



FOREWORD

Since we last published the *Global Financial Stability Report* (GFSR) in October 2024, financial stability risks have increased. With elevated economic policy uncertainty, financial market volatility has risen and investor confidence has turned to concern. Substantially elevated equity and bond market has tightened global financial conditions, indicating global financial markets may be at a turning point. While the role of the GFSR is not to predict future shocks, it does identify vulnerabilities that can propagate and amplify when downside risk realizes. Financial stability assessments are squarely focused on downside risks, akin to the perspectives of risk managers for the global financial system.

In recent years, the global financial system has been able to absorb a protracted series of shocks. These include the COVID-19 pandemic in 2020, the global surge of inflation beginning in 2021, and Russia's war in Ukraine starting in 2022. More recently, uncertainty about economic policies, notably tariffs, is again testing the resilience of the global financial system. In addition, elevated levels of sovereign debt are a worry, given the interaction of financial sector imbalances and government debt. Financial imbalances can amplify adverse shocks.

The financial system's ability to weather shocks has been bolstered in recent years by the prudent management of the financial sector. Banks around the world remain at the core of the financial system and have seen substantially increased levels of capital and liquidity, enhancing their capacity to absorb losses during difficult periods. Going forward, the continued, timely, and consistent implementation of Basel III and other internationally-agreed-upon bank regulatory standards will help ensure a level playing field across jurisdictions and guarantee continued ample capital and liquidity to withstand future shocks. We view the increased focus on the proactive supervision of the largest institutions globally as a key contributor to stability. To increase efficiencies in credit provision, a proportionate approach consistent with the Basel Core Principles for Effective Banking Supervision should be considered.

That means that smaller banking institutions should be supervised and regulated in a proportionate manner, simplifying requirements while strengthening resilience to shocks.

As we move into new analysis in this April 2025 GFSR, we highlight the growing role of nonbank financial intermediation (NBFIs) and the increased exposure of banks to NBFIs. Nonbank financial institutions cover a broad array of intermediation activity, including insurance companies, pension funds, investment funds (mutual funds, exchange-traded funds, hedge funds, private equity, and private credit), and finance companies. The linkages between banks and nonbanks have been growing, increasing the NBFIs' influence on systemwide financial stability.

In light of these considerations, improving the regulation of NBFIs should remain a priority. Important advances have been made to reinforce their soundness, including reforms to money market funds, limits to liquidity risks in mutual funds, margin-setting in central counterparties, counterparty risk management practices for broker-dealers, and trading rules in exchanges and electronic trading platforms. However, data gaps preclude a complete and timely assessment of vulnerabilities. The data gaps are challenging sound decision making for private sector participants and for policy makers. To harness the benefits from the growth of NBFIs, it is paramount to strengthen data availability for risk monitoring and assessment. This will enable the private sector and supervisors to have a systemwide view of risks and single out poorly governed institutions that take excessive risks. Better data will also ensure that national authorities have the appropriate tools to manage these risks effectively. International standard setters are planning further work in this regard, including examining cross-border and cross-sector interconnectedness and enhancing international coordination.

In financial markets, sound trading arrangements and infrastructures are essential for maintaining macrofinancial stability. A resilient global financial system requires financial "plumbing" to operate smoothly

so that the movements of securities, derivatives, and payments can continue during periods of market volatility. To ensure the efficient and reliable operation of payment and settlement systems, it is necessary to prioritize the interoperability of various platforms, particularly across borders. Embracing innovative technologies—such as blockchain and artificial intelligence—can significantly enhance the efficiency and security of these systems, ultimately contributing to a more stable financial environment.

Even well-regulated financial systems may face shocks so severe that they lead to systemic crises. Crisis preparedness, alongside proactive regulatory policies, remains foundational for financial stability. Drawing on insights from the March 2023 banking turmoil, we can make some clear assessments. First, it is crucial for supervisors with the willingness, legal authority, and ability to act to intervene early in weak institutions. Second, stabilizing the financial system may require a large and rapid provision of liquidity to financial

institutions. Central banks should further develop their frameworks for emergency liquidity assistance during regular periods so that they are well prepared for potential intervention in a crisis. Third, even small banks can pose risks to financial stability. It is essential to make further progress in implementing recovery and resolution frameworks to effectively address the challenges posed by weak or failing financial institutions, with the goal of minimizing the need for public funding.

Drawing lessons from the past will continue to guide our efforts in strengthening future preparedness. It is key that we closely monitor evolving financial vulnerabilities for banks and nonbanks alike. The interactions of capital markets and the banking system could be tested if financial conditions were to tighten further. To keep a watchful eye on these risks to global financial stability is the purpose of this report.

Tobias Adrian
Financial Counsellor

EXECUTIVE SUMMARY

Enhancing Resilience amid Uncertainty

The October 2024 *Global Financial Stability Report* highlighted stretched asset valuations, growing financial system leverage, and low financial market volatility against a backdrop of heightened levels of economic uncertainty (Figure ES.1). Such fragilities can amplify shocks and trigger abrupt tightening of financial conditions, exacerbating economic downturns with potentially sizable additional economic costs.

A sharp repricing of risk assets followed the series of tariff announcements by the United States since February and accelerated following the April 2 release of plans for larger-than-expected tariffs. Financial market volatility across stock, currency, and bond markets rose markedly. The response by other countries further amplified uncertainties.

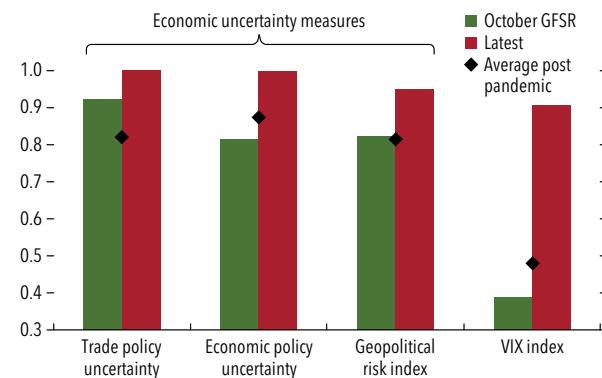
Against the heightened volatility of asset prices, this *Global Financial Stability Report* assesses that global financial stability risks have increased significantly, primarily due to the tightening of global financial conditions (Figure ES.2). According to the IMF's Growth-at-Risk model, macrofinancial downside risks to growth have increased meaningfully.

Our assessment of elevated financial stability risks is also supported by three key forward-looking vulnerabilities. First, despite the recent turmoil in markets, valuations remain high in some key segments of equity and corporate bond markets, meaning that readjustments in valuations could go further if the outlook were to deteriorate. Economic policy uncertainty remains high, and some macroeconomic indicators have surprised to the downside (see the April 2025 *World Economic Outlook*), making corrections of asset prices more likely.

Downside asset price moves could significantly impact emerging markets. Their currencies and stock prices have already depreciated due to weakening growth prospects. With investors increasingly expecting emerging market central banks to ease, the expected carry trade returns have fallen, raising the likelihood

The assessments and analyses in this GFSR are based on financial market data available to IMF staff through April 15, 2025, but may not reflect published data by that date in all cases.

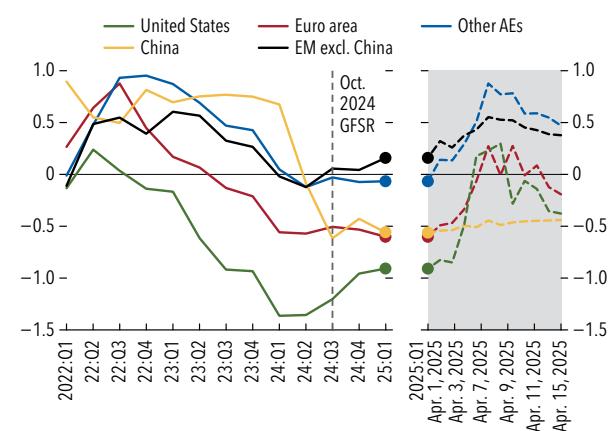
Figure ES.1. Economic Uncertainty and Financial Volatility
(Percentile)



Sources: Bloomberg Finance L.P.; Baker, Bloom, and Davis 2016; Caldara and Iacoviello 2022; and IMF staff calculations.

Note: "Economic policy uncertainty" and "trade policy uncertainty" are the indices of Baker, Bloom, and Davis (2016); "geopolitical risk" is the index of Caldara and Iacoviello (2022). The series are shown in percentiles since 1997 based on monthly data; "Average Post Pandemic" is the average percentile since 2022. Economic uncertainty measures are text based. Latest level for VIX Index is as of April 15, 2025. VIX = Chicago Board Options Exchange Volatility Index.

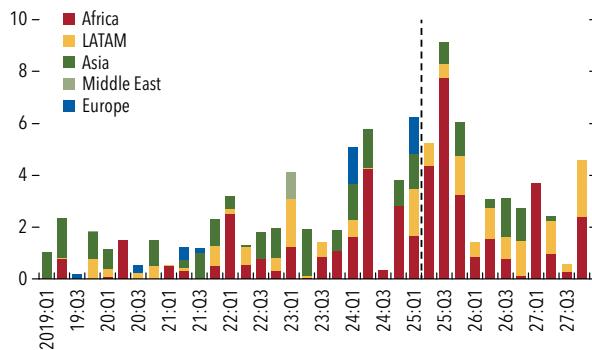
Figure ES.2. Financial Conditions Index
(Number of standard deviations over long-term averages)



Sources: Bloomberg Finance L.P.; and IMF staff calculations.

Note: The IMF FCI is designed to capture the pricing of risk. It incorporates various pricing indicators, including real house prices. Balance sheet or credit growth metrics are not included. For details, see Online Annex 1.1 in the October 2018 *Global Financial Stability Report*. The shaded area on the right side shows the daily FCIs starting April 1, 2025. These daily FCIs are approximate values estimated using the available high-frequency market data, while the long-term standard deviations and averages are calculated over 1990:Q1 and 2025:Q1. GFSR = *Global Financial Stability Report*; AEs = advanced economies; EM = emerging markets; excl. = excluding.

Figure ES.3. Upcoming International Maturing Debt of Frontier Economies
(Billions of dollars)

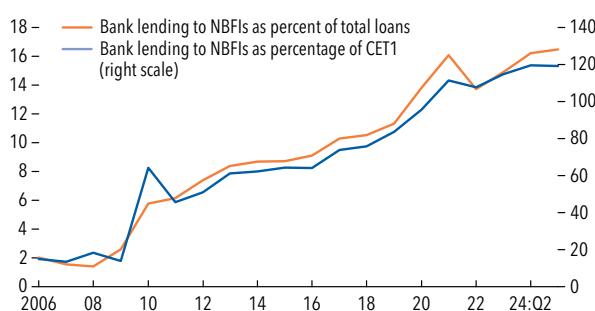


Sources: Bloomberg Finance L.P.; Bond Radar; and IMF staff estimates.

Note: Frontier economies are defined as countries with hard currency debt included in the J.P. Morgan Next Generation Emerging Market (NEXGEM) index. LATAM = Latin America.

Figure ES.4. US Bank Credit Issued to Nonbank Financial Intermediaries

(Percent of term loans and commitments, left scale; percent of shareholder's equity, right scale)



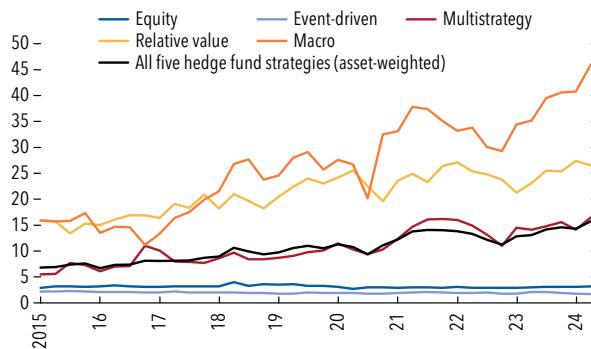
Sources: Federal Reserve, Consolidated Financial Statements for Holding Companies (Form Y-9C); and US Securities and Exchange Commission, Office of Financial Research, aggregation of data from Form PF.

Note: The figure refers to credit provided by bank holding companies. Credit includes loans and credit commitments but excludes derivatives. CET1 = Common Equity Tier 1 capital; NBFI = nonbank financial intermediary.

of capital outflows. In frontier economies, although market conditions had been improving, high levels of yields could expose countries to refinancing risks in an environment where sizable amounts of debt are coming due (Figure ES.3).

Second, some financial institutions could come under strain in volatile markets, especially highly leveraged ones. As the hedge fund and asset management sectors grew, so have their aggregate leverage levels and the nexus with the banking sector from which they borrow (Figure ES.4), raising the specter of weakly managed nonbank financial intermediaries being

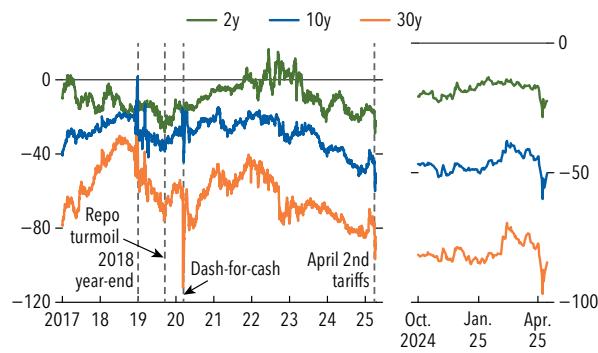
Figure ES.5. Ratio of Gross Notional Exposure to Net Asset Value



Sources: US Securities and Exchange Commission; and IMF staff calculations.

Note: The asset-weighted ratio depicted in the black line is calculated using the assets under management of hedge fund strategies in panel 1 of Figure 1.12 in Chapter 1 of this report.

Figure ES.6. Swap Rates Minus Treasury Bond Yields
(Basis points)



Sources: Bloomberg Finance L.P.; and IMF staff calculations.

Note: Swap spreads reflect the difference between swap rates and Treasury yields of the same maturity. Secured overnight financing swap rates are extended historically using adjusted legacy swap interbank offered rates with a basis adjustment applied to account for differences between secured overnight and term interbank benchmarks.

pushed to deleverage when they face margin calls and redemptions. Some hedge fund strategies have seen a steady increase of leverage recently (Figure ES.5), potentially exacerbating sell-offs, with implications for the broader financial system.

Third, further turbulence could descend upon sovereign bond markets, especially in jurisdictions where government debt levels are high. For instance, popular leveraged cash-futures basis trades in core sovereign bond markets and leveraged carry trades in swap markets could unwind and challenge market liquidity (Figure ES.6). Emerging market economies already

facing the highest real financing costs in a decade may now need to refinance their debt and fund fiscal spending at higher costs (see the April 2025 *Fiscal Monitor*). Overall, investor concerns about public debt sustainability and other fragilities in the financial sector can worsen in a mutually reinforcing fashion.

Heightened policy uncertainty may also impact corporates and households. Global corporate bond spreads have widened recently, reflecting investors' concerns over adverse impacts of an economic slowdown on corporate earnings in coming quarters. In addition, a decent share of soon-maturing corporate debt carries fixed rates below the prevailing market yield, and an increase in credit spread could challenge the refinancing of weaker firms' debt. A sharp repricing in equities and other asset prices may impact household balance sheets through wealth effects, particularly as many of them now allocate a larger portion of their financial assets to equities and investment funds than they did before the pandemic. Finally, weaker-than-expected commercial real estate values and still-high interest rates may further complicate loan refinancing efforts, particularly for properties with negative equity.

One main trigger of further sell-offs could be geopolitical risk. Chapter 2 analyzes how major geopolitical risk events, especially military conflicts, can lead to substantial declines in stock prices and increases in sovereign risk premiums, particularly in countries with limited fiscal and international reserve buffers. Geopolitical risk events can also have cross-border spillover effects because of trade or financial linkages.

Policy Recommendations

The policy toolkit for mitigating financial stability risks includes policies for market infrastructures and exchanges that ensure market functioning, the prudential supervision and regulation of financial institutions, and emergency liquidity and crisis resolution tools. Mitigating financial vulnerabilities and preparedness for crisis management are key to containing the potential adverse impact of financial sector developments on macroeconomic outcomes. History has shown time and time again that financial crises entail significant and persistent macro downside costs.

The possibilities of further correction of asset prices amid heightened uncertainty, potential strains impacting highly leveraged financial institutions, and turbulence in core sovereign bond markets elevate

financial stability risks. Authorities should prepare to deal with financial instability by ensuring that financial institutions are ready to access central bank liquidity facilities and by being prepared to intervene to address severe liquidity or market function stress, especially in core bond and funding markets. Liquidity can be provided to nonbanks with appropriate guardrails (Chapter 2 of April 2023 *Global Financial Stability Report*).

To address potential financial stability risks arising from geopolitical risks, financial institutions and their oversight bodies should allocate adequate resources for scenario analysis and stress testing to identify, quantify, and manage geopolitical risks (see Chapter 2). Emerging market and developing economies should continue efforts to deepen financial markets and maintain adequate fiscal policy space and international reserves to cushion against adverse geopolitical shocks.

Given high levels of leverage in the financial system and growing interconnectedness between nonbank financial intermediaries and banks, sufficient levels of capital and liquidity in the banking sector remain the anchor of global financial stability. Full, timely, and consistent implementation of Basel III and other international standards remains key and should be complemented by independent and intensive supervision. The deepening nexus between banks and nonbank financial intermediaries also calls for supervisors to enhance the risk assessment of such linkages.

It is crucial to strengthen policies that mitigate nonbank leverage and other vulnerabilities. Enhanced nonbank reporting requirements could help supervisors develop a systemwide and cross-sectoral perspective of risks and distinguish poorly governed and excessive risk-taking institutions from those that contribute more positively to financial intermediation.

Elevated economic uncertainty and financial market volatility underscore the need to strengthen the prudential policy frameworks, including micro- and macroprudential approaches. Countries with insufficient buffers should tighten macroprudential tools to increase resilience while avoiding a broad tightening of financial conditions. Where a downturn in activity is leading to financial stress, macroprudential buffers could be released to help banks absorb losses and support the provision of credit to the economy.

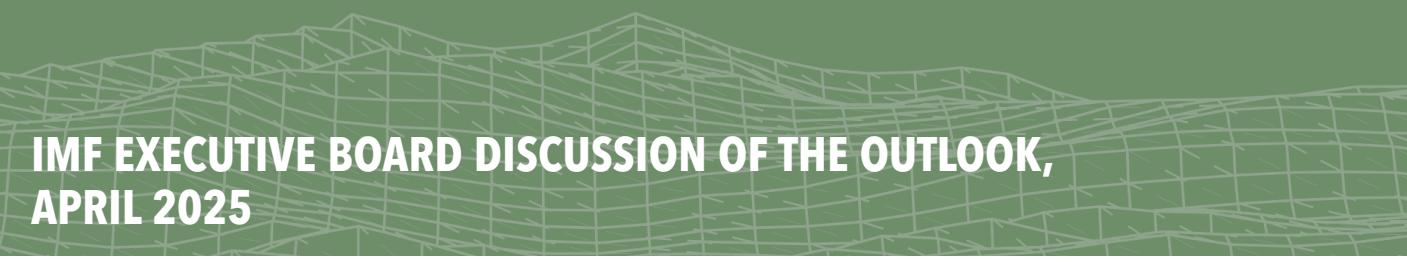
High and rising debt in most countries makes the rebuilding of credibly and growth-friendly buffers imperative. Where opportunities arise, countries should

proactively explore liability management operations to manage refinancing risks and reduce or smooth debt servicing profiles. For countries where debt is at risk of becoming unsustainable, early contact with creditors to coordinate an orderly and efficient debt treatment that restores debt sustainability could help avert costly defaults and prolonged loss of market access.

To address risks from the potential wide adoption of crypto assets, jurisdictions should safeguard monetary sovereignty and strengthen monetary policy

frameworks, guard against excessive volatility in capital flows, and adopt unambiguous tax treatment of crypto assets, following the IMF and Financial Stability Board road map for building institutional capacity.

The growing interconnectedness across jurisdictions means that stress emanating from specific jurisdictions can have a global impact, calling for other regions to be prepared. This highlights the crucial role of both multilateral surveillance and the global financial safety net for swift and effective mitigation of financial risks.



IMF EXECUTIVE BOARD DISCUSSION OF THE OUTLOOK, APRIL 2025

The following remarks were made by the Chair at the conclusion of the Executive Board's discussion of the Fiscal Monitor, Global Financial Stability Report, and World Economic Outlook on April 11, 2025.

Executive Directors broadly agreed with staff's assessment of the global economic outlook, risks, and policy priorities. They concurred that the global economy is at a critical juncture, with significant internal and external imbalances and vulnerabilities. Directors recognized that major policy shifts are underway, generating a new wave of uncertainties with potentially significant implications for the functioning of the global economy.

Directors noted that the financial market landscape is marked by increased uncertainty and market volatility, against the backdrop of stretched valuations within many segments of financial markets. Global financial conditions have tightened, with near-term financial stability risks (as gauged by IMF's Growth-at-Risk metric) rising. Directors concurred that further correction of asset prices (with geopolitical risks being a potential trigger), the ongoing increase in leverage and interconnectedness in the financial system, especially among certain non-bank financial intermediaries (NBFIs) receiving strong investment flows in recent years, alongside still-rising sovereign debt levels, constitute key vulnerabilities keeping risks to financial stability elevated.

Directors noted that risks to the outlook are firmly tilted to the downside. They acknowledged that the escalating protectionism and elevated policy uncertainty could further reduce near- and long-term growth at a time when the world economy is entrenched in a low-growth, high-debt environment. Directors stressed that divergent and rapidly shifting policy stances or deteriorating sentiment could trigger more abrupt repricing of assets and sharp adjustments in foreign exchange rates and capital flows, especially for emerging market and developing economies. On the fiscal side, escalating uncertainty and unexpectedly high interest rates may lead to a significant increase in global public debt, particularly due to rising

expenditures on defense and declining revenues linked to output uncertainty from tariffs. Furthermore, higher interest rates could limit key development spending and exacerbate financing risks in low-income developing countries, including against the background of declining official development assistance. Directors also highlighted that more limited international cooperation on common challenges could also hinder progress toward building a more resilient global economy and addressing development needs.

Directors noted that elevated uncertainty intensifies the growth-inflation trade-offs and called on central banks to carefully fine-tune monetary policy to achieve their mandates and ensure price stability. Monetary policy should remain data-dependent and clearly communicated to anchor expectations. Where near-term inflation risks are tilted to the upside or inflation expectations are rising, future cuts to the policy rate should remain contingent on evidence that inflation is heading decisively back toward target, while ensuring that financial stability is not compromised. Central banks should stand ready to act forcefully if inflation risks materialize. Directors acknowledged that although major emerging markets have proved remarkably resilient in the face of adverse shocks, abrupt sell offs in global markets against the backdrop of potential divergence in monetary policy paths, coupled with high trade policy and economic policy uncertainty, could tighten their financial conditions and raise currency volatility. Emerging markets may thus require adoption of measures to mitigate disruptive capital outflows, and Directors recognized that the IMF's Integrated Policy Framework provides a toolkit for responses in such scenarios, tailored to country-specific circumstances.

Directors emphasized that a full, timely and consistent implementation of Basel III and other internationally agreed bank regulatory standards would

ensure a level playing field across jurisdictions and guarantee ample and adequate capital and liquidity. Directors acknowledged that the growing nexus between banks and NBFIs calls for supervisors to enhance the risk assessment of such linkages. They recognized that continued buildup of debt and elevated economic uncertainty underscore the need to strengthen the macroprudential policy framework to contain excessive risk taking in the NBFI sector, alongside ensuring capital and liquidity buffers in banking systems are adequate to support the provision of credit through periods of stress. Directors emphasized the importance of macroprudential buffers and strong crisis preparedness and resolution frameworks to mitigate shocks.

Directors called for gradual and growth-friendly fiscal adjustment within a credible medium-term framework to reduce debt, rebuild fiscal buffers, and accommodate priority spending while protecting the vulnerable. In light of emerging fiscal risks and new spending pressures, economies with limited fiscal space should reprioritize public spending within their planned budgets. Economies with room for fiscal maneuver could use some of the available space, if appropriate, within well-defined medium-term fiscal frameworks. Directors noted that advanced economies should prioritize expenditure reforms, advance pension and healthcare reforms, eliminate ineffective tax incentives, and expand tax bases by removing exemptions to improve tax expenditure efficiency. For

countries facing new spending needs—for example, in defense—it is essential to demonstrate a strong commitment to upholding the integrity of the existing fiscal rules while ensuring transparency. Emerging market and developing economies should enhance revenues through tax system reforms and improved revenue administration, phase out energy subsidies, and streamline public wage bills while safeguarding public investment and upgrading social safety nets.

Directors emphasized the need for fiscal and structural reforms to enhance growth potential and the criticality of international cooperation to respond to global challenges and bolster resilience. Given significant demographic shifts, they stressed the need for comprehensive policies to increase labor force participation among women and older workers, implement pension reforms, and effectively address migration challenges. Directors recognized that renewable energy sources and innovative production paradigms could help countries reap the benefits of advancements in artificial intelligence without escalating electricity prices. They also highlighted that economic activity thrives under clear and transparent trade policies that stabilize expectations for businesses and consumers while minimizing volatility. Furthermore, continued cooperation across various policy areas—including trade, industrial policy, international taxation, climate, and development and humanitarian assistance—can help mitigate global spillovers and protect vulnerable populations.

ENHANCING RESILIENCE AMID GLOBAL TRADE UNCERTAINTY

The October 2024 *Global Financial Stability Report* highlighted that asset valuations—particularly of stocks related to technology—were stretched and that financial market volatility was low compared with the heightened levels of economic uncertainty. Leverage in the financial system was growing, especially among nonbank financial intermediaries (NBFIs). The exposure of the banking system to NBFIs was rising. These fragilities could amplify adverse shocks, abruptly tightening financial conditions.

Tariff announcements by the United States and countermeasures by other countries triggered a bout of policy uncertainty starting in February 2025. The surprise magnitude of tariffs announced on April 2 significantly shifted analyst expectations toward lower growth (see the April 2025 *World Economic Outlook*). Financial markets reacted swiftly to the evolving economic landscape—with stock markets highly volatile, core sovereign bond market yields gyrating, emerging market currencies depreciating, and corporate bond spreads widening. The spike in financial market volatility can be viewed as a catch-up to the elevated levels of economic and trade uncertainty. Volatility and uncertainty remained high in the weeks after the April 2 tariff announcement as rounds of retaliatory tariffs and countermeasures ensued between the United States and China, while the high US tariffs on other jurisdictions were postponed.

Against this backdrop, this *Global Financial Stability Report* assesses that global financial stability risks have increased significantly, driven by tighter global financial conditions and heightened economic uncertainty. According to the IMF's Growth-at-Risk (Gar) model, in the year ahead and with a 5 percent chance, global growth could fall below 0.4 percent, highlighting an elevated level of financial stability risk. This figure is nearly a full percentage point worse than the October 2024 assessment.

Our assessment of elevated financial stability risks is also supported by three key forward-looking

The assessments and analyses in this GFSR are based on financial market data available to IMF staff through April 15, 2025, but may not reflect published data by that date in all cases.

vulnerabilities. First, despite the recent turmoil in markets, valuations remain high in some key equity and corporate bond segments, conditional on the grimmer global economic outlook. At the same time, economic policy and trade uncertainty remain at an all-time high, foreboding further shocks, corrections of asset prices, and tightening of financial conditions.

Second, some financial institutions could come under strain in volatile markets, especially highly leveraged ones. As the hedge fund and asset management sectors grow, so have their aggregate leverage levels and the nexus with the banking sector from which they borrow, raising the specter of weakly managed NBFIs being pushed to deleverage when they face margin calls and other liquidity needs. The ensuing sell-off and deleveraging spiral could exacerbate market turmoil, with implications for the broader financial system.

Third, further turbulence could descend upon sovereign bond markets, especially in jurisdictions where government debt levels are high. Emerging market economies already face the highest real financing costs in a decade and may now need to issue more debt at high interest rates to fund the fiscal spending needed to ameliorate the economic impact of the new tariffs (see the April 2025 *Fiscal Monitor*). Major advanced economies will likely issue more bonds to finance enlarging fiscal deficits at a time when bond market functioning has become more challenged. Investor concerns about public debt sustainability and other fragilities in the financial sector can worsen in a mutually reinforcing fashion.

These three key vulnerabilities—further correction of asset prices, potential strains impacting highly leveraged NBFIs, and turbulence in sovereign bond markets—are elaborated upon, respectively, in the sections “The Risk of Further Asset Price Corrections,” “Financial Institutions: Increasingly Leveraged and Interconnected,” and “Emerging and Frontier Markets: Challenges and Resilience,” and “Sovereign Bond Market Functioning.” This chapter also discusses policies that can help mitigate the three key vulnerabilities and assesses stability in the corporate and household sectors.

The Risk of Further Asset Price Corrections

Tumultuous Markets: When Stretched Valuations Meet Trade Shocks

Since the October 2024 *Global Financial Stability Report*, investors have become concerned about the stretched valuations of assets they had been confident in. After the United States began to roll out tariffs in February, US equity prices declined significantly (Figure 1.1, panel 1, right bars, and Figure 1.1, panel 2), after outperforming global peers over the past five years (Figure 1.1, panel 1, left and middle bars); heightened geopolitical risks have also played a role (see Chapter 2).¹ The sell-off in equities sped up violently and became worldwide after tariffs were imposed by the United States on April 2 on almost all its trading partners, triggering fears of a stagflationary economy in the United States and recessions in other countries.² With stocks plunging, corporate bond spreads have widened, on net (Figure 1.1, panel 3); US spreads remained tighter compared with bonds of companies in continental Europe and the United Kingdom. Implied volatility in major stock markets has spiked as investors sought downside protections by purchasing put options (Figure 1.1, panel 4), and the Chicago Board of Exchange's VIX index appears to be catching up to trade and economic policy uncertainties (Figure 1.1, panel 5). Although financial markets have regained their footing after the announcement on April 9 that the United States will postpone the implementation of the higher tariffs to allow for negotiation, investors have remained anxious as China and the United States stay locked on retaliatory tariffs.

The sharp sell-off following the April 2 tariffs initially pushed down long-term yields of benchmark government bonds as investors sought safe haven assets in anticipation of a deterioration in the global economic outlook (see Figure 1.1, panel 6). This decline in long-term yields was short-lived, however, with 10-year yields rising strongly within a couple of days.

¹Before this, a more targeted sell-off in technology stocks occurred in January, triggered by the announcement of a potentially lower-cost artificial intelligence large language model from Chinese company DeepSeek, which led investors to reassess the sustainability of a tech rally driven by large prospective investments in artificial intelligence (see Box 1.1 for further discussion).

²Performance of sustainable equities have performed even more poorly, in part due to the asset class's high correlations with the broader stocks market and in part reflecting their lack of attraction to investors in recent years (see Box 1.3).

The rise in US Treasury yields was especially notable and can be attributed to investors' preference for cash and other short duration assets over long-term bonds during very volatile markets, a gyrating US dollar, and the unwinding popular leveraged trades like swap spread trades and Treasury cash-futures basis trades (see section "Asset Managers' Growing Use of Derivatives Increases Risks in the Financial System"). As the selling pressure in the Treasury market mounted, dealers reportedly reached their intermediation limits and market liquidity deteriorated, thereby exerting further upward pressure on yields (see section "Constraints on Dealer Balance Sheets Are Increasing the Fragility of Bond Markets").

By contrast, two-year bond yields (Figure 1.1, panel 6) have consistently declined since the April 2 tariffs, reflecting investors' expectations of more policy rate cuts by major central banks. For the euro area, this is due to inflation expectations having declined compared with before the tariff announcement (Figure 1.1, panel 7). The story is more complicated for the United States, as inflation expectations over the near- to medium-term have risen meaningfully in recent months, suggesting a challenging trade-off faced by the Federal Reserve in lowering inflation pressures and buttressing a slowing economy.

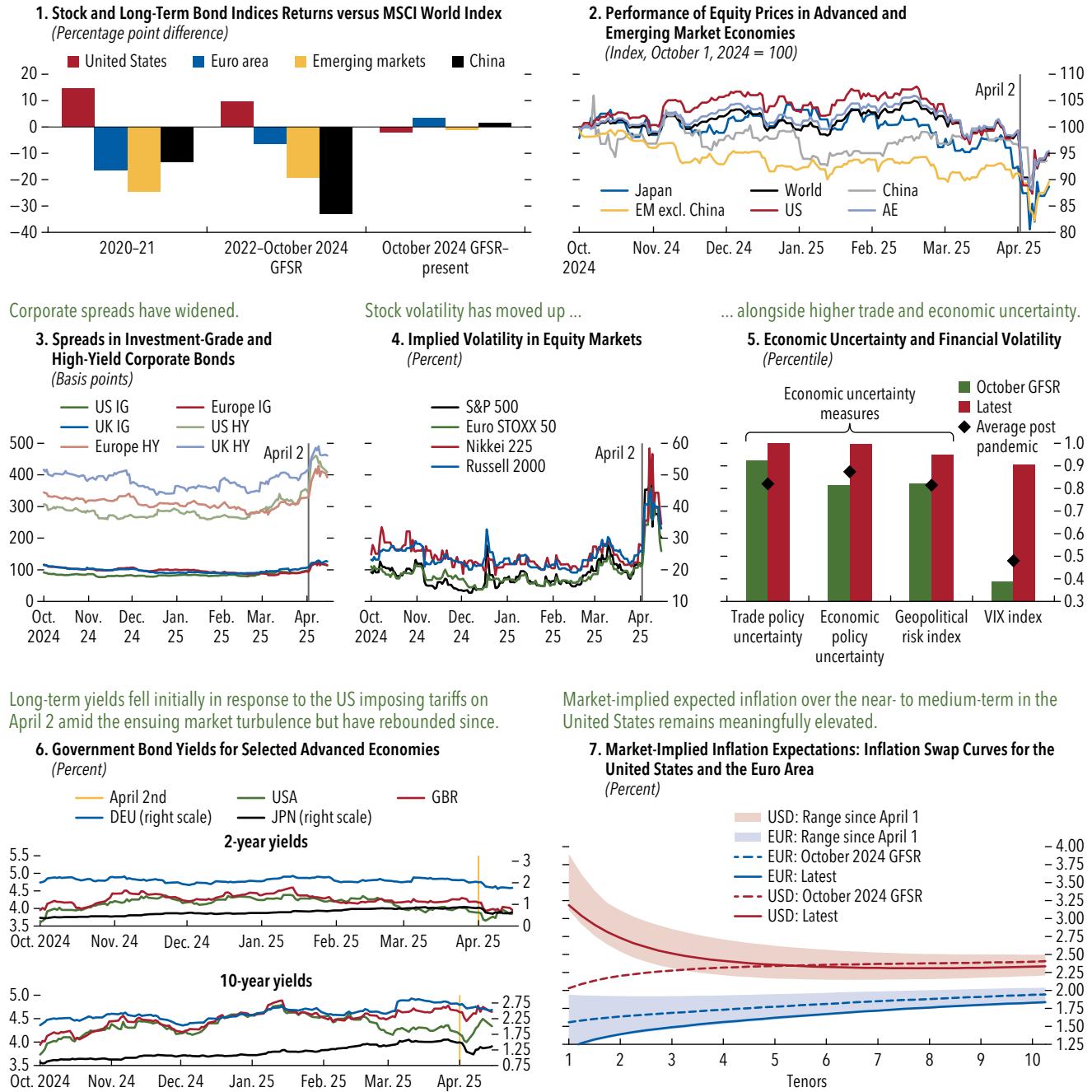
Elevated Uncertainty and Still-High Valuations Forebode Further Asset Price Corrections

Before the recent turbulence, many stock indexes have gone up in value, leaving stock price returns higher on net since the October 2024 *Global Financial Stability Report*. A decomposition of the returns shows that improved earnings projections and compressions of equity risk premiums—the additional compensation investors require to take on the risk of investing in equities rather than "risk-free" bonds—more than offset the drag from high interest rates (Figure 1.2, panel 1). Despite the recent sell-off in US stocks, that market is currently still trading at around the 80th historical percentile of 12-month-forward price-to-earnings (P/E) ratios since 1990, and price appreciation continues to outpace growth in expected 12-month-forward earnings (Figure 1.2, panel 2).

Valuations of US stocks are still lofty, and further price corrections are possible. The current valuation levels require persistently robust growth in earnings over the medium term, an increasingly difficult feat

Figure 1.1. Asset Price Movements since the October 2024 Global Financial Stability Report

Stocks in the United States have underperformed somewhat recently, after years of outperformance relative to other regions ...



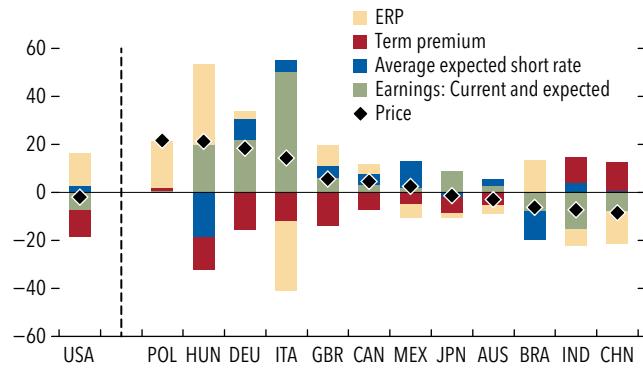
Sources: Baker, Bloom, and Davis 2016; Bloomberg Finance L.P.; Caldara and Iacoviello 2022; MSCI; and IMF staff calculations.

Notes: Panel 1 uses S&P 500 Index for the United States, Euro Stoxx 600 for the euro area, MSCI EM Index for Emerging Markets, and Shanghai Shenzhen CSI 300 Index for China. Series plotted are percentage points difference in each series and the MSCI World Index. Panel 2 uses Nikkei 225 for Japan, Shanghai Shenzhen CSI 300 Index for China, S&P 500 Index for the United States, and MSCI indices for all other series. Panel 3 uses option-adjusted spreads. In panel 4, the Chicago Board Options Exchange Volatility Index (VIX) is the benchmark measure of US stock market volatility. Its European, Japanese, and US small-cap counterparts are the Euro Stoxx 50 Volatility Index, Nikkei Stock Average Volatility Index, and CBOE Russell 2000 Volatility Index, respectively. In panel 5, "economic policy uncertainty" and "trade policy uncertainty" are the indices of Baker, Bloom, and Davis (2016); "geopolitical risk" is the index of Caldara and Iacoviello (2022). The series are shown in percentiles since 1997 based on monthly data; "Average Post Pandemic" is the average percentile since 2022. Economic uncertainty measures are text based. Latest level for VIX Index is as of April 15, 2025. Panel 6 should spot 2- and 10-year nominal yields. In panel 7, the shaded regions depict the max-min range of inflation swap curves recorded on an intraday frequency since April 1. AE = advanced economy; EM = emerging market; GFSR = Global Financial Stability Report; IG = investment grade; HY = high yield.

Figure 1.2. Asset Valuation Pressures

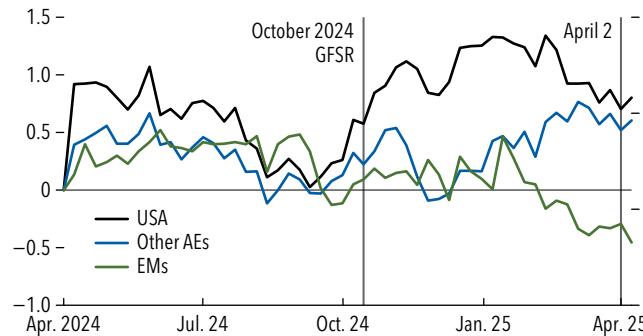
Moderation in earning prospects amid recent sell-off has exerted a downward drag on the S&P 500.

1. Decomposition of Changes in Price Returns since the October 2024 GFSR (Percent)



Notwithstanding the recent drop, implied long-term growth in US earnings has increased more than global peers over the past year.

3. Cumulative Change in Implied Long-Term Growth in Earnings since the April 2024 GFSR (Percent)



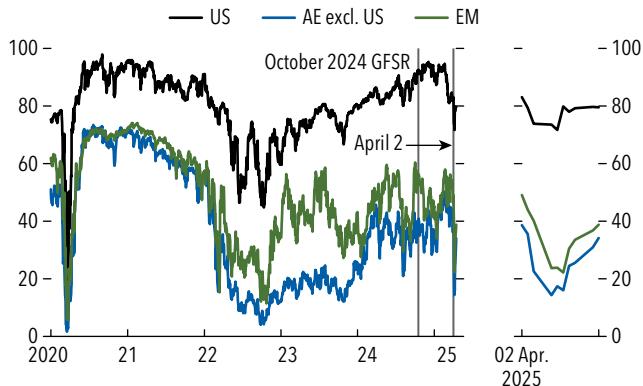
Sources: Bloomberg Finance L.P.; LSEG Datastream; MSCI; and IMF staff calculations.

Notes: The decomposition in panel 1 is calculated using a dividend discount model. Panel 2 shows the percentiles of 12-month-forward price-to-earnings ratios since 1990 or the beginnings of the data series. AE excl. US and EM calculations use MSCI Series, while US is S&P 500. Implied long-term growth in earnings in panel 3 is calculated as the growth rate equating current prices to those in a Gordon growth dividend discount model, with long-term rates equal to the 10-year zero coupon rate and the ERP risk premium set constant to the latest value for each country, as derived in panel 4. The country sample for panels 3 and 4 includes the United States, the United Kingdom, Germany, Japan, France, The Netherlands, Finland, Belgium, Italy, Spain, Portugal, Ireland, Denmark, Sweden, Norway, Switzerland, Australia, New Zealand, Canada, Brazil, Mexico, Hungary, Malaysia, South Africa, China, Indonesia, Colombia, Philippines, Poland, Israel, Chile, Czech Republic, India, Romania, Thailand, and Korea; the AE and EM series reflect the median of countries. Panels 1, 3, and 4 use weekly data and are updated as of April 9, 2025. AUS = S&P/ASX 200; BRA = MSCI Brazil Index; CAN = S&P/TSX Composite Index; CHN = CSI 300 Index; DEU = DAX; excl. = excluding; GFSR = *Global Financial Stability Report*; GBR = Financial Times Stock Exchange (FTSE) 100 Index; HUN = Budapest Stock Exchange (BUX) Index; IND = National Stock Exchange of India Nifty 50 index; ITA = CAC Index; JPN = Tokyo Stock Price Index (TOPIX); MEX = MSCI Mexico Index; POL = Warsaw Stock Exchange WIG index.

amid elevated economic and trade uncertainty. Indeed, model-implied long-term rate of growth in earnings—backed out from a standard dividend discount model for stock prices—has started to decline globally since February, after the United States began to roll out tariffs (Figure 1.2, panel 3). Implied earnings remain significantly higher for companies in the United States than those in other advanced economies or emerging markets.

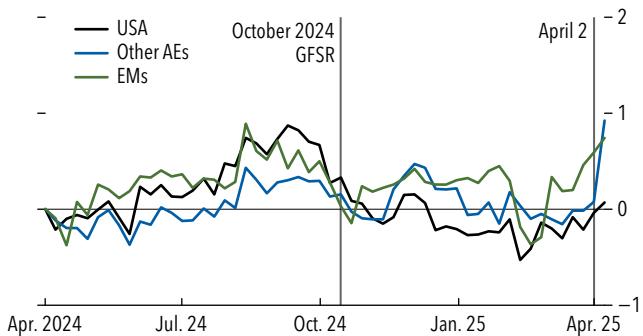
That said, US valuations remain at a premium relative to global peers.

2. Percentiles of 12-Month-Forward Price-to-Equity Ratios since 1990 (Percentile)



Equity risk premium has risen recently, albeit remaining around historically compressed levels.

