

Chapter 2 at a Glance

- Hedge funds have become increasingly important participants in global financial markets, with gross assets more than tripling since the previous decade to about \$13 trillion in early 2026.
- The growing market footprint of hedge funds can support market liquidity and efficiency in normal times but may amplify price dislocations and liquidity strains during periods of stress.
- This amplification is driven by key vulnerabilities, including leverage, fragile investor funding, and crowded trades in which many hedge funds hold similar positions.
- Equities held by more vulnerable hedge funds experience larger price declines and higher volatility during market stress.
- Leverage amplifies the adverse effects of crowded positions and investor redemptions, including through the widening of spreads when leveraged sovereign bond trades unwind.
- Adverse shocks to hedge funds can spill over to prime brokers, typically large dealer banks, and broader financial markets, with potential implications for macrofinancial stability.
- Hedge fund vulnerabilities remain difficult to monitor because of significant data gaps, particularly regarding leverage, derivatives exposures, counterparty relationships, and cross-border activities.

Policy Recommendations

- Close data gaps and strengthen risk monitoring, including through stress testing and scenario analysis, to better identify vulnerabilities in markets with significant hedge fund participation.
- Address risks from crowded trades and synchronized deleveraging through targeted and well-calibrated activity-based measures, including stronger collateral management practices.
- Where risks are concentrated, deploy entity-based measures, such as risk-based leverage limits, capital or margin add-ons, and limits on concentrated exposures.
- Improve market resilience by strengthening counterparty risk management.
- Maintain credible crisis backstops to contain severe market disruptions and strengthen international coordination to limit regulatory arbitrage.

Introduction

Hedge funds have become increasingly important participants in global financial markets.¹ Although hedge funds account for only about 5 percent of total

The authors of this chapter are Yuhua Cai, Andrea Deghi (co-team lead), Jakree Koosakul, Seungduck Lee, Jialiang Lou, Taneli Mäkinen (co-team lead), Mingmei Xiao, and Mustafa Yenice, under the supervision of Mahvash Qureshi and Felix Suntheim. Itzhak Ben-David served as an external advisor.

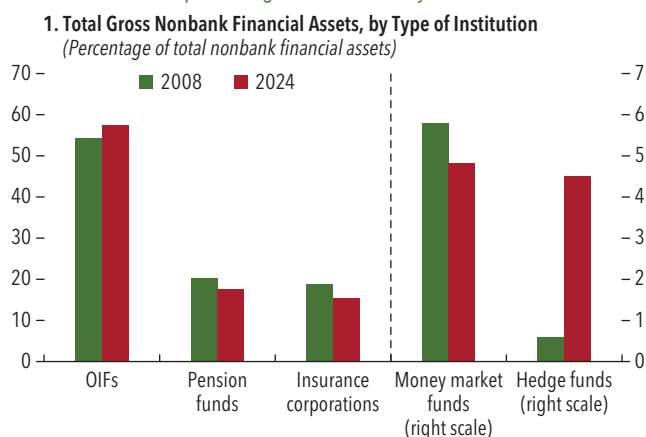
¹Definitions differ across jurisdictions, but hedge funds are generally private investment vehicles for institutional investors and high-net-worth individuals. Compared with other asset management vehicles, hedge funds typically have greater flexibility to use short selling, derivatives, and leverage and pursue a wide range of investment strategies (see Online Annex 2.1 for a detailed description).

nonbank financial intermediation, their assets have grown substantially faster than those of most other nonbank financial segments since the global financial crisis (Figure 2.1, panel 1).² By early 2026, gross assets of hedge funds reached about \$13 trillion, compared with \$4 trillion in 2013 (Figure 2.1, panel 2). In addition, hedge funds now play a more prominent role in trading, liquidity provision, and risk transfer across core financial markets, increasing their relevance

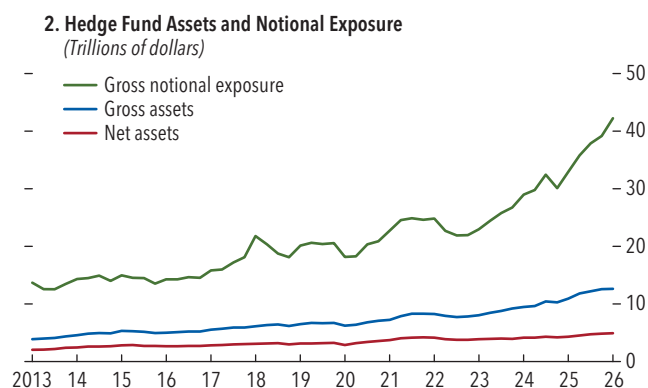
²The growth of the hedge fund sector partly reflects the shift after the global financial crisis toward market-based intermediation, as stronger bank regulations have contributed to the migration of some trading activities from banks to hedge funds (Whitehead 2011).

Figure 2.1. Size of the Hedge Fund Sector

Hedge funds represent a small share of nonbank financial intermediation, but their market footprint has grown substantially ...



... especially in terms of gross notional exposures.



Sources: FSB 2025; Office of Financial Research; and IMF staff calculations.

Note: OIFs refer to investment funds other than hedge funds and money market funds.

in transmitting macrofinancial shocks to the financial system.

The growth of hedge funds has been financed primarily through leverage. Since 2013, the gap between gross and net assets—a measure of borrowing—has risen by nearly \$6 trillion for hedge funds (Figure 2.1, panel 2). Many hedge fund strategies also rely extensively on synthetic leverage through derivatives.³ As a result, the sector's gross notional exposure, including off-balance-sheet derivatives positions, has tripled from \$13 trillion in 2013 to more than \$40 trillion in early 2026.

The increase in leverage has been fueled by rapid growth in prime brokerage and repurchase (repo) financing, which has expanded by more than \$5 trillion since 2013. Whereas repo borrowing has largely funded increased sovereign bond exposures (Figure 2.2, panel 1), prime brokerage financing has supported growth in equity exposures (Figure 2.2, panel 2).

The growing footprint of hedge funds is particularly evident in sovereign bond markets. Hedge funds' sovereign bond exposures have more than doubled since 2022, with about two-thirds of the increase concentrated in US Treasuries. This growth reflects not only higher sovereign bond issuance globally but also a rising share of sovereign debt held by hedge funds.

³Synthetic leverage refers to market exposure obtained through derivatives rather than through direct borrowing. It is measured using derivatives positions expressed in terms of their equivalent exposure to the underlying assets relative to funds' gross assets.

For example, in the US Treasury market, hedge funds are estimated to have increased their share of holdings from around 4 percent in 2022 to 9 percent in 2025, largely through highly leveraged arbitrage strategies (Monin 2026). Consequently, hedge funds now play a more important role in sovereign bond markets, contributing to liquidity provision, price discovery, and absorption of new issuance (Epp and Gao 2025; Mann 2026).

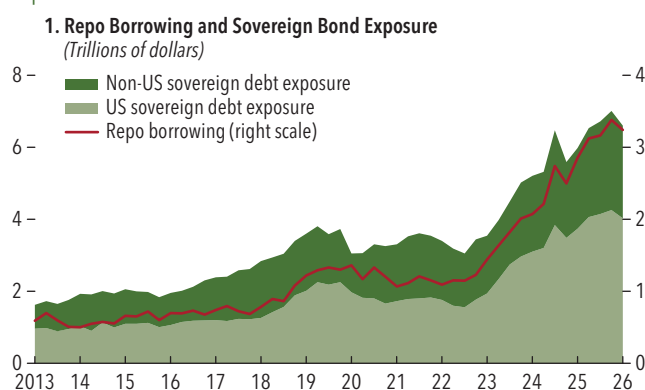
A greater presence of hedge funds can improve market efficiency, liquidity, and risk sharing. Broad mandates, flexible investment strategies, data-driven trading, and access to leverage allow hedge funds to correct mispricing, support price discovery, and absorb order imbalances (Akbas and others 2015; Cao and others 2018), particularly when other intermediaries are constrained (Jylhä, Rinne, and Suominen 2014; Jame 2018).⁴ In doing so, they can enhance market efficiency and risk diversification (Kokkonen and Suominen 2015). These benefits, however, often depend on ample funding liquidity and low market volatility, as many arbitrage strategies rely on leverage to exploit small price differentials (Çötelioglu, Franzoni, and Plazzi 2021).

When market conditions deteriorate, hedge funds can shift from stabilizing markets to amplifying stress. The same features that support market functioning

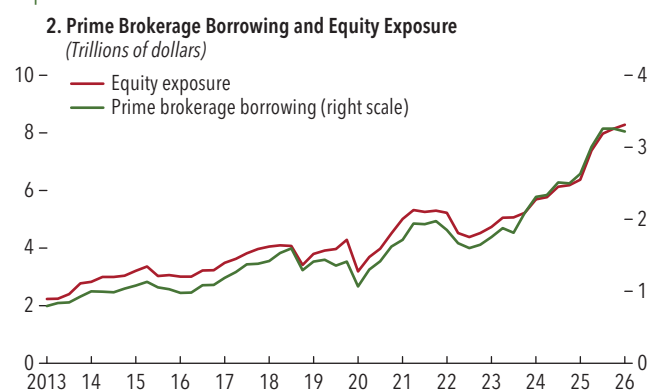
⁴Hedge funds often pioneer the use of new technologies in financial markets, allowing them to extract trading signals from large amounts of data and automate execution (Kaal 2021).

Figure 2.2. Hedge Fund Borrowing and Exposures

Hedge funds' repo borrowing has increased along with government bond exposures ...



... whereas prime brokerage borrowing has grown in tandem with equity exposures.



Sources: Office of Financial Research; and IMF staff calculations.

Note: Panels 1 and 2 show long notional exposure to sovereign debt and equity, respectively. Repo = repurchase agreement.

in normal times can lead hedge funds to retrench substantially when market volatility rises or funding conditions tighten (Ben-David, Franzoni, and Mousawi 2012; FSB 2023; BIS 2024). For example, margin calls, which require borrowers to post additional collateral when asset values fall, may trigger the unwinding of leveraged positions, while concentrated or crowded positions in specific markets can reverse abruptly as hedge funds adjust their portfolios.⁵ Investor redemptions may force further asset sales, intensifying selling pressures and impairing market liquidity. These amplification mechanisms may be more pronounced than in other investment funds since hedge funds typically employ higher leverage and face fewer constraints on portfolio positions and risk levels. However, they may be similar to those in proprietary trading firms, which often employ comparable trading strategies and can adjust risk exposures rapidly in response to market conditions (Bergman and others 2026).⁶ The market impact of hedge funds can therefore be sizable even when their asset holdings are relatively small; this

was evident during the March 2020 “dash for cash,” when hedge fund deleveraging and larger portfolio adjustments than those of mutual funds (Figure 2.3) contributed to market stress (Schrimpf, Shin, and Sushko 2020).

