CHAPTER 1

FINANCIAL FRAGILITIES ALONG THE LAST MILE OF DISINFLATION

Chapter 1 at a Glance

- Expectations that global disinflation is entering its "last mile" and monetary policy will be easing have driven up asset prices worldwide since the October 2023 *Global Financial Stability Report*.
- Many emerging markets have shown resilience, and some frontier economies have taken advantage of buoyant risk appetite to issue international debt.
- The global economy appears increasingly likely to achieve a soft landing, and cracks in the financial system exposed by high interest rates have not ruptured further. Near-term global financial stability risks have receded, according to the IMF's growth-at-risk framework.
- However, there are several salient risks along the last mile. Growing strains in the commercial real estate sector and signs of credit deterioration among corporates and in some residential housing markets could be exacerbated by adverse shocks.
- Stalling disinflation could surprise investors, leading to a repricing of assets and a resurgence of financial market volatility, which has been low despite considerable economic and geopolitical uncertainty.
- Beyond these more immediate concerns, other medium-term vulnerabilities are building, notably the continued accumulation of debt in both public and private sectors. Some governments may find it difficult to service debt in the future, whereas the private sector's leveraged exposures to financial assets may foretell elevated financial stability risks in the coming years.

Policy Recommendations

- Central banks should avoid easing monetary policy prematurely and push back as appropriate against overly optimistic market expectations for policy rate cuts. Where progress on disinflation is enough to suggest inflation is moving sustainably toward the target, central banks should gradually move to a more neutral stance of policy.
- Emerging and frontier economies should strengthen efforts to contain debt vulnerabilities. In China, it is critical to implement robust policies to restore confidence in the real estate sector and avoid further contagion to other sectors of the financial system.
- Supervisory and regulatory authorities should use appropriate tools, including stress tests and early corrective action, to ensure that banks and nonbank financial institutions are resilient to strains in commercial and residential real estate and to the deterioration in the credit cycle.
- Authorities need to improve the breadth and reliability of the data used to monitor and assess the risks associated with the rapid growth of lending by nonbank financial institutions to firms.
- Regulatory and crisis management tools for nonbank financial institutions need to be further developed.

Introduction

Financial market sentiment has been buoyant since the October 2023 *Global Financial Stability Report*. Interest rates are down globally, on balance; stock markets are up substantially, especially in advanced economies; and corporate and sovereign borrowing spreads have narrowed notably. Capital inflows have resumed for many emerging markets, and some frontier and low-income countries have taken advantage of strong investor risk appetite to issue sovereign bonds after a lengthy hiatus.

The continued easing of global financial conditions has been driven by growing confidence in a soft landing for the global economy against a backdrop of better-than-expected economic data in many parts of the world. The quest for disinflation seems to be

entering the "last mile," with investors and central banks alike expecting monetary policy to ease in the coming quarters, considering that cumulative interest rate increases over the past two years are believed to have created monetary conditions sufficiently restrictive to bring inflation back to central banks' targets. That said, the disinflationary momentum has slowed more recently in a number of countries, raising the question of whether central banks in these countries will be able to deliver the extent of monetary easing currently expected by investors.

At the same time, cracks in the financial system—exposed during the tightening cycle by high interest rates—have not ruptured further. Major emerging markets have been resilient, and their financial and external sectors have proven strong throughout the interest rate upswing. Bank failures in Switzerland and the United States in March 2023 have not metastasized to other parts of the global financial system, and soundness indicators for most financial institutions point to continued resilience. With the global economy increasingly likely to achieve a soft landing and the financial system proving resilient, near-term financial stability risks have receded. According to the IMF's growth-at-risk (GaR) framework, downside risks to global growth in the coming year have declined, although they remain somewhat elevated from a historical perspective.

The last mile of disinflation, however, may be complicated by several near-term, salient financial fragilities. Stress in the commercial real estate (CRE) sector has become more acute, with more borrowers likely in trouble, and with a number of banks around the world being scrutinized by investors over CRE-related loan losses. Financial market volatility appears too low compared with the elevated levels of macroeconomic and geopolitical uncertainty and valuation of many risk assets are increasingly stretched, predicated on investor expectations for a relatively brisk monetary easing that may be tested by the bumps along the last mile. Upside inflationary surprises, for example, those driven by commodity price spikes and supply-chain disruptions, could challenge the benign disinflation narrative prevalent in markets and among policymakers. A resurgence of volatility and a repricing of risk assets would lead to a sharp tightening in financial conditions and hasten the deterioration of the credit cycle, triggering adverse feedback loops.

Beyond these more immediate concerns, other medium-term fragilities are building up along the last mile. Both public and private debt continue to accumulate in advanced economies and emerging markets. For governments, the vulnerabilities lie with the servicing of historically high sovereign debt in an environment of large fiscal deficits as real economic growth may fall below market expectations for real long-term interest rates, resulting in a "debt begets more debt" quandary (see the April 2024 *World Economic Outlook* projections). While the level of debt is projected to change little in some countries, this challenge could be more acute for others with still-rising public debt. Elections to be held in a record number of countries in 2024 may also lead to fiscal "slippages" (see Chapter 1 of the April 2024 *Fiscal Monitor*). Interest rates would then become increasingly sensitive to sovereign debt issuance strategies and to central bank quantitative tightening programs, posing a challenge for monetary policy to bring down inflation in the future. In some countries, banking sector health could be jeopardized by large exposures to sovereign debt. In addition, despite the recent improvement in credit market conditions, investor sentiment in China remains weak and may continue to weigh on the already distressed property and local government sectors. Further increases in financial vulnerabilities—especially higher debt—along with loose financial conditions could exacerbate downside risks to growth in the future (according to the IMF three-year-ahead GaR framework).

With signs that reaching for yield is coming back amid expectations that interest rates will decrease in advanced economies in coming quarters, a rise in private financial and nonfinancial sector leverage could reemerge as a pressing financial stability concern. Corporations, even lower-rated ones, are finding financing easier to obtain through traditional means such as corporate bond markets, as well as through new channels like private credit markets that are opaque to policymakers (see Chapter 2). Trading strategies that use leverage to boost returns, such as bond basis trades or exotic stock options linked to Chinese stocks, have been popular among investors seeking to increase their wager by borrowing. The excessive liquidity transformations that made the global financial crisis so severe could reappear, with open-end bond funds receiving large amounts of inflows in recent months and with illiquid asset classes such as private credit

now being marketed to retail investors. In addition to increasing vulnerability in the financial system, faster credit growth stimulates aggregate demand, making disinflation more challenging.

This debt and leverage buildup is forging ahead even while the financial system is still tussling with the ongoing turning of the credit cycle, which could be hastened if the last mile turns out to be longer than expected. Many frontier and low-income countries are still experiencing financing stress, with little to no means of rolling over debt coming due. Around the world, more businesses and households are set to default as they continue to grapple with high interest rates and tighter bank lending standards. More brittle segments such as CRE and weaker banks (see Chapter 2 of the October 2023 *Global Financial Stability Report*) are front and center in the battle against defaults. In the longer term, a reversal of financial globalization could reduce cross-border banking and investment flows, making the diversification of credit risk more challenging (see Chapters 3 and 4 of the April 2023 *Global Financial Stability Report* and *World Economic Outlook*, respectively).

Monetary Policy and Financial Market Developments

The Expected Path of Monetary Policy Has Shifted Lower in Many Economies

Central banks have made notable progress in steering economies to steady disinflation, aided by positive supply-side improvements. Investors accordingly anticipate that major advanced economy central banks will pivot from monetary tightening to easing (Figure 1.1, panels 1–4). Market pricing suggests multiple policy rate cuts over the course of this year. In the United States, evidence of still-significant labor market tightness and oscillating core inflation data releases have prompted the Federal Reserve to push back against market expectations of aggressive rate cuts, joining the chorus of the European Central Bank and the Bank of England.[1] Market pricing currently indicates up to two rate cuts by the Federal Reserve, which are expected over the second half of the year, around three European Central Bank cuts by October, and one Bank of England cut by August. Japan remains an outlier, with markets pricing a gradual increase in the policy rate following the Bank of Japan's exit from long-standing negative interest rate policy and other unconventional measures on the back of its judgment that an achievement of price stability target came into sight.[2] The Bank of Japan's announcement did not elicit major market reactions as investors had reportedly anticipated these changes. In many emerging markets, policy expectations are also lower (Figure 1.1, panels 5–8; see the section "The Resilience of Major Emerging Markets May Be Tested").

As inflation has slowed, expectations of future inflation have fallen in the euro area but have risen some for the United States since the start of the year (Figure 1.2, panel 1). Core inflation remains above central bank targets in most countries, leaving the global economy susceptible to inflationary shocks (for example, shocks arising from supply-chain disruptions). Pricing from inflation option markets reflects this uncertainty, with evidence signaling increased investor disagreement about future US inflation levels, expected over the next five years (Figure 1.2, panel 2). Predicted odds of inflation moving below or above 2 percent over the next five years are almost the same. Analysts' forecast surveys for the end of 2024 suggest that disagreement over the most likely inflation outcomes in the United States has increased since the October 2023 *Global Financial Stability Report* (Figure 1.2, panel 3). Forecasts for real GDP reflect that expected US growth is meaningfully higher than euro area growth but is coupled with higher uncertainty (Figure 1.2, panel 4).

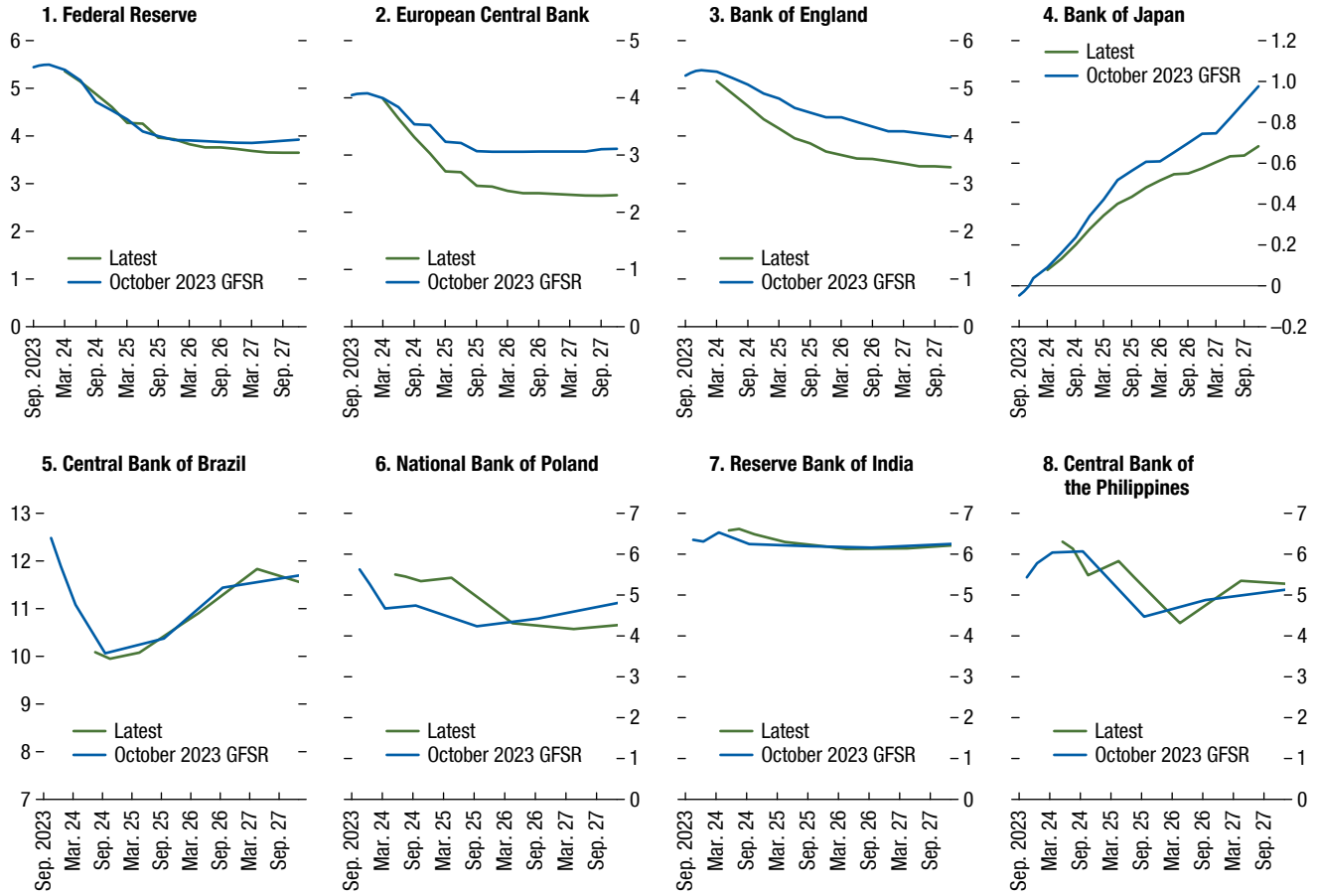
Looking ahead, uncertainty about the path of expected policy rates remains elevated. Interest rate option prices indicate that the most likely level of the federal funds rate has declined and is now more or

[1]Several Federal Reserve officials have reiterated the possibility of further rate increases to counterbalance recent easing of financial conditions amid a still-uncertain inflation outlook.

[2]At its March meeting, along with hiking the short-term policy rate band to above zero (between 0 to 0.1 percent) for the first time since 2016, the Bank of Japan also abolished yield curve control, halted purchases of exchange-traded funds and Japanese real estate investment trust shares, and announced that gross Japanese government bond purchases will be conducted at broadly the same amounts as in the recent past while commercial paper and corporate bond purchases will be gradually reduced before being discontin-ued in about one year's time.

Figure 1.1. Policy Rate Expectations: Selected Advanced and Emerging Market Economies
(Percent)

Market pricing expects most major central banks to cut rates this year.



Sources: Bloomberg Finance L.P.; Federal Reserve; national authorities; and IMF staff calculations.
Note: GFSR = *Global Financial Stability Report*.

less consistent with the level of the median projection for 2024 in the Federal Reserve's latest Summary of Economic Projections (Figure 1.3, panel 1). For the euro area, the distribution of policy rate outcomes has also shifted leftwards since the October 2023 *Global Financial Stability Report*, reflecting an increasingly tepid growth outlook coupled with moderating inflation (Figure 1.3, panel 2). That said, uncertainty around the most likely outcome for the policy rate has narrowed marginally relative to October 2023 for the United States, whereas it has widened some for the euro area (Figure 1.3, panels 1 and 2). From a longer-term historical perspective, uncertainty about rates—proxied by swaption-implied volatility for one-year rates, one year forward—remains elevated compared with the average before the COVID-19 pandemic, say, for both jurisdictions, albeit having compressed in recent months (Figure 1.3, panel 3).

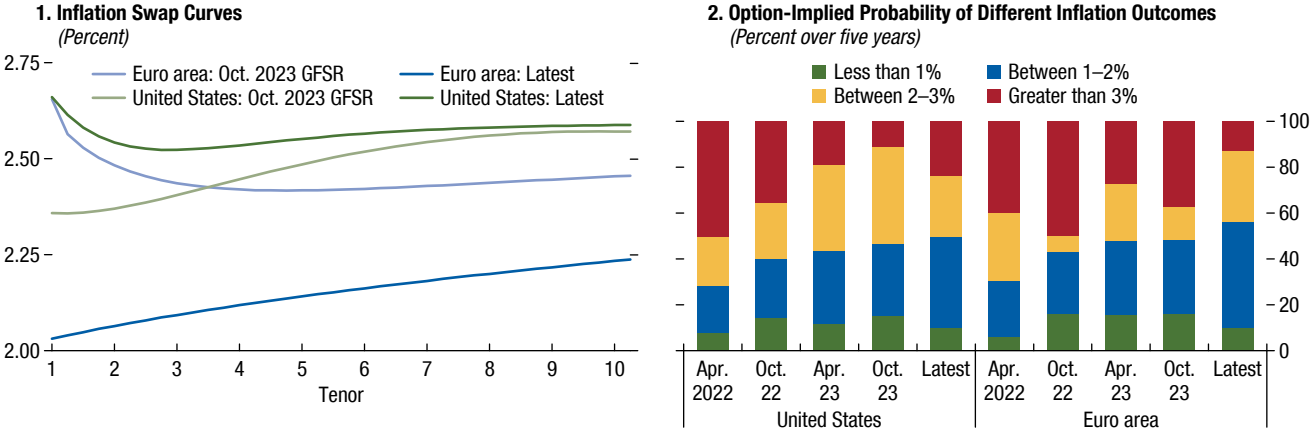
Longer-Term Interest Rates Have Declined Globally

Global long-term interest rates have declined, on net, since the October 2023 *Global Financial Stability Report* (Figure 1.4, panel 1), driven in both advanced economies and major emerging markets by both the lower expected path of policy rates (as discussed previously) and a compression of the term premium—compensation required by investors to bear interest-rate risk over long-maturity bonds (Figure 1.4, panel 2).

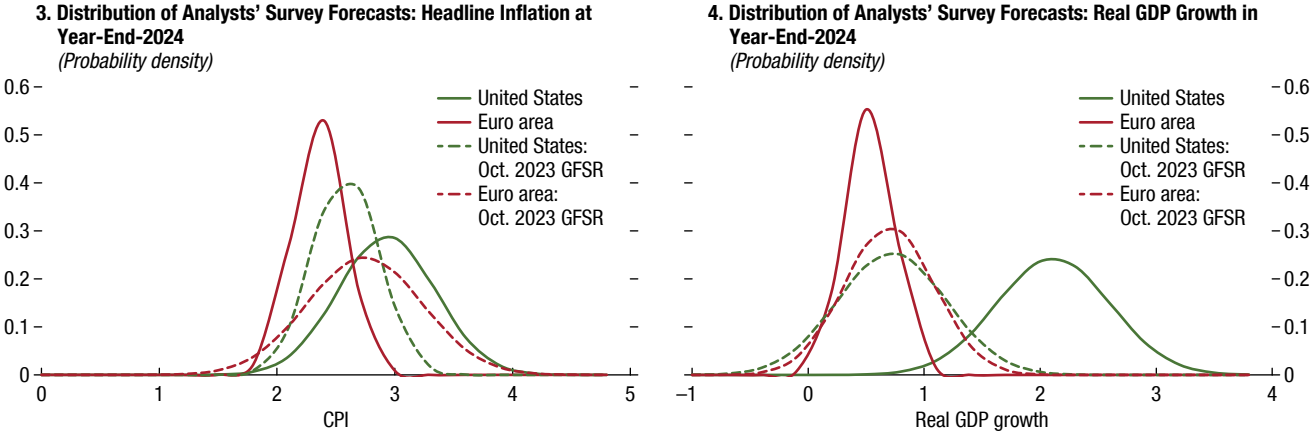
Figure 1.2. Market-Based Inflation Expectations

Market expectations of inflation have fallen in the euro area and risen some for the United States ...

... with the outlook remaining uncertain over the medium term.



Survey forecasts suggest a higher degree of disagreement around both inflation and growth outcomes in the United States compared to the euro area, albeit with the most likely outcome for US growth at the end of 2024 forecast to be meaningfully higher.



Sources: Bloomberg Finance L.P.; Federal Reserve; national authorities; and IMF staff calculations.
Note: In panel 1, expected inflation rates based on swap prices contain a risk premium component. In panel 2, option-implied probabilities are computed from inflation caps and floors. Distributions in panels 3 and 4 are constructed from survey forecast responses, submitted by economists and market participants to Bloomberg. CPI = consumer price index; GFSR = *Global Financial Stability Report*.

In the United States, term premiums have gyrated notably since the October 2023 *Global Financial Stability Report*. In September and October of 2023, an upward revision to the federal government's fiscal deficit and softer demand from traditional Treasury buyers such as banks and foreign reserve managers, weighed on US Treasury securities. The 10-year Treasury yield approached 5 percent at one point, driven by a term premium increase of around 70 basis points as the sell-off that started in mid-September 2023 intensified (Figure 1.4, panels 2 and 3, light and dark blue portions of the bars). More specifically, a higher real risk premium component of the term premium—capturing fiscal and economic uncertainty—drove up the term premium.[3] Subsequent announcements that Treasury securities issuances were lower than investor expectations helped ease pressure on the real risk premium. That said, the current level of real risk premiums across future horizons remains elevated compared with

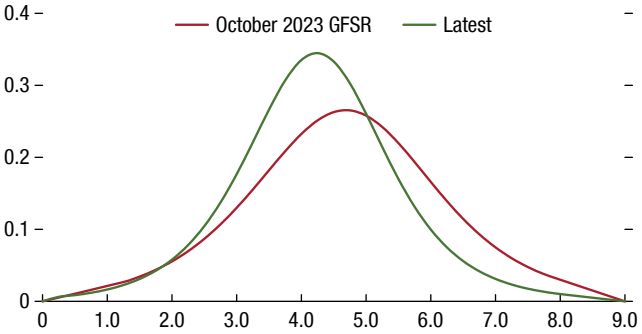
[3]The term premium may be decomposed further into two components: (1) the *inflation risk premium*, which reflects compensation related to future inflation uncertainty; and (2) the *real risk premium*, related to uncertainty about the future path of interest rates and the economic outlook, broadly encompassing developments in central bank balance sheets, as well as in the fiscal outlook (see the October 2023 *Global Financial Stability Report* for more details).

Figure 1.3. Option-Implied Expectations of Policy Rates

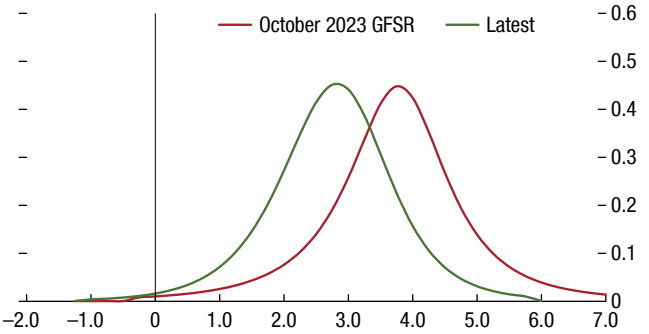
In both the United States and the euro area, market pricing reflects rate cuts on average, but uncertainty around most likely outcomes remains somewhat elevated.

The leftward shift in rates distribution for the euro area reflects, in large part, a tepid growth outlook coupled with moderating inflation.

1. Option-Implied Probability Distributions of Federal Funds Outcomes
(Percent by the end of 2024, probability density)

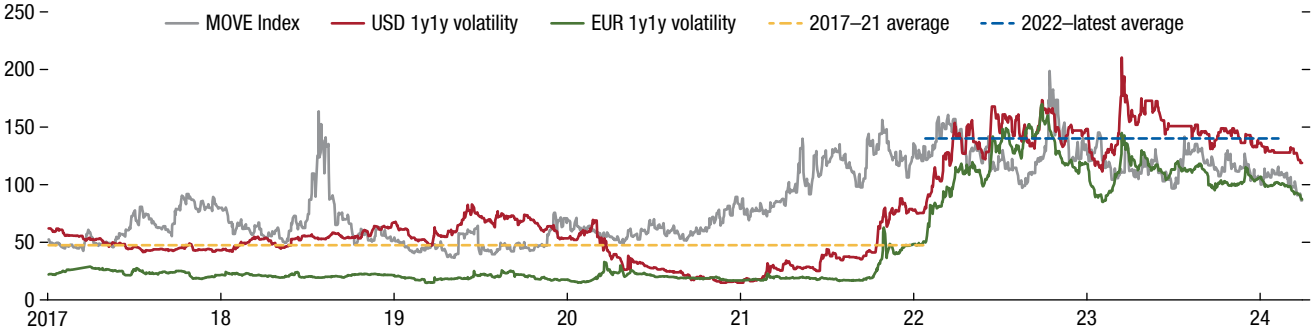


2. Option-Implied Probability Distributions of ECB Policy Rate Outcomes
(Percent by the end of 2024, probability density)



Interest rates' volatility, corresponding to the near term, remains elevated for both the United States and the euro area.

3. Evolution of Option-Implied Uncertainty Proxied by Near-Term Swaption Volatility and MOVE Index
(Basis points, annualized)



Sources: Bloomberg Finance L.P.; Federal Reserve; and IMF staff calculations.
Note: In panels 1 and 2, probability densities are based on short-dated interest rate swap options, denominated in US dollars and euros, respectively. In panel 3, the horizontal dashed lines represent the averages of the USD 1y1y volatility over the periods before and after January 2022. Short-term interest rate uncertainty is captured by 1y1y at-the-money swaption-implied volatility. The ICE Bank of America MOVE index tracks the weighted average basket of at-the-money one-month options of 2-, 5-, 10-, and 30-year interest rate swaps. 1y1y = one-year, one-year forward; ECB = European Central Bank; EUR = euro; GFSR = *Global Financial Stability Report*; MOVE = Merrill Lynch Option Volatility Estimate.

the end of the previous tightening cycle in January 2019 (Blinder 2023), as well as to the average after the global financial crisis (Figure 1.4, panel 4; see also the section "Advanced Economy Government Bond Supply Will Likely Remain Large").