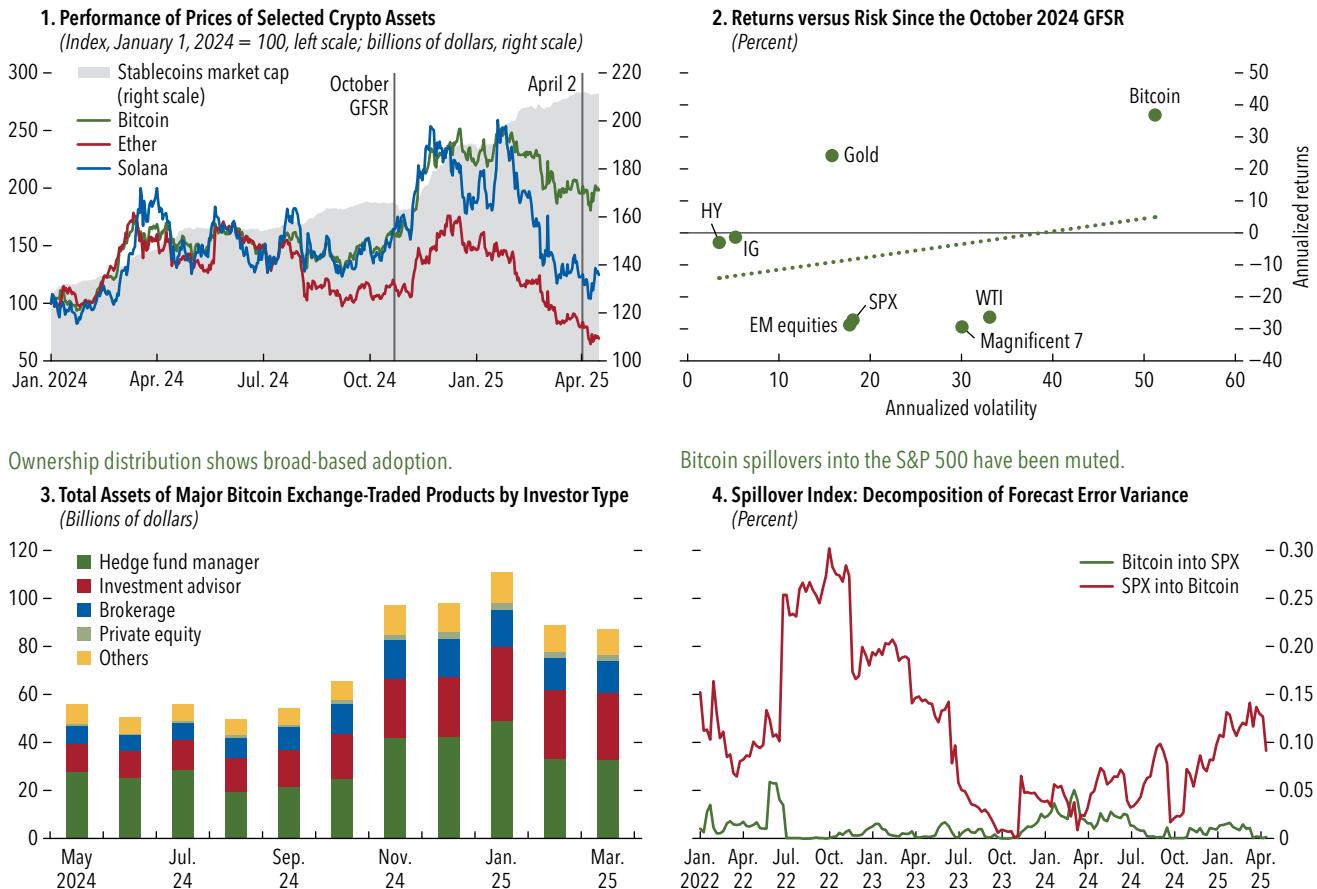
4. Cumulative Change in Equity Risk Premium since the April 2024 GFSR (Percent)



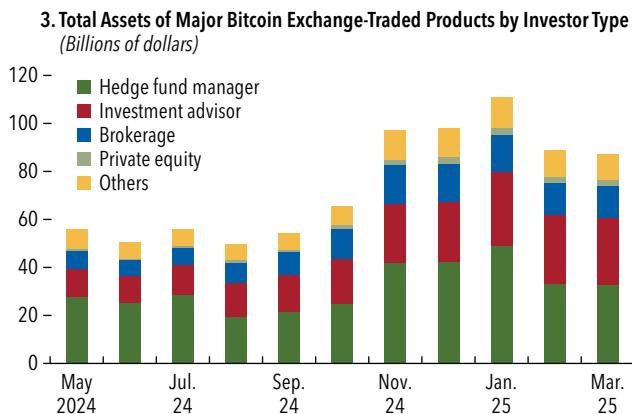
In the US stock market, the equity risk premium (ERP) has declined to historically compressed levels since the October *Global Financial Stability Report*, suggesting that investors have a very high appetite for US stocks and that stock prices have further deviated from fundamentals (Figure 1.2, panel 4). ERPs in other jurisdictions are relatively less compressed, having also displayed some notable decompression since the April 2 tariff announcements.

Figure 1.3. Strong Performance of Bitcoin Outperformance and Broad-Based Adoption Prices

Bitcoin has outperformed other major asset classes, on net since October 2024, even when considered on a risk-adjusted basis.



Ownership distribution shows broad-based adoption.



Sources: Bloomberg Finance L.P.; and IMF staff calculations.

Notes: In panel 2, a longer-term analysis since January 1, 2020, presents similar results, as Bitcoin outperformance from risk-return basis would still hold. In panel 4, the analysis is based on Diebold and Yilmaz (2012) and Iyer and Popescu (2023) and involves a forecast error variance decomposition using a lag-2 vector autoregression following Akaike information criteria for best fit, with a 52-week rolling window and a 10-week forecast horizon. EM = emerging market; GFSR = *Global Financial Stability Report*; HY = high yield; IG = investment grade; SPX = S&P 500; WTI = West Texas Intermediate Crude Oil.

Crypto Assets Show Broadening Adoption

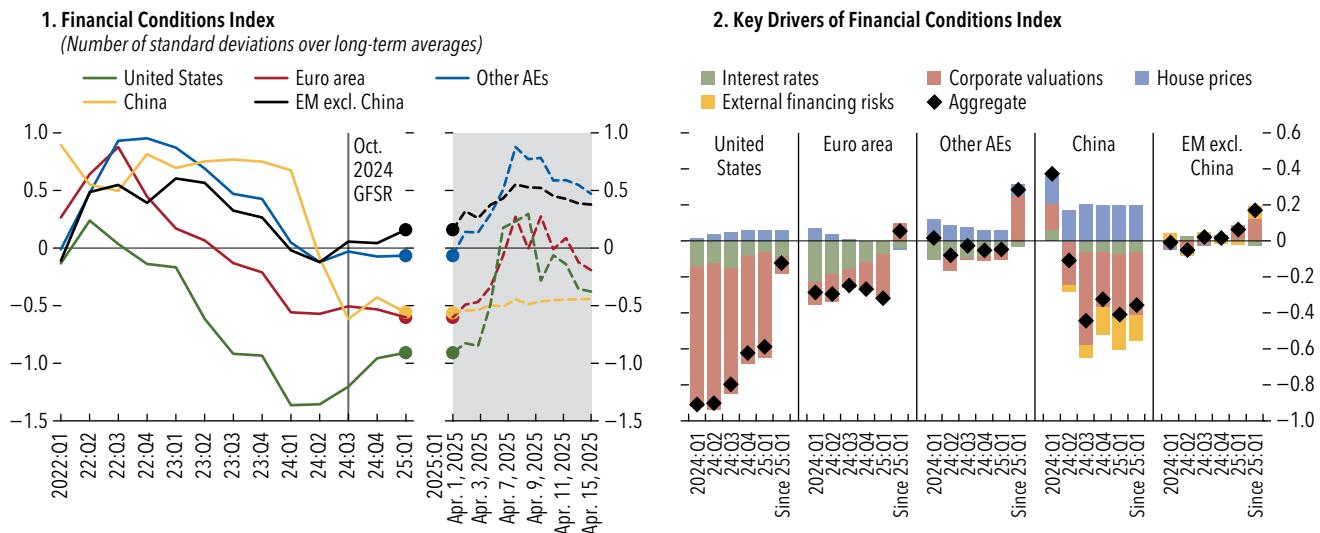
Within crypto assets, Bitcoin has experienced strong performance, on net, since the October 2024 *Global Financial Stability Report* (Figure 1.3, panel 1), and its risk-adjusted returns have significantly outperformed those for other asset classes (Figure 1.3, panel 2). Meanwhile, the market capitalization of stablecoins has surpassed \$200 billion. Another wave of inflows into Bitcoin exchange-traded products, whose assets now surpass \$80 billion, has accompanied its price gains. Optimism regarding further regulatory developments in the United States provided an additional tailwind to sentiment. Data on holdings of the five main exchange-traded products highlight

broad-based adoption among retail and institution investors, suggesting Bitcoin is likely growing more interconnected with the financial system (Figure 1.3, panel 3).

Bitcoin prices have fallen by over 25 percent from their peak at the beginning of the year, suggesting that it is quite sensitive to pressures in other asset prices. Shocks originating in the stock market appear to spill over to Bitcoin to a higher degree than the other way around (Figure 1.3, panel 4). Looking ahead, as the regulatory landscape develops, interconnectedness between Bitcoin and mainstream financial markets may increase, requiring close monitoring of emerging financial stability risks.

Figure 1.4. Financial Conditions Index

Tightening in financial conditions accelerated recently with overall conditions now tighter than historical averages for some regions ...



Sources: Bloomberg Finance L.P.; Haver Analytics; national data sources; and IMF staff calculations.

Notes: The IMF FCI is designed to capture the pricing of risk. It incorporates various pricing indicators including real house prices. Balance sheet or credit growth metrics are not included. For details, see Online Annex 1.1 in the October 2018 *Global Financial Stability Report*. In panel 1, the shaded area on the right side shows the daily FCIs starting April 1, 2025. These daily FCIs are approximate values that are estimated using the available high-frequency market data, while the long-term standard deviations and averages are calculated over 1990:Q1 and 2025:Q1. In panel 2, the key drivers of financial conditions index exhibit the contributions of underlying components which are the weighted average of the z-scores of these components. The series "aggregate" represents the sum of these contributions and is similar but not identical for FCI values shown in panel 1. The series "Since 25:Q1" show the simple average of aggregated z-scores and their drivers during April 1 to 15, 2025. AE = advanced economy; EM = emerging market; excl. = excluding; GFSR = *Global Financial Stability Report*.

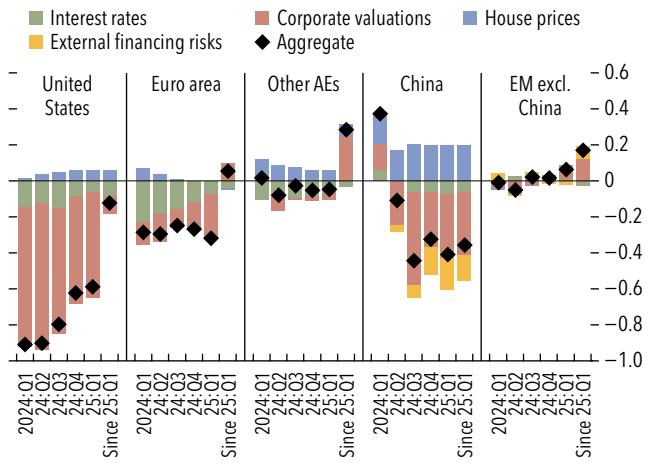
Financial Stability Risks Have Increased Significantly

The tightening seen in global financial conditions since the October 2024 *Global Financial Stability Report* has accelerated notably in recent weeks amid turbulence in financial markets across regions following the April 2 tariffs (Figure 1.4, panel 1). Most advanced economy jurisdictions that were operating on lofty equity valuations and historically tight corporate credit spreads saw sharp sell-offs and spikes in volatility, abruptly tightening financial conditions (Figure 1.4, panel 2). In comparison, the tightening in financial conditions in emerging markets excluding China appears relatively contained, as relatively stable currencies ameliorated the impact of lower equity prices.

With global financial conditions having tightened, the IMF's updated GaR forecasts that downside risks expected over the near-term have risen significantly—one-year-ahead global growth is forecast to fall below 0.4 percent with a 5 percent chance (blue dot in Figure 1.5, panel 1); this Growth-at-Risk metric has deteriorated from around 1.2 percent as of the October 2024 *Global Financial Stability Report* (red dot), and is now around the

... driven largely by heightened volatility amid steep decline in corporate valuations.

2. Key Drivers of Financial Conditions Index



30th historical percentile, suggesting risks are considerably elevated compared with historical standards (Figure 1.5, panel 2). In addition to tighter financial conditions, a slowdown of credit growth has also contributed to this deterioration. The balance of risks to global growth over 2025 continues to be skewed to the downside (see also the April 2025 *World Economic Outlook*). This top-down GaR assessment is supported by three key vulnerabilities: further correction of asset prices, potential strains impacting highly leveraged NBFIs (see section “Financial Institutions: Increasingly Leveraged and Interconnected”), and turbulence in sovereign bond markets (see sections “Emerging and Frontier Markets: Challenges and Resilience” and “Sovereign Bond Market Functioning”).

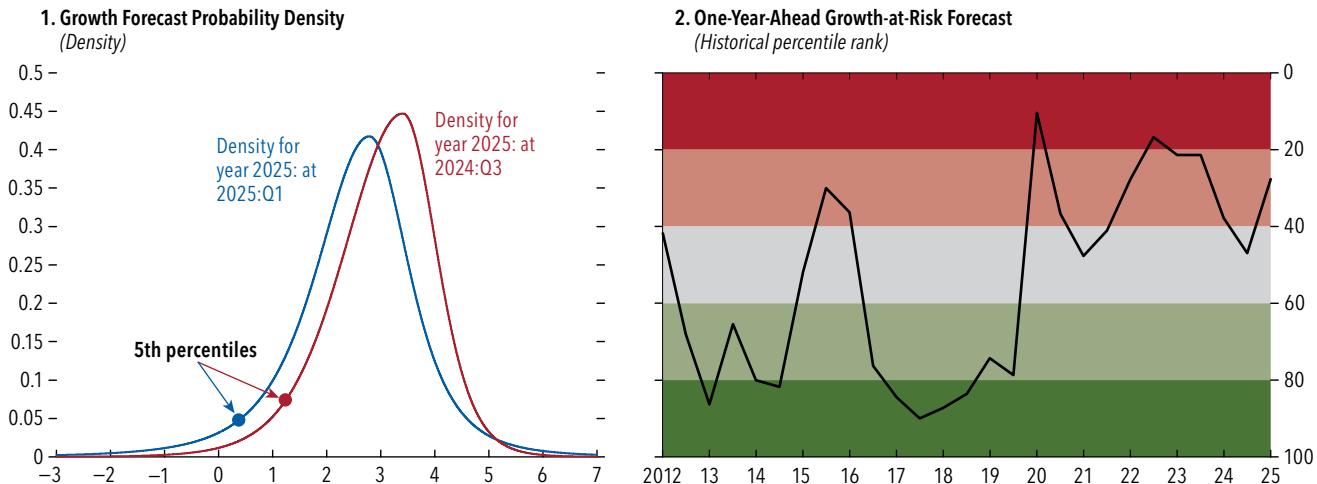
Financial Institutions: Increasingly Leveraged and Interconnected

Trade Shock Creates Headwinds to the Global Banking Sector

While accommodative financial market conditions boosted banks' profits and valuations last year, the sharp decline in bank stock prices observed after the

Figure 1.5. Global Growth-at-Risk

Downside risks to global growth expected over the near-term horizon have risen significantly.



Sources: Bank for International Settlements; Bloomberg Finance L.P.; Haver Analytics; IMF, International Financial Statistics database; and IMF staff calculations.

Notes: In panel 1, the mode (that is, the most likely outcome) of the estimate for current forecast density accords with the IMF *World Economic Outlook* forecast, as of the first quarter of 2025, for global growth in year 2025. In panel 2, the black line traces the evolution of the 5th percentile threshold (the Growth-at-Risk metric) of the near-term forecast densities, where lower percentiles represent higher downside risk. The intensity of the shading depicts the percentile rank for the Growth-at-Risk metric; the quintiles with the lowest and highest percentile ranks are shaded the brightest red and brightest green, respectively. See Adrian, Boyarchenko and Giannone 2019; and Adrian and others 2022.

April 2 tariff announcement highlights the risks faced by the sector (Figure 1.6, panel 1). In 2024, widening net interest margins and, for larger banks, strong results from asset management, advisory, and trading services expanded revenues. At the same time, lackluster but stable global growth did not materially increase the cost of credit, as asset quality improved. As a result, banks' profitability has rebounded sharply, particularly that of European banks, and valuations improved, driven by expectations of regulatory easing (Figure 1.6, panel 2).

The sustainability of this improved outlook is now in balance because several cyclical factors supporting profitability could be reversed by the trade shock.

First, the reduction of loan loss provisions has been a substantial driver of return on assets across all regions (Figure 1.6, panel 3). The new macrofinancial scenario could reverse this trend, as banks are exposed to economic sectors impacted by tariffs, and falling growth along with rising uncertainty is negative for borrower default rates and bank credit costs.

Second, recent widening of net interest margins, driven by rising interest rates, has contributed disproportionately to profitability gains, particularly in Europe (Figure 1.6, panel 3). The downward revision in the trajectory of the policy rate observed after the

tariff announcement will weigh on bank net interest margins, reducing their revenues. In addition, uncertainty is expected to slow down capital markets and advisory activities, reducing noninterest income.

Third, tariffs might disrupt banks' trade finance, a business that supports over \$10 trillion in annual transactions and generates \$18 billion of bank revenues globally. Trade finance depends on stable cash flows, supply chains, and regulatory frameworks, all of which might be disrupted by abrupt tariff changes. As borrower cash flows become less predictable and larger trade credit facilities are sought, banks tighten lending criteria due to rising credit risks. Tightening credit availability intensifies borrowers' default pressures, leading to a negative spiral of shrinking financing and trade volumes. Tariffs can also reconfigure supply chains and require new compliance processes, raising banks' costs and reducing their underwriting appetite.

Finally, internationally active non-US banks are vulnerable to increased US dollar funding pressures that might arise from elevated volatility and geopolitical events. These risks contribute to keeping a relatively large number of banks on the IMF's monitoring list of weaker banks (Figure 1.6, panel 4; see also Chapter 2 of the October 2023 *Global Financial Stability Report*).

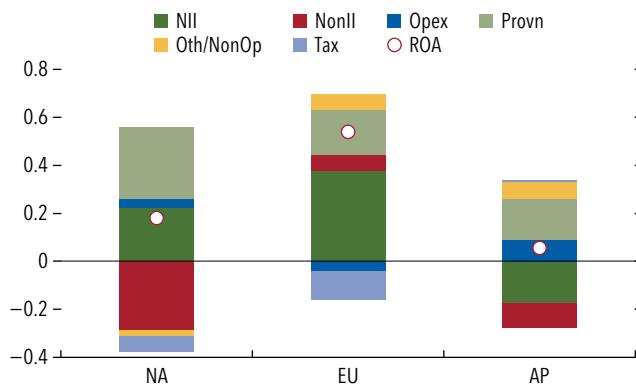
Figure 1.6. Challenges to Global Banks' Outlook

Sharp decline in banks valuation after April 2 tariffs announcement highlights challenges ahead.

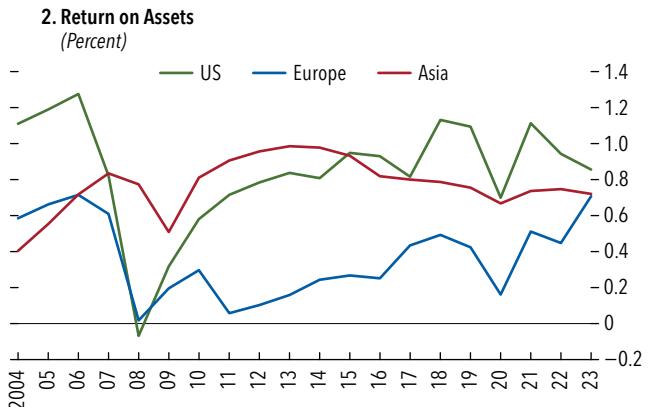


However, improved profitability has been strongly driven by cyclical factors that might be reversed by trade tension.

**3. Sources of Change in Return on Assets between 2020 and 2023
(Percentage points)**

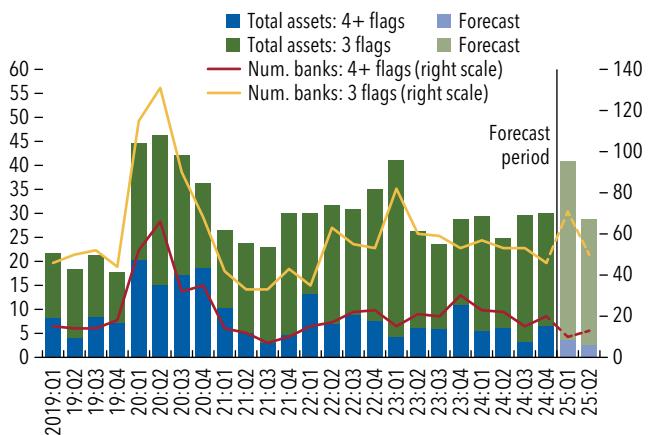


Banks' profitability has improved recently, particularly in Europe.



The headwinds created by the tariff announcement keep the IMF's monitoring list of weak banks relatively large.

**4. Banks Signaling Weaknesses in Most Risk Dimensions
(Trillions of dollars, left scale; number of banks, right scale)**



Sources: Bloomberg Finance L.P.; IMF, International Financial Statistics database; Organisation for Economic and Development, Bank Profitability; S&P Capital IQ Pro; and Visible Alpha.

Note: Panels 1 and 3 show weighted averages in each period for a sample of 829 banks across all regions. AP = Asia and Pacific; EU = Europe; NA = North America; NII = net interest income; Nonll = net noninterest income; Num. = number of; Opex = operating expense; Oth/NonOp = other items, including nonoperating; Provn = provisions for credit losses; ROA = return on assets.

Risk Weights Derived from Internal Models May Overstate Banks' Capital Buffers

Banks' capital adequacy ratios could be overstated if the methods used to compute their denominator, risk-weight assets (RWA), underestimate the true level of risk and make banks seem safer than they actually are. Banks' average risk weight, also known as RWA density, is supposed to reflect the level of risks associated with banks' exposures and activities. However, data from internationally active banks show wide variation

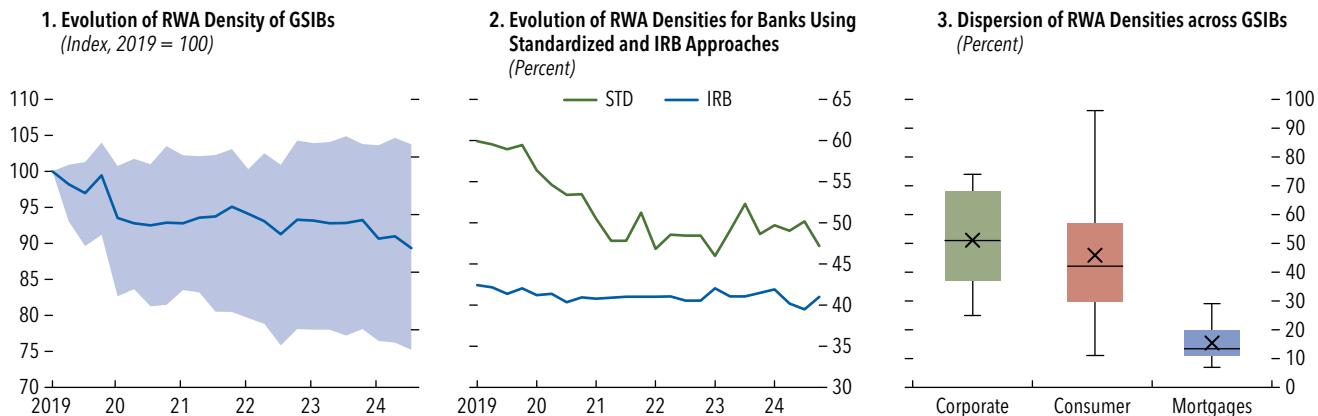
in RWA densities across banks, even among those that feature broadly comparable business models and overall risk profiles. This raises the question of whether such large variations result from the extensive use of internal models for RWA calculation and whether some models underestimate risks. The Basel Committee on Banking Supervision found that capital requirements based on risk parameters estimated by banks for exactly the same set of exposures could differ by more than 20 percent (BCBS 2013, 2016).

Figure 1.7. Risk-Weighted Asset Densities Continue to Decline and Vary Substantially across Banks

The density of risk-weighted assets in global systemically important banks has declined 12 percent over the past five years.

Standardized and internal models produce divergent densities for risk-weighted assets.

Densities of risk-weighted assets for specific portfolios vary substantially.



Sources: Bank for International Settlements, banks' Pillar 3 disclosures; Bloomberg Finance L.P.; and IMF staff analysis.

Note: Panel 1 includes all GSIBs. The shaded area indicates the part of the sample between the 10th and 90th percentiles, and the black line indicates the total weighted average. In panel 2, the sample include 81 banks around the globe for which there are detailed data related to RWA. GSIBs = global systemically important banks; RWA = risk-weighted assets; IRB = internal ratings based; STD = standardized.

In recent years, in addition to the widening variation of RWA densities across banks, that of the average global systemically important bank (GSIB) has fallen by 12 percent (Figure 1.7, panel 1). Changes in banks' portfolios can explain part of this decline. For instance, banks have increased operations like synthetic risk transfers, in which banks buy credit protection and reduce their capital requirements (see the October 2024 *Global Financial Stability Report*). In addition, during the COVID pandemic, supporting measures on the part of governments (that is, public guarantees) reduced the risk of credit exposures. As a result, RWA densities, even for banks using standardized approaches, wherein regulations provide the risk weights, declined (Figure 1.7, panel 2). As these supporting measures were unwound, this downward trend reversed for banks using the standardized approach. By contrast, densities of RWAs have continued to decline in recent times among banks using internal models. Furthermore, average RWA densities estimated using internal models show substantial variation even within asset types (Figure 1.7, panel 3), adding to the literature suggesting that risk cannot entirely explain the variability in the density of risk-weighted assets (Böhnke and others 2023). The Basel Committee developed a comprehensive set of policies to address unwarranted variability of risk weights, including an output floor, but these measures have not been implemented in several jurisdictions.

Growing Linkages between Banks and NBFIs Increase the Risk of Contagion

Over the last decade, NBFIs have grown faster than banks. In particular, investment funds—including mutual funds, hedge funds, and private equity and credit funds—have gradually gained a share of the global financial system assets from banks, insurers, and pension funds (Figure 1.8, panel 1), because investors have been attracted by the realized returns provided by these financial vehicles.

This increased role of NBFIs in financial intermediation proceeds in tandem with growing linkages between banks and nonbanks. In the United States, for instance, banks have shifted balance sheet focus toward the provision of loans, commitments, and other exposures to NBFIs (Acharya, Cetorelli and Tuckman 2024a, 2024b; Cetorelli and Prazad 2024). US banks' loans and commitments to NBFIs increased from about 6 percent of total loans and commitments in 2010 to about 16 percent, equivalent to almost 120 percent of bank regulatory capital, as of the third quarter of 2024 (Figure 1.8, panel 2). Some types of NBFIs are highly reliant on bank funding. Hedge funds, for instance, rely on banks, particularly GSIBs, for more than 50 percent of their total funding and have rapidly increased the total dollar amount of their borrowing from banks (Figure 1.8, panel 3).

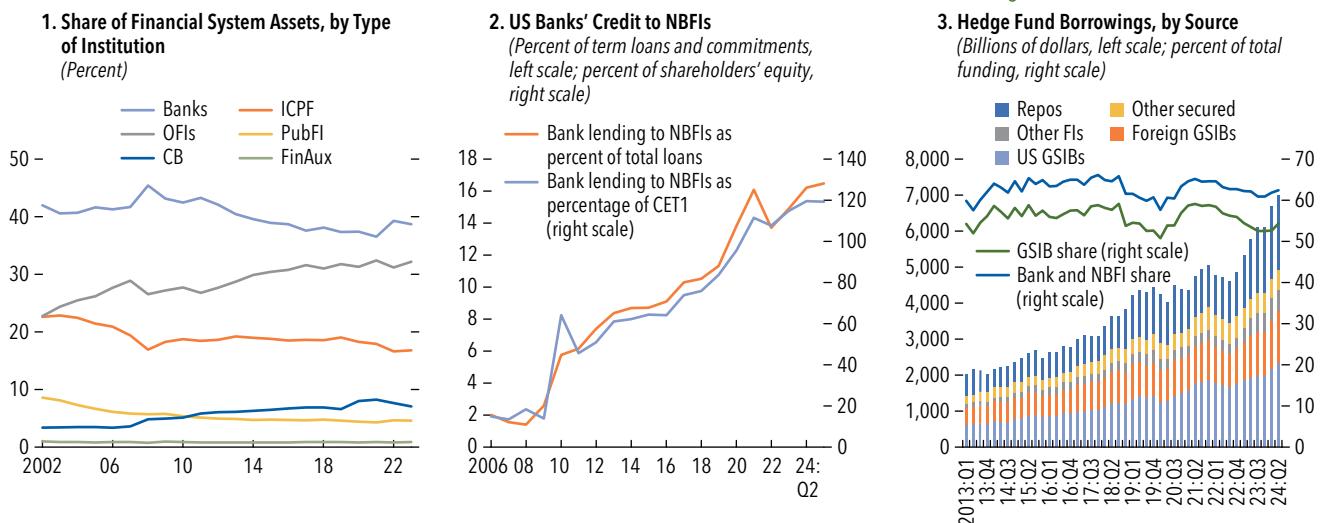
More diverse credit sources might benefit financial stability, but excessive growth among NBFIs predicated

Figure 1.8. Financial Stability's Increasing Dependence on Resilience of Nonbank Financial Intermediaries

Investment funds are growing faster than banks, insurers, and pension funds.

Bank interlinkages with nonbank financial intermediaries are growing strongly ...

... and some of these intermediaries, such as hedge funds, have become quite dependent on bank funding.



Sources: CEIC; Federal Reserve, Consolidated Financial Statements for Holding Companies (Form Y-9C); Financial Stability Board; S&P Capital IQ Pro; and US Securities and Exchange Commission, Office of Financial Research, aggregation of data from Form PF.

Note: Panel 1 shows the simple average across 29 countries reporting exposures to the Financial Stability Board. Panel 2 refers to credits provided by bank holding companies. Credit includes loans and credit commitments but excludes derivatives. The right axis in panel 3 refers to the proportion of hedge funds' borrowings from GSIBs and from GSIBs plus other financial institutions (OFIs). "OFIs" includes both banks other than GSIBs and nonbank financial intermediaries (NBFIs). "Other secured" includes debt instruments, other than loans, from sources other than financial institutions. Data labels in the figure use International Organization for Standardization (ISO) country codes. CB = central bank; CET1 = common equity tier 1 capital; FIs = financial institutions; FinAux = financial auxiliaries; GSIB = global systemically important bank; ICPF = insurance companies and pension funds; OFIs = other financial institutions, including money market funds, hedge funds, captive financial institutions and money lenders, central counterparties, broker-dealers, finance companies, trust companies, and structured finance vehicles; PubFI = public sector financial institutions; Repos = repurchase agreements.

on borrowing from banks could make the financial system more vulnerable to high levels of leverage and interconnectedness. While contagion due to the tariff turmoil seems limited so far, it highlights some of the potential risks. As equity and oil prices plunged after the April 2 announcement, banks reportedly asked their hedge fund clients to post additional margin. This action can mitigate banks' exposures but may also force the unwinding of positions that in some conditions could become disorderly (see section "Hedge Funds' Elevated Use of Leverage May Exacerbate Losses during Turmoil"). In addition, since there is a positive correlation between collateral prices and counterparty risk, margin calls can fail, exposing banks to credit losses.

Interconnected Private Credit Funds Can Spread Credit Shocks across Institutions and Countries

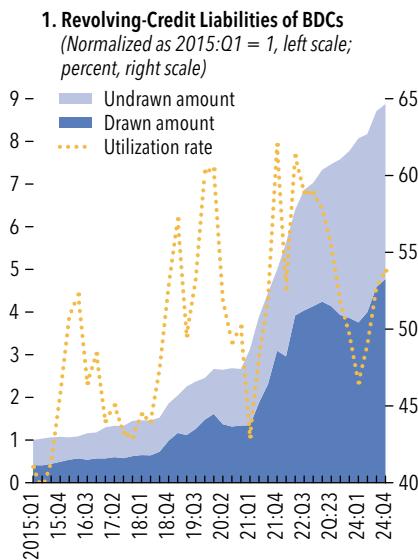
Companies are increasingly obtaining financing from private credit funds alongside their reliance on traditional intermediaries like banks. Economic

downturns that put pressure on private credit borrower firms' credit quality could lead to losses in the banking sector (see section "Corporate and Household: Vulnerabilities Assessment" for an assessment of credit quality). Private credit funds rely on various types of financing to generate leveraged returns and to manage their liquidity needs, including subscription credit facilities and asset-based lending provided by international bank syndications and collateralized with middle-market loans; large, foreign banks play a crucial role in financing the US private credit ecosystem. The identified portion of bank exposures to private credit vehicles globally exceeds \$500 billion (Moody's Investors Service 2024a), and total bank exposure likely exceeds 25 percent of total assets under management in private credit funds.

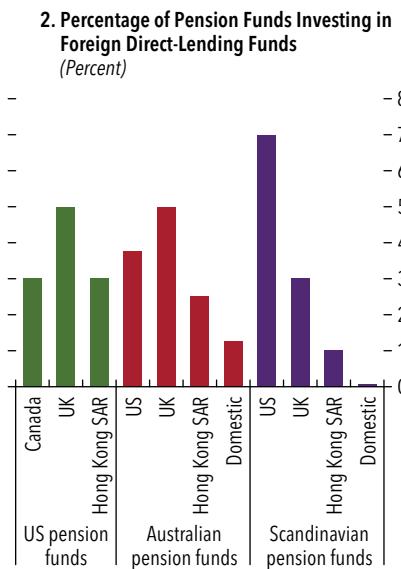
Private credit funds' reliance on bank credit arises, in particular, from the complex asset-liabilities framework required to manage unexpected outflows. Besides term loans, most direct lenders offer revolving facilities to borrowers, which increases the volatility of these

Figure 1.9. Liquidity Management in Select Business Development Companies and Cross-Border Flows in Direct Lending

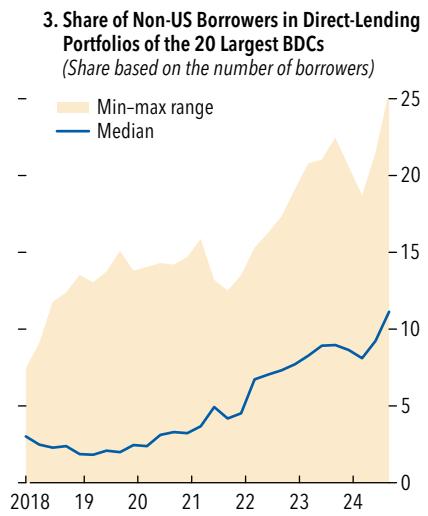
Revolving debt is growing and has volatile utilization rates.



Pension funds are increasing investments in foreign direct-lending funds.



Direct lending funds increasingly extend credit to foreign borrowers.



Sources: Bloomberg Finance L.P.; PitchBook, Leveraged Commentary & Data (LCD); US Securities and Exchange Commission, 10Q/10K disclosures of BDCs; and IMF staff calculations.

Note: In panel 1, revolving credit represents all senior secured revolving credit facilities across BDCs and their subsidiary bankruptcy-remote special-purpose vehicles. The numbers are normalized by the amount of outstanding debt as of the first quarter 2015. In panel 2, each bar represents the percentage of pension funds that had at least some allocation to direct-lending funds domiciled in the jurisdiction on the horizontal axis. In panel 3, the share is calculated based on the number of borrowers, not the amount of loans extended. BDC = business development company; Q = quarter.

lenders' cash flows. To manage this volatility, direct lenders often depend on revolving credit lines from banks. Evidence from business development companies shows revolving debt facilities to these entities (Figure 1.9, panel 1) have been increasing along with the rapid growth of the industry (S&P Global Ratings 2024a; Moody's Investors Service 2025).

In addition to private credit funds' connection with banks, the cross-border nexus has also increased. Available data, though limited, suggest that many investors in direct lending, like pension funds, are investing more frequently in foreign direct-lending funds. Diversification benefits and, in many cases, the small size of domestic direct-lending ecosystems seem to be motivating the trend toward internationalization of investments (Figure 1.9, panel 2). At the same time, many direct-lending funds increasingly extend credit to foreign borrowers, following the intensified cross-border expansion of UK and US private equity sponsors and direct lending platforms (Figure 1.9, panel 3). Although the internationalization of direct-lending ecosystems aids in the development

of credit provision in many countries, the reliance of domestic ecosystems of smaller countries on investments from larger jurisdictions may lead to an abrupt halt of financing during prolonged risk-off episodes. As the cross-border nexus continues to grow, the risk that credit shocks will propagate from one jurisdiction to others intensifies, further highlighting the need for supervisors from different countries to coordinate.

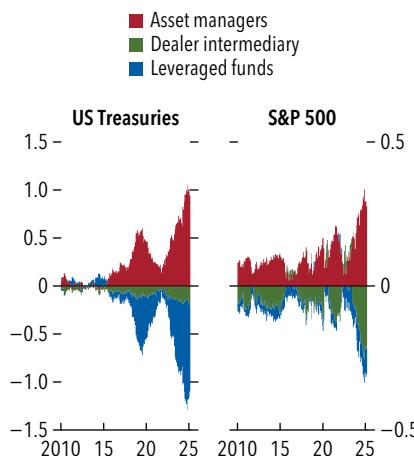
Nonbank Intermediaries: High Leverage Exacerbates Losses and Imperils Market Functioning

The market turmoil that followed the April 2 tariff announcement exposed the vulnerabilities posed by elevated use of leverage by some NBFIs (see sections "Asset Managers' Growing Use of Derivatives Increases Risks in the Financial System" and "Hedge Funds' Elevated Use of Leverage May Exacerbate Losses during Turmoil"). Following the sharp decline in global equities, Treasury yields increased substantially and funding conditions came under pressure

Figure 1.10. Asset Managers' Increasing Long Futures Positions in Recent Years

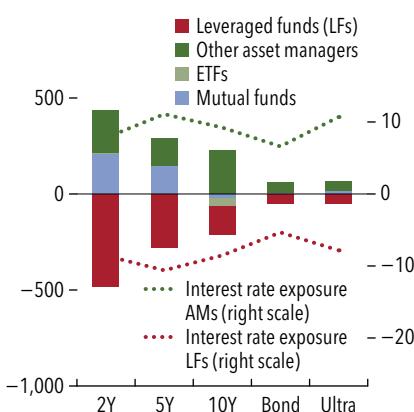
Asset managers' net long Treasury and S&P 500 futures positions have increased, with leveraged funds or dealers taking the opposite side.

1. Net Treasury and Equity Futures Positions (Trillions of dollars)



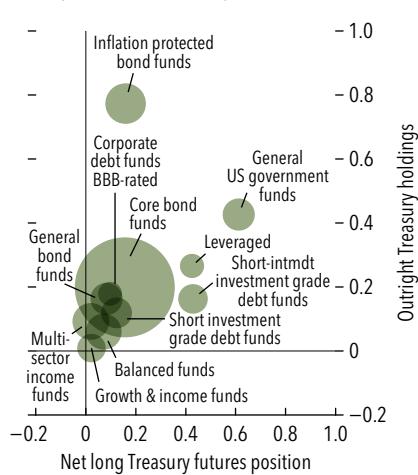
Mutual funds account for about half the net long positions in two- and five-year Treasury futures.

2. Net Treasury Futures Positions of Asset Managers and Leveraged Funds (Billions of dollars, left scale; billions of dollars per basis point, right scale)



Different types of mutual funds have a different mix of outright and futures exposures to Treasuries.

3. Mutual Funds' Mix of Outright and Futures Positions in Treasuries (Percent of total assets)



Sources: Bloomberg Finance L.P.; US Securities and Exchange Commission, Form N-PORT filings; and IMF staff calculations.

Notes: In panel 2, "interest rate exposure" reflects the value of a basis point in a particular futures contract in billions of dollars, based on the duration of the contract, which, in turn, depends on the duration of the cheapest-to-deliver issues. "Other asset managers" includes pension funds, insurance corporations, and foreign asset managers. AM = asset manager; ETF = exchange-traded fund; LF = leveraged fund; Y = year.

(see section "Constraints on Dealer Balance Sheets Are Increasing the Fragility of Bond Markets"). These sections document that, among several other drivers, Treasury selling by leveraged NBFIs in response to margin calls may have played a role in amplifying the moves. The nature of the risk is similar to the March 2020 dash-for-cash episode, when generalized forced selling of Treasuries caused a spike in Treasury yields and an unraveling of leveraged positions (Banegas, Monin, and Petrasek 2021).

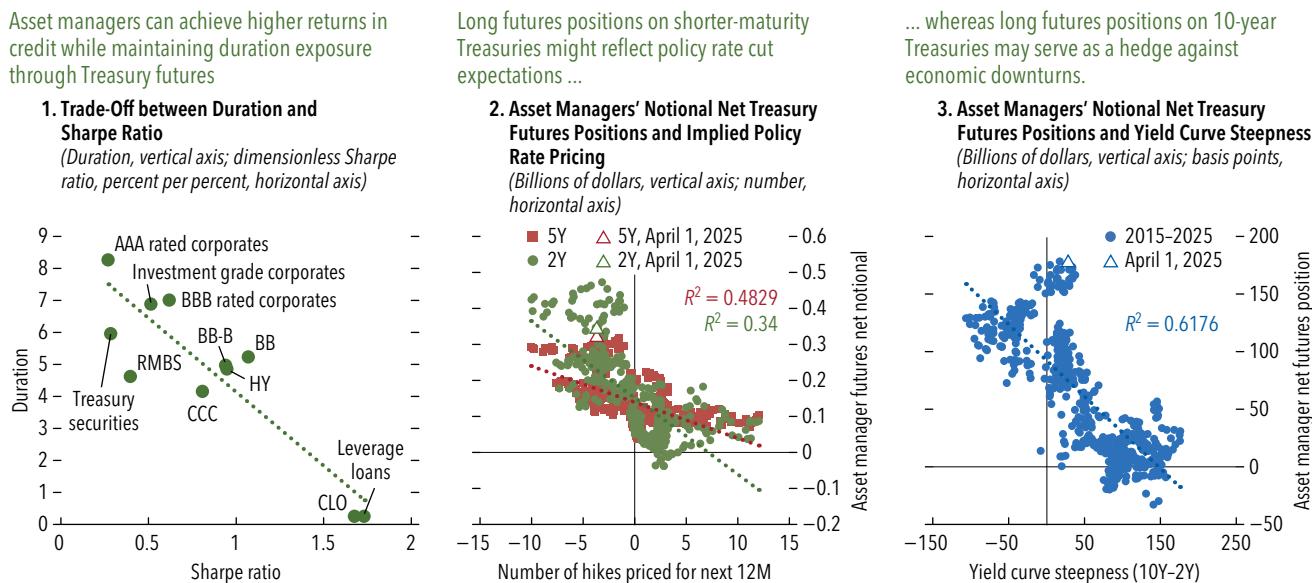
Asset Managers' Growing Use of Derivatives Increases Risks in the Financial System

Asset managers represent a notable example of NBFIs that have significantly expanded their use of leveraged positions in recent years by employing long futures positions in Treasuries and US equities (Figure 1.10, panel 1). Futures contracts provide synthetic leverage, which can enhance asset managers' returns. However, the use of leverage can also amplify adverse shocks and increase liquidity risk from margin calls on futures contracts. If not managed carefully, the use of leverage can force a

rapid unwinding of positions with a substantial market impact. With the large cumulative losses on the S&P 500 since February, some asset managers may have seen significant losses in their long equities positions.

Asset managers have various options for taking leveraged positions, but they seem to prefer futures contracts for operational reasons. The futures market is deep and liquid, and compared with alternatives such as repos, futures have a favorable reporting treatment (Iorio, Li, and Petrasek 2024). Data from the US Securities and Exchange Commission show that US mutual funds account for about half of the net long positions in two- and five-year Treasury futures contracts (Figure 1.10, panel 2).

Some asset managers use futures contracts rather than outright holdings in Treasury bonds to extend the duration of portfolios that tilt more heavily toward corporate credit (Figure 1.10, panel 3). This may enable them to obtain better risk-adjusted returns by rotating their portfolios away from lower-yielding Treasuries toward higher-yielding corporate credit (see Barth and others. 2024 and Figure 1.11, panel 1). Asset managers may also

Figure 1.11. Reasons for Asset Managers' Demand for Long Futures Positions

Sources: Bloomberg Finance L.P.; LSEG Datastream; S&P Capital IQ Pro; and IMF staff calculations.