The vulnerabilities and risks associated with hedge funds vary across strategies but can spill over across asset classes and financial institutions. For example, macro and relative-value strategies often rely on significant leverage, making them susceptible to margin calls and forced deleveraging when funding conditions tighten. Equity funds are more exposed to changes in equity valuations and market liquidity, whereas managed futures strategies may be more sensitive to abrupt reversals in market trends.⁷ The unwinding of leveraged or concentrated positions can transmit stress beyond the initially affected market, as funds are forced to sell other assets to raise cash. Global trading activity, cross-border funding arrangements, collateral linkages, and offshore investment vehicles can further amplify these spillovers by reinforcing an adverse feedback loop between deleveraging, asset sales, and tighter financial conditions.⁸

The growing footprint and systemic relevance of hedge funds have increased the importance of effec-

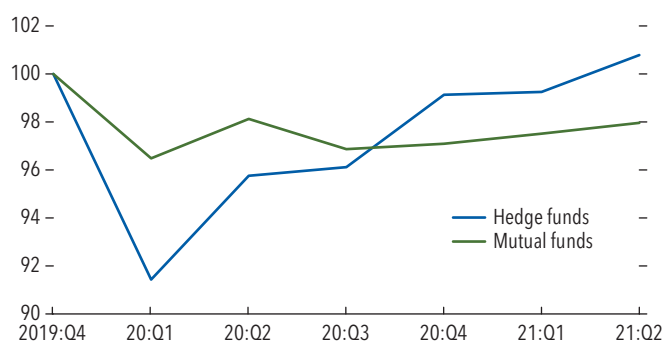
⁵A case in point is the July 2026 stress episode at Situational Awareness, then a major hedge fund managing a multibillion-dollar portfolio, when losses on highly leveraged and concentrated AI-related equity positions triggered margin calls and forced deleveraging. The fund's publicly listed portfolio was subsequently acquired by another market participant, facilitating an orderly unwind and helping to mitigate the immediate market impact of the forced liquidation (With Intelligence 2026).

⁶The financial stability concerns posed by proprietary trading firms may therefore be similar to those of hedge funds. This chapter focuses on hedge funds and does not examine proprietary trading firms because of data availability issues.

⁷Managed futures funds can also be significantly leveraged, particularly through derivatives.

⁸Collateral linkages refer to interconnections created through the use and reuse of collateral in funding markets. Offshore investment vehicles are entities domiciled in foreign jurisdictions that facilitate cross-border investment and funding.

Figure 2.3. Global Equity Holdings of Hedge Funds and Mutual Funds during the March 2020 Market Turmoil
(Index)



Sources: FactSet; and IMF staff calculations.

Note: Global equity holdings are adjusted for valuation changes, indexed to 100 in the quarter preceding the shock. Q = quarter.

tive monitoring and oversight. Historically, hedge funds operated with fewer disclosure requirements and investment restrictions than most other nonbank financial intermediaries (Cumming, Johan, and Wood 2021). Reforms following the global financial crisis have improved transparency through adviser registration, regulatory filings, and more systematic reporting of private fund activity (Brown and others 2008; FSB 2023). Nevertheless, hedge funds remain inherently opaque, making comprehensive risk assessment difficult because of significant heterogeneity across funds, rapidly shifting exposures, and leverage embedded in derivatives (Ang, Gorovyy, and van Inwegen 2011; FSB 2024). Offshore structures and uneven data coverage further complicate the measurement of aggregate exposures, counterparty concentration, and cross-border spillovers, potentially obscuring the buildup and transmission of systemic risks (Aragon, Liang, and Park 2014).

In this context, this chapter analyzes the evolution of the hedge fund sector and its implications for market functioning and financial stability. It begins by presenting a simple conceptual framework that illustrates how hedge funds can transmit and amplify shocks through markets and intermediaries, with potential consequences for macrofinancial stability. The chapter then examines the evolution of the hedge fund sector over time, including changes in its size, concentration across investment strategies, and leverage. The chapter next assesses the role of hedge funds in equity and bond markets, focusing on how their behavior affects market liquidity and efficiency during both calm and

stressed conditions and comparing it with that of other nonbank financial intermediaries like mutual funds.⁹ The analysis then turns to assessing the role of vulnerabilities, including leverage, investor redemptions, and crowded positions, in influencing hedge fund trading behavior and market impact. Finally, the chapter evaluates the systemwide financial stability implications of hedge fund stress, including spillovers to other financial intermediaries and broader market conditions, and concludes by outlining policy options to strengthen monitoring, transparency, and risk mitigation.

To examine these issues, the chapter combines information from multiple data sources to develop a comprehensive picture of the hedge fund sector. The analysis draws on granular data for more than 25,000 unique hedge funds domiciled in 78 advanced and emerging market economies from 1990 to 2026. It integrates several commercial hedge fund databases covering information on fund size, investment strategies, leverage, redemption terms, and counterparty relationships, including links to prime brokers.¹⁰ These data are complemented by quarterly security-level equity and bond holdings data, capturing both sovereign and corporate issuers. Collectively, these sources provide a uniquely comprehensive view of hedge fund activities and exposures, facilitating a systematic assessment of key vulnerabilities, transmission channels, and broader financial stability implications.¹¹

Hedge Funds and the Transmission of Financial Shocks: A Conceptual Framework

The growing presence of hedge funds in financial markets makes them potentially important conduits

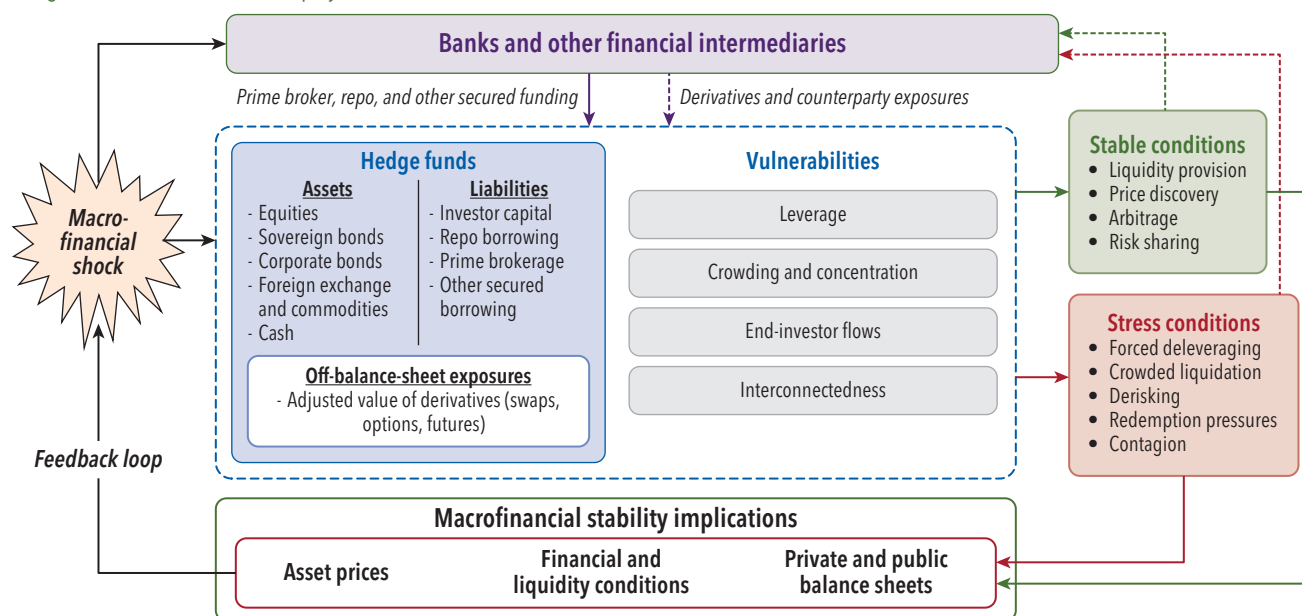
⁹The impact of hedge funds can vary across financial markets, reflecting differences in their activities, leverage, and market footprint. This chapter focuses on equity and bond markets; Box 2.1 examines their role in foreign exchange markets.

¹⁰Data coverage is broad and includes offshore financial centers. Although the United States accounts for the largest share of reported funds and advisers, many funds are domiciled offshore (Barth and others 2025). Important data gaps remain, however, including incomplete information on leverage, derivatives exposures, and prime broker relationships and weaker coverage of bond holdings than of equities. Further details on the data are provided in Online Annex 2.2.

¹¹Beyond the comprehensive data, the chapter makes three key contributions to the literature: It examines how hedge funds affect market liquidity and efficiency relative to mutual funds, analyzes how different hedge fund vulnerabilities can amplify macrofinancial shocks, and identifies channels through which hedge fund stress can spill over to other financial intermediaries.

Figure 2.4. Shock Transmission and Amplification through the Hedge Fund Sector

Hedge fund vulnerabilities can amplify the effects of adverse macrofinancial shocks on financial markets and intermediaries.



Source: IMF staff illustration.

Note: Investor capital represents the net assets of the fund. Hedge fund investors typically include institutional investors and high-net-worth individuals. Repo = repurchase agreement.

for the transmission of global macrofinancial shocks to financing conditions. Although hedge funds hold a modest share of outstanding equity and debt securities, they play a central role in arbitrage and information-driven trading, which allows them to influence both the speed and magnitude of asset price adjustments. For example, hedge funds can accelerate the incorporation of news about technological developments into equity prices through short selling, derivatives trading, and other flexible trading strategies that enable them to adjust positions more rapidly than many traditional asset managers.

Vulnerabilities of hedge funds influence the transmission of shocks. The dual role of hedge funds in financial markets, discussed earlier as supporting efficiency and liquidity in calm times but potentially exacerbating stress when conditions deteriorate, is closely linked to their vulnerabilities—notably, concentrated and crowded positions, correlated end-investor flows, and leverage.

Concentrated and crowded exposures increase the sensitivity of portfolios to adverse price movements and raise the risk of synchronized unwinding. Concentrated positions reflect large exposures to specific

assets, whereas crowded positions arise when similar exposures are shared across investors. Hedge funds often concentrate investments in securities with attractive risk-adjusted expected returns, and when such exposures become widespread across funds, prices can become more sensitive to their trading activity. During periods of market stress, crowded positions can unwind rapidly, leading to price declines that exceed what fundamentals alone would suggest (Boyson, Stahel, and Stulz 2010; Cai and others 2019; Brown, Howard, and Lundblad 2022). Consequently, securities heavily held by hedge funds may be vulnerable not only to issuer-specific risks but also to shocks from hedge fund deleveraging and herding, amplifying stress across markets and institutions (Figure 2.4).