Such gyrations in the term premium have had global implications, as spillovers from US term premiums to those in other advanced economies and emerging markets have steadily risen in recent years. The premiums reached a new high after US fiscal concerns in late 2023, according to the percent of variation methodology in Diebold and Yilmaz (2009) (Figure 1.4, panel 5). Co-movements among global longer-term interest rates could remain pronounced in the future.

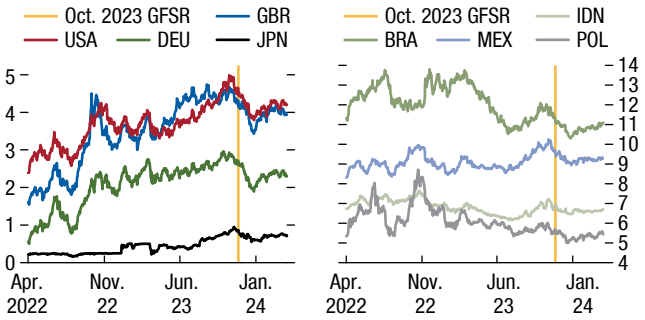
Asset Prices Have Rallied on the Basis of Buoyant Sentiment and Optimism about Earnings

Global equity markets have experienced broad-based rallies since the October 2023 *Global Financial Stability Report*, with the largest gains in Japan and the United States (Figure 1.5, panel 1). By contrast, Chinese stocks have significantly underperformed, reflecting tepid economic performance as property market downturns remain a drag (see the section "Chinese Asset Prices Face a Difficult Turnaround amid Weak Sentiment"). European and US corporate bond markets have moved in sympathy with the stock market rally, with borrowing spreads narrowing considerably for both investment-grade and high-yield issuers (Figure 1.5, panels 2 and 3).

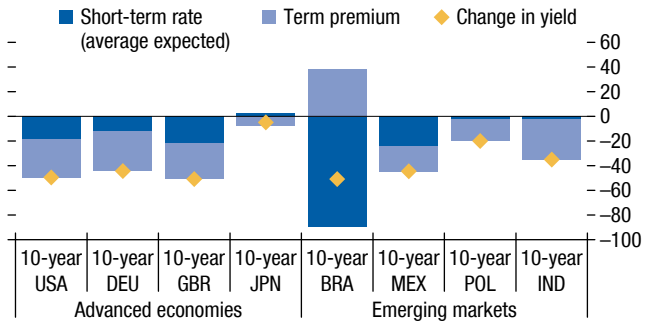
Figure 1.4. Evolution of Long-Term Rates

Long-term bond yields across major advanced and emerging market economies have declined, on net, since the October 2023 GFSR, in most cases, driven by a fall in expected path of short-term rates as well as term premiums.

1. Ten-Year Bond Yields: Advanced and Emerging Market Economies
(Percent)



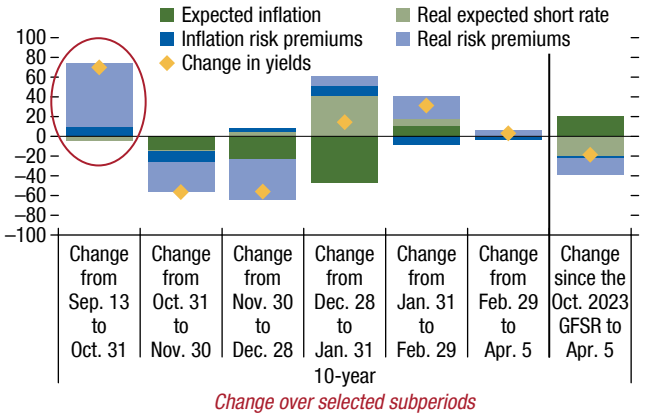
2. Decomposing Changes in 10-Year Yields: Since October 2023 *GFSR* to Date
(Basis points)



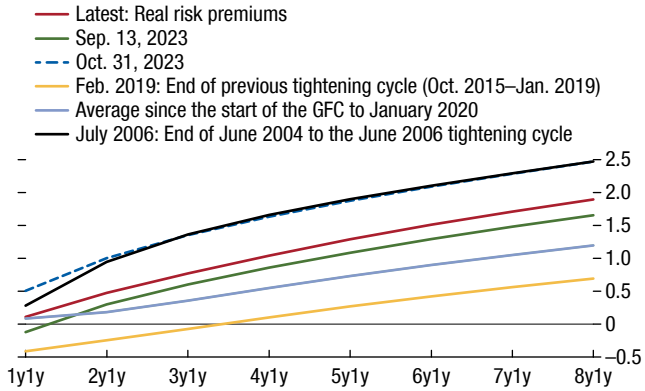
However, over the period between the middle of September and the end of October 2023, term premiums exerted significant upward pressure on yields, reflecting fiscal concerns in the United States, mainly due to higher real risk premiums.

Real risk premiums across future horizons are currently elevated compared to the post-GFC average and following the end of the previous tightening cycle.

3. Decomposing Changes in US 10-Year Yields: Mid-September Sell-Off to Date
(Basis points)

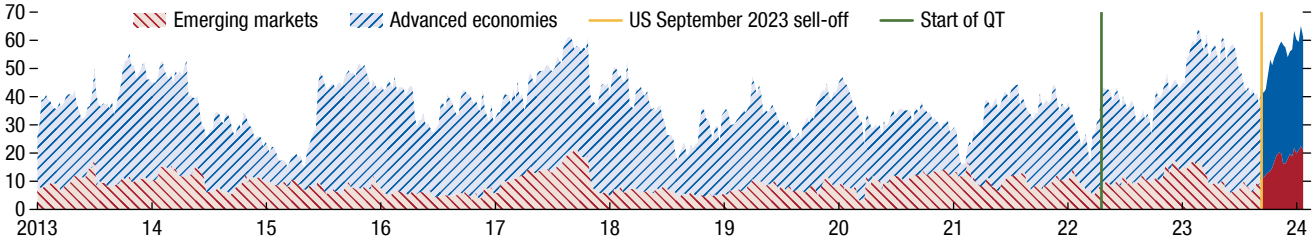


4. Term Structure of US Real Risk Premiums: One-Year Forwards
(Percent)



Spillovers from gyrations in US term premium to those in other advanced economies and emerging markets appear to have also risen after the September 2023 sell-off, against the backdrop of historically elevated level of interest rate volatility.

5. Spillovers from 10-Year US Term Premiums to Other Regions
(Percent)



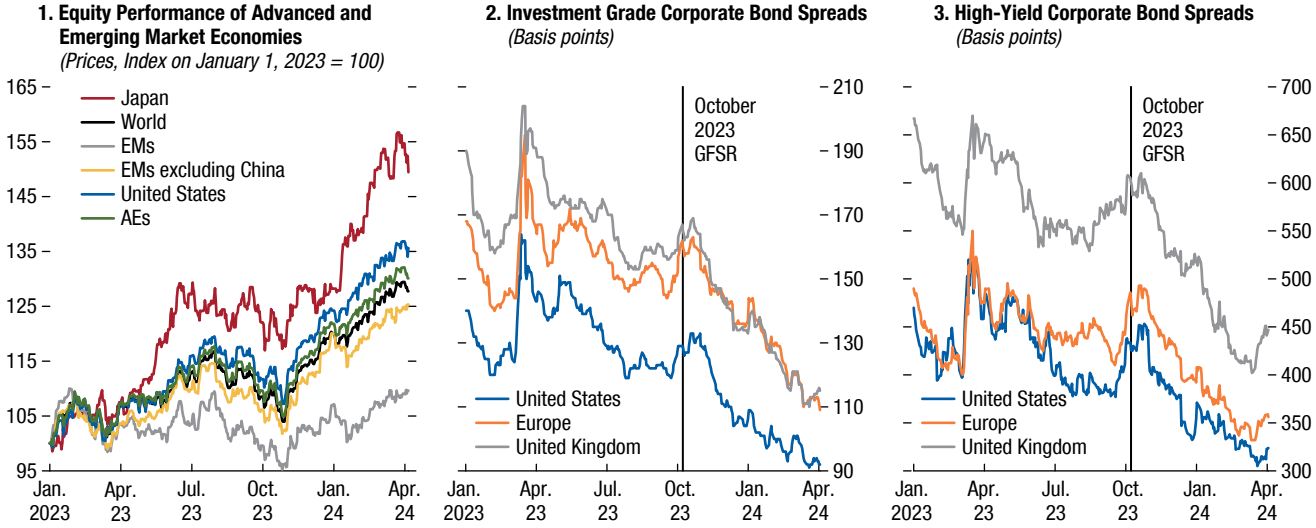
Sources: Bank of England; Bloomberg Finance L.P.; European Central Bank; Federal Reserve; ICE Bank of America; and IMF staff calculations.
Note: In panel 3, the red ellipse indicates change in yield components from the mid-September 2023 sell-off to the end of October 2023. In panel 4, time periods for Federal Reserve tightening cycles are based on Blinder (2023). Panel 5 reports spillovers from changes in US term premium to AE and EM term premium, respectively. Specifically, the measure of spillovers reported here—as per the methodology proposed by Diebold and Yilmaz (2009)—is the proportion of variation in AE and EM term premium which may be explained by shocks emanating from US term premium. AEs include 20 countries (48 percent to GDP of all AEs) and 15 EMs, amounting to around 76 percent of total EM GDP. The spillovers shown here correspond to a 50-week rolling window. On average, over a longer time period, spillovers to AEs have stood around 45 percent compared to 11 percent for EMs, albeit with significant variation over time. For instance, at the time of the taper tantrum, EM spillover was around 15 percent. AE = advanced economy; BRA = Brazil; DEU = Germany; EM = emerging market economy; GBR = Great Britain; GFC = global financial crisis; GFSR = *Global Financial Stability Report*; IDN = Indonesia; JPN = Japan; MEX = Mexico; POL = Poland; QT = quantitative tightening.

Figure 1.5. Asset Price Rally

Advanced economies have continued to outperform emerging market economies.

Investment grade bond spreads have narrowed in major AEs since the last GFSR ...

... and even high-yield bonds have rallied.



Sources: Bloomberg Finance L.P.; and IMF staff calculations.
Note: Panels 2 and 3 are using option-adjusted spreads. AE = advanced economies; GFSR = *Global Financial Stability Report*; EMs = emerging markets.

Market expectations for a soft landing have been a major tailwind for asset prices. In the United States, this has led to positive earnings prospects for the corporate sector, driven by the mega technology stocks known as the Magnificent 7. These stocks have experienced high price-to-earnings ratios accompanied by investor optimism about medium-term earnings prospects (Figure 1.6, panel 1). In recent months, earnings optimism and the stock price rally have spread more widely through the market, as reflected by price appreciation of the Russell 2000 index since October 2023 (Figure 1.6, panel 2). A standard discount cash flow model (Bank of England 2017; IMF 2019) suggests that the rise in the overall S&P 500 index appears to have been driven, almost in equal parts, by improved earnings projections and investors' stronger risk appetite (Figure 1.6, panel 3). That said, companies with strong margin power, mostly in the information technology and materials sectors, have outperformed companies with weak margin power (Figure 1.6, panel 4). Companies with weak margin power have traditionally been more sensitive to inflation, but despite inflation having fallen from its peak in June 2022, recovery by these companies has been sluggish thus far.

Even crypto markets—which have proven sensitive to risk sentiment—have rallied. Bitcoin prices have surpassed $70,000 for the first time in history, boosted by the recent approval of spot Bitcoin exchange-traded products (Figure 1.6, panel 5). On the back of the crypto recovery rally, market capitalization of crypto assets surpassed $2.79 trillion in March 2024 (Figure 1.6, panel 6; see also Box 1.1). If expectations of a soft landing and continued disinflation no longer remain the baseline for investors, then overall, any optimism in earnings projections and buoyant risk sentiment could abruptly reverse, dragging stock prices down.

Financial Conditions Have Eased, But Bank Lending Standards Have Tightened in Some Countries

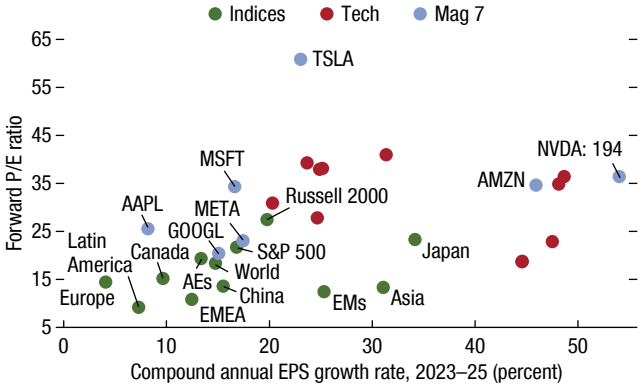
Supported by investor optimism about a soft landing, lower long-term yields, and rallies in stock and corporate bond markets, financial conditions have eased, especially in advanced economies in most regions (Figure 1.7, panel 1). In emerging markets, modest volatility in exchange rates in recent quarters has translated into a lower price of external financing risk, also modestly easing financial conditions (Figure 1.7, panel 2). In China, financial conditions have eased slightly but remain somewhat tight by historical standards, as risk sentiment is weighed down by growth and property sector issues.

In contrast with financial conditions, which summarize the price of risk in capital markets, bank

Figure 1.6. Equity Valuation and Returns Decomposition

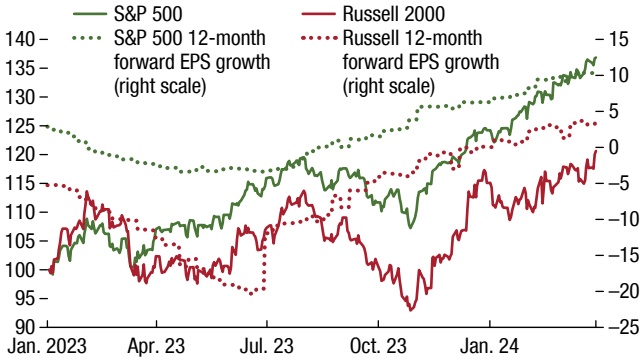
Valuations broadly respond to medium-term growth profiles.

1. Price-to-Earnings Ratio versus EPS Growth Rate (2023–25 CAGR)
(Price-to-earnings ratio; yearly EPS growth rate, percent)



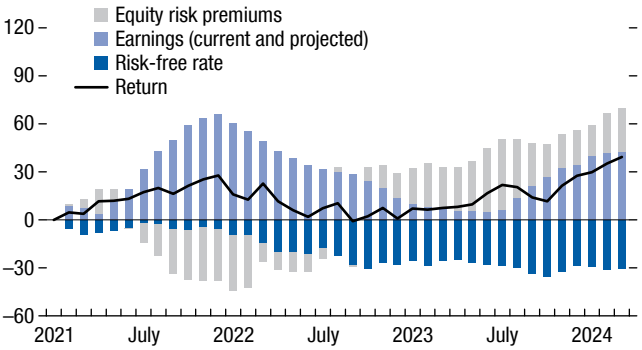
Year-over-year growth in expected earnings have steadily increased since July 2023 for S&P 500 and Russell 2000.

2. S&P 500 and Russell 2000 Expected Earnings Growth
(Prices indexed at January 1, 2023 = 100, left scale; percent, right scale)



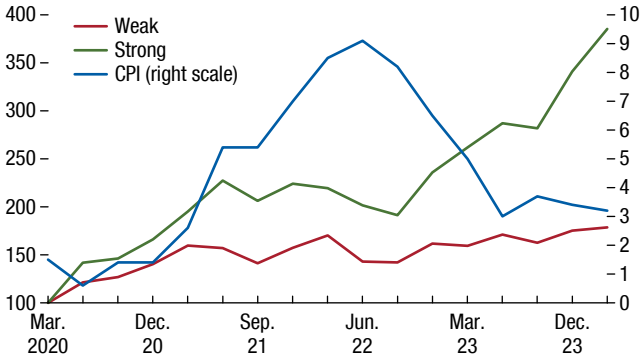
Since July 2022, S&P 500 returns have been supported by equity risk premium.

3. Decomposition of Cumulative Returns for S&P 500
(Percent)



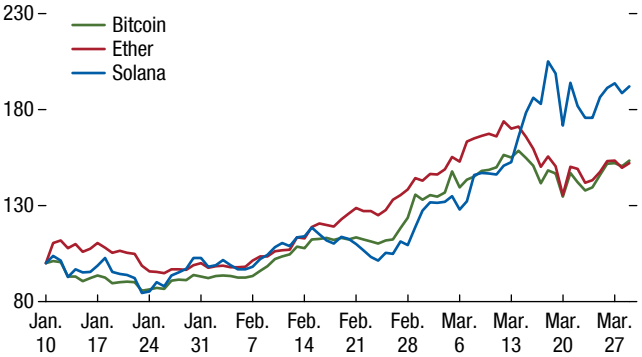
Sectors with weak margin power have not recovered despite inflation falling.

4. Performance of Companies with Strong versus Weak Margin Power
(Median price, indexed, March 31, 2020 = 100, left scale; percent, right scale)



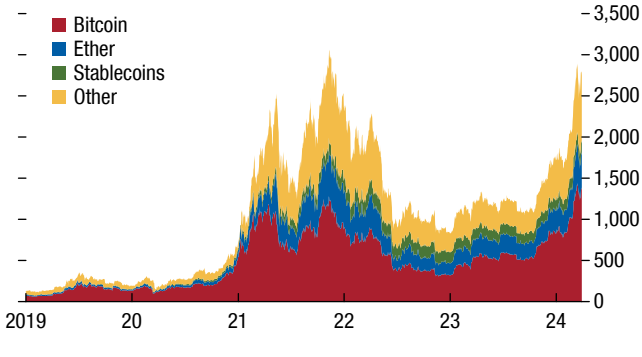
Bitcoin and other crypto-assets have recovered, fueled by the Bitcoin spot-ETP approval.

5. Price of Selected Crypto Assets since Bitcoin Spot-ETP Approval
(Percent change, indexed, January 10, 2024 = 100)



Overall market capitalization of crypto assets has increased significantly since the October 2023 GFSR.

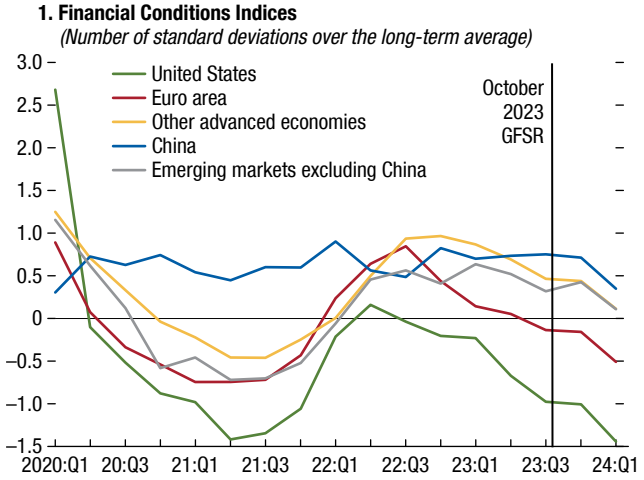
6. Market Capitalization of Selected Crypto Assets
(Billions of US dollars)



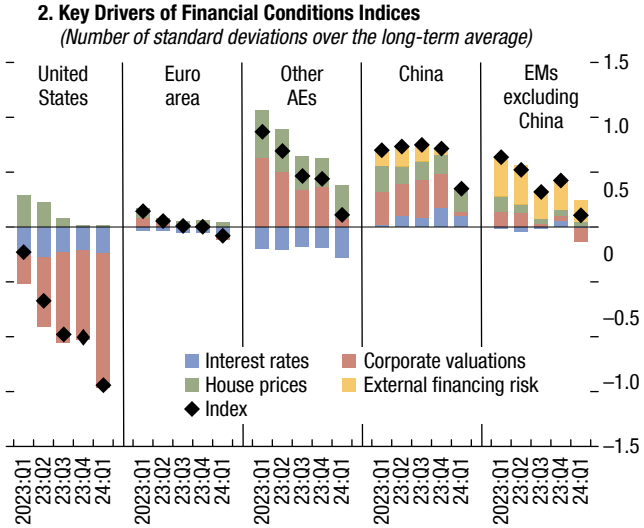
Sources: Bloomberg Finance L.P.; CoinGecko; Haver Analytics; Thomson Reuters; and IMF staff calculations.
Note: In panel 1, Mag 7 (Magnificent 7) includes Amazon, Apple, Alphabet (GOOGL, Alphabet Class C), Meta, Microsoft, Nvidia, and Tesla. In panel 3, strong (weak) margin power companies include the top (bottom) 10th percentile of earnings before interest, taxes, depreciation, and amortization margin performers from the first quarter of 2020 to the second quarter of 2022 of current S&P 500 companies. AAPL = Apple Inc.; AEs = advanced economies; AMZN = Amazon.com Inc.; CAGR = compound annual growth rate; CPI = consumer price index; EMs = emerging markets; EMEA = Europe, the Middle East and Africa; EPS = earnings per share; ETP = exchange-traded product; GOOGL = Alphabet Inc.; META = Meta Platforms, Inc.; MSFT = Microsoft Corporation; NVDA = NVIDIA Corp; P/E = price to earnings; TSLA = Tesla, Inc.

Figure 1.7. Financial Conditions Indices

Financial conditions have eased significantly since the October 2023 GFSR ...



... driven by a further improvement in corporate valuations.



Sources: Bloomberg Finance L.P.; Dealogic; Haver Analytics; national data sources; 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*. To decompose the FCI into the four components of interest rates, corporate valuations, house prices, and external financing risk, we make outside the model adjustments to FCI such that they ensure negative signs of the FCI, and lags in data do not give a contrary-to-actual interpretation. In such instances, the value of the FCI in the line chart (panel 1) might be marginally different from the one in the drivers chart (panel 2). AEs = advanced economies; EMs = emerging markets; FCI = Financial Conditions Index; GFSR = *Global Financial Stability Report*; Q = quarter.

lending standards—measuring banks' willingness to lend—tightened sequentially in much of 2022 and 2023, especially in advanced economies (Figure 1.8, panels 1–3), amid concerns about deteriorating borrower risk profiles, expectations of economic slowdowns, and reductions in banks' risk tolerance. More recently, tentative signs indicate that the tightening in lending standards has stabilized in Brazil, the euro area, and the United States. Historically, tighter standards appear to portend an ebbing of credit growth over the next year in some countries, most notably the United States, although this connection is more tenuous in others, including Brazil, Japan, and the Philippines (Figure 1.8, panels 2, 4, and 6), as other factors such as the strength of loan demand and banking sector soundness attenuate the effect of lending standards on loan growth.

Growth-at-Risk Forecasts

Near-Term Downside Risk to Growth Has Receded Somewhat

With global financial conditions having eased and credit growth having changed little since the October 2023 *Global Financial Stability Report*, estimates based on the IMF's GaR framework suggest that downside risks to global growth for 2024 have receded somewhat, with the balance of risks to growth forecast to be broadly symmetrical. Downside risk—specifically as measured by the GaR metric[4]—suggests that with 5 percent probability, global growth over 2024 could fall below +0.7 percent, although that is an improvement compared with the level in October 2023, which stood at just below 0 percent (Figure 1.9, panel 1). From a historical perspective, the current level of forecast downside risk for the near term is still marginally elevated (Figure 1.9, panel 2).