Note: In panel 2, the implied number of (25-basis-point) rate hikes over the subsequent 12 months are based on the spread between the one-year-one-month-forward overnight indexed swap (OIS) rate and the federal funds effective rate. CLO = collateralized loan obligation; RMBS = residential mortgage-backed securities; Y = year.

use futures contracts to express directional views. In particular, they seem to take larger net long positions in two- and five-year Treasury futures when more central bank rate cuts are priced in (Figure 1.11, panel 2). Positions in 10-year contracts appear correlated with the steepness of the curve in the 2- to 10-year segment (Figure 1.11, panel 3), which is sometimes taken to be indicative of the economy's business cycle phase.

Asset managers' demand for long Treasury futures positions can raise vulnerabilities elsewhere in the financial system. Their demand for long futures positions creates arbitrage opportunities that attract leveraged investors, including hedge funds, who assume a large part of the correspondent short futures positions (Figure 1.10, panel 1), combined with repo-financed holdings of Treasury bonds in so-called leveraged basis trades (see the April 2024 *Global Financial Stability Report*). A sudden increase in Treasury market volatility could lead to higher margin requirements, while a rise in the repo rate could make the trade unprofitable. Both developments (or either) can potentially trigger a disorderly unwind of the trade. This unwinding reportedly happened to an extent in the period after the April 2 tariff announcement. However, the persistence and magnitude of this dynamic remain uncertain at the cut-off date of this report.

Hedge Funds' Elevated Use of Leverage May Exacerbate Losses during Turmoil

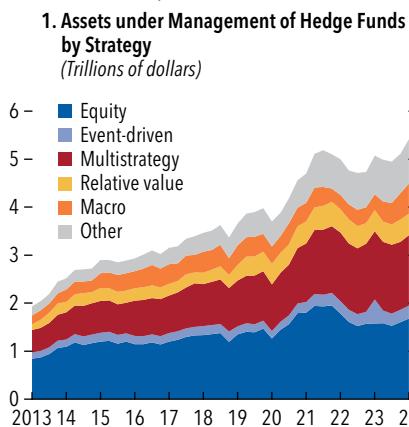
Assets under management of leveraged hedge funds have doubled over the past decade (Figure 1.12, panel 1) as investors were attracted by their realized returns. Although not all hedge funds employ high levels of leverage. The aggregate gross notional exposure of hedge funds keeps increasing across a number of major strategies, with the average ratio of gross notional exposure to assets having more than doubled over the past decade (see the black line in Figure 1.12, panel 2). This financial leverage is particularly large in macro and relative-value fixed-income strategies, in aggregate 40 and 25 times their asset values, respectively. The leverage of multistategy hedge funds, one of the fastest-growing and largest strategies, has also increased significantly, with gross notional exposures more than 15 times their asset values.³ Certain funds in all three strategies may have significant exposures in interest rate markets.

Hedge funds typically gain financial leverage through their use of derivatives and repurchase agreements.

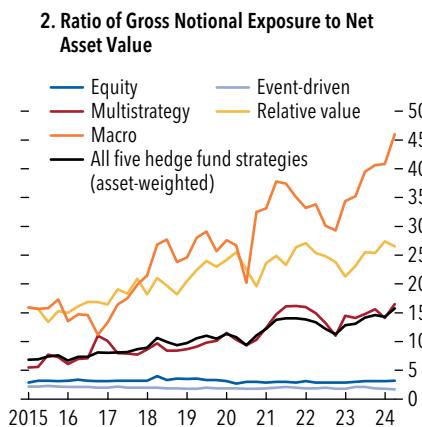
³Multistategy hedge funds employing a multimanager setup—in which individual portfolio managers trade independently from one another—can make individual managers deleverage rapidly and in a highly correlated manner during periods of stress, which can exaggerate market moves and pose additional vulnerabilities. See Bailey (2025).

Figure 1.12. Elevated Hedge Fund Leverage

Hedge funds' assets under management have doubled over the past decade ...

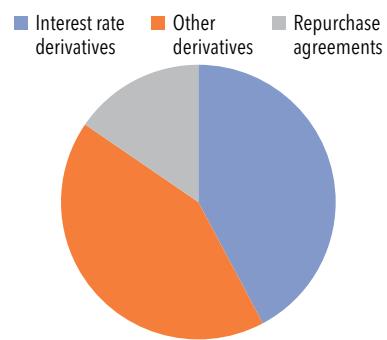


... and their use of leverage continues to increase ...



... with interest rate derivatives accounting for almost half of the leverage.

3. Gross Notional Exposure of Derivatives and Repurchase Agreements (Percent)



Sources: US Securities and Exchange Commission; and IMF staff calculations.

Note: The "Multistrategy" category in panel 1 may include other single-strategy hedge funds included in this category in US Securities and Exchange Commission data. This panel uses a representative sample of hedge funds globally with total assets under management exceeding \$5 trillion, as opposed to the \$8.5 trillion estimate for total assets under management in the Financial Stability Board's 2024 *Global Monitoring Report on Non-bank Financial Intermediation*. About two-thirds of the hedge funds in the sample are domiciled outside of the United States. The asset-weighted ratio depicted by the black line in panel 2 is calculated using the data for assets under management of hedge fund strategies in panel 1. Panel 3 is based on the aggregate of long and short notional exposures of the derivatives and repurchase agreements of a smaller sample of qualifying hedge funds that report these exposures to the Securities and Exchange Commission. The calculation excludes long and short notional exposures related to investments in publicly and privately traded securities.

In a representative sample of global hedge funds, as of the first quarter of 2024, interest rate derivatives accounted for almost half of the total gross notional exposure of derivatives and repurchase agreements, reflecting the active use of these derivatives by macro and relative-value fixed-income and multistrategy hedge funds (Figure 1.12, panel 3).⁴ The significant exposure to interest rate derivatives may partly reflect the active participation of these hedge fund strategies in US Treasury basis trades (see section "Asset Managers' Growing Use of Derivatives Increases Risks in the Financial System"). The same sample of qualifying hedge funds owned \$1.6 trillion in Treasury bonds as of the first quarter of 2024, in addition to being short an additional \$1.3 trillion in the same instrument.

The spike of Treasury yields in the March 2020 period is a clear example of the interplay among open-ended and hedge fund forced selling in the face of investor redemptions, a spike in repo rates, and rising

margin calls. Forced selling by open-ended investment funds to pay for redemptions was a major driver of the spike in Treasury yields during March 2020 (Banegas, Monin, and Petrasek 2021). Hedge funds are better protected than other investment funds when facing investor redemption pressures because of stricter liquidity terms and the more active use of investor gates. However, given the strong reliance of basis trade investors on repos, a spike in repo rates triggered by, for example, disorderly trading conditions and a sharp increase in the volatility of US Treasury markets can render basis trades unprofitable and trigger the forced selling of Treasury securities. Margin calls and portfolio rebalancing can also lead to a brisk unwinding of futures positions as funds seek to deleverage quickly (Vissing-Jorgensen 2021; April 2020 Global Financial Stability Report).

Emerging and Frontier Markets: Challenges and Resilience

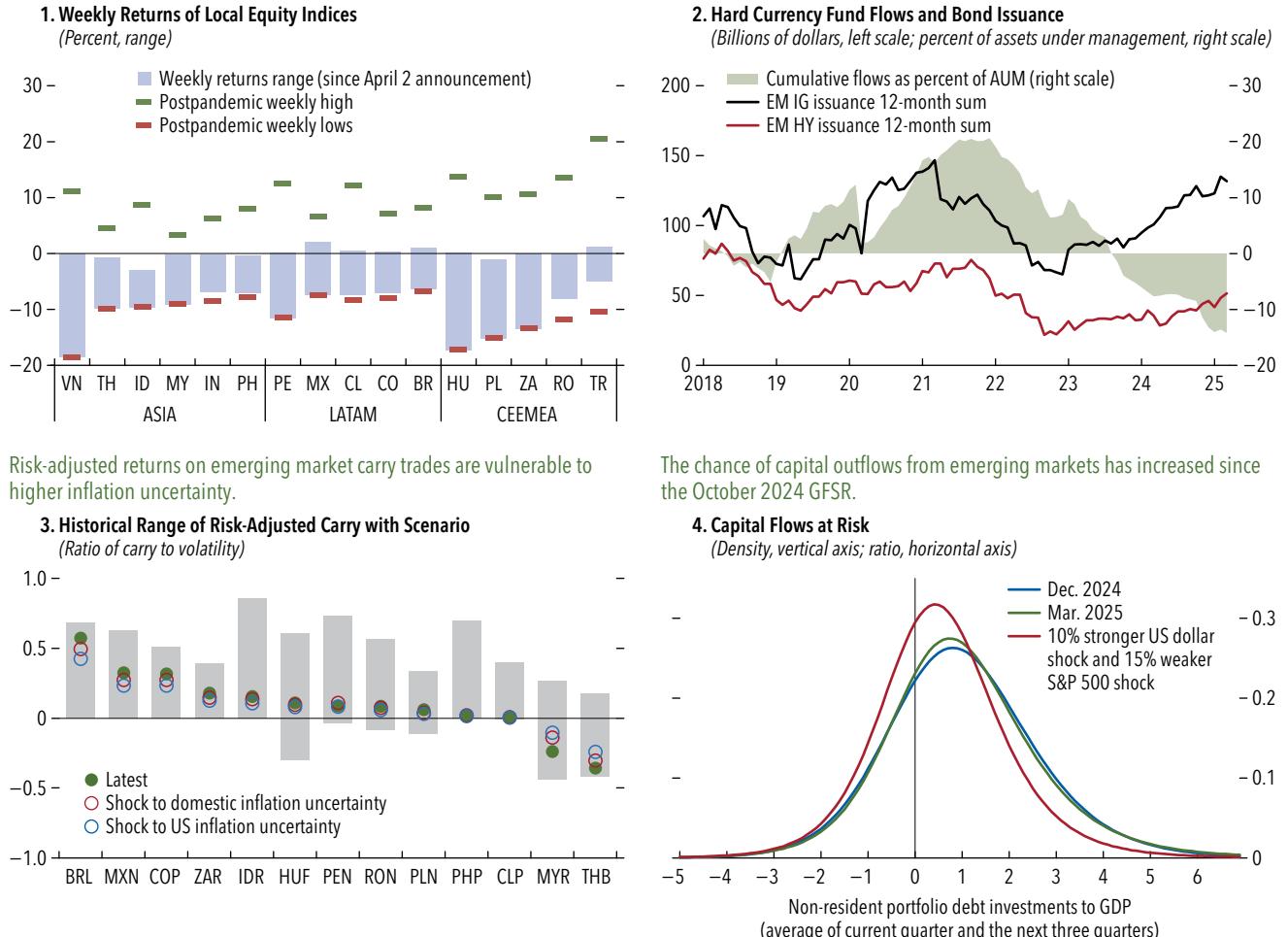
Weathering Strong Headwinds from Trade Tensions with Further Turbulence Ahead

The escalation of global trade tensions has had a significant impact on emerging market assets. Tariffs—through reducing trade volumes or by increasing

⁴The US Securities and Exchange Commission estimated \$8 trillion in interest rate derivative exposures as of the first quarter of 2024. This estimate is based on a sample of qualifying hedge funds that report these exposures to the commission and therefore underestimates the total exposure of hedge funds to interest rate derivatives globally. According to a survey from the International Organization of Securities Commissions, hedge funds held more than \$25 trillion in interest rate derivatives as of the end of 2022.

Figure 1.13. Emerging Markets: External Headwinds

Emerging market equities retreated in early April with large volatility posted by all major local indices.



Sources: BIS, Bond Radar; Bloomberg Finance L.P.; FactSet, Fitch Ratings; Moody's Investors Service; S&P; and IMF staff calculations.

Note: In panel 1, returns are in local currency, with datasets from January 2022 to April 2025. In panel 3, the chart calculates the volatility adjusted nominal carry, using implied yields and dollar funding rates. It then applies a shock to implied currency volatility from an increase in macro uncertainty, which is proxied by the median response of one-year-implied foreign exchange volatility to a shock in the forecast dispersion of one-year-ahead inflation using a dynamic impulse response function. The capital flows-at-risk analysis in panel 4 is based on an unbalanced panel quantile regression in which the average of the ratio of one-year-ahead nonresident portfolio debt investments to GDP is regressed on global push and domestic pull factors. The probability of outflows is computed by calculating the area under the distribution curve in which nonresident portfolio debt investment to GDP is negative. US dollar (DXY Index) and S&P 500 shocks are calculated from end of 2025:Q1 levels. Data labels in the figure use International Organization for Standardization (ISO) country codes. AUM = assets under management; BRL = Brazilian real; CEEMEA = Central and Eastern Europe, Middle East, and Africa; CLP = Chilean peso; COP = Colombian peso; EM = emerging market; GFSR = *Global Financial Stability Report*; HUF = Hungarian forint; HY = high yield; IDR = Indonesian rupiah; IG = investment grade; LATAM = Latin America; MXN = Mexican peso; MYR = Malaysian ringgit; PEN = Peruvian sol; PHP = Philippine peso; PLN = polish zloty; RON = Romanian new leu; THB = Thai baht; ZAR = South African rand.

uncertainty for consumers and businesses—weigh on the emerging market growth outlook and stock prices, especially for those countries directly impacted by the April 2 tariffs announcements (Figure 1.13, panel 1), as well as commodity exporters. Even before trade tensions, emerging market bond funds have seen

persistent outflows in the last few years (Figure 1.13, panel 2). Issuance of hard currency denominated debt by both sovereign and corporate firms, which has been purchased from institutional or crossover investors, may be threatened should financial conditions continue to tighten.

Although other advanced economy currencies strengthened against the dollar during the recent tariff turmoil, emerging market currencies depreciated against the dollar as fears of weak growth escalated, and market-implied foreign exchange rate volatility saw a significant and durable increase. Combined with a decline in emerging market interest rates during this episode—investors increasingly expect many emerging market central banks to continue their current easing cycle, or else to embark on a new one, to support growth amid high uncertainty—the expected risk-adjusted returns on carry trades involving emerging market currencies have fallen (Figure 1.13, panel 3). The IMF’s analysis of capital flows at risk captures the impact of this lower expected return and tighter global financial conditions on portfolio capital flows—emerging market capital outflows could reach 1.6 percent of GDP over the next year with a 5 percent chance. In a scenario in which the broad dollar index rises and US equities sell off further, the tail outcome could worsen to 1.9 percent (Figure 1.13, panel 4).

External headwinds bite especially hard in emerging markets that have excessive credit growth or large financing needs. On aggregate, emerging markets’ sovereign credit ratings have shown positive momentum over the last year after a long period of downgrades following the pandemic (Figure 1.14, panel 1). Private nonfinancial sector leverage and various estimates of credit gaps⁵—a gauge of whether credit growth is above or below trend—do not clearly signal overheating in most large emerging market economies (Figure 1.14, panel 2 and panel 3). Although emerging market sovereign credit risks are contained, in a world with tighter financial conditions and more fiscal spending to buttress emerging markets from the impact of tariffs and trade uncertainty, future gross financing needs are forecast to remain above prepandemic averages in most emerging markets, and more government revenue has to be spent on interest payments (Figure 1.14, panel 4). Expectations of weaker growth among emerging market economies have also led to expectations that monetary policy rates will decline toward their terminal rates (Figure 1.14, panel 5), although real interest rates are still currently around their highest levels over the past decade (Figure 1.14, panel 6).

⁵Estimates of credit gaps can differ significantly based on methodology. The above assessment averages three methodologies, Hodrick-Prescott, Christiano-Fitzgerald, and the moving average approach. The results can be seen in Figure 1.2, panel 3.

In a Longer-Term View, Demand for Emerging Market Assets Could Remain Subdued

Emerging markets have endured a long period of tepid portfolio flows. A prolonged period of weak emerging market currencies in which the dollar has strengthened in both good and bad states of the world, along with increased volatility in foreign exchange markets, has made the asset class less appealing. Additionally, following a period of strong interest from foreign investors in the years after the global financial crisis, nonresident interest in local currency bond markets (LCBMs) in emerging markets has stagnated. Since 2018, nonresident participation in LCBMs has declined (Figure 1.15, panel 1), which can be attributed to foreign investors having not kept up with the growing size of these markets (Figure 1.15, panel 2). Although the growing support from domestic institutional investors has bolstered recent fiscal expansion and somewhat mitigated recent spillovers from the external environment for some major emerging markets, the declining nonresident interest could pose challenges for weaker emerging markets that lack the necessary domestic buffers.

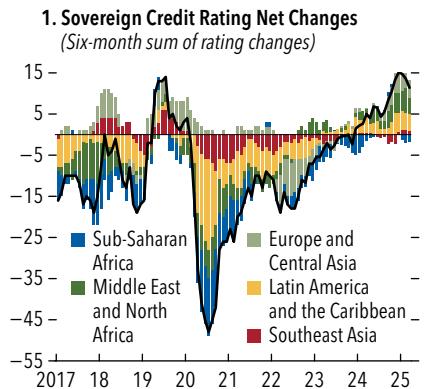
This weakness of foreign flows into emerging market LCBMs may in part be the result of underwhelming performance of the asset class over the past decade. With lackluster 10-year cumulative returns but high realized volatility compared with that of other fixed-income assets such as US corporate bonds (Figure 1.15, panel 3), the Sharpe ratio for LCBMs has been among the lowest compared with those of liquid assets. Weak LCBM performance has primarily been driven by weak emerging market currencies, which have appreciated against the dollar in only 2 out of the past 10 years (Figure 1.15, panel 4). Realized emerging market currency performance continues to underwhelm ex ante expectations, based on surveys of analysts.

Frontier and Low-Income Economies Face Higher Yields and Market Access Concerns

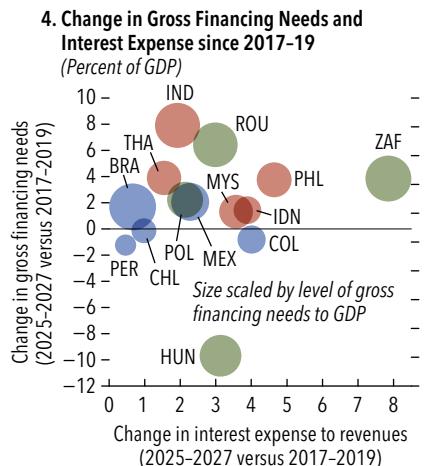
Before the recent turmoil driven by the April 2 tariff announcement, market conditions for frontier economies had been improving since the October *Global Financial Stability Report*. However, even before that, the level of yields remained high for many countries, increasing their refinancing risks as a significant amount of their debt matures over the next several quarters. The sharp rise in spreads and

Figure 1.14. Emerging Markets: Sovereign Financing and Private Sector Risks

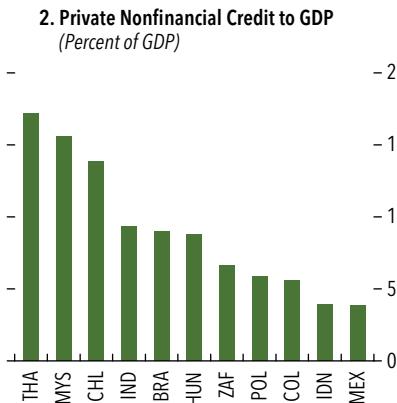
Positive ratings momentum has accelerated.



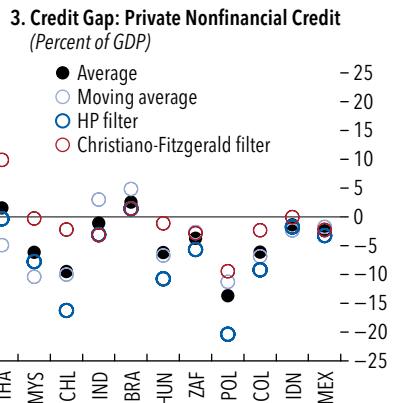
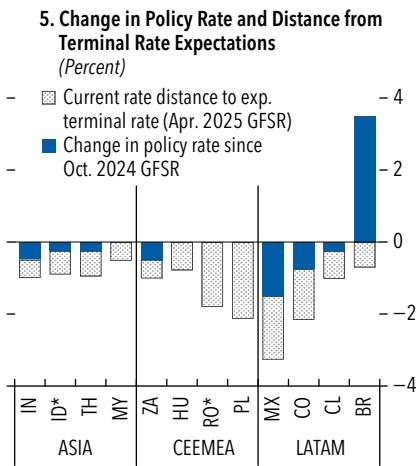
... but interest expenses have increased substantially in recent years.



Credit gaps and leverage appear contained in most countries, with a few exceptions ...



Markets increasingly expect major emerging markets to ease rates in response to weaker growth....



...as real policy rates remain relatively high compared with the past decade.



Sources: Bloomberg Finance L.P.; Bond Radar; Fitch Ratings; FactSet, Moody's Investors Service; S&P Global Ratings; and IMF staff calculations.

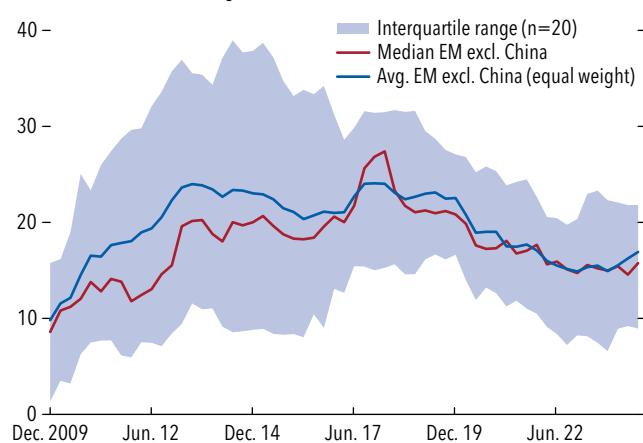
Note: Panel 1 counts the changes in average rating for an unbalanced sample of 97 emerging market sovereigns on a monthly basis, summed over six months, using the average of Moody's, S&P, and Fitch where available. Panel 3 calculates the credit gap for private nonfinancial credit to GDP by averaging three methodologies, including: Hodrick-Prescott, Christiano-Fitzgerald and five-year moving average; latest data are from the third quarter of 2024. The methodologies use different methods for decomposing trend and cycle to measure the difference between the ratio of private nonfinancial credit to GDP and its longer-term trend. Panel 5 derived the terminal policy rates based on market expectations excluding Indonesia and Romania, which are derived from analysts' consensus expectations. Panel 6 computes the normalized ex-ante real policy rates from the difference between policy rate and analysts' consensus inflation forecasts for 6 months ahead. Data labels in the figure use International Organization for Standardization (ISO) country codes. CEEMEA includes Hungary, Poland, Romania, and South Africa. EM = emerging market; LATAM = Latin America.

the overall tightening of financial conditions due to the global market turmoil have made this even more of a challenge. Issuing debt at such high yield levels could exacerbate existing debt vulnerabilities at a time when uncertainty about the future of official development assistance weighs on government funding and growth prospects. Any cutback of official development assistance could increase the need for frontier economies and low-income countries to rely more on private markets for debt financing.

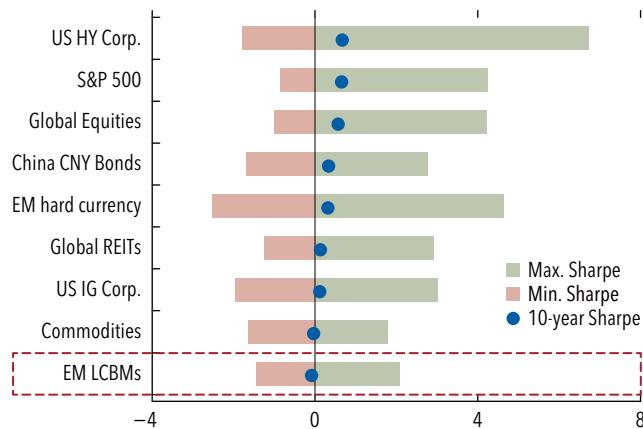
Sovereign eurobond spreads for frontier economies narrowed in 2024 and at the start of 2025, with macrofinancial reforms, progress on debt restructuring, and credit rating upgrades in several countries all having contributed to this narrowing. Examples include progress on debt restructuring in Ethiopia and Ghana, and foreign exchange market reforms in Nigeria. Frontier economies were able to issue foreign currency debt at relatively modest yields, with total issuance during the first quarter of this year amounting to roughly half of

Figure 1.15. Longer-Term View on Foreign Participation in Emerging Market Bond Markets

The stock of nonresident holdings of local currency emerging market debt has stagnated.

**1. Nonresident Participation in LCBMs of Major Emerging Markets Excluding China
(Percent of outstanding)**

Emerging market local currency government bonds performance has been lackluster in the past decade.

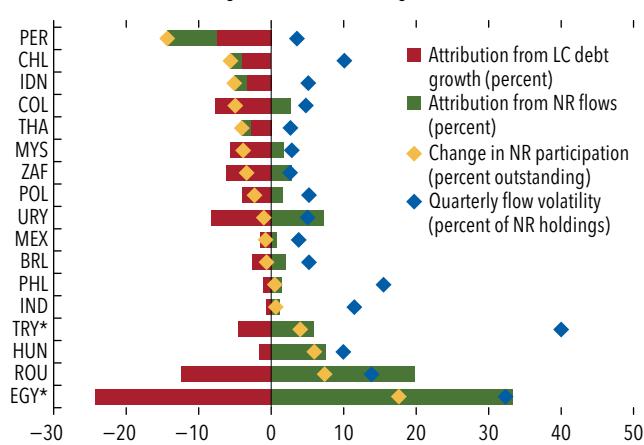
3. Sharpe Ratio for Asset Classes in the Past 10 Years

Sources: Bloomberg Finance L.P., IMF, J.P. Morgan index suite; and IMF staff calculations.

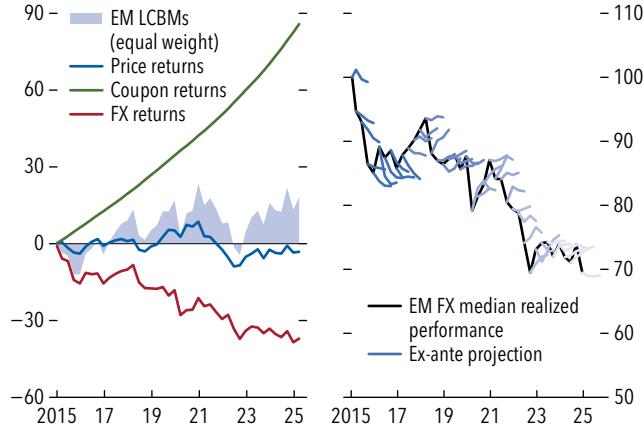
Notes: Data only include outstanding central government securities and NR participation in these markets. In panel 2, attribution from LC debt growth also include the residual component of the changes to NR participation rate. Data points for Egypt and Türkiye are expressed in multiples of three for better clarity in the presentation of the figure. Data labels in the figure use International Organization for Standardization (ISO) country codes. EM = emerging market; excl. = excluding; LC = local currency; LCBM = local currency bond market; NR = nonresident. In panels 1, 3 and 4, data for emerging market sovereigns includes data only for 15 major sovereigns and excludes data for China and Russia. Government debt securities include only central government debt. The range of Sharpe ratios in panel 3 is based on yearly data for 2014 to 2024. CNY = Chinese yuan; corp. = corporate; EM = emerging market; FX = foreign exchange; HY = high yield; IG = investment grade; LC = local currency; LCBM = local currency bond market; max. = maximum; min. = minimum; REIT = real estate investment trust; UST = Treasuries; VIX = Chicago Board Options Exchange Volatility Index.

total issuance in 2024 (Figure 1.16, panel 1). Nigeria returned to the eurobond market in late 2024 for the first time since 2022 and Egypt returned in January 2025 for the first time since early 2023. Additionally, Angola obtained foreign currency financing via a total return swap with an international bank while the

Foreign participation has not kept pace with the growth in local currency bond markets.

**2. Attribution of Changes in Nonresident Participation from 2021:Q4 to 2024:Q2
(Percent of Outstanding, Percent of NR Holdings)**

Foreign exchange in emerging markets has dragged down LCBM returns in these economies and has broadly underperformed expectations.

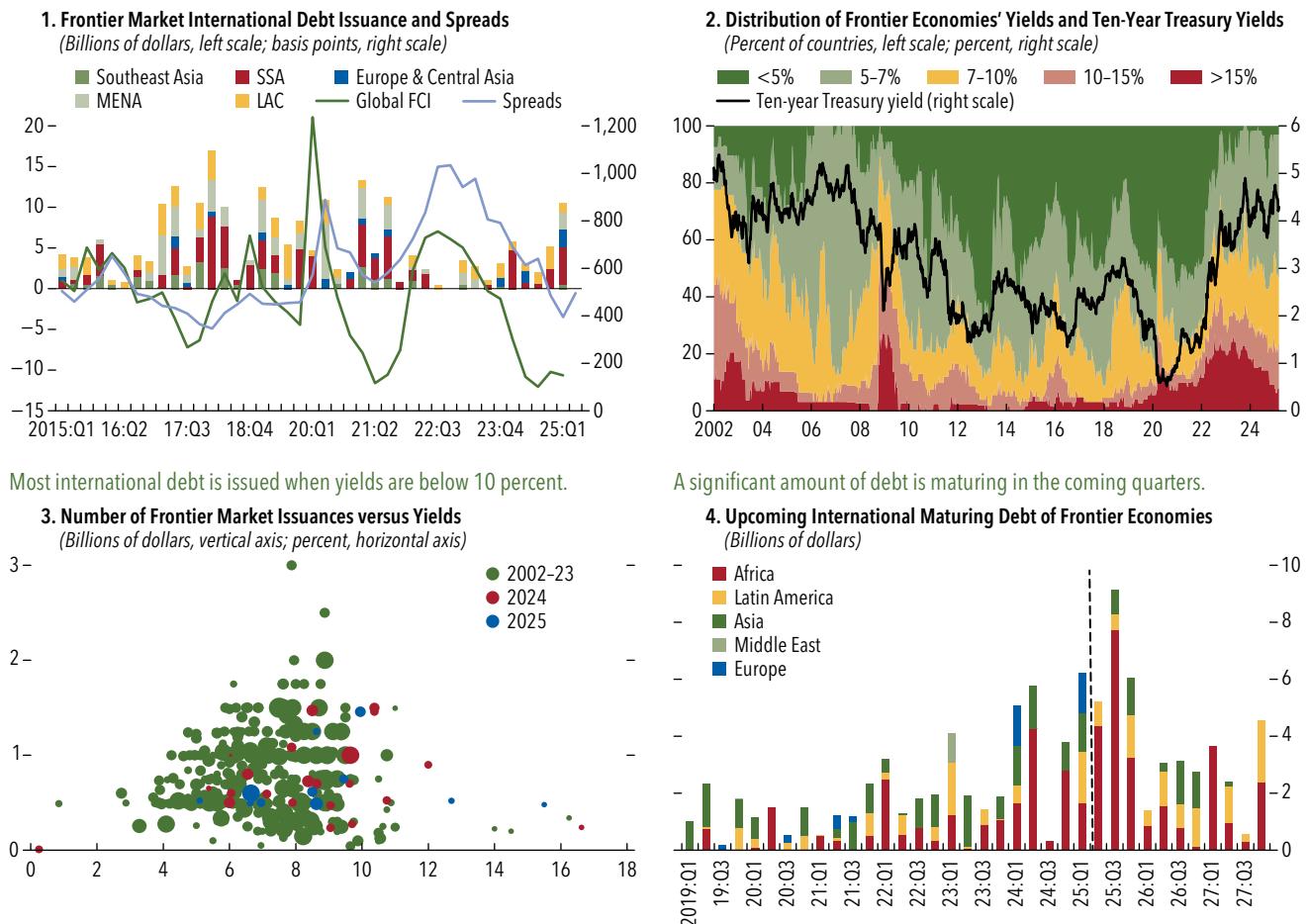
4. Cumulative Returns, Foreign Exchange Returns, Three-Month Foreign Exchange Performance, and Ex Ante Expectations

largest eurobond issuance in Africa during the first quarter came from Côte d'Ivoire.

However, in the aftermath of the April 2 tariff announcements, frontier yields increased as global financial conditions tightened and US yields increased, pushing the share of frontier sovereigns with yields above

Figure 1.16. Frontier Economies

Frontier issuance was robust in the first quarter as spreads compressed and financial conditions eased.



Sources: Bloomberg Finance L.P.; Bond Radar; and IMF staff estimates.

Notes: In panel 3, larger bubbles represent the relative maturity. A smaller bubble shows a shorter maturity. Frontier economies are defined as countries with hard currency debt and included in the J.P. Morgan Next Generation Emerging Market (NEXGEM) index. LAC = Latin America and the Caribbean; MENA = Middle East and North Africa; SSA = Sub-Saharan Africa.

10 percent to almost 30 percent in April (Figure 1.16, panel 2). Should advanced economy yields increase further, or spreads of frontier economies' bonds could come under pressure, and they could be at risk of losing market access. Historically, only a small number of frontier bonds have been issued at yields exceeding 10 percent, in part due to the increased fiscal pressures such high coupons entail and in part due to the negative investor perception generated by a sovereign's willingness to pay such high coupons. These issuances have also generally been smaller and of shorter maturity (Figure 1.16, panel 3; note not only the number of bubbles to the right of the 10 percent label on the horizontal axis, but also the small

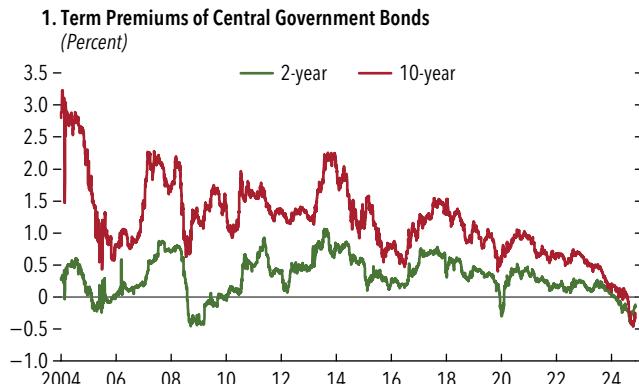
size on the vertical scale). Although some of these economies have already issued eurobonds to cover upcoming debt (for example, Côte d'Ivoire, Gabon, and Kenya), there remain sizable amounts of debt coming due over the next three years (Figure 1.16, panel 4).

China: Rising Risks to Falling Prices

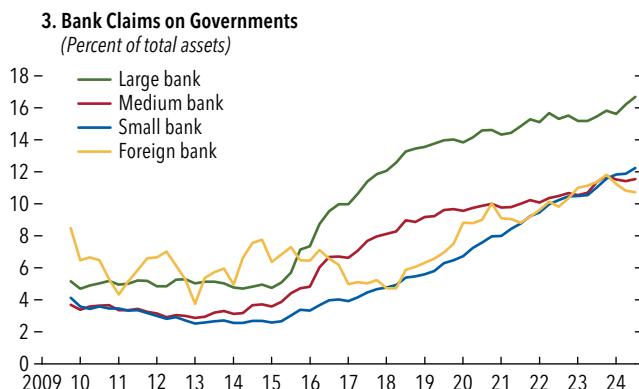
China's economic outlook remains highly uncertain amid mounting external and domestic challenges. Tightening external financial conditions and rounds of retaliatory tariffs and countermeasures with the United States are weighing on sentiment and growth while

Figure 1.17. China's Bond Market

Term premiums have turned negative ...



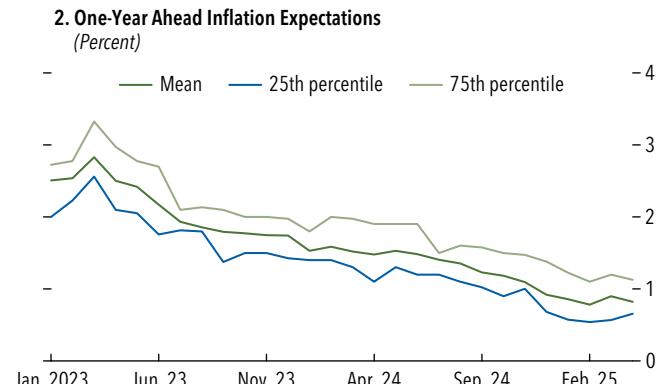
Weak credit demand and profit outlook have given banks incentives to favor government bonds, with large and small banks leading the way.



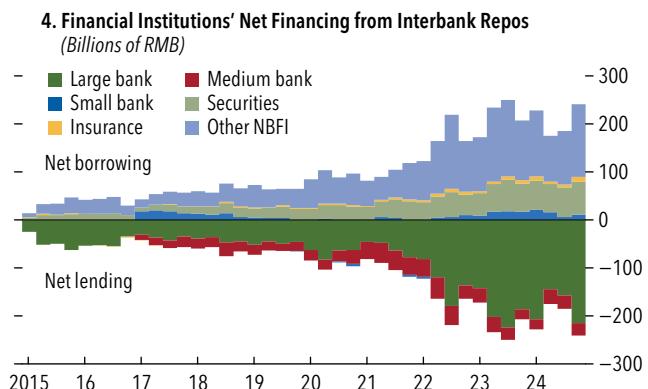
Sources: Bloomberg; CEIC; and IMF staff estimates.

Note: In panel 1, term premium estimates largely follow Adrian, Crump, and Moench (2013). In panel 2, one-year ahead inflation expectations are calculated from forecasts submitted to Bloomberg. NBFI = nonbank financial intermediary; RMB = renminbi.

... on a downbeat growth and inflation outlook.



Nonbanks are borrowing from banks to finance bond purchases.



also constraining domestic monetary easing. Notably, the tariffs could amplify existing deflationary pressures and weigh on the renminbi, further complicating the macro policy trade-off. At the same time, the protracted adjustment in the property sector and the local government debt overhang continue to dampen demand and elevate the risks of debt deflation. The government's coordinated policy measures to support the housing market and address local government "hidden debt" may have prevented some imminent defaults, but a comprehensive strategy is still needed to address financially unviable developers and local government financing vehicles. This strategy could include phasing out forbearance measures to ensure timely loan loss recognition by banks. In the banking sector, the recent capital injection into large state-owned banks provides some buffer to absorb shocks and sustain

credit supply. Nonetheless, more attention is needed to mitigate risks in smaller banks, which could come under disproportionate pressure if tariffs trigger a material growth slowdown.

Reflecting investors' concerns over a weakening growth outlook and deflation pressures, China's government bond yields have continued to decline since the October 2024 *Global Financial Stability Report*. Although core inflation appears to be stabilizing at a low level, inflation expectations have weakened further, with analysts' forecasts of one-year-ahead headline inflation dropping below 1 percent (Figure 1.17 panel 2), which has reinforced expectations of further monetary policy easing. Consequently, the term premium on 10-year government bonds has dropped to a record low (Figure 1.17, panel 1). As historically high tariffs imposed by the United States may intensify

deflationary pressures, accommodative macroeconomic policies along with structural and promarket reforms are urgently needed to bolster near-term activity and business and consumer confidence, as well as to prevent a further downward spiral in inflation expectations.

The decline in term premiums is also linked to shifts in the investment behavior of institutions, as banks and investment funds have increased their security holdings amid weak demand for credit and challenges to profitability. Over the past two years, Chinese banks—especially smaller ones—have significantly expanded their exposures to government bonds (Figure 1.17, panel 3); even so, investment funds and wealth management products overtook banks as the largest buyers of government debt in 2024. The concentrated holdings of government debt by financial institutions (see Box 1.2 in the case of Chinese insurers) could crowd out bank lending and credit creation as well as raise questions about the size of potential bond losses should inflation and interest rates change.

Managing interest rate risk is now important for China's financial stability. Although Chinese banks classify most of their government bond portfolios as held to maturity, thereby limiting mark-to-market losses, the hedging of interest rate risks by smaller institutions remains limited. Another vulnerability lies in leveraged investment strategies in which bond purchases are financed through repurchase agreements (repos), which are dominated by very short-term instruments, with overnight and seven-day tenors accounting for nearly 90 percent of transactions. If sentiment shifts unexpectedly, the unwinding of leveraged trades could exacerbate volatility in short-term rates, even in the absence of direct adjustments to policy rates, posing risks to broader financial stability. Nonbank financial institutions—particularly securities firms and investment funds—remain by far the largest borrowers and most active participants in the interbank repo market, and large banks are the predominant lenders (Figure 1.17, panel 4). These dynamics played out in the past few months—interbank liquidity tightened sharply and disproportionately affected nonbank participants as investors reassessed the pace of monetary easing amid heightened trade uncertainties. Although authorities have made progress in reducing risks in the nonbank financial sector in recent years, additional regulatory measures to prevent excessive concentration of bond holdings and to enhance management of liquidity and maturity risk, as well as to close regulatory and data gaps, could help contain systemic risks emanating from the bond market.

Sovereign Bond Market Functioning

The Supply of Government Bonds Will Likely Remain Large

Elevated levels of government bond issuance will increasingly be absorbed by relatively price-sensitive private investors, especially if quantitative tightening by central banks continues. All else equal, this could drive up bond yields via higher risk premia and could heighten bond price volatility. These pressures can be amplified by financial intermediaries that are now more constrained in providing liquidity in bond and securities financing markets.

In the United States, persistent fiscal deficits—with market expectations suggesting stabilization at 6.5–7 percent of GDP—need to be financed by substantial Treasury securities issuance in years to come. Rising interest costs and large nondiscretionary spending needs may constrain or delay fiscal consolidation, reinforcing upward pressure on yields.⁶ Although net issuance of Treasuries is temporarily capped,⁷ the need to refinance a significant share of maturing debt—40 percent of which is concentrated in the first quarter of 2025—may necessitate a steep increase in supply later in the year, particularly for shorter maturities (Figure 1.18, panel 1).

In the euro area, net issuance of government bonds is also set to ratchet up, mainly driven by the need to finance higher defense and infrastructure spending. At the same time, ongoing normalization of the European Central Bank's (ECB) balance sheet is adding to the amount of bonds private investors need to absorb, particularly bonds (Figure 1.18, panel 2). A relaxation of Germany's "debt brake"⁸—although aligned with IMF recommendations and supported by flexibility in the revised EU fiscal framework

⁶While higher premiums and yields reflect cyclical and policy-related factors, longer-term structural trends such as aging populations (see the April 2025 *World Economic Outlook*, Analytical Chapter 2, "The Rise of the Silver Economy") may exert downward pressure over time.

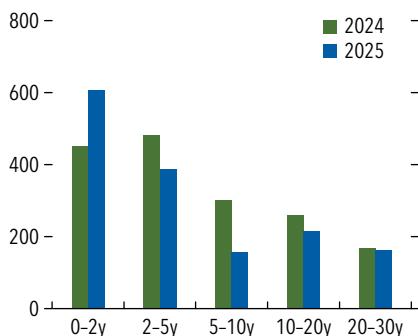
⁷On January 2, 2025, the debt ceiling, the limit on the total amount of federal debt the US government can hold, became binding again, and the current ceiling, set at \$36.1 trillion, has been reached. For further reference, see the April 2023 *Global Financial Stability Report*.

⁸Germany's debt brake is a constitutional fiscal rule that limits the federal government's structural deficit to 0.35 percent of nominal GDP. The debt brake permits temporary borrowing during economic downturns, with repayment required in subsequent periods. Introduced in 2009 and legally binding since 2016, it is one of the most restrictive fiscal rules among those imposed on European Union sovereigns, designed to ensure long-term budget sustainability.

Figure 1.18. Sovereign Bond Issuance in the United States and the Euro Area

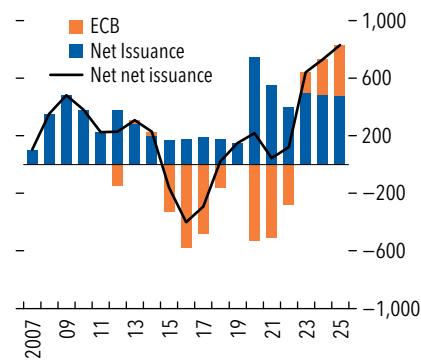
Net issuance in the United States will likely become more front-loaded.

**1. Projected Net Issuance Volume of Treasuries, 2025 versus 2024
(Billions of dollars)**



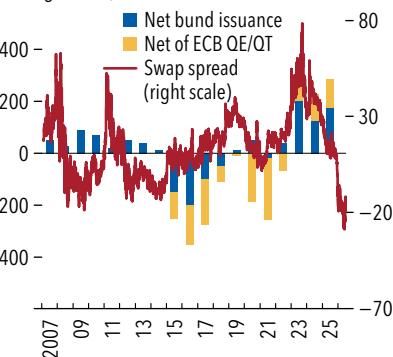
Euro area government bond supply is set to reach post-global financial crisis highs.

**2. Aggregate Euro Area Net Issuance Volume
(Billions of euros)**



Germany's net bond supply has changed even more.

