics: First Calendar Quarter 2024*, https://www.sec.gov/files/investment/private-funds-statistics-2024-q1.pdf#page=42.

Notes: Aggregate qualifying hedge fund reporting on SEC Form PF. A fund with more than 50% of assets concentrated in a strategy is assigned that strategy type. Otherwise, it is classified as multi-strategy. CTA = commodity trading advisors.

While some NBFIs face statutory limitations regarding their leverage ratios, others can build large leveraged positions. For example, mutual funds are subject to a 300% asset coverage requirement.[54] This is a leverage ratio of 33%, meaning the fund cannot borrow an amount exceeding a third of its portfolio size. By contrast, hedge funds do not face the same leverage restrictions.[55] As **Figure 4** illustrates, as of first quarter 2024, depending on hedge funds' investment styles, their leverage could reach between two and 46 times their net asset value. Although some hedge funds maintain low leverage, the funds that focus on macroeconomic conditions and relative value trades—which profit from perceived mispricing between related financial instruments (e.g., Treasury basis trades)—employ increasingly high leverage (**Figure 4**).[56]

Leverage Creation Process

To create leverage, NBFIs could use a variety of methods, such as direct bank loans, repo, margin lending, and synthetic financing. Below are more detailed explanations of the common methods of repo and margin lending.

Margin lending allows securities broker-dealers to directly lend money to hedge funds and others secured by their collateral.[57] Investors are subject to margin requirements for their specific levels of borrowing. For example, an initial margin decides the maximum amount an investor could initially borrow against the collateral amount. The maintenance margin decides the minimum amount of equity in the margin account after the trade, on an ongoing basis, when the equity value fluctuates. When the collateral value falls below the requirements, the investors receive *margin calls*. The March 2020 market turmoil and Archegos fallout in 2021 (discussed

Financing by Prime Brokers," *Journal of Financial Crises* (2019), https://elischolar.library.yale.edu/journal-of-financial-crises/vol1/iss4/7.

[54] 15 U.S.C. §80a-18. For more on public and private funds, see CRS Report R45957, *Capital Markets: Asset Management and Related Policy Issues*, by Eva Su.

[55] For more on hedge funds, see CRS In Focus IF12511, *Hedge Funds: Background and Policy Issues*, by Eva Su.

[56] For more on Treasury basis trades, see Jonathan Glicoes et al., "Quantifying Treasury Cash-Futures Basis Trades," *FEDS Notes*, March 8, 2024, https://www.federalreserve.gov/econres/notes/feds-notes/quantifying-treasury-cash-futures-basis-trades-20240308.html.

[57] SEC, "Margin: Borrowing Money to Pay for Stocks," April 16, 2009, https://www.sec.gov/about/reports-publications/investorpubsmarginhtm.

below) have drawn attention to how margin and collateral calls could amplify market stress and create procyclical behavior that exposes some market participants' lack of liquidity preparedness during crisis.[58]

Multiple entities—including the Financial Industry Regulatory Authority (FINRA), the SEC, the Fed, national securities exchanges, and broker-dealers—could set margin requirements. In general, the Fed's Regulation T sets the initial margin requirements, and FINRA Rule 4210 sets maintenance margin and other requirements.[59]

A repurchase agreement, or "repo," allows an NBFI to sell its securities to a broker-dealer while simultaneously agreeing to purchase the securities back at a future date at a higher price that would reflect a return similar to the implied interest rates of a borrowing.[60] As such, a repo contract is economically similar to an interest-bearing cash loan against securities collateral. Securities broker-dealers make money in such transactions by receiving the difference between cash lenders and cash borrowers in the economic sense. In the triparty repo market, where transactions take place among three different parties, about half of the transactions (between 40% and 60% of all repo transactions) involve broker-dealers channeling cash from MMF lenders to hedge fund borrowers.[61]

Example of Leverage Creation Affected by "Repo Chain" Haircuts

Given the large-scale use of repo chain borrowing by hedge funds (e.g., Treasury securities basis trades),[62] potential adjustments to repo "haircut" requirements (i.e., reduction on the borrowing amount against a given collateral's market value) could be a powerful policy tool to control leverage creation. This section explains the details. In theory, if without haircuts and controlled for other conditions, a hedge fund could create *infinite* leverage. To start this hypothetical process, a hedge fund could purchase securities using its own funds and repo these securities for cash. It could then use the cash raised from repo to buy more securities and repo these securities again for cash and continue this process indefinitely to create infinite leverage.

In practice, repos may involve a haircut that limits (among other real-world constraints) how much leverage can actually be achieved. Nevertheless, the infinite hypothetical illustrates how, in segments of the repo market where haircuts are particularly low or zero, a high amount of leverage can be achieved. For example, a Fed research note indicates that for the Treasury

[58] FSB, *Liquidity Preparedness for Margin and Collateral Calls*, April 17, 2024, https://www.fsb.org/uploads/P170424.pdf. For more on March 2020 market turmoil and the Archegos fallout, see CRS Report R46424, *Capital Markets Volatility and COVID-19: Background and Policy Responses*, by Eva Su; CRS In Focus IF11825, *Family Office Regulation in Light of the Archegos Fallout*, by Eva Su; and the "Archegos Fallout" section of this report.

[59] Financial Industry Regulatory Authority (FINRA), "Margin Regulation," https://www.finra.org/rules-guidance/key-topics/margin-accounts.

[60] For definition of *broker-dealer*, see SEC, "What Is a Broker-Dealer?," https://www.sec.gov/files/oasb-broker-dealer-building-block.pdf. For more on securities lending and repo, see Viktoria Baklanova et al., *Reference Guide to U.S. Repo and Securities Lending Markets*, Federal Reserve Bank of New York, December 2015, https://www.newyorkfed.org/medialibrary/media/research/staff_reports/sr740.pdf.

[61] Amy Huber, "How Market Power in Repo Financing Leads to Imperfect Competition," *Knowledge at Wharton*, July 2, 2024, https://knowledge.wharton.upenn.edu/article/how-market-power-in-repo-financing-leads-to-imperfect-competition. Other cash lenders in the repo market could include mutual funds, banks, and government-sponsored enterprises. See Viktoria Baklanova, "Repo and Securities Lending: Improving Transparency with Better Data," Department of the Treasury, Office of Financial Research, April 23, 2015, https://www.financialresearch.gov/briefs/files/OFRbr-2015-03-repo-sec-lending.pdf.

[62] Claudio Bassi et al., "Financial Stability Risks from Basis Trades in the US Treasury and Euro Area Government Bond Markets," European Central Bank, May 2024, https://www.ecb.europa.eu/press/financial-stability-publications/fsr/focus/2024/html/ecb.fsrbox202405_03~09cad3d18d.en.html.

securities market, hedge funds achieved as high as an aggregate 56-to-1 leverage ratio on $553 billion Treasury repo borrowing as of December 2022 (**Table 2**).[63] As **Table 2** illustrates, the research note estimated that if a minimum haircut of 2% were applied to all repos while the hedge fund's capital supporting the repo stays the same, the leverage ratio reduces to 25-to-1, and the hedge fund's Treasury repo borrowing reduces to $247 billion. This example demonstrates the impact of haircuts to leverage in repo chain transactions.

Table 2. Hedge Fund Leverage and Treasury Repo Haircuts

	December 2022	Minimum Haircut 2%, No Change in Capital
Treasury repo borrowing	$553 billion	$247 billion
Capital supporting Treasury repo	$9.88 billion	$9.88 billion
Leverage on Treasury repo	56-to-1	25-to-1

Source: Ayelen Banegas and Phillip Monin, "Hedge Fund Treasury Exposures, Repo, and Margining," *FEDS Notes*, September 8, 2023, https://www.federalreserve.gov/econres/notes/feds-notes/hedge-fund-treasury-exposures-repo-and-margining-20230908.html.

Notes: The first column reflects data and estimates as of December 2022. The second column considers the effects of a hypothetical 2% floor on Treasury repo haircuts faced by hedge funds with the capital remaining at December 2022 levels.

[63] For more on Treasury securities, see CRS In Focus IF12012, *Treasury Securities Market Disruptions and Policy Issues*, by Eva Su.

Market Event: The Collapse of Long-Term Capital Management (LTCM)

The previously mentioned relative value basis trade investment strategy was first made famous by LTCM, a large hedge fund run by Nobel laureates that collapsed in 1998, prompting the Fed to organize a rescue. *Basis trading* normally refers to a trading strategy that seeks to exploit the difference in prices between a derivative and its underlying instrument.[64] For example, a basis trade in Treasury securities could involve shorting Treasury futures while buying the underlying Treasury securities using borrowed money.[65] Such an arbitrage technique, in theory, is low risk if an asset's different prices in different markets eventually converge. Specifically, an arbitrager could start by selling the higher-priced asset in one market and buying the same (lower-priced) asset in a different market. When the prices converge, it could capture a profit by selling the formerly lower-priced asset and buying back the formerly higher-priced asset. Because the price differentials are typically very small, a hedge fund must build a large position through borrowed money to make a meaningful profit.

Unfortunately, in the case of LTCM, unexpected events, such as the market distress caused by Russia's default in 1998, dislocated the expected price convergence. When LTCM collapsed in September 1998, other institutions faced more than $1 trillion worth of exposure. Specifically, it had approximately $1.2 trillion in derivatives and a more than $100 billion balance sheet backed by $4 billion to $5 billion of net asset value.[66] The event prompted the Federal Reserve Bank of New York to organize a consortium of large banks to invest $3.6 billion to acquire 90% of LTCM's ownership.[67] Lessons learned from the LTCM failure include the risks of excessive leverage and the need for enhanced disclosure.

In 2023, the increase in the hedge fund basis trade between Treasury futures and cash Treasury securities led to a new round of financial stability discussions. Multiple financial authorities, including the Fed and the Bank for International Settlements, have voiced concerns about hedge funds' potential effects on financial stability.[68]

Policy Options

Policy options for managing leverage generally face a trade-off between systemic risk monitoring and mitigation on one hand and the costs of compliance and efficient market operations on the other. Examples of specific policy options include potentially reevaluating certain regulatory changes or increasing transparency on leverage through new disclosures, such as

- Requiring haircuts on repo borrowings.[69]
- Leverage ratio requirements at certain investment funds.
- Regulatory requirements at key financial intermediaries, such as regulation and restrictions at prime brokers.[70]
- Reporting and disclosure requirements at related market participants.

[64] See CRS In Focus IF10117, *Introduction to Financial Services: Derivatives*, by Rena S. Miller.

[65] For more on Treasuries, see CRS In Focus IF12012, *Treasury Securities Market Disruptions and Policy Issues*, by Eva Su.

[66] SEC Chair Gary Gensler, "'Fall Feelings: Treasury Markets' Efficiency and Resiliency' Remarks before SIFMA," November 7, 2023, https://www.sec.gov/newsroom/speeches-statements/gensler-fall-feelings-20231107.

[67] The President's Working Group on Financial Markets, *Hedge Funds, Leverage, and the Lessons of Long-Term Capital Management*, April 1999, https://ypfsresourcelibrary.blob.core.windows.net/fcic/fcic-docs/1999-04-00%20Hedge%20Funds,%20Leverage,%20and%20the%20Lessons%20of%20Long-Term%20Capital%20Management%20(PWG%20on%20Financial%20Markets).pdf.

[68] Daniel Barth et al., "Recent Developments in Hedge Funds' Treasury Futures and Repo Positions: Is the Basis Trade 'Back'?," *FEDS Notes*, August 30, 2023, https://www.federalreserve.gov/econres/notes/feds-notes/recent-developments-in-hedge-funds-treasury-futures-and-repo-positions-20230830.html; and Bank for International Settlements, *BIS Quarterly Review*, September 2023, https://www.bis.org/publ/qtrpdf/r_qt2309.htm.

[69] See this report's section titled "Example of Leverage Creation Affected by "Repo Chain" and Lydia Beyoud and Katanga Johnson, "US Weighs Leaning on Banks to Curb Hedge Fund Leveraged Trading," *Bloomberg*, October 19, 2023, https://www.bloomberg.com/news/articles/2023-10-19/us-weighs-leaning-on-banks-to-curb-hedge-fund-leveraged-trading.

[70] See "Prime Broker" section of this report for more details.