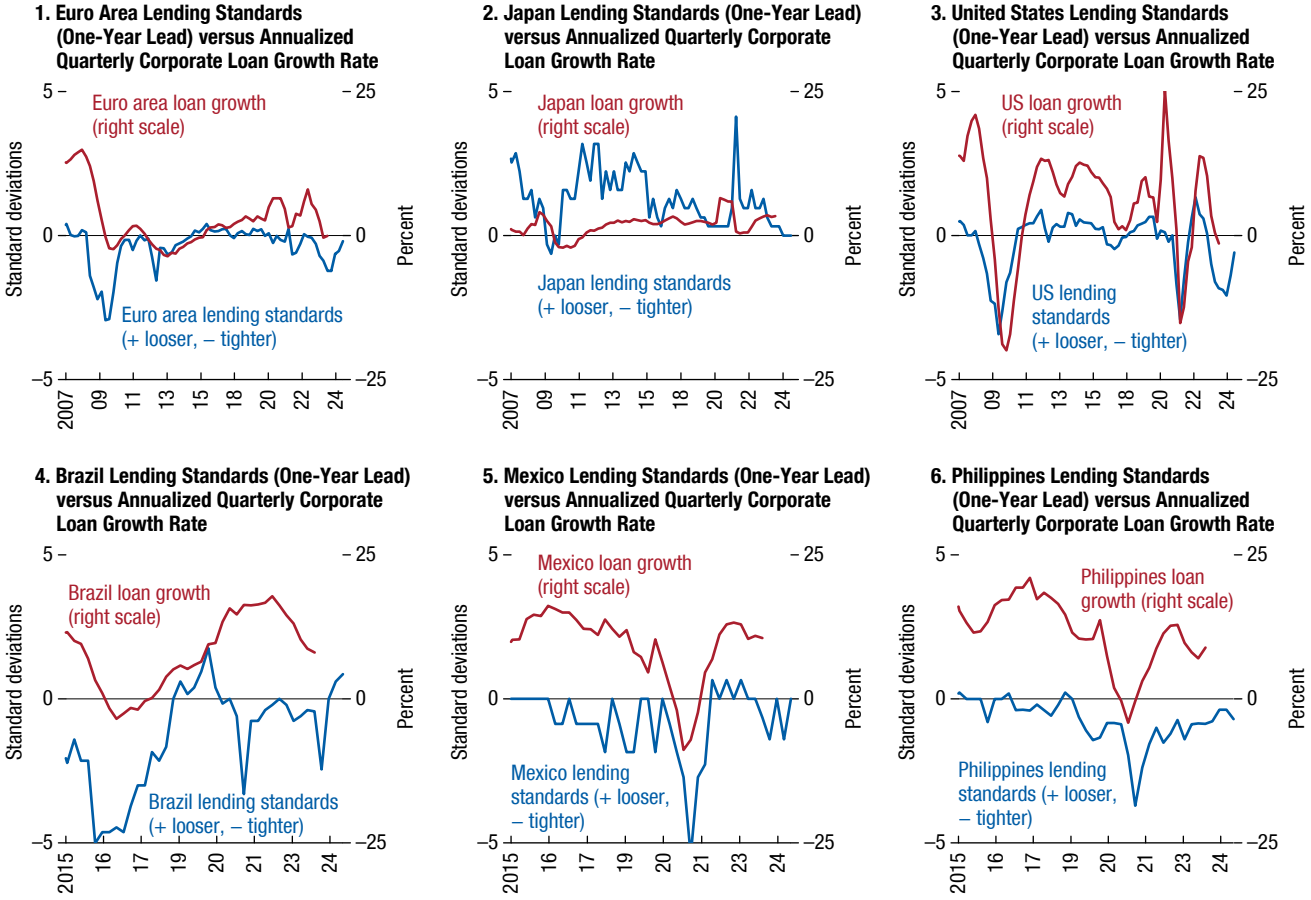
Medium-Term Downside Risk to Growth Remains Elevated

By contrast, medium-term risks to growth appear far more elevated, suggesting an intertemporal risk

[4]The GaR framework assesses downside risks by gauging the range of severely adverse growth outcomes, falling within the lower fifth percentile of the conditional growth forecast distribution. This is referred to as the GaR metric.

Figure 1.8. Lending Standards and Loan Growth
(Standard deviations and net percent of respondents)

Lending standards have tightened across most countries and tighter standards typically forecasts lower loan growth.



Sources: National central banks; and IMF staff calculations.
Note: Lending standard series for individual jurisdictions are normalized by their respective standard deviations. Positive values indicate looser standards; negative values indicate tighter standards.

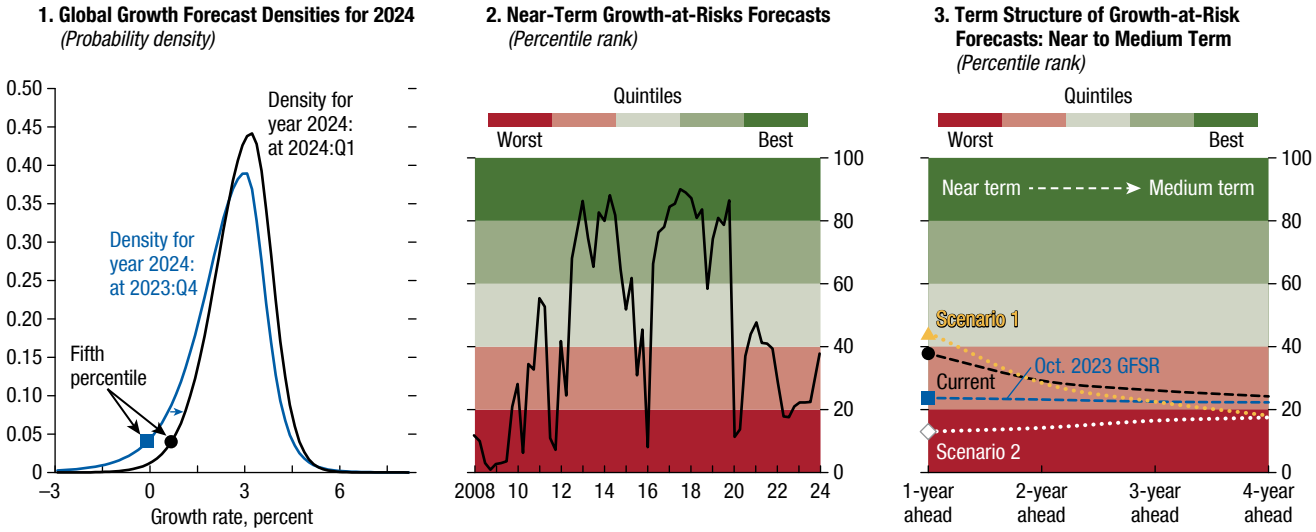
trade-off. Easy financial conditions at present may prompt excessive risk taking and a buildup of financial vulnerabilities, leading to higher downside risk to growth in the coming years (Figure 1.9, panel 3, black dashed line). Possible shifts in this trade-off may be further illustrated by the following scenarios. First, if credit growth is held constant at current levels and financial conditions continue to ease to postpandemic lows, the GaR metric for the medium term would deteriorate to about its 20th historical percentile, with some marginal improvement for the near term (the yellow dotted line indicating Scenario 1 in panel 3 of Figure 1.9, panel 3). Second, if credit growth declines to its slowest pace since, say, 1991, and financial conditions are held constant, near-term downside risk becomes elevated. Downside risk to growth is forecast to slightly lessen over the medium term, however, as ensuing deleveraging could support financial stability over time (the white dotted line depicting Scenario 2 in Figure 1.9, panel 3; see also Box 1.2, which analyzes shifts in intertemporal risk trade-off for US growth in credit scenarios calibrated on periods after previous high-inflation periods).

Salient Near-Term Risks

Even though downside risks have receded in the near term, a number of salient risks could challenge the health of the financial system, as outlined in the sections that follow.

Figure 1.9. Global Growth-at-Risk

While downside risks over the near term have receded some, these remain relatively elevated for the medium term; reflecting an intertemporal risk trade-off as financial conditions ease (and downturn in credit growth plateaus).



Sources: Bank for International Settlements; Bloomberg Finance L.P.; Haver Analytics; IMF, International Financial Statistics database; and IMF staff calculations.
Note: The mode (that is, the most likely outcome) of the forecast density estimate accords with the October 2023 *World Economic Outlook* forecast for year 2024, as of the third quarter of 2023. In panel 2, the black line traces the evolution of the fifth percentile threshold (the growth-at-risk metric) of near-term growth forecast densities. The color of the shading depicts the percentile rank for the growth-at-risk metric one year ahead. Panel 3 depicts the term structure of growth-at-risk, starting from the near term and tracing out to the medium-term horizon, four years ahead. GFSR = *Global Financial Stability Report*; Q = quarter.

Commercial Real Estate Stress Has Intensified

Investors have been squarely focused on CRE, for which prices declined by 12 percent globally over the past year in real terms amid rising interest rates and slower economic growth in the United States and Europe. Notably, the US office sector declined by a significant 23 percent, while that of Europe dropped by 17 percent (Figure 1.10, panel 1). By contrast, CRE prices in the Asia-Pacific region (excluding China) remained relatively stable on aggregate, as positive net operating income partially offset high debt-servicing costs.

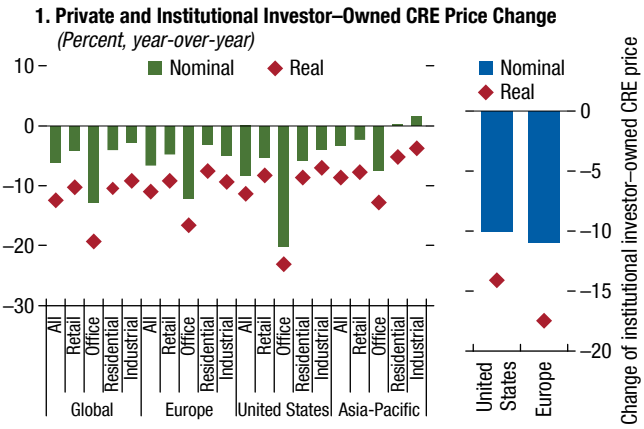
CRE price declines are driven by both higher global interest rates and postpandemic structural changes to CRE demand.[5] The work-from-home trend has weighed on CRE transactions, particularly in major global cities (Figure 1.10, panel 2), fueling concerns over future occupier demand in the office sector. Vacancy rates continued to rise in 2023, and absorption rates—a measure of how quickly CRE supply is absorbed by demand—have been negative, hinting at persisting upheaval in the sector (Figure 1.10, panel 3). Downside risks to CRE remain elevated as yields from owning CRE fall below the cost of financing CRE purchases with debt, weighing down property prices (Figure 1.10, panel 4). In a severely adverse scenario, with 5 percent probability, real CRE price declines over the next three years could reach 20 percent in the Europe, Middle East, and Africa region and 23 percent in North America. In the office sector, prices could fall more than 25 percent (Figure 1.10, panel 5).

Although the banking sector appears well positioned to absorb CRE losses on aggregate, some economies could face painful losses, given the large size of the sector and its interconnectedness with the financial system and the broader economy (Figure 1.10, panel 6; see also the next section, "Concerns Are Mounting about Banks' Exposures to Commercial Real Estate"). This is especially true in the United States, where CRE

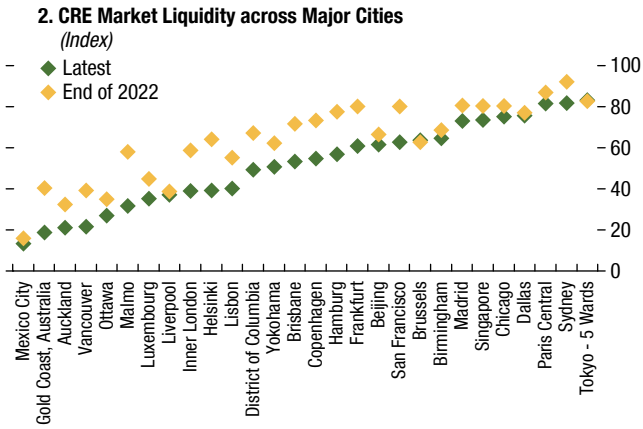
[5]Recent empirical studies (Deghi, Natalucci, and Qureshi, 2022; Gupta, Mittal, and Van Nieuwerburgh 2022) highlighted that significant shifts in lease revenues, office occupancy, lease durations, and market rents attributed to remote work in the wake of the COVID-19 pandemic have had a significant effect on CRE valuations in addition to the effect of tighter financing conditions. Chapter 3 of the April 2021 *Global Financial Stability Report* also investigated the extent to which CRE prices reflect economic fundamentals and the implications of structural shifts in demand using a structural model for CRE valuations, finding that the median drop in fair values could reach 15 percent over five years after a permanent increase in the vacancy rate by 5 percentage points.

Figure 1.10. Developments in Global Commercial Real Estate Markets

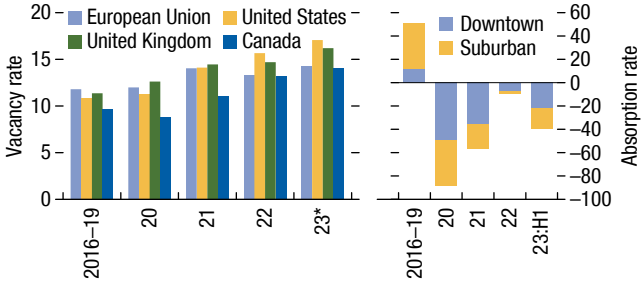
The CRE sector continued to reprice to higher interest rates in 2023 ...



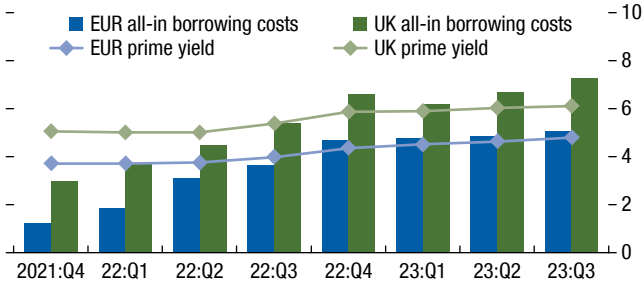
... contributing to large declines in CRE liquidity, especially major cities.



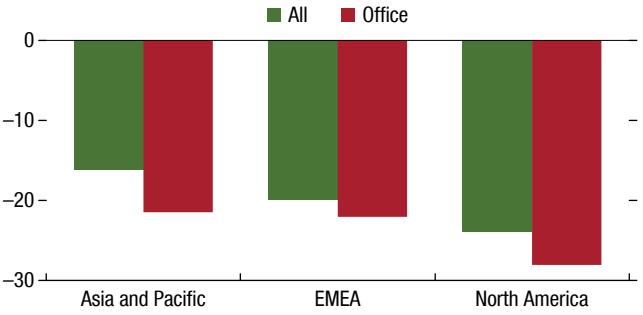
Pandemic-related structural changes continue to depress demand for office properties.



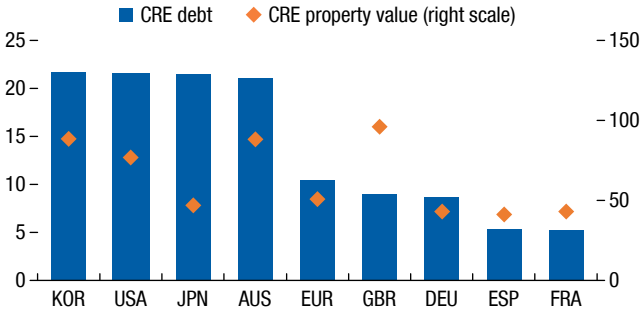
Elevated interest rates are pushing up debt costs ...



... increasing downside risks to CRE prices.



Given the large size of the sector, further price pressures could lead to painful economic losses.



Sources: AEW Capital Management; Bloomberg Finance L.P.; European Public Real Estate Association; Haver Analytics; MSCI Real Estate; Nareit; and IMF staff computations.
Note: In panel 1, changes in private CRE properties (left scale) are computed as of the fourth quarter of 2023. Changes in valuation of high-quality properties owned by institutional investors (right scale) are computed as of January 2024. In panel 2, the liquidity score uses a combination of absolute and relative measures to calculate market liquidity, including percentage of global cross-border investment, share of institutional investment, and volume and number of unique buyers. Larger values indicate higher liquidity. In panel 3, the absorption rate is calculated by dividing the number of homes sold over a particular period by the total number of homes available for sale. The asterisk indicates data up to the third quarter of 2023 and the first half of 2023. Panel 5 shows the results from a CRE-prices-at-risk model based on Deghi, Mok, and Tsuruga (2021). Bars indicate the CRE price decline in a severely adverse scenario with a 5 percent probability (fifth percentile). Data labels in the figure use International Organization for Standardization (ISO) country codes. CRE = commercial real estate; EMEA = Europe, the Middle East, and Africa; H1 = first half.

debt is estimated at almost $6 trillion.[6] US CRE prices saw some of the steepest price declines during this interest rate hike cycle relative to almost all past cycles (Figure 1.11, panel 1).[7] Origination and refinancing of commercial mortgages remain challenging because of still-high interest rates, reduced property values, and risk aversion of banks (Figure 1.11, panel 2). According to analyst estimates, of the $1 trillion of debt maturing in the US CRE market in 2024 and 2025, the refinancing gap exceeds $300 billion.

Market-based CRE financing has also slowed dramatically, with the issuance of commercial mortgage-backed securities (CMBS) down 45 percent from the previous year and delinquencies of CMBS specializing in offices reaching 6.1 percent, up from 1.5 percentage points a year ago (Figure 1.11, panel 3 and panel 4, left). Banks' net charge-off rates for CRE loans also rose briskly (Figure 1.11, panel 4, right). Large near-term refinancing needs and further price declines could jeopardize the health of financial institutions with concentrated holdings in CRE. The share of real estate investment funds (REITs)—major holders of US CRE properties—with an interest coverage ratio (ICR) below 1—that is, REITs with cash flows not covering debt payments—increased in 2023 relative to previous years (Figure 1.11, panels 5 and 6).[8] A concern is that 15 percent of REITs that specialize in the troubled office sector are potentially in debt distress, a 10 percentage point increase from the previous year.

An easing in financial conditions could aid the recovery in CRE markets, as capital growth and financial conditions are closely related (Deghi, Natalucci, and Qureshi 2022). Reduced interest rates should lower the financial burden on investors seeking to either fund fresh transactions or restructure existing loans, fostering increased investment in the sector. That said, the scale of past rate hikes, higher labor and material costs, and structurally lower occupancy rates in some sectors suggest that challenges within the CRE sector may endure.

Concerns Are Mounting about Banks' Exposures to Commercial Real Estate

CRE loans make up a sizable portion of total bank loans in a number of banking systems around the world (Figure 1.12, panel 1). Most banks appear to have adequate loan-loss reserves and capital buffers to absorb potential CRE losses, but some have come under investor pressure recently. For example, the stock prices of a number of banks around the world declined precipitously after they announced losses or provisions on their US CRE portfolios. As the CRE sector grapples with declining property prices, rising vacancy rates, higher financing costs, and structural changes after the pandemic, banks have tightened lending standards in both the euro area and the United States (Figure 1.12, panel 2).

In the United States, where CRE loans make up about 18 percent of total bank loans, an estimated $277 billion in CRE loans will mature in 2024, $82 billion of which are backed by office properties (Mandtz, 2023). The nonperforming CRE loan rate for US banks by the end of 2023 had doubled from a year earlier, reaching 0.81 percent from just 0.40 percent at the end of 2022. Over the past year, banks have continued to increase provisions for CRE nonperforming loans, albeit at a slower pace than the rise in such loans. As a result, the CRE coverage ratio—that is, the ratio of loan-loss reserves to cover future losses to nonperforming loans—fell to 154 percent from 200 percent for the banking sector, with a more pronounced decrease for US global systematically important banks than for other banks (Figure 1.12, panel 3). Despite this decline, the coverage ratio remains relatively high, suggesting that banks are anticipating higher delinquencies, defaults, and charge-offs within their CRE portfolios.

Credit losses are expected to vary across CRE categories, geographic regions, and bank sizes. The proportion of office loans with a high probability of default in major metropolitan areas, for example, indicates substantial regional differences.[9] San Francisco, Seattle,

[6]In the United States, for example, current CRE net charge-offs represent a small fraction of the total loan portfolio (on aggregate, less than 1 percent). However, for some banks (including large banks), delinquency of nonowner-occupied loans over total CRE loans is above 5 percent, reaching up to 17 percent.

[7]Part of the divergence in price behavior between recent and past cycles may be attributed to the steep pace of monetary policy tightening, a factor that has contributed to the sharp increase in mortgage rates and CMBS spreads. Tightening has also notably slowed private equity fundraising (Deghi, Natalucci, and Qureshi 2024).

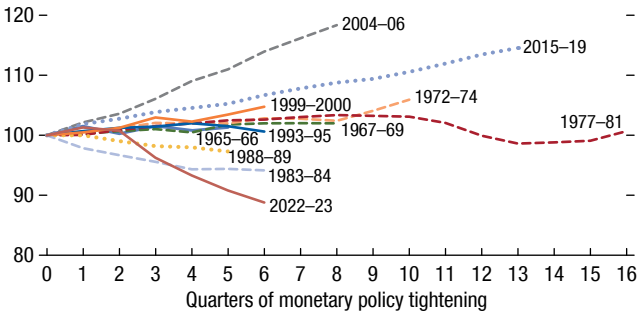
[8]The ICR is a metric widely used by practitioners to assess how easily firms can meet interest payments out of earnings. In this analysis, ICR is calculated as the ratio of EBITDA (that is, earnings before interest, taxes, depreciation, and amortization) to interest expenses on outstanding debt. Any ICR below 1 is a signal of severe distress. Debt at risk is therefore defined as the amount of debt attributable to firms with an ICR of less than one.

[9]"The proportion of office loans with a high probability of default" refers to criticized rate, which is defined as the share of criticized office loans to total loans calculated by Mandzy (2023).

Figure 1.11. Vulnerabilities in the US Commercial Real Estate Market

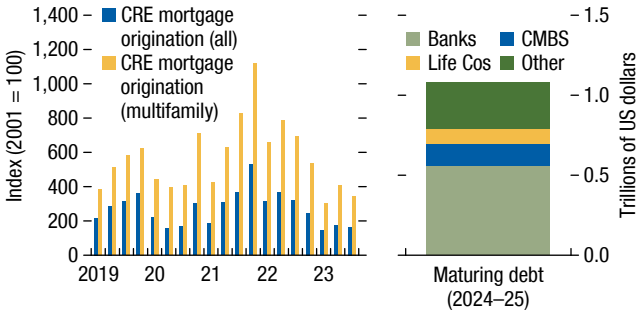
CRE valuations have plummeted more in the present monetary policy tightening cycle than in previous episodes.

1. CRE Price Trajectories during Rate Hike Cycles
(Index = 100 at beginning of cycle)



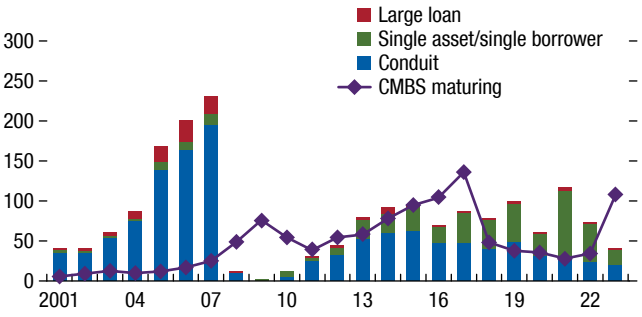
Commercial mortgage originations have declined ...

2. US: Commercial Mortgage Origination Volume and Maturing Debt
(Index, left panel; trillions of US dollars, right panel)



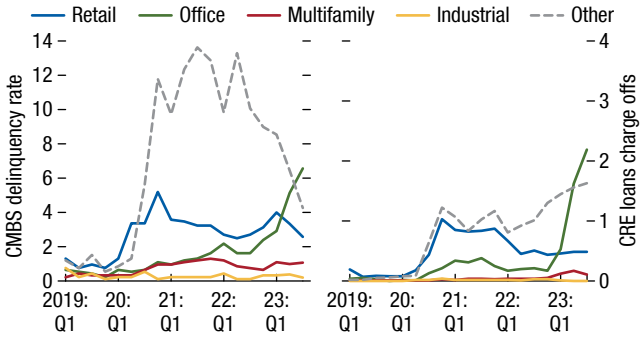
... and maturing CMBS have exceeded new issuance ...

3. US CMBS Private-Label Issuance
(Billions of US dollars)



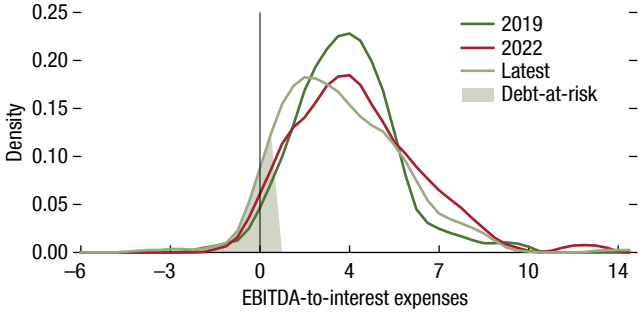
... while delinquencies in the office sector and bank net charge offs in multiple sectors surged.

4. CMBS Delinquency Rate and Banks Net Charge-Offs, by Property Type
(Percent)



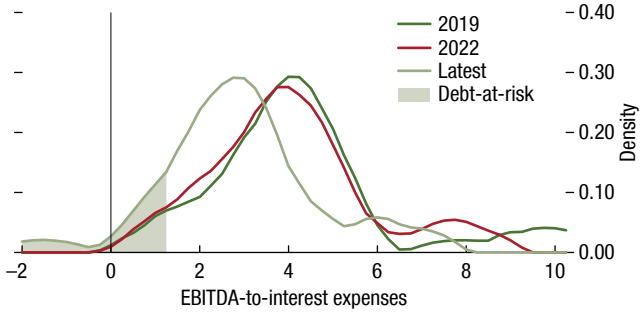
A decline in CRE valuation could put further pressure on financial institutions with concentrated holdings in the sector, like REITs ...

5. US REITs: ICR Distribution
(Probability density)



... especially REITs owning and managing office space.