Correlated end-investor redemptions can further amplify selling pressures during market stress. The impact of hedge fund sales on asset prices depends on the concentration of holdings as well as on the degree of synchronization in portfolio adjustments across funds. Securities held by a small number of hedge funds experiencing significant redemptions are particularly vulnerable to price dislocations arising from forced sales. When redemption pressures are correlated

across investors, funds are more likely to sell simultaneously, exacerbating price declines and liquidity strains.¹²

Deleveraging can force hedge funds to reduce exposures and withdraw liquidity when market conditions are strained. Hedge funds rely heavily on secured financing and derivatives-based leverage, both of which are highly sensitive to market conditions through financing terms and margin requirements. As a result, hedge fund leverage is strongly procyclical (Kerry, Lewrick, and Schmieder 2026). This procyclicality can transform hedge funds from liquidity providers in calm times into demanders of liquidity during market stress (Jylhä, Rinne, and Suominen 2014), exacerbating selling pressures, asset price dislocations, and market illiquidity (Ben-David and others 2013; Brunnermeier and Oehmke 2014; Schrimpf, Shin, and Sushko 2020; FSB 2023).

Interactions among leverage, crowding, and redemption pressures can create powerful feedback loops that intensify market stress and price dislocations. For example, margin calls can trigger the unwinding of crowded positions, resulting in price declines that can generate additional margin calls and further deleveraging. Similarly, correlated investor redemptions can force leveraged funds to reduce exposures simultaneously, especially when they target specific leverage ratios. The ensuing selling pressure may increase market volatility, with binding internal risk limits prompting further portfolio adjustments.

The extent of shock transmission from hedge funds to broader financial conditions depends on the market footprint and interconnectedness of the sector. Hedge funds with a significant presence across core financial markets can serve as important conduits through which shocks propagate across markets and borders (see Box 2.1 for evidence from the foreign exchange market). These effects are amplified by hedge funds' close links with other financial intermediaries, particularly prime brokers. When hedge funds are forced to deleverage, prime brokers may incur losses on their hedge fund exposures. Moreover, the resulting asset sales can strain the balance sheets of prime brokers and other dealers absorbing these flows, potentially limiting their intermediation capacity because of regulatory and risk-management constraints (Duffie 2020). The

resulting balance sheet pressures may, in turn, tighten financing conditions, further reinforcing hedge fund deleveraging and asset liquidations (Barth and Zarra 2026). As liquidity provision weakens, stress can spread across asset markets and jurisdictions, amplifying the initial shock, tightening financing conditions more broadly, and posing risks to macrofinancial stability.

Characteristics and Evolution of the Hedge Fund Sector

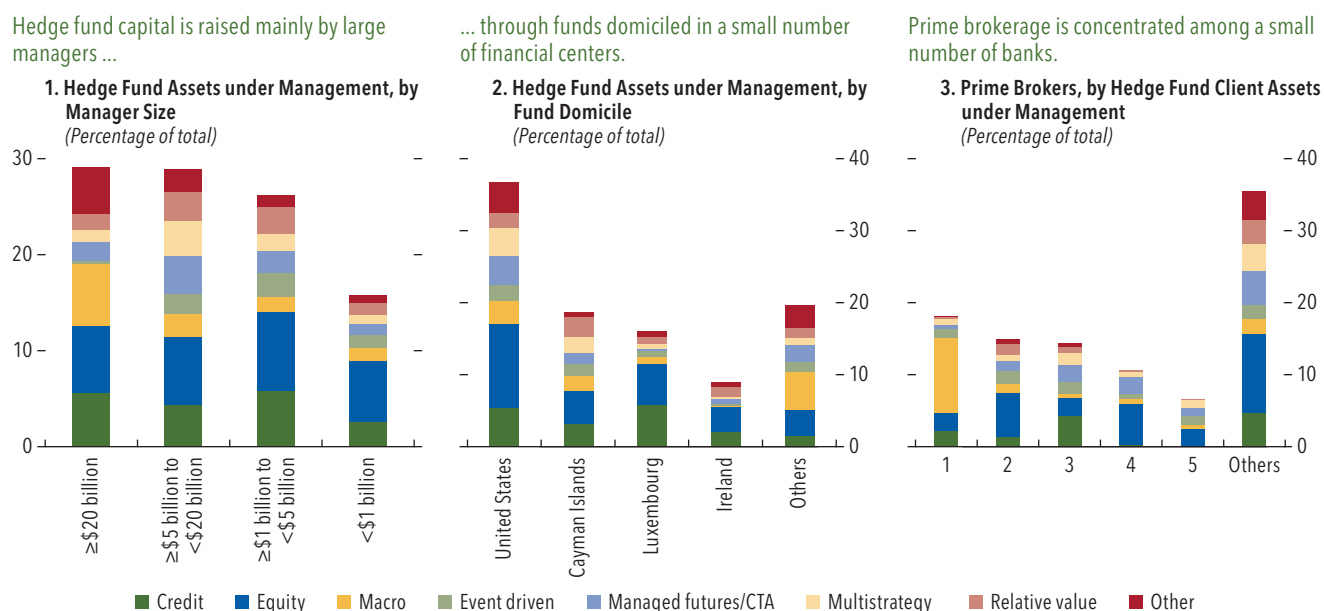
The growth of the hedge fund sector has varied considerably across investment strategies. Gross assets have expanded most rapidly among credit-focused funds, which invest primarily in debt instruments, followed by managed futures and multistrategy funds (Online Annex Figure 2.2.2, panel 1). More recently, growth has been particularly pronounced among relative-value and multistrategy funds, consistent with strong investor demand for diversified sources of return and strategies that can exploit a wider range of market opportunities. Equity funds have also expanded notably, likely reflecting the strong performance of global equity markets, particularly technology-related sectors, and positive investor inflows into these funds (Online Annex Figure 2.2.2, panel 3).¹³

The hedge fund sector is highly concentrated, with a small number of large managers accounting for a sizable share of assets under management, market exposure, and borrowing. The largest 16 managers oversee over \$20 billion in investor capital each and account for about one-third of total net assets (Figure 2.5, panel 1). Among the 300 or so firms managing more than \$1 billion in net assets, which account for about 85 percent of the sector's capital, macro and managed futures strategies are more prevalent than they are among smaller firms. Concentration is even higher when measured by gross exposures, with the largest 10 managers accounting for one-third of total exposures (OFR 2026). Combined with the higher financial leverage of larger firms, this suggests that balance sheet and synthetic leverage through derivatives are also concentrated among a relatively small group of managers.

Hedge funds are domiciled in a small number of financial centers and raise most of their capital through offshore structures. Funds in the United

¹²Redemption arrangements with end investors—such as notice periods, redemption fees, and gates—can limit outflows during periods of market stress and can be key determinants of stress amplification.

¹³Compared with market-capitalization weights, hedge funds may be somewhat overweight in “hyperscaler” stocks, making them potentially more exposed to valuation changes in these firms (see also Chapter 1 for a discussion).

Figure 2.5. Hedge Fund Concentration, by Size, Domicile, and Prime Brokerage

Sources: Hedge Fund Research; Lipper Trading Advisor Selection System; With Intelligence; and IMF staff calculations.

Note: Panels 1 through 3 report hedge fund assets under management as of December 2025, disaggregated by investment strategy. In panel 3, the numbers refer to the largest five prime brokers. For funds reporting multiple prime brokers, assets under management are allocated equally across the reported prime brokers. See Online Annex 2.2 for additional details. CTA = commodity trading advisor.

States, the Cayman Islands, Luxembourg, and Ireland collectively hold over 80 percent of the sector's assets under management (Figure 2.5, panel 2). Other major managers are domiciled in Brazil, Hong Kong SAR, Singapore, and the United Kingdom. Fund managers raise approximately 70 percent of their investor capital through offshore structures, which broadens access to a global investor base but can complicate risk monitoring and supervisory oversight, particularly when disclosure requirements vary across jurisdictions.¹⁴

Leverage is concentrated in a few strategies and is obtained primarily from the largest dealer banks. Relative-value and macro strategy funds exhibit the highest financial leverage and account for most of the increase in leverage since 2023 (Online Annex Figure 2.2.2, panel 2). Leverage of relative-value funds has been more variable over time, suggesting greater susceptibility to deleveraging, particularly during periods of stress. Hedge funds typically obtain leverage from a handful of prime brokers, mostly large global banks, with the five largest providers serving an estimated two-thirds of funds by assets under man-

agement (Figure 2.5, panel 3). Prime broker exposures vary considerably across investment strategies, creating channels through which shocks can be transmitted between hedge funds and dealer banks.

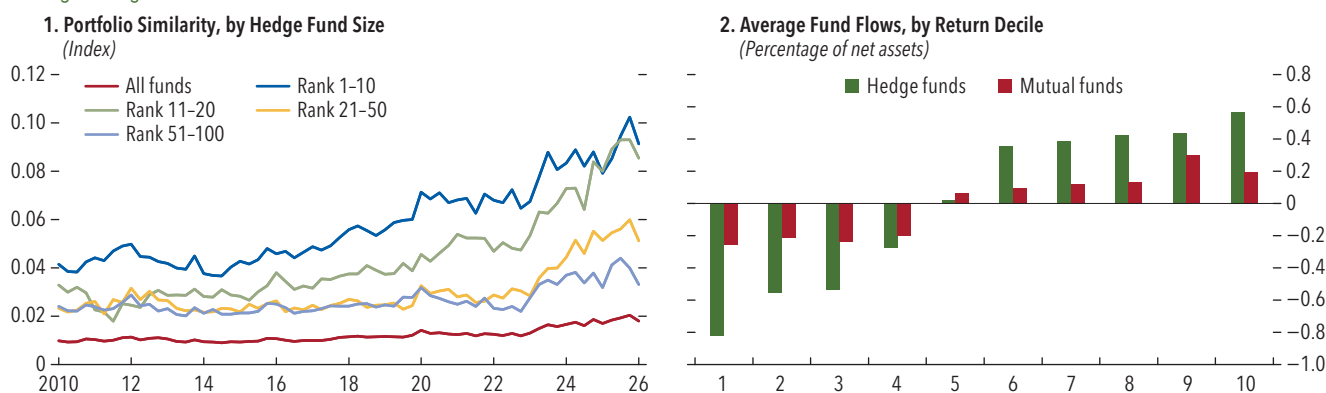
Hedge fund portfolios are becoming increasingly similar. The overlap in equity holdings across hedge funds—measured by the similarity of portfolio weights—has risen over time, especially among the largest funds (Figure 2.6, panel 1). This trend has accelerated since 2022, alongside rising concentration in advanced economy equity markets, driven by the rapid growth of large information technology firms (HFR 2026). Although increasing similarity in portfolios is not unique to the hedge fund sector, greater commonality in positions can raise the risk of synchronized asset sales, thereby amplifying price pressures and market volatility during periods of stress.

Hedge funds' end investors are highly sensitive to performance. Although hedge funds tend to rely more on longer-term institutional investors than mutual funds (Kruttli, Monin, and Watugala 2017), investor flows remain strongly linked to past returns (Figure 2.6, panel 2). The relationship is especially pronounced following large losses, consistent with investors redeeming from underperforming managers. More generally, the strong flow-performance relation

¹⁴Offshore capital is raised mainly through feeder and parallel funds. Feeder funds channel investor capital into a common master portfolio, whereas parallel funds hold similar portfolios in separate legal vehicles tailored to different investor groups.