**3. Germany's Net Issuance Volume versus Swap Spreads
(Billions of euros, left scale; basis points, right scale)**



Sources: Bloomberg Finance L.P.; and IMF staff analysis.

Notes: Gross issuance reflects both new debt issuance—underpinned by IMF estimates—and refinancing of maturing securities. Net issuance adjusts for central bank transactions, decreasing with asset purchases during quantitative easing and increasing with the runoff of maturing holdings during quantitative tightening. Swap spread capture the interest rate differential of 10-year EUR-denominated interest rate swaps less Bund securities of the same maturity.

for public investment—has prompted some market analysts to express concerns about the potential increase in government debt issuance and the ability of the market to absorb it easily, at a time when the ECB is also reducing purchases of government debt, for which they cite the negative basis spread that has opened between interest-rate swaps and similar maturity bonds (Figure 1.18, panel 3).⁹ Prolonged periods of negative bond swap spreads do not necessarily reflect changes in sovereign creditworthiness, as the credit default swap spread of Germany remains stable around a low level: similar conditions were observed in early 1990s amid elevated issuance of German federal debt related to reunification. But, given the bund's role as the key pricing benchmark for European sovereign debt, higher bund yields translate into higher borrowing costs across the euro area. Going forward, potential risks from higher borrowing costs for euro area sovereigns should continue to be monitored.

Constraints on Dealer Balance Sheets Are Increasing the Fragility of Bond Markets

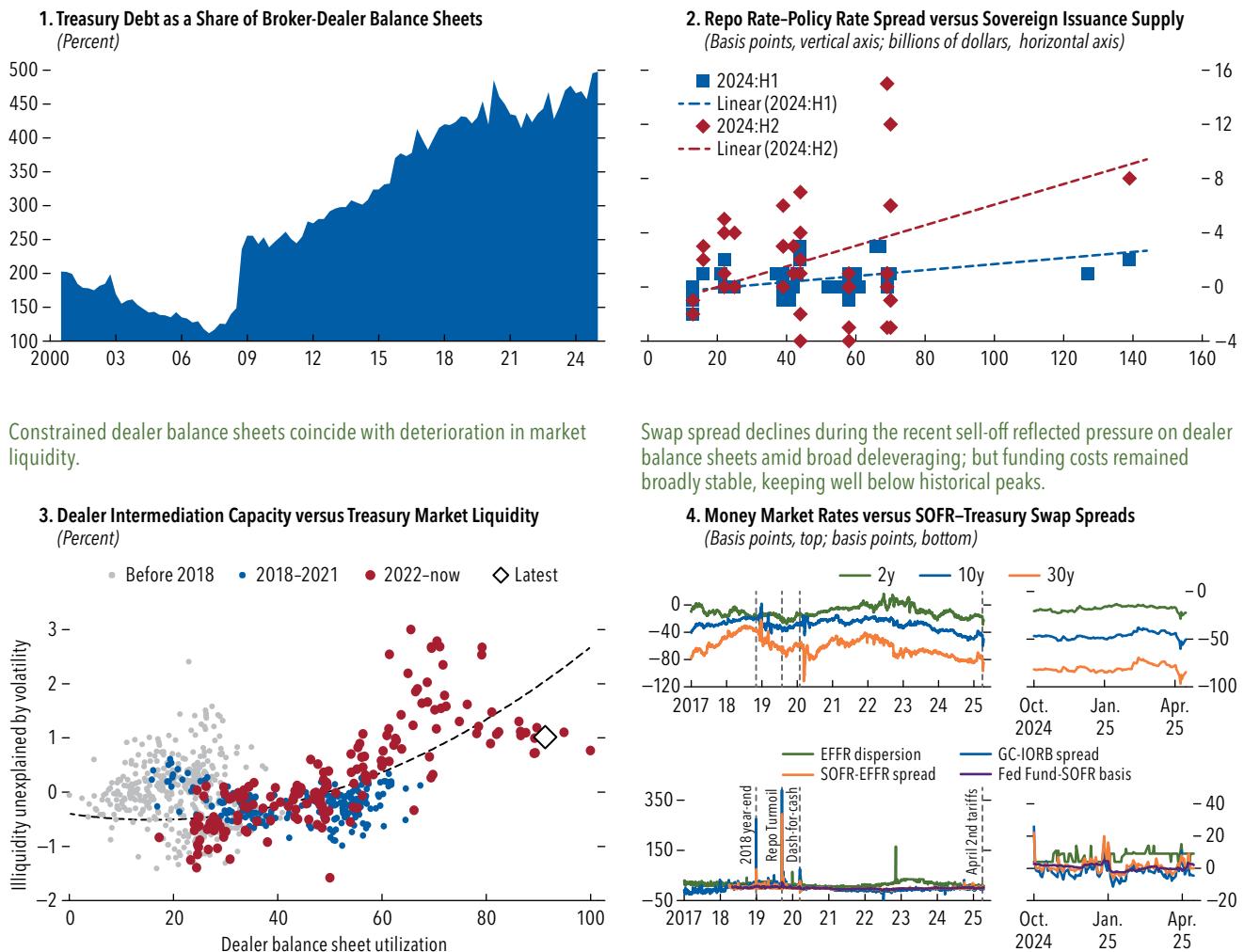
Heightened volatility of bond yields during the market turmoil following the April 2 tariff announcements have reportedly pushed the intermediation capacity of US primary dealers—key intermediaries in the Treasury market—toward its limit. Even before the episode, the Treasury market had outgrown dealers: its size is now five times dealers' balance sheets, a significant increase from just one-and-a-half times around 20 years ago (Figure 1.19, panel 1). As a result, spreads on repurchase agreements—representing amounts dealers demand to finance their clients' purchase of Treasury securities—have become more sensitive to the quantity of Treasury issuance (Figure 1.19, panel 2). Episodes of deterioration in market liquidity could become more likely, pushing up term premiums and Treasury yields (Figure 1.19, panel 3).

The ensuing market turmoil following the announcement of April 2 tariffs saw the unwinding of popular leveraged trades like Treasury cash-futures basis trades and swap spread trades. In the latter case, the turmoil pushed up margin requirements and forced a wave of deleveraging by investors that were positioned for yields to decline relative to swap rates. This resulted in a sharp narrowing in

⁹In addition to capturing a price-based indicator of the relative supply and demand of government bonds, swap spreads are also impacted by structural factors relating to intermediation constraints, increased financing or risk management costs associated with holding bonds, and structural shifts in investor demand.

Figure 1.19. Dealer Balance Sheets and Intermediation Capacity

The Treasury market has outgrown broker-dealers balance sheets since the GFC ...

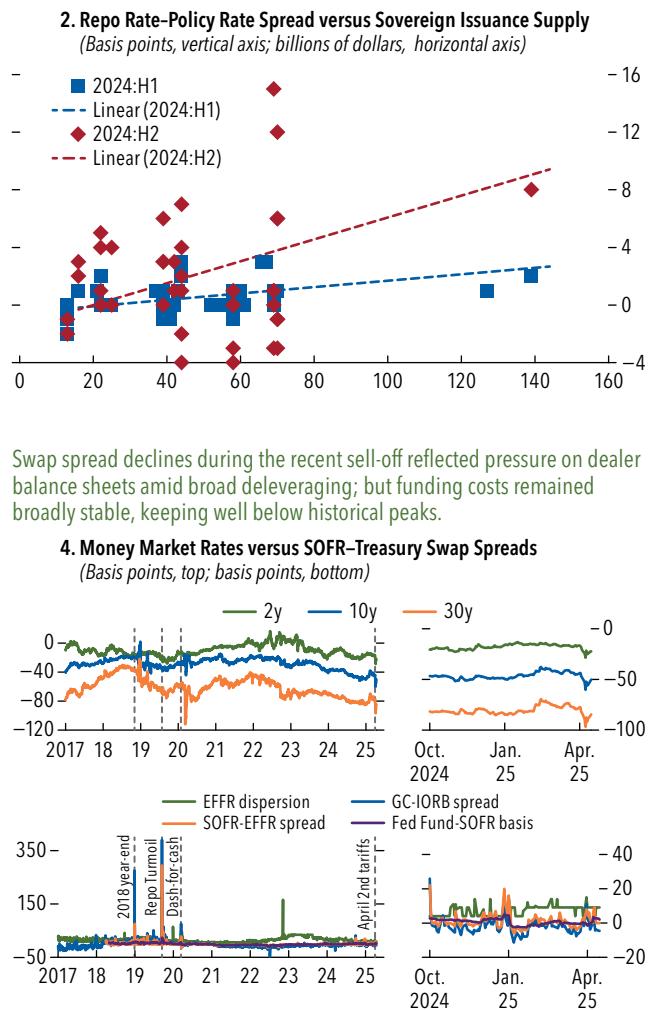


Sources: Bloomberg Finance L.P.; Federal Reserve Bank of New York; Federal Reserve Bank of St. Louis; Federal Reserve Economic Data (FRED); Haver Analytics; J.P. Morgan DataQuery; and IMF staff calculations.

Notes: In panel 3, dealer capacity utilization is proxied by normalized net primary dealer positions in Treasuries and agency MBS, scaled between 0 and 1 relative to in-sample peaks (January 2010 to March 2025). This construction of capacity utilization proxy is related to a revealed-preference approach followed in Duffie and others (2023). Residual illiquidity refers to market-value-weighted spline fitting errors of Treasury yields unexplained by interest rate volatility, as captured by the MOVE index. The dotted line depicts the fitted quadratic relationship between utilization and residual illiquidity from 2020–present. In panel 4, swap spreads reflect the difference between swap rates and Treasury yields of the same maturity. SOFR swap rates are extended historically using adjusted legacy swap interbank offered rates, with a basis adjustment applied to account for differences between secured overnight and term interbank benchmarks. EFFR dispersion reflects the difference between the 1st and 99th percentile of effective Federal Fund rates. GC-IORB reflects the difference between general collateral overnight repos and the overnight interest on reserve balances. The SOFR-EFFR spread reflects the difference between secured overnight funding rates and effective federal fund rates. The Fed Fund-SOFR basis reflects the difference between near-term Fed Fund futures and SOFR futures.

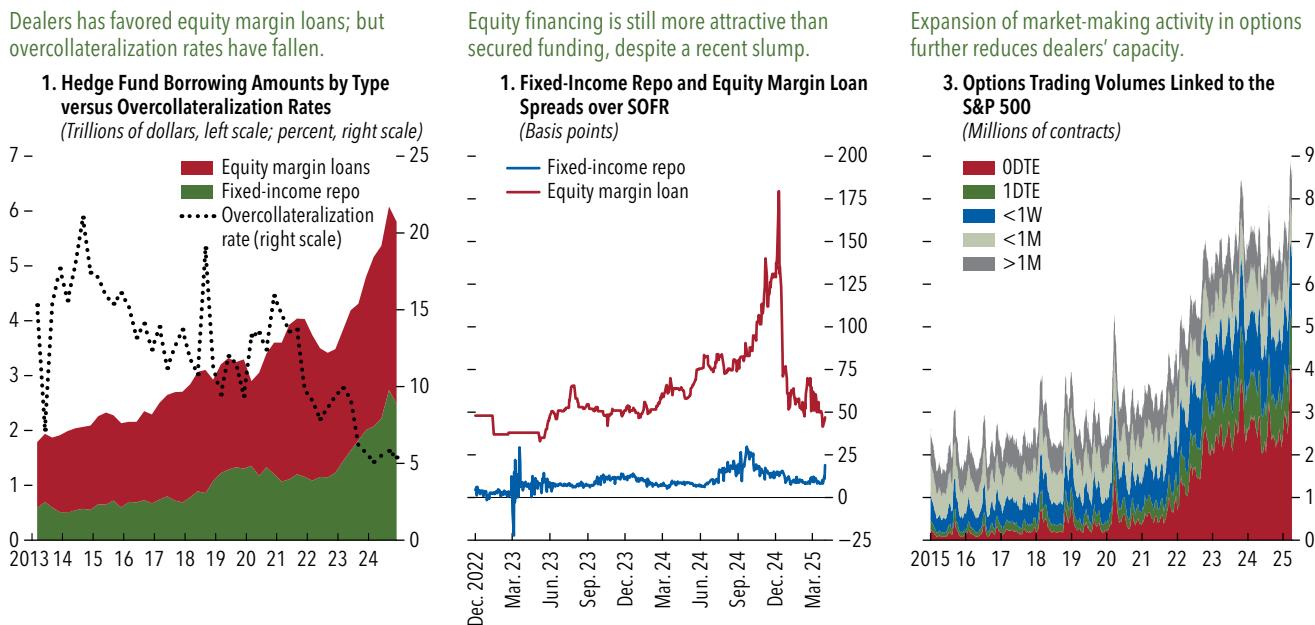
swap spreads (Figure 1.19, panel 4, top) and more challenged market liquidity conditions. The sharp decline in spreads was reportedly exacerbated by dealers reaching capacity limits and having difficulty absorbing the Treasury securities sold during the deleveraging. More broadly, Treasury market

... and sensitivity of repo rates to issuance suggests intermediation capacity may be approaching its limit.



functioning was challenged but did not break down, as repo funding costs rose only marginally (Figure 1.19, panel 4, bottom) as compared with levels seen during past episodes of market dysfunction, which were associated with large-scale unwinding of basis trades (for example, the “dash-for-cash”

Figure 1.20. Dealers' Intermediation Shift toward Higher Margin Activities



episode in March 2020; see the “Asset Managers’ Growing Use of Derivatives Increases Risks in the Financial System” section). Still, elevated trade uncertainty might lead to further turmoil in markets, including in repo markets.

From a longer-term perspective, decline in dealers’ intermediation capacity in government bonds may also be a consequence of increased usage of balance sheets to provide equity margin loans to hedge funds and other clients (Figure 1.20, panel 1). Equity financing spreads are more attractive than fixed-income repo spreads, despite some declines of the former after year-end 2024 and some increases of the latter in early April, upholding dealers’ incentives to shift toward these higher-margin activities (Figure 1.20, panel 2). According to market contacts, smaller dealers have tilted their lending toward equity margin loans, whereas major institutional dealers with deep client relationships have maintained diversified exposure across asset classes. This shift has contributed to a weakening in collateralization levels (Figure 1.20, panel 1, dashed black line), exposing dealers to losses if hedge funds are unable

to repay loans during market stress.¹⁰ Also, expansion of options market-making activity (Figure 1.20, panel 3)—partly driven by retail speculative positioning—has further shifted dealers’ focus away from core markets like government bonds.

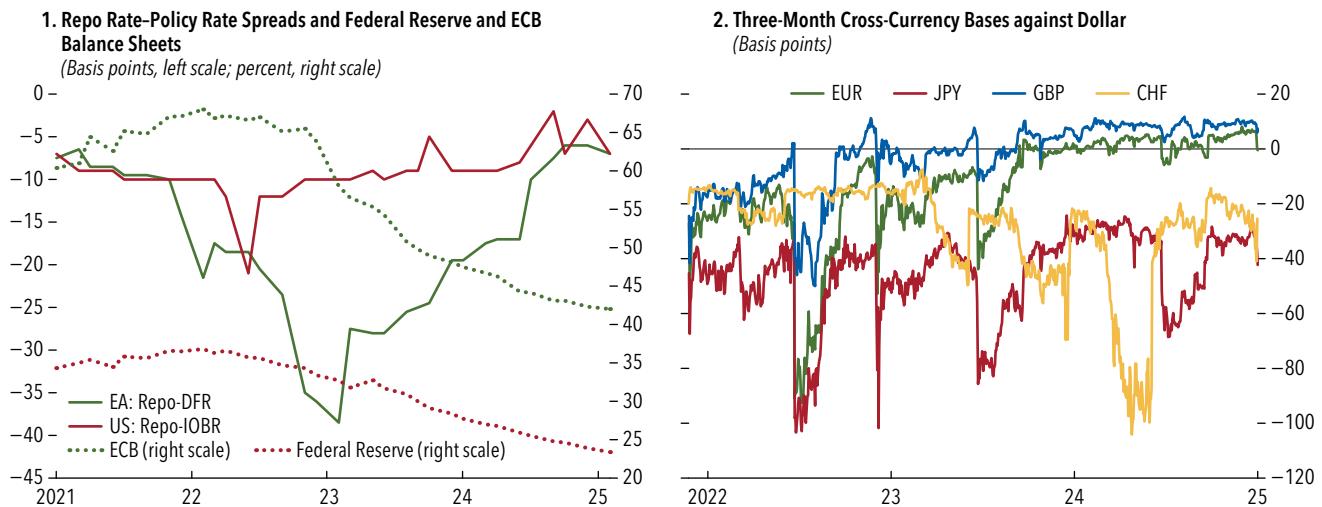
Cross-border funding dynamics may be amplifying vulnerabilities in the international dollar market. Euro area banks, which previously benefited from deeply negative repo rates due to a scarcity of European government bonds, have faced rising funding costs, as the ECB’s quantitative tightening is alleviating this scarcity (Figure 1.21, panel 1). In response, they have reportedly increasingly turned to US repo markets,

¹⁰Overcollateralization is determined by haircuts in fixed-income repos and by initial and variation margins in equity margin loans, both of which aim to cover potential collateral losses. Structural improvements—such as a shift from zero-haircut bilateral repo toward centrally cleared and sponsored repo—have strengthened margining in Treasury markets. But equity margin loans, which now account for a larger share of dealer activity, are mostly extended in the dealer-to-customer space under looser risk standards and competitive pricing, meaning margin requirements may not necessarily be calibrated to absorb worst-case losses, particularly in periods of elevated market volatility.

Figure 1.21. Cross-Border Funding amid Ongoing Quantitative Tightening

Rising funding costs for euro area banks amid ongoing ECB quantitative tightening, has driven them to tap US repo market ...

... leading to an improvement in availability of the dollar as a funding currency, but increasing rollover risks and deepening cross-border linkages in dollar funding markets.



Sources: Bloomberg Finance L.P.; Haver Analytics; J.P. Morgan DataQuery; and IMF staff analysis.

Note: CHF = Swiss franc; DFR = deposit facility rate; EA = euro area; ECB = European Central Bank; EUR = euro; GBP = British pound; IORB = Interest Rate on Reserve Balances; JPY = Japanese yen.

borrowing dollars against Treasury collateral and swapping proceeds back into euros.¹¹ While this shift has improved availability of the dollar as a funding currency (Figure 1.21, panel 2), it has also deepened cross-border interconnections in dollar funding markets. Growing reliance among euro area banks on US repo funding exposes them to rollover risk: during volatile markets, like the one after the April 2 tariff announcements, these banks might scramble for dollars in the foreign exchange (FX) swap market to meet their obligations.¹² Given the scale of their dollar borrowing, a sudden loss of access to US repo funding could widen the euro-to-dollar basis, signaling rising dollar scarcity and triggering broader funding strains (see the October 2010 Global Financial Stability Report, Box 2.2). Elevated fragility of cross-border dollar liquidity underscores the importance of globally coordinated backstops—such as standing repo facilities and central bank swap lines—to mitigate systemic risks and prevent disorderly spillovers.

¹¹Euro area banks also issue unsecured commercial papers (see ECB 2024) as another source for borrowing dollars.

¹²For instance, if dollar borrowings mature before the corresponding euro loan from the bank subsidiary to its holding company expires, the subsidiary may be forced to abruptly short-cover dollars in the cross-currency swap market, to honor the dollar liability owed to the US repo counterparty.

Corporate and Household: Vulnerabilities Assessment

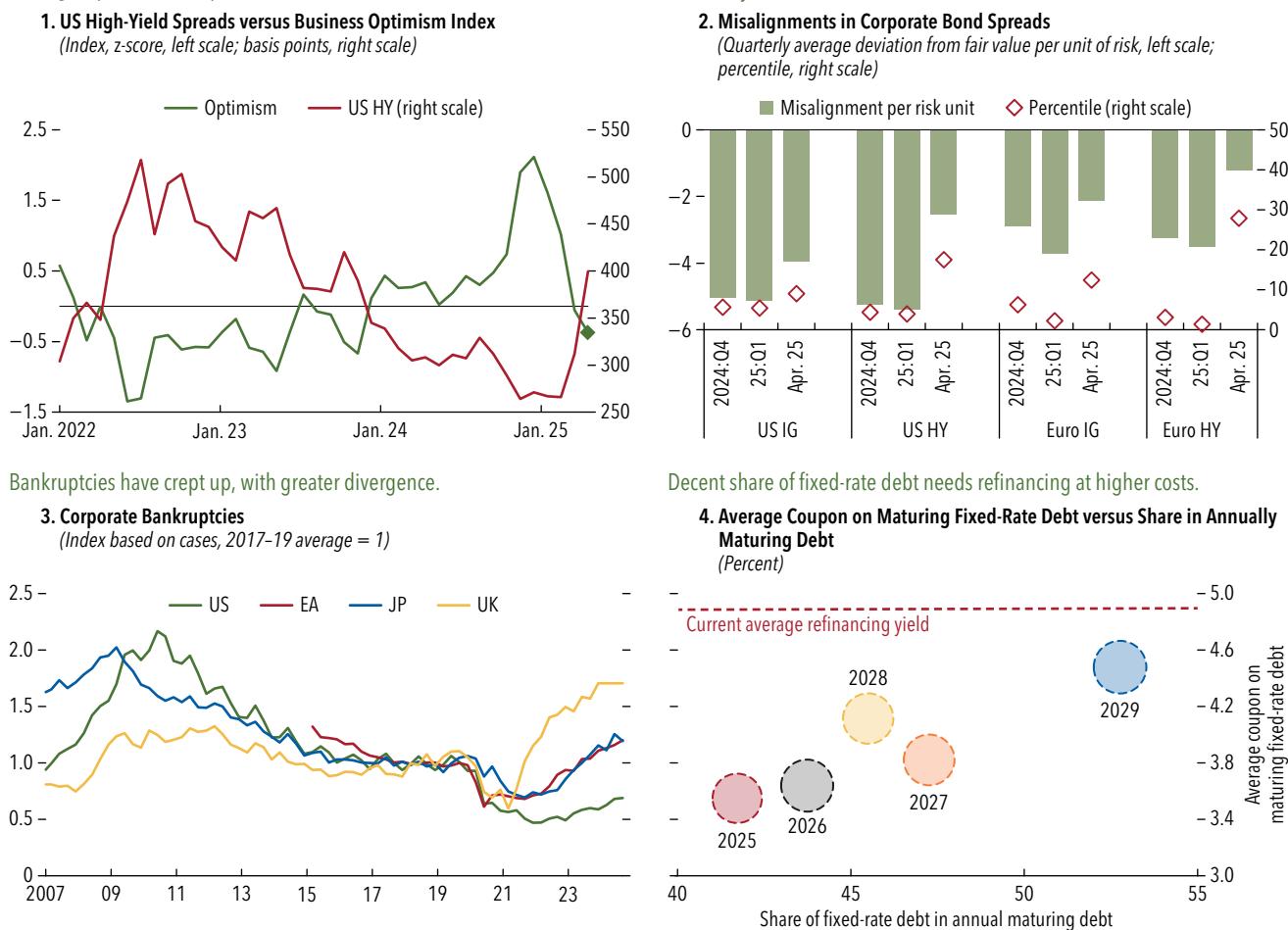
Corporate Credit Fundamentals Are Solid Overall, but Weak Spots Are Emerging

Since the October 2024 *Global Financial Stability Report*, corporate cash flows have remained healthy, and balance sheets remain resilient, in aggregate. Nevertheless, corporate bond spreads have widened recently (see Figure 1.1 panel 3), reflecting investors' concerns over the adverse impact of higher global tariff rates on corporate earnings in coming quarters. For example, US high-yield corporate bond spreads have risen as the optimism of American businesses faded (Figure 1.22, panel 1). Despite their widening spreads, US corporate bond valuations remain stretched relative to macro fundamentals, as investment grade and high-yield spread misalignments are still around the 10th and 25th historical percentiles, respectively (Figure 1.22, panel 2), suggesting that further widening of spreads are likely should economic and trade uncertainty remain high.

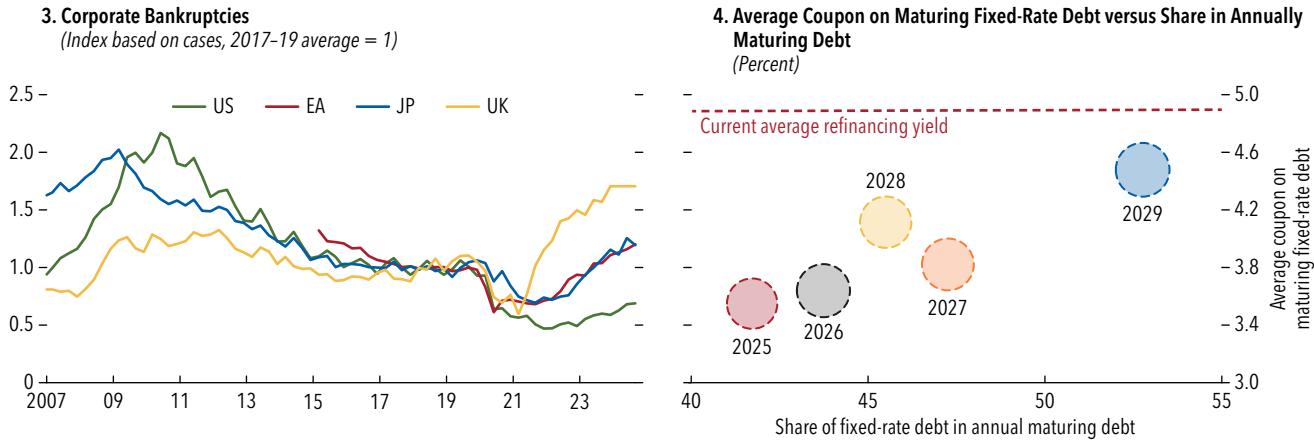
Globally, corporate firms' debt serviceability outlook has been bolstered by still-solid corporate earnings projections. Until recently, weaker borrowers had been able to restructure their debts, avoiding

Figure 1.22. Corporate Credit Fundamentals

Deteriorating economic sentiment in the United States has contributed to driving corporate bond spreads wider.



Bankruptcies have crept up, with greater divergence.



Sources: Bloomberg Finance L.P.; Dealogic; Moody's Investors Service; and IMF staff calculations.

Note: In panel 1, the business optimism index is the arithmetic average of the normalized National Federation of Independent Business (NFIB) Small Business Optimism Index and the University of Michigan Consumer Expectations Index since 2022. The green marker is a proxy for optimism index in April. In panel 2, model values are based on available data as of April 8. In panel 2, misalignment is the difference between market spread and model-based spread scaled by the standard deviation of monthly changes in spread. Negative values indicate overvaluation. For the model details, please see the October 2019 Global Financial Stability Report, Online Annex 1.1. In panel 4, the size of the bubbles represents the amount of total outstanding debt maturing. Data labels in the figure use International Organization for Standardization (ISO) country codes. HY = high yield; IG = investment grade.

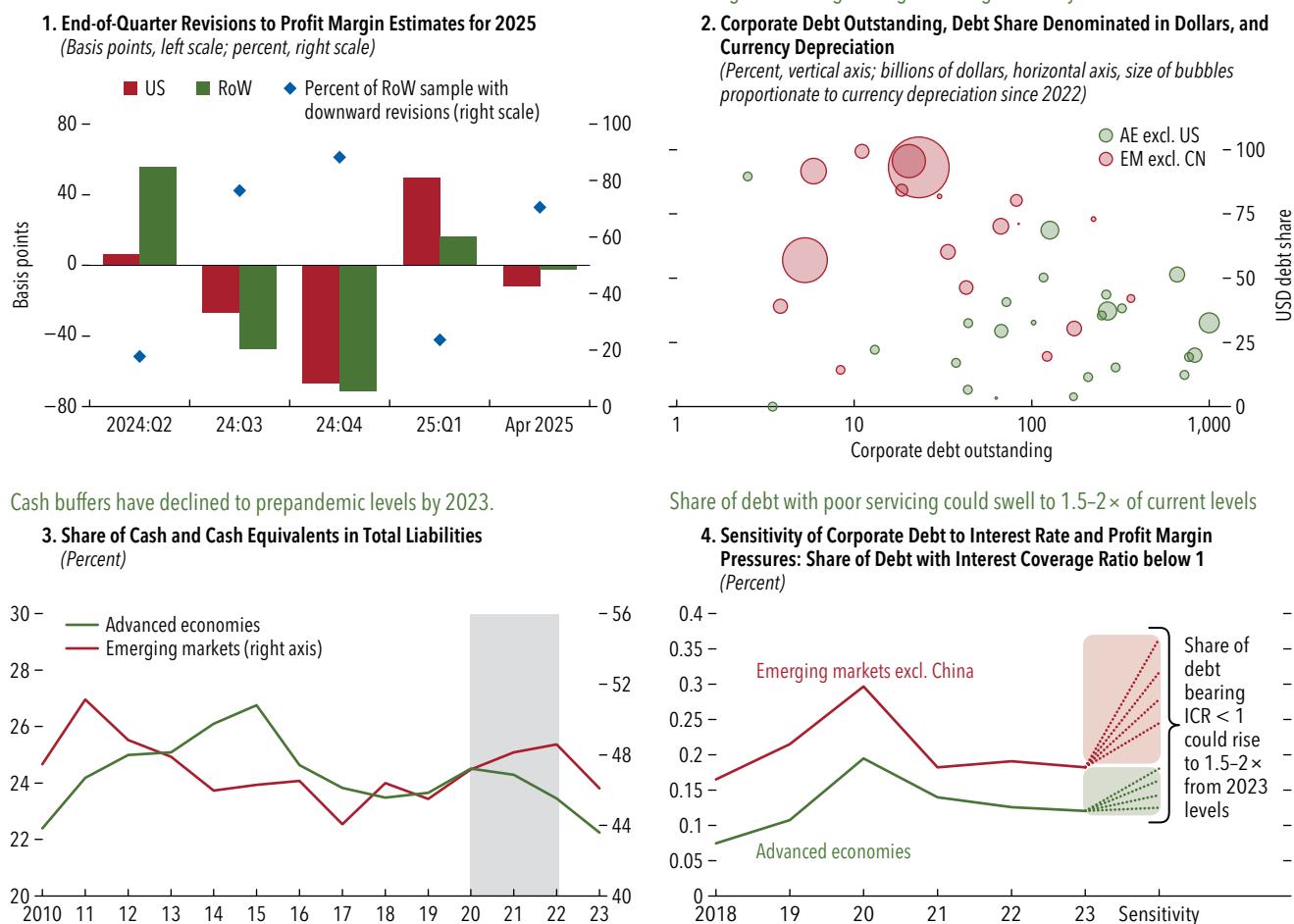
costly bankruptcies. That said, corporate bankruptcies have continued to creep up in major advanced economies (Figure 1.22, panel 3). Debt serviceability outlook could deteriorate rapidly if a prolonged period of trade policy uncertainty adversely affects earnings prospects. A decent share of corporate debt that will need to be refinanced in the next few years carries a fixed rate below the prevailing market yield, and an increase in credit spread leading to a higher funding cost owing to refinancing could challenge weaker firms amid such circumstances (Figure 1.22, panel 4).

Trade Policy Uncertainty Is Especially Challenging for Emerging Market Firms

Compared with a decade ago, many countries have increased the shares of their exports destined for the United States and the shares of their imports coming from China, in turn increasing their exposures to international trade policies. Most of these countries are navigating periods of heightened trade uncertainty, which has weighed on corporate profitability estimates in the last few quarters. In the first quarter of 2025, optimism regarding trade negotiations and other country-specific prospective policy measures led to

Figure 1.23. Trade Policy Uncertainty and Corporate Profitability and Debt Serviceability

Estimates of corporate profitability widely revised down.



Sources: Bloomberg Finance L.P.; Dealogic; Moody's Investors Service; S&P Capital IQ Pro; Organization for Economic Co-operation and Development, National Accounts database and IMF staff calculations.

Note: Panel 1 shows end-of-quarter revisions to profit margin estimates for benchmark equity indices in 17 advanced and emerging market economies and the United States. The “rest of the world” series is the simple average of country-level revisions. In panel 2, the size of the bubbles represents the extent of local currency depreciation since 2022, when the Federal Reserve started its round of rate hikes. Panel 3 features median cash and equivalents as a percentage of total financial liabilities of the corporate sector for 10 AEs and 10 EMs. Cash and equivalents include cash and deposits, loans, debt securities, and accounts receivable on the asset side of the balance sheet. The AE country group comprises Canada, France, Germany, Greece, Japan, Korea, The Netherlands, Spain, the United Kingdom, and the United States. The EM country group comprises Brazil, Chile, Colombia, Croatia, Hungary, India, Israel, Mexico, Poland, and Türkiye. In panel 4, the Advanced economies group includes Australia, Belgium, Canada, Czech Republic, France, Germany, Italy, Japan, Luxembourg, The Netherlands, New Zealand, Norway, South Korea, Spain, Sweden, the United Kingdom, and the United States. “Emerging markets excl. China” includes Brazil, Chile, Colombia, Hungary, India, Indonesia, Israel, Malaysia, Mexico, Poland, Russia, South Africa, Thailand, and Türkiye. AE = advanced economy; EM = emerging market.

improved profitability estimates for both US firms and companies from the rest of the world; these estimates have recently been revised downward on growing concerns about potentially higher tariff rates squeezing corporate margins going forward (Figure 1.23, panel 1).

In the case of emerging market corporate firms, one critical channel through which heightened trade policy uncertainty could impact firms, is through higher

exchange rate volatility (see section “Emerging and Frontier Markets: Challenges and Resilience”), as was also evident during global trade tensions in 2018–19. Exchange rate volatility drives up the cost of FX hedging instruments for corporate firms, particularly for those directly integrated into global supply chains or with sizable foreign-currency-denominated debt. These firms must cover their FX exposures but may typically have only limited access to hedging tools—only 11 percent

of the turnover in global FX derivatives is denominated in emerging market currencies, far less than emerging markets' share in global trade of more than one-third (see BIS 2016 and 2022)—and so FX and maturity mismatches alongside higher volatility could exacerbate funding problems. Limited access to FX hedging also potentially weakens earnings via lower exports, higher hedging costs, or substantial FX-related losses.¹³

The FX challenge could prove especially formidable for firms that have built up dollar-denominated liabilities in recent years. Specifically, if trade tensions were to reduce income in foreign currencies, servicing these liabilities could become increasingly onerous. Many emerging market firms have large amounts of dollar-denominated debt in their liabilities, and their currencies are prone to depreciation more than those of peers operating with smaller dollar exposures. For example, firms in Latin America, which have taken greater advantage of the opportunity to tap cheap dollar debt in the last few years,¹⁴ have faced larger local currency depreciation. Despite the relatively small size of each country's corporate debt outstanding, portfolio outflows, coupled with global currency depreciation against the dollar and potentially exacerbated by various external factors, could increase the risk of market stress (Figure 1.23, panel 2).

With uncertainties abounding, firms may further draw down cash liquidity buffers built up during the pandemic. These cash buffers¹⁵ helped firms ride out the global tightening in monetary policy during 2022–23 but have now declined to below prepandemic levels in both advanced and emerging market economies (Figure 1.23, panel 3). With dwindling cash buffers and lower expected earning margins, the share of firms with poor debt serviceability, that is, those with interest coverage ratios (ICRs) of less than 1, could rise closer to levels seen in 2020. Currently, 12 percent of advanced economy corporates have interest coverage

¹³Many emerging market corporate firms have limited “natural FX hedges” because future claims and liabilities in foreign currency are not necessarily correlated. Firms may not match claims and liabilities in foreign currency. The “natural hedge” may also be limited if the correlation between exports and imports trade credit is not high.

¹⁴According to Chui, Kuruc, and Turner (2016), emerging market firms have historically raised debt from offshore markets during prolonged low-rate environments as sovereign spreads have narrowed, making the debt cheaper. More than 70 percent of the bonds issued by firms in major Latin American countries since 2020 have been denominated in dollars. The corresponding share for emerging markets excluding China averages around 47 percent.

¹⁵“Cash buffers” are defined here as cash and cash equivalent assets as a percentage of total financial liabilities.

ratios below 1, whereas this share is 18 percent for emerging market corporate firms outside China. IMF staff analysis suggests that a progressive worsening of earning margins, along with an increase in spreads and effective funding costs, could impair corporate debt serviceability in a nonlinear manner, and the share of debt with poor serviceability could reach 1.5 to 2 times of levels in 2023. The sensitivity is higher among emerging market corporates, where an initial 50 basis point compression in profit margins and an equivalent increase in effective interest rates could raise this share of debt with poor serviceability by 6 percentage points; this share could increase by 17 percent under a more adverse scenario of a 200 basis point impact on profit margins and interest rates (Figure 1.23, panel 4). For advanced economies, the adverse scenario could raise the share of debt with poor serviceability by 5.6 percentage points to 18 percent.

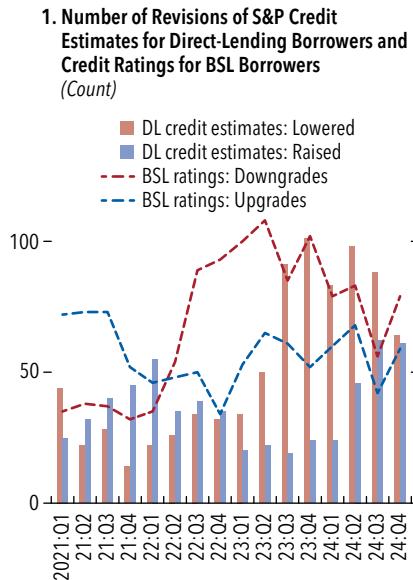
The Direct Lending Segment of Corporate Credit Is Showing Mixed Prospects

Leveraged finance instruments—corporate debt characterized by borrowers with high amounts of leverage and weaker credit ratings—have become a more systemic segment of the credit market. They remain under pressure from high interest rates, in large part, because of the floating-rate nature of the debt. The main categories affected are broadly syndicated loans (BSLs—typically public loans with multiple lenders) and direct lending (DL—debt provided by nonbank lenders, that is, private credit). Compared with that of BSLs, the universe of DL borrowers includes a larger share of vulnerable borrowers.

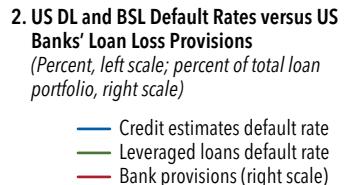
Credit quality showed some improvement alongside the narrowing downgrade-upgrade gap among DL borrowers through late 2024 (Figure 1.24, panel 1), and DL default rates have been broadly in line with other measures of credit distress, for instance, BSL default rates and banks’ loan loss provisions (Figure 1.24, panel 2). More recently, rising uncertainty and weakened investor confidence amid the market turmoil following the tariff announcements by the United States starting April 2 have driven up spreads on new deals and driven down expected deal flow. The risk of earnings erosion and cash flow problems has increased, with idiosyncratic pockets of risk in some industries or borrowers. Even before the tariffs, nearly half of DL borrowers had negative free operating cash flows (Figure 1.24, panel 3), prolonging their reliance

Figure 1.24. Broadly Syndicated Loans and Direct Lending

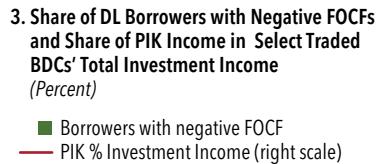
Downgrades still exceed upgrades for broadly syndicated loans and direct-lending borrowers.



Direct-lending default rates have been broadly in line with other measures of credit distress.



Free operating cash flows have often been negative, and usage of PIK has been high.



Sources: Bloomberg Finance L.P.; S&P Global Ratings; and IMF staff calculations.

Note: In panel 2, default rates include selective defaults. Banks' loan loss provisions are expressed as percentages of total loans. In panel 3, the share of direct-lending borrowers with negative FOCFs is based on the universe of S&P Global Ratings' Credit Estimates. Select traded BDCs are based on Bloomberg's set of peer BDCs. PIK income includes interest and dividend income. BDC = business development company; BSL = broadly syndicated loan; DL = direct lending; FOCF = free operating cash flow; PIK = payment-in-kind.

on payment-in-kind (PIK) provisions and amend-and-extend restructurings.¹⁶ Health care services and software remain among most affected, with 20 and 27 percent, respectively, of DL borrowers in these sectors having S&P credit estimates in the “ccc” category (S&P Global Ratings 2024b) and are therefore among the most vulnerable to elevated policy uncertainty. Market participants express concerns that this deterioration of the borrowers’ credit quality has not been reflected in the accounting valuation of DL loans (see the discussion about stale valuation practices in the April 2024 *Global Financial Stability Report*, chapter 2). Moreover, as private equity (PE) funds are facing pressures to sell investments to return capital to their investors (LPs), PE funds are increasingly levering up their acquired companies to fund special dividends to be distributed to LPs, thereby further straining borrowers’ debt sustainability.

¹⁶PIK provisions in DL loans allow borrowers to pay a portion of interest in cash and capitalize the remaining interest by adding it to the loan principal. Such provisions can address borrowers’ short-term cash flow challenges but may defer the recognition of underlying financial issues, potentially increasing debt burdens over time.

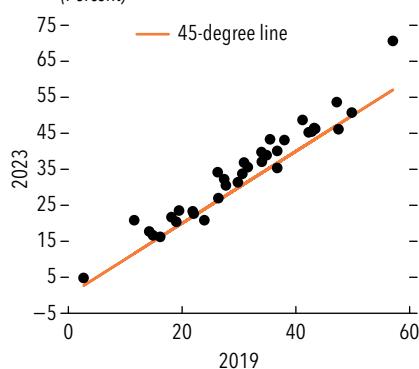
Household Sector Vulnerabilities Are Increasing due to Elevated Holdings of Equity

Household assets had grown rapidly since the end of the pandemic, with price increases in equities and residential housing markets fueling the growth. Households in most countries now hold more stocks as a share of their financial assets than they did in 2019 (Figure 1.25, panel 1). For countries where household stock holding shares were previously low, an increase in the share is a sign of improved stock market participation and investment diversification. Notably, US households’ stock holdings have reached a record high level by the end of 2024, driven in large part by the appreciation in the value of households’ portfolios of equity securities, but also in part by the modest decline in deposits and steady holdings of debt securities as risk appetite among households increased (Figure 1.25, panel 2). US households’ exposure to equities and investment fund shares now modestly surpasses real estate, which has historically been the largest asset on household balance sheets. Increasing stock market exposure has made households more vulnerable to any

Figure 1.25. Household Exposure to Stock Market and Real Estate

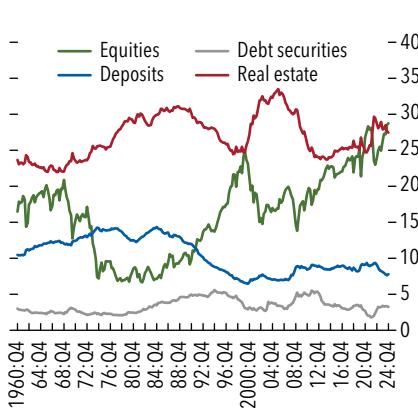
Globally, households are currently holding a larger share of financial assets in equities.

1. Share of Stocks in Household Financial Assets across Countries, 2019 versus 2023 (Percent)



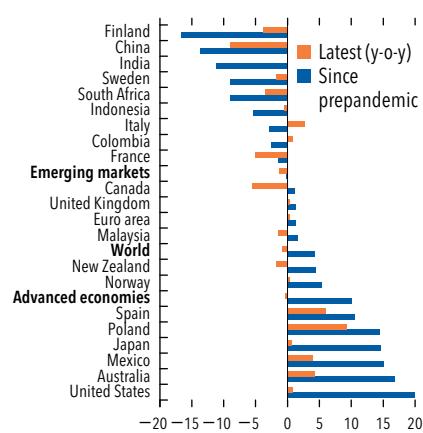
In the United States, equities as a share of total household assets have increased to a record high.

2. US Households' Asset Allocations (Percent)



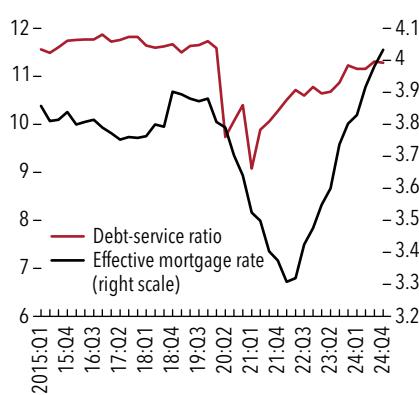
Housing markets have cooled modestly but average real home prices remain elevated relative to pre-pandemic levels.