- Assessment tools to identify and analyze leverage. The International Organization of Securities Commissions developed a two-step framework to assess leverage in investments funds for financial stability monitoring purposes.[71]
- Margin lending requirements. FSB developed recommendations in relation to (1) managing exposures to spikes in margin and collateral calls, (2) liquidity stress testing and scenario design for understanding the impact of margin calls, and (3) ensuring that sufficient collateral is available when required.[72]

As an international body that monitors and makes recommendations about the global financial system, the FSB states in its 2024 annual report that financial stability risks from leverage in NBFI is one of its policy focuses.[73] The FSB plans to "publish a consultation report with proposed policy recommendations for authorities to monitor vulnerabilities and use policy measures to address systemic risk from NBFI leverage" by 2025.[74]

Interconnectedness Between Nonbanks and Banks

Certain nonbanks and banks are increasingly interconnected. Under normal market conditions, this "NBFI-bank nexus" could broaden financial access and be considered as having a net positive effect for the financial system.[75] However, the increased interconnectedness and co-dependencies could also generate complexity, increase correlation between the two segments, and amplify shocks and spillover effects during a financial crisis. The ways nonbanks and banks are interconnected include (1) direct business transactions, such as lending, investments, synthetic risk transfer (SRT), and other business collaboration; (2) the existence of entities that assume both nonbank and bank roles[76]; and (3) the exposure to common assets and their fire sale risks.

Direct Interactions—Examples: NBFI-Bank Direct Lending and Private Credit SRT

Data and research from financial authorities indicate that bank term loans and lines of credit have supported NBFIs' operations.[77] U.S. large banks' credit commitments to NBFIs reached $2.1 trillion in the third quarter of 2024.[78] Specific market segments, such as broker-dealers, borrowed

[71] Step one measures leverage to identify and analyze funds that may pose financial stability risks. Step two involves risk-based analysis on the subset of funds identified in step one. IOSCO, "Recommendations for a Framework Assessing Leverage in Investment Funds."

[72] FSB, *Liquidity Preparedness for Margin and Collateral Calls*.

[73] FSB, *Promoting Global Financial Stability: 2024 FSB Annual Report*, November 18, 2024, https://www.fsb.org/uploads/P181124-2.pdf#page=17.

[74] FSB, *Promoting Global Financial Stability*.

[75] Viral Acharya et al., "The Growing Risk of Spillovers and Spillbacks in the Bank-NBFI Nexus," *Liberty Street Economics*, Federal Reserve Bank of New York, June 20, 2024, https://libertystreeteconomics.newyorkfed.org/2024/06/the-growing-risk-of-spillovers-and-spillbacks-in-the-bank-nbfi-nexus.

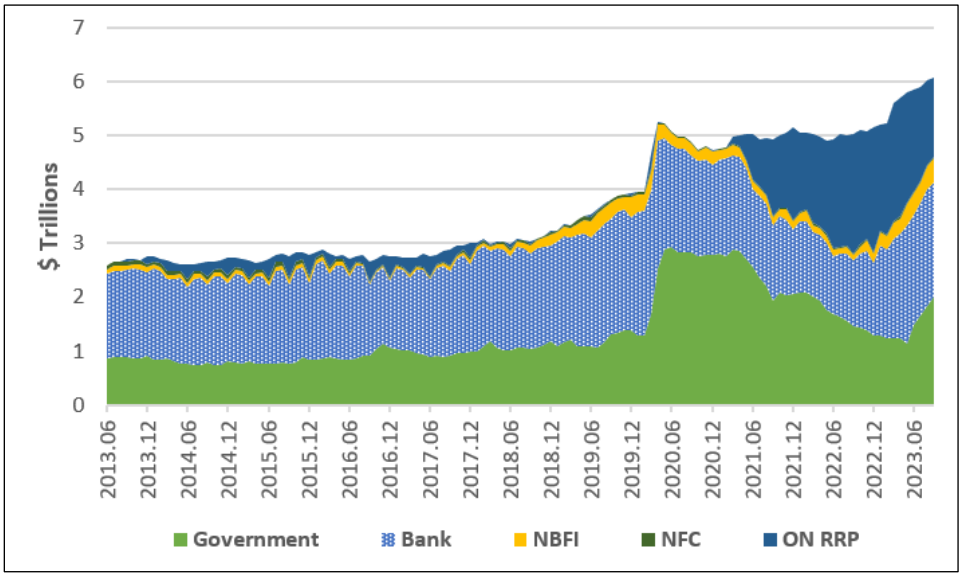
[76] Some large entities, through different subsidiaries, may assume the roles of broker-dealers and deposit-taking banks. In the United States, these entities must generally be organized as *bank-holding companies* subject to Federal Reserve regulation at the parent company level. For more information, see CRS Report R48291, *Bank Holding Companies: Background and Issues for Congress*, by Marc Labonte.

[77] Viral Acharya et al., "Nonbanks Are Growing but Their Growth Is Heavily Supported by Banks," *Liberty Street Economics*, Federal Reserve Bank of New York, June 17, 2024, https://libertystreeteconomics.newyorkfed.org/2024/06/nonbanks-are-growing-but-their-growth-is-heavily-supported-by-banks.

[78] Federal Reserve Board, *Financial Stability Report*, November 2024, https://www.federalreserve.gov/publications/files/financial-stability-report-20241122.pdf#page=45.

$1.4 trillion from banks during the first quarter of 2023.[79] As broker-dealers channel funding from banks to hedge funds and other NBFIs, the relationship could expose banks to counterparty credit risk and spillover effects during financial crisis.[80] Banks also receive funding from NBFIs. For example, the $6 trillion U.S. MMF market primarily channels funding to banks and governments (**Figure 5**).[81] MMFs' funding support to banks are mostly through unsecured commercial paper and other short-term investments.[82] As previously discussed, MMFs are prone to run-like behaviors.[83] During market distress, the MMF runs could adversely affect banks' availability of funding and liquidity, transmitting risks between MMFs and banks.

Figure 5. Money Market Mutual Fund Funding to Banks and Others



Source: CRS using data from Bank for International Settlements, https://www.bis.org/statistics/qt2312d_stats.xlsx.

Notes: Government = Treasury, municipal, and other government securities. NBFI = nonbank financial institution. NFC = nonfinancial corporation. ON RRP = Federal Reserve overnight reverse repurchase agreement facility.

Private credit generally refers to lending by NBFIs to small- and medium-sized companies that are not publicly traded.[84] The private credit market reached approximately $2 trillion globally as of year-end 2023 and continues to grow.[85] The NBFI-bank cooperation in the private credit market could involve risk transfer, fund lending, fund service, wealth management, and

[79] Acharya et al., "Nonbanks Are Growing."

[80] John Kambhu et al., "Hedge Funds, Financial Intermediation, and Systemic Risk," *FRBNY Economic Policy Review* (December 2007), https://www.newyorkfed.org/medialibrary/media/research/epr/07v13n3/0712kamb.pdf.

[81] Iñaki Aldasoro and Sebastian Doerr, "Who Borrows from Money Market Funds?," *BIS Quarterly Review*, December 4, 2023, https://www.bis.org/publ/qtrpdf/r_qt2312d.htm.

[82] Marco Cipriani et al., "Money Market Funds Intermediation and Bank Instability," Federal Reserve Bank of New York, May 2013, https://www.newyorkfed.org/medialibrary/media/research/staff_reports/sr599.pdf.

[83] See "'Runnable' Behavior" section of this report for more details on MMF runs.

[84] See CRS In Focus IF12642, *Private Credit: Trends and Policy Issues*, by Eva Su.

[85] Charles Cohen et al., "Fast-Growing $2 Trillion Private Credit Market Warrants Closer Watch," *IMF Blog*, April 8, 2024, https://www.imf.org/en/Blogs/Articles/2024/04/08/fast-growing-USD2-trillion-private-credit-market-warrants-closer-watch.

investment advisory, among other methods.[86] Within this NBFI-bank cooperation context, banking clients may benefit from private credit firms' faster and more flexible lending services, while private credit firms could benefit from banks' client relationships.[87] To illustrate the complexity and interconnectedness between nonbank and bank operations in the private credit market, below are more specifics on the NBFI-bank risk transfer practice.

Synthetic risk transfer—also referred to as credit linked notes, credit risk transfer, or capital relief trade—is a method for a bank to transfer risk to an NBFI for a fee. Banks use SRT to transfer credit risk to NBFIs by obtaining credit protection agreements while maintaining ownership of the underlying assets and borrower relationships.[88] SRT transactions could enable banks to reduce regulatory capital requirements by mitigating credit risks on the banks' own books.[89] While more U.S. banks have begun to issue SRT to manage regulatory capital requirements, SRT remains more commonly seen in Europe than in the United States.[90]

An SRT transaction typically involves a bank generating a basket of assets on its own balance sheet and buying credit risk protection, such as a financial guarantee or credit derivative, from a third-party NBFI.[91] In situations of actual credit loss, the holder of SRT, as opposed to the bank, would assume the loss, thus mitigating the bank's credit risk exposure for its assets. Through the SRT process, certain credit risk at the bank issuers is transferred to NBFIs.

Some industry participants view SRT transactions as *synthetic securitization*, because, similar to the securitization process, the basket of assets in the reference pool is often segregated into different tranches with different payment order during a default, leading to the asset tranches' different levels of riskiness.[92] But in contrast to the *traditional securitization* process,[93] which allows the assets to be transferred off the banks' own balance sheets, synthetic securitization using SRT leaves the assets and client relationships at the banks.

Combined Roles—Examples: Investment Banks and Prime Brokers

The nonbank and bank roles can sometimes combine at a common entity or its affiliates. This section discusses two of such examples—investment banks and prime brokers—in more detail.

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[86] Richard Rosenthal et al., "How Can Banks Adapt to the Growth of Private Credit?," Deloitte Center for Financial Services, August 13, 2024, https://www2.deloitte.com/us/en/insights/industry/financial-services/alternative-lending-effect-on-banks.html.

[87] Rosenthal et al., "How Can Banks Adapt."

[88] FitchRatings, "Synthetic Risk Transfers Reduce US Bank RWA, Boost Alt IM Capital Deployment," May 29, 2024, https://www.fitchratings.com/research/non-bank-financial-institutions/synthetic-risk-transfers-reduce-us-bank-rwa-boost-alt-im-capital-deployment-29-05-2024.

[89] Federal Reserve Board, "Frequently Asked Questions about Regulation Q," https://www.federalreserve.gov/supervisionreg/legalinterpretations/reg-q-frequently-asked-questions.htm; letter from Federal Reserve to Mayer Brown, March 12, 2024, https://www.federalreserve.gov/supervisionreg/legalinterpretations/bhc_changeincontrol20240312.pdf.

[90] S&P Global, "Banks Ramp Up Credit Risk Transfers to Optimize Regulatory Capital," February 22, 2024, https://www.spglobal.com/ratings/en/research/articles/240222-banks-ramp-up-credit-risk-transfers-to-optimize-regulatory-capital-13009236.

[91] For an example of a flowchart, see Mayer Brown, "Synthetic Risk Transfer," https://www.mayerbrown.com/public_docs/Diagram-SyntheticRiskTransfer.pdf.

[92] FitchRatings, "Synthetic Risk Transfers." For more on securitization and asset tranches, see CRS Insight IN11421, *Leveraged Loans and Collateralized Loan Obligations (CLOs): Recent Developments and Policy Actions*, by Eva Su.

[93] For more on traditional securitization, see Office of the Comptroller of the Currency, "Securitization," https://www.occ.treas.gov/topics/supervision-and-examination/capital-markets/financial-markets/securitization/index-securitization.html.

Investment Banks

Not all entities with the word *bank* in their names are primarily focusing on the deposit-taking banking business. Some self-described banks could be officially NBFIs according to the North American Industrial Classification System.[94] Investment banking, for example, facilitates raising capital for security issuances and financial consultancy services.[95] Investment banks normally act as intermediaries between securities issuers and investors and assist firms with large and complex financial transactions such as mergers and acquisitions and initial public offerings.[96] Examples of investment banks include Goldman Sachs, Morgan Stanley, and UBS Securities. Because large investment banks' primary business operations focus on securities transactions rather than deposit-taking, the SEC is the main regulator for investment banks' securities activities.[97] An investment bank could also be an affiliate of a bank holding company (BHC), a company that owns or controls one or more commercial banks.[98] The Fed provides supervision and regulation for BHCs.[99] The largest U.S. BHCs include JPMorgan Chase, Bank of America, Wells Fargo, Citigroup, Goldman Sachs, and Morgan Stanley, all of which have subsidiaries that perform investment bank activities, with some of them being primarily investment banks.[100]

Prime Brokers

Prime brokers, which are generally subject to both securities and banking regulation (when the entity provides brokerage service via a bank subsidiary in a BHC), are at the center of leverage creation and are a main funding channel that transmits risks between banks and NBFIs.