Figure 2.6. Hedge Fund Portfolio Similarity and Flow-Performance Relationship

Hedge fund equity portfolios are becoming increasingly similar, especially among the largest funds.



Sources: Hedge Fund Research; Lipper; Lipper Trading Advisor Selection System; With Intelligence; and IMF staff calculations.

Note: Panel 1 shows the degree of overlap in hedge fund securities holdings, measured using cosine similarity, ranging from 0 (no overlap) to 1 (full overlap). The subgroups refer to hedge funds ranked by their assets under management. Panel 2 shows average monthly fund flows relative to lagged monthly assets, by previous-month return decile. Flows are expressed as deviations from the full-sample mean for each fund type. Return deciles are formed separately by fund type, with 1 indicating the lowest decile. The differences between hedge funds and mutual funds are larger when using a common returns scale. Returns and flows are winsorized at the 0.5th and 99.5th percentiles.

suggests that investors closely monitor performance when evaluating managers, given the difficulty in assessing expected returns based solely on fund mandates and strategies.

Redemption restrictions are widely used across hedge funds, though their intensity varies. Hedge funds typically limit investor withdrawals through lockup periods that restrict the redemption of newly invested capital, advance notice requirements, and specified redemption frequencies (Online Annex Figure 2.3.7, panel 1).¹⁵ Redemptions can also be subject to fees and, in some cases, gates that temporarily limit the amount of capital investors can withdraw. Notably, redemption terms vary considerably across funds—smaller managers tend to impose more restrictive terms, whereas larger, more leveraged funds offer investors greater liquidity. Although redemption terms may also reflect investor base composition and portfolio liquidity, this may leave leveraged funds more vulnerable to investor outflows during periods of stress.

Market Impact of Hedge Fund Trading

Hedge funds tend to trade against price movements in calm times but become less contrarian when

market volatility rises. An analysis of individual equity holdings, following Grinblatt and others (2020), suggests that hedge funds generally increase positions in equities whose prices are falling and reduce positions in those whose prices are rising (Figure 2.7, panel 1). This contrarian tendency, however, weakens when markets are under stress, suggesting that hedge funds absorb order imbalances and provide risk-bearing capital in normal times but are less likely to play this stabilizing role when volatility is elevated and liquidity conditions deteriorate.¹⁶

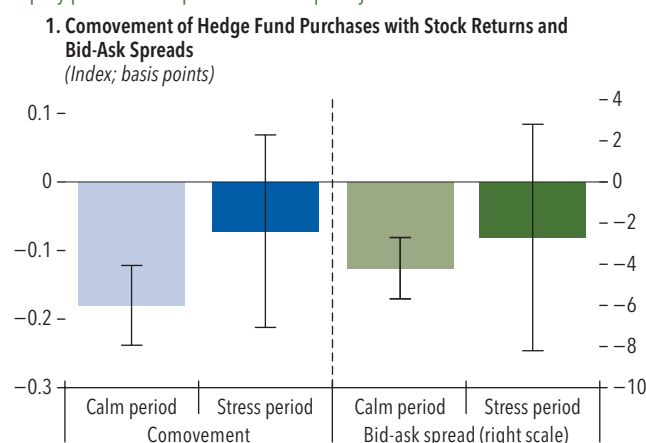
The stabilizing role of hedge funds varies considerably by fund size.¹⁷ Whereas the largest funds are equally contrarian under both tranquil and stressed market conditions, smaller funds exhibit contrarian trading primarily during calm times. When volatility rises, the trading behavior of the smallest hedge funds resembles that of mutual funds: buying stocks whose prices are rising and selling those whose prices are falling (Online Annex Figure 2.3.1, panel 1). These findings are consistent with smaller funds facing funding

¹⁶The difference between momentum trading during periods of stress and calm is statistically significant at the 10 percent level. Analysis for corporate and sovereign bonds also provides some evidence of hedge funds becoming less contrarian in periods of stress (Online Annex Figure 2.3.1, panel 3).

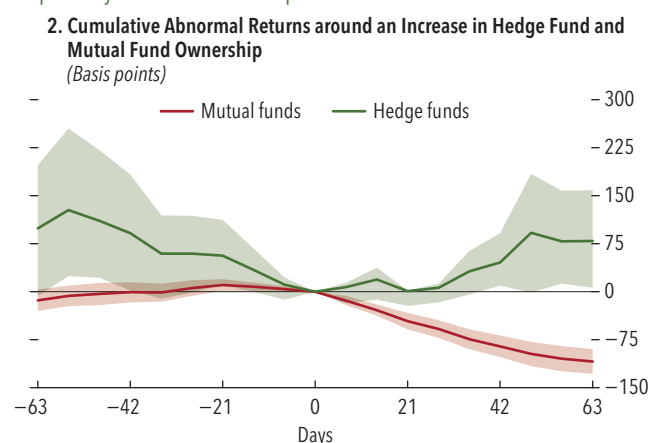
¹⁷The market impact of hedge funds may also vary across investment strategies, but such differences are difficult to examine within equity markets because long-short equity funds dominate hedge fund equity holdings.

Figure 2.7. Hedge Fund Momentum, Ownership, and Equity Market Conditions

In calm times, hedge funds trade against price movements, and their equity purchases improve market liquidity.



Equities bought by hedge funds subsequently overperform, whereas those acquired by mutual funds underperform.



Sources: FactSet; and IMF staff calculations.

Note: Panel 1 reports (1) the average quarterly comovement between hedge fund net purchases and stock returns (blue bars); and (2) the estimated effect of a 10-percentage-point increase in hedge fund ownership (90th percentile of the ownership changes) on next-quarter bid-ask spreads (green bars). Regressions are unweighted. Stress periods are defined as quarters in which the Chicago Board Options Exchange Volatility Index is in its top decile. Panel 2 plots the estimated cumulative abnormal returns (CARs) associated with a 10-percentage-point increase in hedge or mutual fund ownership at different horizons. CARs are based on Fama-French five-factor abnormal returns accumulated over trading-day horizons; negative (positive) horizons indicate returns before (after) the increase in ownership. Error bars and shaded areas indicate 90 percent confidence intervals. See Online Annex 2.3 for additional details.

or risk-management constraints during market stress, which may limit their ability to provide liquidity.

Securities with greater hedge fund ownership tend to be more liquid, although this effect is not significant during periods of market stress. In calm markets, equities purchased by hedge funds subsequently experience a narrowing of their bid-ask spreads (Figure 2.7, panel 1), consistent with evidence that hedge funds can improve market liquidity (Jylhä, Rinne, and Suominen 2014).¹⁸ However, this relationship is not significant under stress, potentially reflecting tighter funding conditions and reduced risk-bearing capacity.

Hedge fund trading is linked to information acquisition, valuation-based investing, and arbitrage activity. Using the event-study methodology of Coval and Stafford (2007), cumulative abnormal equity returns are analyzed around increases in hedge fund ownership. The returns rise gradually, show little subsequent reversal, and tend to occur after periods of relative price weakness (Figure 2.7, panel 2), consistent with hedge funds identifying undervalued stocks or accumulating

positions following market dislocations.¹⁹ By contrast, increases in mutual fund ownership are associated with lower subsequent abnormal returns and exhibit little evidence of a pre-trend.

Role of Hedge Fund Vulnerabilities

Hedge fund vulnerabilities can amplify the effects of global risk shocks. In times of stress, hedge funds with larger exposures to crowded trades, correlated investor redemption pressures, and higher leverage tend to exacerbate rather than stabilize price movements. These effects are particularly pronounced when multiple vulnerabilities are present simultaneously:

1. *Equities held by funds with crowded positions are more vulnerable to synchronized liquidations*, as losses on crowded trades can trigger deleveraging and broader portfolio sales. Consequently, stocks with a higher risk of such synchronized selling exhibit significantly higher volatility and deeper drawdowns (that

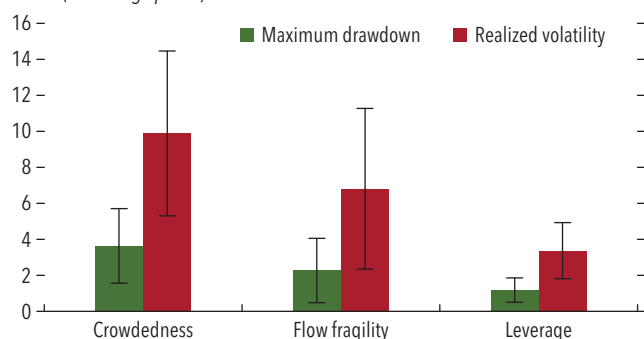
¹⁸The narrowing in bid-ask spreads in calm times, driven mainly by high-portfolio-turnover funds (Online Annex Figure 2.3.3, panel 2), may also reflect greater informational efficiency, as hedge fund trading promotes price discovery and incorporation of information into prices (Figure 2.7, panel 2).

¹⁹Earlier studies find that hedge funds help correct equity mispricing, whereas mutual funds may reinforce it (Akbas and others 2015; Cao and others 2018). Overall, Figure 2.7 points to information- or arbitrage-driven trading as well as liquidity provision when hedge funds buy after price declines. Information-driven trading is concentrated among larger funds (Online Annex Figure 2.3.2).

Figure 2.8. Relationship between Hedge Fund Vulnerabilities, Equity Returns, and Volatility during Market Stress

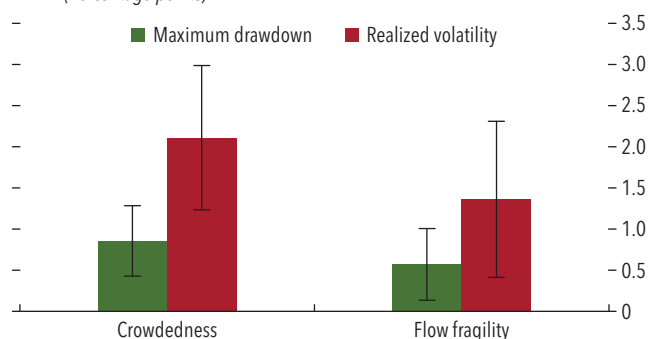
Downside risks are higher for equities exposed to crowded trades, correlated redemption pressures, and elevated hedge fund leverage.

1. Market Volatility and Drawdowns following Increases in Crowdedness, Flow Fragility, and Leverage
(Percentage points)



Higher leverage amplifies the effect of crowdedness and investor base fragility on equity returns and volatility.

2. Market Volatility and Drawdowns following Increases in Crowdedness and Flow Fragility under High Leverage
(Percentage points)



Sources: FactSet; Hedge Fund Research; Lipper Trading Advisor Selection System; With Intelligence; and IMF staff calculations.