6. US Office REITs: ICR Distribution
(Probability density)

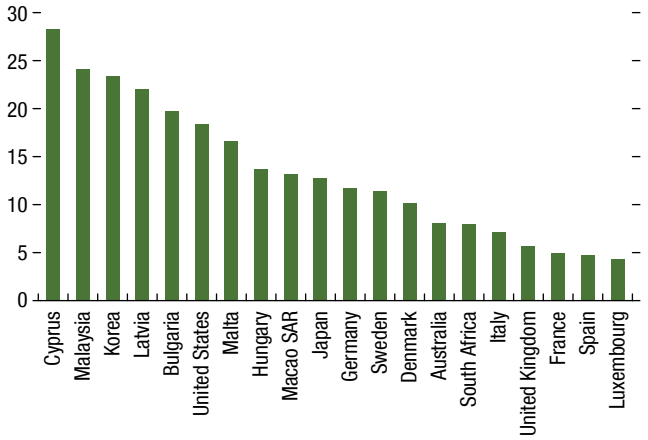


Sources: Bloomberg Finance L.P.; Haver Analytics; Mortgage Bankers Association; MSCI Real Estate; S&P Capital IQ; Trepp T-ALLR; and IMF staff computations.
Note: Panel 2 shows a CRE loan origination volume index by property type. The indexes are reported relative to the year 2001, with the average quarterly volume in that year defined as a value of 100. Panels 5 and 6 show the distribution of the ratio of EBITDA-to-interest rate expense (that is, ICR) across REITs and REITs specialized in office space, respectively. Distribution is based on yearly average of ICR across US REITs. "Latest" refers to 2023 up to the third quarter. Debt-at-risk corresponds to the debt of firms' with ICR below 1 debt at risk for (shaded area). CMBS = commercial mortgage-backed securities; CRE = commercial real estate; EBITDA = earnings before interest, taxes, depreciation, and amortization; ICR = interest coverage ratio; Life Cos = life insurance companies; REITs = real estate investment trusts.

Figure 1.12. Banking Exposures to Commercial Real Estate

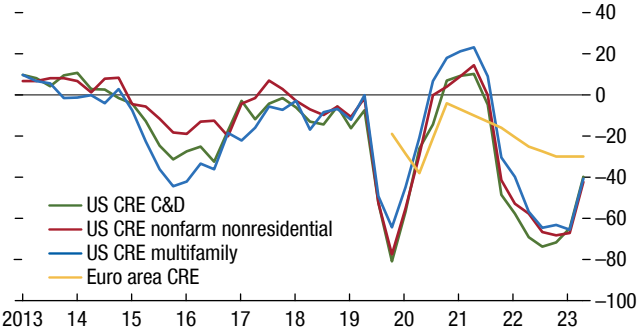
Some banking systems have significant CRE exposures.

1. Commercial Real Estate Exposure to Total Loans
(Percent)



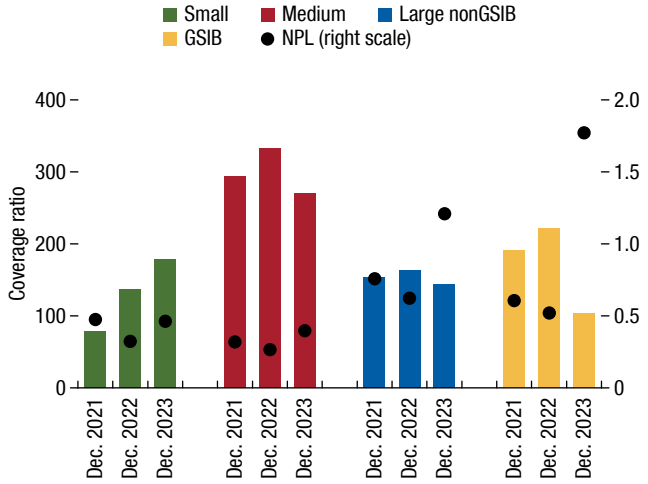
CRE lending standards tightened both in the euro area and the United States.

2. CRE Lending Standards
(Percent of net respondents)



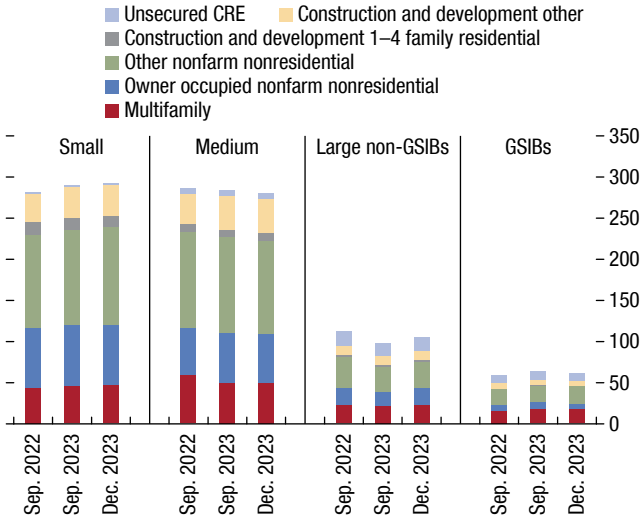
CRE NPLs are rising while coverage ratios are falling across most banks in the United States subcomponent of CRE across banks in the United States.

3. CRE Coverage and NPL Ratios
(Percent)



Nonfarm nonresidential loans, which includes office, represent the largest subcomponent of CRE across banks in the United States.

4. CRE Segment Exposure to Tier 1 Capital
(Percent)



Sources: European Central Bank; Federal Financial Institutions Examination Council; Federal Reserve; Haver Analytics; IMF, Financial Soundness Indicators; and IMF staff calculations.
Note: In panel 1, the ratio is calculated using in the numerator loans collateralized by commercial real estate, loans to construction companies, and loans to companies active in the development of real estate; and gross loans as the denominator. Data are as of the third quarter of 2023, except Italy and Korea (2023:Q2), Australia and Germany (2023:Q1), and South Africa (2022:Q3). Some banking systems would have substantially lower ratios if non-CRE loans collateralized by commercial properties are excluded. The ratio does not fully capture the inherent risks from CRE, which also depend on other fundamental factors such as vacancy rates. In panel 2, positive values indicate looser standards; negative values indicate tighter standards. Panels 3 and 4 were calculated based on a data set including 4,528 banks accounting for 99.8 percent of total bank assets in third quarter of 2023 and followed the Federal Reserve's supervisory definition, small banks correspond to banks with less than $10 billion in total assets, medium banks correspond to banks with assets between $10 billion and $100 billion, Large non-GSIB corresponds to large banks with assets above $100 billion not classified as a GSIB, and GSIB corresponds to large banks classified as GSIBs. In panel 3, coverage ratio = loan loss reserves to NPLs; NPLs = nonperforming loans defined as noncurrent loans to total loans; the CRE breakdown corresponds to the Federal Financial Institutions Examination Council definitions. C&D = construction and development loans; CRE = commercial real estate; GSIB = global systemically important bank.

and Washington, DC, reported rates above 50 percent, whereas areas like Miami and San Diego reported values below 20 percent. Global systemically important banks (GSIBs) from the United States are more exposed to problematic office CRE areas in central business districts than are small banks (Glancy and Wang 2023). However, GSIBs have significantly smaller CRE exposures to Tier 1 capital (Figure 1.12, panel 4).

Nonperforming loans are expected to climb further in the coming quarters for several reasons—for example, in the United States, quarterly CRE nonperforming loans and losses did not peak until nine quarters after the start of the global financial crisis in mid-2007.[10] In addition, there remains a subset of banks that have exceptionally high CRE concentration for which losses could compromise their safety and soundness. One-third of US banks, mainly small and medium banks, with $3.7 trillion in total assets, reported CRE exposures exceeding 300 percent of their Tier 1 capital plus the allowance for credit losses, including a large non-GSIB bank, which shocked its shareholders by reporting sizable provisions for CRE-related loan losses in its fourth quarter 2023 earnings release (Box 1.3).

Notable Pressures on Residential Real Estate in Some Countries

Since the October 2023 *Global Financial Stability Report*, residential home prices have continued to move modestly downward in most countries, although they are generally still above the prepandemic average (Figure 1.13, panel 1). The cooling of home prices likely reflects lower affordability and, by extension, demand, amid higher interest payments. Overall, declines in quarterly real house prices were more marked among advanced economies (–2.7 percent year over year, based on latest available data) than in emerging markets (–1.6 percent), likely because mortgage rates have climbed substantially in some of these economies since the pandemic, restraining home purchase activities (Figure 1.13, panel 2). The Chinese property market has fared worse than other countries, although for reasons other than interest rate pressures (see the section "Chinese Asset Prices Face a Difficult Turnaround amid Weak Sentiment").

The cooling of home prices does not by itself suggest more elevated financial stability risks, which instead depend on whether the household debt burden is unsustainable. Debt sustainability ratios across advanced economy households are still at modest levels based on the latest data (the third quarter of 2023; Figure 1.13, panel 3, green bars). Assuming the average interest on households' outstanding debt increase further in the fourth quarter of 2023, in line with the average quarterly pace observed in 2023, debt service ratios could increase by up to almost 2 percentage points (Figure 1.13, panel 3, red dots). The effect would be larger in more leveraged consumer markets such as Denmark, The Netherlands, and Sweden.[11] In all, with a modest debt burden across countries, the risk of a surge in residential mortgage defaults remains contained. Underwriting standards have been more stringent since the global financial crisis, and the household sector's leverage never rebounded, which has helped to safeguard stability in the household sector.

In the United States, monthly home prices have risen by 6.1 percent since the beginning of last year (Figure 1.13, panel 4). This appreciation has been fueled by a dearth in the supply of homes, with the lock-in effect—homeowners with mortgages fixed at low rates being discouraged from changing homes given high prices and high new mortgage rates—playing a part (see the October 2023 *Global Financial Stability Report*). Although the demand for home purchases has been supported recently by mortgage rates declining from a peak of 7.8 percent to 6.8 percent, 30-year mortgage rates are still around 3 percentage points above pandemic lows. A smaller stock of consumer savings available for down payments also attenuates demand, and mortgage originations are 21 percent lower than one year ago (Figure 1.13, panel 4).

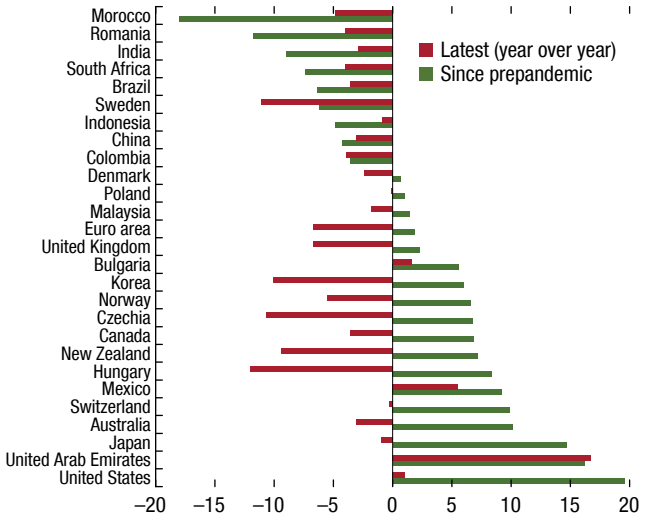
[10]The conclusion on nonperforming loans is based on the Federal Deposit Insurance Corporation's "Federal Quarterly Banking Profile" https://www.fdic.gov/analysis/quarterly-banking-profile/. Accessed February 26, 2024.

[11]The risks related to higher interest rates under two alternative scenarios for the fourth quarter of 2023 are mitigated by a large share of fixed-rate mortgages in some countries. The mortgage debt service interest rates use the reference mortgage rates from the G10 Accounts, a weighted average of the prevailing mortgage rates in each country, excepting Australia and Japan, for which a variable or floating rate is used, and Canada and the United States, for which a fixed 5-year and 30-year mortgage rate, respectively, are used.

Figure 1.13. Developments in Residential Real Estate Markets

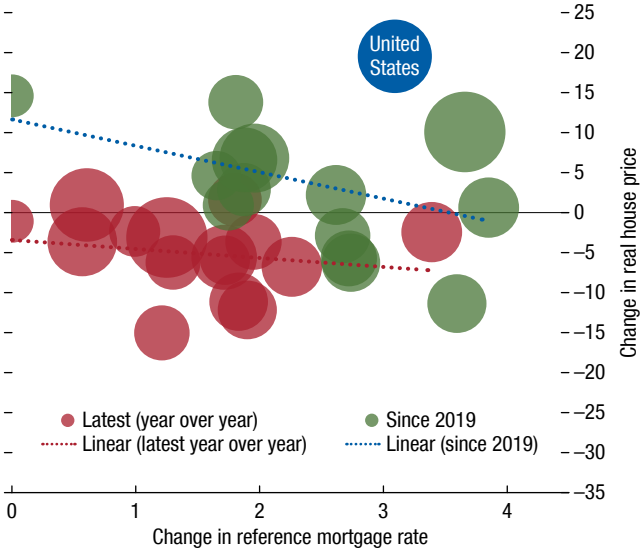
Housing markets continue to feel the effect of the high interest rate environment.

1. Real House Price Growth, by Country or Region
(Percent, year-over-year)



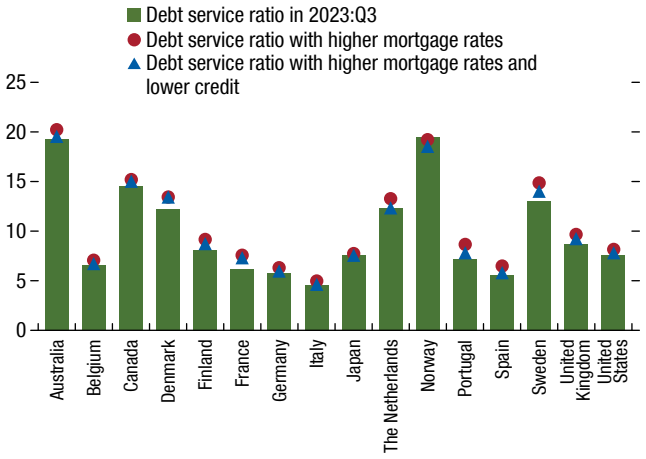
A rebound of home prices could prove a headwind to central bank efforts to control inflation, as prices remain higher than prepandemic levels.

2. Change in Real House Price and Reference Mortgage Rates in Selected OECD Countries
(Percent and percentage points, respectively)



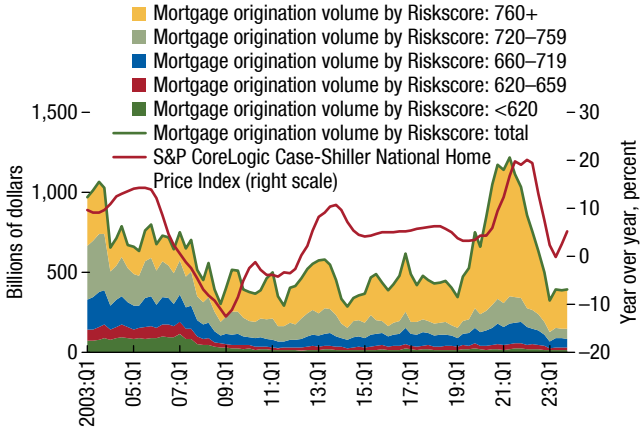
Higher mortgage rates could result in higher debt to income ratios and a progressive deterioration in housing affordability which could spur a further home price correction.

3. Debt Service Ratio in Selected OECD Countries
(Percent)



US house prices have rebounded, fueled in part by a temporary boost to demand caused by falling mortgage rates, while mortgage originations are slowing down for high-credit-score borrowers.

4. US Mortgage Origination by Credit Score and S&P CoreLogic Case-Shiller National Home Price Index
(Billions of US dollars; percent, year over year)



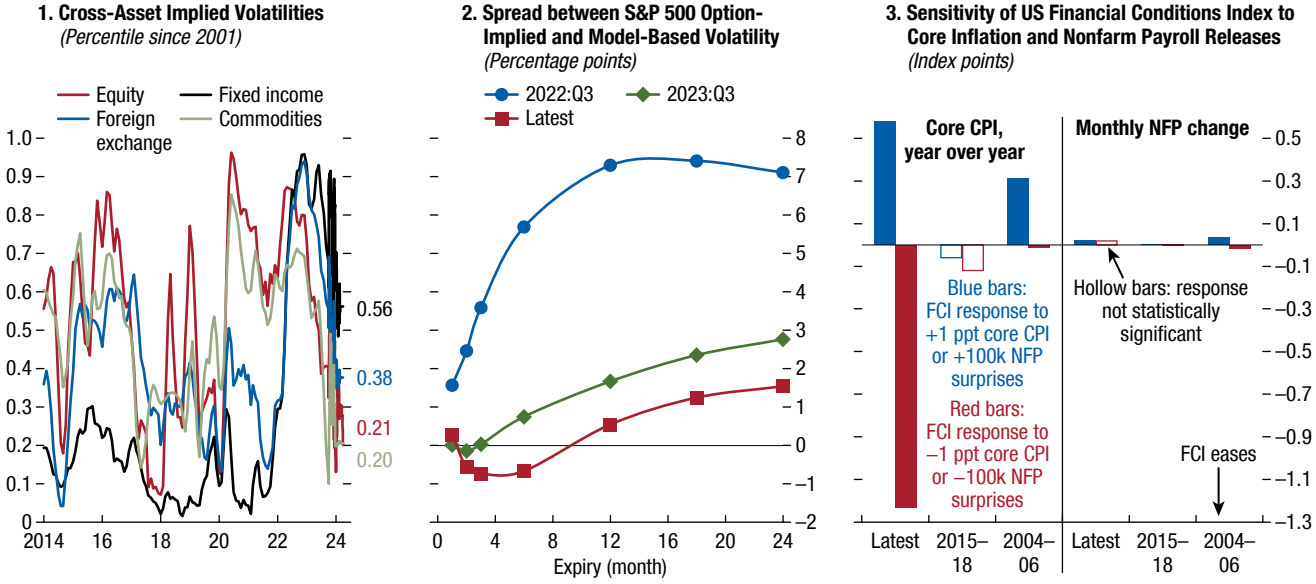
Sources: Bank for International Settlements; Federal Housing Finance Agency; Federal Reserve Bank of St. Louis; Haver Analytics (G10 Accounts); National Association of Realtors; New York Fed Consumer Credit Panel/Equifax; and IMF staff calculations.
Note: In panel 2, the reference mortgage rate in each country is obtained from Haver Analytics, G10 Accounts. For Belgium, Denmark, Finland, France, Germany, Italy, The Netherlands, Spain, Sweden, and the United Kingdom, this is represented by a weighted average of the prevailing mortgage interest rates. For Canada, the reference rate is the five-year average residential mortgage lending rate, whereas for the United States, it is the 30-year fixed mortgage rate. The size of the bubble refers to the latest level of the reference mortgage rate in each country. Since prepandemic refers to the average of the available quarters in 2023 versus the fourth quarter of 2019. Mortgage interest rates data for Australia, Norway, and the United States include information until the fourth quarter of 2023. In panel 3, the debt service ratio is defined as the ratio of interest payments plus amortizations to income, assuming debt is repaid in equal portions over the maturity of the loan (that is, no prepayments). The panel shows changes of debt-service to income ratios in the third quarter of 2023 (latest available), year over year, under two alternative scenarios for the fourth quarter of 2023. The first alternative scenario corresponds to an increase of the average interest rate paid on the outstanding stock of debt, ceteris paribus, based on the average change in mortgage rates across jurisdictions since 2023. The second alternative scenario shows instead the same increase in mortgage rates against a continuation of a credit slowdown, obtained projecting the latest year-over-year credit growth into the fourth quarter 2023. In the case of Norway, the reference credit growth is the second quarter of 2023. The average remaining maturity of household debt across countries is assumed equal to 18 years. Income is proxied by households' gross disposable income that proxies for the amount of money available to households to pay debt service costs, consistent with the definition by the Bank for International Settlements. In panel 4, monthly US house prices are interpolated at quarterly frequency. OECD = Organisation for Economic Co-operation and Development.

Figure 1.14. Cross Asset Volatility

An optimistic policy and economic outlook has compressed volatility across asset classes.

Volatility risk premiums are now deeply in negative territory, suggesting some risks of complacency.

However, financial conditions appear responsive to data surprises, especially inflation surprises.



Sources: Bloomberg Finance L.P.; and IMF staff calculations.
Note: Panel 1 shows the average percentile of implied volatility against own history across asset classes in Europe, Japan, the United States, and emerging markets. Commodities include implied volatility of oil and gold as well as 180-day realized volatility of weekly returns for bitcoin. Panel 2 shows the difference between S&P option-implied volatility and a forward-model-based volatility estimated using the Glosten-Jagannathan-Runkle generalized autoregressive conditional heteroskedasticity model. Panel 3 displays the coefficients of regressions of the change in the Goldman Sachs US FCI on core CPI and NFP surprises. CPI = consumer price index; FCI = Financial Conditions Index; NFP = nonfarm payroll; ppt = percentage point.

Compressed Volatility and High Cross-Asset Correlations Could Amplify Repricing Risks

Volatility has declined to multiyear lows for most asset classes (Figure 1.14, panel 1), likely reflecting increased optimism that the global hiking cycle is near its end while the global economy has remained largely resilient. Volatility risk premium, measured as the spread between market-implied volatility and model-based fair value, have fallen across maturities since the October 2023 *Global Financial Stability Report*. Shorter-dated volatility risk premiums are now deeply in negative territory, similar to levels just before the start of the tightening cycle in 2022 (Figure 1.14, panel 2). These low levels of premiums may reflect investor complacency, thereby exacerbating any sudden reassessment of the policy or economic outlook.

Low volatility has masked financial conditions becoming more responsive to economic data releases in this hiking cycle than in past ones. Intraday financial conditions, in particular, move appreciably in response to core consumer price index surprises, defined as the actual core inflation number minus the Bloomberg survey median, likely reflecting investor attention to the Federal Reserve's data dependence (Figure 1.14, panel 3). Sizable inflation surprises may therefore abruptly change financial conditions and rapidly decompress the low asset price volatility.

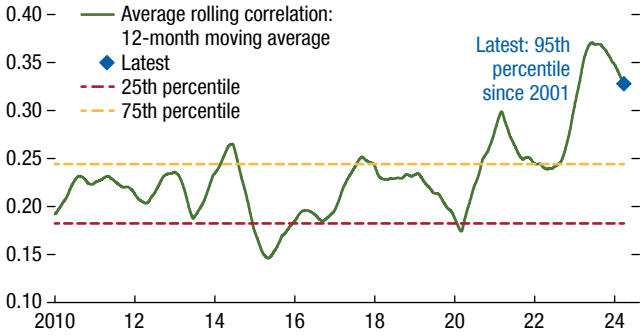
In contrast to the low asset price volatility, the average correlation across advanced economy and emerging market equities, bonds, credit, and commodity indices is high, exceeding the 90th historical percentile (Figure 1.15, panel 1). Shocks hitting correlated markets could cause simultaneous price reversals and contagion, as movements in one asset class can quickly spill over into others.

A key reason for the concerted rise of asset correlation is the increase in passive investing and hedge fund activities focused on index-level products. The use of passive investing vehicles, such as exchange-traded funds (ETFs), has increased significantly (Figure 1.15, panel 2), with ETFs focused on high-yield and emerging market bonds more sensitive to market-wide proxies, such as S&P 500 returns, than their respective underlying

Figure 1.15. Cross-Asset Correlations and Some Structural Factors

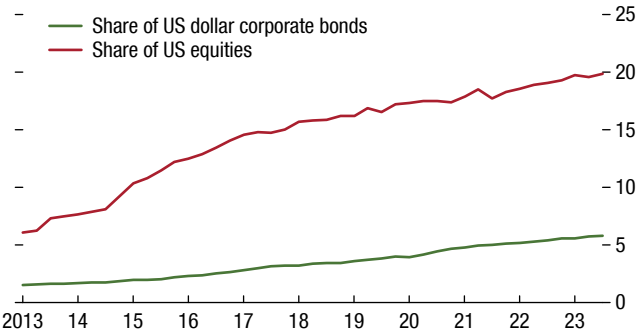
Average cross-asset correlations are elevated, heightening the risk of contagion.

1. Average Rolling Cross-Asset Correlation
(12-month moving average)



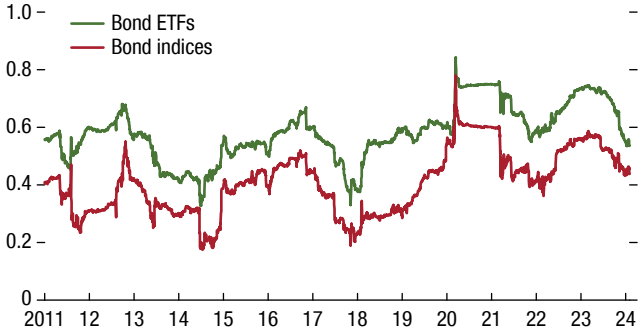
The rise of passive investing may reduce the relative importance of asset-specific fundamentals ...

2. Market Share of Passive Investing of US Equities and US Dollar Corporate Bonds
(Percent)



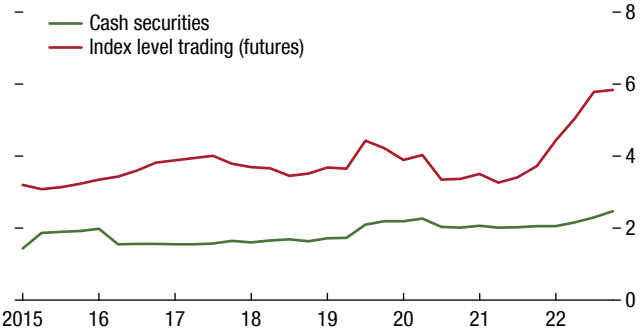
... and its greater sensitivity to broader market indices may help boost cross-asset correlations.