3. Changes in Global Real Estate Index (Percent)



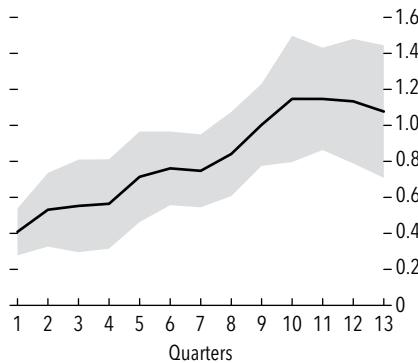
US household debt-service ratios have increased amid higher mortgage rates.

4. US Debt-Service Ratios and Effective Mortgage Rates (Percent)



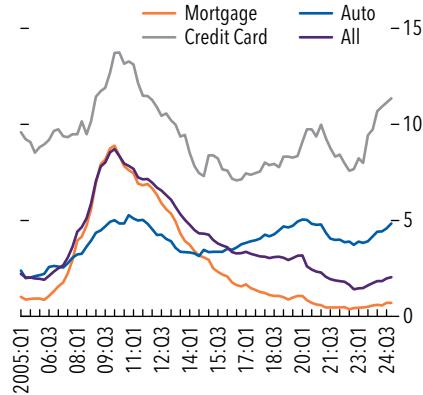
The rise in debt-service ratio is associated with higher delinquency rates.

5. Impulse Response of US Household Delinquency to a 1 Percentage Point Increase in Debt-Service Ratio (Percent)



Credit card and auto loan delinquency rate have increased.

6. Rates of Delinquency for 90 Days or Longer: Percent of Balance by Loan Type (Percent)



Sources: Bank for International Settlements; Federal Reserve Board, Financial Accounts of the United States (Z.1); Haver Analytics; Federal Reserve Bank of New York, New York Fed Consumer Credit Panel/Equifax, Household Debt and Credit data; and IMF staff estimates.

Note: In panel 2, equities and investment fund shares, debt securities, deposits, and real estate are at market value and include indirect and direct holdings of households and nonprofit institutions according to US financial accounts. Investment fund shares include mutual fund and money market fund shares. Deposits include currency. In panel 4, the household debt-service ratio is the ratio of debt-service payments to disposable personal income. Debt-service payments include both mortgage and consumer debt payments. Panel 5 uses the local-projections method to estimate the impulse responses of delinquency rates, with right-hand side variables including current and lagged-four debt-service ratios and lagged-three delinquency rates. The delinquency rate is calculated as the share of balances with payments late by at least 30 days. The shaded area shows Newey-West 90 percent confidence bands. Panel 6 data are taken from the Federal Reserve Bank of New York's Household Debt and Credit report (2025) and do not depict all credit types.

prolonged decline in stock prices; indeed, the recent tariff-related stock market correction could directly reduce household wealth.¹⁷ Financial turbulence may also exacerbate market sell-offs if households, sometimes known as retail investors, reduce exposures to assets or redeem their investment vehicles, such as mutual funds.

Similarly, fluctuations in home prices can also challenge household balance sheets, given households' high levels of exposure to the housing market. Household wealth in the United States, particularly housing prices, may have been the most significant driver of consumption in recent years, meaning that a sharp repricing in housing and stock holdings could pose significant headwinds to aggregate consumption and overall economic activity (see Dao, Jirasavetakul, and Zhou 2024; and IMF 2024).

So far, global real home prices have been declining gradually and only to a modest degree (Figure 1.25, panel 3) from their pandemic period highs, in part because of recent rate-cutting cycles among global central banks. Paces of price changes have varied, however, and US home prices have notably remained elevated.¹⁸ That said, despite higher aggregate levels of home equity due to elevated home prices, a longer period of higher interest rates—if inflation proves more persistent than currently expected—may adversely affect households' debt servicing capacity to service their debt and erode the value of their real estate assets. This has already been felt in countries with predominantly variable-rate mortgages, which have seen higher debt-service ratios, though there appears to be some moderation or plateauing as interest rates decline. Households in countries with predominantly fixed-rate mortgages have seen debt-service ratios remain relatively low, though their capacity to service their

debt may strain as outstanding debt gradually shifts to higher rates.¹⁹

Some evidence would suggest this is already playing out to some degree in the United States, as higher interest rates have modestly increased the household debt-service ratio (Figure 1.25, panel 4). IMF staff estimates suggest that a 1 percentage point increase in the debt-service ratio is associated with a gradual rise in household delinquency rates in subsequent quarters (Figure 1.25, panel 5). Furthermore, lower-income households appear more vulnerable to higher interest rates, given their higher levels of exposure to variable-rate debt. Although delinquency rates for fixed-rate mortgages remain low (Figure 1.25, panel 6), they have increased notably for variable-rate auto loans and credit card debt over the past couple of years. Stress on households may reaccelerate if the economy slows down or if inflation remains high (Federal Reserve 2025).

Sentiment in Commercial Real Estate Has Shown Signs of Stabilization, but Headwinds Remain

Global prices and transaction volumes for commercial real estate (CRE) have continued to stabilize since the October *Global Financial Stability Report*. Total CRE returns were 1.3 percent in the fourth quarter of 2024, and volume climbed to positive territory for the first time after bottoming out in the third quarter of 2023 (Figure 1.26, panel 1). While the latest data may not yet fully account for the recent market turmoil, evidence of stabilization of CRE returns and transaction volumes could be driven by the ongoing easing of monetary policy, with both occupier and investment markets showing some positive headline balances.²⁰

Recovery remains uneven across regions and property types. Notably, in North America, office sector values have declined significantly (12.3 percent) year

¹⁷Some market observers associate household equity ownership with equity market cycle peaks on the belief that households may have a bias toward investments based on past performance. Research also suggests that consumer spending is sensitive to stock market movements, as indicated by credit card spending (see also Farrell and Eckerd 2021 and Brown and Wright 2023).

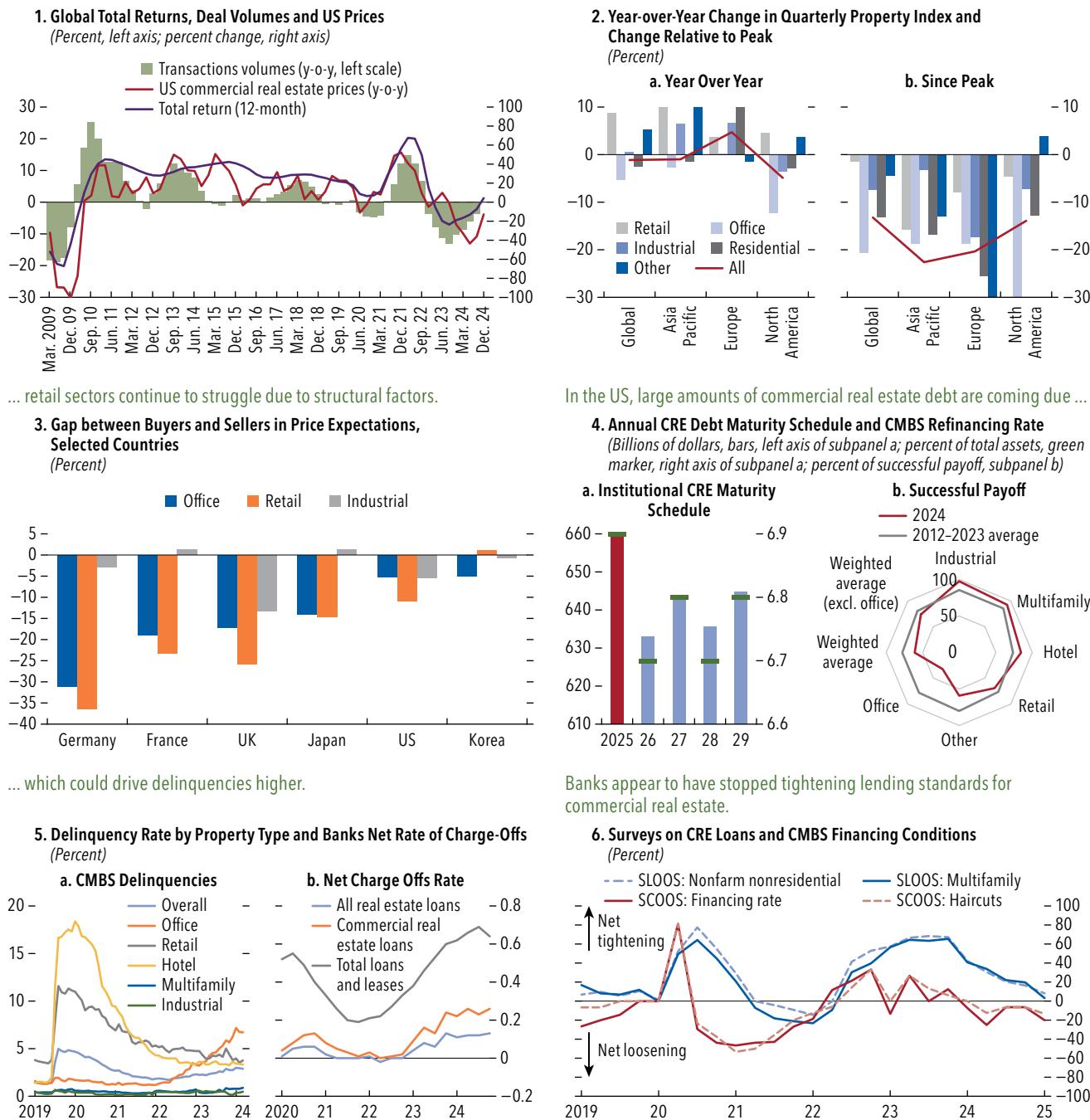
¹⁸This contrasts with countries with a higher percentage of variable-rate mortgages, like Norway, but also with developments in other, similar advanced economies with a high percentage of fixed-rate mortgages, like Canada and France, where home prices have declined significantly (see the April 2024 *World Economic Outlook*). Elevated home prices in the United States continue to be supported by the lack of single-family housing supply, as well as the so-called lock-in effect, which discourages homeowners from selling their house at the cost of a higher mortgage rate.

¹⁹Despite the lock-in effect, the share of homeowners with higher mortgage rates has gradually increased in the United States as a growing percentage of buyers come to accept the higher rates. According to the latest data from the US Federal Housing Finance Agency's National Mortgage Database (<https://www.fhfa.gov/data/dashboard/nmdb-outstanding-residential-mortgage-statistics>), 83 percent of US mortgage holders have an interest rate below 6 percent, a decrease from the mid-2022 peak of about 93 percent.

²⁰“Occupier” and “investment” markets refer to the commercial real estate landscape, whereby businesses (occupiers) lease properties for their operations (for example, office space, retail stores, and industrial facilities), as opposed to those who purchase properties as an investment to generate income through rent, capital appreciation, or both.

Figure 1.26. Developments in Commercial Real Estate

Transaction volumes and prices for commercial real estate have reached their nadirs.



Sources: BofA Global Research; Federal Reserve (2024, 2025); Fitch Ratings; Mortgage Bankers Association; MSCI World Real Estate Index; and IMF staff calculations.

Note: In panel 1, the MSCI Global Quarterly Property Index is relative to peak values of each corresponding property type/region; last observation is 2024:Q4. In panel 3, the gap in price expectations measures the degree of difference in buyer and seller views regarding pricing as computed by MSCI as of the end of 2023. Panel 4 shows the percentage of conduit loans maturing in 2024. In panel 5, net charge-offs are the value of loans and leases removed from books and charged against loss reserves; values are annualized and net of recoveries. In panel 6, the Senior Credit Officer Opinion Survey on Dealer Financing Terms (SCOOS) reports the percentage of respondents to question 70, "Over the past three months, how have the terms under which CMBS are funded changed?" that reported an "unchanged" financing rate for commercial mortgage-backed securities (CMBS). For both SCOOS and SLOOS, the latest survey observation is 2025:Q1. CRE = commercial real estate; SLOOS = Senior Loan Officer Opinion Survey on Bank Lending Practices; y-o-y = year over year.

over year, with values of industrial and retail properties remaining steady overall. Offices in Asia and the Pacific and Europe have registered smaller declines (Figure 1.26, panel 2). Relative to their post-pandemic peak, private real estate values globally have decreased 13.2 percent, declining most for offices (20.6 percent), as the sector continues to face a structural shift to less in-office work. Such declines echo the market's estimates for the so-called price gap—the degree of difference in buyers' and sellers' views on pricing—in respect to office and retail properties. For offices, the price gap ranges between 5 percent (Korea) and 30 percent (Germany). Industrial property prices have seen some more modest buyer-seller divergence: -5.2 percent in the United States and 1.5 percent in Japan (Figure 1.26, panel 3).

The pressure to refinance legacy loans persists. Estimates suggest that \$660 billion in commercial and multifamily real estate mortgages in the United States is due for payoff in 2025, with about \$3.2 trillion in CRE debt maturing between 2025 and 2029, accounting for more than half of the \$6.1 trillion in outstanding debt. Some loans that originated during periods of low interest rates and high property valuations may now be subject to negative equity. This corresponds to nearly 30 percent of office loans maturing in 2025 (about \$30 billion) and \$19 billion of loans on apartment properties (10 percent of maturing loans). On the commercial mortgage-backed securities (CMBSs) front, just 61 percent of US loans that matured in 2024 were actually paid off, compared with 78 percent over the previous decade, highlighting cash flow difficulties among CRE borrowers. Refinance success rates continue to vary by property type. Only 32 percent of conduit loans collateralized by office properties were able to be refinanced in 2024, compared with about 85 percent of industrial, multifamily, and retail conduit loans that expired last year (Figure 1.26, panel 4). Although the ongoing monetary policy easing and pent-up demand have helped increase origination of CRE debt, current levels remain below those before 2019 across all property types on account of increased lender caution and regulatory scrutiny (down by 41 percent for all segments and 54 percent for office real estate).

Consequently, CRE delinquencies have continued to pick up. In the fourth quarter of 2024, the overall CRE loan default rate in the United States reached its highest level since 2014 (about 1.57 percent). At the

segment level, office-secured loans remain the primary cause for concern, and delinquency rates for other property types have leveled off (Figure 1.26, panel 5). At the same time, US banks' net charge-offs on CRE loans—though still low by historical standards—rose in 2024 to 0.26 percent at the end of 2024, with the increase mainly reflecting the financial strain on owners of office property. Banks appear to have stopped tightening credit standards for CRE loans across all categories. In securitized markets, a vast majority of primary dealers recently reported that the rates offered, and haircuts required, to finance CMBSs have stabilized (Figure 1.26, panel 6; Federal Reserve 2024). Liquidity challenges remain, however, being most pronounced in the office sector, in which credit availability is the tightest and concerns over future demand among occupiers persist.²¹

Overall, there appear to be upside and downside risks for the CRE market going forward. Across major advanced economies, effects of trade uncertainty and potential disruptions to global supply chains could result in a weaker-than-expected recovery in CRE through lower transaction volumes and higher cap rates, depressing property values, and make refinancing more difficult. Higher interest rate term premiums could challenge the repayment ability of developers and borrowers. At the same time, the CRE sector generally outperforms the broader equity market during easing periods, hence the current Federal Reserve cutting cycle has the potential to support recovery in prices and valuations, everything else equal. In parallel, office conversions are becoming increasingly attractive to developers, with conversion rates having surged recently, albeit for just a small part of the market (in the United States, 71 million square feet or 1.7 percent of total office space, as of the third quarter of 2024). Owners of office property have been forced to sell buildings at a discount owing to high rates of office vacancy (based on market estimates, between 17 and 20 percent in the United States), which has encouraged price discovery and a reorientation of investors toward emergent property types.

²¹In the fourth quarter of 2024, CRE lenders and lessors had higher delinquency rates than the previous year. While bank exposure to CRE through providing credit lines to real estate investment trusts remains relatively low, recent evidence suggests that indirect exposure through real estate investment trusts could amplify systemic risks during periods of market stress (see also Acharya and others 2025 and Crosignani and Prazad 2024).

Policy Recommendations

The possibilities of further correction of asset prices, potential strains impacting highly leveraged financial institutions, and turbulence in core sovereign bond markets elevate financial stability risks. This section recommends policies to limit vulnerabilities and increase financial sector resilience. The policy toolkit for mitigating financial stability risks includes policies for market infrastructures that ensure market functioning, the prudential supervision and regulation of financial institutions, and emergency liquidity and crisis resolution tools. Mitigating financial vulnerabilities and preparedness for crisis management are key to containing the potential adverse impact of financial sector developments on macroeconomic outcomes.

History has shown time and time again that financial crises entail significant and persistent macro downside costs.

Amid heightened economic and trade policy uncertainty and turbulent financial markets, authorities should prepare to deal with financial instability. They should ensure that financial institutions are prepared to access central bank liquidity facilities and be prepared to intervene early to address severe liquidity or market functioning stress, especially in core bond and funding markets. Liquidity can be provided to nonbanks with appropriate guardrails (see Chapter 2 of the April 2023 Global Financial Stability Report). Financial institutions should be required to test their access to central bank instruments periodically. Implementation of recovery and resolution frameworks is critical for addressing weak or failing financial institutions without undermining financial stability or risking public funds.

Inflation surprises could trigger further sell-offs in financial markets. Central banks should gauge price movements carefully. Where growth and inflation momentum are set to continue slowing, central banks should gradually ease monetary policy toward a more neutral stance. Where inflation remains stubbornly above targets, central banks should maintain a restrictive monetary stance and affirm their commitment to bring inflation back to their targets to ameliorate upside risks to inflation.

Although major emerging markets have proven remarkably resilient to the recent market turbulence, further abrupt asset price corrections in global markets could tighten emerging markets' financial conditions and raise currency volatility. Appropriate policy

responses recommended by the IMF's Integrated Policy Framework depend on country-specific circumstances. For countries with deep foreign exchange markets and low foreign currency debt, relying on monetary policy and exchange rate flexibility is appropriate. On the other hand, if foreign exchange markets are shallow or countries face large foreign currency debts, it may be appropriate to conduct foreign exchange interventions temporarily or loosen inflow capital flow management measures if conditions allow, provided such interventions do not impair the credibility of macroeconomic policies or replace necessary adjustments. The strength and independence of institutions at the foundation of monetary and financial sector policies must be continuously increased to boost longer-term resilience in emerging market economies.

High leverage of NBFIs and increased interconnectedness between NBFIs and banks mean that strains at weaker institutions may have financial stability consequences for the broader system. Sufficient levels of capital and liquidity in the banking sector remain the anchor of global financial stability. Evidence of unwarranted divergence of average risk weights across banks highlights the need for full, timely, and consistent implementation of Basel III and other international standards. Better-resourced, independent, intensive, and conclusive supervision also remains paramount to financial stability. Supervisors should continue to stress-test banks' exposures, especially those from sectors facing challenges, such as commercial real estate. The deepening nexus between banks and NBFIs also calls for supervisors to enhance the risk assessment of their linkages.

It is crucial to strengthen policies that mitigate vulnerabilities and mechanisms of shock amplification stemming from nonbank leverage. It is also paramount to enhance reporting requirements for NBFIs so that supervisors can distinguish poorly governed and excessive risk-taking institutions from others that contribute more positively to financial intermediation. Given the potential significant externalities from NBFIs, the relevant authorities need to coordinate more closely to ensure that they have sound governance structures, mechanisms, and processes in place for monitoring NBFIs from systemwide and cross-sectoral perspectives. The strong growth of NBFIs in financial intermediation can generate alternative sources of financing for firms, better capital allocation, and greater market efficiency through activity in capital markets. However,

reaping these benefits requires policy steps to contain risks to financial stability.

Elevated economic uncertainty and financial market volatility underscore the need to strengthen the prudential policy frameworks, including micro and macroprudential approaches. In countries with insufficient buffers, policymakers should tighten macroprudential tools to increase resilience against a range of shocks while avoiding a broad tightening of financial conditions. Where a downturn in activity is leading to financial stress, macroprudential buffers could be released to help banks absorb losses and support the provision of credit to the economy, thereby reducing the financial amplification of the downturn.

With gross sovereign financing needs forecasted to remain above prepandemic averages in most countries, fiscal adjustments should primarily focus on credible and growth-friendly rebuilding buffers to keep amounts of debt issuance and costs of external financing affordable, as both of these are imperative to prevent escalation of investors' concerns and an abrupt tightening of financial conditions. Where opportunities arise, countries should proactively explore liability management operations to manage refinancing risks and reduce or smooth debt servicing profiles. For countries where debt is at risk of becoming unsustainable, early contact with creditors to coordinate an orderly and efficient debt treatment that restores

debt sustainability could help avert costly defaults and prolonged loss of market access.

To address risks from potential wide adoption of crypto assets, jurisdictions should safeguard monetary sovereignty and strengthen monetary policy frameworks, guard against excessive volatility in capital flows, and adopt unambiguous tax treatment of crypto assets. The IMF and Financial Stability Board have set out a road map for building institutional capacity. Consistent, comprehensive, and coordinated implementation of this road map and other relevant international standards and recommendations is paramount for addressing financial stability and integrity risks stemming from crypto assets while supporting macroeconomic policies. Some crypto projects, including certain tokenization developments, may fall under existing banking or securities regulations, and authorities should monitor and supervise those activities to address vulnerabilities based on them.

The growing interconnectedness across jurisdictions means that stress emanating from specific jurisdictions can have a global impact, calling for other regions to be prepared. Enhancing multilateral surveillance should enable policymakers to monitor and prepare for global shocks, cross-country contagion, and economic and financial spillovers from other jurisdictions. Strengthening the global financial safety net is crucial to swift and effective mitigation of financial risks.

Box 1.1. DeepSeek and the AI Revolution

On January 27, 2025, a Chinese company, DeepSeek, announced a potentially lower-cost artificial intelligence (AI) large language model (LLM), shifting investor sentiment concerning the sustainability of the recent equity rally led by the technology sector and driven in large part by optimism about investment in AI-enabling computational resources (for example, infrastructures). This shift led to a correction in equity prices that day, centered on equities in the information technology (IT) sector, especially those in advanced economies (see Figure 1.1.1, panel 1). For example, the S&P 500 IT sector fell by more than 5 percent, dragging the overall index down 1.5 percent. Spillovers to other sectors and regions were limited and mainly involved energy sectors.

As highlighted in the October 2024 *Global Financial Stability Report*, equity valuations had become highly dependent on continued growth in earnings. The launch of DeepSeek's model triggered concerns over current earnings forecasts for key US stocks, especially those in the semiconductor space. Price-to-earnings ratios (P/E) in the S&P 500 IT sector have fallen by close to 2 percentage points since the launch but remain significantly above historical norms

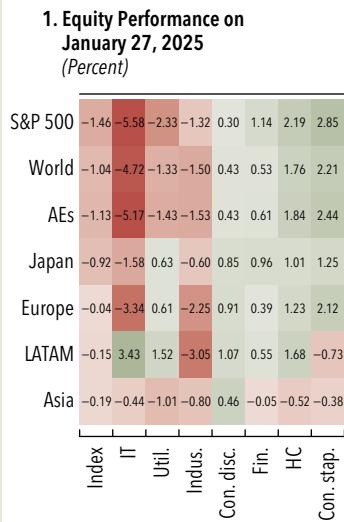
This box was prepared by Gonzalo Fernandez Dionis and Harrison S. Kraus.

(See Figure 1.1.1, panel 2). Although Chinese stock markets were closed on the day of the announcement, investor reaction was positive, with technology sectors from the Chinese mainland and Hong Kong SAR having gained 10 and 30 percent, respectively, over the month following.

Since the announcement, major players in AI have reaffirmed their commitments to investing in the field, with capital expenditures for the Magnificent 7 (Alphabet, Amazon, Apple, Meta Platforms, Microsoft, NVIDIA, and Tesla) still showing strong growth (see Figure 1.1.1, panel 3). Investment from several of these companies, along with other AI developers, remains a major driver of growth in earnings for companies producing AI infrastructure or supplying energy to AI-related facilities. From a financial stability perspective, the existence of a cost-efficient open-source LLM could mean earnings for this subsector do not grow as expected, prompting a reassessment of current valuations and possibly a stock market correction. If a broader perspective is taken, on the other hand, competition among LLM models could drive down costs, increase take-up, and broaden the returns on AI. This could represent a quicker move to a second phase of the AI revolution as markets continue shifting focus from AI infrastructure to AI software and usage.

Box 1.1 (continued)**Figure 1.1.1. Asset Prices: Divergence of Global Equity Markets as Corporate Bond Spreads Tightened**

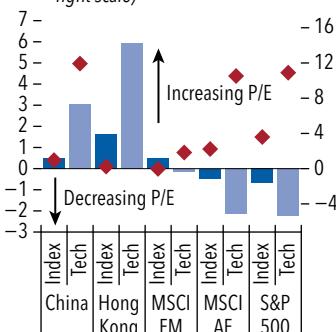
The stock price reaction has been centered in the technology sector, especially in AEs.



The impact on valuation in Chinese technology firms appears to have been mostly positive.

2. Changes in Forward P/E Ratios across Major Indices following the DeepSeek Announcement

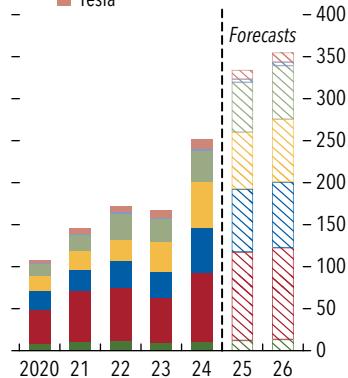
(Changes in 2025 P/E ratios over the period January 27 to February 27, 2025, left scale; 12-month trailing P/E ratio's deviation from 10-year average, right scale)



Analysts forecast capital expenditures in the Magnificent 7 in 2025 will double levels seen in 2023.

3. Magnificent 7 Capital Expenditures (Billions of dollars)

■ Apple ■ Amazon
■ Alphabet ■ Microsoft
■ Meta ■ NVIDIA
■ Tesla



Sources: Bloomberg Finance L.P.; and IMF staff calculations.

Note: In panel 2, red diamonds show the current 12-month trailing deviation of the price-to-earnings (P/E) ratio from the 10-year average P/E ratio, plotted on the right scale. Blue bars represent percentage point change in P/E ratio using expected year-end 2025 EPS, plotted on the left scale. Analysis in this panel focuses on the one-month period following the DeepSeek announcement. It should be noted that stocks in Chinese mainland and Hong Kong SAR were experiencing a rally prior to the DeepSeek event, with the CSI Index, CSI Technology, Hang Seng Index, and Hang Seng Technology increasing 20, 45, 16, and 27 percent, respectively, between September 10, 2024, and January 24, 2025. Panel 3 depicts total capital expenditures for the Magnificent 7 companies. AE = advanced economy; Con. disc. = consumer discretionary; Con. stap. = consumer staples; EM = emerging market; Fin. = financials; HC = health care; Indus. = industrials; IT = information technology; LATAM = Latin America; Magnificent 7 = Alphabet, Amazon, Apple, Meta Platforms, Microsoft, NVIDIA, and Tesla; Tech = technology; Util. = utilities.

Box 1.2. Lower Bond Yields Are Exerting Pressure on Chinese Insurers

Yields on Chinese life insurers' investments are declining, impacting their solvency and valuations (Figure 1.2.1, panel 1). Bonds account for more than half of these investments. Monetary policy easing amid heightened deflationary pressures is driving the yield on domestic bond holdings lower (see the subsection "China: Rising Risks to Falling Prices"). This movement is exerting pressure on the returns from bond investments, which account for a share of the insurers' earnings (Fitch Ratings 2024). Consequently, Chinese insurance firms have significantly underperformed the valuation of other insurance companies globally, reflecting these pressures (Figure 1.2.1, panel 2).

Lower valuations may also reflect the decline in China's broad domestic equity index, which has also weighed on insurers' investment returns, because equities account for 17 percent of insurers' portfolios.¹ The relationship between insurers' investment returns and changes in domestic equity prices may strengthen, given a recent directive that encourages insurers to invest a portion of their incremental premiums in the domestic stock market.² Although greater equity exposure helps Chinese insurers diversify away from concentrated holdings of bonds, it may also increase the volatility of their earnings (S&P Global Ratings 2025).

Lower investment yields and returns are also exerting pressure on the solvency ratios of Chinese insurers,

This box was prepared by Fabio Cortes.

¹This exposure has increased over the past decade and is calculated from a sample that comprises the six listed life insurers or insurance groups in China: China Life Insurance Company, China Pacific Insurance Group, China Taiping Insurance Holdings Company, New China Life Insurance Company, Ping An Insurance (Group) Company of China, and The People's Insurance Company (Group) of China.

²China's six government agencies hosted a press conference on January 23, 2025, to explain their plan to encourage long-term capital participation in the equities market. The China Securities Regulatory Commission Chief gave insurers and mutual funds quantitative targets for investment in equities. The authorities expect major state-owned insurers to invest 30 percent of newly added insurance premiums into yuan-denominated A shares.

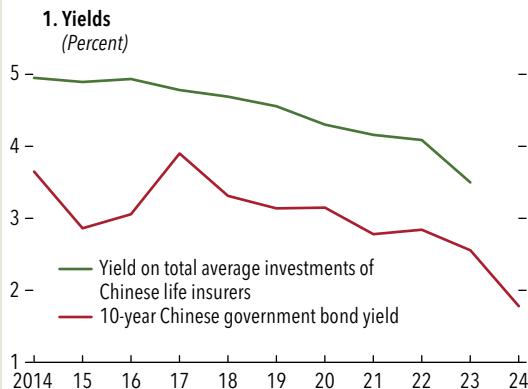
which although remain adequate, have deteriorated substantially in recent years (Figure 1.2.1, panel 3).³ Chinese insurers are large investors in Chinese domestic markets and therefore their solvency matters for financial stability. This includes the property sector, where further downside pressure will continue to challenge insurers' solvency and profitability. In particular, analysts are concerned that insurers' current loss provisions may not sufficiently cover potential losses from the property sector because of limited data regarding fair market valuations and public defaults in the sector (Moody's Investors Service 2024b). On the other hand, the share of alternative and illiquid assets in insurance portfolios, of which property is a significant component, has decreased in recent years (Figure 1.2.1, panel 4).⁴ A stricter "look-through" analysis to identify underlying assets and an increase in required capital charges for concentrated property investments could help mitigate vulnerabilities. To address the impact from the decline in investment yields on asset-liability mismatches, Chinese authorities should consider encouraging life insurers to reduce guaranteed rates and increase the share of floating-return policies. Overall, recent regulatory reforms are contributing to the strengthening of operational practices for Chinese insurers, and regulation and supervision have been enhanced, with greater emphasis on capital, risk management, and governance. Finalizing the implementation of new prudential standards is key (IMF 2025).

³Some of the decline in solvency ratios, and the core solvency ratio in particular, could also be related to the implementation of stricter domestic regulations regarding solvency. The introduction of the China Risk-Oriented Solvency System (C-ROSS) Phase II in December 2021 may partly explain the decline in the core solvency ratio in 2022. For example, Phase II limits the amounts of unearned profits recognized as core capital to increase the quality of available capital.

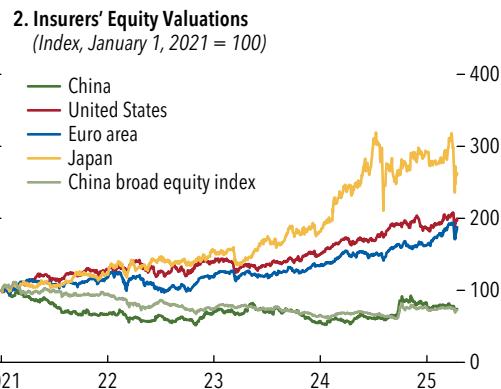
⁴This reduction may reflect insurers having taken account of losses in property investments in the valuation of their portfolios, rather than outright sales of these exposures.

Box 1.2 (continued)**Figure 1.2.1. Challenges Facing Chinese Life Insurers**

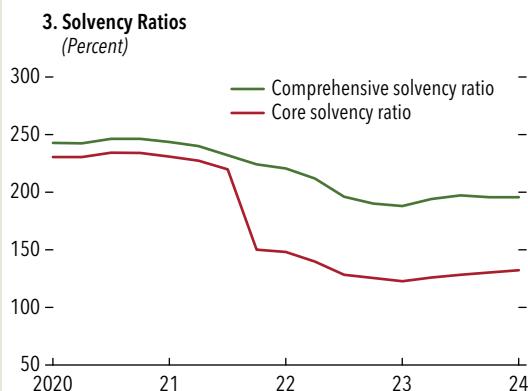
Chinese life insurers are under pressure from lower yields on their investments ...



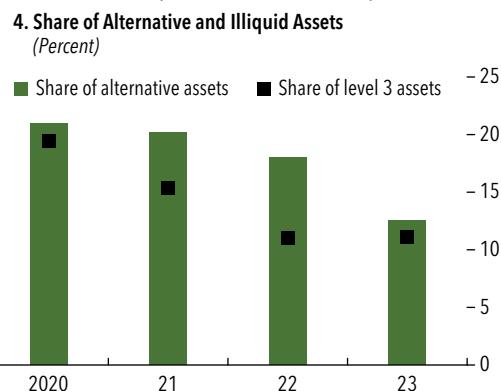
... as reflected in their valuations when compared with those of insurers in other major jurisdictions.



Their solvency ratios have deteriorated ...



... but liquidity has improved as they have reduced the share of alternative and illiquid investments in their portfolios.



Sources: Bloomberg Finance L.P.; China National Financial Regulatory Administration; Moody's Investors Service; S&P Capital IQ Pro; and IMF staff calculations.

Note: The calculations for the yield on total average investments of Chinese life insurers in panel 1, as well as all calculations in panel 4, are based on a sample that comprises the six listed life insurers or insurance groups in China: China Life Insurance Company, China Pacific Insurance Group, China Taiping Insurance Holdings Company, New China Life Insurance Company, Ping An Insurance (Group) Company of China, and The People's Insurance Company (Group) of China. The insurers' equity valuations in panel 2 reflect equity prices.

Box 1.3. Declining Enthusiasm for Green Investments Is Widening the Climate Financing Gap

Global issuance of sustainable debt has been decelerating over the past three years and remains below its annual peak in 2021 (Figure 1.3.1, panel 1). This deceleration has coincided with a decrease in media mentions of sustainable investments and suggests a deterioration in favorable sentiment toward green investments. Narrower differentials in the yields of conventional bonds and those of green debt also reflect this deterioration, although this “greenium” has rebounded in recent months (Figure 1.3.1, panel 2). Sustainable equities have performed worse, as outflows from

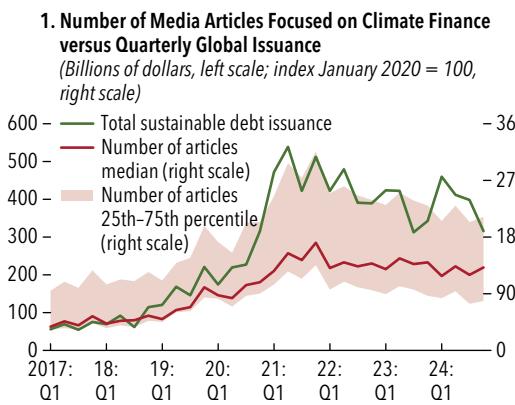
This box was prepared by Deepali Gautam and Esti Kemp.

equity-focused environmental, social, and governance (ESG) funds have driven overall subpar flows to the ESG asset class, and the number of funds has also plateaued as a share of total funds (Figure 1.3.1, panel 3). Correspondingly, ESG-equities’ relative outperformance against broad equity indices observed in 2020–22 has completely vanished (Figure 1.3.1, panel 4).

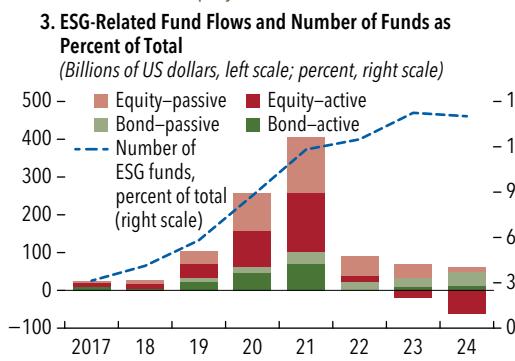
While these trends can be seen as a correction from peak levels around 2021, the slowdown in issuance of sustainable debt has left a widening financing gap. The Climate Policy Initiative (2024) estimates that \$7.2 trillion is required annually through 2030 for mitigation and \$0.2 trillion for adaptation.

Figure 1.3.1. Climate Finance Developments

Global sustainable debt issuance has trended downward.



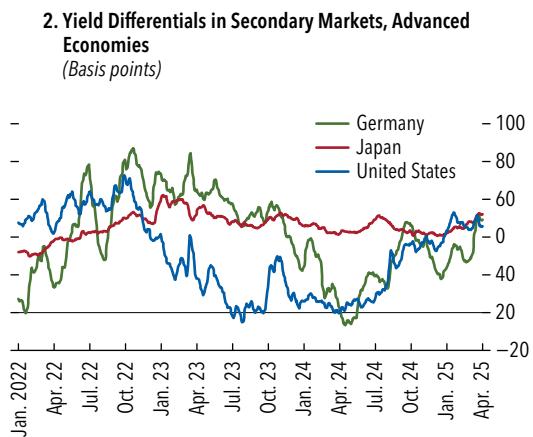
Net flows into ESG-related funds turned negative in 2024, as outflows from active-equity funds accelerated.



Sources: Bloomberg Finance L.P.; EPFR; Haver Analytics; and IMF staff calculations.

Note: In panel 1, sustainable loans include green, social, sustainability, and sustainability-linked loans. The shaded area depicts the 25th through 75th percentiles of the number of media articles that include terms related to sustainable debt such as “climate finance,” “green bonds,” and “ESG.” The number of sites in media articles are aggregated up to monthly values and then normalized such that January 2020 = 100. ACWI = All Country World Index, ESG = environmental, social, and governance.

Differentials between the yields of regular bonds and those of green bonds remain below the levels in 2022.



Sustainable equities gave back all outperformances.



References

- Acharya, Viral V., Nicola Cetorelli, and Bruce Tuckman. 2024a. "Banks and Nonbanks Are Not Separate, but Interwoven." *Liberty Street Economics*, June 18, 2024. <https://libertystreeteconomics.newyorkfed.org/2024/06/banks-and-nonbanks-are-not-separate-but-interwoven/>
- Acharya, Viral, Nicola Cetorelli, and Bruce Tuckman. 2024b. "Nonbanks are Growing but Their Growth Is Heavily Supported by Banks." *Liberty Street Economics*, June 17, 2024. <https://libertystreeteconomics.newyorkfed.org/2024/06/nonbanks-are-growing-but-their-growth-is-heavily-supported-by-banks/>
- Acharya, Viral V., Manasa Gopal, Maximilian Jager, and Sascha Steffen. 2025. "Shadow Always Touches the Feet: Implications of Bank Credit Lines to Non-Bank Financial Intermediaries" (May). https://pages.stern.nyu.edu/~sternfin/vacharya/public_html/pdfs/working-papers/ShadowTouchesFeet.pdf
- Adrian, Tobias, Nina Boyarchenko, and Domenico Giannone. 2019. "Vulnerable Growth." *American Economic Review* 109 (4): 1263–89.
- Adrian, Tobias, Richard K. Crump, and Emanuel Moench. 2013. "Pricing the Term Structure with Linear Regressions." *Journal of Financial Economics* 110 (1): 110–38.
- Adrian, Tobias, Federico Grinberg, Nellie Liang, Sheheryar Malik, and Jie Yu. 2022. "The Term Structure of Growth-at-Risk." *American Economic Journal: Macroeconomics*, 14 (3): 283–323.
- Bailey, Andrew. 2025. "Are We Underestimating Changes in Financial Markets?" Speech delivered at the Booth School of Business, University of Chicago, February 11. <https://www.bis.org/review/r250212a.htm>
- Baker, Scott R., Nicholas Bloom, and Steven J. Davis. 2016. "Measuring Economic Policy Uncertainty." *Quarterly Journal of Economics* 131 (4).
- Banegas, Ayelen, Phillip J. Monin, and Lubomir Petrasek. 2021, "Sizing Hedge Funds' Treasury Market Activities and Holdings," FEDS Notes, Board of Governors of the Federal Reserve System, October 6.
- Bank of England. 2017. "An Improved Model for Understanding Equity Prices." *Quarterly Bulletin* Q2: 86–97.
- Bank for International Settlements (BIS). 2022. "Triennial Central Bank Survey of Foreign Exchange and Over-the-Counter (OTC) Derivatives Markets in 2022."
- Barth, Daniel, R. Jay Kahn, Phillip Monin, and Oleg Sokolinskiy. 2024. "Reaching for Duration and Leverage in the Treasury Market." Finance and Economics Discussion Series 2024-039. Board of Governors of the Federal Reserve System, Washington, DC.
- Basel Committee on Banking Supervision (BCBS). 2013. "Analysis of Risk-Weighted Assets for Credit Risk in the Banking Book." Bank for International Settlements, Basel, Switzerland.
- Basel Committee on Banking Supervision (BCBS). 2016. "Analysis of Risk-Weighted Assets for Credit Risk in the Banking Book." Bank for International Settlements, Basel, Switzerland.
- Böhnke, Victoria, Steven Ongena, Florentina Paraschiv, and Endre J. Reite. 2023. "Back to the Roots of Internal Credit Risk Models: Does Risk Explain Why Banks' Risk Weight Asset Levels Converge over Time?" Research Paper Series N. 22-33, Swiss Finance Institute, Frankfurt, Germany.
- Brown, Michael, Ben Wright. 2023. "The Sudden Increase in the Wealth Effect and its Impact on Spending," Visa Business and Economics Insights, U.S. Economics Insight, June 2023.
- Caldara, Dario, and Matteo Iacoviello. 2022. "Measuring Geopolitical Risk." *American Economic Review* 112 (4): 1194–225.
- Cetorelli, Nicola, and Saketh Prazad. 2024. "The Nonbank Footprint of Banks." Staff Report 1118, Federal Reserve Bank of New York. <https://doi.org/10.59576/sr.1118>
- Chui, Michael, Emese Kuruc, and Philip Turner. 2016. "A New Dimension to Currency Mismatches in the Emerging Markets: Non-Financial Companies." BIS Working Paper No. 550. Bank for International Settlements, Basel, Switzerland. <https://www.bis.org/publ/work550.htm>
- Climate Policy Initiative. 2024. "Global Landscape of Climate Finance 2024: Insights for COP29." Climate Policy Initiative, San Francisco.
- Crosignani, Matteo, and Prazad Saketh. 2024. "Extend-and-Pretend in the US CRE Market." Staff Report 1130, Federal Reserve Bank of New York. https://www.newyorkfed.org/medialibrary/media/research/staff_reports/sr1130.pdf?sc_lang=e
- Dao, Mai, La-Bhus Fah Jirasvetakul, and Jing Zhou. 2024. "Drivers of Post-COVID Private Consumption in the US" IMF Working Paper 2024/128, International Monetary Fund, Washington, DC.
- Diebold, Francis X., and Kamil Yilmaz. 2012. "Better to Give Than to Receive: Predictive Directional Measurement of Volatility Spillovers." *International Journal of Forecasting* 28 (1): 57–66.
- Duffie, Darrell, Michael Fleming, Frank Keane, Claire Nelson, Or Shachar, and Peter Van Tassel. 2023. "Dealer Capacity and US Treasury Market Functionality." Staff Report 1070, Federal Reserve Bank of New York.
- European Central Bank (ECB). 2024. *ECB Financial Stability Review*, November. ECB, Brussels.
- Farrell, Diana and George Eckerd. 2021. "The Stock Market and Household Financial Behavior." JPMorgan Chase Institute, January 2021.
- Federal Reserve. 2024. "Senior Credit Officer Opinion Survey on Dealer Financing Terms, December 2024." Updated December 26, 2024. Board of Governors of the Federal Reserve System, Washington, DC. <https://www.federalreserve.gov/data/scoos/scoos-202412.htm>
- Federal Reserve. 2025. "The January 2025 Senior Loan Officer Opinion Survey on Bank Lending Practices." Board of Governors of the Federal Reserve System, Washington, DC, February 3, 2025. <https://www.federalreserve.gov/data/sloos/sloos-202501.htm>

- Federal Reserve Bank of New York. 2025. “Quarterly Report on Household Debt and Credit (Q42024).” Research and Statistics Group, Federal Reserve Bank of New York.
- Fitch Ratings. 2024. “Chinese Insurers Face Prospects of Lower Investment Returns.” *Fitch Wire*, March 24. <https://www.fitchratings.com/research/insurance/chinese-insurers-face-prospects-of-lower-investment-returns-25-03-2024>
- International Monetary Fund (IMF). 2024. “United States Staff Report for the 2024 Article IV Consultation.” Washington, DC.
- International Monetary Fund (IMF). 2025. “China Financial Sector Assessment Program 2025.” Washington, DC.
- Iorio, Benjamin, Dan Li, and Lubomir Petrasek. 2024. “Why Do Mutual Funds Invest in Treasury Futures?” FEDS Note, Board of Governors of the Federal Reserve System, May 10, 2024. <https://doi.org/10.17016/2380-7172.3488>
- Iyer, Roshan, and Adina Popescu. 2023. “New Evidence on Spillovers between Crypto Assets and Financial Markets.” IMF Working Paper 23/213, International Monetary Fund, Washington, DC.
- Moody’s Investors Service. 2024a. “Bank Funding of Private Credit Grows Rapidly, in Step with Sector’s Capital-Raising.” Private Credit—Global, October 15, 2024. <https://www.moodys.com/web/en/us/insights/ratings/bank-survey.html>
- Moody’s Investors Service. 2024b. “Insurance—China: Lingering Risk from Property Investments Could Challenge Insurers’ Profitability.” Sector In-Depth.
- Moody’s Investors Service. 2025. “Private Credit—Global: Primed for Growth as LBOs Revive, ABF Opportunities Accelerate.” Outlook, January 21, 2025.
- S&P Global Ratings. 2024a. “ABS Frontiers: The Blurring of Private Credit Funds and CLOs.” Comments, January 30. <https://www.spglobal.com/ratings/en/research/articles/240130-abs-frontiers-the-blurring-of-private-credit-funds-and-clos-12980906>
- S&P Global Ratings. 2024b. “Code and Care: Navigating Private Credit Risk in the Software and Health Care Services Industries.” Comments, November 19, 2024. <https://www.spglobal.com/ratings/en/research/articles/241119-code-and-care-navigating-private-credit-risk-in-the-software-and-health-care-services-industries-13323659>
- S&P Global Ratings. 2025. “China Insurance Brief: Stock Directive Aligns with Life Insurers’ Strategy.” January 24, 2025.
- Vissing-Jorgensen, Annette. 2021. “The Treasury Market in Spring 2020 and the Response of the Federal Reserve.” NBER Working Paper 29128, National Bureau of Economic Research, Cambridge, MA.