Note: The figure shows the association of crowdedness, end-investor flow fragility, and leverage with next-quarter outcomes during market stress, defined as periods in which the Chicago Board Options Exchange Volatility Index is in its top decile. Crowdedness measures a stock's exposure to synchronized hedge fund liquidations as captured by the ownership share of hedge funds with large holdings relative to average daily trading volumes. Flow fragility measures a stock's vulnerability to correlated hedge fund selling pressure, combining ownership shares with the estimated comovement of hedge fund flows. Panel 2 shows the association of pre-stress crowdedness and flow fragility with next-quarter outcomes during stress when leverage is above its within-quarter median. Regressions are unweighted. Error bars denote 90 percent confidence intervals. Online Annex 2.3 provides additional technical details.

is, peak-to-trough losses) during periods of market stress (Figure 2.8, panel 1).²⁰ The most crowded stocks exhibit about 10 percentage points higher volatility and 4 percentage points larger drawdowns than the least-crowded stocks. These effects are also economically meaningful, with an average stress-period realized volatility of daily returns of 37 percent and maximum stress-period drawdowns of 17 percent. The effects are somewhat stronger for US equities and weaker for emerging market stocks, consistent with hedge funds being able to unwind crowded positions more rapidly in deeper, more liquid markets.

- Equities more exposed to correlated redemption pressures face greater downside risk.* As noted previously, concentrated ownership and highly correlated end-investor flows can amplify selling pressures due to redemptions and increase price volatility (Greenwood and Thesmar 2011). Consistent with this mechanism, stocks with the least-stable hedge fund investor base exhibit 7 percentage points higher volatility and 2 percentage points deeper drawdowns

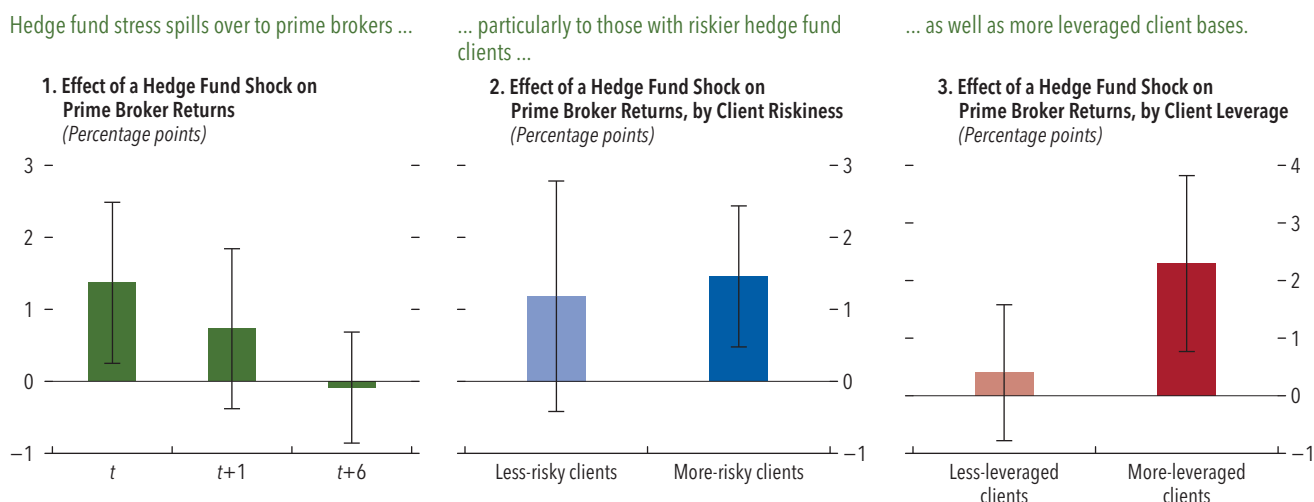
than comparable stocks with less-correlated redemption pressures.²¹

- Equities held by more leveraged hedge funds experience larger price declines and higher volatility during market stress episodes.* As leveraged positions are more likely to be unwound when market conditions deteriorate, stocks with greater exposure to hedge fund leverage face stronger selling pressure and downside risk, consistent with the evidence. However, the effects are, on average, smaller than those associated with crowdedness and investor base fragility, suggesting that in equity markets, leverage on its own may play a more limited role in amplifying selling pressure during stress episodes.²² Box 2.2 shows that leverage can have a significant effect in the US Treasury market, where leveraged basis-trade positions support market functioning in calm times but can amplify dislocations when funding conditions deteriorate.

²¹Redemption terms can significantly influence investor outflows during market stress. Redemptions tend to be about seven times smaller for funds with lockup periods of at least one year and four times smaller for funds with redemption frequencies longer than one month than for funds with more flexible terms (Online Annex 2.3).

²²The amplification effects are stronger for securities exposed to the vulnerabilities of smaller funds, which are more likely to be constrained during market stress and thereby exert greater price pressures (Online Annex Figure 2.3.6).

²⁰A security holder's exposure to crowded trades is measured by extending the approach of Brown, Howard, and Lundblad (2022). See Online Annex 2.3 for details.

Figure 2.9. Effects of Hedge Fund Stress on Prime Broker Returns

Sources: Hedge Fund Research; Lipper Trading Advisor Selection System; With Intelligence; and IMF staff calculations.

Note: Effect of a one-standard-deviation shock to hedge fund returns on prime broker returns. See Online Annex 2.3 for technical details. Error bars show 90 percent confidence intervals. Panels 2 and 3 split brokers by median average variance of fund returns and fund leverage, respectively.

4. *Leverage amplifies the effects of crowdedness and investor base fragility.* Equities simultaneously exposed to hedge fund leverage and crowded positions experience significantly larger increases in volatility and deeper drawdowns during periods of market stress (Figure 2.8, panel 2). Leverage similarly intensifies the effect of investor base fragility, suggesting that redemption pressures can force hedge funds to liquidate leveraged positions, reinforcing downward price pressures and triggering further redemptions.

Taken together, the findings on hedge fund trading behavior, market impact, and vulnerabilities suggest that the funds play a dual role in securities markets. In tranquil times, hedge funds tend to improve price discovery and market liquidity. During periods of stress, however, hedge fund vulnerabilities can amplify price dynamics, contributing to higher volatility. The resilience of hedge fund balance sheets and funding arrangements is therefore critical in determining whether they dampen or amplify shocks.

Macrofinancial Effects of Hedge Fund Stress

Hedge funds can adversely affect financial stability by transmitting stress to their counterparties and propagating shocks across markets. This section examines two channels through which these risks can

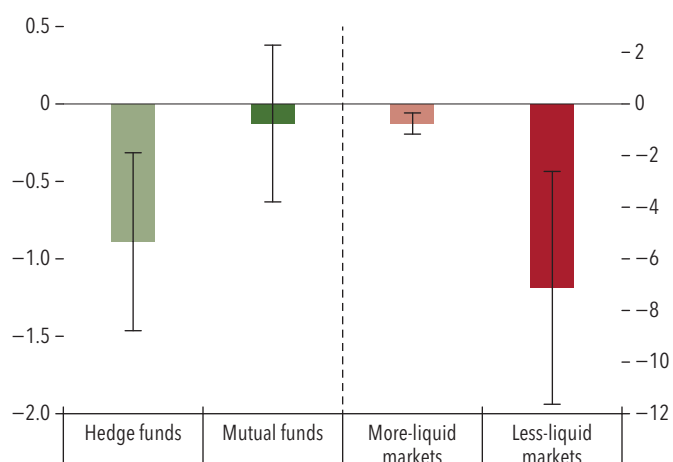
materialize: (1) spillovers from hedge funds to prime brokers and (2) the amplification of global shocks to domestic financing conditions.

Prime brokers are exposed to shocks affecting their hedge fund clients. A one-standard-deviation increase (decline) in hedge fund returns, equivalent to around 2 percentage points, raises (reduces) prime broker returns by 1.4 percentage points during the month of the shock (Figure 2.9, panel 1).²³ Because declines in bank equity valuations increase leverage, all else equal, adverse shocks to hedge fund clients may induce prime brokers to reduce lending and risk taking, potentially transmitting stress to the broader financial system (Adrian and Shin 2010). However, the spillover effect dissipates over subsequent months, suggesting that it is relatively short-lived.

These spillovers are significant for prime brokers with riskier and more leveraged hedge fund clients. Prime brokers with riskier clients, as measured by the volatility of their returns, are affected statistically significantly by a hedge fund return shock of a given magnitude (Figure 2.9, panel 2), consistent with greater exposure to lower-quality collateral. Spillovers are significantly larger for prime brokers with more leveraged clients, indicating that the effect likely

²³The analysis isolates shocks to hedge fund returns that are unrelated to marketwide movements using the instrumental variables approach of Gabaix and Koijen (2024) and aggregates them to the prime broker level using assets-under-management weights.

Figure 2.10. Hedge Fund Equity Market Presence and Stock Returns during Market Stress
(Percentage points)



Sources: FactSet; and IMF staff calculations.

Note: Effect of a one-standard-deviation change in hedge funds' ownership share on equity returns when the Chicago Board Options Exchange Volatility Index is in its top decile. Error bars denote 90 percent confidence intervals. Red bars show the effect of hedge fund ownership for liquid (illiquid) markets, defined as those for which the Amihud illiquidity measure is below (above) its median. See Online Annex 2.3 for additional details.

operates through funding provided by prime brokers rather than indirectly through common exposure to stressed markets (Figure 2.9, panel 3).

Equity markets with a larger hedge fund footprint are strongly affected by global macrofinancial shocks. In countries with a greater hedge fund presence in publicly traded equities, global risk shocks have a larger effect on domestic stock markets (Figure 2.10). A one-standard-deviation increase in aggregate hedge fund ownership (1.3 percentage points) amplifies the effect of a global risk shock on quarterly domestic equity returns by about 1 percentage point, which is sizable relative to the average 7 percent decline following such a shock. The amplification is substantially more pronounced in less-liquid markets, where hedge fund asset liquidations are likely to create strong price pressures. These effects are not observed for mutual fund ownership, suggesting that hedge funds transmit shocks and respond more forcefully to global risk conditions.

Conclusions and Policy Recommendations

Hedge funds have become increasingly important participants in global financial markets. During calm

market conditions, hedge funds support market functioning by providing liquidity, facilitating risk sharing, and correcting price dislocations. However, during periods of stress, their leverage, crowded positions, and correlated investor redemptions can interact to trigger synchronized deleveraging and asset sales, reducing market liquidity, tightening funding conditions, and amplifying shocks. Given hedge funds' extensive links to prime brokers, derivatives counterparties, repo markets, and other financial intermediaries, stress in the sector can spill across markets, impairing market functioning, increasing asset price volatility, and tightening financial conditions more broadly.

As the sector continues to grow, safeguarding macrofinancial stability requires close attention to hedge fund vulnerabilities. The findings of this chapter underscore the need for a comprehensive policy approach that combines improved data collection and risk monitoring, targeted prudential measures, and market-structure reforms to strengthen resilience. By identifying key hedge fund vulnerabilities and the conditions under which they can amplify shocks, the chapter helps inform targeted policy responses and systemwide surveillance.