Prime brokers (or *prime brokerage*) refers to securities broker-dealers who provide certain services to large active investors, such as hedge funds and other NBFIs. Prime brokers' services include leverage transactions, securities lending, cash management, custody and safekeeping, and settlements and recordkeeping, among other services.[101] Broker-dealers, including prime brokers, are normally FINRA members and subject to FINRA and SEC regulation. Because most prime brokers are part of large banking groups, these prime brokers are also subject to certain banking regulation.[102] Some research indicates that hedge funds that are receiving credit supply from prime brokers increase their borrowing and generate higher excess returns relative to

[94] Andres Fernandez et al., "Are Nonbank Financial Institutions Systemic?," *Liberty Street Economics*, Federal Reserve Bank of New York, October 1, 2024, https://libertystreeteconomics.newyorkfed.org/2024/10/are-nonbank-financial-institutions-systemic. In addition, banks are defined by charter, not by name.

[95] *The Economic Times*, "What Is 'Investment Banking,'" https://economictimes.indiatimes.com/definition/investment-banking.

[96] For more on initial public offerings, see CRS Report R45221, *Capital Markets: Public and Private Securities Offerings*, by Eva Su.

[97] Testimony of Erik Sirri, Professor of Finance, Babson College, before the Financial Crisis Inquiry Commission, May 5, 2010, https://fraser.stlouisfed.org/files/docs/historical/fct/fcic/fcic_testimony_sirri_20100505.pdf.

[98] For more on bank holding companies, see CRS Report R48291, *Bank Holding Companies: Background and Issues for Congress*, by Marc Labonte.

[99] For more on banking, see CRS In Focus IF10035, *Introduction to Financial Services: Banking*, by Raj Gnanarajah and Andrew P. Scott.

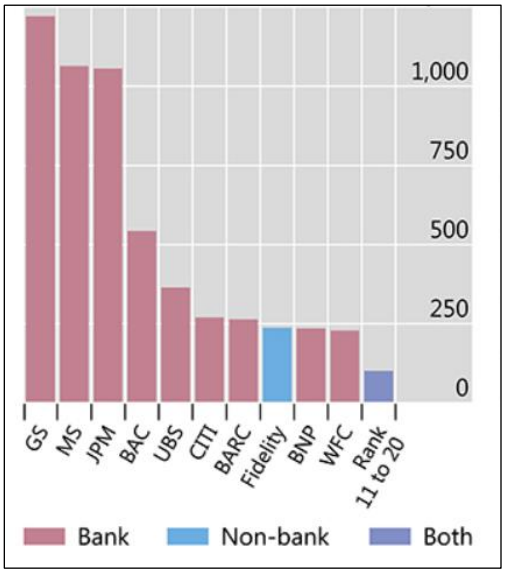
[100] Department of the Treasury, Office of Financial Research, "Largest U.S. Bank Holding Companies and Intermediate Holding Companies by Total Assets and Exposures ($ Trillions)," December 2017, https://www.financialresearch.gov/gsib-scores-chart/files/GSIB_Figures_Dec21.pdf.

[101] Corporate Finance Institute, "Prime Brokerage," https://corporatefinanceinstitute.com/resources/career-map/sell-side/capital-markets/prime-brokerage.

[102] Douglas Kiarelly Godoy de Araujo et al., "The Prime Broker–Hedge Fund Nexus: Recent Evolution and Implications for Bank Risks," Bank for International Settlements, March 4, 2024, https://www.bis.org/publ/qtrpdf/r_qt2403y.htm.

benchmarks.[103] As such, hedge funds are incentivized to borrow from prime brokers. As of June 2024, prime broker lending to hedge funds reached a historic high of $2.3 trillion.[104] The top 10 prime brokers, which are also affiliated with banks (with the exception of Fidelity) serve the vast majority of all hedge fund clients (**Figure 6**).

Figure 6. Top 10 Prime Brokers by Number of Hedge Funds Served



Source: Douglas Kiarelly Godoy de Araujo et al., "The Prime Broker–Hedge Fund Nexus: Recent Evolution and Implications for Bank Risks," Bank for International Settlements, March 4, 2024, https://www.bis.org/publ/qtrpdf/r_qt2403y.htm.

Notes: GS = Goldman Sachs. MS = Morgan Stanley. JPM = JP Morgan Chase. BAC = Bank of America. CITI = Citigroup. BARC = Barclays. BNP = BNP Paribas. WFC = Wells Fargo.

Prime brokers could transmit liquidity pressure and funding shocks from hedge funds to banks and cause rapid de-leveraging during a crisis.[105] Such shocks could directly affect prime brokers, their affiliated banks, and the NBFI clients' risks and returns. In addition, prime brokers could compel NBFI clients to adjust their positions and reduce leverage financing, creating systemic financial intermediary risks, including forcing clients into asset fire sales during de-leveraging.[106] Prime brokers could also face run-like behavior during a crisis, because it would be difficult for clients to access their securities once a prime broker fails.[107] Prime broker clients are likely to withdraw assets as soon as they learn about their brokers' difficulties. Furthermore, because prime brokers use client assets as sources of funding and liquidity, they would have to either locate

[103] Dan Li et al., "Credit Supply and Hedge Fund Performance: Evidence from Prime Broker Surveys," Federal Reserve Board, October 2024, https://www.federalreserve.gov/econres/feds/files/2024089pap.pdf.

[104] Department of the Treasury, Office of Financial Research, "Hedge Fund Monitor," https://www.financialresearch.gov/hedge-fund-monitor/datasets/fpf-single/?mnemonic=FPF-BORROW_PRIMEBROKER_SUM.

[105] Mathias Kruttli et al., "The Life of the Counterparty: Shock Propagation in Hedge Fund-Prime Broker Credit Networks," February 22, 2022, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3140900; Tobias Adrian and Hyun Song Shin, *Procyclical Leverage and Value-at-Risk*, National Bureau of Economic Research, April 2013, https://www.nber.org/papers/w18943.

[106] Magnus Dahlquist et al., "Hedge Funds and Prime Broker Risk," January 15, 2024, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3396632.

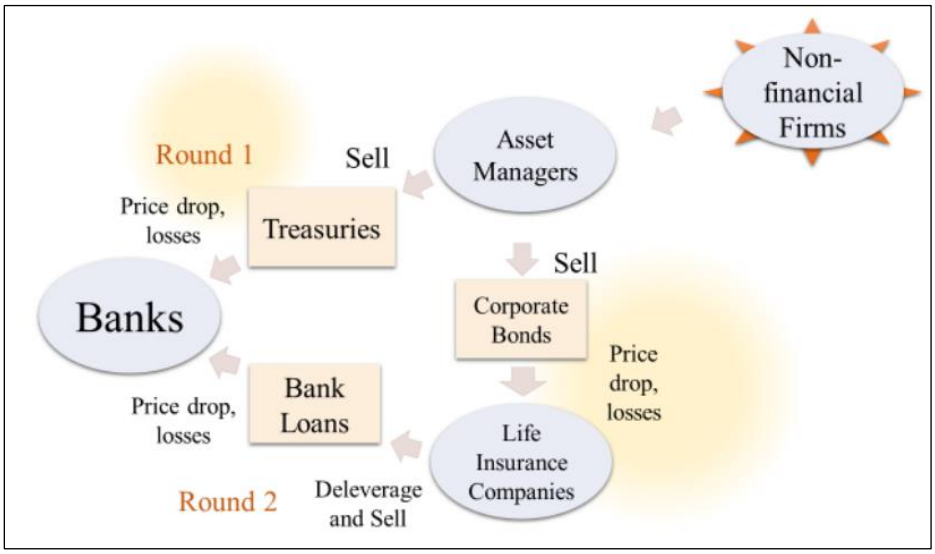
[107] Squam Lake Working Group on Financial Regulation, "Prime Brokers and Derivatives Dealers," April 2010, https://ciaotest.cc.columbia.edu/wps/cfr/0018650/f_0018650_15972.pdf.

replacement financing or conduct fire sales of assets to raise funding, further amplifying the market crisis.[108] The sections below discuss asset fire sales and a specific example of market fallout involving prime brokers in more detail.

Exposure to Common Assets and Fire Sale Risks

NBFIs and banks could be exposed to the risks of owning the same common assets, such as equity, corporate bonds, and Treasury securities, among others. Price changes of such assets could affect asset value and net worth of all asset holders. During crisis-induced fire sale events, the initial price drops could lead to multiple rounds of externalities.[109]

Figure 7. Fire Sale Impact on Nonbanks and Banks



Source: Nicola Cetorelli et al., "Non-Bank Financial Institutions and Banks' Fire-Sale Vulnerabilities," Federal Reserve Bank of New York, March 3, 2023, https://www.newyorkfed.org/medialibrary/media/research/staff_reports/sr1057.pdf; Viral Acharya et al., "Where Do Banks End and NBFIs Begin?," April 12, 2024, p. 50, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4760963.

As **Figure 7** illustrates, during a hypothetical fire sale event, when NBFI asset managers fail to identify natural buyers for their corporate bonds and Treasury securities at normal price levels, they may sell these assets at discounted prices. Faced with price pressure on corporate bonds, insurance companies may de-lever by selling bank loans. The banks then suffer from losses of both impacts of corporate bond and Treasury price declines (Round 1 impact) and impacts of bank loan price declines (Round 2 impact). Furthermore, the initial rounds of fire sales may cause banks to tighten their lending to NBFIs, inducing more fire sales at the affected NBFIs.[110] As such, the initial fire sale may cascade toward further impairment of net worth at NBFIs and banks that hold common assets, multiplying price dislocations and financial stress.

[108] Squam Lake Working Group, "Prime Brokers and Derivatives Dealers."

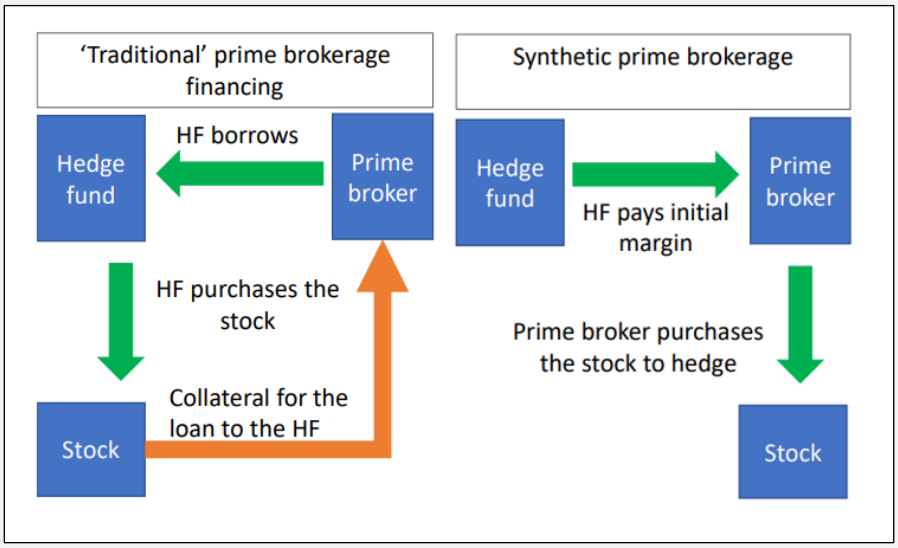
[109] Nicola Cetorelli et al., "Non-Bank Financial Institutions and Banks' Fire-Sale Vulnerabilities," Federal Reserve Bank of New York, March 3, 2023, https://www.newyorkfed.org/medialibrary/media/research/staff_reports/sr1057.pdf.

[110] Acharya et al., "The Growing Risk of Spillovers."

Market Event: The Archegos Fallout

Archegos Capital Management was a family office (a type of private investment company) managing investor Bill Hwang's personal wealth.[111] The firm accumulated large exposures through loans from a number of different prime brokers, which is normally one business line within an investment bank.[112] When Archegos defaulted on March 26, 2021, it caused over $10 billion in losses across several large banks.[113] Right before its collapse (as of March 22, 2021), Archegos had $36 billion in invested capital and $160 billion in gross exposures.[114] Archegos's default was prompted by the stock price declines of a concentrated portfolio of U.S. and Chinese technology and media company stocks that triggered margin calls.[115] After failing to meet margin calls, Archegos defaulted on its loans, causing its global bank counterparties to liquidate the stock positions and book losses. As a result, in addition to Archegos's own net worth, the losses spread to several lenders and counterparties to the firm. Credit Suisse, Nomura, Morgan Stanley, and UBS accumulated collective losses of about $10 billion.[116] Another large lender, Goldman Sachs, reportedly escaped the loss with luck.[117] Around half, or $5.5 billion, of the loss was assumed by Credit Suisse, which was subsequently acquired by UBS in 2023.[118] The event drew attention from both U.S. and international financial regulators, as affected institutions included foreign banks. The Fed fined UBS $268.5 million for Credit Suisse's "unsafe and unsound counterparty credit risk management practices" with counterparty Archegos.[119] UBS paid a total of $387 million in fines after accounting for additional actions by the Swiss and British authorities.[120]

Figure 8. Prime Broker Financing



Source: European Securities and Markets Authority, *Leverage and Derivatives—the Case of Archegos*, May 2022, https://www.esma.europa.eu/sites/default/files/library/esma50-165-2096_leverage_and_derivatives_the_case_of_archegos.pdf.