Chapter 2 at a Glance

- Stock prices have generally had a modest reaction to geopolitical risk events, but major events—especially military conflicts—have a disproportionately larger and more persistent effect on asset prices.
- Sovereign risk premiums can increase notably in response to major geopolitical risk events, particularly in emerging market economies with weaker fiscal and external buffers.
- The impact of geopolitical risk events can spill over to sovereigns and firms in other countries through trade and financial linkages, increasing the risk of financial contagion.
- Investors appear to price geopolitical risk into both equity and option markets to some extent. However, the realization of these risks can raise financial market volatility.
- Geopolitical risk events can adversely affect the stability and intermediation capacity of banks and non-bank financial institutions, such as investment funds, with potential impacts on macrofinancial stability.

Policy Recommendations

- Policymakers should consider country-specific geopolitical risks in their oversight of financial institutions. Financial institutions should devote adequate resources to identifying, quantifying, and managing such risks (*April 2023 Global Financial Stability Report*).
- Financial institutions should hold adequate capital and liquidity buffers to protect against extreme but plausible losses associated with the materialization of geopolitical risks.
- Emerging market and developing economies should continue efforts to deepen financial markets, accompanied by robust regulatory frameworks, to help investors manage and hedge against financial risks posed by geopolitical shocks.
- Adequate macroeconomic policy space and international reserve buffers should be maintained to help mitigate the adverse effects of geopolitical risk events.

Introduction

Geopolitical risks, encompassing potential adverse events such as wars, terrorist acts, and inter-state tensions that can disrupt international relations and economic stability, have risen notably in recent years. For example, news-based measures of geopolitical risk events, such as conflicts, wars, terrorist attacks, and military buildups, along with countries' actual military spending (relative to GDP) and restrictions on cross-border trade and financial transactions, have all increased since 2022 compared with levels in preceding years (Figure 2.1, panels 1–3). A measure combining

This chapter has been prepared by Yuhua Cai, Radu-Gabriel Cristea, Salih Fendoglu (co-lead), Oksana Khadarina, Seungduck Lee, Tatsushi Okuda, Enyu Shao, Felix Suntheim (co-lead), and Mustafa Yenice, under the guidance of Dong He and Mahvash Qureshi. Yi Zhou provided research support for some of the analyses. Jesús Fernández-Villaverde served as an expert advisor.

these various indicators to capture overall geopolitical risk and fragmentation has reached its highest level in the last several decades (Figure 2.1, panel 4).¹ The elevated geopolitical risk raises concerns about further diplomatic and military tensions across countries and their potential implications for macrofinancial stability (Aiyar and others 2023; April 2023 *Global Financial Stability Report*).²

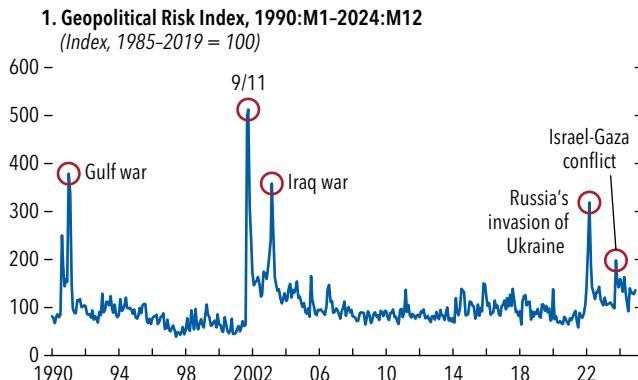
An increase in geopolitical risks can threaten macrofinancial stability through several channels. For

¹The overall measure of geopolitical risk discussed here, known as the “geoeconomic fragmentation index” is a composite measure of restrictions on cross-border trade, investments, and financial transactions; military conflicts; indicators of diplomatic tensions; and migration policies (Fernández-Villaverde, Mineyama, and Song 2024).

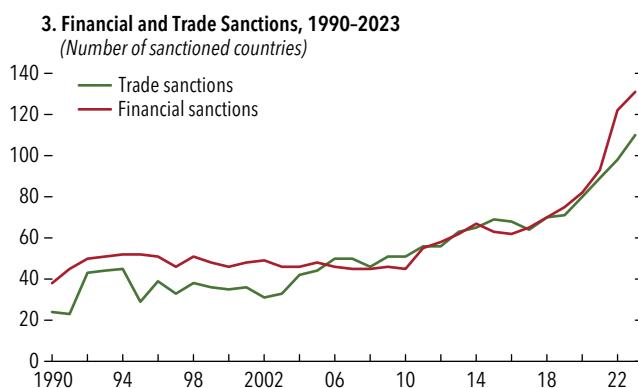
²According to some surveys carried out since the second half of 2024 (for example, Bank of England 2024; Natixis Investment Managers 2024), investors and businesses view geopolitical risks as a major downside risk to economic activity and financial stability.

Figure 2.1. Rise in Global Geopolitical Tensions

Geopolitical risks remain elevated against a backdrop of multiple conflicts.



... and an increasing number of countries are facing financial and trade sanctions.

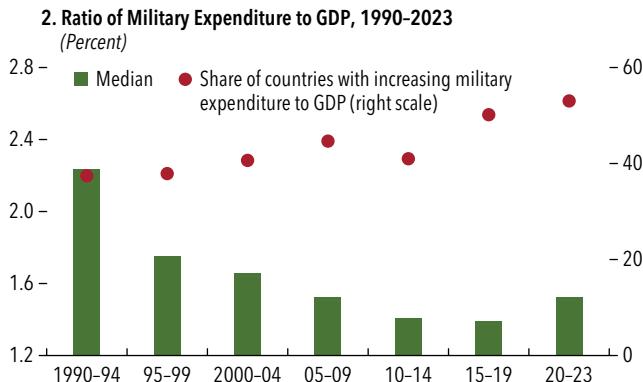


Sources: Caldara and Iacoviello 2022; Felbermayr and others 2020; Fernández-Villaverde, Mineyama, and Song 2024; Global Sanctions Database (release 4); Stockholm International Peace Research Institute, SIPRI Military Expenditure Database; and IMF staff calculations.

Note: Panel 1 plots the monthly global geopolitical risk index of Caldara and Iacoviello (2022), a news-based measure of adverse geopolitical events that covers 10 major newspapers in Canada, the United Kingdom, and the United States. Panel 2 plots the ratio of median military spending to GDP across all countries in the sample considered in this chapter and the share of countries in the sample with an increase in this ratio, averaged over the time periods indicated on the horizontal axis. Panel 3 presents the number of countries in the sample facing bilateral financial or trade sanctions. The trend of an increasing number of sanctioned countries holds even if Belarus and Russia are excluded from the sample. Panel 4 plots the geo-economic fragmentation index of Fernández-Villaverde, Mineyama, and Song (2024), a composite measure of 14 indicators of geopolitical risk, such as the geopolitical risk index of Caldara and Iacoviello (2022), and several measures of uncertainty, financial flows, and trade openness. See Online Annex Table 2.1.1 for a description of the variables and data sources.

example, a rise in geopolitical risks that manifests through actual or potential restrictions on cross-border trade and financial transactions or military conflicts can trigger a reallocation of capital flows and cause abrupt asset price corrections (April 2023 *Global Financial Stability Report*; Gopinath 2024).³ The adverse effect on asset prices can, in turn, jeopardize macrofinancial stability by affecting the liquidity and solvency of financial and nonfinancial institutions and

Countries' military spending has increased, on average ...



A composite measure of geopolitical risk has reached its highest level in several decades.



by raising the risk of a negative macrofinancial feedback loop (Adrian and others 2019).

The impact of geopolitical risks on asset prices may vary across asset classes, sectors, and countries. For example, supply-chain disruptions may increase commodity prices but decrease stock prices if the disruptions are expected to have an adverse effect on economic activity.⁴ Differences may also arise across sectors: for

³A number of studies (for example, Barro 2006; Berkman, Jacobsen, and Lee 2011; Barro and Ursua 2012; Baur and Smales 2020; Amiti and others 2024, Federle and others, forthcoming) document a significant impact of geopolitical risk events such as military conflicts and trade tensions on asset prices.

⁴For example, after Russia's 2022 invasion of Ukraine, prices of financial assets (such as stocks, sovereign bonds, and exchange rates) fell immediately, whereas prices of commodities (including oil and grains) increased notably on fears of supply disruptions. See Chapter 3 of the October 2023 *World Economic Outlook* for a discussion of how disruption in commodities trade can affect commodities prices and economic activity.

example, the energy sector may benefit if supply-chain disruptions raise oil prices, whereas energy-dependent sectors are likely to suffer in such a case.⁵ The effect on countries is likely to differ as well depending on their economic and structural characteristics. For example, commodity-exporting countries may benefit if commodity prices rise in response to a geopolitical risk event. In addition, countries directly involved in a geopolitical risk event may experience more severe outcomes from physical damages or the imposition of trade and financial restrictions, whereas the impacts may be less severe in other countries. Geopolitical risk events can also significantly affect countries that have close economic and financial links with conflict-afflicted countries because of, for example, trade or investment disruption.⁶

The nature and intensity of geopolitical risk also matter. Extreme geopolitical risk events such as military interventions and wars may have a more severe economic and financial impact because of damages to physical and human capital than the imposition of economic sanctions or restrictions. Similarly, longer-lasting conflicts may have a more persistent effect than shorter ones. On average, major geopolitical events since World War II have triggered a modest and short-lived decline in aggregate stock prices, possibly because of policy reactions to mitigate the adverse effects of these events. But, in some cases, such as the 1973 Arab oil embargo and the 1990 Iraq invasion of Kuwait, the adverse stock market reaction was stronger and more persistent, lasting over several months (Figure 2.2, panels 1–3).⁷

Geopolitical risk events may be challenging for investors to price because of their unique nature, uncertain

duration and scope, and rare occurrence. In some cases, a lack of financial market development may also impede the pricing of geopolitical risk. Moreover, investors may react to geopolitical risk events heuristically (Tversky and Kahneman 1974, 1992; Bordalo, Gennaioli, and Shleifer 2012; Dessaint and Matray 2017) or pay less attention to them if these risks persist for some time. This can lead to investor complacency and sharp market corrections when such risks materialize.⁸

Against this background, this chapter assesses the impact of geopolitical risk events on prices of financial assets and discusses potential policy measures for maintaining financial stability. The chapter begins by laying out a simple conceptual framework that summarizes the main channels through which an increase in geopolitical risk can have an impact on financial asset prices and threaten macrofinancial stability. It then presents some stylized facts on the association between geopolitical risk events and prices in a broad range of asset classes for a sample of major advanced and emerging market and developing economies, and empirically analyzes the following four key questions. First, how does an increase in geopolitical risk affect aggregate stock prices? Second, what factors determine the reaction of stock prices to geopolitical risk events at the firm level, and do cross-border linkages matter? Third, do equity investors price in geopolitical risk? Fourth, do geopolitical risk events affect macrofinancial stability, as proxied by the stability and lending behavior of banks and the redemption risks and returns of nonbank financial intermediaries, specifically investment funds?

To address these questions, the chapter uses various empirical methodologies and data sets. It measures geopolitical risk, at both the global and country levels, primarily using the news-based indices by Caldara and Iacoviello (2022), which capture the realization as well as the perception of risks that could matter for asset prices.⁹ On the basis of these indices, the chapter

⁵Sectors related to defense may also benefit from increased government military expenditure in response to a rise in geopolitical risk. For example, the relatively low volatility in US stock markets during major conflicts may be attributable to a substantial increase in defense contracts during these times, which helps to reduce the uncertainty of the future cash flow of firms, especially those that produce goods and services for the military (Cortes, Vossmeier, and Weidenmier 2024).

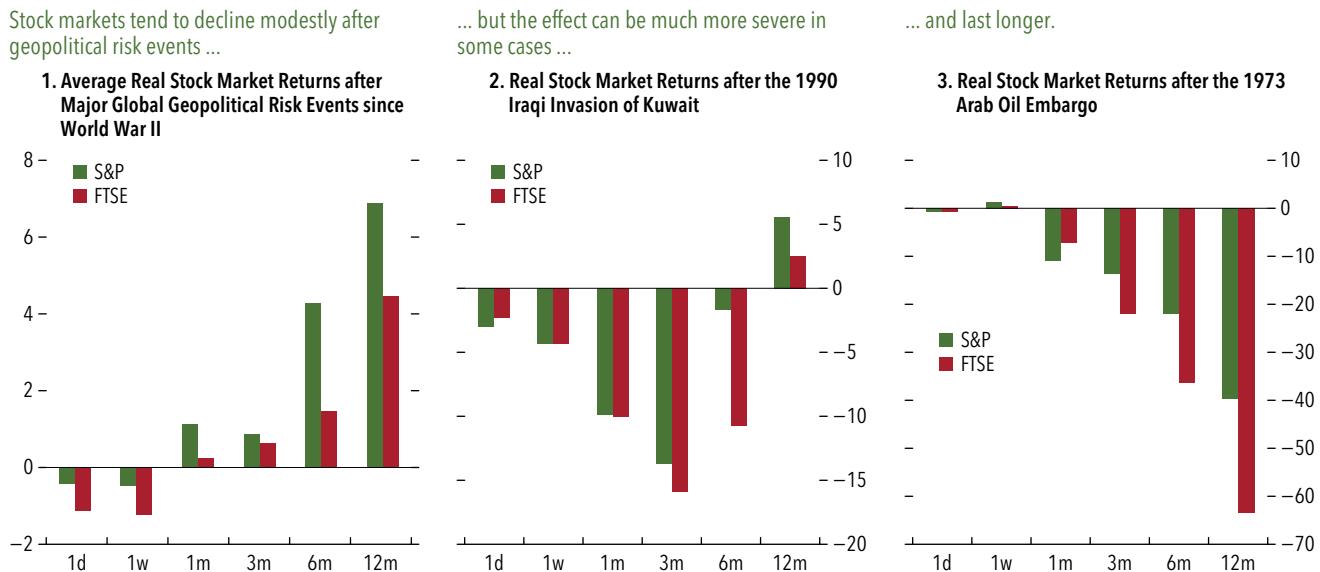
⁶For example, Qureshi (2013) finds that military conflicts can affect the bilateral trade of neighboring countries negatively, even if the latter are not directly involved in the conflict. Biermann and Leromain (2024) and Federle and others (forthcoming) show that stock markets in European countries that are geographically and economically closer to Ukraine experienced a larger immediate decline after Russia's invasion of Ukraine.

⁷Empirical analysis later in the chapter takes into account the impact of possible macroeconomic policy reactions to geopolitical risk events when assessing the impact on aggregate stock prices. As for the Arab oil embargo, cumulative stock returns for the US turned positive only after about six years as a recession followed the oil supply shock. During World Wars I and II, stock prices declined notably in countries that were directly involved in the conflict, but also in those that were not (Online Annex Figure 2.2.1).

⁸Even if investors were to account for the likelihood of geopolitical risk events, the actual realization of these events could still result in large asset price corrections as the uncertainty is resolved.

⁹The geopolitical risk indices of Caldara and Iacoviello (2022) are designed to capture various geopolitical risk events, both actual and threats, that have an international impact, such as diplomatic tensions, wars, uprisings and revolutions, and terrorism. The global index reflects the share of news articles in major publications related to adverse geopolitical events in a particular month. Country-specific indices capture the share of articles that meet the authors' criteria for inclusion in the global index and mention the name of a country or at least one of its major cities. These indices tend to be highly correlated with other text-based indices, particularly for large, advanced countries (Bondarenko and others 2024; Liu and Zhang 2024).

Figure 2.2. Stock Market Reaction after Major Geopolitical Risk Events
(Percent)



Sources: Caldara and Iacoviello 2022; and Finaeon Global Financial Data.

Note: Major geopolitical risk (GPR) events are identified as those for which the global geopolitical risk index by Caldara and Iacoviello (2022) is more than two standard deviations above the mean (see Online Annex Table 2.3.1 for the list of major global GPR events). The change in the S&P and FTSE indices is computed from the identified onset of an event to one day (1d), one week (1w), one month (1m), 3 months (3m), 6 months (6m), and 12 months (12m) afterward (in cumulative terms). For comparison, annual real return to S&P and FTSE indices after June 1950, when the first major post-World War II geopolitical risk event is identified, is 6.3 and 3.5 percent, respectively. "S&P" in the panels shows the cumulative returns for the S&P 500 index starting from 1957 and for the S&P 90 before 1957.

identifies about 450 major geopolitical risk events across countries over 1985–2024; events are defined as “major” if their scores on the index are at least two standard deviations above the average score for the country where they occurred.¹⁰ About one-sixth of the events classified as major are international military conflicts; others involve diplomatic tensions, domestic political unrest, terrorism incidents, or the announcement and implementation of trade restrictions.

Transmission of Geopolitical Risk to Asset Prices: Framework and Stylized Facts

An increase in geopolitical risk can have an impact on prices of financial assets through two key chan-

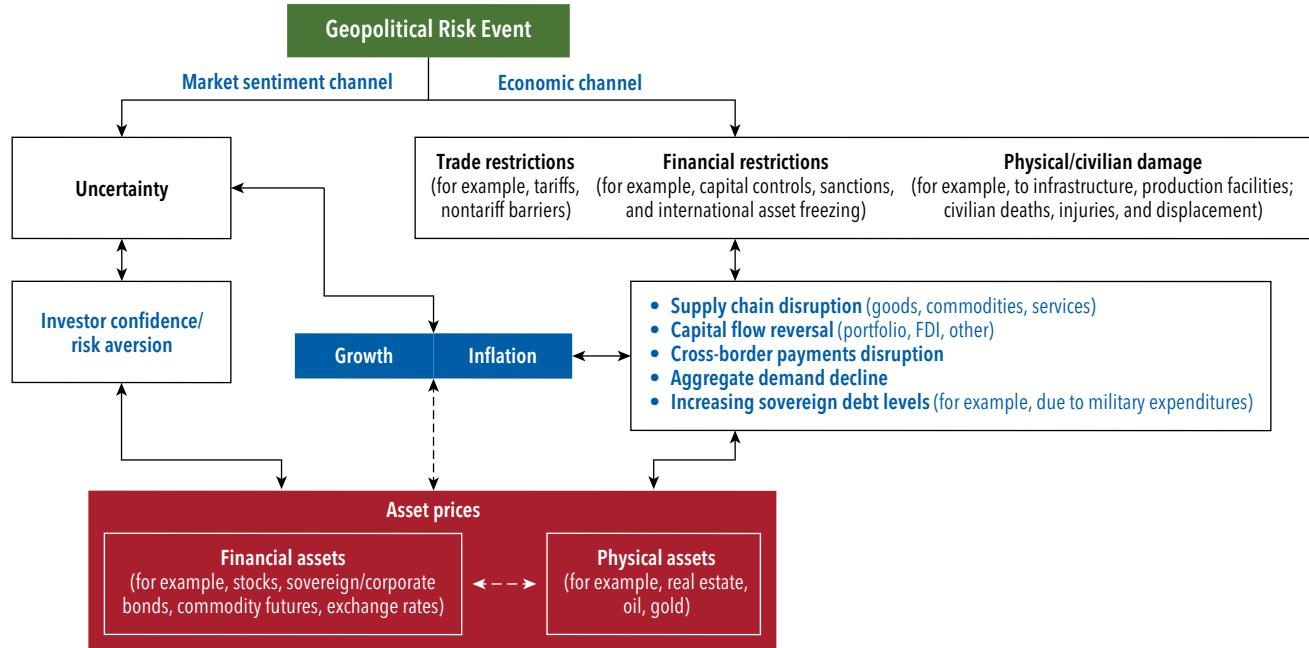
nels. First, it can affect prices through an *economic* channel, whereby the threat or realization of geopolitically motivated restrictions on trade and financial transactions disrupts supply chains, reverses capital flows, or inflicts adverse demand shocks in the economy targeted by the restrictions, directly affecting prices of financial and real assets (Figure 2.3).¹¹ These changes can also affect asset prices indirectly through policy response to macroeconomic developments, such as growth and inflation. In cases of military conflicts, actual or expected damage to physical infrastructure, production facilities, and civilians and the resulting reduction in domestic and external demand can undermine investment and economic activity, with an impact on asset prices. Sovereign yield spreads or credit default swap (CDS) spreads may also increase if geopolitical risks raise fiscal sustainability concerns (due to, for example, increased spending and borrowing needs or because

¹⁰Identified events are verified using publicly available sources. Only major events that capture geopolitical risk from the perspective of a specific country are considered. Events that mark multinational summits, such as protests around such summits in a particular host country, are therefore not included as major geopolitical risk events from the perspective of that country. All countries in the chapter’s sample had at least one identified major geopolitical risk event during the period under consideration, and some had many.

¹¹For example, stock prices are likely to fall if such events are expected to dampen firms’ cash flows and profitability, raise discount rates, or both.

Figure 2.3. Key Channels of Transmission for Geopolitical Risk and Prices of Financial Assets

An increase in geopolitical risk can have an impact on prices of financial assets through two key channels.



Source: IMF staff.

Note: FDI = foreign direct investment.

of a decline in output).¹² A second channel through which increases in geopolitical risk can affect prices of financial assets is the *market sentiment channel*. Such increases may raise macroeconomic and financial uncertainty even if no conflict or policy change has been realized, with an impact on asset prices through a decline in investor confidence and an increase in risk aversion (October 2024 *Global Financial Stability Report*).¹³ Depressed asset valuations can, in turn, increase liquidity and credit risks for both financial and nonfinancial institutions. Large and abrupt declines in asset prices can also lead to margin and collateral calls, as well as redemption pressures on investment funds that could trigger asset fire sales and contagion within the broader financial system,

¹²Meyer, Reinhart, and Trebesch (2022) note that sovereign borrowing has historically been positively linked to extreme geopolitical events such as wars. Huang and others (2015) and Afonso, Alves, and Monteiro (2024) find that an increase in geopolitical risks raises sovereign spreads.

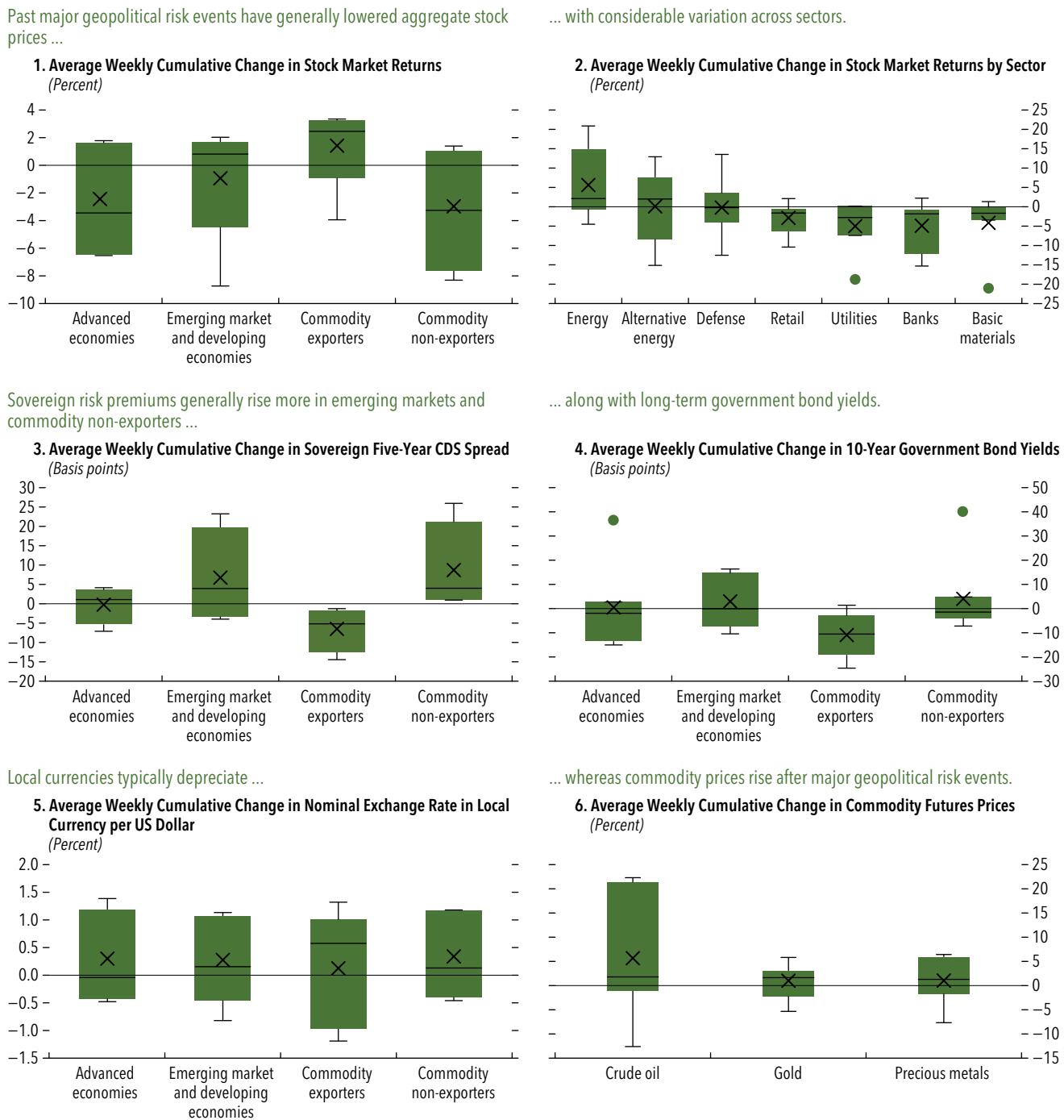
¹³Geopolitical risk indices and measures of economic policy uncertainty provided by Baker, Bloom, and Davis (2016) and the world uncertainty index (Ahir, Bloom, and Furceri 2022) show strong positive correlations in the range of 0.1 to 0.4.

thereby heightening the risk of an adverse macrofinancial feedback loop.

On average, aggregate asset prices exhibit a modest reaction to major geopolitical risk events, but the impact can be notable in some instances. For example, aggregate stock prices across economies have generally declined in the immediate aftermath of major global geopolitical risk events (Figure 2.4, panel 1). Although the average impact has been moderate, about 3 percent, some events have caused a substantially larger negative impact, up to 9 percent on average across countries.¹⁴ The effects vary based on country-specific factors. For example, commodity-importing countries tend to suffer more, whereas commodity exporters often experience positive stock returns after major geopolitical risk events. The impact on commodity-exporting countries aligns

¹⁴Although aggregate stock prices appear to recover, on average, within a month after the event (Online Annex Figure 2.2.2), subsequent analysis reveals that particularly large shocks can have persistent effects. This chapter primarily focuses on the short-term impact of geopolitical risk events on asset prices, considering that abrupt asset price movements may lead to financial stability concerns.

Figure 2.4. Varying Impact of Global Geopolitical Risk Events across Countries and Asset Classes
(Interquartile ranges across events)



Sources: Bloomberg Finance L.P.; LSEG Datastream; UN Trade and Development; IMF, Global Data Source; and IMF staff calculations.

Note: Figure shows the interquartile ranges of one-week cumulative changes in asset prices across major global geopolitical risk events in the sample, defined as those for which the global geopolitical risk index of Caldara and Iacoviello (2022) is more than two standard deviations above the average. Cross marks and lines inside the boxes denote the average and the median impacts across events, respectively. Whiskers show the whole range of impacts across events, excluding outliers, which are shown by dots outside the whiskers. See Online Annex Table 2.3.1 for the list of the identified events. The sample includes the largest 40 economies, classified as advanced and emerging market and developing economies based on the IMF's *World Economic Outlook*, and as commodity exporters and non-commodity exporters based on UN Trade and Development data from 2019 to 2021. Commodity-exporting countries are defined as those for which commodities constitute more than 60 percent of total merchandise exports. In panel 6, precious metals refers to the average prices of copper, palladium, platinum, and silver futures (on a continuous contract basis). CDS = credit default swap.

with a general rise in prices of commodities, particularly that of oil, which tends to benefit firms in the energy sector (Figure 2.4, panels 2 and 6).

Sovereign risk premiums, yields, and exchange rates also react to geopolitical risk. The impact appears most pronounced for commodity-importing countries, whose CDS spreads generally increase more than 1 percent cumulatively one week after major global geopolitical risk events (Figure 2.4, panel 3).¹⁵ By contrast, the sovereign CDS spreads of commodity exporters typically decline. While average sovereign CDS spreads and government bond yields increase slightly in advanced economies after major geopolitical risk events because of some large outlier observations, median values generally decline, suggesting possibly increased risk aversion and flight-to-safety behavior among investors in response to adverse global shocks.¹⁶ Currencies, especially of commodity-importing countries, seem to weaken, on average, following major global geopolitical risk events (Figure 2.4, panels 3–5).

Geopolitical Risk Shocks and Aggregate Stock Prices

Geopolitical risks, macroeconomic outcomes, and asset prices are intertwined. As Figure 2.3 shows, an increase in geopolitical risk can affect prices of financial assets through an increase in uncertainty and disruptions to trade and financial transactions, which can be mutually reinforcing. In addition, factors other than geopolitical risk, such as domestic monetary or fiscal policy stances or global financial conditions, may influence prices of financial assets. To account for these relationships and identify the effect of geopolitical risk shocks on financial asset prices, this chapter estimates a panel vector autoregression model focusing on aggregate stock prices, while differentiating between global and country-specific geopolitical risk shocks.¹⁷

¹⁵Sovereign CDS spreads measure the cost of buying protection against the risk of a sovereign default.

¹⁶Traditional safe haven countries not directly part of major geopolitical risk events, such as Japan and Switzerland, show larger median declines in long-term government bond yields.

¹⁷A panel vector autoregression model captures interdependencies among time series and accounts for country heterogeneity. The benchmark model includes monthly industrial production, the consumer price index, real oil prices, real equity prices in US dollars, short- and long-term rates, and the stock market option-implied volatility. Following the literature, geopolitical risk shocks are plausibly identified recursively (ordered first), assuming structural shocks to geopolitical risk affect all variables contemporaneously. See Online Annex 2.4 for a discussion of the model and the identification methodology.

The analysis shows that geopolitical risk shocks weigh modestly on stock markets, on average, but major shocks can have a more pronounced effect. Aggregate stock prices generally decline by about 0.3 percent in response to a country-specific geopolitical risk shock, and the effect is persistent and lasts at least two years after the shock (Figure 2.5, panel 1).¹⁸ However, more severe geopolitical risk shocks—that is, shocks that increase the geopolitical risk index by at least two standard deviations beyond its mean—have an effect about 7 times larger and are notably persistent. Global geopolitical risk shocks, which are likely to affect international relations or economies at a wider scale, also have an impact on aggregate stock prices. On average, the effect is about 1 percent and persists for a quarter. These effects are quantitatively meaningful, as the average three-month stock market return across countries in the chapter's sample is about 0.1 percent. In other words, a typical geopolitical risk shock has an impact about three times as large, and a large geopolitical risk shock has an impact about 20 times larger, than the average stock market return.¹⁹

Macroeconomic uncertainty and the risk attitude of participants in financial markets are two key channels through which geopolitical shocks are transmitted to aggregate stock prices. Following major domestic or global geopolitical shocks, the Chicago Board Options Exchange Volatility Index (VIX)—a widely used measure of expected volatility and market uncertainty—tends to spike (Figure 2.5, panel 2). This increase in implied volatility could reflect a lower tolerance for risk (risk aversion) or investor fears about economic fundamentals (macroeconomic uncertainty).²⁰ A decomposition of the VIX into these two components

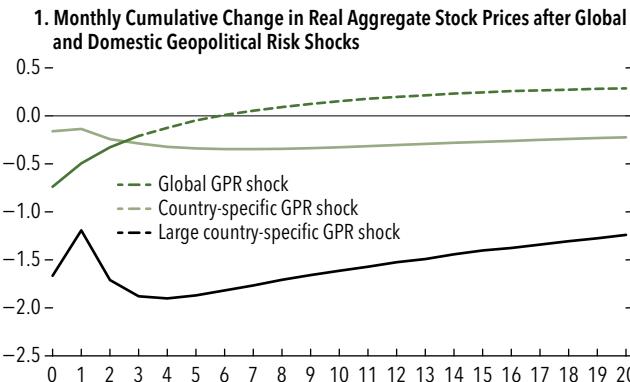
¹⁸The reported effect applies to country-specific geopolitical risk shocks scaled to two standard deviations. The modest average stock price reaction could be a result of more localized events included in the country-specific geopolitical risk index. It could also indicate that financial markets generally incorporate information on geopolitical risk events to some extent, as shown later in the chapter.

¹⁹The results presented in Figure 2.5 apply to the full sample of advanced and emerging market economies. An analysis of the subsamples suggests that the average response of aggregate stock prices is somewhat larger for Group of Seven economies compared with the other economies. See Online Annex 2.4.

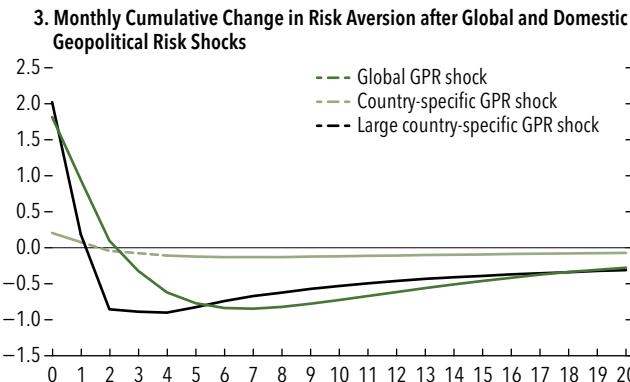
²⁰Bekaert, Hoerova, and Lo Duca (2013) decompose the options-implied US stock market volatility (as measured by the VIX) into two components: uncertainty and risk aversion. Uncertainty represents the expected volatility of the stock market and is computed as a prediction of future stock market volatility based on option prices. Risk aversion is reflected in the premium investors demand for bearing risk, which can fluctuate with market conditions and investor sentiment. It is proxied by the variance risk premium, which is the difference between the predicted volatility from options and the actual market volatility.

Figure 2.5. Response of Aggregate Stock Prices and Option-Implied Volatility to Geopolitical Risk Shocks (Percent)

Stock prices decline, on average, across countries after geopolitical risk shocks, particularly after more severe ones ...

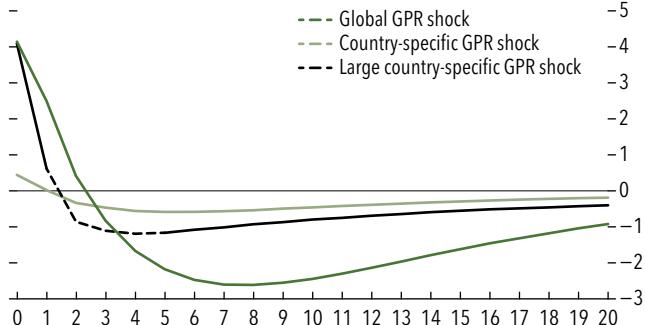


Investors' risk aversion increases after geopolitical risk shocks, but the impact is short-lived ...



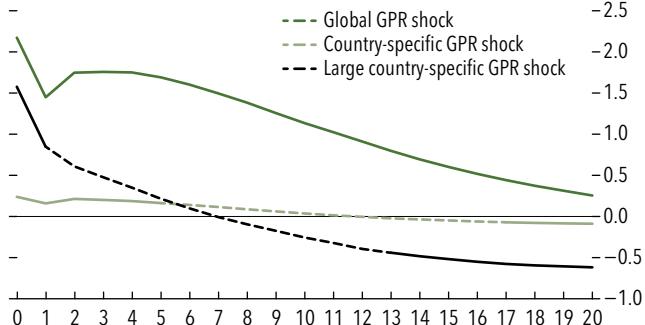
... whereas implied volatility spikes.

2. Monthly Cumulative Change in Option-Implied Stock Market Volatility after Global and Domestic Geopolitical Risk Shocks



... whereas economic uncertainty generally increases more strongly and persistently.

4. Monthly Cumulative Change in Uncertainty after Global and Domestic Geopolitical Risk Shocks



Sources: Bekaert, Engstrom, and Xu 2022; Caldara and Iacoviello 2022; Chicago Board Options Exchange; IMF, International Financial Statistics database; and IMF staff calculations.

Note: Panels 1–4 show the impulse response functions (IRFs) from the benchmark panel vector autoregressive models for, respectively, aggregate stock prices, the Chicago Board Options Exchange Volatility Index (VIX), risk aversion, and uncertainty. Online Annex 2.4 describes the methodology and sample in detail. For definitions of global and country-specific geopolitical risk (GPR) indices, see Online Annex 2.3. GPR shocks are identified using a recursive ordering in which the global and country-specific geopolitical risk indices of Caldara and Iacoviello (2022) are ordered first, consistent with the plausible exogeneity of the underlying variable. Risk aversion and uncertainty are obtained from the VIX following Bekaert, Hoerova, and Lo Duca (2013) and Bekaert, Engstrom, and Xu (2022). The panels indicate the responses to average geopolitical risk shocks that are scaled, for comparability purposes, to a shock of two standard deviations. The panels also show the responses to large shocks that correspond to observations for which the geopolitical risk index is more than two standard deviations above its mean; otherwise, the variable is set to zero. Solid lines indicate that the effect is statistically significant, that is, the 68 percent credible set around the IRF is not crossing the horizontal axis. The sample comprises major advanced and emerging market economies.

suggests that although both risk aversion and uncertainty increase after large geopolitical shocks, the effect on uncertainty is more notable and persistent, particularly when the shocks are global (Figure 2.5, panels 3 and 4).

An increase in geopolitical risk also raises market tail risks. Beyond the effect on average stock prices, an increase in geopolitical risk also raises downside risks to aggregate stock prices, defined as prices at the 10th percentile of the aggregate stock return distribution across countries (Box 2.1). An increase in global geo-

political risk has a quantitatively larger impact than an increase in country-specific geopolitical risks and lasts for about six months after the risk event that triggers the increase.

These results suggest that major geopolitical risk events can trigger large and persistent corrections in asset prices, generating market volatility that could threaten macrofinancial stability. To better explain how geopolitical risk shocks transmit to prices of financial assets, the analysis in the following section examines the effect of various factors, including the type of risk event

and cross-border trade and financial linkages, using more granular, firm-level data across countries.

Exposure of Firms to Geopolitical Risk

To investigate factors that drive the impact of geopolitical risk events on stock prices, the chapter follows two approaches. First, it carries out a regression analysis using firm-level data for a large panel of advanced and emerging market economies to determine how stock prices react to different types of geopolitical risk events and whether cross-border linkages of firms matter in the transmission of foreign geopolitical risk. Second, the chapter considers case studies of two more recent major geopolitical risk events, Russia's 2022 invasion of Ukraine and the trade tensions between China and the United States in recent years (2018–24), to examine their implications for firms' stock performance in detail.

Firm-level panel analysis suggests that, in general, stock prices react more to international military conflicts than to other types of risk events, particularly in emerging market economies. Regression results show that stock returns decline, on average, by about 1 percentage point in the month of a major domestic geopolitical risk event, which is comparable with the earlier results based on aggregate stock prices (Figure 2.6, panel 1).²¹ The impact is statistically and quantitatively significant, as the average monthly firm-level stock return in the sample is about 0.6 percent. However, considerable variation across countries underlies this result. For example, international military conflicts have much larger effects, at about 5 percent, on stock prices of firms in emerging market economies than on stock prices of those in advanced economies (Figure 2.6, panel 2). This may be because advanced economies, unlike emerging market economies, did not experience military conflict on their own soil during the sample period, thus avoiding the risk of significant destruction and economic damage. Their military and economic power also often outpaces that of countries with which they may be in conflict.²²

²¹This analysis defines domestic geopolitical risk events as major if the country-specific geopolitical risk index of Caldara and Iacoviello (2022) is at least two standard deviations above the country's average. See Online Annex 2.5 for a detailed discussion of the methodology for this analysis and the results.

²²International military conflicts involving emerging markets in the sample range from mild armed border disputes to full-scale military wars.

Overall, international military conflicts appear to affect stock prices of emerging market firms more than other types of risk events (Figure 2.6, panel 2), underlining that the severity of conflicts matters.²³

Geopolitical risk events transcend borders and can affect firms through cross-country trade linkages. Geopolitical risk events can still have an impact, through trade linkages, on firms in countries not directly involved in the events. For example, the involvement of a country's main trading partner in a major geopolitical risk event, on average, reduces stock returns for the country's firms by about 1 percentage point (Figure 2.6, panel 1). The impact is more pronounced, up to 2.5 percentage points, when a country's main trading partner is involved in a military conflict (Figure 2.6, panel 3), implying a potentially more significant disruption in revenue stream or supply-chain sources.

Firms' revenue sources and their exposure to partner countries through subsidiaries and corporate shareholders also highlight the importance of disrupted cross-border linkages on stock returns. Specifically, firms that generate a significant proportion of their revenues from, or have subsidiaries or shareholding companies in, countries affected by a geopolitical risk event generally experience an additional decline in their stock prices of 0.1–0.25 percentage points, while controlling for other macro and sectoral effects (Figure 2.6, panel 4).²⁴ The impact on emerging market firms appears to be primarily through their shareholding companies, rather than their subsidiaries, in countries affected by major geopolitical risk events.