Data, Transparency, and Risk Monitoring

Significant data gaps continue to limit the ability of policymakers to assess vulnerabilities and interconnections involving hedge funds. Efforts should prioritize improving information on leverage, exposures to derivatives, securities financing transactions, prime broker relationships, and investor redemption arrangements. Closing these gaps would support a more comprehensive assessment of risks and their transmission channels. Given the global nature of the hedge fund industry and the prominent role of offshore fund domiciles, stronger cross-border reporting frameworks and information-sharing arrangements are essential to improve risk attribution and monitoring.

Systemwide surveillance and stress-testing frameworks should be strengthened to better assess the resilience of markets with significant hedge fund participation. Stress tests and scenario analyses could incorporate hedge funds' linkages with other financial intermediaries, as well as their cross-asset positions, to assess how leverage, margin calls, funding pressures, and asset liquidations affect market liquidity and asset prices (see, for example, IMF 2025) and generate adverse feedback loops that amplify and propagate

shocks across financial markets. Such exercises can help identify vulnerabilities, transmission channels, and amplification mechanisms before they materialize.

Risk-Based Prudential Toolkit

Policy measures should be calibrated to the nature and source of underlying vulnerabilities, consistent with international efforts to strengthen the resilience of nonbank financial intermediaries. Where risks arise primarily from the potential for synchronized deleveraging across a wide range of hedge funds—for example, in response to margin calls or correlated investor redemptions—activity-based measures may be appropriate. These could include minimum margin and haircut requirements in securities financing transactions and derivatives markets, stronger collateral management practices, and measures to ensure preparedness for margin calls during periods of market stress. Their design should account for uneven application across jurisdictions and counterparties as well as potential adverse effects on market liquidity (FSB 2025).

Where vulnerabilities are concentrated in specific firms or exposures, entity- and concentration-based tools may be warranted. Securities regulators overseeing hedge funds and fund managers may consider measures such as risk-based leverage limits, enhanced reporting of large positions, capital or margin add-ons, and large-exposure limits. Carefully calibrated, such measures can reduce vulnerabilities while preserving the beneficial role that hedge funds play in financial markets.²⁴

²⁴Because hedge funds are typically not prudentially regulated (FSB 2023), such tools are available in few jurisdictions and often

Market Resilience and Crisis Preparedness

Supervisors should ensure that prime brokers maintain robust counterparty risk management, given their central role in providing leverage and financing to hedge funds. Enhanced risk assessment, monitoring of concentrated exposures, and prudent collateral practices can help limit contagion between hedge funds and the banking sector (BCBS 2024).

Central banks should maintain credible, targeted, and operationally ready backstops to address episodes of severe dysfunction in core financial markets. To limit moral hazard, such measures should aim to preserve market functioning rather than support the solvency of individual institutions and should complement, rather than substitute for, ex ante resilience at prime brokers and other key intermediaries.²⁵ Because hedge funds operate across borders, effective international cooperation is needed to promote consistent implementation of policy measures, reduce regulatory gaps, and limit opportunities for regulatory arbitrage across jurisdictions.

operate indirectly through fund managers or counterparty requirements. The effectiveness of the tools may be constrained by the use of synthetic leverage, cross-border activity, limits on information sharing, and potential effects on market liquidity. Where funds, managers, and counterparties span jurisdictions, measures applied at the point of financing may be more practical (FSB 2025).

²⁵Backstops could include discretionary marketwide operations informed by predefined, data-driven indicators of market dysfunction (April 2023 *Global Financial Stability Report*). Collateralized lending and securities financing operations can ease funding pressures, while market-functioning asset purchases can relieve the balance sheet constraints of dealers (Duffie 2020; Box 2.2). To preserve incentives for prudent risk management, eligibility, collateral, and pricing should be set ex ante and designed to limit use to periods of acute dysfunction.

Box 2.1. Hedge Fund Activity and the Foreign Exchange Market

Hedge funds are active participants in foreign exchange markets, accounting for about 8 percent of global foreign exchange turnover in April 2025 (BIS 2025). One common foreign exchange strategy is the carry trade: borrowing in low-yielding currencies to invest in higher-yielding currencies or assets. Although carry trades are often profitable in low-volatility periods, they can reverse sharply following unexpected policy changes or shifts in risk sentiment. This box examines how leveraged hedge fund activity can amplify such reversals, using the Swiss franc floor removal in January 2015 and the yen carry trade unwind in August 2024 as case studies.¹

The analysis begins by assessing whether hedge funds had become increasingly exposed to carry trade risks ahead of the unwinds. To do so, it estimates the sensitivity of hedge fund returns across strategies to a benchmark carry trade, capturing how closely hedge fund performance tracks carry trade returns.² The estimates show that exposures increased notably before both events and declined sharply thereafter (Figure 2.1.1, panels 1 and 2).

Positioning data also point to crowded funding-currency shorts (Online Annex Figure 2.3.9, panel 1). Noncommercial yen shorts rose during the yen depreciation of 2022–24, reaching a record 3.5 standard deviations above their historical average before unwinding abruptly. Swiss franc shorts were also elevated ahead of removal of the floor.³ A returns-

based crowdedness indicator peaked ahead of both episodes, suggesting that the risk reflected broad hedge fund exposure to the same funding-currency factor rather than a few concentrated positions. Following the yen carry trade unwind, volatility spilled over to equity markets as multistrategy funds, especially those domiciled offshore, reduced both carry trade and Japanese equity exposures (Online Annex Figure 2.3.9, panel 2).⁴

Leveraged and crowded positioning raises the risk of sharp funding-currency reversals, with potentially broader market spillovers. A one-standard-deviation increase in leveraged short positions is associated with significantly worse lower-tail outcomes up to one quarter, with cumulative effects reaching 2 percentage points for funding currencies and related equity indices (Figure 2.1.1, panel 3). The effect is highly nonlinear: When crowdedness is elevated, the same buildup is associated with a 9-percentage-point decline in the 10th percentile of the Nikkei, compared with 1.5 percentage points otherwise (Figure 2.1.1, panel 4). This suggests a crowded-trade tail-risk mechanism in which synchronized unwinds amplify shocks across funding and investment currencies (Online Annex Figure 2.3.10, panel 2) as well as other asset markets.

The findings highlight the importance of monitoring leveraged and crowded carry trade exposures, particularly among funds domiciled offshore, where exposures tend to be concentrated and transparency is limited. Granular data on over-the-counter derivatives, prime broker financing, and cross-asset exposures would help identify vulnerabilities before they unwind. The evidence also underscores the need to assess the procyclicality of margining practices and volatility-sensitive risk models, which can amplify shocks through synchronized deleveraging across asset classes (FSB 2024; BCBS, CPMI, and IOSCO 2025).

This box was prepared by Andrea Deghi.

¹On January 15, 2015, the Swiss National Bank abandoned the franc floor, triggering an intraday franc appreciation of 16 percent against the US dollar and a sharp Swiss equity sell-off. In early August 2024, narrowing dollar-yen differentials triggered a yen carry trade unwind with margin calls and volatility-driven deleveraging amplifying market stress (Aquilina and others 2024).

²A higher sensitivity (carry beta) means hedge fund returns co-move more closely with a benchmark carry trade; funds tend to gain when a carry trade performs but are more exposed when funding currencies appreciate and the trade unwinds.

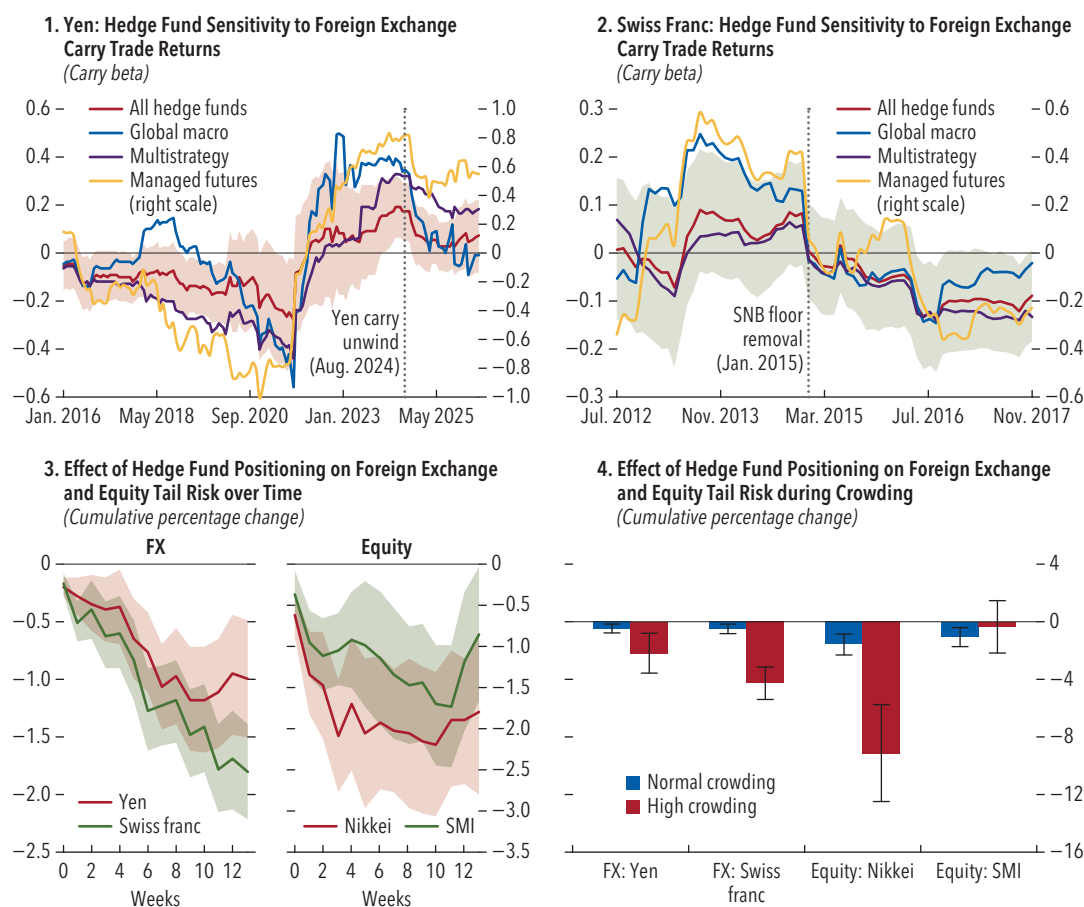
³Because data on direct hedge fund foreign exchange carry positions are not available, the box uses the Commodity Futures Trading Commission positions of leveraged funds as a proxy (Galati, Heath, and McGuire 2007). Following Pojarliev and Levich (2011) and BIS (2024), the crowdedness indicator is con-

structed by estimating 36-month rolling carry sensitivities (betas) for hedge fund strategy indices, controlling for broad market risk, and measuring the net share of strategies with significantly positive versus negative betas.