Notes: HF = hedge fund. *Synthetic prime brokerage* refers to derivative-enabled prime brokerage transactions.

The SEC charged Archegos and its founder with market manipulation in 2022.[121] The SEC alleged that they manipulated stock prices and concealed their activities from market participants and regulators. Archegos invested heavily in a handful of stocks using financial instruments called *equity total return swaps*.[122] These instruments allowed Archegos to receive economic exposure to the relevant stocks without directly owning them, thus avoiding direct-ownership-based disclosure requirements. As **Figure 8** illustrates, in a traditional prime brokerage model, the investor entity (e.g., a hedge fund or family office) would purchase the stocks and pledge them as collateral to prime brokers for loans. The "synthetic" prime brokerage arrangement from Archegos via total return swaps involved the prime brokers purchasing the stocks and transferring the economic exposure to Archegos (right side of the panel).[123] This arrangement allowed Archegos to create somewhat higher leverage and more concealed positions.[124] The Archegos fallout illustrates the risks in leverage, concentration, and opacity and the interconnectedness between NBFIs and banks via prime broker financing. It also leads to more questions about data and transparency as well as international coordination.

[111] For more background, see CRS In Focus IF11825, *Family Office Regulation in Light of the Archegos Fallout*, by Eva Su.

[112] For example, Credit Suisse's prime brokerage service is housed under the investment bank's Global Markets business line's equity sales and trading unit. Credit Suisse, "Credit Suisse Group Special Committee of the Board of Directors Report on Archegos Capital Management," July 29, 2021, https://www.sec.gov/Archives/edgar/data/1159510/000137036821000064/a210729-ex992.htm.

[113] Federal Reserve Board, "SR 21-19: The Federal Reserve Reminds Firms of Safe and Sound Practices for Counterparty Credit Risk Management in Light of the Archegos Capital Management Default," December 10, 2021, https://www.federalreserve.gov/supervisionreg/srletters/SR2119.htm.

[114] SEC, "SEC Charges Archegos and Its Founder with Massive Market Manipulation Scheme," press release, April 27, 2022, https://www.sec.gov/newsroom/press-releases/2022-70.

[115] See "Leverage" section of this report for more on margin lending and margin calls.

[116] European Securities and Markets Authority, *Leverage and Derivatives—the Case of Archegos*, May 2022, https://www.esma.europa.eu/sites/default/files/library/esma50-165-2096_leverage_and_derivatives_the_case_of_archegos.pdf. Mitsubishi UFJ Financial Group's securities arm also booked a $270 million loss. Taiga Uranaka and Yuki Hagiwara, "MUFG Securities Unit to Book $270 Million Loss on Archegos," *Bloomberg*, March 31, 2021, https://www.bloomberg.com/news/articles/2021-03-31/mufg-unit-to-book-270-million-loss-on-archegos-next-quarter.

[117] According to Bloomberg, Goldman Sachs accidentally received $470 million from Archegos because a junior staffer mistakenly wired it, and Goldman kept the money. Ava Benny-Morrison and Sridhar Natarajan, "The Last 72 Hours of Archegos," *Bloomberg*, June 25, 2024, https://www.bloomberg.com/features/2024-bill-hwang-archegos-collapse-timeline.

[118] UBS, "UBS Completes Credit Suisse Acquisition," June 12, 2023, https://www.ubs.com/global/en/media/display-page-ndp/en-20230612-ubs-credit-suisse-acquisition.html.

[119] Federal Reserve Board, "Federal Reserve Board Announces a Consent Order and a $268.5 Million Fine with UBS Group AG, of Zurich, Switzerland, for Misconduct by Credit Suisse, Which UBS Subsequently Acquired in June 2023," press release, July 24, 2023, https://www.federalreserve.gov/newsevents/pressreleases/enforcement20230724a.htm.

[120] Federal Reserve Board, "Federal Reserve Board Announces a Consent Order."

[121] SEC, "SEC Charges Archegos and Its Founder." In addition to SEC charges, Hwang was also convicted on criminal charges.

[122] Colin Marks, "Total Return Meltdown: The Case for Treating Total Return Swaps as Disguised Secured Transactions," March 24, 2022, https://ssrn.com/abstract=4065946.

[123] European Securities and Markets Authority, *Leverage and Derivatives—the Case of Archegos*, May 2022, https://www.esma.europa.eu/sites/default/files/library/esma50-165-2096_leverage_and_derivatives_the_case_of_archegos.pdf.

[124] European Securities and Markets Authority, *Leverage and Derivatives*, pp. 4-5.

Policy Options

Some scholars believe that after the 2008 global financial crisis, more stringent banking regulation has led to the migration of traditional banking activities to NBFIs that face looser regulation.[125] There are also signs of increased cooperation between NBFIs and banks in areas where banks could transfer risks affecting their capital requirements to NBFIs while maintaining client relationships and certain income.[126] Related policy proposals include the development of a "congruence" principle for financial regulation, where forms of financial intermediation posing similar risks to financial stability could be regulated with similar (but not necessarily identical) stringency.[127]

Other scholars argue that, given the interwoven nature of the NBFI-bank nexus, regulation should "treat the two sectors holistically; by recognizing the implications for risk propagation and amplification; and by exploring new ways to internalize the costs of systemic risk."[128]

As previously discussed, domestic and international banking regulators have applied their supervisory power to the safety and soundness of prime brokerage business and bank lending to asset managers, among other NBFI activities.[129] While some observers continue to focus on applying traditional banking regulatory tools to NBFIs, others demonstrate the extent of the existing securities laws and regulations, emphasizing that the existing securities laws already have significant jurisdictional authority over NBFI, including authority relating to financial stability.[130] Certain of these scholars argue for greater regulation of NBFI through securities law.[131]

Federal Reserve Exploratory NBFI Scenario Analysis

The Fed is conducting an exploratory analysis as a companion to the 2025 banking supervisory stress test, which assesses large banks' capabilities to withstand adverse economic conditions.[132] The exploratory analysis will help inform the level of the resiliency at the U.S. banking system in relation to (1) credit and liquidity shocks in the NBFI sector during a severe global recession and (2) a market shock causing the unexpected defaults of the subject bank's five largest equity hedge fund counterparties.

[125] Metrick and Tarullo, "Congruent Financial Regulation."

[126] For more details, see "Direct Interactions—Example: Private Credit and SRT" section of this report. Also see "Regulatory Philosophy of NBFIs and Banks" section of this report for discussions of fundamental differences between banks and nonbanks from risk management and risk mitigation perspectives.

[127] Metrick and Tarullo, "Congruent Financial Regulation."

[128] Viral Acharya et al., "Where Do Banks End and NBFIs Begin?," April 12, 2024, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4760963.

[129] See "Market Event: The Archegos Fallout" section of this report for more details.

[130] Gabriel Rauterberg and Jeffery Zhang, "Shadow Banking and Securities Law," *Stanford Law Review*, vol. 77 (August 24, 2024), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4936041.

[131] Rauterberg and Zhang, "Shadow Banking and Securities Law."

[132] Federal Reserve Board, "Exploratory Analysis of Risks to the Banking System," February 13, 2025, https://www.federalreserve.gov/publications/february-2025-exploratory-analysis-of-risks-to-the-banking-system.htm.

Data and Transparency

Some observers believe that policymakers' ability to assess vulnerabilities and develop policy solutions are only as good as the data they have.[133] Because vulnerabilities are often revealed after market turmoil, some hope that with sufficient data, these costly stresses could be better diagnosed ex ante.

Data Gaps

NBFI-related risk monitoring and risk mitigation face significant data gaps, especially in those areas that are relatively less regulated. Some industry observers believe that regulators and market participants already have ample access to data on MMFs and open-end funds segments but not enough data on private securities markets and the exposure between private markets and traditional banks.[134]

As previously demonstrated (e.g., the Archegos fallout), regulators and market participants do not have visibility into some NBFI operations that could allow them to accurately price risks and monitor developments with financial stability implications. The NBFI data issues are widespread and can be viewed from the perspectives of (1) the absence of data, (2) the problems in aggregating existing data, and (3) difficulties in producing meaningful measures using data.[135]

The collection of data also comes with costs—such as data reporting costs, business model reconfiguration costs for reporting entities, and new infrastructure development costs for data platforms—and potential new risks emerging from cybersecurity and protection of confidential personal and proprietary information.[136] Much of the costs may eventually be borne by market participants as part of doing business in fundraising.

[133] John Schindler, Secretary General of the FSB, "Building Bridges: The Case for Better Data and Coordination for the Non-Bank Sector," speech at the Eurofi Financial Forum 2024 in Budapest, September 12, 2024, https://www.fsb.org/2024/09/building-bridges-the-case-for-better-data-and-coordination-for-the-non-bank-sector.

[134] Ashley Alder, "The Drive for Data in Non-Bank Financial Intermediation (NBFI)," speech at the Managed Funds Associations' Global Summit, May 16, 2023, https://www.fca.org.uk/news/speeches/drive-data-non-bank-financial-intermediation-nbfi.

[135] For example, see FSB, *The Financial Stability Implications of Leverage in Non-Bank Financial Intermediation*.

[136] SEC Commissioner Caroline Crenshaw, "Mind the (Data) Gaps," speech at the Eighth Annual Conference on Financial Market Regulation, May 14, 2021, https://www.sec.gov/newsroom/speeches-statements/mind-data-gaps.

Market Event: The Flash Crash and a $1 Trillion Stock Valuation "Near Miss"

On May 6, 2010, U.S. capital markets experienced an abnormal decline and subsequent recovery of significant scale. Many stocks and exchange-traded funds (ETFs) saw price declines and reversals of 15% or even 60% within one day. This event was later referred to as a "flash crash."[137] Some attribute the crash to hedge fund trading programs that use automated orders. Because certain algorithms were programmed to execute trades without regard to price or time, they may have contributed to trading pauses and heightened market volatility during the crash.[138] One of the biggest lessons learned was that it took regulators many months (with lingering debates) to clarify what happened. Although the market quickly recovered from a temporary $1 trillion valuation loss, this "near miss" led to policy debates about regulators' lack of understanding of financial markets and their participants at the time.[139]

Policy Options

Policy proposals to address data and transparency issues often center around the following topics:

- Building new infrastructure to collect and disseminate data (e.g., the Consolidated Audit Trail project)[140]
- Making more intensive use of existing data (e.g., deploying data collected for purposes other than financial stability to be used in systemic risk monitoring)
- Enhancing existing reporting frameworks to bolster agency oversight and systemic risk monitoring (e.g., SEC private fund reporting reform)[141]
- Coordinating data sharing among different financial regulators (e.g., the SEC's memorandum of understanding with the Commodity Futures Trading Commission, the Fed, and international capital markets regulators)[142]
- Allocations of resource and funding toward agency data functions, such as the creation of designated use of appropriations toward data functions[143]

SEC Actions on Consolidated Audit Trail (CAT)

In response to the 2010 flash crash,[144] which revealed data needs for market monitoring, the SEC adopted Rule 613 in July 2012 to create the CAT.[145] Authorized under Section 11A(a)(3)(B) of the Exchange Act, the CAT requires national securities exchanges and FINRA to develop and

[137] SEC and Commodity Futures Trading Commission (CFTC), *Findings Regarding the Market Events of May 6, 2010*, September 30, 2010, https://www.sec.gov/news/studies/2010/marketevents-report.pdf.

[138] SEC and CFTC, *Findings Regarding the Market Events of May 6, 2010*.

[139] Andrew Haldane, Bank of England, "The Race to Zero," speech at the International Economic Association Sixteenth World Congress, July 8, 2011, https://www.bankofengland.co.uk/-/media/boe/files/speech/2011/the-race-to-zero-speech-by-andrew-haldane.pdf.

[140] SEC, "Rule 613 (Consolidated Audit Trail)," https://www.sec.gov/about/divisions-offices/division-trading-markets/rule-613-consolidated-audit-trail.

[141] SEC, "SEC Adopts Amendments to Enhance Private Fund Reporting," press release, February 8, 2024, https://www.sec.gov/newsroom/press-releases/2024-17.