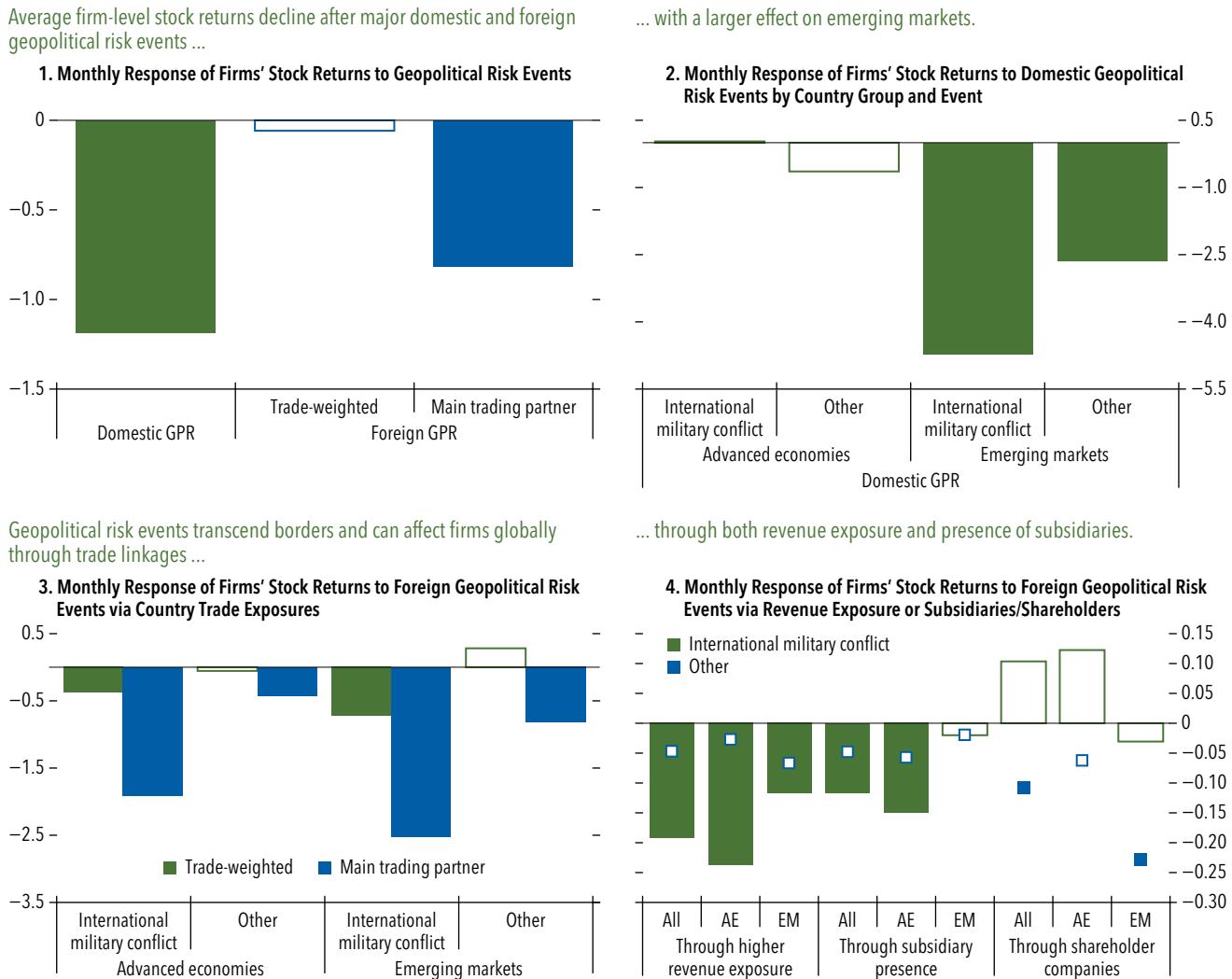
Russia's Invasion of Ukraine

Russia's 2022 invasion of Ukraine had a strong impact on stock markets in both countries. Beginning with media reports of Russian troop movements near the Ukrainian border on October 30, 2021, the Russian stock market entered a gradual decline (Figure 2.7, panel 1). This decline culminated in

²³For emerging markets, about one-third of the impact on stock prices appears to be driven by exchange rate movements vis-à-vis the US dollar. Furthermore, the impact on stock returns appears persistent up to at least six months.

²⁴The reported results in Figure 2.6, panels 1 to 3, summarize the impact of the various channels laid out in Figure 2.3. Figure 2.6, panel 4, takes a more granular approach and identifies the impact through the trade and investment channels. The analysis here includes all firms in the sample, including those that may benefit from heightened geopolitical tensions, such as energy or defense firms. In countries where such sectors are not dominant, the impact could be larger.

Figure 2.6. Rise in Global Geopolitical Tensions and Firm Stock Returns
(Percentage points)



Sources: Caldara and Iacoviello 2022; FactSet; LSEG Datastream; Orbis; IMF, Direction of Trade Statistics and World Economic Outlook databases; and IMF staff calculations.

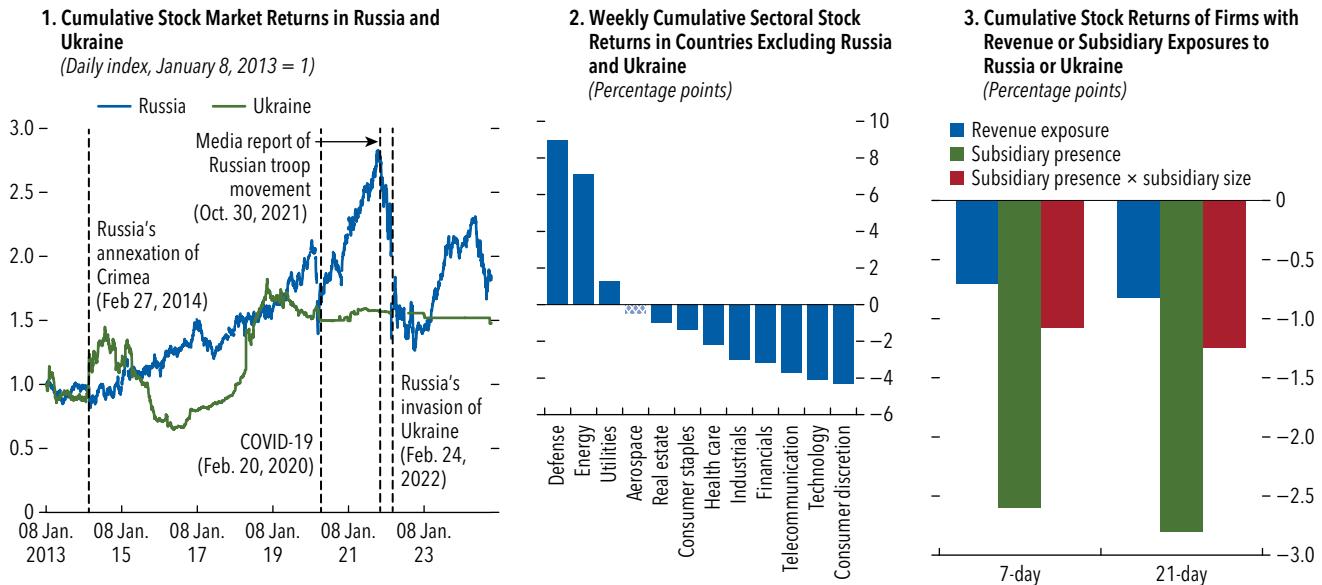
Note: Major geopolitical risk (GPR) events are defined as those for which values on the GPR indices of Caldara and Iacoviello (2022) are more than two standard deviations above the average. The events are cross verified from publicly available data sources and classified as either international military conflicts or other. See Online Annex 2.3 for further details on the definition of GPR events. The estimates are based on a sample of more than 60,000 firms (located in 20 advanced and 20 emerging market economies) and conditional on firm-level controls (panels 1–4), macroeconomic controls (panels 1–3), firm fixed effects (panels 1–3), or firm and country-sector-month fixed effects (panel 4). GPR events are deemed domestic if they occur in the country in which a particular firm is publicly listed and from which it derives most of its revenue, and foreign if they occur in one of its trading partners. Panel 3 shows the impact of involvement in a military conflict of a trading partner whose share in total exports and imports is 10 percentage points (corresponding to an increase in the respective standard deviation of about 2½ percentage points), or of a "main trading partner". "Main trading partner" is defined as the main export or import partner country, where the impacts are similar and averaged. Panel 4 shows the impact of a GPR event on stock returns of firms with higher revenue exposure to or subsidiary/shareholding companies in countries afflicted by such an event, by weighting the foreign GPR indicator variable with cross-border revenue shares, share of cross-border subsidiary, or shareholder companies. The identified impacts correspond to the change in stock returns of firms with a two-standard-deviation higher (weighted) foreign GPR indicator variable among firms within the same country and four-digit sector at a given month. Solid bars or markers indicate statistical significance at the 10 percent or lower level. See Online Annex 2.5 for further details. AE = advanced economies; EM = emerging markets.

Figure 2.7. Stock Returns After Russia's 2022 Invasion of Ukraine

Stock returns of local firms fell notably after Russia's invasion of Ukraine ...

... but the invasion also affected firms in other countries with exposure to Russia and Ukraine ...

... especially those directly connected to Russia.



Sources: FactSet; LSEG Datastream; Orbis; IMF, World Economic Outlook database; and IMF staff calculations.

Note: In panel 1, the Moscow Exchange was closed after Russia's invasion of Ukraine and reopened on March 24, 2022. The reopening was limited, with trading resuming for a select number of major stocks under strict restrictions, including a ban on short selling. The Ukrainian stock exchange also suspended trading until August 8, 2022, when trading partly resumed under strict regulations. In panel 2, the dependent variable is a firm's cumulative stock returns measured in US dollars seven trading days after the invasion (February 24, 2022). The analysis accounts for country-specific fixed effects. See Online Annex 2.6 for a detailed description of the empirical methodology. Solid bars indicate that the effect of the war on a particular industry was statistically significant at the 10 percent or lower level. In panel 3, the dependent variable is a firm's cumulative stock returns measured in US dollars for 7 and 21 days after February 24, 2022. The vertical axis represents the effect (in percentage points) of revenue exposure to either Russia or Ukraine two standard deviations greater than the average in the sample and of subsidiary presence (both unweighted and weighted by the share of subsidiary assets in a firm's total assets) on the cumulative stock returns of firms in the sample. The impact of subsidiary presence weighted by subsidiary size is computed for two standard deviations above the average.

Russia's military invasion of Ukraine on February 24, 2022, when the Russian stock market plummeted by 33 percent and trading on the Ukrainian stock market was suspended.²⁵

The impact of Russia's invasion of Ukraine quickly spilled over to firms in other countries, especially those with strong ties to both countries. For example, stock returns of firms in the defense sector in other economies generally rose on investors' expectations of increased military expenditure as security concerns took center stage (Figure 2.7, panel 2). Firms in the energy sector also benefited as oil prices surged on fears of disruption in the global oil supply. By contrast,

the invasion adversely affected stock returns of firms in these two sectors with direct revenue exposure to Russia or to Ukraine (Figure 2.7, panel 3). For example, stock returns of firms with high revenue exposures to Russia or Ukraine—defined as two standard deviations above the average exposure in the sample—had cumulatively declined about 0.7 percentage points seven days after the invasion, after accounting for a range of country- and sector-specific factors.²⁶ Whether firms had subsidiaries in Russia or Ukraine also made a difference. Stock returns of firms with a subsidiary in either or both countries had declined 2.5 percentage points, on average, a week after the war began.

Firms' exposure to Russia, both through subsidiaries and through revenues, has generally declined over time,

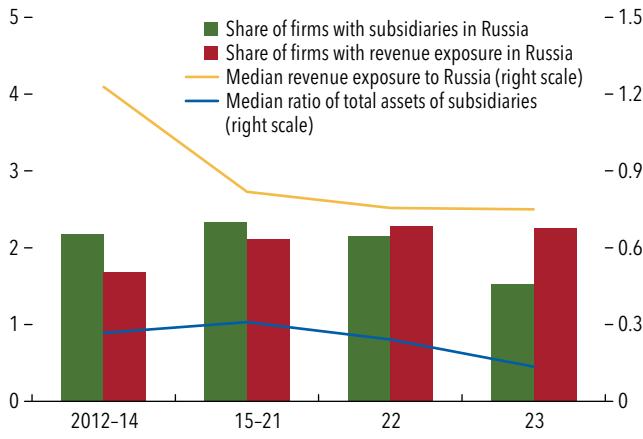
²⁵The impact on the Ukrainian stock market was muted, likely because it was characterized by low liquidity and a limited number of listed firms even before the invasion (Gorodnichenko and Rodnyansky 2024). For example, the number of stocks listed on the PFTS (First Stock Trading System) exchange had declined from 20 to 7 by 2018 as the Russian annexation of Crimea and occupation of Donbas in 2014 severely affected many Ukrainian companies.

²⁶The average revenue exposure of firms in the sample to Russia or Ukraine before the onset of the war was about 0.1 percent. A two-standard-deviation increase represents firm revenue exposure of about 1.3 percent.

**Figure 2.8. Firms' Exposure to Russia
(Percent)**

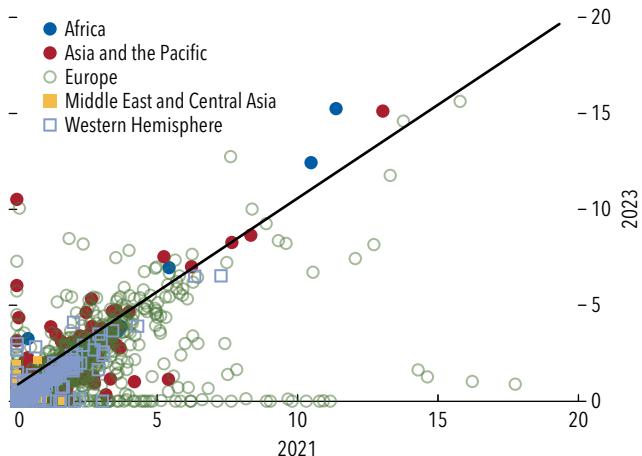
After Russia's invasion of Ukraine, firms reduced their exposure to Russia, on average ...

1. Revenue and Subsidiary Exposure to Russia



... but in some countries, firms' exposure to Russia has increased.

2. Exposure of Firm Revenue to Russia, 2021 versus 2023



Sources: Centre d'Etudes Prospectives et d'Informations Internationales (CEPII); FactSet; LSEG Datastream; Orbis; and IMF staff calculations.

Note: In panel 1, the share of firms with revenue exposure to Russia is based on the largest 100 publicly listed firms in each country. The ratio of total assets of subsidiaries refers to the share of subsidiary assets in total assets of the parent company. Panel 2 shows for each firm in the sample the share of revenue derived from Russia in the year 2023 (y-axis) against that in the year 2021 (x-axis), with each dot colored by the firm's headquarters location, and the solid line representing the 45-degree reference line. The panel is based on firms that derive up to 20 percent of total revenues from Russia, covering over 99 percent of the firms with revenue exposure to Russia in 2021 or 2023.

but there are several exceptions. The share of firms with subsidiaries in Russia declined after Russia's invasion of Ukraine from more than 2 percent in 2015–21 to about 1.5 percent in 2023 (Figure 2.8, panel 1). Similarly, the size of these subsidiaries also halved, from about 0.3 percent of firms' total assets to about 0.14 percent. Although the share of firms with revenue exposure to Russia has remained somewhat stable, the average size of firms' revenue exposure appears to have decreased marginally. The average statistic, however, masks significant underlying variation, as the revenue exposure to Russia of firms in several European countries has declined, whereas that of firms in some other countries has increased, albeit from relatively low levels (Figure 2.8, panel 2). These findings suggest a possible reorientation of trade and investment linkages after major geopolitical risk events that could be disruptive for some countries, particularly in the near term.

China-US Trade Tensions

Geopolitical risk can manifest in the form of trade tensions. Although trade-related measures are not necessarily associated with geopolitical risk, trade tensions, such as tariffs, trade wars, and sanctions, could be imposed for geopolitical reasons and impact interna-

tional relations and economic activity. For example, trade tensions between the US and China that accelerated in 2018 are reflected in an elevated geopolitical risk index for China around that time (Online Annex Figure 2.6.2).

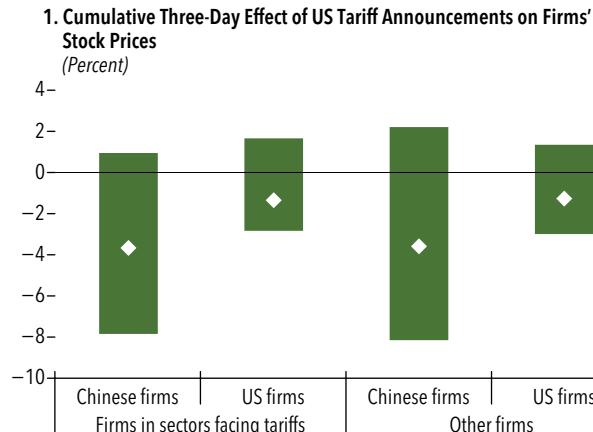
Analysis shows that stock prices reacted negatively to tariff announcements by China and the US during 2018–24.²⁷ After announcements of tariffs on China by the US, the stock prices of Chinese firms declined by nearly 4 percent, on average. This decrease affected firms in both the directly impacted sectors and those in other sectors (Figure 2.9, panel 1).²⁸ The magnitude of the effect is notable, as the average stock return in these firms in the two-year period prior to the imposition of these tariffs was about 0.1 percent. Moreover, some US tariff announcements had an even larger impact on Chinese firms. For example, average stock

²⁷The chapter focuses on announcements that introduced significant tariff increases or imposed new tariffs. It excludes tariff announcements that implied modifications to existing tariffs or followed within a few days of each other, as well as those that were eventually not implemented. See Online Annex 2.6 for details.

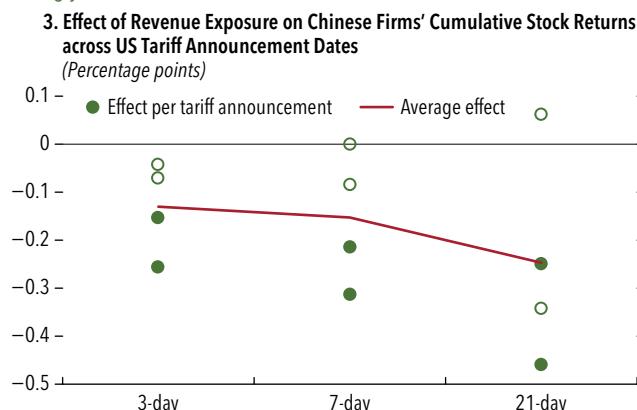
²⁸The strong impact on firms in sectors not directly affected by tariffs could indicate interconnectedness among firms, as well as broader uncertainty and investor risk aversion. See Online Annex 2.6 for additional details.

Figure 2.9. China and US Tariff Announcements and Firm Stock Returns

US tariff announcements had a negative impact on the stock prices of Chinese and US firms ...



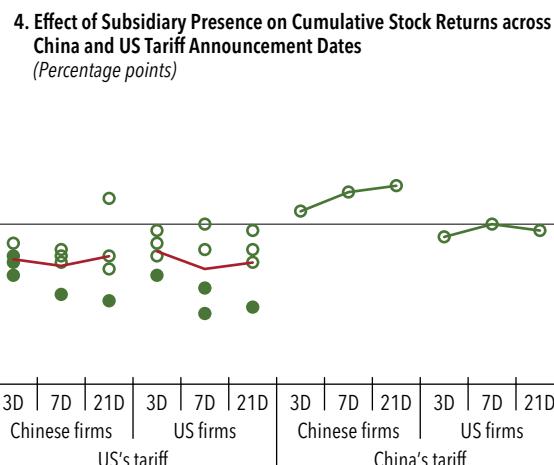
US tariffs affected firms with revenue exposure to the United States more strongly ...



... as did tariff announcements by China.



... along with Chinese firms with US subsidiaries and US firms with subsidiaries in China.



Sources: FactSet; LSEG Datastream; Orbis; and IMF staff calculations.

Note: US tariff increases correspond to the following announcement dates: March 22, 2018; May 6, 2019; August 1, 2019; and May 14, 2024. China's increase in tariffs on US goods, in particular soy and autos, was announced on August 23, 2019. The event dates have been selected based on the earliest official or media announcements of new tariff changes by each country, excluding retaliatory measures announced shortly after initial policies, to isolate primary market reactions, similar to the methodology in Amiti and others (2024) (see Annex 2.6). In panel 1, bars represent the minimum to maximum range of average stock returns across events, with diamonds indicating averages. In panel 2, diamonds represent average stock returns after China's retaliatory tariff announcement. Panel 3 measures effects using coefficients of revenue exposure to the United States. In the regression analysis, the dependent variables are firms' cumulative stock returns measured in US dollar terms for the next three (3D), 7 (7D), and 21 (21D) trading days after the date of a particular tariff announcement. Panel 4 measures effects using coefficients of dummy variables that have values of 1 for Chinese or US firms with subsidiaries in the United States or China, respectively. Solid circles indicate statistical significance at the 10 percent or lower level. Standard errors are clustered at the sector level.

returns declined by almost 8 percent on May 6, 2019, when the US announced tariff increases on Chinese products amounting to \$200 billion.²⁹

²⁹Not every tariff announcement resulted in a pronounced stock market reaction. For example, the tariff announcements on March 22, 2018, and May 14, 2024, had a negligible or positive impact on firms' stock prices, suggesting that the specifics of the announcements matter. More targeted and less severe tariff announcements may have a smaller impact.

Stock prices in the United States also appear to have responded to its tariff announcements. US firms' stock prices declined by 1.3 percent, on average, after the US government made announcements regarding tariffs on China (Figure 2.9, panel 1). This suggests some "spillover" effects, possibly because of the anticipation of retaliatory tariffs, interconnectedness of firms through revenue exposure and supply chains, potential impact on aggregate demand, or a general rise in uncertainty and

investor risk aversion. Consistent with this, stock prices of firms in sectors directly affected by the tariffs declined similarly to those of firms in other sectors.³⁰

The retaliatory tariff announcement by China also had a significant impact on both Chinese and US firms' stock prices. Stock prices of US firms fell by 1.6–1.8 percent, on average, after China's announcement of retaliatory tariffs on August 23, 2019. This tariff announcement also appears to have affected Chinese firms, with their stock prices declining by 0.3–0.7 percent (Figure 2.9, panel 2).

Tariff announcements affected firms connected through revenue or subsidiary exposure more acutely. Stock returns of Chinese firms that had revenue exposure to the United States before a US tariff announcement declined by about 0.2 percentage points more after the announcement than those of comparable firms without such revenue exposure (Figure 2.9, panel 3). Moreover, after a US tariff announcement, the stock returns of both US firms with subsidiaries in China and Chinese firms with a subsidiary in the US dropped, on average, by 0.6 percentage points more than returns of comparable firms without such subsidiary presence (Figure 2.9, panel 4).

Taken together, these results suggest that an increase in geopolitical risks, particularly of a military nature, can have significant, adverse effects on financial markets of the countries involved in the conflict. In addition, there can be cross-border contagion effects through trade and financial linkages.

Response of Sovereign Risk Premiums to Geopolitical Risk

An increase in geopolitical risks can influence sovereign risk. This may occur because of higher military spending weighing on a government's fiscal outlook or a deterioration in economic activity pushing up public-debt-to-GDP ratios and raising fiscal sustainability concerns (*April 2025 Fiscal Monitor*). The rise in sovereign risk premia can in turn impact financial stability through the interconnectedness of sovereign and financial sector balance sheets (*April 2022 Global Financial Stability Report*, Chapter 2). These effects are

³⁰The impact of tariffs on firms in other countries (not directly affected by the tariffs) is less clear. Stock prices for firms in Mexico increased soon after the US tariff announcements on China, whereas firms in Canada, Germany, India, Japan, Korea, and the United Kingdom generally experienced negative stock market reactions (Online Annex 2.6).

likely to be more pronounced in response to military conflicts than to other risk events, given the generally higher fiscal expenditure and greater deterioration in economic growth in the case of such conflicts. To examine whether geopolitical risk events affect sovereign risk, the chapter estimates a panel regression model using sovereign CDS spreads as a proxy for sovereign risk premiums.³¹

Sovereign CDS spreads widen significantly after major geopolitical risk events and most notably during military conflicts. For example, within one month of a country's involvement in a major international military conflict, sovereign CDS spreads widen by about 40 basis points in advanced economies and by about 180 basis points in emerging market economies (Figure 2.10, panel 1).³² Sovereign risk premiums also increase in response to international military conflicts involving a country's trading partners, particularly its main export and import partners (Figure 2.10, panel 2), likely reflecting a negative impact on economic activity and upward pressures on inflation.

Foreign geopolitical risk events have a more pronounced effect on sovereign risk premiums for economies with smaller fiscal and international reserve buffers or weaker institutional quality. For example, sovereign risk premiums increase more in emerging market economies with high public-debt-to-GDP ratios (defined as those above the median in the emerging markets sample) when their key trading partners are involved in an international military conflict (Figure 2.10, panel 3).³³ Similarly, sovereign CDS premiums increase by 100 basis points more in economies with international reserve adequacy ratios below the sample median, and by 120 basis points in economies with institutional quality below the sample median,

³¹Sovereign bond spreads and CDS spreads tend to move together in the long run (Zhu 2004). See Online Annex 2.7 for a discussion of the methodology and the detailed results.

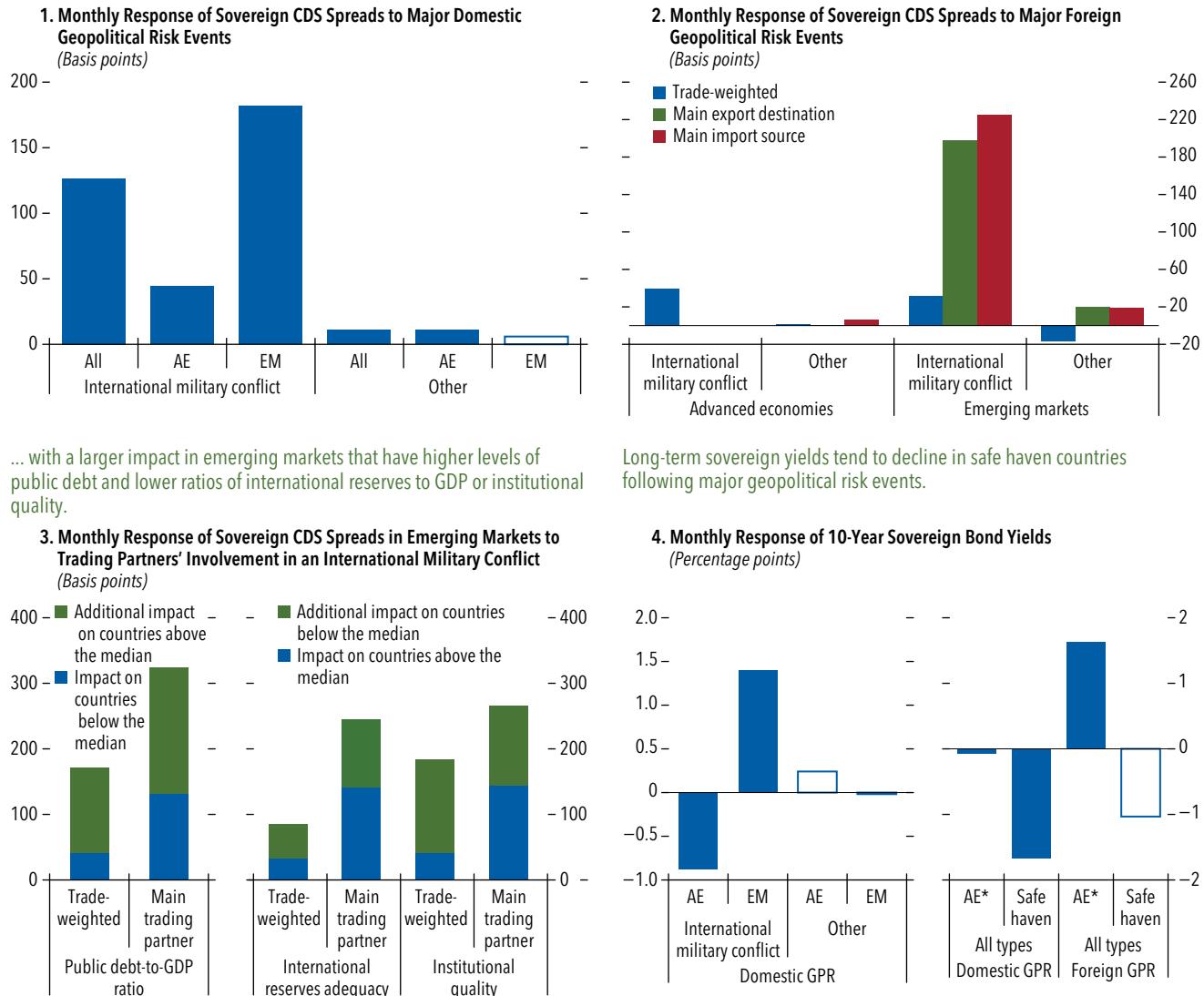
³²To the extent that sovereign bonds are viewed as safer or less risky investments than other alternatives, an increase in geopolitical risk could also imply a flight-to-safety effect, pushing down sovereign bond yields and sovereign risk premiums. The chapter's analysis, however, suggests that, on average, such safe haven effects do not dominate. Additional analysis shows that in the case of global geopolitical risk events, advanced economies typically act as safe havens and their sovereign risk premiums decline.

³³This result holds for the full sample of advanced and emerging market economies. However, when the sample is restricted to advanced economies, the results do not suggest an amplifying effect of the public-debt-to-GDP ratio, perhaps because of advanced economies' safe haven status, as noted earlier.

Figure 2.10. Response of Sovereign Risk Premiums to Geopolitical Risk Events

Sovereign CDS premiums rise after major domestic geopolitical risk events, particularly military conflicts ...

... as well as foreign geopolitical risk events ...



... with a larger impact in emerging markets that have higher levels of public debt and lower ratios of international reserves to GDP or institutional quality.

Long-term sovereign yields tend to decline in safe haven countries following major geopolitical risk events.

Sources: Bloomberg Finance L.P.; Caldara and Iacoviello 2022; International Country Risk Guide (ICRG); IMF, World Economic Outlook and Direction of Trade Statistics databases; and IMF staff calculations.

Note: Panel 1 shows the impact on five-year sovereign credit default swap (CDS) premiums, estimated for a monthly panel of 17 advanced and 20 emerging market economies, when a country is involved in an international military conflict, with lags of various domestic macroeconomic fundamentals controlled for, and country and month fixed effects included. "Trade-weighted" in panels 2 and 3 shows the impact in a particular country when a trading partner with a 10 percent greater weight in total trade (corresponding to about 2.5 standard deviations of trade shares in the sample) experiences a geopolitical risk event. Panel 3 interacts the indicator variable for major geopolitical risk events with the lagged public-debt-to-GDP ratio, international reserves adequacy ratio (as defined in IMF 2016), or institutional quality. "Institutional quality" is the average of ICRG's scores on bureaucracy quality, corruption, democratic accountability, investment profile, and law and order, of a country. Panel 4 shows the impact on 10-year sovereign bond yields, estimated for a monthly panel of 20 advanced and 18 emerging market economies, when a country experiences a major geopolitical risk event. These estimates reflect the long-term relationship between geopolitical risk events and sovereign CDS premiums or yields. Safe haven countries are taken as Germany, Japan, Switzerland, the United Kingdom, and the United States. Solid bars indicate statistical significance at the 10 percent or lower level. See Online Annex 2.7 for details. AE = advanced economies; AE* = advanced economies excluding traditional safe haven countries; EM = emerging markets.

after a major trading partner becomes involved in an international military conflict.

Long-term sovereign yields in countries traditionally considered safe havens tend to decline following geopolitical risk events. Following major domestic geopolitical risk events, long-term sovereign yields tend to decline in advanced economies, driven mainly by safe haven countries (Figure 2.10, panel 4). In contrast, the yields in emerging markets tend to increase. Such safe haven effects appear more pronounced for major foreign geopolitical risk events, when long-term yields tend to notably increase in other advanced economies but not so in traditional safe haven countries.³⁴

These results suggest that rising geopolitical risks, and the associated macroeconomic uncertainty, can create a feedback loop with fiscal risk, adversely impacting financial stability. A significant geopolitical event can increase sovereign risk premiums, thereby amplifying fiscal vulnerabilities (see also the April 2025 *Fiscal Monitor*). The increase in fiscal vulnerabilities can, in turn, further exacerbate the impact of the geopolitical risk shock on sovereign risk premiums, which may adversely affect banks' balance sheets and lending, especially in countries with less well-capitalized banking systems and higher fiscal vulnerabilities (April 2022 *Global Financial Stability Report*, Chapter 2).

Pricing of Geopolitical Risk

The impact of geopolitical risk shocks on asset prices depends on the extent to which investors price in geopolitical risks. The relationship between geopolitical risk and stock returns can provide insights into the pricing in of geopolitical risks. According to modern asset-pricing theory, investors require positive risk premiums to hold stocks that are likely to lose value when economic activity worsens. This implies that stocks that respond more negatively to geopolitical risk should have higher risk premiums, and those that can hedge against such risks should have lower ones. To determine these premiums—well-established standard approaches from asset pricing—this section first calculates the exposure of assets to geopolitical risk

and then estimates the premium expected with this risk exposure.³⁵

Stock returns respond heterogeneously to geopolitical risk events. The sensitivity of stock returns to geopolitical risk shocks after market factors are controlled for—known as the geopolitical risk (GPR) beta—is nearly symmetric, with a large number of stocks exhibiting both positive and negative GPR betas (Figure 2.11, panel 1).³⁶ On average, stocks in the energy and defense sectors exhibit higher GPR betas, implying that their value rises after a geopolitical risk shock, whereas stocks in the consumer goods sector tend to have lower betas. This is consistent with the observation that geopolitical risk events tend to raise energy prices but reduce consumer demand, on average.³⁷

Investors seem to factor in geopolitical risk to some extent.³⁸ When a cross-section of stock returns is examined, the analysis shows a statistically significant and negative premium associated with geopolitical risk shocks between 2012 and 2021. On average, over that period, a one-percentage-point difference in the GPR betas, equivalent to the difference between the average GPR beta for the energy sector and that for all other firms, leads to a negative premium of 0.01 percent-

³⁵In the first step, the chapter estimates risk exposures (betas) using time-series regressions of firm-level stock returns on risk factors. In the second step, regressions are estimated to obtain the time series of risk premiums for each factor by estimating cross-sectional regressions of returns on the estimated betas (Fama and MacBeth 1973), controlling for market, size, book-to-market ratio, and the momentum factor. The averages of these time series can be interpreted as the risk premiums associated with the factors. In the decile portfolio analysis, the chapter calculates returns of a portfolio that buys stocks with geopolitical risk betas in the highest decile and sells those with betas in the lowest decile. These returns are then regressed on the Fama and French (1993) three factors and the momentum factor. The estimated alphas indicate the (risk-adjusted) premiums for stocks with higher geopolitical risk betas.

³⁶GPR shocks are the residuals from the first-order autoregressive model of the logarithm of the global GPR index by Caldara and Iacoviello (2022). See Online Annex 2.8 for a discussion of the sample, methodology, and results reported in this section.

³⁷The estimated GPR beta represents the average response of stock returns (in percentage points) to a geopolitical risk shock corresponding with that for Russia's invasion of Ukraine. See Online Annex Figure 2.8.2 for further details on the results.

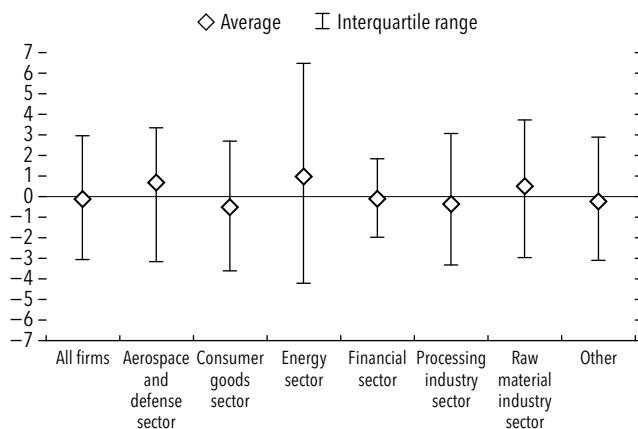
³⁸Consistent with the analysis in this chapter, Hirshleifer, Mai, and Pukthuanthong (2023a, 2023b) find a text-based index measuring war discourse to have significant predictive power for expected returns in the US stock market. Zhang and others (2024); Zaremba and others (2022); and Cheng, Liao, and Pan (2023) also find that geopolitical risk is a significant factor in pricing a cross-section of stocks in China, stocks in the aggregate in emerging markets, and commodity futures, respectively.

³⁴The results also suggest an increase in long-term yields in emerging markets following major foreign geopolitical risk events. See Online Annex 2.7 for details.

Figure 2.11. Pricing of Geopolitical Risk in Stock Markets
(Percentage points)

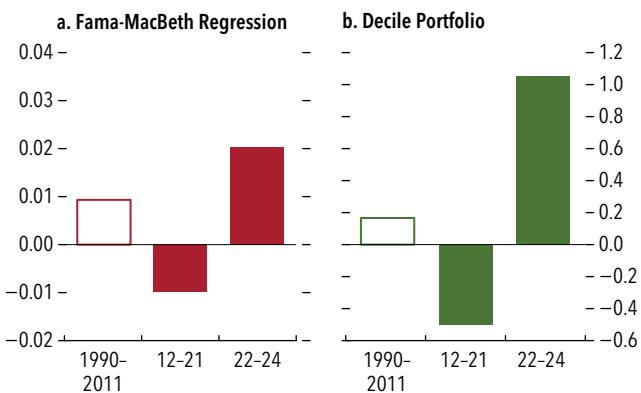
Stock returns show varying sensitivity to geopolitical risk shocks across and within sectors.

1. Geopolitical Risk Beta Values by Sector, 1989-2024



Consistent with investors' pricing in geopolitical risks, stocks that act as hedges offered lower premiums before Russia's invasion of Ukraine and higher premiums afterward.

2. GPR Beta Premium, 1990-2024



Sources: Caldara and Iacoviello 2022; LSEG Datastream and Worldscope Fundamentals database; and IMF staff calculations.

Note: In panel 1, diamonds and whiskers, respectively, represent the simple average and interquartile range of the within-industry distribution of the time-series average of the estimated individual excess stock return sensitivity (in percentage points) to a one-unit geopolitical risk (GPR) shock, for a sample period from January 1989 to September 2024. Panel 2 indicates the estimated average coefficients for GPR betas for time windows in Fama-MacBeth (1973) regressions. Subpanel a. shows these coefficients for regressions in which one-month-ahead individual excess stock returns are regressed on GPR betas; subpanel b. shows the alphas of one-month-ahead returns of simple average portfolios constructed by buying stocks with GPR betas in the top 10 percent and selling those with GPR betas in the bottom 10 percent, with Fama-French (1993) three factors and momentum factor controlled for. In both subpanels, the sample period is from May 1990 to July 2024. Solid bars indicate statistical significance at the 10 percent or lower level. For details of the methodology, see Online Annex 2.8.

age points (proxied by the cross-sectional variation in one-month-ahead excess return across stocks). This premium, however, turned positive after Russia's invasion of Ukraine in 2022 (Figure 2.11, panel 2). Moreover, a portfolio that buys stocks with GPR betas in the highest decile and sells those with GPR betas in the lowest decile is found to have generated statistically significant negative premiums of about 0.5 percent per month during 2012–21 but a positive premium of about 1.1 percent after 2022.³⁹ These results suggest that, before Russia's 2022 invasion of Ukraine, investors demanded a premium for holding stocks that responded negatively to geopolitical risks. But after the invasion, they favored stocks that served as a hedge against such risks.

³⁹Because the GPR betas differ, on average, by about 35 units between the first and tenth deciles, the marginal impact of a one-unit increase in GPR beta on one-month-ahead excess return (about 0.01 percentage point) is similar to the result obtained from the Fama-MacBeth (1973) regression. Moreover, consistent with these findings, GPR beta-based sorted portfolios appear to have provided opportunities for investors to hedge against geopolitical risk (Online Annex Figure 2.8.5).

Investors' consideration of geopolitical risks can also be evaluated by analyzing the protection they seek against potential downside impacts from geopolitical risk events. Options markets are particularly suitable for analyzing the pricing in of such risk because the costs of protection against downside risks can be measured using "out-of-the-money" put options.⁴⁰ For an exercise using such an analysis, the chapter focuses on Russia's 2022 invasion of Ukraine and trade tensions between China and the US.

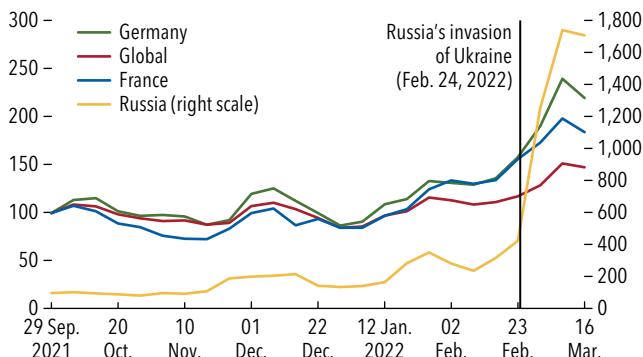
Investors appear to have priced geopolitical risks associated with Russia's invasion of Ukraine into stock options. The premiums for protecting against downside risk (the risk of declining stock prices) and additional premiums for protecting against

⁴⁰An out-of-the-money put option is a type of options contract with a strike price (the price at which the option can be exercised) lower than the current market price of the underlying asset. Following Pastor and Veronesi (2013), the analysis here measures the cost of protection against tail risks by relating the implied volatility of out-of-the-money put options to their "moneyness" (delta), which measures how much the price of an option is expected to change in response to a change in the price of the underlying asset. See Online Annex 2.8 for further details on the analysis.

Figure 2.12. Pricing of Geopolitical Risk in Options Markets around Russia's 2022 Invasion of Ukraine
(Indices, 22 weeks before invasion = 100; unless noted otherwise)

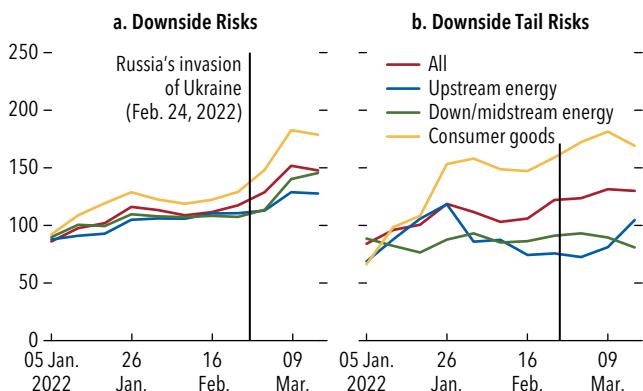
In Europe, the costs of protection from downside risks increased before Russia's invasion of Ukraine ...

1. Cost of Protection for Downside Risks across Countries



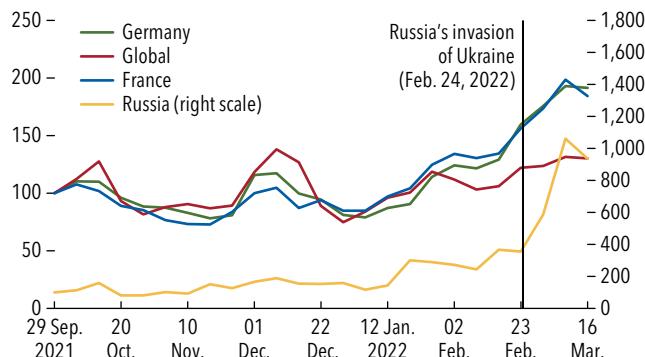
The cost of both types of protection remained stable for the energy sector while increasing for consumer goods ...

3. Cost of Protection across Sectors



... as did those for protection from downside tail risks.

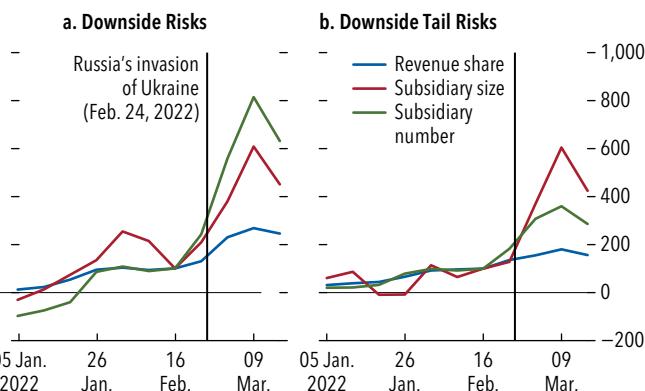
2. Cost of Protection for Downside Tail Risks across Countries



... and for firms with greater exposure to Russia and Ukraine.

4. Cost of Protection by Exposures to Russia and Ukraine

(Indices, 2 weeks before invasion = 100)



Sources: FactSet; LSEG Datastream and Worldscope Fundamentals database; Orbis; and IMF staff calculations.