⁴BIS (2024) notes that before the August 2024 episode, multistrategy hedge funds had leverage of about 4:1 on traditional measures and 14:1 including synthetic leverage through derivatives.

Box 2.1 (continued)

Figure 2.1.1. Hedge Funds in Foreign Exchange Markets: Carry Trades and Spillover Risks



Sources: Bloomberg Finance L.P.; Commodity Futures Trading Commission; EUROPACE AG/Haver Analytics; Hedge Fund Research; Kenneth French Data Library; and IMF staff calculations.

Note: Panels 1 and 2 show rolling 36-month carry betas of hedge fund strategy-index excess returns to a benchmark foreign exchange carry factor, controlling for the market factor, around the August 2024 yen unwind and the January 2015 Swiss franc shock. Panel 3 shows the cumulative effect of a one-standard-deviation increase in gross short positions on the 10th percentile of future foreign exchange and equity returns over the projection horizon. Foreign exchange outcomes are quoted as funding-currency units per US dollar (lower values indicate an appreciation of the funding currency). Panel 4 shows the one-month-ahead effect of leveraged positioning conditional on hedge fund crowding, with high (normal) periods reflecting when the crowdedness indicator is above (below) its historical upper tercile. Shaded areas in panels 1 through 3 indicate 90 percent confidence bands. FX = foreign exchange; SMI = Swiss Market Index; SNB = Swiss National Bank. See Online Annex 2.3 for further details.

Box 2.2. Implications of US Treasury Cash-Futures Basis Trades of Hedge Funds

Hedge funds have become increasingly important participants in the US Treasury market, driven by the growth of leveraged relative-value strategies. Their share of outstanding Treasury securities rose from about 4 percent in 2022 to 9 percent in 2025 (Monin 2026). A significant portion of this activity is associated with Treasury cash-futures basis trading, in which hedge funds buy Treasury securities financed in repurchase markets while selling Treasury futures to profit from small pricing discrepancies expected to converge over time (Glicoes and others 2024; Barth and Kahn 2025).

Although basis trades can improve Treasury market functioning by narrowing pricing gaps between cash and futures markets, they depend on large leveraged positions and uninterrupted access to funding. Shocks to volatility, margins, or funding conditions can force rapid deleveraging, amplifying stress through asset sales, reduced liquidity, and tighter financing conditions. These pressures may also spill over to other asset classes as hedge funds adjust their portfolios.¹ The March 2020 Treasury market turmoil highlighted these vulnerabilities, which continue to feature prominently in policy discussions as leveraged relative-value strategies have become increasingly important in Treasury market intermediation (CFTC 2024; Kashyap and others 2025; Kahn and McCormick 2026).

Understanding the scale and evolution of hedge fund basis-trade exposures is important in assessing these vulnerabilities. The basis-trade footprint for hedge funds is assessed using the relationship between hedge fund returns and Treasury net-basis volatility.² The estimated footprint has varied substantially over time, accounting for a meaningful share of hedge fund return variation at times (Figure 2.2.1, panel 1).

This box was prepared by Andrea Deghi and Mingmei Xiao.

¹The amplification mechanism does not require hedge funds to lead the sell-off. If tighter funding conditions or dealers' balance sheet constraints force leveraged arbitrageurs to retrench, their reduced capacity to absorb supply can widen the basis and erode market liquidity, amplifying market stress from other sources.

²The basis-trade footprint is estimated from rolling regressions of hedge fund strategy returns on the realized volatility of Bloomberg Finance L.P.'s 10-year Treasury net basis, controlling for broader market risk factors. Basis volatility is used instead of the basis because it captures both the risks and opportunities in basis trading, including margin-related pressures and changes in trading opportunities, while preserving high-frequency variation in basis-market conditions. Figure 2.2.1 reports the share of residual hedge fund return variation explained by basis volatility.

It has grown during periods associated with elevated basis-trade activity, became insignificant following the March 2020 Treasury market turmoil, and strengthened again after 2022. The pattern broadly mirrors documented developments in Treasury cash-futures basis trading (Glicoes and others 2024). More recently, the footprint has moderated, consistent with the decline in leveraged funds' short Treasury futures positions reported by the Office of Financial Research Hedge Fund Monitor.³

The analysis also suggests that basis-trade activity is concentrated in relative-value and macro strategies, consistent with evidence on large basis traders (Barth and Kahn 2025). Exposure appears greater among more leveraged funds, consistent with the reliance of basis trades on repurchase financing and leverage to scale positions (Figure 2.2.1, panel 2). Within relative-value strategies, exposures were particularly pronounced among offshore-domiciled and larger funds during the buildup before the COVID-19 pandemic (Online Annex 2.3).

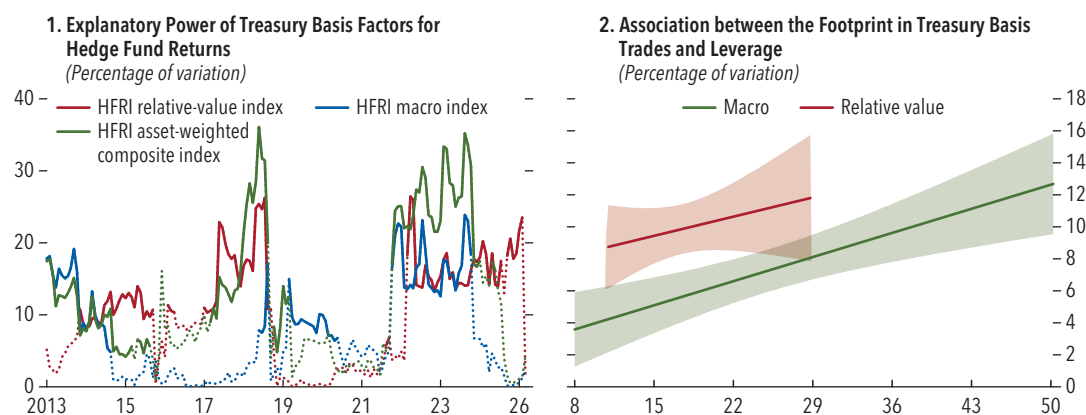
The growth and concentration of basis-trade exposures suggest that hedge fund positioning may have important implications for market functioning. This is indeed the case—regression analysis shows that hedge fund positioning can help absorb cash-futures dislocations in normal conditions but can amplify them under stress. A one-standard-deviation increase in leveraged positioning leaves the median basis unchanged but raises its 90th percentile by 1.5 basis points over eight weeks while helping reduce dislocations when the basis is already converging (Figure 2.2.2, panel 1). The effect is even larger when the Federal Reserve balance sheet is smaller relative to the debt stock, suggesting that quantitative tightening can amplify the market impact of hedge fund positioning (Figure 2.2.2, panel 2).

The effects of hedge fund positioning also depend on dealer intermediation capacity. When dealer capacity is ample, greater positioning helps absorb Treasury supply and reduces basis widening. When capacity is constrained, the effect reverses, amplifying market dislocations (Figure 2.2.2, panel 3). This suggests that basis traders can improve market functioning in normal times but become an amplification channel when funding conditions tighten and dealers' balance sheet capacity is limited (Kashyap and others 2025).

³Office of Financial Research (OFR), Hedge Fund Monitor; CFTC Traders in Financial Futures (TFF) report, updated July 2026.

Box 2.2 (continued)

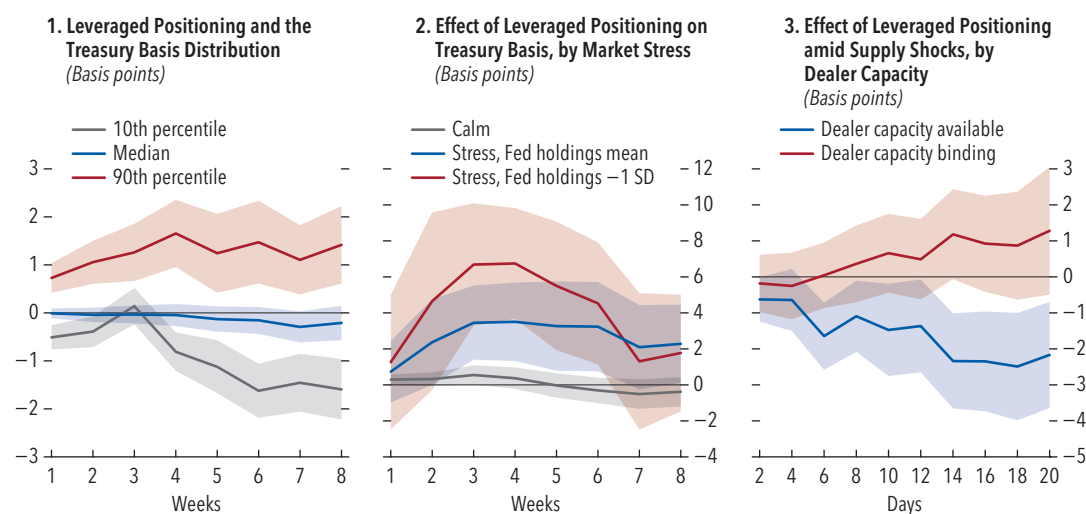
Figure 2.2.1. Treasury Basis and Hedge Fund Exposures



Sources: Bloomberg Finance L.P.; Hedge Fund Research; Office of Financial Research; and IMF staff calculations.

Note: Panel 1 reports 36-month rolling partial R^2 estimates, defined as the share of residual hedge fund return variation explained by contemporaneous and lagged Treasury net-basis volatility, after controlling for relevant factors. Treasury net-basis volatility is the monthly realized volatility of Bloomberg's 10-year Treasury futures net basis computed from daily changes in the same-contract net basis. Solid (dotted) lines denote periods when net-basis volatility factors are jointly significant (not significant) at the 10 percent level. Panel 2 relates quarterly Office of Financial Research leverage measures to the estimated basis-volatility footprint for these strategies. The shaded areas indicate 90 percent confidence intervals around fitted relationships. HFRI = Hedge Fund Research Index. Online Annex 2.3 provides further details.

Figure 2.2.2. Effect of Hedge Fund Positioning on Treasury Basis



Sources: Bloomberg Finance L.P.; Commodity Futures Trading Commission; Federal Reserve Board; TreasuryDirect; Financial Accounts; FR 2004; and IMF staff calculations.

Note: Panel 1 shows the cumulative response of the 10-year Treasury basis to a one-standard-deviation increase in leveraged positioning at the 10th, 50th, and 90th percentiles. Panel 2 shows the cumulative change in the Treasury basis to a one-standard-deviation increase in positioning under stress (calm) periods, defined as those in which the Chicago Board Options Exchange Volatility Index is above (below) its 90th percentile. Results for stress periods are compared when the Federal Reserve Treasury holdings, as a share of marketable Treasury debt, are at their average level (blue line) and one standard deviation below average (red line). Panel 3 shows the effect of a one-standard-deviation increase in positioning on the Treasury basis following Treasury auction shocks, conditional on dealer capacity. Auction surprises are defined as the DV01-weighted change in offering size against the previous auction of the same tenor and reopening status. See Online Annex 2.3 for additional details. Fed = Federal Reserve; SD = standard deviation.