[142] For example, CFTC, "Memorandum of Understanding Between the U.S. Securities and Exchange Commission and the U.S. Commodity Futures Trading Commission Regarding Coordination in Areas of Common Regulatory Interest and Information Sharing," https://www.cftc.gov/sites/default/files/2018-07/CFTC_MOU_InformationSharing062818.pdf.

[143] SEC, Office of the Chief Data Officer, *Data Strategy Fiscal Years 2022-2026*, https://www.sec.gov/files/2022-ocdo-data-strategy-fy2022-2026.pdf.

[144] See "Market Event: The Flash Crash and a $1 Trillion Stock Valuation 'Near Miss'" section of this report.

[145] SEC, "Rule 613."

maintain a CAT for the trading of national market system (NMS) securities.[146] The CAT is meant to be a central repository for every quote and order of an NMS security and reportable event such as origination, modification, routing, and execution of trades.[147] When fully implemented, the CAT will capture equities and options data (but not data from futures exchanges) and become the world's largest database for securities transactions, tracking orders throughout their life cycles. The CAT is designed to enable regulators to gain visibility into illegal or manipulative trades and diagnose the causes of market disruptions, such as flash crashes.[148] The participants began reporting data in 2018.[149] The CAT data has been used in the SEC's market surveillance, research, and rulemaking.[150]

Rule 613 directs FINRA and the exchanges to implement the CAT to capture

> [a]n accurate, time-sequent record of orders beginning with the receipt or origination of an order by a member of a national securities exchange or national securities association, and further documenting the life of the order through the process of routing, modification, cancellation, and execution (in whole or in part) of the order.

Despite the CAT's benefits mentioned above, it faces policy challenges associated with its operating costs and concerns about the protection of personally identifiable information (PII).[151] During the 119th Congress, some Members urged the SEC to conduct a comprehensive review of

[146] 15 U.S.C. §78k–1 and 17 C.F.R. §242.

[147] SEC, "Rule 613."

[148] For more information, see Will Kenton, "Flash Crash: What They Are, Causes, History," Investopedia, April, 1, 2022, https://www.investopedia.com/terms/f/flash-crash.asp.

[149] FINRA, "FAQs," https://www.catnmsplan.com/faq.

[150] For example, the analysis for the SEC proposed rule to enhance order competition used CAT data. SEC, "Order Competition Rule," 88 *Federal Register* 128-245, January 3, 2023.

[151] The CAT's total costs reportedly reached $1 billion to build and around $250 million per year for ongoing operations. The SEC adopted a CAT funding model amendment in September 2023 to evenly divide the CAT's costs three ways among the broker-dealer for the buyer, the broker-dealer for the seller, and the self-regulatory organizations (which include national securities exchanges and FINRA). The proposal received objections regarding (1) whether the high costs could be reduced through adjusting reporting requirements or timelines, (2) whether the cost allocations sufficiently align with proper incentives for trading transaction decisionmaking, and (3) whether the SEC is operating outside of its statutory authority in allocating the costs. Bill Alpert, "The SEC Is Considering Blunting Its Trade-Tracking System," *Barron's*, April 14, 2025, https://www.barrons.com/articles/sec-trade-tracking-system-cat-b2222e58; SEC, "SEC Approves Funding Amendment to National Market System Plan Governing the Consolidated Audit Trail," press release, September 6, 2023, https://www.sec.gov/news/press-release/2023-169; SEC Commissioner Mark Uyeda, "Statement on Consolidated Audit Trail Revised Funding Model," September 6, 2023, https://www.sec.gov/news/statement/uyeda-statement-cat-funding-090623; Reuters, "Citadel Securities, Trade Body Sue US SEC over 'Consolidated Audit Trail,'" October 18, 2023, https://www.reuters.com/markets/us/citadel-securities-trade-body-sue-us-sec-over-consolidated-audit-trail-2023-10-17. Regarding the protection of personally identifiable information (PII), the CAT's collection of PII has been an ongoing policy concern because of the scale of the PII data collection that potentially affects every investor that trades national securities exchange stocks. Some policymakers worry about investor privacy and the cybersecurity risks of such large sensitive datasets. The Protecting Investors' Personally Identifiable Information Act (H.R. 4551 and S. 2230 in the 118th Congress), for example, prohibits the SEC from requiring the CAT to collect PII. Jerry Markham, "The SEC's Consolidated Audit Trail (CAT): A Case Study of Financial Privacy and U.S. Government Surveillance," November 4, 2024, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=5012274; Sen. John Kennedy, "Kennedy, Britt Demand Government Accountability Office Investigation into Privacy Risks of SEC's CAT," press release, October 5, 2023, https://www.kennedy.senate.gov/public/press-releases?ID=52B29404-4B32-4C66-975C-0D9FAE81E384.

the CAT, including PII, cybersecurity vulnerabilities, and program funding structure.[152] The SEC exempted certain PII from CAT reporting in February 2025.[153]

SEC Actions on Private Fund Reform

The SEC adopted amendments to Form PF, the confidential reporting form for private funds, on February 8, 2024.[154] The Form PF reform aims to provide greater insight into private fund operations and strategies and collect more reliable data for systemic risk monitoring purposes. Specifically, the amended Form PF requirements include (1) enhanced reporting of operations and strategies at large hedge fund advisers on qualifying hedge funds with net asset value (NAV) of more than $500 million; (2) additional reporting by advisers about themselves and their private funds, such as assets under management, inflows and outflows, creditors, and beneficial ownership, among other information; (3) enhanced reporting on hedge fund investment strategies, counterparty exposures, and trading and clearing mechanisms, among others; (4) amendments to how fund advisers report complex structures; and (5) removal of certain aggregated and duplicative reporting.[155]

The SEC adopted new private fund adviser rules and rule amendments on August 23, 2023.[156] The new rules require registered private fund advisors to provide investors with quarterly statements on fund performance, fees, and expenses; conduct annual audits of each private fund; and obtain fairness opinions or valuation opinions in connection with adviser-led secondary transactions, among other requirements.[157] A fairness opinion is a statement issued by a qualified third party regarding the fairness of the price offered for an asset at a financial transaction, such as during the sale of assets or mergers and acquisitions.[158] A federal court vacated the rules effective June 5, 2024, stating that the SEC had exceeded its authority.[159] With the SEC's leadership transition in 2025, some industry groups are pushing the SEC to rethink multiple rules promulgated under former SEC Chair Gary Gensler.[160]

[152] House Financial Services Committee, "Hill, Cotton, Scott and Colleagues to Uyeda: Review Approach to Consolidated Audit Trai," press release, February 28, 2025, https://financialservices.house.gov/news/documentsingle.aspx?DocumentID=409483.

[153] SEC, "Exemption from the Requirement to Report Certain Personally Identifiable Information to the Consolidated Audit Trail," press release, February, 10, 2025, https://www.sec.gov/newsroom/press-releases/2025-38.

[154] SEC, "SEC Adopts Amendments to Enhance Private Fund Reporting."

[155] SEC and Commodity Futures Trading Commission, "Form PF; Reporting Requirements for All Filers and Large Hedge Fund Advisers," 89 *Federal Register* 17984, March 12, 2024, https://www.sec.gov/files/rules/final/2024/ia-6546.pdf.

[156] SEC, "SEC Enhances the Regulation of Private Fund Advisers," press release, August 23, 2023, https://www.sec.gov/newsroom/press-releases/2023-155.

[157] SEC, "Private Fund Advisers; Documentation of Registered Investment Adviser Compliance Reviews," 89 *Federal Register* 91252, November 19, 2024, https://www.sec.gov/files/rules/final/2024/ia-6773.pdf.

[158] For more on fairness opinion, see Houlihan Capital, "Fairness Opinions: Uses and Issues," https://www.houlihancapital.com/wp-content/uploads/2022/08/Fairness-Opinions-Uses-Issues-2022.pdf.

[159] SEC, "Private Fund Advisers; Documentation of Registered Investment Adviser Compliance Reviews," November 19, 2024, https://www.sec.gov/rules-regulations/2024/11/s7-03-22.

[160] Carolina Mandl, "US Private Funds Ask SEC to Rethink Gensler-Era Rules," Reuters, March 11, 2025, https://www.reuters.com/markets/wealth/us-private-funds-ask-sec-rethink-gensler-era-rules-2025-03-11.

Liquidity Mismatch

Liquidity refers to the ability for market participants to buy or sell securities quickly without affecting the price.[161] *Liquidity mismatch* refers to the difference between the market liquidity for a fund's shares and their underlying assets, as seen in open-end funds. A mismatch occurs if funds give their investors the option of short-term redemptions, but they invest in assets that cannot be easily turned into cash to fulfill the redemption needs, increasing the risk of procyclical asset sales and fund suspensions.[162] The FSB views this characteristic as a structural vulnerability that may warrant policy attention from financial stability perspectives.[163] This section generally discusses open-end funds and focus more on ETFs, given the structural complexity of ETFs.

Open-End Funds

Open-end funds (or open-ended funds) are pooled investment vehicles that allow for daily liquidity through redemptions at NAV and could offer shares continually without a limit on the number of shares to issue.[164] Mutual funds and ETFs are two types of open-end funds. As of 2023, net assets at mutual funds and ETFs totaled $25.5 trillion and $8.1 trillion, respectively.[165] Open-end funds are the most popular investment vehicles, with around 50% of U.S. households owning them.[166]

Mutual Funds

A mutual fund is an investment company that pools money from many investors and invests the money in securities, such as stocks and bonds, for a fee. The underlying assets in a fund are its portfolio, and each mutual fund share represents a slice of the ownership to the fund's portfolio of securities assets.[167]

[161] Investment Company Institute, "Frequently Asked Questions About Mutual Fund Liquidity," https://www.ici.org/faqs/faq/mfs/faqs_mf_liquidity.

[162] European Central Bank, *Financial Stability Review*, November 2022, p. 89, https://www.ecb.europa.eu/pub/pdf/fsr/ecb.fsr202211~6383d08c21.en.pdf.

[163] FSB, *Revised Policy Recommendations to Address Structural Vulnerabilities from Liquidity Mismatch in Open-Ended Funds*, December 20, 2023, https://www.fsb.org/uploads/P201223-1.pdf.

[164] SEC, "Open-End Fund Liquidity Risk Management Programs and Swing Pricing; Form N-PORT Reporting," 87 *Federal Register* 77172, November 2, 2022, https://www.sec.gov/files/rules/proposed/2022/33-11130.pdf.

[165] Investment Company Institute, "Investment Company Factbook 2024," https://www.ici.org/system/files/2024-05/2024-factbook.pdf. Net assets refer to a fund's assets minus liabilities.

[166] Around 54.4% of U.S. households own some form of funds, such as mutual funds, ETFs, closed-end funds, and unit investment trusts. The share of mutual funds and ETFs makes up the vast majority of U.S. registered funds' total assets. For more details, see Investment Company Institute, "Investment Company Factbook 2024"; and Investment Company Institute, "Majority of American Households Rely on Mutual Funds to Save and Invest," press release, November 1, 2023, https://www.ici.org/news-release/23-news-mutual-funds.

[167] SEC, "Mutual Funds," https://www.investor.gov/introduction-investing/investing-basics/investment-products/mutual-funds-and-exchange-traded-1.

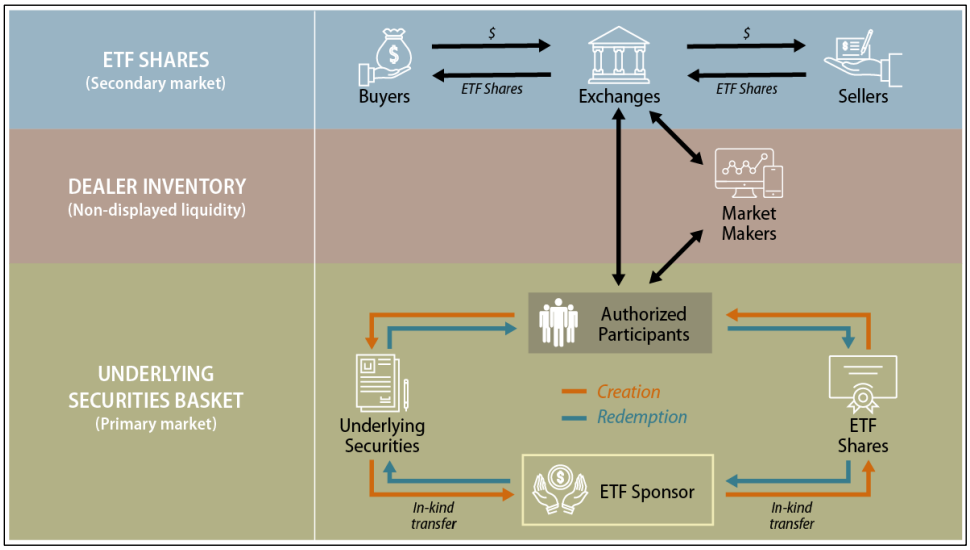
ETFs

Relative to mutual funds, ETFs are structurally more complex.[168] An ETF is an investment vehicle that, similar to a mutual fund, offers public investors shares of a pool of assets. Unlike a mutual fund, however, an ETF can be traded on exchanges like a stock.[169]

An ETF sponsor typically assembles a collection of securities and then divides the basket of securities into tradable shares. In terms of operational structure, unlike mutual funds that sell and redeem shares directly with investors, ETFs have a unique creation and redemption process that involves third-party specialists called authorized participants (APs).