3. Average Correlation to the S&P 500 Index
(US high yield and emerging market bonds, 12-month moving average)



Greater focus of hedge funds on trading index level securities may be another factor.

4. Turnover in US Hedge Fund Portfolios
(Percent of net asset value, four-quarter moving average)



Sources: Bloomberg Finance L.P.; Federal Reserve; Securities Exchange Commission; and IMF staff calculations.
Note: The average cross-asset correlation in panel 1 is calculated using daily returns over a six-month period on the following proxies: the S&P US Treasury Bond Current 10-Year Total Return Index, the S&P 500 Index, the MSCI EAFE Index, the MSCI Emerging Markets Index, the iBoxx USD Liquid Investment-Grade Index, the iBoxx USD Liquid High-Yield Index, the J.P. Morgan EMBI Global Core Index, the United States Oil Fund LP, and gold and silver US dollar spot prices. Panel 2 uses ETFs as the proxy for passive investing. This may potentially underestimate the overall share of passive investing as it does not include other vehicles such as index trackers that are also associated with passive investing. Panel 3 uses the iShares iBoxx $ High Yield Corporate Bond and the iShares J.P. Morgan USD Emerging Markets Bond ETFs as the proxies for high-yield and emerging market bond ETFs. The iBoxx USD Liquid High Yield and J.P. Morgan EMBI Global Core indices are used as the proxies for the underlying high-yield and emerging market bond indices. This panel calculates a simple average of the correlation of both to the S&P 500 index. Panel 4 uses futures as a proxy for the trading of index level securities. ETF = exchange-traded fund.

indices (Figure 1.15, panel 3; see also Chapter 1 of the April 2018 *Global Financial Stability Report*). Similarly, hedge funds appear to have shifted from picking individual securities—sometimes as contrarians to the broader market, thereby supporting asset price differentiation—to increasing their trading of index-level securities, such as futures, options, and ETFs (Figure 1.15, panel 4). This shift has exposed hedge funds to common shocks across financial markets rather than to asset-specific fundamentals. The assets of multi-strategy hedge funds that are more likely to trade index-level securities have grown significantly in recent years, increasing to almost $700 billion from $356 billion in 2020.[12] These hedge funds are also active participants in leveraged basis trade (see the section "Leveraged Positions in Treasury Markets Have Remained Large"), having increased their financial leverage significantly during the past decade.[13]

[12]Multi-strategy hedge funds' share of total hedge fund assets has risen to 14 percent from 9 percent in 2020, according to data from BarclayHedge.

[13]The ratio of gross notional exposure of derivatives to net asset value for multi-strategy hedge funds rose to 14.8 in the second quarter of 2023 from 5.5 in the fourth quarter of 2014.

Medium-Term Vulnerabilities

Beyond these more immediate concerns, other medium-term fragilities are accumulating along the last mile.

The Resilience of Major Emerging Markets May Be Tested

Most major emerging markets have shown resilience to the external environment. Inflation has eased markedly in many emerging markets, having responded to early and proactive monetary tightening (Figure 1.16, panel 1), most notably in Latin America. There, measures of core inflation peaked in early 2023 and have continued to decline for most economies. On average, emerging market central banks have raised policy rates by 780 basis points from trough to peak after the pandemic, compared with an average increase of just 400 basis points by advanced economy central banks. Many emerging markets have already started their cutting cycles, given the improving inflation outlook. Early tightening widened the average nominal interest rate differential between emerging markets and the United States to over 6 percentage points. Real rates also rose on an ex ante basis (Figure 1.16, panel 2). As a result, emerging market currencies experienced modest volatility against the dollar, even as advanced economies hiked rates. Volatility did rise substantially for currencies in Latin America and in Central and Eastern Europe, Middle East, and Africa (CEEMEA) when advanced economies began rate hikes, but declined soon after (Figure 1.16, panel 3). For Asian currencies, volatility has been low throughout the cycle.

Portfolio flows to emerging markets have recovered since the October 2023 *Global Financial Stability Report*. The IMF's measure of capital flows-at-risk improved on the back of constructive investor sentiment. Flows to local currency bond and equity markets in emerging markets (excluding China) were robust in the final quarter of 2023, before softening in early 2024. Chinese portfolio inflows have rebounded somewhat in recent months (Figure 1.16, panel 4). Across all emerging markets, the estimated likelihood of outflows over the next year declined from 32 percent to 27 percent, and the 5th percentile of one-year-ahead capital outflows fell to 2.3 percent of GDP (Figure 1.16, panel 5).

With inflation abating in major emerging markets, many central banks have started to cut interest rates. Since the start of 2023, Latin American interest rate differentials compared with the United States—which has yet to cut rates—have declined by nearly 200 basis points on average, led by Brazil and Chile, while in CEEMEA, the average differential has declined by about 120 basis points (Figure 1.16, panel 6, solid blue line).

At this juncture, the key question is whether emerging market resilience is at a turning point—that is, will diminishing interest rate differentials lead to exchange rate depreciation and capital outflows anew? In fact, there are reasons to believe that narrowing rate differentials will not abruptly sour investor sentiment toward major emerging markets, as they appear to have already priced this in (Figure 1.16, panel 6, dashed lines). For Asia excluding China and CEEMEA, expectations for one-year-ahead interest differentials peaked in the first and third quarters of 2022, respectively, and have been on the decline since, indicating that investors anticipated emerging market central banks to be ahead of the United States in cutting rates. Latin American markets correctly predicted a year before that policy differentials would peak in late 2022. The market has therefore acknowledged the progress that countries have made in their fight against inflation, which has kept currency volatility, capital outflows, and other external pressures at bay. This has allowed major emerging markets to focus monetary policy on inflation.

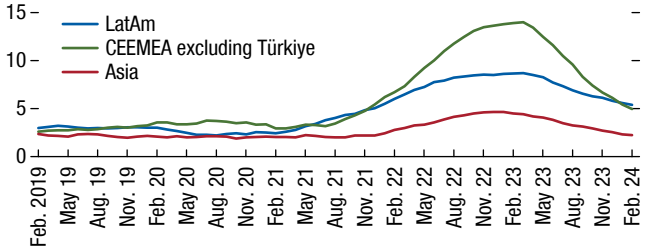
That said, investors could also be too sanguine about the gradual pace at which policy rate differentials close. External pressures on emerging markets could emerge if policy rate differentials turn out narrower from what is currently priced in, especially if advanced economies keep rates higher than anticipated to fight stubbornly high inflation. Historically, emerging markets have also faced spillovers of term premium shocks in the United States (see the section "Longer-Term Interest Rates Have Declined Globally"). Should this scenario play out, countries with strong current accounts, fiscal credibility, and relatively lower short-term debt will tend to face more moderate capital flow (Fratzscher 2012). The strength of institutional frameworks and the depth of domestic capital markets can also plausibly impact emerging market resilience to external financial stress.

Another area of concern is geopolitical developments in the Middle East and North Africa (MENA). An escalation of current conflicts could trigger a repricing of emerging market sovereign risk, resulting

Figure 1.16. Emerging Market Inflation, Interest Rates, and Portfolio Flows

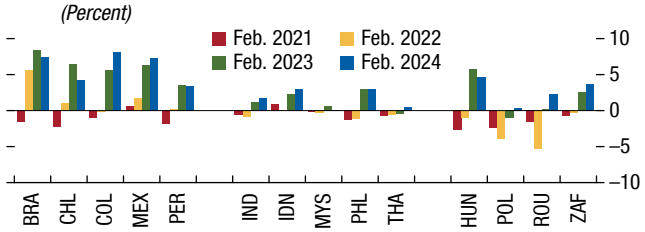
Inflation decelerated quickly in many emerging market economies in response to earlier and more proactive monetary policy tightening ...

1. Emerging Market Core Inflation
(Percent, year-over-year)



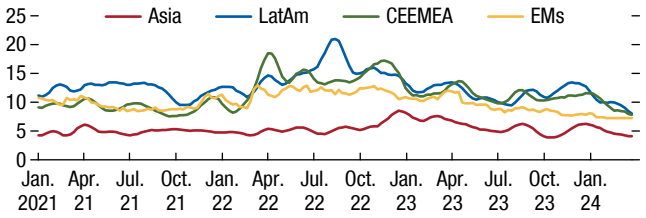
... resulting in large, positive ex ante real rates, particularly in Latin America and CEEMEA.

2. Ex Ante Real Rates Difference between Policy Rate and Consensus Inflation Forecasts
(Percent)



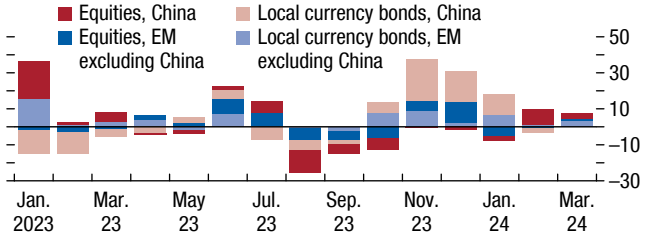
EM FX volatility has declined and remained relatively contained even as advanced economy interest rates rose sharply.

3. EM FX Volatility
(Historic two-month for regional indices, and ATM implied volatility for EM aggregate)



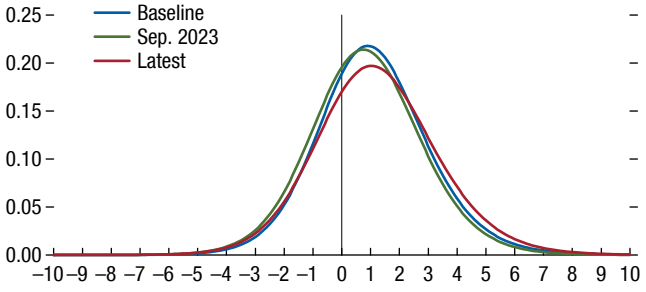
EM portfolio inflows accelerated in the fourth quarter of 2023 before moderating in the first quarter of 2024.

4. Portfolio Flow Tracking: Local Currency Bonds and Equities
(Billions of US dollars)



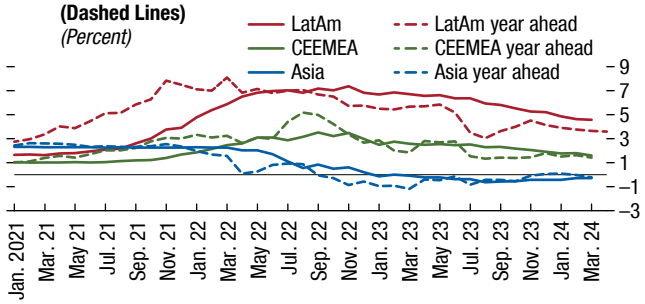
Capital flow-at-risk has improved on the back of improved risk sentiment, with the conditional probability distribution shifting toward inflows.

5. Capital Flows-at-Risk
(Conditional probability distribution)



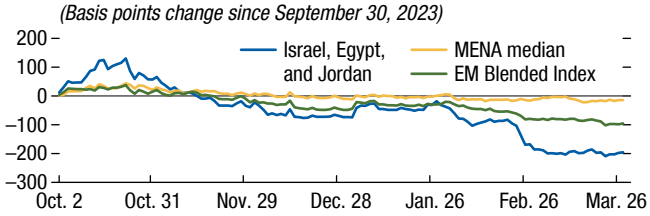
Markets have been pricing a declining interest rate differential in relation to the United States since early in 2022.

6. Average Difference in Policy Rate between EM and US (Solid Lines) and One-Year Ahead Average Differential Implied by Forward Rates (Dashed Lines)
(Percent)



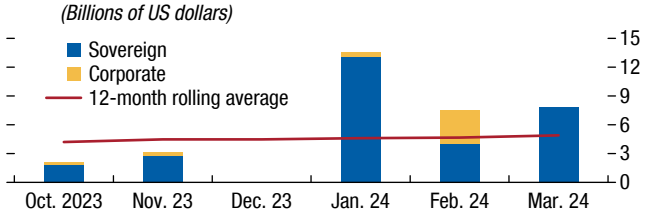
Funding conditions in MENA have improved, alongside broader EMs, indicating that contagion risk is contained.

7. International Bond Spreads Change
(Basis points change since September 30, 2023)



Major MENA sovereigns and firms continue to tap international markets to raise funding.

8. MENA Hard Currency Sovereign and Corporate Issuances
(Billions of US dollars)



Sources: Bloomberg Finance L.P.; J.P. Morgan; and IMF staff calculations.
Note: In panel 1, the figures are an average of regional core consumer price inflation. In panel 2, ex ante real rates are computed using market expectations of year-ahead inflation, and the percent is the difference between policy rate and consensus inflation forecasts. In panel 3, the regional indices are a simple average of historic two-month volatility for five countries in each region. The EM aggregate line is calculated by JP Morgan using three-month at-the-money implied volatility. In panel 7, EM Blended Index is 67% B rated and 33% A rated, reflecting the average rating of directly impacted economies. Data labels in the figure use International Organization for Standardization (ISO) country codes. Asia = India, Indonesia, Korea, Malaysia, Philippines, and Thailand; ATM = at-the-market; CEEMEA = Czechia, Hungary, Poland, and South Africa; CPI = consumer price index; EM = emerging market economy; FX = foreign exchange; LatAm = Brazil, Chile, Colombia, Mexico, and Peru; MENA = Middle East and North Africa.

in tighter financing conditions, as markets reassess potential default risk amid heightened uncertainties. Nonetheless, market indicators suggest that contagion from the conflict remains contained for now. Despite initial heightening of risk aversion in October, energy prices and implied volatility have moderated. Hard currency bond spreads also tightened for most MENA sovereigns, some to levels even tighter than before the current conflict (Figure 1.16, panel 7). MENA issuers continue to access international markets despite the ongoing conflict (Figure 1.16, panel 8).

Investors Are More Attuned to Fiscal Sustainability Risks in Major Emerging Markets

Beyond near-term risks in emerging markets, signs indicate that investors are increasingly focused on medium-term fiscal sustainability. Emerging market local currency bond yields are still broadly trading near the upper end of their historical range on a nominal basis and, to a lesser degree, on an inflation-adjusted basis (Figure 1.17, panel 1). These yields could remain elevated in the years ahead, as investors demand additional compensation (that is, term premiums) for holding emerging market bonds instead of receiving US long-term real interest rates (Figure 1.17, panel 2).[14] In several emerging markets, term premiums are now substantially higher than their prepandemic levels, together with higher expected short-term rates (Figure 1.17, panel 3).[15] In the hard currency bond market, emerging markets across the ratings spectrum will also need to refinance or issue new debt close to current secondary market yields, which are significantly above the coupons paid on existing debt stock (Figure 1.17, panel 4).

Higher emerging market term premiums may also reflect the increase in bond supply in those countries. Averaged across emerging markets, net domestic local currency bond issuance is nearly 1 percentage point of GDP higher than in prepandemic years. Banks, and in some cases central banks, stepped in to absorb significant amounts during 2020–21 but have since slowed their purchases, while foreign inflows have not been consistent in recent years (Figure 1.17, panel 5). Nonbank financial institutions have become influential buyers in several countries, although the depth of that investor base, allocation strategies, and regulatory frameworks vary considerably across countries (Figure 1.17, panel 6), offering no guarantee that those institutions will remain the marginal buyers of emerging market government bonds if policy or investor preferences change. Emerging markets facing the combination of sizeable expected debt issuance and uncertainty about who will absorb additional debt are more likely to experience market instability, even absent external shocks.

Even though emerging market hard-currency sovereign spreads narrowed recently—likely a result of the easing in global financial conditions (Figure 1.18, panel 1; see also the section "Financial Conditions Have Eased, but Bank Lending Standards Have Tightened in Some Countries")—market-implied default rates over the next five years remain higher than in 2019 for some sovereigns, even after adjusting for recent credit rating changes (Figure 1.18, panel 2). This suggests that investors have become more attuned to debt sustainability risks in the medium term, likely a result of pandemic-era fiscal expansions, higher debt burdens, and a disproportionate increase in the share of external borrowings by some emerging markets (Figure 1.18, panel 3). The persistent balance sheet erosion of some emerging market sovereigns over recent years, coupled with a lack of evident fiscal consolidation despite periods of robust economic growth, has ignited concerns about the adequacy of fiscal buffers to face future shocks.

Crucially, with interest rates settling at higher levels than before the pandemic, inflation coming down, and growth moderating (Figure 1.18, panel 4; see also the April 2024 *World Economic Outlook*), an increasing number of emerging market sovereigns have high real refinancing costs relative to economic growth (Figure 1.18, panel 5) and face large interest payments as a share of government revenues.[16] Looking ahead, the gap between five-year-ahead real local currency interest rates—implied by long-term government bond yields—and consensus forecasts of real growth is expected to increase (as seen by the shift of the cross-country distribution of this gap in

[14]Real financing rates are proxied by the real 5y10y-forward Treasury yield.

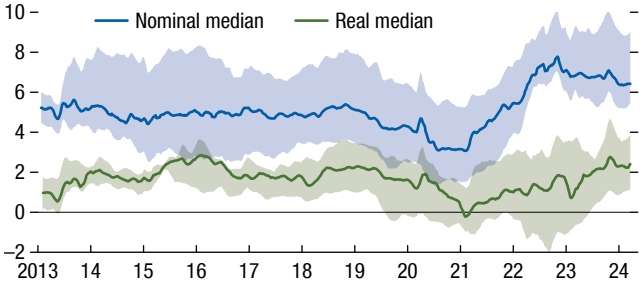
[15]Emerging bond yields are decomposed into term-premium and risk-neutral expected short-term rates, estimated by IMF staff using the Adrian, Crump, and Moench (2013) methodology. See also Chapter 1 of the April 2024 *Fiscal Monitor* for a more comprehensive spillover analysis of US longer-term yields to those in other countries.

[16]Refinancing costs are proxied by consensus analysts' estimates of long-term real economic growth.

Figure 1.17. Emerging Market Bonds and Investor Base

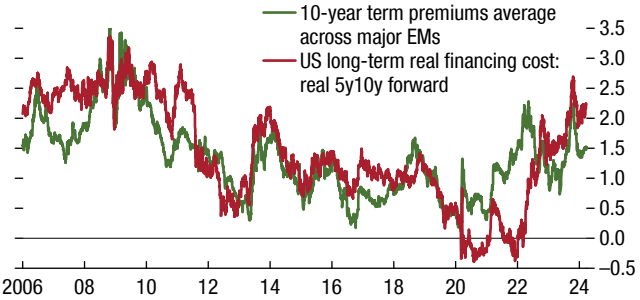
Local currency government bond yields remain high ...

1. Local Currency EM Government Bond Yields, Nominal and Inflation Adjusted, Five Year
(Percent, interquartile range)



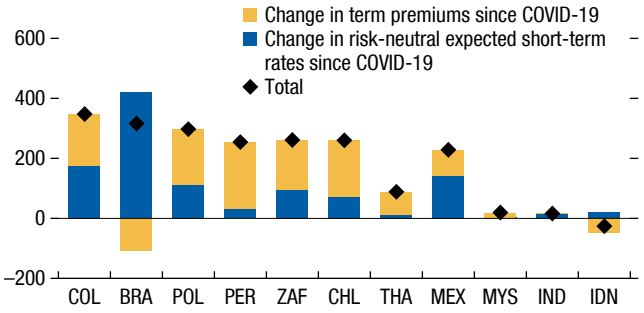
... and term premiums have tracked long-term real forward rates in advanced economies.

2. EM Term Premiums and Long-Term US Financing Costs
(Percent, EM average)



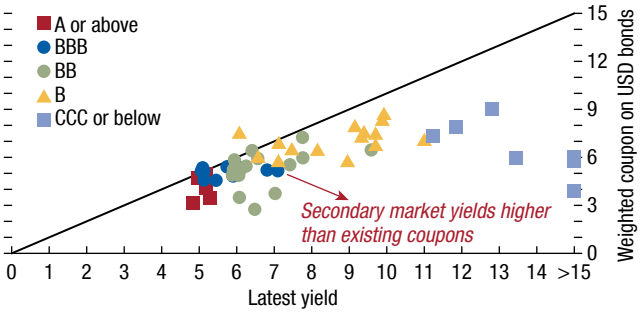
Expected short-term rates and term premiums a have risen on net since 2019 in many emerging markets.

3. Change in 10-Year Yields since 2019:Q4, Decomposition
(Percent)



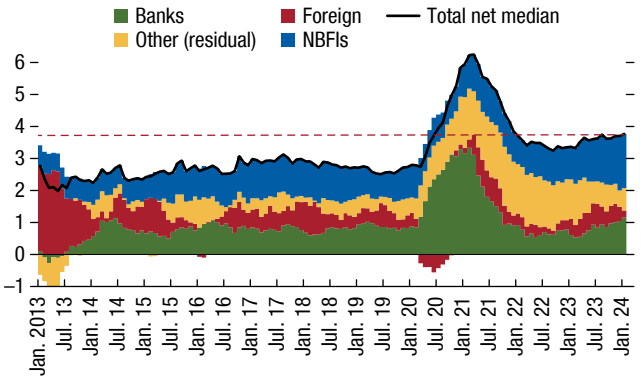
Secondary market yields on international dollar bonds are well above coupons on existing debt stock, implying higher debt servicing costs going forward.

4. International Dollar Denominated Sovereign Bond Yields and Coupons, by Rating
(Percent)



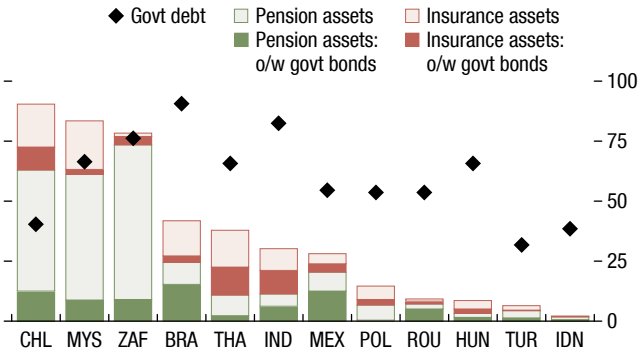
Net domestic bond issuance has remained fairly high, with nonbank financial institutions taking on a longer financing role in recent months.

5. Net Domestic Local Currency Bond Issuance and Absorption by Sector
(Percent of GDP, EM average, 12-month rolling sum)



The size of the domestic investor base and each sector's bond allocation varies considerably across countries.

6. Pension and Insurance Assets, Government Bond Holdings, and Government Debt
(Percent of GDP)

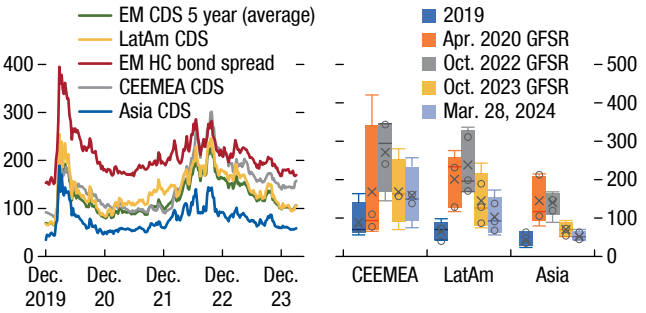


Sources: Bloomberg Finance L.P.; Consensus Economics; Haver Analytics; J.P. Morgan; national pension authorities; sovereign rating agencies; and IMF staff calculations.
Note: In panel 1, real yields are calculated using blended 1-year-forward inflation expectations based on Consensus Forecasts. In panel 2, yield decomposition is calculated by IMF staff using ACM methodology. Panel 4 calculates the weighted coupon for sovereign bonds (excluding quasi sovereigns) included in the JPM EMBIG or calculated individually as of January 2024. Panel 5 represents the change in monthly holdings of domestic local currency bonds by each sector, scaled by GDP, and averaged across 12 major EMs. The NBFI category generally includes insurance, pension, and investment funds where available, although definition differs somewhat across countries. BRA = Brazil; CHL = Chile; COL = Colombia; EM = emerging market; HUN = Hungary; IDN = Indonesia; IND = India; MEX = Mexico; MYS = Malaysia; NBFI = nonbank financial institution; POL = Poland; ROU = Romania; THA = Thailand; TUR = Türkiye; ZAF = South Africa.

Figure 1.18. Investors Expect Debt Sustainability to Be Challenged in Coming Years

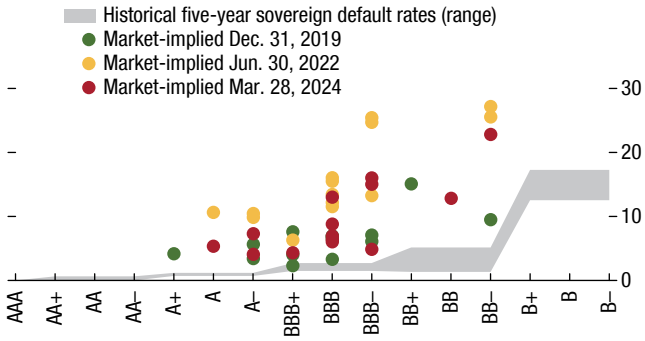
EM sovereign bond spreads have narrowed as global financial conditions eased ...