References

- Adrian, Tobias, and Hyun Song Shin. 2010. "Liquidity and Leverage." *Journal of Financial Intermediation* 19 (3): 418–37.
- Akbas, Ferhat, Will J. Armstrong, Sorin Sorescu, and Avanidhar Subrahmanyam. 2015. "Smart Money, Dumb Money, and Capital Market Anomalies." *Journal of Financial Economics* 118 (2): 355–82.
- Ang, Andrew, Sergiy Gorovyy, and Gregory B. van Inwegen. 2011. "Hedge Fund Leverage." *Journal of Financial Economics* 102 (1): 102–26.
- Aquilina, Matteo, Marco Jacopo Lombardi, Andreas Schrimpf, and Vladyslav Sushko. 2024. "The Market Turbulence and Carry Trade Unwind of August 2024." BIS Bulletin 90, Bank for International Settlements, August.
- Aragon, George O., Bing Liang, and Hyuna Park. 2014. "Onshore and Offshore Hedge Funds: Are They Twins?" *Management Science* 60 (1): 74–91.
- Bank for International Settlements (BIS). 2024. *BIS Quarterly Review* (September).
- Bank for International Settlements (BIS). 2025. "Triennial Central Bank Survey of Foreign Exchange and Over-the-Counter (OTC) Derivatives Markets in 2025." Basel, Switzerland.
- Barth, Daniel, Daniel Beltran, Matthew Hoops, Jay Kahn, Emily Liu, and Maria Perozek. 2025. "The Cross-Border Trail of the Treasury Basis Trade." FEDS Notes 2025-10-15-2, Board of Governors of the Federal Reserve System, Washington, DC.
- Barth, Daniel, and R. Jay Kahn. 2025. "Hedge Funds and the Treasury Cash-Futures Basis Trade." *Journal of Monetary Economics* 155: 103823.
- Barth, Daniel, and Nicholas A. Zarra. 2026. "Prime Broker Credit Supply and the Stock Market: Evidence on Hedge Fund Transmission." Unpublished.
- Basel Committee on Banking Supervision (BCBS). 2024. "Guidelines for Counterparty Credit Risk Management." Bank for International Settlements, Basel, Switzerland.
- Basel Committee on Banking Supervision (BCBS), Committee on Payments and Market Infrastructures (CPMI), and International Organization of Securities Commissions (IOSCO). 2025. *Transparency and Responsiveness of Initial Margin in Centrally Cleared Markets: Review and Policy Proposals*. Basel, Switzerland: Bank for International Settlements.
- Ben-David, Itzhak, Francesco Franzoni, and Rabih Moussawi. 2012. "Hedge Fund Stock Trading in the Financial Crisis of 2007–2009." *Review of Financial Studies* 25 (1): 1–54.
- Ben-David, Itzhak, Francesco Franzoni, Augustin Landier, and Rabih Moussawi. 2013. "Do Hedge Funds Manipulate Stock Prices?" *Journal of Finance* 68 (6): 2383–434.
- Bergman, Nittau K., Ohad Kadan, Roni Michaely, and Pamela C. Moulton. 2026. "Do Proprietary Traders Provide Liquidity?" *Journal of Financial Economics* 184: 104325.
- Boyson, Nicole M., Christof W. Stahel, and René M. Stulz. 2010. "Hedge Fund Contagion and Liquidity Shocks." *Journal of Finance* 65 (5): 1789–816.
- Brown, Gregory W., Philip Howard, and Christian T. Lundblad. 2022. "Crowded Trades and Tail Risk." *Review of Financial Studies* 35 (7): 3231–71.
- Brown, Stephen J., William N. Goetzmann, Bing Liang, and Christopher Schwarz. 2008. "Mandatory Disclosure and Operational Risk: Evidence from Hedge Fund Registration." *Journal of Finance* 63 (6): 2785–815.
- Brunnermeier, Markus K., and Martin Oehmke. 2014. "Predatory Short Selling." *Review of Finance* 18 (6): 2153–95.
- Cai, Fang, Song Han, Dan Li, and Yi Li. 2019. "Institutional Herding and Its Price Impact: Evidence from the Corporate Bond Market." *Journal of Financial Economics* 131 (1): 139–67.
- Cao, Charles, Bing Liang, Andrew W. Lo, and Lubomir Petrasek. 2018. "Hedge Fund Holdings and Stock Market Efficiency." *Review of Asset Pricing Studies* 8 (1): 77–116.
- Commodity Futures Trading Commission (CFTC). 2024. "The Treasury Cash-Futures Basis Trade and Effective Risk Management Practices." Report of the Market Structure Subcommittee, Market Risk Advisory Committee of the US Commodity Futures Trading Commission, Washington, DC.
- Çötelioglu, Efe, Francesco Franzoni, and Alberto Plazzi. 2021. "What Constrains Liquidity Provision? Evidence from Institutional Trades." *Review of Finance* 25 (2): 485–517.
- Coval, Joshua, and Erik Stafford. 2007. "Asset Fire Sales (and Purchases) in Equity Markets." *Journal of Financial Economics* 86 (2): 479–512.
- Cumming, Douglas, Sofia Johan, and Geoffrey Wood. 2021. "Introducing Hedge Funds." In *The Oxford Handbook of Hedge Funds*, edited by Douglas Cumming, Sofia Johan, and Geoffrey Wood. Oxford, UK: Oxford University Press.
- Duffie, Darrell. 2020. "Still the World's Safe Haven? Redesigning the US Treasury Market after the COVID-19 Crisis." Hutchins Center Working Paper 62, Brookings Institution, Washington, DC.
- Epp, Adam, and Jeffrey Gao. 2025. "Are Hedge Funds a Hedge for Increasing Government Debt Issuance?" Staff Discussion Paper 2025-7, Bank of Canada, Ottawa, Canada.
- Financial Stability Board (FSB). 2023. "The Financial Stability Implications of Leverage in Non-Bank Financial Intermediation." Financial Stability Board, Basel, Switzerland.
- Financial Stability Board (FSB). 2024. "Global Monitoring Report on Non-Bank Financial Intermediation 2024." Financial Stability Board, Basel, Switzerland.
- Financial Stability Board (FSB). 2025. "Leverage in Nonbank Financial Intermediation: Final Report." Financial Stability Board, Basel, Switzerland.
- Gabaix, Xavier, and Ralph S. J. Koijen. 2024. "Granular Instrumental Variables." *Journal of Political Economy* 132 (7): 2274–303.
- Galati, Gabriele, Alexandra Heath, and Patrick McGuire. 2007. "Evidence of Carry Trade Activity." *BIS Quarterly Review* (September).

- Glicoes, Jonathan, Benjamin Iorio, Phillip Monin, and Lubomir Petrasek. 2024. "Quantifying Treasury Cash-Futures Basis Trades." FEDS Notes 2024-03-08-3, Board of Governors of the Federal Reserve System, Washington, DC.
- Greenwood, Robin, and David Thesmar. 2011. "Stock Price Fragility." *Journal of Financial Economics* 102 (3): 471–90.
- Grinblatt, Mark, Gergana Jostova, Lubomir Petrasek, and Alexander Philipov. 2020. "Style and Skill: Hedge Funds, Mutual Funds, and Momentum." *Management Science* 66 (12): 5505–31.
- Hedge Fund Research (HFR). 2026. "Hedge Fund Industry Asset Growth Shatters Records." Market Commentary, HFR, July 23.
- International Monetary Fund (IMF). 2025. "Euro Area Policies: Financial System Stability Assessment." IMF Country Report 2025/203, Washington, DC.
- Jame, Russell. 2018. "Liquidity Provision and the Cross Section of Hedge Fund Returns." *Management Science* 64 (7): 3288–312.
- Jylhä, Petri, Kalle Rinne, and Matti Suominen. 2014. "Do Hedge Funds Supply or Demand Liquidity?" *Review of Finance* 18 (4): 1259–98.
- Kaal, Wulf A. 2021. "Financial Technology and Hedge Funds." In *The Oxford Handbook of Hedge Funds*, edited by Douglas Cumming, Sofia Johan, and Geoffrey Wood. Oxford, UK: Oxford University Press.
- Kahn, R. Jay, and Matthew McCormick. 2026. "Rising Hedge Fund Leverage Affects Monetary Policy Implementation." Dallas Fed Economics 103350, Federal Reserve Bank of Dallas.
- Kashyap, Anil K., Jeremy C. Stein, Jonathan L. Wallen, and Joshua Younger. 2025. "Treasury Market Dysfunction and the Role of the Central Bank." *Brookings Papers on Economic Activity* (Spring): 221–65.
- Kerry, Will, Ulf Lewrick, and Christian Schmieder. 2026. "Understanding Hedge Fund Leverage Targeting and Fire Sales." SUERF Policy Brief 1342, European Money and Finance Forum, Vienna, Austria.
- Kokkonen, Joni, and Matti Suominen. 2015. "Hedge Funds and Stock Market Efficiency." *Management Science* 61 (12): 2890–904.
- Kruttli, Mathias S., Phillip J. Monin, and Sumudu W. Watugala. 2017. "Investor Concentration, Flows, and Cash Holdings: Evidence from Hedge Funds." Finance and Economics Discussion Series 2017-121, Board of Governors of the Federal Reserve System, Washington, DC.
- Mann, Catherine L. 2026. "Old Exposures, New Actors: Implications for Monetary Policy of the UK's External Imbalances." Speech at the London School of Economics and Political Science, May 13.
- Monin, Phillip J. 2026. "Decomposing Hedge Funds' US Treasury Exposures." FEDS Notes 2026-06-22-1, Board of Governors of the Federal Reserve System, Washington, DC.
- Office of Financial Research (OFR). 2026. "Hedge Fund Monitor." US Department of the Treasury, Washington, DC. <https://www.financialresearch.gov/hedge-fund-monitor/>
- Pojarliev, Momtchil, and Richard M. Levich. 2011. "Detecting Crowded Trades in Currency Funds." *Financial Analysts Journal* 67 (1): 26–39.
- Schrimpf, Andreas, Hyun Song Shin, and Vladyslav Sushko. 2020. "Leverage and Margin Spirals in Fixed Income Markets during the COVID-19 Crisis." BIS Bulletin 2, Bank for International Settlements, April.
- Whitehead, Charles K. 2011. "The Volcker Rule and Evolving Financial Markets." *Harvard Business Law Review* 1: 39–73.
- With Intelligence. 2026. "A \$10bn Lesson Learned: Archegos Informed Prime Brokers' Response to Situational Awareness." Market Commentary, August 5.