As **Figure 9** illustrates, when purchasing an ETF share, a public investor is buying and selling a collective exposure to the underlying basket of securities. As such, the ETF architecture generally consists of the primary market, where the underlying basket of securities is assembled, and the secondary market, where the ETF shares are publicly traded. Dealer inventory, which is the ETF shares held by dealers, is referred to as an additional layer of liquidity.

Figure 9. ETF General Structure and Mechanics Underlying "Liquidity Mismatch"



Source: CRS.

Notes: The structure generally applies to traditional types of physically backed ETFs, not including synthetic ETFs or nontraditional ETFs. The illustration refers to typical transactions only and is not inclusive of all transactions.

Arbitrage Mechanism

Both mutual funds and ETFs are required to calculate their funds' worth as measured by NAV each business day.[170] ETF shares, though, are traded intraday on exchanges. As such, an ETF's market share price (in the secondary market) could differ, at a particular time, from the value of its underlying basket (in the primary market) as expressed in the fund's NAV. The arbitrage

[168] SEC "Meeting of the Fixed Income Market Structure Advisory Committee," April 9, 2018, https://www.sec.gov/spotlight/fixed-income-advisory-committee/fimsa-040918transcript.txt.

[169] CRS Report R45318, *Exchange-Traded Funds (ETFs): Issues for Congress*, by Eva Su.

[170] *NAV* is the per share value of a fund's assets minus liabilities. It is one way to calculate how much a fund is worth.

process is a common ETF mechanism to help align the ETF share trading price with its underlying NAV.

Arbitrage is the simultaneous buying and selling of securities to profit from price imbalance without being subject to additional risks. With ETFs, differences in price between primary and secondary markets create arbitrage opportunities that could be captured from either the primary market (via APs) or the secondary market (via ordinary open-market participants).[171] Arbitrageurs would simultaneously buy or sell ETF shares and their underlying assets. AP-enabled arbitrage activities are done in the primary market involving creation units, whereas ordinary market participants would conduct arbitrage through open-market operations in the secondary market.

To illustrate the process, when an ETF's price is far above the price of its underlying stocks or bonds, the arbitrageurs would buy the underlying securities and exchange them for ETF shares. This activity would create new supply-and-demand dynamics that would align the price of the shares with their underlying assets. When ETF shares trade at below NAV, arbitrageurs would purchase the shares and exchange them for the underlying securities.[172] The arbitrageurs are motivated by the transactions' economic incentives to bridge the gap between the market price and the value of the underlying assets.

The APs are not obligated to create or redeem shares to enable the arbitrage mechanism through the creation and redemption process. Should market stress or some other event cause APs to simultaneously exit the market, then the ETFs would trade like closed-end funds, which would still have access to secondary-market liquidity but would be unable to create or redeem shares.[173] A closed-end fund generally sells a fixed number of shares at an initial public offering and then trades on a secondary market thereafter without continually offering its shares for sale.[174] The expectations are that if the ETFs trading as closed-end funds widen their arbitrage opportunities, the increased economic incentives would attract new APs to enter the market and resume creation and redemption.

Liquidity Mismatch of ETFs

Although, in theory, ETFs are at least as liquid as their underlying assets, some question ETFs' behavior in a market downturn, when markets often become significantly less liquid. In those situations, liquidity mismatch is perceived to pose challenges to investors seeking to sell the illiquid ETF shares for cash.[175] Some argue that liquidity mismatch could induce systemic risk and lead to financial instability through spillover effects, fire sales, and arbitrage mechanism

[171] Kevin Pan and Yao Zeng, "ETF Arbitrage Under Liquidity Mismatch," *S&P Global Market Intelligence Research*, December 2017, https://ssrn.com/abstract=3723406.

[172] Bradley Kay, "Has the ETF Arbitrage Mechanism Failed?," *Morningstar*, March 16, 2009, https://www.morningstar.co.uk/uk/news/63972/has-the-etf-arbitrage-mechanism-failed.aspx.

[173] Ananth Madhavan, *Exchange-Traded Funds and the New Dynamics of Investing* (Oxford University Press, 2016).

[174] SEC, "Closed-End Funds," https://www.sec.gov/fast-answers/answersmfclosehtm.html.

[175] For example, bond ETFs with underlying assets in less-liquid bonds are believed to have especially benefited from enhanced liquidity. This could help offset other bond market trends that have reduced liquidity. For instance, one source states that bond dealer inventories have declined 70% since 2008 and that only 2% of U.S. bonds trade every day, compared to 3.5% in 2008—prior to the financial crisis. Certain bond ETFs are regarded as having provided a liquidity "wrapper" for an otherwise less-liquid basket of assets. But the mismatch between higher liquidity ETF shares and lower liquidity underlying bonds has also created concerns about liquidity-mismatch-induced systemic risk. The liquidity mismatch concern has drawn regulatory attention to ETFs globally. More details at iShares, "ETF Education," https://www.ishares.com/us/investor-education/etf-education. Data cited from Federal Reserve, Securities Industry and Financial Market Association, as of December 31, 2017; and Mike Bird, "Could ETFs Fall Into a Liquidity Jam?," *Wall Street Journal*, March 21, 2018, https://www.wsj.com/articles/return-of-volatility-raises-liquidity-question-for-etfs-1521627574.

malfunction under illiquid conditions.[176] Some industry practitioners assert that liquidity mismatch is often misunderstood due to its complexity.[177] Some argue that certain ETF design features work to mitigate systemic risks. The main arguments countering the financial stability concerns include that (1) ETFs are largely not subject to cash redemption, (2) ETFs' relatively transparent pricing derived from trading allows them to provide "emergency brakes" in a market downturn, and (3) ETFs are less susceptible to liquidity events than are other open-end funds, namely mutual funds.[178]

[176] For more detailed discussions of each, see CRS Report R45318, *Exchange-Traded Funds (ETFs): Issues for Congress*, by Eva Su.

[177] SEC "Meeting of the Fixed Income Market Structure Advisory Committee."

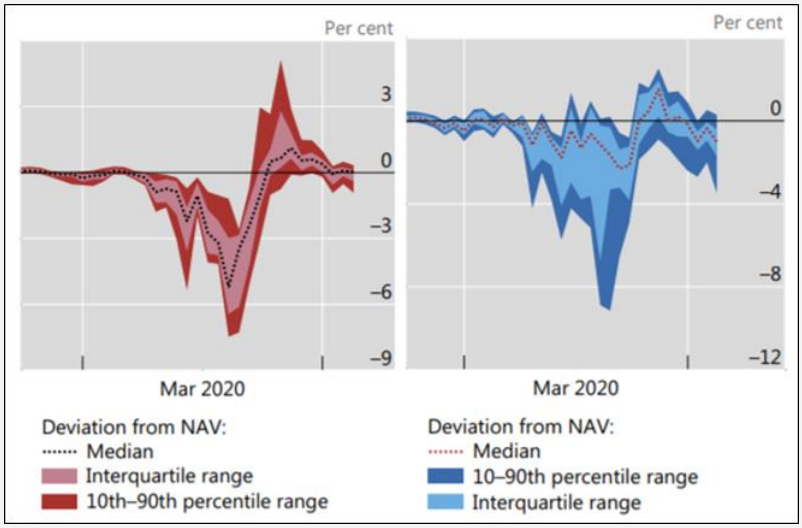
[178] Bank of England, *Financial Stability Report*, November 2017, https://www.bankofengland.co.uk/-/media/boe/files/financial-stability-report/2017/november-2017.pdf.

Market Event: ETF Market Irregularities During COVID-19-Induced Stress

As previously mentioned, unlike mutual funds, ETF shares can trade on securities exchanges like stocks, thus technically not facing the same type of redemption risks that mutual funds do—that is, mutual funds calculate their liquidity on a daily basis and must pay redemption proceeds to requested shareholders within a short period of time.[179] However, an ETF's liquidity mismatch could force its shares to trade at different price levels than its underlying portfolio's per share NAV (a fund's assets minus liabilities). The effects of liquidity mismatch and ETF NAV gaps are a subject of long-term policy debate. Some argue that ETF NAV gaps during market stress are evidence of ETF shares providing price discovery faster than underlying bonds can provide.[180] Others are concerned that the liquidity mismatch could pose a threat to financial stability.[181]

Figure 10. Bond ETF Net Asset Value Gaps in March 2020

Investment-Grade ETFs (Left) and High-Yield ETFs (Right)



Source: Bank for International Settlements, "The Recent Distress in Corporate Bond Markets: Cues from ETFs," April 14, 2020, https://www.bis.org/publ/bisbull06.pdf.

Note: Includes both U.S. and European ETFs.

During the high market volatility experienced in March 2020, large gaps opened up between ETF shares and the NAV of their holdings in an unprecedented manner, an indication of stress (**Figure 10**).[182] In this short period, certain large bond ETFs saw both their widest discounts and their widest premiums to NAV since inception. An ETF gap with discount to NAV means that ETF shares are worth less than their underlying holdings, a situation that would not occur under normal market conditions.

Policymakers introduced market-wide actions and rescue packages to calm volatility. For the fund market in particular, direct policy responses include federal government liquidity intervention and SEC temporary exemption of interfund lending. For bond ETFs, on March 23, 2020, the Fed established a Secondary Market Corporate Credit Facility, which can buy certain ETFs that provide broad exposure to investment-grade bonds.[183] The Fed expanded the program on April 9, 2020, to include certain high-yield bond ETFs as well.[184] Before any actual purchases took place, the ETF market already showed signs of stabilization. Bond ETFs experienced strong inflows immediately following the announcement, and some ETFs reportedly ceased trading at discounts to their NAV.[185] An international securities authority later concluded that ETFs did not pose imminent risks from a financial stability perspective during COVID-19-induced market stress, finding that the ETF structure was resilient throughout the high volatility period in 2020.[186]

Policy Options

Recommendations to address liquidity mismatch in open-end funds include suggestions for good practices for ETFs and reform options for mutual funds (excluding MMFs here, which is a separate discussion). The ETF-related suggestions include specific steps to encourage effective

product structuring, disclosure, liquidity provision, and enhancements at volatility control mechanisms.[187]

Recommendations for mutual funds include data collection, investor disclosure, guidance on funds' liquidity risk management, availability of a broad set of liquidity management tools—including tools to mitigate potential first-mover advantage arising from liquidity mismatches (e.g., swing pricing)[188]—and potential stress testing at the individual fund level to support liquidity risk management, among other considerations.[189]

SEC Actions on Public Funds Reform

In November 2022, the SEC proposed amendments to open-end funds (while excluding MMFs and certain ETFs) that aim to better position these funds for market distress.[190] The proposed rule aims to improve liquidity risk management and liquidity risk reporting, including holding highly liquid assets at a minimum of 10% of the fund's NAV, requiring use of swing pricing (i.e., a pricing method that spreads the costs of redemption more widely during a crisis in order to reduce the first-mover advantage and incentives to run) and a hard close to trading at 4 p.m. Eastern Time, and increasing the frequency of fund reporting.[191] In a separate document announced in August 2024, the SEC stated that it was not adopting swing pricing amendments at the time.[192]

[179] SEC, "Mutual Fund Redemptions," https://www.investor.gov/introduction-investing/investing-basics/glossary/mutual-fund-redemptions.

[180] Sirio Aramonte and Fernando Avalos, "The Recent Stress in Corporate Bond Markets: Cues from ETFs," Bank for International Settlements, April 14, 2020, https://www.bis.org/publ/bisbull06.pdf. For more on the definition of *price discovery*, see James Chen, "Price Discovery," Investopedia, April 30, 2019, https://www.investopedia.com/terms/p/pricediscovery.asp.

[181] For more on the liquidity-mismatch-related policy debates, see CRS Report R45318, *Exchange-Traded Funds (ETFs): Issues for Congress*, by Eva Su, p. 13.