1. Select Major EM Hard Currency Sovereign Bond Spreads, Five-Year CDS Spread
(Basis points)



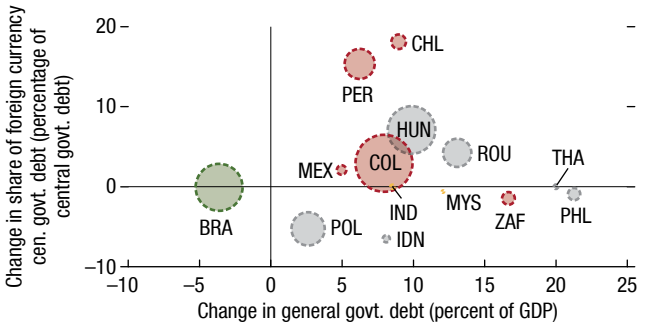
... and implied default rates are high for some sovereigns, potentially suggesting for further downgrades ...

2. Market Implied and Historical Cumulative Five-Year Default Rates
(Percentage points)



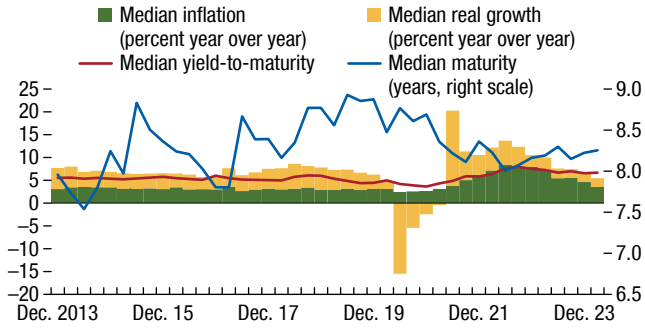
... as increasing fiscal burdens have been financed by more external financing borrowing for some sovereigns.

3. Change in Share of Foreign Currency Central Government Debt, Change in General Government Debt, 2019 to 2023:Q2
(Percentage of central government debt, percent of GDP)



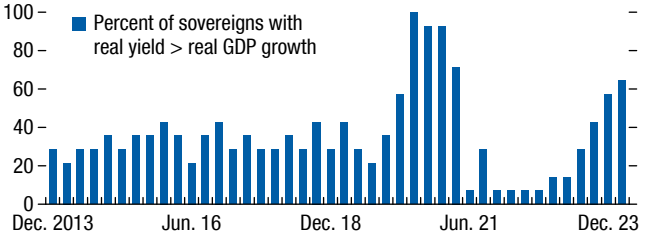
The median EM saw slowing growth and inflation, alongside still-elevated sovereign interest rates.

4. Maturity of Domestic Sovereign Debt, Domestic Yield-to-Maturity, Trailing 12-Month Inflation and Real Economic Growth
(Years, percent, percent change year over year)



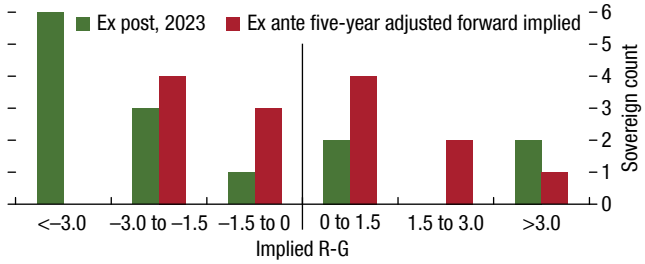
An increasing number of EMs have experienced higher real refinancing costs relative to economic growth in the past year ...

5. Sovereigns with Ex Post Real Yields Larger than Ex Post Real GDP Growth
(Percent)



... refinancing may be unsustainable and could pose challenge to some EMs in the medium term in the absence of fiscal consolidation.

6. Count of Sovereigns and Implied Differentials of Ex Ante Real Rates and Real Economic Growth (R-G)
(Count)



Sources: Arslanalp and Tsuda 2014; Bloomberg Finance L.P.; Consensus Economics, Inc.; Fitch Ratings; Moody's; S&P Global Ratings; and IMF staff calculations.
Note: Data for EM sovereign includes 14 major sovereigns and excludes China and the Russian Federation. Government debt securities refers to central government debt unless otherwise specified. Spreads in panel 1 are simple averages across 14 major sovereigns. In panel 2, implied market default rates are derived from pricing of five-year CDS spreads, with assumption of 50 percent recovery rate. Five-year historical default range is from Moody's, Fitch, and S&P sovereign default studies. The size of bubbles reflects the relative change in local currency five-year government yields. Sovereigns in red are those downgraded by at least one-notch, yellow are those downgraded by at least one rating agency without changes to the average rating, and green are sovereign upgraded by at least one notch. For Hungary, credit ratings were upgraded by one agency and downgraded by another agency during the period. Average rating changes are from the past three years. Average maturity of local currency government debt in panel 4 is a simple average of 14 major sovereigns with all data as of March 28, 2024. Ex post real yields in panel 5 are local currency government financing rates and trailing 12-month inflation rate. Implied government financing rates in panel 6 are proxied by five year local currency government yields. Ex ante estimates consider consensus 5-year estimates of real economic growth and inflation, while projected refinancing rates are reflected by the local 5y5y forward, adjusted for differences in term premiums as of December 31, 2023. Data labels in the figure use International Organization for Standardization (ISO) country codes. CDS = credit default swap; CEEMA = Central and Eastern Europe, Middle East, and Africa; EM = emerging market; GFSR = *Global Financial Stability Report*; HC = hard currency; LatAm = Latin America.

Figure 1.18, panel 6).[17] Without fiscal consolidation, more sovereigns will find it difficult to service debt, see their fiscal buffers dwindle, and face even higher sovereign interest rates. A "debt begets more debt" vulnerability may therefore be building, particularly in a high-for-longer interest rate environment.

Frontier Economies and Low-Income Countries Still Face Debt Challenges

Financing conditions for frontier and low-income countries have improved as lower secondary market yields—a combination of reduced spreads and the decline in Treasury yields—have made issuance more affordable. High risk-free interest rates combined with investors' cautiousness about riskier sovereign bonds had depressed demand for debt from these countries. In contrast with the significant issuance from frontier economies in the years immediately preceding rate hike cycles of major central banks, issuance was minimal throughout 2022 and 2023. Net issuance—gross issuance minus maturing bonds—has essentially been zero over the past year (Figure 1.19, panel 1). Yields on bonds from these countries remain much higher than those that prevailed before the current advanced economy hiking cycle, but they have fallen markedly in recent months. In the first quarter of 2024, several frontier economies have taken advantage of the improved market conditions to issue new debt or roll over upcoming maturities.

Even though the backdrop for frontier economies and low-income countries is not favorable, the spread these issuers need to pay has narrowed in recent months. High-yield sovereigns—consisting of frontier economies and low-income countries—have outperformed investment-grade sovereigns in recent months after reaching historically high levels in 2023, largely driven by easier global financial conditions. Progress in certain restructuring cases has also served as a tailwind. In late 2023, Zambia negotiated a deal with its international bondholders but was set back by the lack of agreement with other creditors. Earlier in 2024, Ghana reached a deal with its official creditors, paving the way for the sovereign to come to terms with bondholders.

[17]Refinancing rates are reflected by the local currency 5y5y forward, adjusted for differences in term premiums as of December 31, 2023. Consensus analysts' growth and inflation expectations over the next 5 to 10 years are used, except for South Africa, where the short-term (2025) estimates are used because of a lack of data.

This improvement in financing, if sustained, is occurring at a critical time, with a substantial amount of hard currency bonds maturing in coming quarters. Frontier issuers were able to sell significant amounts of bonds from 2017–21, but most of that debt was relatively short-dated, with about half of the debt issued during that time having 10 or fewer years' initial maturity. Frontier issuers have a combined $30 billion in foreign currency bonds coming due in 2024 and 2025 (Figure 1.19, panel 2), about the same amount as aggregate debt that matured in the entire five-year period from 2019 to 2023. This is partly a result of fiscal responses to the pandemic, which ballooned total debt for frontier economies and low-income countries (Figure 1.19, panel 3). Even if markets will be receptive to rolling over these maturities, it is likely to be at much higher coupons than the debt they are replacing, placing a further fiscal burden on these countries in the coming years. The interest rate burden for these countries is already high by historical standards, as they have increasingly borrowed on commercial rather than concessional terms in recent years (see Chapter 1 of April 2024 *Fiscal Monitor*).

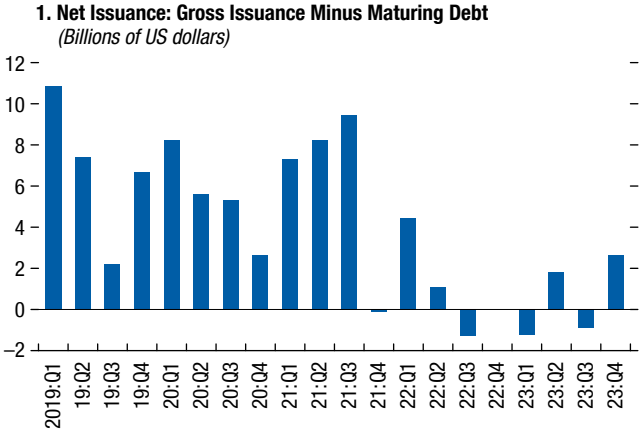
With external markets effectively closed during prior years, fiscal authorities have increasingly turned to domestic markets to obtain funding. For many low-income countries, this has meant that local banking institutions have significantly increased their holdings of sovereign debt, increasing potential risks from a sovereign bank nexus. This has been particularly true for low-income countries in Africa (Figure 1.19, panel 4). Should financing conditions tighten again, local markets in these countries could be pressured further.

Chinese Asset Prices Face a Difficult Turnaround amid Weak Sentiment

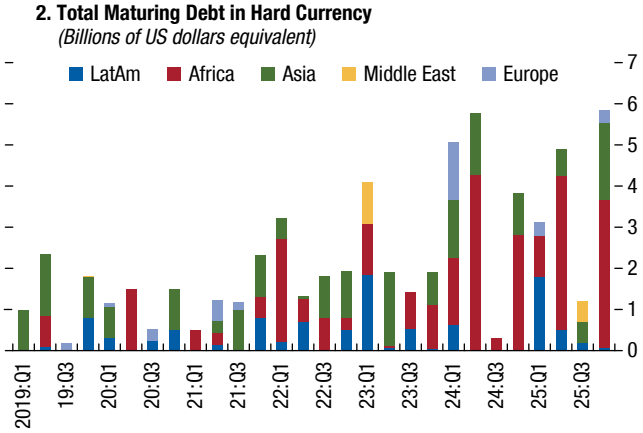
China's housing market downturn has shown few signs of bottoming out. Declines in new home prices have been moderate to date compared with major correction episodes of the past (for example, Japan in the early 1990s) (Figure 1.20, panel 1). Yet existing home prices and activity measures such as starts, sales, and investments, have dropped off sharply. The limited new home price adjustment and the extended use of forbearance measures for struggling developers have restrained negative spillovers to banks' balance sheets but have disincentivized debt restructuring crucial to a sustained recovery of the housing market.

Figure 1.19. Financing Still Challenging for Frontier and Low-Income Countries

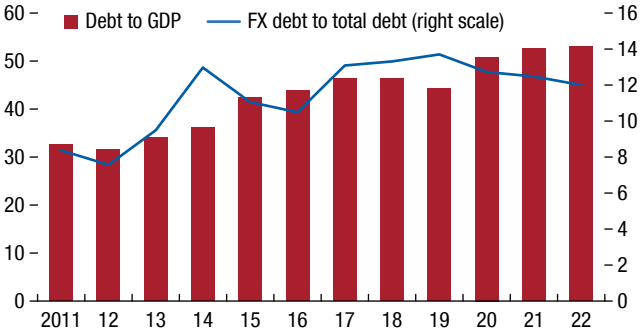
Total foreign currency issuance from frontier economies has barely kept pace with maturing bonds in recent years.



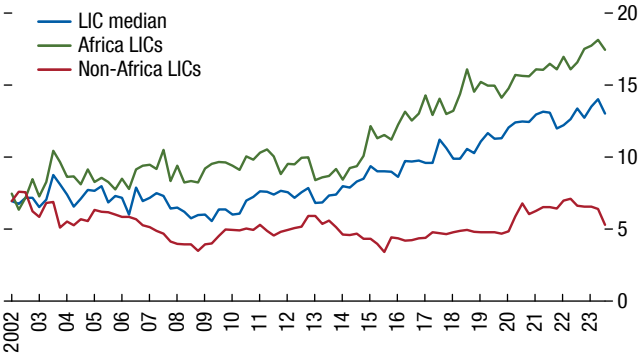
Frontier countries will have large maturities of hard currency bonds in the coming quarters.



Total debt from LICs rose sharply, with foreign currency debt comprising a smaller share of the total.



Domestic banks have been absorbing more of this sovereign debt, especially for African LICs.



Sources: Bloomberg Finance L.P.; Haver Analytics; IMF, International Financial Statistics; and IMF staff calculations.
Note: Panels 1 and 2 refer to frontier markets, which are defined here as countries with hard currency debt included in the J.P. Morgan NEXGEM (Next Generation Emerging Markets) index. The sample of countries for panels 3 and 4 are those classified as LICs by the IMF. Many LICs have never issued hard currency bonds. A list of LICs can be found at http://www.imf.org/external/pubs/ft/dsa/dsalist.pdf. FX = foreign exchange; LIC = low income country.

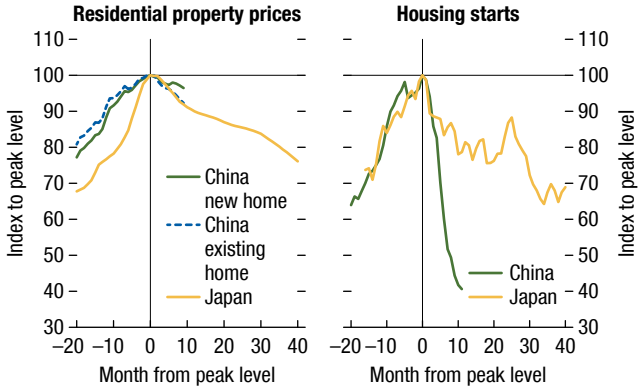
Other support policies over the past few months—including mortgage rate cuts, easing of home purchase restrictions, and promises for affordable housing and urban redevelopment—have had limited success in restoring homebuyer confidence.

As negative factors continue to dominate, financing conditions for the property sector remain tight in terms of both banks and market-based financing (Figure 1.20, panel 2), despite repeated official policy guidance for the financial sector to support the housing market. A large decline in presale revenues adds further challenges and may have prevented some construction projects from being completed. This has in turn depressed land-sale proceeds to local governments at a time when their off-balance sheet borrowing entities, local government financing vehicles (LGFVs), are due for large debt repayments over the next two years (Figure 1.20, panel 3). High debt-to-earnings ratios put most LGFVs' commercial viability in question, with those in financially weaker provinces also facing high financing costs (Figure 1.20, panel 4).

Figure 1.20. Property Market and LGFV Problems Have Not Improved

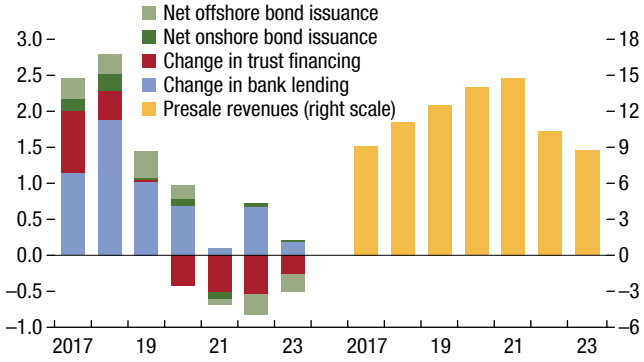
China's housing market correction continues.

1. China versus Japan's 1990s Housing Market Corrections



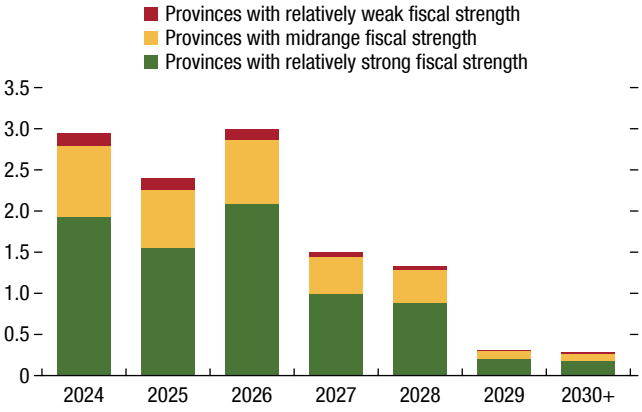
Property developers' financing conditions remain tight, with their funding from the financial system unable to offset the decline in presale revenues.

2. Property Developers: Sources of Financing
(Billions of renminbi)



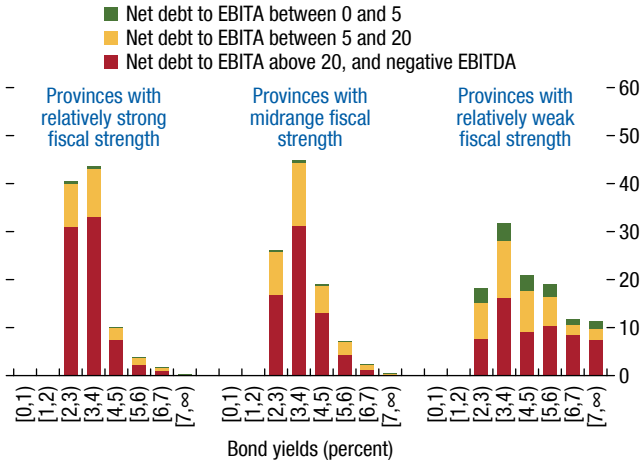
Despite policy support to ease short-term refinancing risks, debt-repayment pressure remains high for LGFVs.

3. Local Government Financing Vehicles: Bond Maturity Schedule
(Trillions of renminbi)



LGFV from fiscally weak regions continue to face higher funding costs due to market perception of weaker government support.

4. Local Government Financing Vehicles: Bond Yields, by Provincial Fiscal Strength
(Percent of outstanding bonds in each group of provinces)



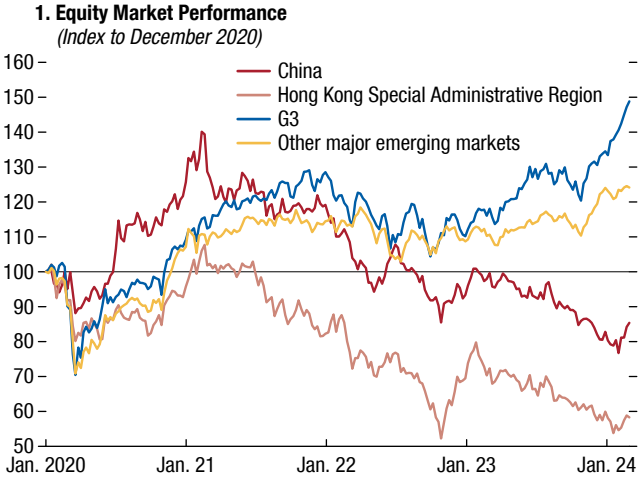
Sources: Bloomberg Finance L.P.; CEIC; WIND; and IMF staff estimates.
Note: In panel 1, China residential price is based on the average of primary and secondary market price index from National Bureau of Statistics. Japan housing start is based on building construction started in square meters. In panels 3 and 4, the ranking of public finance conditions is based on local governments' general budget deficit and official debt. EBITA = earnings before interest, taxes, and amortization; LGFV = local government financing vehicle.

Reflecting property market ailment as well as disinflationary pressures, China's stock market has come under pressure in recent months. Despite the recent rebound, Chinese and Hong Kong SAR stock prices declined as much as 11 and 14 percent, respectively, since the October 2023 *Global Financial Stability Report*, in sharp contrast with the strong rally in global markets (Figure 1.21, panel 1). Concerningly, investors are not yet ready to "buy the bottom" despite a 45 percent decline since the peak in 2021 and a multiyear low valuation as measured by the forward-price-to-earnings ratio. This reflects investor disappointment about macro policy support, uncertainty in the property market outlook, and rising geopolitical risks. Sentiment remains fragile despite the authorities' measures to stabilize the markets since the third quarter of 2023.

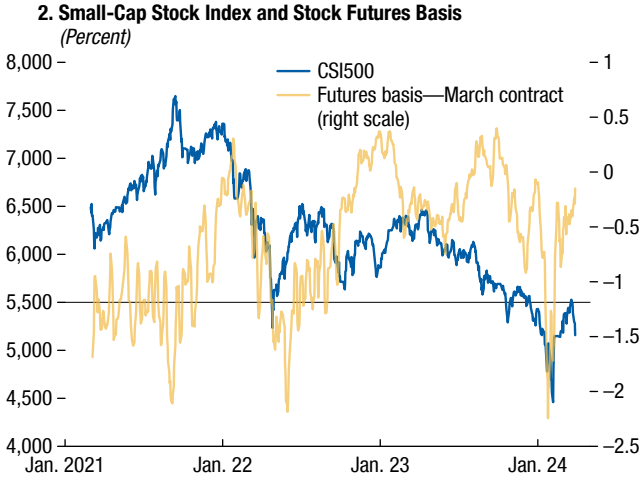
The stock sell-off may have also been exacerbated by derivative products. The "snowball product" is a structured deposit product with embedded derivatives

Figure 1.21. Chinese Stock Markets under Pressure

Intensified pressure continues on concerns of slowing growth outlook and deflation risks.



A collapse in the futures basis may reflect the unwinding of snowball options.



Sources: Bloomberg Finance L.P.; and IMF staff calculations.
Note: CSI = Chinese Securities Index; G3 = Group of Three.

that offers high-net-worth investors bond-like coupons if the small cap China Securities Index (CSI) indices stay within a predetermined range, with options to use leverage to boost returns. If stock prices fall below that range, investors lose the coupon payment, and leveraged investors could face margin calls. Banks and security firms that sell these products—estimated at US$45 billion outstanding—effectively have short positions on stocks, which they hedge by buying stock futures. As small cap CSI indices fell precipitously, partly because of to lower liquidity, many leveraged investors failed to meet the margin calls, forcing the sellers to liquidate the products while unwinding their futures hedges, which in turn widens the stock-futures basis and further feeds into selling pressures (Figure 1.21, panel 2). Related products have also been marketed to offshore investors, such as the equity-linked investments popular in Korea and are, like options on the Hang Seng China Enterprise Index, leading to spillovers from Chinese to regional markets.[18]

Asset Managers at Chinese Nonbanks Are Hit by Property Sector and Stock Market Woes

The property market and equity fallout have created heavy losses in parts of China's large asset management industry. As of 2023, total assets under management across various products was ¥110 trillion or nearly 90 percent of GDP (Figure 1.22, panel 1). The 45 percent decline in the equity market since 2021 has reduced the net asset value of equity and hybrid mutual funds by over 20 percent, reflecting both valuation losses and redemptions. In addition, many trust products have experienced large losses over the past three years, resulting in widespread defaults of real-estate-focused trust products. That said, trust products are not allowed to use leverage, therefore, their financial spillovers have been limited, and their investor base consists mostly of institutions and high-net-worth individuals.

Unlike trust funds, wealth management products and investment funds focused on public sector debt could pose greater financial stability risks. Their combined size is three times as large as trust funds. Their large fixed-income exposures consist almost entirely of credit bonds,[19] making them more vulnerable to credit risks and rollover risks in a corporate bond market for which the average maturity is only three years. Previous IMF staff analysis showed that LGFV and property bonds may account for a sizable share

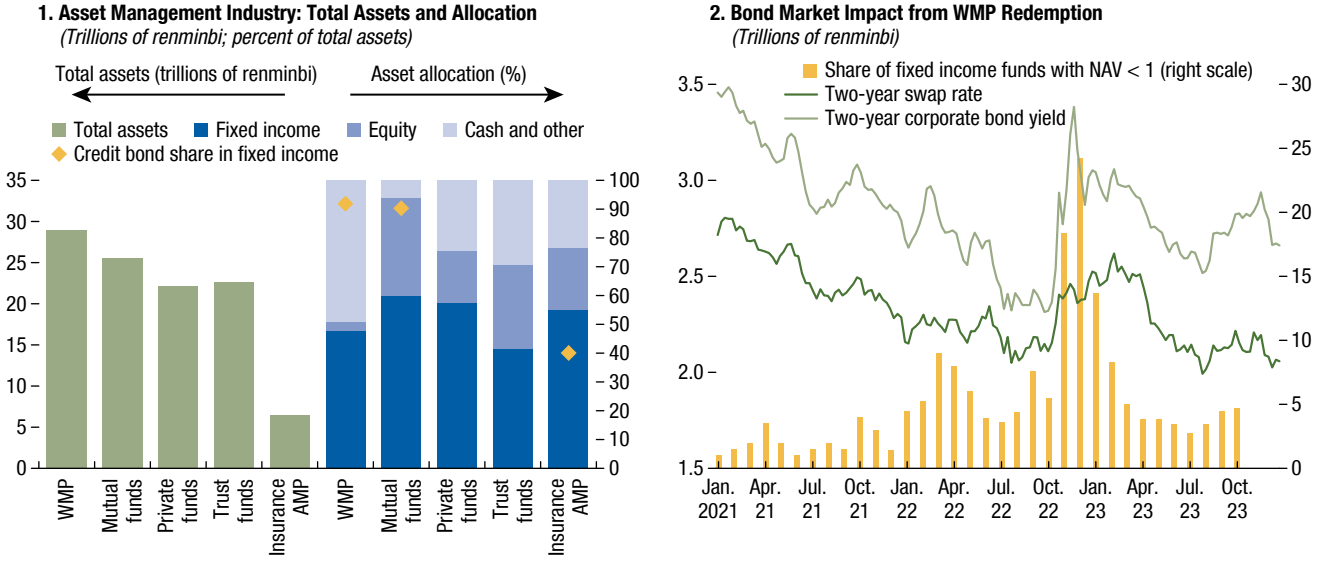
[18]There is an estimated $20 billion of equity-linked investments in Korean markets.