Note: "Downside risks" and "Downside tail risks" represent estimates of the average level and slopes of the implied volatility curves for firm-level stock put options for one-month-ahead prices; the estimates are calculated using panel data with a one-week window (the respective date and past four business days). The estimates for Russia in panels 1 and 2 are based on a country-level stock index, owing to data limitations. Panel 4 shows the increases in downside risks and tail risks resulting from a one-unit increase in exposures to Russia and Ukraine, relative to firm average exposure. The exposure measures are Russia's and Ukraine's shares in revenue exposure (percent), total asset size of subsidiaries in Russia and Ukraine relative to asset size of the parent company (percent), and the number of subsidiaries in Russia and Ukraine. For details of the methodology, see Online Annex 2.8.

downside tail risks (the risk of extreme drops in stock prices) increased moderately before Russia's invasion but surged notably around the event (Figure 2.12, panels 1, 2, and 3). The premiums increased most for stock options on Russian firms, but they also rose for options on firms in European countries, reflecting the firms' higher exposure to the event than stocks of firms in other geographic areas to geopolitical risk. Sectoral breakdowns indicate that premiums remained stable in the energy sector, consistent with the notion that the sector was benefiting from rising energy prices. By contrast, options on stocks of firms with a higher exposure

to Russia and Ukraine through subsidiaries or revenues faced higher premiums (Figure 2.12, panel 4).⁴¹

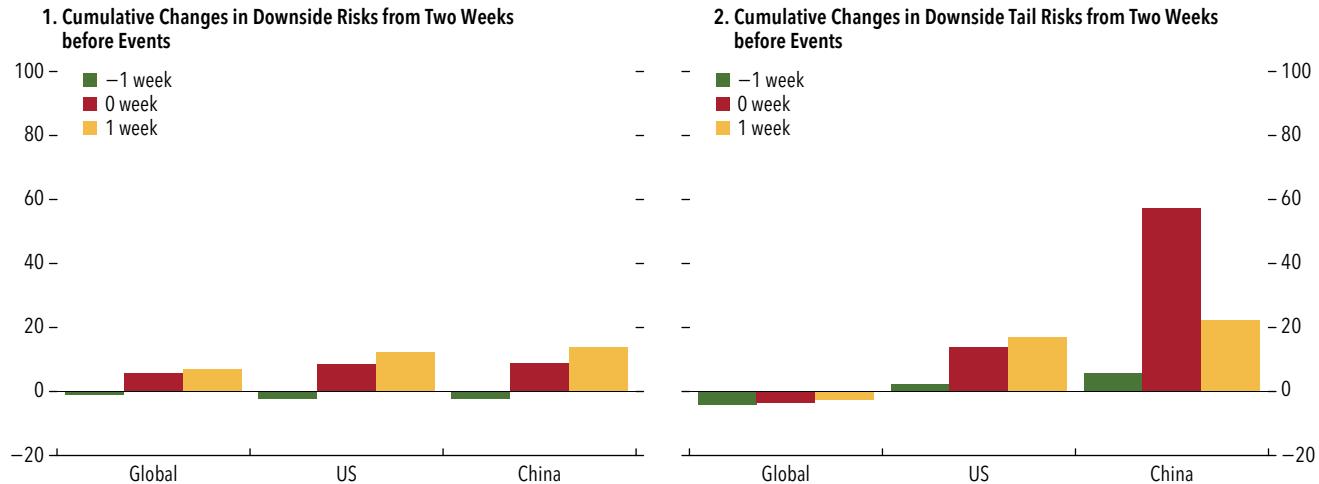
China–US trade tensions appear to have increased tail risks. For Chinese and US firms, option premiums for protecting against downside and tail risks increased after the tariff announcements by the Chinese and US governments in 2018–19 (Figure 2.13, panels 1 and 2). By contrast, premiums did not increase for options on stocks of firms in other countries, on average, after

⁴¹At the onset of the Israel–Gaza conflict, premiums on options of stocks of firms with exposure to Israel increased modestly (Online Annex Figure 2.8.11).

**Figure 2.13. Pricing of Geopolitical Risk in Options Markets amid China-US Trade Tensions
(Percent)**

The costs of protection from downside risks broadly increased in Chinese and US firms after 2018–19 tariff announcements ...

... and even more strongly for protection from tail risks.



Sources: LSEG Datastream and Worldscope Fundamentals database; and IMF staff calculations.

Note: "Downside risks" and "Downside tail risks" represent estimates of the average level and slopes of the implied volatility curves for firm-level stock put options for one-month-ahead prices; the estimates are calculated using panel data with a one-week (five-business-day) window. Event weeks (0 week) represent the week that consists of the date of a tariff hike announcement by the United States and China and the next four business days. The selected announcements are consistent with those in Figure 2.9, but also include retaliatory tariff announcements. For details of the methodology and selected announcement dates, see Online Annex 2.8.

these announcements. In addition, the option premiums for protecting against tail risk rose more prominently than those for protecting against downside risk, indicating that the China–US trade tensions had a stronger impact on perceived tail risks.

Overall, investors seem to factor geopolitical risk into both equity and options markets. However, surprise realizations of geopolitical risks can still lead to sharp asset price corrections and increased financial market volatility, potentially impacting investors and financial institutions, as discussed in the next section.

Implications of Geopolitical Risk Exposure for the Financial System

Banks and nonbank financial institutions are exposed to a multitude of risks emanating from geopolitical developments. Because adverse geopolitical risk events may trigger market volatility, elevate macroeconomic uncertainty, and disrupt economic activity (Figures 2.3 and 2.5), financial institutions, including banks and nonbanks, may face elevated market, liquidity, and credit risks during these events (April 2023 *Global Financial Stability Report*). Changes in asset prices, especially in the case of rapid selloffs, can cause the value of financial assets held by these institu-

tions to fluctuate significantly, with an impact on the institutions' balance sheets, risk-taking capacity, and funding conditions, triggering an adverse macrofinancial feedback loop. Moreover, investment funds facing rapid outflows after geopolitical risk shocks can exacerbate fragility in less liquid asset markets (October 2022 *Global Financial Stability Report*, Chapter 3). Increased risk of cyberattacks and the fragmentation of financial markets because of sanctions and capital controls can also challenge the operational resilience of financial institutions (April 2022 and April 2024 issues of the *Global Financial Stability Report*).

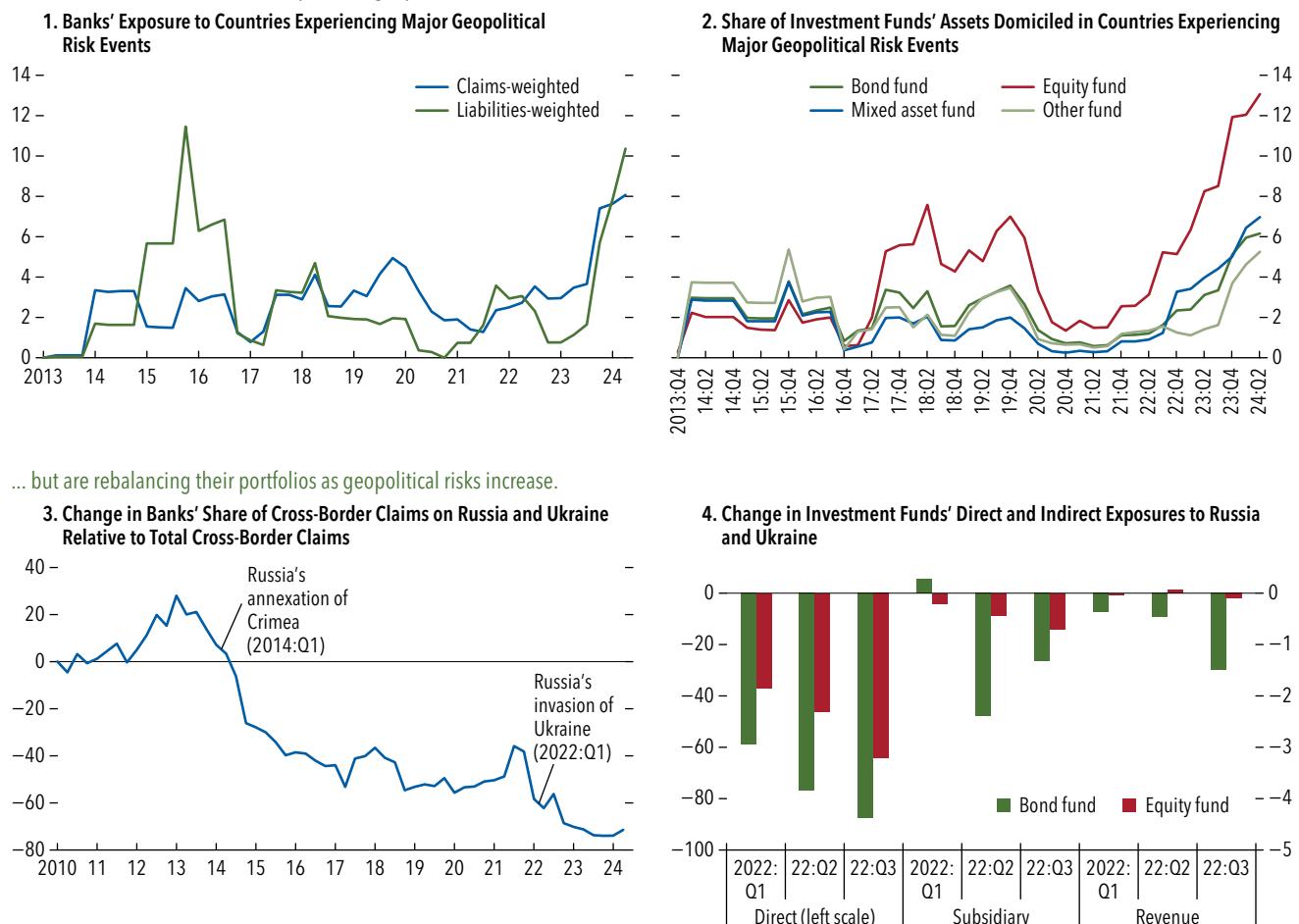
Banks and nonbank financial institutions hold assets in countries exposed to major geopolitical risk events.⁴² Cross-border bank claims and liabilities involving countries afflicted by major geopolitical risk events are sizable: about 8 and 10 percent of total cross-border bank claims and liabilities, respectively, as of the second half of 2024 (Figure 2.14, panel 1).⁴³

⁴²Major geopolitical risk events are defined as those with values more than two standard deviations above the average on the respective geopolitical risk indices of Caldara and Iacoviello (2022).

⁴³Banks' exposure to countries involved in major geopolitical risk events has increased considerably over time. The average share of cross-border bank claims on countries experiencing major geopolitical risk events was about 3 percent, on average, from the first quarter of 2000 to the first quarter of 2024.

**Figure 2.14. Exposure of Banks and Investment Funds to Geopolitical Shocks
(Percent)**

Banks and investment funds are exposed to geopolitical risks ...



Sources: Bank for International Settlements, Locational Banking Statistics; Caldara and Iacoviello 2022; FactSet; Lipper; and IMF staff calculations.

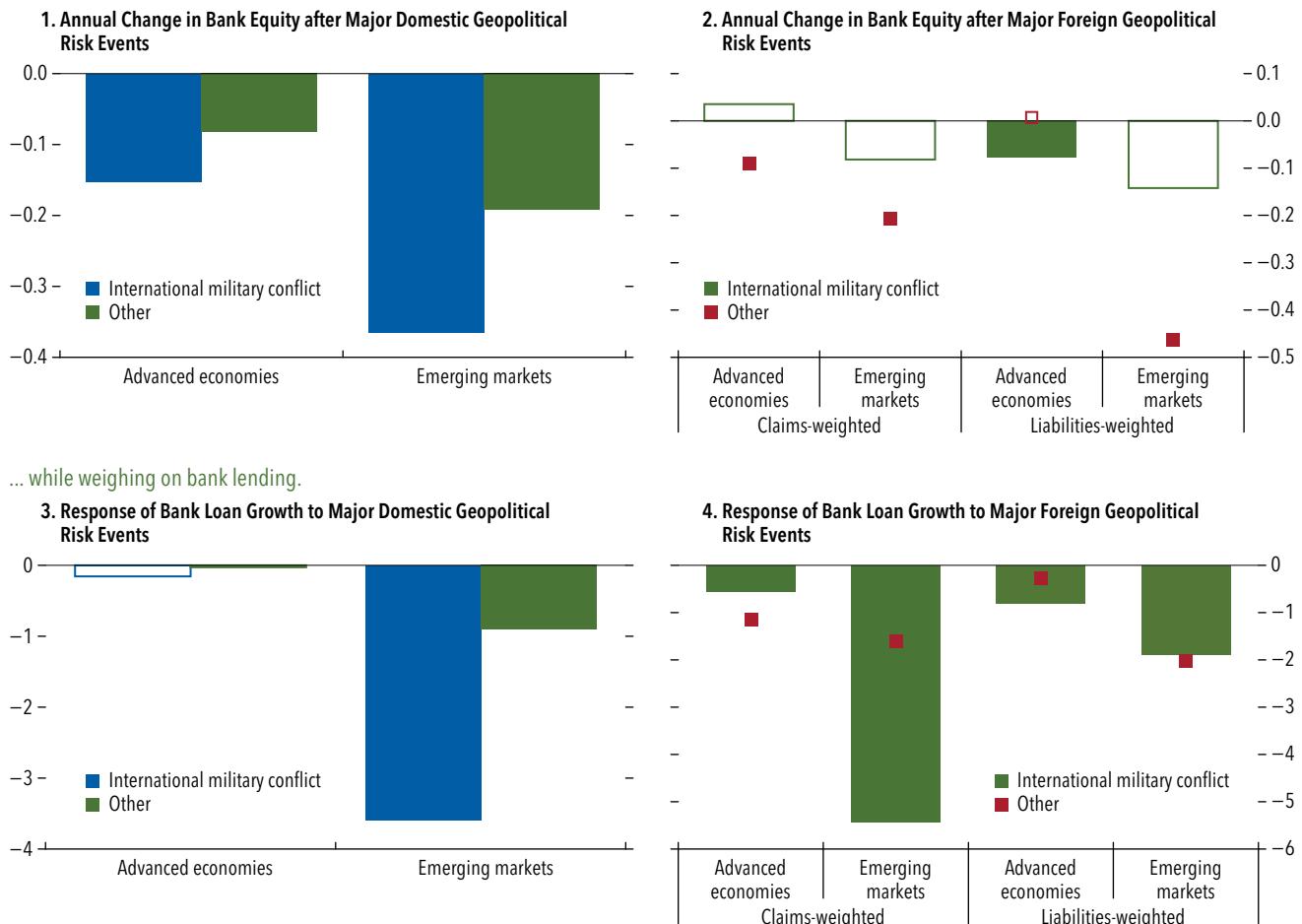
Note: Panel 1 shows 4-quarter moving averages for cross-border exposures, through claims or liabilities on a consolidated immediate basis measured at the end of the quarter, of banking sectors to countries afflicted by a major geopolitical risk event. The averages are calculated by weighting the foreign geopolitical risk indicator variable by the share of cross-border claims on or liabilities against countries for each quarter. Panel 2 is calculated similarly using fund holding positions at the end of the quarters, but the weighted 4-quarter moving averages for the risk indicator variable are averaged instead across individual funds (within fund types). The weighted average of shares across funds, with weights proportional to funds' assets under management, yields a similar picture, but values that are three to four percentage points lower, suggesting that smaller funds tend to have greater exposure to countries afflicted by geopolitical risk events. Panel 3 shows the change in total cross-border banking claims on Russia and Ukraine relative to total cross-border banking claims, expressed as the cumulative percent change relative to the first quarter of 2010. In panel 4, the vertical axis shows the change in portfolio exposures compared with one quarter before the event (that is, in the fourth quarter of 2021). Exposures are calculated as the weighted average of a variable indicating whether the issuer of a security is domiciled in, has at least one subsidiary in, or derives revenues from the countries in which an event occurs and the revenue percentage is higher than the country-sectoral median. The weights reflect the change in shares after the underlying price of assets is kept constant at the price at the end of the quarter before the event.

Similarly, the share of holdings by equity funds of assets domiciled in these countries reached 13 percent of these funds' assets in 2024 (Figure 2.14, panel 2). Moreover, most banking sectors and investment funds hold assets in countries exposed to major geopolitical risk events, highlighting previously noted industry concerns regarding geopolitical risks (see footnote 2).

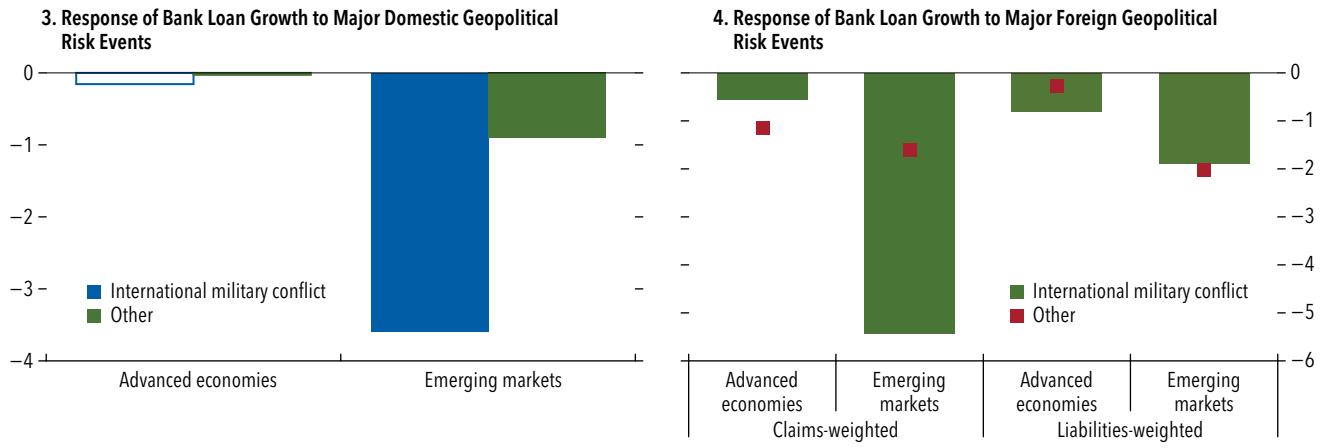
Financial institutions have reduced their exposure to Russia and Ukraine. For example, cross-border banking claims on Russia and Ukraine fell significantly after the annexation of Crimea in 2014 and after Russia's invasion of Ukraine in the first quarter of 2022 (Figure 2.14, panel 3). Similarly, investment funds seem to have reduced their direct exposures to

Figure 2.15. Impact of Major Geopolitical Risk Events on Bank Capital and Lending
(Percentage points)

Major geopolitical risk events generally have an adverse effect on bank capital, especially in emerging markets ...



... while weighing on bank lending.



Sources: Bank for International Settlements, Locational Banking Statistics; Bloomberg Finance L.P.; Caldara and Iacoviello 2022; Fitch Connect; and IMF staff calculations.

Note: The panels show the effect on bank outcome variables—namely, the change in the ratio of equity to lagged total assets and the log change in total domestic loans—after major geopolitical risk events in which the country in which a bank is located is involved (panels 1 and 3) or in foreign countries against which banks in a particular country have claims or from which these banks are funded (panels 2 and 4). In panels 2 and 4, the reported magnitudes correspond to the estimated impact of a one-standard-deviation increase in the weighted average of indicator variables for major foreign geopolitical risk events, with weights proportional to the share of total outstanding claims in total cross-border claims (or similarly for liabilities). The results are based on an unbalanced panel of more than 6,000 banks from 21 advanced economies and 15 emerging markets, with controls for a large set of bank and macro variables and bank and year fixed effects. See Online Annex 2.9 for further details. Solid bars or markers indicate statistical significance at the 10 percent or lower level.

both countries by 60 percent after Russia's invasion of Ukraine (Figure 2.14, panel 4). Moreover, investment funds also appear to have reduced their indirect exposures to these countries to some extent. For example, investment funds reduced their holdings of firms in third countries with high (above the country-sectoral median) revenue or subsidiary exposures to Russia or Ukraine.

Major geopolitical risk events may weigh on bank stability and lending, especially in emerging market

economies. For example, borrower creditworthiness can deteriorate after a major domestic geopolitical risk event, and banks may cut back lending amid heightened uncertainty. Foreign geopolitical risk events can cause cross-border claims to lose value and make rolling over foreign wholesale debt more difficult, especially when such events affect key counterparts. Empirical results confirm these channels and suggest a stronger impact for emerging market economies, reflecting their greater vulnerability and weaker

capacity to absorb shocks related to such events.⁴⁴ For example, bank equity tends to decline when a bank's home country or key foreign counterparts are involved in an international military conflict (Figure 2.15, panels 1 and 2, respectively), contributing to a decline in loan growth (Figure 2.15, panels 3 and 4).⁴⁵

Investment funds with significant exposure to countries involved in geopolitical risk events, especially international military conflicts, generally experience lower returns and lower net flows. Across international military conflicts, bond funds with a 10 percent exposure of fund holdings to countries affected by a conflict subsequently suffered a 1.0 percentage point decrease in returns and a 2.3 percentage point decline in flows. The impact was, on average, smaller for equity funds, with about a 0.2 percentage point decrease in returns and a 0.3 percentage point decline in flows (Figure 2.16, panels 1 and 2).⁴⁶ Moreover, investment funds that were highly exposed to Russia and Ukraine experienced lower returns and flows. For example, after Russia's invasion of Ukraine, investment funds with 10 percent of their holdings directly exposed to Russian or Ukrainian assets experienced about a 6 percent decline in cumulative returns within a week and an 8 percent decrease in cumulative flows over the subsequent six months (Figure 2.16, panels 3 and 4).⁴⁷

China-US tariff announcements did not materially affect investment funds. During 2018–24, investment funds holding assets in Chinese firms in sectors affected by US tariffs experienced somewhat lower returns. For example, cumulative returns of funds with an additional

⁴⁴The smaller impacts for advanced economies should be interpreted with some caution as, unlike emerging markets, they were generally not involved in military conflicts on their own soil during the sample period.

⁴⁵The results are generally statistically significant at conventional levels and are economically relevant. For instance, the average annual change in the equity-to-total-assets (lagged) ratio and loan growth are 0.4 and 8 percent, respectively, for emerging markets and 0.4 and 4.4 percent, respectively, for advanced economies. The results also confirm an increase in borrowing costs and nonperforming loans after major geopolitical risk events. See Online Annex 2.9 for details.

⁴⁶These effects are economically significant, given that equity funds without exposure to affected countries before the risk event experienced 0.7 percent monthly return and 0.002 percent net flows, on average, and bond funds without exposure before the risk event experienced 0.2 percent return and 0.01 percent net flows.

⁴⁷Similarly, funds with 10 percent of their assets from issuers generating substantial revenue from, or having subsidiaries in, Russia or Ukraine saw declines of about 0.2 percent and 0.3 percent, respectively. An increase in subsidiary or revenue exposure decreased cumulative flows by a small amount (see Online Annex Figure 2.10.3). These findings are consistent with those of Wang and Young (2020), who find that investors reduce their investment in equity funds in response to terror attacks.

10 percent exposure to Chinese firms directly affected by US tariffs decreased, on average, by about 0.1 percent in the month after the US tariff announcements.

However, there was no statistically significant impact on flows into funds (Online Annex Figure 2.10.4).

Overall, these findings suggest that an increase in geopolitical risk, particularly one related to international military conflicts, affects financial institutions and can undermine macrofinancial stability. Major geopolitical risk events generally have a significant impact on the performance and intermediation capacity of financial institutions, especially those in emerging markets. This suggests that should geopolitical shocks become larger, more frequent, or more persistent compared with, for example, those covered in the chapter's analysis, they could have a more severe impact on asset prices and macrofinancial stability.

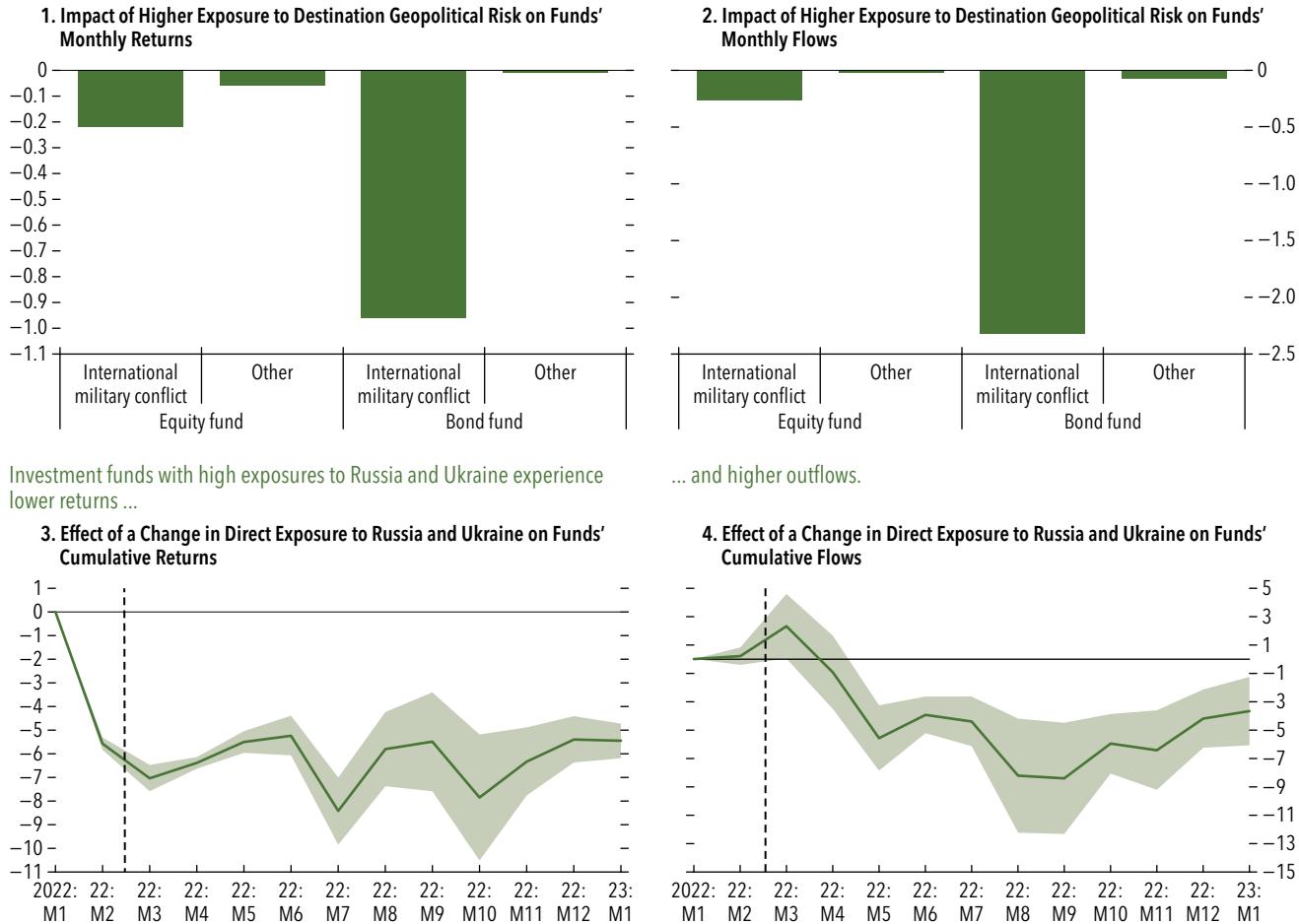
Conclusion and Policy Recommendations

Major geopolitical risk events could pose a threat to macrofinancial stability. The analysis in this chapter shows that although asset prices have reacted only modestly to most geopolitical risk events, the reaction has varied significantly across different types of events, asset classes, countries, and sectors. Stock prices can decrease, and sovereign risk premiums can increase meaningfully after major geopolitical risk events, notably international military conflicts. Moreover, the analysis suggests that countries with limited fiscal and international reserve buffers are particularly vulnerable to a rise in sovereign risk premiums. The chapter also documents cross-border contagion effects, with the effects of geopolitical risk events spilling across countries through trade or financial linkages. Although geopolitical risks appear to be, at least to some extent, priced into stocks and options markets, the sudden realization of major geopolitical risks can adversely affect bank and nonbank financial institutions, with adverse consequences for macrofinancial stability.

Managers of financial institutions and their oversight bodies should consider the implications of geopolitical risks. Financial institutions should devote adequate resources to identifying, quantifying, and managing geopolitical risks. In addition, policymakers should explore the implications of these risks for the supervision and regulation of financial institutions (Chapter 3 of the April 2023 *Global Financial Stability Report*). Scenario analysis and stress testing, incorporating the interaction of geopolitical risks with traditional

Figure 2.16. Impact of Exposure to Foreign Geopolitical Risk on Investment Funds
(Percentage points)

Investment funds, particularly bond funds, tend to experience lower returns and lower net flows, especially following international military conflicts, to the extent they ex-ante hold securities of countries involved in the conflict.



Sources: Caldara and Iacoviello 2022; FactSet; Lipper; LSEG Datastream; and IMF staff calculations.

Note: Vertical axes represent the effect of a 10-percentage-point change in exposure. In panels 1 and 2, exposure measures are calculated as the weighted averages of a variable that indicates whether the issuer of a security is domiciled in a country experiencing high international military conflict risks or high levels of other risks. Investment fund flows at month t are normalized by fund size at month $t - 1$. In panels 3 and 4, exposure measures are derived by calculating the weighted average of a variable that indicates whether the issuer of a security is domiciled in Russia or Ukraine. All regression models control for investment fund size and fund liquidity, and flow regressions control for one-month-lagged fund return. Models in panels 1 and 2 also include fund type-domicile-month fixed effects, and standard errors are two-way clustered at fund and domicile-month levels. Models in panels 3 and 4 include fund type-domicile fixed effects, and standard errors are two-way clustered at fund and domicile levels. The weights reflect the holding percentage of each security one quarter before the event. Solid bars indicate statistical significance at the 10 percent or lower level. The shaded area represents the 90 percent confidence interval.

market, credit, and liquidity risks, can support the assessment and quantification of the transmissions of geopolitical shocks to financial institutions.⁴⁸ Capital

⁴⁸Financial sector exposures to geopolitical risk may be inherently difficult to determine ex ante given the uncertain nature of these events. This underscores the importance of conducting scenario analysis to determine the resilience of financial institutions in the face of a variety of geopolitical risk shocks. To support the scenario analysis and stress testing, data on financial institutions' direct and indirect exposures to geopolitical risk should be collected.

and liquidity buffers at financial institutions should be able to absorb extreme but plausible losses associated with the materialization of geopolitical risks. Policy-makers should also ensure that they have appropriate tools to tackle the financial stability consequences of stress in nonbank financial intermediaries (Chapter 2 of the April 2023 *Global Financial Stability Report*), including the use of liquidity management tools by open-end funds to mitigate the systemic impact from abrupt outflows in the face of geopolitical risk events

(Chapter 3 of the October 2022 *Global Financial Stability Report*). Furthermore, crisis preparedness and management frameworks should be strengthened to deal with potential financial instability arising from an escalation of geopolitical tensions.

Policymakers should continue efforts to deepen and develop financial markets in emerging market and developing economies. Deeper financial markets and more developed derivatives markets can support investors' ability to manage and hedge financial risks, including those posed by geopolitical shocks. Robust regulatory frameworks should accompany the deepening and development of financial markets to ensure that hedging activities are conducted safely and transparently by, among other things, setting clear

guidelines for the use of derivatives and other financial instruments (Cuervo, Long, and Stobo 2022).

Adequate fiscal policy space and external buffers can help mitigate the potential adverse effects of geopolitical risk events. Fiscal vulnerabilities should be contained to limit the potential amplifying effects of high public debt levels on sovereign borrowing costs, especially amid elevated geopolitical risks and uncertainty, which can undermine macrofinancial stability (October 2024 *Fiscal Monitor*). Economies reliant on external financing should ensure an adequate level of international reserves to cushion the impact of adverse geopolitical shocks and manage risks from potential capital flow volatility in line with the IMF's Integrated Policy Framework (IMF 2020).

Box 2.1. Tail Risks to Stock Market Returns Amid Global Geopolitical Risks

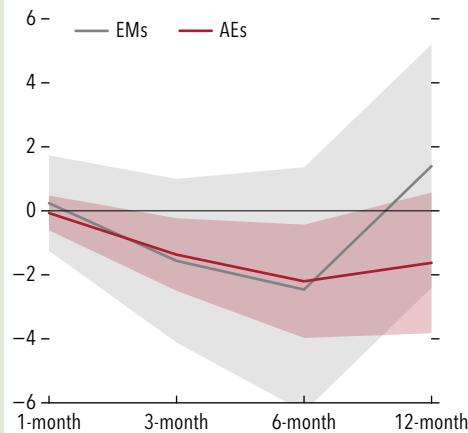
Geopolitical risk events, such as wars, terrorism attacks, or political unrest, can increase uncertainty and investor risk aversion, raising downside risk for asset prices—that is, the risk of large negative realized future asset returns. The realization of market tail risks could be transmitted to the broader economy through balance sheet and financial acceleration effects, increasing downside risks to output (Adrian and others 2019).

This box investigates the impact of geopolitical risk on downside tail risks to stock market returns in advanced and emerging market economies using a panel quantile regression framework, following the approach in the October 2024 *Global Financial Stability Report*.¹ Geopolitical risk is measured at the global and country levels using the indices of Caldara and Iacoviello (2022) described in Online Annex 2.3.

The results show that an increase in global geopolitical risk raises the likelihood of large future stock market corrections. For example, a two-standard-deviation increase in the global geopolitical risk index is, on average, associated with a decline of 2 percentage points in downside tail risks to stock market returns (defined as the 10th percentile of the distribution of aggregate stock market returns) in advanced economies at a six-month horizon (Figure 2.1.1). For emerging market economies, an increase of a similar magnitude raises downside tail risks, but the effect is not statistically significant. Downside tail risks to stock returns in emerging market economies, however, react more to large country-specific geopolitical risk events (defined as those with index scores two standard deviations above the country-specific average). On average, a large country-specific geopolitical risk

¹The analysis focuses on the 10th percentile of cumulative stock returns over 1-, 3-, 6-, and 12-month horizons, using the overall stock price index. The model includes several control variables, standardized at the country level. These include three-month domestic consumer price index inflation, the three-month percentage change in real industrial production, average stock market dividend yield, a detrended short-term (three-month) interest rate constructed using the Hodrick-Prescott filter, the domestic term spread (calculated as the difference between 10-year and three-month government bond yields), the three-month daily stock market volatility, and the price-to-earnings ratio for the overall stock market. The sample consists of about 30 advanced and emerging market economies covering 1990–2024.

**Figure 2.1.1. Global Geopolitical Risk and Downside Risk to Stock Market Returns
(Percentage points)**



Sources: Federal Reserve Bank of St. Louis, Federal Reserve Economic Data; Haver Analytics; LSEG Datastream; Organisation for Economic Co-operation and Development, Main Economic Indicators database; IMF, Global Data Source and International Financial Statistics databases; and IMF staff calculations.

Note: The figure shows the impact of a two-standard-deviation increase in the (log) global geopolitical risk index on cumulative stock returns 1, 3, 6, and 12 months ahead for advanced and emerging market economies. The shaded areas indicate the 95 percent confidence interval. AEs = advanced economies; EMs = emerging markets.

event raises downside tail risk to stock returns by about 3 percentage points.²

The regressions control for a measure of real economic uncertainty (October 2024 *Global Financial Stability Report*), which significantly exacerbates the risk of future stock market crashes in both advanced and emerging market economies. The results therefore suggest that in addition to economic uncertainty, geopolitical risks increase the likelihood of large declines in stock prices, possibly through the economic channel, by affecting economic activity and the expected cash flows of firms.³

²These results imply a meaningfully large impact of geopolitical risk, given that the 10th percentile of stock market returns for advanced and emerging market economies in the sample is -5 percent.

³Further distinguishing between geopolitical risk events as “acts” or “threats,” as in Caldara and Iacoviello (2022), the analysis shows that it is geopolitical acts rather than threats that have a strong impact on downside tail risks to stock markets.

References

- Adrian, Tobias, He Dong, Nellie Liang, and Fabio Natalucci. 2019. "A Monitoring Framework for Global Financial Stability." IMF Staff Discussion Note 19/06, International Monetary Fund, Washington, DC.
- Afonso, António, José Alves, and Sofia Monteiro. 2024. "Beyond Borders: Assessing the Influence of Geopolitical Tensions on Sovereign Risk Dynamics." *European Journal of Political Economy* 83: 102550.
- Ahir, Hites, Nicholas Bloom, and Davide Furceri. 2022. "The World Uncertainty Index." NBER Working Paper 29763, National Bureau of Economic Research, Cambridge, MA.
- Aiyar, Shekhar, Jiaqian Chen, Christian H. Ebeke, Roberto García-Saltos, Tryggvi Gudmundsson, Anna Ilyina, Alvar Kangur, and others. 2023. "Geoconomic Fragmentation and the Future of Multilateralism." IMF Staff Discussion Note 23/001, International Monetary Fund, Washington, DC.
- Amiti, Mary, Matthieu Gomez, Sang Hoon Kong, and David Weinstein. 2024. "Trade Protection, Stock Prices, and Welfare." NBER Working Paper 28758, National Bureau of Economic Research, Cambridge, MA.
- Baker, Scott R., Nicholas Bloom, and Steven J. Davis. 2016. "Measuring Economic Policy Uncertainty." *Quarterly Journal of Economics* 131 (4): 1593–636.
- Bank of England. 2024. "Systemic Risk Survey Results—2024 H2." October 2, 2024. <https://www.bankofengland.co.uk/systemic-risk-survey/2024/2024-h2>
- Barro, Robert J., 2006. "Rare Disasters and Asset Markets in the Twentieth Century." *Quarterly Journal of Economics* 121: 823–66.
- Barro, Robert J., and Jose F. Ursua. 2012. "Rare Macroeconomic Disasters." *Annual Economic Review* 4: 83–109.
- Baur, Dirk G., and Lee A. Smales. 2020. "Hedging Geopolitical Risk with Precious Metals." *Journal of Banking and Finance* 117: 105823.
- Bekaert, Geert, Eric C. Engstrom, and Nancy R. Xu. 2022. "The Time Variation in Risk Appetite and Uncertainty." *Management Science* 68 (6): 3975–4004.
- Bekaert, Geert, Marie Hoerova, and Marco Lo Duca. 2013. "Risk, Uncertainty, and Monetary Policy." *Journal of Monetary Economics* 60 (7): 771–88.
- Berkman, Henk, Ben Jacobsen, and John B. Lee. 2011. "Time-Varying Rare Disaster Risk and Stock Returns." *Journal of Financial Economics* 101: 313–32.
- Biermann, Marcus, and Elsa Leromain. 2024. "The Indirect Effect of the Russian-Ukrainian War through International Linkages: Early Evidence from the Stock Market." Discussion Paper 1899, Centre for Economic Performance, London.
- Bondarenko, Yevheniia, Vivien Lewis, Matthias Rottner, and Yves Schüller. 2024. "Geopolitical Risk Perceptions." *Journal of International Economics* 152: 104005.
- Bordalo, Pedro, Nicola Gennaioli, and Andrea Shleifer. 2012. "Salience Theory of Choice under Risk." *Quarterly Journal of Economics* 127: 1243–85.
- Caldara, Dario, and Matteo Iacoviello. 2022. "Measuring Geopolitical Risk." *American Economic Review* 112 (4): 1194–225.
- Cheng, Daxuan, Yin Liao, and Zheyao Pan. 2023. "The Geopolitical Risk Premium in the Commodity Futures Market." *Journal of Futures Markets* 43: 1069–90.
- Cortes, Gustavo S., Angela Vossmeyer, and Marc D. Weidenmier. 2024. "Stock Volatility and the War Puzzle: The Military Demand Channel." NBER Working Paper 29837, National Bureau of Economic Research, Cambridge, MA.
- Cuervo, Cristina, Jennifer Long, and Richard Stobo. 2022. "Strengthening Capital Markets Regulation—National Progress and Gaps." IMF Departmental Paper 22/012, International Monetary Fund, Washington, DC.
- Dessaint, Olivier, and Adrien Matray. 2017. "Do Managers Overreact to Salient Risks? Evidence from Hurricane Strikes." *Journal of Financial Economics* 126: 97–121.
- Fama, Eugene F., and Kenneth R. French. 1993. "Common Risk Factors in the Returns on Stocks and Bonds." *Journal of Financial Economics* 33 (1): 3–56.
- Fama, Eugene F., and James D. MacBeth. 1973. "Risk, Return, and Equilibrium: Empirical Tests." *Journal of Political Economy* 81 (3): 607–36.
- Federle, Jonathan, Andre Meier, Gernot J. Muller, and Victor Sehn. Forthcoming. "Proximity to War: The Stock Market Response to the Russian Invasion of Ukraine." *Journal of Money, Credit, and Banking*.
- Felbermayr, Gabriel, Aleksandra Kirilakha, Constantinos Syropoulos, Erdal Yalcin, and Yoto V. Yotov. 2020. "The Global Sanctions Data Base." *European Economic Review* 129 (October): 103561.
- Fernández-Villaverde, Jesús, Tomohide Mineyama, and Dongho Song. 2024. "Are We Fragmented Yet? Measuring Geopolitical Fragmentation and Its Causal Effects." NBER Working Paper 32638, National Bureau of Economic Research, Cambridge, MA.
- Gopinath, Gita. 2024. "Navigating Fragmentation, Conflict, and Large Shocks." Remarks delivered at the NBU-NBP Annual Research Conference, Kyiv, Ukraine, June 21, 2024.
- Gorodnichenko, Yuriy, and Alexander Rodnyansky. 2024. "Ukraine's Capital Market: A Brief History." VoxEU/CEPR Debate, "The Economic Consequences of War," May 23, 2024. <https://cepr.org/voxeu/columns/ukraines-capital-market-brief-history>
- Hirshleifer, David, Dat Mai, and Kuntara Pukthuanthong. 2023a. "War Discourse and the Cross-Section of Expected Stock Returns." NBER Working Paper 31348, National Bureau of Economic Research, Cambridge, MA.
- Hirshleifer, David, Dat Mai, and Kuntara Pukthuanthong. 2023b. "War Discourse and Disaster Premia—60 Years of Evidence from Stock and Bond Markets." NBER Working Paper 31204, National Bureau of Economic Research, Cambridge, MA.

- Huang, Tao, Fei Wu, Jing Yu, and Bohui Zhang. 2015. “International Political Risk and Government Bond Pricing.” *Journal of Banking and Finance* 55: 393–405.
- International Monetary Fund (IMF). 2016. “Guidance Note on the Assessment of Reserve Adequacy and Related Considerations.” IMF Policy Paper, Washington, DC.
- International Monetary Fund (IMF). 2020. “Toward an Integrated Policy Framework.” IMF Policy Paper, Washington, DC.
- Liu, Xi, and Xueyong Zhang. 2024. “Geopolitical Risk and Currency Returns.” *Journal of Banking and Finance* 161: 107097.
- Meyer, Josefina, Carmen M. Reinhart, and Christoph Trebesch. 2022. “Sovereign Bonds since Waterloo.” *Quarterly Journal of Economics* 137 (4): 1615–80.
- Natixis Investment Managers. 2024. “Wash. Rinse. Repeat. After 2024’s Positive Results, Institutional Investors Hope for More of the Same in 2025.” 2025 Natixis Institutional Outlook Survey. Kansas City, MO: Natixis Investment Managers. <https://www.im.natixis.com/content/dam/natixis/website/insights/investor-sentiment/2024/institutional-outlook/institutional-outlook-full-report.pdf>
- Pastor, Lubos, and Pietro Veronesi. 2013. “Political Uncertainty and Risk Premia.” *Journal of Financial Economics* 110 (3): 520–45.
- Qureshi, Mahvash S. 2013. “Trade and Thy Neighbor’s War.” *Journal of Development Economics* 105: 178–95.
- Tversky, Amos, and Daniel Kahneman. 1974. “Judgment under Uncertainty: Heuristics and Biases.” *Science* 185 (4157): 1124–31.
- Tversky, Amos, and Daniel Kahneman. 1992. “Advances in Prospect Theory: Cumulative Representation of Uncertainty.” *Journal of Risk and Uncertainty* 5: 297–323.
- Wang, Albert Y., and Michael Young. 2020. “Terrorist Attacks and Investor Risk Preference: Evidence from Mutual Fund Flows.” *Journal of Financial Economics* 137 (2): 491–514.
- Zaremba, Adam, Nusret Cakici, Ender Demir, and Huaiyang Long. 2022. “When Bad News Is Good News: Geopolitical Risk and the Cross-Section of Emerging Market Stock Returns.” *Journal of Financial Stability* 58 (February): 100964.
- Zhang, Yaojie, Yuxuan Zhang, Xinrui Ren, and Meichen Jin. 2024. “Geopolitical Risk Exposure and Stock Returns: Evidence from China.” *Finance Research Letters* 64 (June): 105479.
- Zhu, Haibin. 2004. “An Empirical Comparison of Credit Spreads between the Bond Market and the Credit Default Swap Market (August 2004).” BIS Working Paper 160, Bank for International Settlements, Basel, Switzerland.