[182] Aramonte and Avalos, "The Recent Stress in Corporate Bond Markets."

[183] Federal Reserve Board, "Federal Reserve Announces Extensive New Measures to Support the Economy," press release, March 23, 2020, https://www.federalreserve.gov/newsevents/pressreleases/monetary20200323b.htm.

[184] Federal Reserve Board, "Secondary Market Corporate Credit Facility Term Sheet," press release, April 9, 2020, https://www.federalreserve.gov/newsevents/pressreleases/files/monetary20200409a2.pdf.

[185] Katherine Greifeld, "Fed's Ability to Buy ETFs May Help Ensure It Never Needs To," *Bloomberg*, April 15, 2020, https://www.bloomberg.com/news/articles/2020-04-15/fed-didn-t-actually-have-to-buy-anything-to-rescue-bond-etfs.

[186] IOSCO, Exchange Traded Funds Thematic Note—Findings and Observations During COVID-19 Induced Market Stresses," August 2021, https://www.iosco.org/library/pubdocs/pdf/IOSCOPD682.pdf.

[187] IOSCO, "Exchange Traded Funds—Good Practices for Consideration," April 2022, https://www.iosco.org/library/pubdocs/pdf/IOSCOPD701.pdf.

[188] See "Swing Pricing on Open-End Funds" section of CRS Report R47309, *Money Market Mutual Funds: Policy Concerns and Reform Options*, by Eva Su.

[189] FSB, *Revised Policy Recommendations*.

[190] SEC, "SEC Proposes Enhancements to Open-End Fund Liquidity Framework," press release, November 2, 2022, https://www.sec.gov/newsroom/press-releases/2022-199.

[191] SEC, "Open-End Fund Liquidity Risk Management Programs and Swing Pricing; Form N-PORT Reporting," 87 *Federal Register* 77172, December 16, 2022, https://www.sec.gov/files/rules/proposed/2022/33-11130.pdf.

[192] "We also are not adopting proposed reporting amendments relating to funds' use of swing pricing or to liquidity classifications in this release, as we are not adopting amendments to the underlying rules at this time." SEC, "Form N-PORT and Form N-CEN Reporting; Guidance on Open-End Fund Liquidity Risk," 89 *Federal Register* 73764, September 11, 2024, https://www.sec.gov/files/rules/final/2024/ic-35308.pdf.

On August 28, 2024, the SEC finalized rules relating to registered funds and guidance on open-end fund liquidity risk management.[193] The changes aim to enhance the oversight of the asset management industry and increase transparency, including increasing public reporting frequency about certain portfolio holdings.[194] The guidance on certain open-end fund liquidity risk management program addresses classification of liquidity of fund investments, terminology of "cash" in liquidity requirements, and other details.[195]

Concentration

For NBFIs, concentration risks could apply to concentration in assets, stewardship, operations, or third-party services. Broadly speaking, high market concentration could amplify price movements and increase risks during the interruptions to vital services.[196] Narrowly speaking, for individual firms, *concentration risk* refers to any single exposure or group of exposures that could produce losses large enough to threaten a firm's core operations.[197] This section discusses two types of concentration risks: (1) concentration of voting power at large asset managers with regard to corporate operations and stewardship and (2) concentration of critical services and market infrastructure.

The "Big Three"

Asset managers can influence corporate decisions through their ownership stakes in the companies they invest in. Policymakers are concerned that large asset managers may use this influence to advance their own agendas or engage in anti-competitive practices that are not at the best interest of capital markets and the economy.[198] With the rise of passive investments and index funds has come increased concentration in corporate stewardship by these funds. As measured by assets under management, the three largest index fund asset managers are BlackRock ($10.5 trillion), Vanguard ($9.3 trillion), and State Street Global Advisors ($4.3 trillion)—collectively referred to as the Big Three.[199] The Big Three control an estimated 22% of the shares at 500 large publicly traded companies that make up the S&P 500 index as of 2021 (**Figure 11**).[200]

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[193] SEC, "SEC Adopts Reporting Enhancements for Registered Investment Companies and Provides Guidance on Open-End Fund Liquidity Risk Management Programs," August 28, 2024, https://www.sec.gov/newsroom/press-releases/2024-110.

[194] SEC, "Form N-PORT and Form N-CEN Reporting; Guidance on Open-End Fund Liquidity Risk," 89 *Federal Register* 73764.

[195] Ibid.

[196] Bank of England, *Financial Stability in Focus: The FPC's Approach to Assessing Risks in Market-Based Finance*, October 10, 2023, https://www.bankofengland.co.uk/financial-stability-in-focus/2023/october-2023.

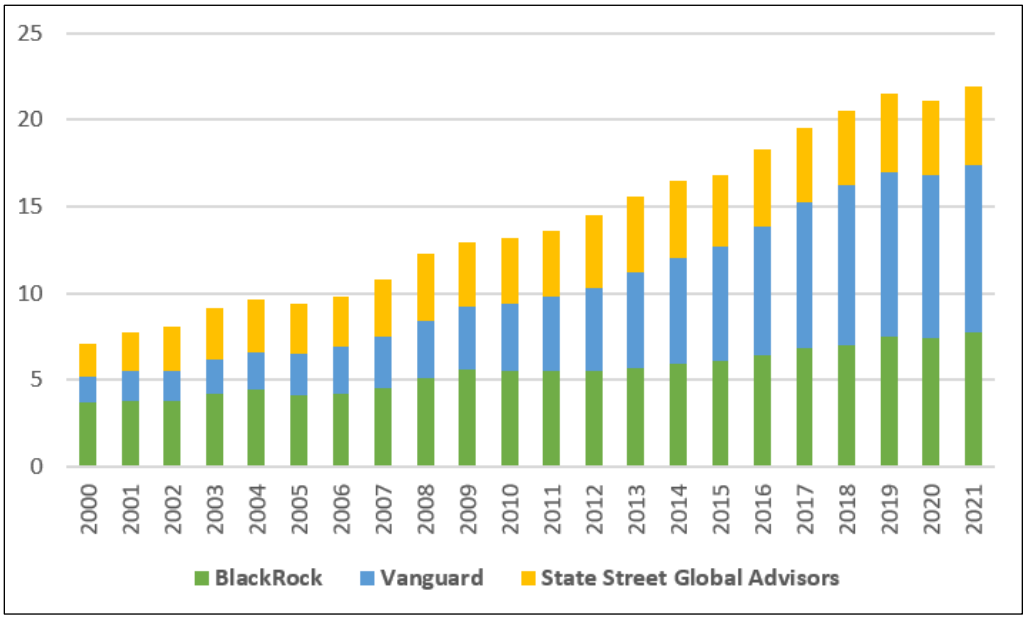
[197] National Credit Union Administration, "Concentration Risk," March 2010, https://ncua.gov/regulation-supervision/letters-credit-unions-other-guidance/concentration-risk-0.

[198] Brooke Masters and Stephen Gandel, "BlackRock Leads Opposition to New US Limits on Bank Ownership," *Financial Times*, October 24, 2024, https://www.ft.com/content/2201dc05-f7d0-4756-a71f-f01107320e2a.

[199] Ruth Aguilera et al., "From Universal Owners to Owners of the Universe? How the Big Three Are Reshaping Corporate Governance," June 15, 2024, https://ssrn.com/abstract=4896076; Jeff Cox, "Passive Investing Rules Wall Street Now, Topping Actively Managed Assets in Stock, Bond and Other Funds," *CNBC*, January 18, 2024, https://www.cnbc.com/2024/01/18/passive-investing-rules-wall-street-now-topping-actively-managed-assets-in-stock-bond-and-other-funds.html; Morningstar, "Active vs. Passive Funds by Investment Category," September 23, 2024, https://www.morningstar.com/business/insights/blog/funds/active-vs-passive-investing.

[200] The S&P 500 index covers 500 large companies that make up about 80% of total market capitalization. S&P Global, "S&P 500," https://www.spglobal.com/spdji/en/indices/equity/sp-500/#overview.

Figure 11. Median Big Three Ownership of S&P 500 Companies (%)



Source: CRS using data from Lucian Bebchuk and Scott Hirst, "Big Three Power, and Why It Matters," *Boston University Law Review*, vol. 102 (December 12, 2022), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4300447.

Due to this large concentration, major corporate decisions at publicly traded companies are affected by the consolidated shareholder voting power at these asset managers. The Big Three's voting and engagement decisions with their portfolio companies could impact the governance and performance of publicly traded companies and the economy.[201] Some observers argue that large investors' common ownership of multiple competing companies can create conflicts of interest.[202] The conflicts arise when investors must decide between maximizing profits at an individual company or across their entire portfolios. Such dynamics raise concerns about the potential harm these decisions could cause to consumers, competition, and the economy. Some scholars also note that "in the near future roughly twelve individuals will have practical power over the majority of U.S. public companies."[203] BlackRock counters the policy concern with emphasis on the roles of company management, boards of directors, shareholders, and compensation consultants and how these other roles also share certain corporate decisionmaking responsibilities.[204] While academic studies and policy contention are more focused on the Big Three, there are also other large asset managers, such as Fidelity and Morgan Stanley, having similar influences on their portfolio companies.[205]

[201] Lucian Bebchuk and Scott Hirst, "Big Three Power, and Why It Matters," *Boston University Law Review*, vol. 102 (December 12, 2022), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4300447.

[202] Jacob Greenspon, "How Big a Problem Is It That a Few Shareholders Own Stock in So Many Competing Companies?," *Harvard Business Review*, February 19, 2019, https://hbr.org/2019/02/how-big-a-problem-is-it-that-a-few-shareholders-own-stock-in-so-many-competing-companies.

[203] John Coates, "The Future of Corporate Governance Part I: The Problem of Twelve," Harvard Public Law Working Paper 19-07, September 20, 2018, https://ssrn.com/abstract=3247337.

[204] BlackRock, "The Role of Shareholders in Public Companies," April 2019, https://www.blackrock.com/corporate/literature/whitepaper/policy-spotlight-the-role-of-shareholders-in-public-companies-april-2019.pdf.

[205] Dorothy Lund and Adriana Robertson, "Giant Asset Managers, the Big Three, and Index Investing," USC CLASS Research Paper 23-13, March 31, 2023, https://ssrn.com/abstract=4406204.

Banking Regulator Actions on the Big Three

Banking regulators have taken actions to curtail the influence of large asset managers over the publicly traded banks they have large ownership stakes in. For example, in December 2024, banking regulator Federal Deposit Insurance Corporation (FDIC) signed a passivity agreement with one of the Big Three asset managers, Vanguard, to reduce its influence on such banks.[206] Vanguard is required to file the agreement if it controls more than 10% of the voting securities at FDIC-supervised banks. The agreement imposes new compliance measures and restricts Vanguard's influence at the covered banks, including prohibiting director nominations.

Central Counter Parties

As previously discussed, NBFI vulnerabilities could transmit through vital service infrastructures. A central counter party (CCP) is one such vital service infrastructure to clear NBFI financial market contracts relating to the buying and selling of securities.[207] The clearing and settlement operations have evolved over time to become highly concentrated. A failure of merely one or a few firms could create systemic risk and financial instability.[208]

With the awareness of the CCP concentration risk, the SEC adopted a rule in December 2023 to expand central clearing in the U.S. Treasury market that could further increase CCP concentration.[209] This policy decision reflects the difficulty in mitigating CCP concentration risks. In this case, the SEC viewed the benefits of having a CCP—including enhanced risk management, settlement flow, and risk transparency—to outweigh its concentration risks.[210]

[206] Federal Deposit Insurance Corporation, "Investor Passivity Agreement," December 27, 2024, https://www.fdic.gov/bank-examinations/passivity-agreement-vanguard-group-december-27-2024.

[207] For questions on clearing, settlement, and central counter parties, contact CRS specialist Rena Miller. For more background on clearing, see CRS Report R44351, *Derivatives: Introduction and Legislation in the 114th Congress*, by Rena S. Miller.

[208] Ketan Patel, "How Concentrated Is the Clearing Ecosystem and How Has It Changed Since 2007?," Federal Reserve Bank of Chicago, July 2024, https://www.chicagofed.org/publications/chicago-fed-letter/2024/497.

[209] SEC, "SEC Adopts Rules to Improve Risk Management in Clearance and Settlement and Facilitate Additional Central Clearing for the U.S. Treasury Market," press release, December 13, 2023, https://www.sec.gov/newsroom/press-releases/2023-247.

[210] For more on Treasuries central clearing, see Michelle Neal, "Central Clearing in the U.S. Treasury Market: The Why and the How," remarks at the Treasury Clearing Forum: The Evolution of Agency Clearing, Futures Industry Association, October 15, 2024, https://www.newyorkfed.org/newsevents/speeches/2024/nea241015.