[19]Most Chinese corporate bonds are rated AA and above, as state-owned enterprises are the primary issuers. The domestic rating is not comparable to international standards, as domestic rating agencies place considerable weight on the perceived strength of implicit guarantees and the domestic ratings tend to be static. There is also limited risk differentiation except for those bonds rated below AA, even though those issuers are mainly not state owned.

Figure 1.22. The Chinese Asset Management Industry Is Large and Exposed to Risks

Asset management industry have high exposures to credit risks.

A credit shock could generate a negative feedback loop between losses and redemptions and spillover to broader funding market.



Sources: AMAC; Bloomberg Finance L.P.; China Trustee Association; China Wealth; and Insurance Asset Management Association of China.
Note: NAV = net asset value; WMP = wealth management product.

of the credit bond holdings of wealth management products, as they constitute about 25 percent of total assets under management for wealth management products and credit mutual funds (see the April 2023 *Global Financial Stability Report*). Moreover, the investor base is more retail focused and thus prone to run risks. For example, wealth management products are held almost exclusively by retail investors who are also bank depositors and lack experience handling investment volatility. The perils of these features were on full display in late 2022, when a spike in bond yields led to large-scale redemptions by retail investors who feared wealth management product losses, inducing further spikes in bond yields that spilled over to broader funding markets (Figure 1.22, panel 2). Large liquidity injections into the interbank market by the People's Bank of China stabilized redemptions and funding rates.

It is of concern that spillovers from asset management products may be higher now, given rising interconnectedness and higher financial leverage in the bond markets. Both interbank lending and lending between banks and nonbank financial institutions have increased notably in recent years. Financial leverage in the interbank market, as proxied by repo transaction volume, has also risen sharply recently.[20] Shocks emanating from wealth management products and mutual funds could quickly spread to banks through tightening financial conditions in the credit and funding markets, with those that have higher wholesale funding exposures, such as the small and medium-sized banks, being more vulnerable.

Global Corporate Default Risk Might Be Underpriced by Markets

Since the October 2023 *Global Financial Stability Report*, global corporate earnings projections have been bolstered by prospects of a likely soft landing and expectations of monetary easing, reversing the downward trend in earlier quarters (Figure 1.23, panel 1). At a sectoral level, interest rate sensitive sectors such as the consumer discretionary showed the

[20]Financial institutions have increased investment in the repo market, particularly the overnight repo. The repo rate remains below the policy rate, likely reflecting that the liquidity injected by the People's Bank of China through structural credit facilities has not been met by loan demand (the M1–M2 gap).

largest narrowing in credit spreads in accordance with gains in stock prices. Although equity prices in the energy sector underperformed due to lower oil prices, credit spreads still contracted as investors' assessment of the sector's creditworthiness was boosted by lower global interest rates (Figure 1.23, panel 2).

Spreads have narrowed even in riskier segments, owing partly to credit substitution. The proportion of CCC- or lower-rated firms in the speculative-grade corporate bond index was halved over the past decade (Figure 1.23, panel 3), as some firms that faced constraints in accessing bond markets issued other forms of debt, including private credit (Bank of England 2023a; April 2024 *Global Financial Stability Report*, Chapter 2). The departure of riskier firms has meaningfully improved the credit quality of the index.

But market pricing may not reflect true corporate credit risk, considering that credit substitution, reduced issuance, and strong inflows (for example, via open-end funds; see the section "Liquidity Mismatch at Open-End Investment Funds Is Rising") may have suppressed bond spreads. In actuality, the rise in corporate earnings since 2020 is losing momentum in most parts of the world (Figure 1.23, panel 4), and remains sensitive to economic growth and inflation developments as well as the transmission of monetary policy tightening. Reflecting these headwinds, corporate spread models such as the excess bond premium (Figure 1.23, panel 5) and IMF staff's cross-country corporate bond misalignment model (Figure 1.23, panel 6) suggest that corporate spread valuations are stretched and could face sharp upward adjustment should a soft landing not materialize. In the case of high-yield bonds, misalignments relative to the levels implied by fundamentals are severe for both US and euro area issuers by historical standards.

More Firms May Become Vulnerable in the Medium Term

Increasing evidence has shown that cash liquidity buffers for firms in both advanced economies and emerging markets eroded further over the course of 2023 (Figure 1.24, panel 1; see also the October 2023 *Global Financial Stability Report*), owing to still-high global interest rates. As of the third quarter of 2023, the share of small firms with a cash-to-interest expense ratio below 1 was around 33 percent in advanced economies and 55 percent in emerging markets. If interest expense rises in line with current market yields, these shares would rise to 38 percent and 59 percent, respectively, pushing more firms into liquidity problems. Corporate bankruptcies have therefore steadily increased in the euro area, Japan,[21] and the United States, led by smaller firms, amid policy support measures being scaled back (Figure 1.24, panel 2). Over the medium term, slowing economic growth in many parts of the world would also likely heighten corporate debt vulnerability.

Before global rate hikes, corporate issuers were able to reduce interest expenses by refinancing. However, a considerable amount of corporate debt will mature in the coming year across countries at interest rates significantly higher than existing coupon rates (Figure 1.24, panel 3), making refinancing challenging. Recent trends in credit ratings have reflected these concerns: net rating upgrades among investment-grade firms have fallen sharply on a market-cap-weighted basis, suggesting that credit quality is deteriorating even for large issuers (Figure 1.24, panel 4). Borderline corporates, or firms just above speculative grade, are at risk of becoming "fallen angels." Scenario analysis of US BBB-rated firms shows that even under a soft-landing scenario, by 2025, the probability of default will be higher for some firms, posing higher downgrade risks (Figure 1.24, panel 5).[22] Many institutional investors with investment mandates focused on capital preservation may then be tempted to dump potential fallen angels, creating holes in these companies' funding profiles. It is concerning that even though the credit downturn has deepened, global private nonfinancial corporate credit growth is recovering rather quickly in this hiking cycle compared with previous ones, including the cycle before the global financial crisis (Figure 1.24, panel 6).[23]

[21]In Japan, the recent rise in bankruptcies is not broad based but largely confined to specific sectors (for example, food services and retail, for which bankruptcies were subdued during the pandemic, possibly because of policy support measures).

[22]US BBB-rated firms include BBB+, BBB, and BBB– issuers rated by S&P.

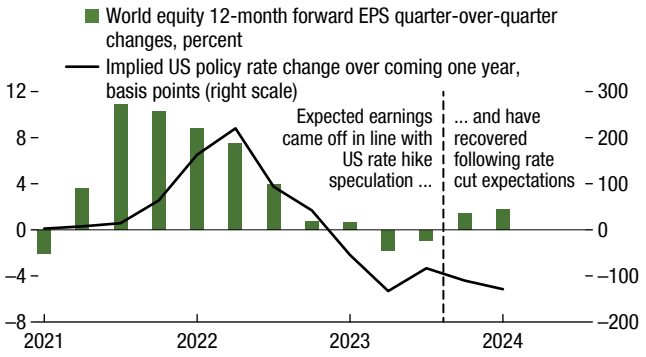
[23]Negative credit growth during hiking cycles is a result of both a slowdown in originating new debt and a decline in the market value of existing debt (especially debt securities such as bonds) because of higher interest rates. The latter driver may lead to the large negative credit growth at the onset of this rate hike cycle, given how quickly global interest rates have moved up.

Figure 1.23. Corporate Earnings

The growing expectations for the Federal Reserve's dovish pivot and soft landing of the economy boosted expected earnings.

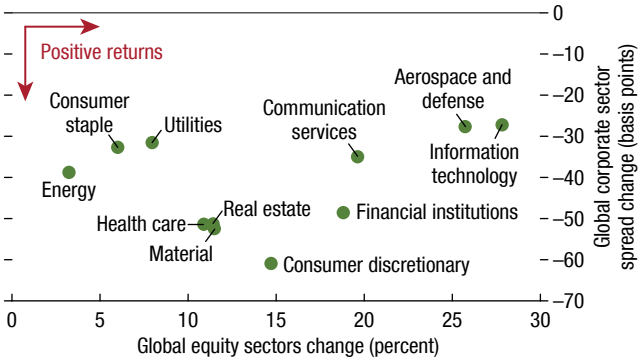
1. Global 12-Month-Forward Earnings per Share and US Policy Rate Expectations

(Percent change, quarter over quarter)



Rate-sensitive and war-related industries outperformed since the Federal Reserve's dovish pivot amid heightened geopolitical tensions.

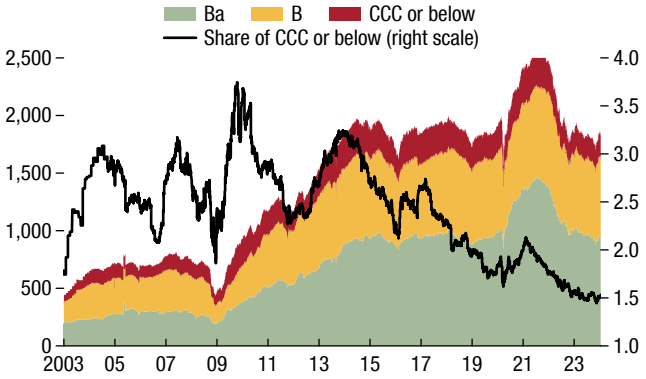
2. Global Equities and Corporate Bonds Performance since the October 2023 GFSR



The share of CCC or lower-rated corporate bonds halved over the last decade, improving the average credit quality of the universe, as private debts substitute a part of them.

3. Global Speculative Grade Corporate Bond Market

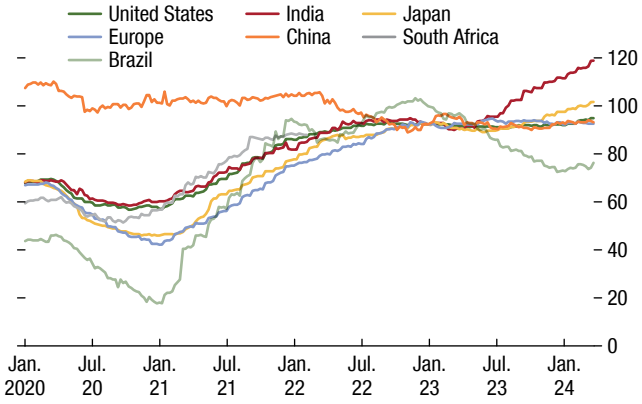
(Billions of US dollars, percent)



The upward trend in corporate profitability since the 2020 is now losing momentum.

4. Global 12-Month-Trail Earnings per Share Ratios

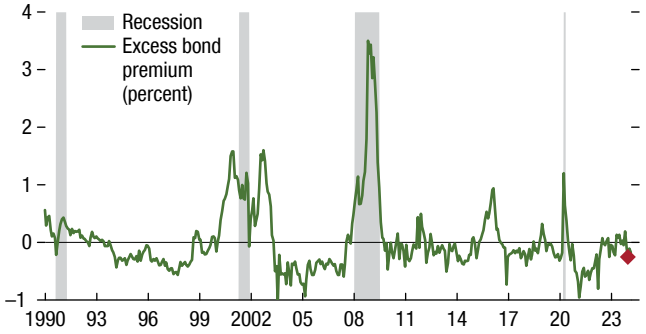
(Indices, January 2023 = 100)



Excess bond premium historically widens significantly in recessions.

5. US Excess Bond Premium

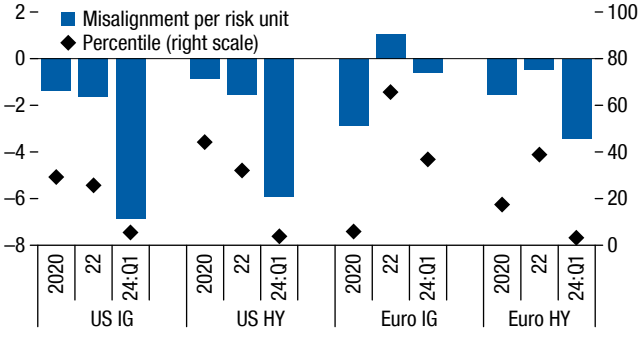
(Percentage points)



US corporate bond spreads are narrower than model values based on macro fundamentals.

6. Corporate Bond Spread Misalignments

(Deviation from fair value per unit of risk, quarterly averages, left scale; percentile, right scale)

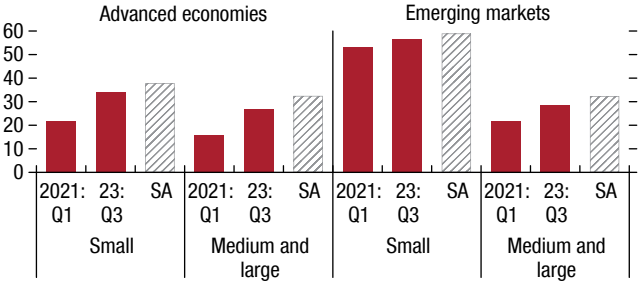


Sources: Bloomberg Finance L.P.; Federal Reserve Board; Haver Analytics; Refinitiv DataStream; and IMF staff calculations.
Note: In panel 2, corporate sector spreads are based on Bloomberg Global Aggregate Corporate Bond Index. Real estate sector spread is proxied by Global Aggregate Securitization REIT Index spread. EPS = earnings per share; GFSR = *Global Financial Stability Report*; HY = high yield; IG = investment grade.

Figure 1.24. Weaker Tail Corporate Borrowers

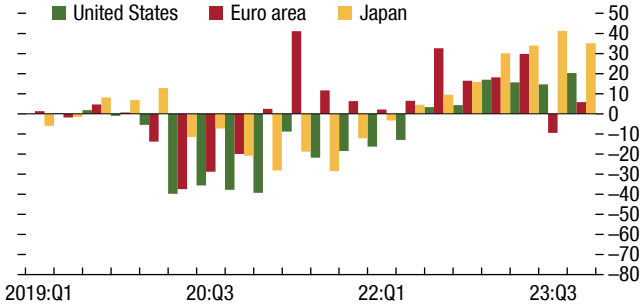
Nearly 40 percent and 60 percent of small firms in AEs and EMs, respectively, do not have sufficient cash balances to cover their annual interest expenses if interest expenses increase to levels equivalent to current market yields.

1. Cash Liquidity Buffers at Risk
(Percent, share of debts issued by firms with cash-to-interest expense ratio below 1)



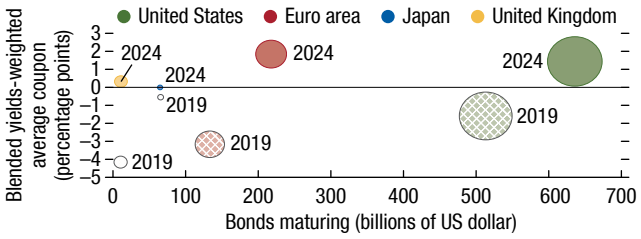
The rise in bankruptcies indicates that smaller businesses face difficulties, although it remains at a moderate level.

2. Corporate Bankruptcy Growth Rate
(Percent, four quarter change)



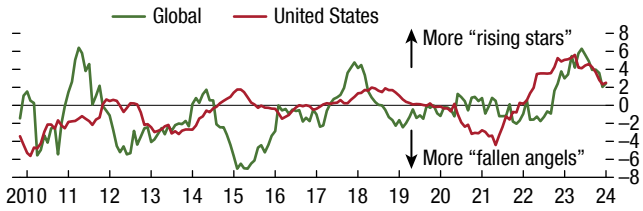
Maturing debts for the coming year are larger than as of 2019, prepandemic period, and refinancing costs are higher globally

3. Additional Cost of Refinancing versus Maturing Corporate Bonds for the Year
(Percentage points; billions of US dollars)



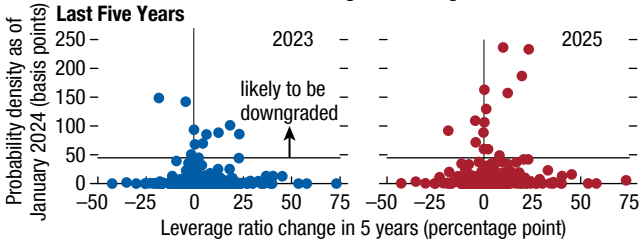
Credit cycle peaked even for larger and stronger corporates, as the "fallen angels" debts have been increasing more than "rising stars."

4. Investment Grade Corporates Credit Cycle Index
(Percentage points)



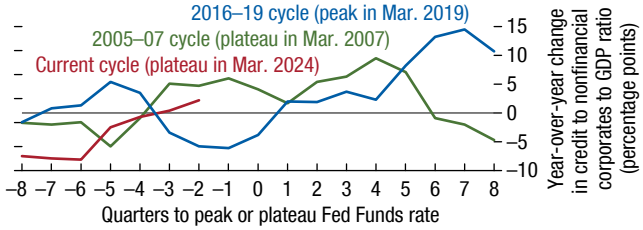
Credit fundamentals of US BBB corporates will likely deteriorate marginally even under soft-landing scenario.

5. Projected Probability of Default of US BBB Firms under the SEP Median Scenario versus Change in Leverage Ratio over Last Five Years



Non-financial corporate credit growth is recovering in this hiking cycle rather quickly than previous episodes, fostering medium-term vulnerability.

6. Global Non-financial Corporate Credit to GDP
(Percentage point change, year over year)



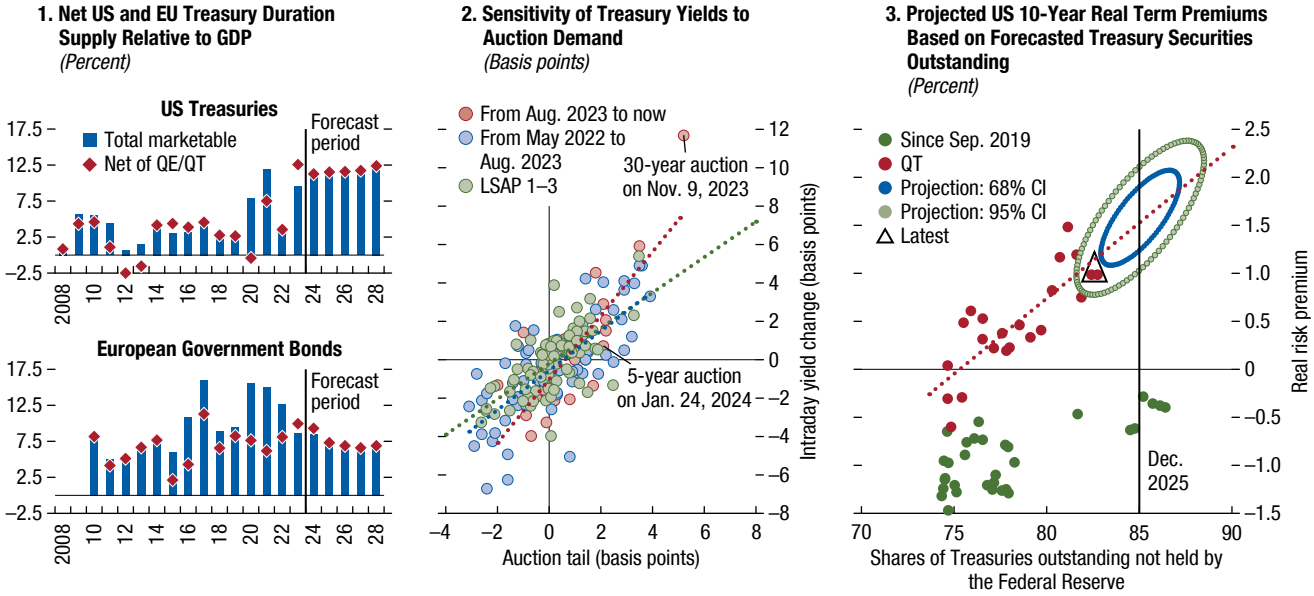
Sources: Bank of America; Bank of International Settlement; Bloomberg Finance L.P.; Credit Research Initiative Team of the National University of Singapore, Dealogic; Federal Reserve Board; Haver Analytics; S&P Capital IQ; and IMF staff calculations.
Note: In panel 1, a lower cash-to-interest-expense ratio implies smaller buffers. "SA" refers to scenario analysis and the corresponding bars display the share of debts issued by firms with cash-to-interest-expense ratio below one under the scenario where interest expense increases to the levels equivalent to the current market yields. The sample consists of 15 advanced economies, including Czech Republic, and 14 emerging markets and developing economies including Korea. In panel 2, US bankruptcies are counted as the sum of Chapters 7 and 11. US small businesses are proxied by Chapter 13 bankruptcies. In panel 3, the currency of denomination is used as a proxy for the respective regions under the assumption that debt is largely issued in the domestic currency. The size of bubbles displays the total market value of indices for each currency. "Blended yields" are the average yield of both investment and speculative grade corporate bonds based on Bloomberg Bond Indices. Panel 4 shows the gap between total versus credit spread (proxy) returns, calculated each month by subtracting from the total return the monthly change in the corporate yield multiplied by duration plus the monthly coupon return, based on Panigirtzoglou (2023). If a corporate bond gets downgraded or defaults, it drops out of the index at a loss. This loss would be reflected in the actual return of the index, but the bond index's yield change would not capture it. The index is 12-month moving average of the spread and annualized. In panel 5, the simulation is based on J.C. Duan, W. Miao, J.A. Chan-Lau, and The Credit Research Initiative Team of the National University of Singapore, 2022. BuDA: A Bottom-Up Default Analysis Framework, version 3.5.1. The scenario for the projection is based on the median of real GDP, unemployment rate, personal consumption expenditures inflation, and Federal funds rate of economic projections of Federal Reserve Board members and Federal Reserve Bank presidents, under their individual assumptions of projected appropriate monetary policy as of December 2023. Extreme values, above 95th percentile, were trimmed from the results of the simulation. Panel 6 displays four quarter changes of global private nonfinancial corporations' credit-to-GDP ratio that consist of 11 advanced economies for the 2005–07 cycle, and 31 global economies for other cycles. AE = advanced economy; EM = emerging market; SEP = Summary of Economic Projections.

Figure 1.25. Government Bond Supply in Europe and the United States

Net supply of advanced economy bonds to remain elevated ...

... with some evidence that sensitivity of yields to auction demand has increased.

Upward pressure on real term premiums could persist as share of Treasury securities outstanding (net of Fed holding) continues to rise.



Sources: Bloomberg Finance L.P.; Federal Reserve Bank of New York; Haver Analytics; J.P. Morgan; and IMF staff calculations.
Note: Panel 1 shows net duration supply, expressed in terms of 10-year equivalent bonds net of domestic central bank purchases. Given data availability, European Government Bond net issuance estimates start in 2010. Forecasts reflect consensus expectations for bond issuance and domestic central bank purchases. Panel 2 captures intraday yield changes within a narrow event window, spanning five minutes before the start of the Treasury bond auction, to five minutes after. Panel 3 relates the US 10-year real term premium to the share of Treasuries outstanding, net of Federal Reserve holdings, both historical and forecasted. Projections of the real risk premium are obtained using parametric bootstrap techniques and considering a range of forecasts for Federal Reserve holdings by year-end 2025, as shown in the latest Primary Dealer Survey. The ellipses shown delineate the 68 and 95 percent CIs, within which the projected real risk premium is expected to fall.
CI = confidence interval; LSAP = large-scale asset purchases; QE = quantitative easing; QT = quantitative tightening.