Market Event: Credit Rating Agencies and the 2007-2009 Financial Crisis

Credit rating agencies provide investors with evaluation of the creditworthiness of debt, which could in turn serve as a reference point for asset pricing.[211] The three largest rating agencies—S&P, Moody's, and Fitch—account for 94% of all outstanding credit ratings.[212]

Observers recall the 2008 financial crisis, when credit rating agencies allegedly inappropriately assigned high ratings to risky securities, misled investors, and amplified the financial crisis.[213] Some scholars believe that the credit rating crisis amplified the great recession.[214] For example, the mortgage-backed securities market ($11 trillion at the time) saw rapid deterioration of credit ratings from being highly rated to sudden downgrades within a short period of time, creating market confusion about asset valuation that was tied to credit ratings.[215] The cascading credit ratings and asset prices, reflecting the sharply adjusted views on the amount of risks embedded in subprime mortgages, induced a credit crunch that carried widespread adverse effects on the financial system.[216]

Market concentration, accuracy of credit ratings, and conflicts of interest (as embedded in the "issuer pays" business model) are key elements of policy discussions about the rating agencies. Regarding market concentration, research indicates that a mortgage tranche rated solely by one agency was more likely to be downgraded and suffer more severe downgrades.[217] Following the crisis, the rating agencies paid billion-dollar settlements and went through major regulatory reforms.[218] The Dodd-Frank Wall Street Reform and Consumer Protection Act (P.L. 111-203) expanded the SEC's regulatory power and altered certain mechanisms that could induce concentration, such as requiring federal agencies to reduce reliance on and references to credit ratings in agency regulations.[219]

Policy Options

Policy options to address NBFI concentration risk often start with gaining awareness and measurements of the existing effects of the concentration.[220] Such a framework could also include provisions to reduce conflicts of interest and enhancements to reporting and transparency. When it is possible to reduce the exposure, specific exposure limits could apply.[221] More drastic measures could include breaking up the related concentrated services or finding alternative methods to promote competition. These measures are more common when the relevant concentration risk also coincides with antitrust enforcement actions that aim to protect economic competition.[222]

[211] For more on credit rating agencies, see CRS In Focus IF11916, *Credit Rating Agencies: Background and Regulatory Issues*, by Rena S. Miller.

[212] SEC, *Staff Report on Nationally Recognized Statistical Rating Organizations*, February 2024, https://www.sec.gov/files/feb-2024-ocr-staff-report.pdf#page=27.

[213] SEC, *Report to Congress on Assigned Credit Ratings*, December 2012, https://www.sec.gov/files/assigned-credit-ratings-study.pdf.

[214] Efraim Benmelech, *The Credit Rating Crisis*, National Bureau of Economic Research, March 1, 2010, https://www.nber.org/reporter/2010number1/credit-rating-crisis.

[215] Efraim Benmelech and Jennifer Dlugosz, *The Credit Rating Crisis*, June 2009, https://www.nber.org/system/files/working_papers/w15045/w15045.pdf.

[216] Yuliya Demyanyk and Otto Van Hemert, "Understanding the Subprime Mortgage Crisis," *Review of Financial Studies*, vol. 24, no. 6 (May 4, 2009), https://academic.oup.com/rfs/article/24/6/1848/1583661.

[217] Benmelech and Dlugosz, *The Credit Rating Crisis*.

[218] For more details on current rating agency oversight, see SEC, *Annual Report on Nationally Recognized Statistical Rating Organizations*, January 2020, https://www.sec.gov/files/2019-annual-report-on-nrsros.pdf.

[219] SEC, "Credit Rating Agencies," https://www.sec.gov/spotlight/dodd-frank/creditratingagencies.shtml.

[220] Basel Committee on Banking Supervision, IOSCO, and International Association of Insurance Supervisors, "Risk Concentrations Principles," December 1999, https://www.iosco.org/library/pubdocs/pdf/IOSCOPD102.pdf.

[221] For example, following some of the practices set forth by banking supervision. Basel Committee on Banking Supervision, "Supervisory Framework for Measuring and Controlling Large Exposures," March 2013, https://www.bis.org/publ/bcbs246.pdf.

[222] For more on antitrust, see CRS In Focus IF11234, *Antitrust Law: An Introduction*, by Jay B. Sykes.

Policymakers could also evaluate and amend NBFI regulatory regimes to heighten regulation in selected areas (such as for concentration risk purposes) and disincentivize firms or activities from reaching certain dominant risk levels. Examples of such an approach include the nonbank systemically important financial institution (SIFI) designation that could potentially subject designated NBFIs to additional prudential regulatory requirements.[223] Multiple vital service infrastructures—such as *financial market utilities*, which provide key clearing and settlement infrastructure—have already been designated as critical infrastructure to receive heightened supervision and regulation.[224]

Financial Stability Oversight Council (FSOC) Nonbank Designation

FSOC is a financial stability oversight body that is chaired by the Treasury Secretary and includes capital markets and banking regulators among its members.[225] The Dodd-Frank Act provides FSOC with authority to identify financial stability risks derived from NBFIs.[226] Upon the completion of a holistic risk assessment, if FSOC designates an NBFI, it would face additional prudential regulatory requirements established by the Fed.[227] These enhanced prudential standards could include capital requirements, leverage limits, liquidity restrictions, concentration limits, and resolution plans, among other regulatory tools. FSOC designated four NBFIs historically. None of the NBFIs remained designated as of March 2025.[228]

The FSOC's approach to nonbank designation has evolved over time across different Administrations. On November 3, 2023, FSOC approved a new analytical framework and interpretive guidance for nonbank SIFI designations.[229] The new guidance revamps previous guidance, which was promulgated in 2012 and amended in 2019.[230] The 2023 framework makes it easier and faster for FSOC to designate NBFIs by removing the cost-benefit analysis requirements previously imposed on FSOC, among other changes. The new FSOC guidance makes it easier for FSOC to potentially designate a wide array of NBFIs, such as hedge funds,

[223] For more on systemically important financial institutions (SIFIs), see CRS Legal Sidebar LSB10039, *Changes to "Too Big To Fail?": Treasury Recommends Revisions to Dodd-Frank SIFI Designation Process for Non-Banks (Part I)*, by Jay B. Sykes.

[224] Federal Reserve Board, "Designated Financial Market Utilities," https://www.federalreserve.gov/paymentsystems/designated_fmu_about.htm.

[225] For more on the Financial Stability Oversight Council (FSOC), see CRS Report R45052, *Financial Stability Oversight Council (FSOC): Structure and Activities*, by Marc Labonte. For more on nonbank systemic risk considerations, see CRS Insight IN10982, *After Prudential, Are There Any Systemically Important Nonbanks?*, by Marc Labonte and Baird Webel; and CRS Insight IN10997, *Activities-Based Regulation and Systemic Risk*, by Marc Labonte and Baird Webel.

[226] 12 U.S.C. §5322.

[227] For more on SIFIs, see CRS Legal Sidebar LSB10039, *Changes to "Too Big To Fail?": Treasury Recommends Revisions to Dodd-Frank SIFI Designation Process for Non-Banks (Part I)*, by Jay B. Sykes.

[228] Department of Treasury, "Nonbank Financial Company Designations," https://home.treasury.gov/policy-issues/financial-markets-financial-institutions-and-fiscal-service/fsoc/designations.

[229] Department of Treasury, "FSOC Issues for Public Comment Proposed Analytic Framework for Financial Stability Risks and Proposed Guidance on Nonbank Financial Company Determinations," press release, April 21, 2023, https://home.treasury.gov/news/press-releases/jy1432.

[230] FSOC, "Guidance on Nonbank Financial Company Determinations," 88 *Federal Register* 80110, November, 11, 2023, https://www.federalregister.gov/documents/2023/11/17/2023-25053/guidance-on-nonbank-financial-company-determinations.

MMFs, open-end funds, large asset managers, digital asset intermediaries, and capital markets infrastructure providers.[231]

NBFI issues have attracted ongoing congressional debates, including multiple hearings to discuss the FSOC nonbank designation frameworks.[232] Members of Congress who support FSOC's recent amendments argue that vulnerabilities associated with NBFI have grown and that the FSOC actions to revamp the nonbank designation process could enhance financial regulation and enable preemptive and proactive mitigation of potential systemic risks. They consider the new process a "forward-looking effort to rein in unregulated financial giants before their overleveraged, interconnected activities threaten the economy with a repeat of the 2008 financial collapse."[233] Members opposing the new guidance argue that the enhanced prudential regulation of nonbanks is not necessarily appropriate for the nonbank entities that engage in different activities and thus pose different risks.[234] They contend that, with regard to the new process's removal of the cost-benefit analysis requirements, among other changes, the new designation process "paves the path for potential abuse and unintended consequences and raises serious questions about whether FSOC is taking the best approach to actually address systemic risk."[235] During the 119th Congress, some Members urged Treasury Secretary Scott Bessent to rescind the 2023 guidance.[236] While the FSOC's designation authority allows it to impose additional regulation on the *designated* entities, the Government Accountability Office, referring to FSOC's limitations in authorities associated with nonbinding recommendations, recommended that Congress "consider legislative changes to align FSOC's authorities with its mission to respond to systemic risks."[237]

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[231] The new *Analytic Framework for Financial Stability Risk Identification, Assessment, and Response* explains the vulnerabilities and transmission channels that commonly contribute to financial stability risks and describes the range of authorities FSOC may use to address them. The updated *Guidance for Nonbank Financial Company Determinations* explains the process FSOC intends to use to subject an NBFI to prudential standards and supervision under Section 113 of the Dodd-Frank Act. FSOC, "Analytic Framework for Financial Stability Risk Identification, Assessment, and Response," 88 *Federal Register* 78026, November 14, 2023, https://home.treasury.gov/system/files/261/Analytic-Framework-for-Financial%20Stability-Risk-Identification-Assessment-and-Response.pdf; FSOC, "Guidance for Nonbank Financial Company Determinations," 88 *Federal Register* 80110, November 17, 2023, https://home.treasury.gov/system/files/261/Interpretive-Guidance-Regarding-Authority-to-Require-Supervision-and-Regulation-of-Certain-Nonbank-Financial-Companies.pdf.

[232] U.S. Congress, House Committee on Financial Services, *Regulatory Whiplash: Examining the Impact of FSOC's Ever-Changing Designation Framework on Innovation*, hearings, 118th Cong., 2nd sess., January 10, 2024, https://financialservices.house.gov/calendar/eventsingle.aspx?EventID=409089; U.S. Congress, Senate Committee on Banking, Housing, and Urban Affairs, *Financial Stability Oversight Council Nonbank Designation*, hearings, 116th Cong., 1st sess., March 14, 2019, https://www.govinfo.gov/content/pkg/CHRG-116shrg36538/pdf/CHRG-116shrg36538.pdf; U.S. Congress, House Committee on Financial Services, *Oversight of the Financial Stability Oversight Council: Due Process and Transparency in Non-Bank SIFI Designations*, hearings, 114th Cong., 1st sess., November 19, 2015, https://financialservices.house.gov/calendar/eventsingle.aspx?EventID=399889.

[233] Letter from Sens. Jack Reed, Sherrod Brown, Chris Van Hollen, and Elizabeth Warren to Treasury Secretary Janet Yellen, July 27, 2023, https://www.reed.senate.gov/imo/media/doc/fsoc_comment_letter_re_nonbank_designations_-_final.pdf; and Office of Sen. Jack Reed, "Reed and Brown Hail FSOC's Steps to Enhance Oversight of Shadow Banks," November 3, 2023, https://www.reed.senate.gov/news/releases/reed-and-brown-hail-fsocs-steps-to-enhance-oversight-of-shadow-banks.

[234] House Financial Services Committee, "McHenry Demands FSOC Reverse Course on Nonbank Financial Institution Supervisory Guidance," press release, June 14, 2023, https://financialservices.house.gov/news/documentsingle.aspx?DocumentID=408870.

[235] House Financial Services Committee, "Hill Delivers Remarks at Hearing to Examine the Impact of FSOC's Ever-Changing Designation Framework on Innovation," press release, January 10, 2024, https://financialservices.house.gov/news/documentsingle.aspx?DocumentID=409100.

[236] Nine Members of the House Financial Services Committee to Treasury Secretary Scott Bessent, March 31, 2025.

[237] Government Accountability Office, *Financial Stability Oversight Council Assessing Effectiveness Could Enhance Response to Systemic Risks*, GAO-23-105708, September 2023, https://www.gao.gov/assets/gao-23-105708.pdf.

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