Advanced Economy Government Bond Supply Will Likely Remain Large

Some advanced economies will likely require heavy government bond issuances in the coming years to fund fiscal deficits (Figure 1.25, panel 1), which are projected to persist, as well as to service debt carrying higher interest rates. As investors become attuned to debt sustainability, elevated issuance will likely weigh on longer-term yields. This can be seen when comparing the auction tail—the difference between the anticipated and actual yields at the conclusion of US Treasury auctions and a price-based measure of demand–supply imbalance—with changes in secondary market yields during an auction. For example, the marked increase in US Treasury bond supply since August 2023 is associated with increased sensitivity of intraday yields to the tail (Figure 1.25, panel 2, red dots), reflecting broader market concerns that yields—especially the real risk premium component (Figure 1.25, panels 3 and 4)—would need to be higher for bonds to get sold.[24,25] As the share of outstanding Treasuries net of Federal Reserve holdings is forecast to rise further, some evidence suggests that upward pressure on real term premiums could persist (Figure 1.25, panel 3).

Although the supply of advanced economy government bonds will likely remain heavy, the buyer base has shifted in recent years. In the United States, new

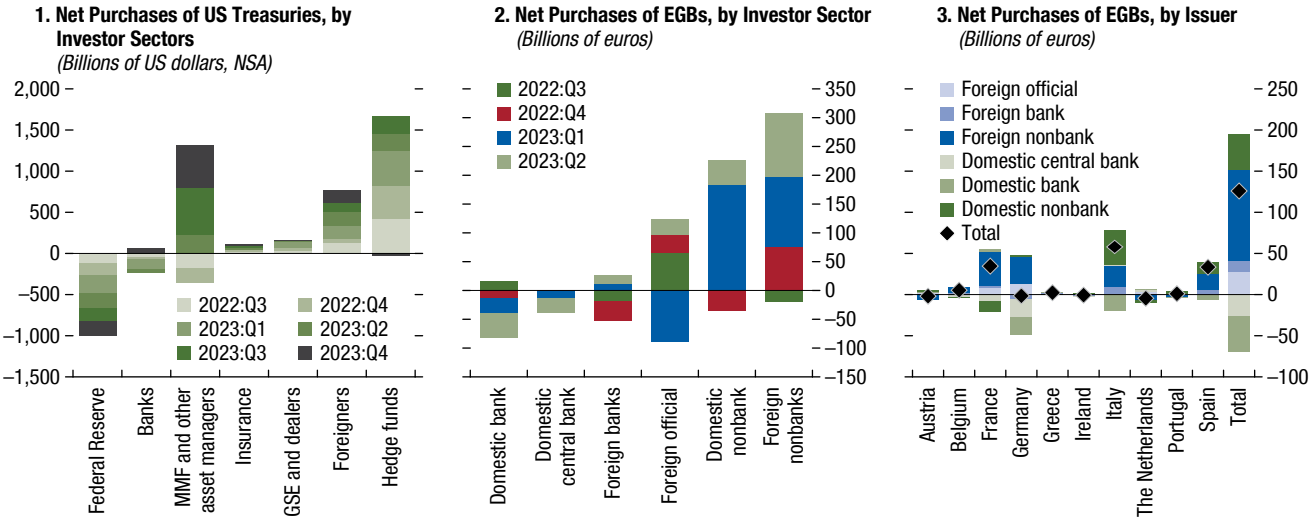
[24]In May 2023, the Treasury announced a supply of $547 billion in bonds. For August 2023, the expectation was for $593 billion, whereas the Treasury announced a supply of $601 billion (all in in terms of 10-year equivalents).

[25]In response, primary dealers, as part of their obligation to act as intermediaries in the Treasury market, filled the void. This proved a valuable backstop, containing further spillover into secondary markets. However, primary dealers' constrained balance sheet intermediation capacity suggests a potential challenge in serving as a resilient backstop in the future.

Figure 1.26. Demand Base for Longer-Term Bonds

Hedge funds have become marginal buyers of Treasuries since the start of latest round of QT in the United States.

In Europe, the foreign nonbank sector was the largest marginal buyer of European government bonds, albeit with considerable heterogeneity across issuer countries.



Sources: Federal Reserve Board; Arslanalp and Tsuda 2012; and IMF staff calculations.
Note: Sovereign bond holdings of domestic hedge funds are included residually in the household category of the flow of funds and investor holdings. Panels 2 and 3 reflect data until 2023:Q2 (latest available). EGB = European government bond; GSE = government-sponsored enterprise; MMF = money market fund; NSA = not seasonally adjusted.

net issuances of Treasury securities are increasingly absorbed by the nonbank sector (that is, households and hedge funds); by contrast, banks have been net sellers (Figure 1.26, panel 1). Similar trends are evident in European countries, where government bond issuance—especially issuance from core euro area countries such as France and Germany—is increasingly purchased by nonbanks such as households, asset managers, and the foreign sector (Figure 1.26, panels 2 and 3). Most of those new marginal buyers of government bonds, notably hedge funds, are arguably more price sensitive and more attuned to debt sustainability than buyers in the past, such as central banks. Such a shift in ownership portends more volatility in bond markets in the medium term, potentially exerting further upward pressure on term premiums.

Quantitative Tightening Is Crucial to Bond and Funding Markets

Part of the shift in the composition of government bond buyers can be attributed to central bank quantitative tightening, which effectively lessens central banks' role as holders of government bonds. With the Bank of England, European Central Bank, and the US Federal Reserve shedding bonds at annual paces of £100 billion, approximately €300 billion, and $720 billion, respectively, the effect will not only be felt in longer-term government bond markets, but also short-term funding markets.[26]

This is because as quantitative tightening progresses, liquidity is withdrawn from the financial system and commercial banks' holdings of central bank reserves typically decline. Ongoing quantitative tightening could result in a scarcity of these reserves—used by banks for transactions, liquidity management, and fulfillment of regulatory requirements—in the banking system, forcing banks without adequate reserves to borrow from the interbank market at higher costs. A demand curve for reserves summarizes this relationship (Afonso and others 2023), with reserves over total bank assets representing the quantity dimension, and

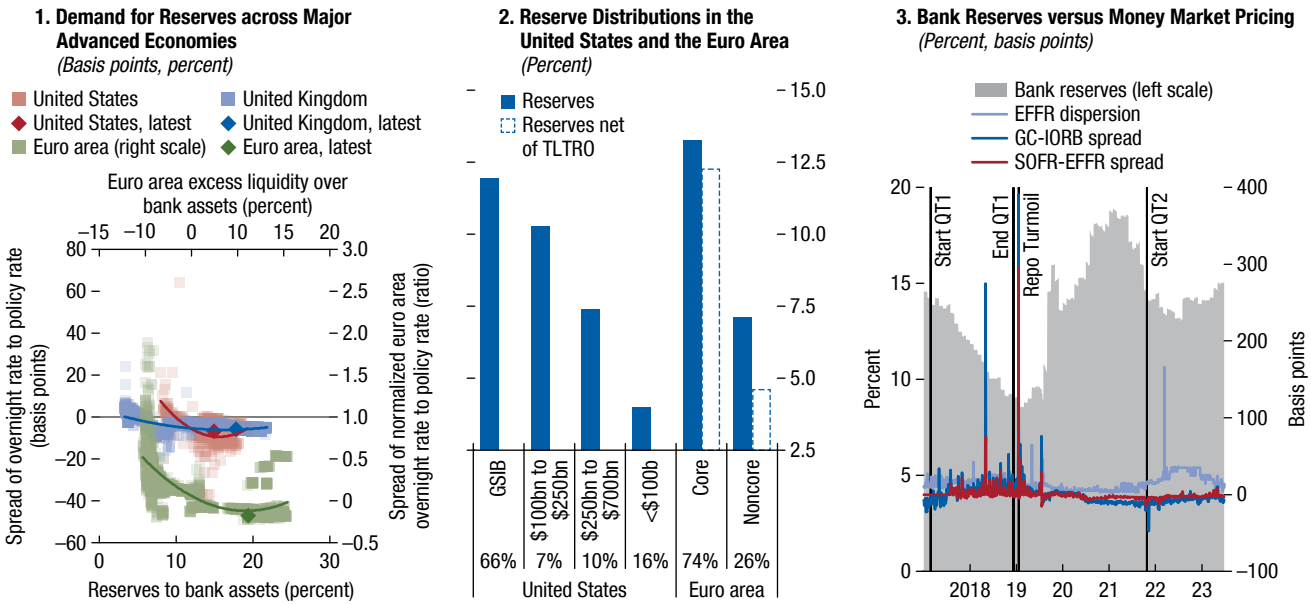
[26]The BoE announced in September 2023 a reduction of the stock of the UK government bond portfolio by £100 billion over the following year. Redemptions of the government bond portfolio in the ECB's Asset Purchase Program are estimated to reach approximately €260 billion in 2024, with another €45 billion of redemptions announced from redemptions in the Pandemic Emergency Purchase Programme of the ECB. The Federal Reserve is shrinking its Treasury holdings by $60 billion per month, but may taper quantitative tightening in the second half of 2024.

Figure 1.27. The Impact of Quantitative Tightening

Despite current abundant reserves, it is difficult to estimate when reserves may become scarce.

Heterogeneity in the distribution of reserves suggest these may become scarce sooner for some.

Developments in funding market pricing may offer signals to guide the pace and scope of QT.



Sources: Bloomberg Finance L.P.; Capital IQ; European Central Bank; Federal Reserve Board; Haver Analytics; and IMF staff calculations.
Note: Panel 2 depicts bank reserves in relation to each banking subsector's size. The percentages under each banking subsector indicate its share relative to the total banking sector. Data for the United States are derived from regulatory filings of the 500 largest banks, while data for the Euro Area is sourced from the most recent European Central Bank data, encompassing excess liquidity, TLTRO borrowings, and bank sector market capitalizations per country. Panel 3 shows bank reserves in the United States relative to the size of the banking sector. AE = advanced economy; EFFR = effective federal funds rate; GC = general collateral; GSIB = global systematically important bank; IORB = interest on reserve balances; SOFR = secured overnight financing rate; QT = quantitative tightening; TLTRO = targeted longer-term refinancing operations.

the spread between interbank funding rates and policy rates representing the price dimension (Figure 1.27, panel 1). Major central banks have committed to operate monetary policy under an *ample* reserve regime, that is, away from the steep part of this demand curve where funding rates are sensitive to reserve levels, and closer to the flatter part of the demand curve.[27,28]

Because liquidity management practices and regulatory requirements have changed over time, pinning down the shape of this demand curve and the level at which reserves become scarce is challenging in practice, creating uncertainty over the stability of funding rates. Uneven reserves across banks could also exacerbate funding constraints as quantitative tightening unfolds. For example, the reserves holdings of smaller US banks or euro area banking systems not in the core countries, which tend to hold less reserves (Figure 1.27, panel 2), could become scarce sooner. In that case, redistributing liquidity within the system becomes necessary to meet the demand for reserves by all. Experience from 2019 suggests that rate pressures can serve as price signals for strains in this process. In the US, various funding rates, including repurchase agreement or repo rates, have episodically jumped since the last *Global Financial Stability Report*, offering tentative signs that liquidity may not be ample for all (Figure 1.27, panel 3).

So far, quantitative tightening has not drained reserves on a one-for-one basis in many countries

[27]See Afonso and others (2023) and Bank of England (2023). The Board of Governors of the Federal Reserve has expressed preference toward maintaining reserves at levels "somewhat above ample" (see the minutes from the Federal Open Market Committee, January 30–31, 2024, https://www.federalreserve.gov/newsevents/pressreleases/monetary20240221a.htm).

[28]Maintaining reserves at ample levels can enhance functional market intermediation and provide more informative market prices, while the central bank balance sheet can be further wound down to allow for additional policy space in future expansions.

because other components of central bank balance sheets can also adjust, like the Fed's overnight reverse repo facility.[29] However, as quantitative tightening progresses further, these other sources of absorption will exhaust; by then, reserve levels, and by extension interbank funding costs, will be more directly affected, increasing the likelihood and magnitude of episodic funding strains. Because funding markets are crucial to the healthy functioning of the financial system—for example, providing leverage to institutions performing arbitrage trades—central banks need to provide funding backstops as quantitative tightening progresses. The pace of quantitative tightening therefore should account for its effect on funding markets to avoid excessive pricing strains.

Leveraged Positions in Treasury Markets Have Remained Large

Despite some recent unwinding, the short positions of leveraged funds in Treasury futures remain large (Figure 1.28, panel 1). There are indications that these positions are related to what is called Treasury market basis trade, which seeks to gain arbitrage profits by capturing the price difference, or basis, between futures and comparable Treasury bonds, with long positions in Treasuries financed by borrowing in repo markets (Figure 1.28, panels 1 and 2).[30] Under normal market conditions, these basis trades contribute to market liquidity and efficiency by aligning the cash and futures markets. The trade has also made the hedge fund sector a key buyer base of Treasury securities (Figure 1.28, panel 2).

However, the scale of this basis trade has also increased leverage in the financial system as volumes of repos have increased substantially over the past year (Figure 1.28, panel 3). Basis trade investors rely on low repo haircuts and low repo rates to leverage their positions and increase basis trade profitability. A spike in repo rates—triggered, for example, by surprises in quantitative tightening (see the section "Quantitative Tightening Is Crucial to Bond and Funding Markets")—can render the trade unprofitable and could trigger the forced selling of Treasury securities and a brisk unwinding of futures positions as funds seek to quickly delever. This dynamic occurred in late 2019, when a spike in the repo rates began to unwind basis trades and likely exacerbated Treasury illiquidity problems during the pandemic (Figure 1.28, panel 1, black line). Aggressive use of repo financing also makes the basis trade vulnerable to other shocks, such as upside inflationary surprises that lower the value of funds' long bond positions, amplified by leverage.

Of greater concern, a concentration of vulnerability has built up, as a handful of highly leveraged funds account for most of the short positions in Treasury futures (Figure 1.28, panel 4). Some of these funds may have become systemically important to the Treasury and repo markets, and stresses they face could affect the broader financial system.

The Banking System Is Broadly Resilient, but a Weak Tail of Banks Remains

The vast majority of banks demonstrated resilience throughout the banking sector turmoil in 2023. Strong capital and liquidity buffers and improved profitability and higher net interest margins have lifted bank stock prices across regions (Figure 1.29, panel 1). Looking ahead, however, the IMF's key risk indicators (see Chapter 2 of the October 2023 *Global Financial Stability Report*) show that a subset of banks remains vulnerable along certain dimensions. As of the fourth quarter of 2023, banks with an aggregate $33 trillion in total assets, or 19 percent of global banking assets, breached three of the five key risk indicators (Figure 1.29, panel 2). Chinese and US banks account for most of these banks. In China, capital ratios are thinning, and there are concerns about deteriorating asset quality as lower net interest margins and higher loan delinquencies

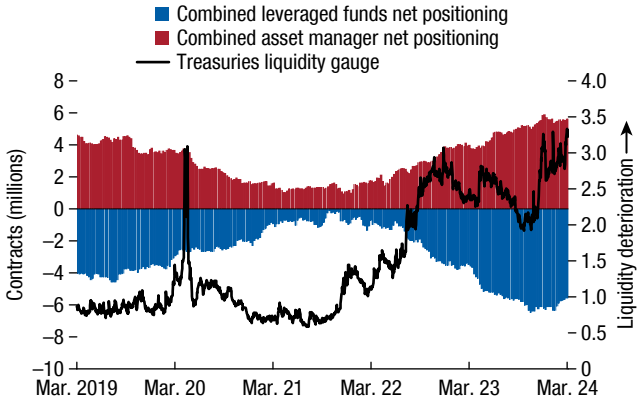
[29]In the euro area and Australia, banks repaying term liquidity provided by central bank facilities and operations was the main driver of a decline in excess liquidity. With the full repayment taking place by March 2024 in the euro area and by end of June 2024 in Australia, quantitative tightening will remain the key driver behind reserve developments, but the decline will be at a slower pace. Conversely, in the United States, reserves have grown since the Summer 2023 despite ongoing quantitative tightening, mainly because of the buffer provided by the rate for overnight reverse repurchase agreements (ON RRP), a Federal Reserve facility where money market funds can invest cash. RRP balances have declined faster than the quantitative tightening pace since June 2023, as money market funds substituted more than $1.5 trillion from the facility with alternative investments (primarily Treasury bills). Some cash released from the RRP recirculated in the system, becoming reserves and increasing the level of reserves in the system.

[30]Federal Reserve Board staff, using proprietary data sets, find that the volume of the basis trade is likely significantly lower than that implied by leveraged funds' Treasury futures positions alone, and estimate that hedge funds have increased basis trades activities by at least $317 billion since the first quarter of 2022 (see Glicoes and others 2024).

Figure 1.28. Leveraged Basis Trades

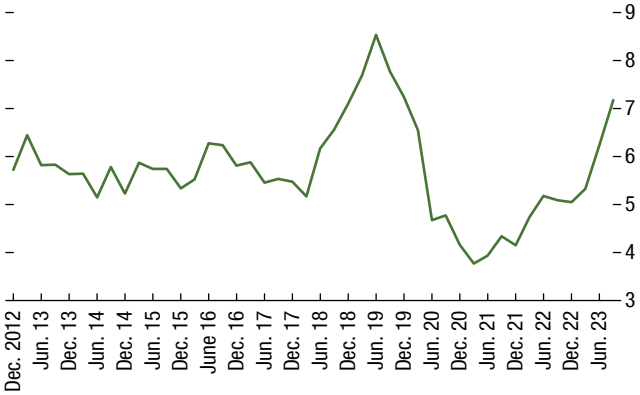
Leveraged funds continue to increase their short positions in Treasury futures, with asset managers taking the other side.

1. Leveraged Funds and Asset Managers' Future Positioning
(Contracts, millions)



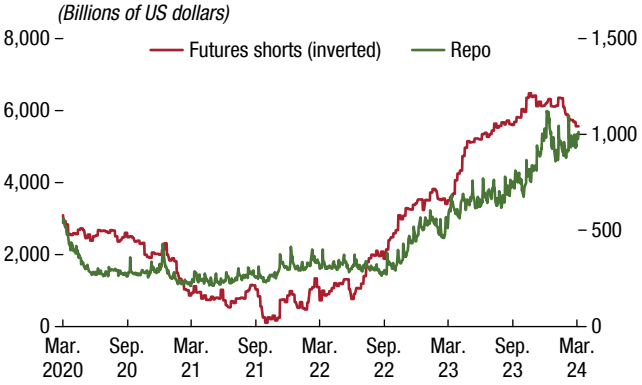
The share of Treasury bonds held by US Hedge Funds has increased in recent years.

2. US Hedge Fund Holdings of Treasury Securities (excluding Derivatives)
(Percent of Treasury outstanding)



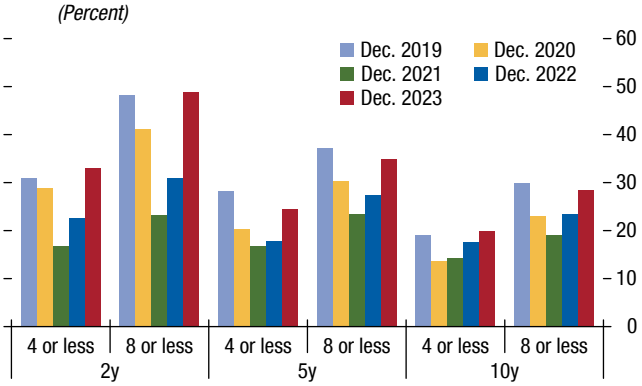
The volume of repo funding has increased considerably, in line with increased demand basis trades.

3. Repo and Futures Shorts Have Increased
(Billions of US dollars)



Concentration of leveraged funds' short positions in Treasury futures have increased with nearly half of the two-year positions held by fewer than eight traders.

4. Share of Leveraged Funds Position in Treasury Futures
(Percent)



Sources: Bloomberg Finance L.P., Commodity Futures and Trading Commission; Depository Trust and Clearing Company; and IMF staff calculations.
Note: Panel 3 plots data on sponsored repo.

are expected to take hold. In the United States, some regional banks are facing multiple pressures (Box 1.3). These include heightened competition for deposits, leading to increased funding costs, as well as rising credit costs as a result of nonperforming CRE exposures. These banks are also grappling with elevated levels of unrealized losses from their securities portfolios and decreased revenue from trading and investment banking activities.

Banks on the IMF's monitoring list based on key risk indicators (Figure 1.29, panel 3, red line) score significantly worse than banks not on the list (green line) across nearly all indicator categories, including Tier 1 capital ratio, market leverage, and returns on equity. The monitoring list trims somewhat in the first half of 2024, likely reflecting expectations of a soft landing and stable return-on-equity for non-US regional banks (Figure 1.29, panel 4).

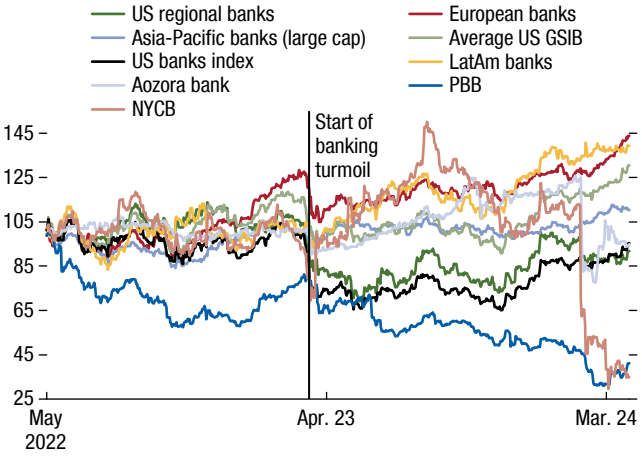
The Bank–Sovereign Nexus Has Moderated but Could Rise Again

Sovereign debt outstanding has climbed markedly in both emerging markets and advanced economies as governments have increased spending to cushion the economy from the effect of the pandemic. Absorption of this additional sovereign issuance by banks could

Figure 1.29. Banks Continue to Face Challenges in Higher for Longer Interest Rate Environment

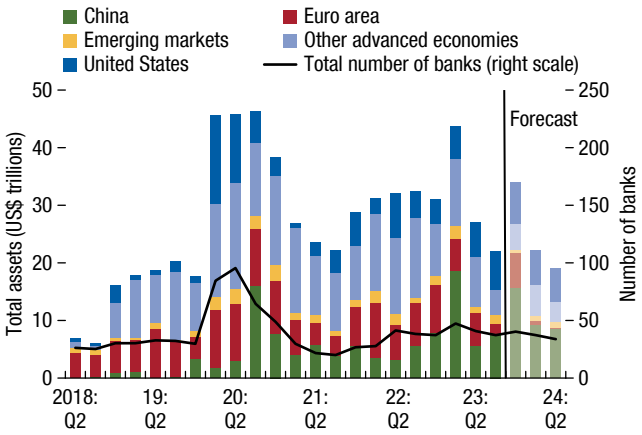
Equity performance continued to rebound from the bank stress in March 2023.

1. Selected Equity Indices
(Prices, indexed January 1, 2023 = 100)



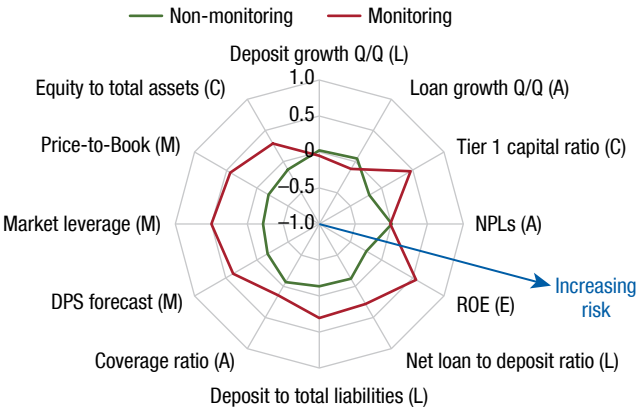
Regional distribution highlights structural weakness and profitability challenges ahead.

2. Banks Signaling a Majority of Key Risk Indicator Dimensions by Region
(Total assets, trillions of US dollars)



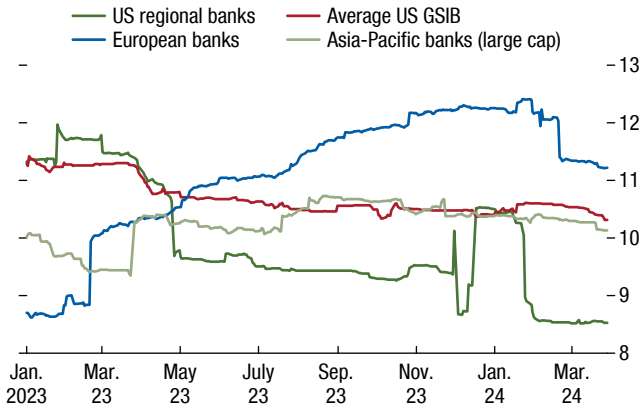
Higher market leverage and lower profitability, Tier 1 capital and price-to-book ratios are key differentiations between monitoring list and non–monitoring list banks.

3. Comparison of Monitoring List and Non–Monitoring List Banks
(Standardized values)



Return on equity forecast for US regional banks has fallen dramatically.

4. One-Year-Forward Return on Equity
(Bloomberg consensus one-year forward EPS to equity; percent)



Sources: Bloomberg Finance L.P.; Visible Alpha; and IMF staff calculations.
Note: Panel 2 data include results based on historical data from the first quarter of 2018 to the third quarter of 2023, aggregate consensus forecasts for the fourth quarter of 2023 if actual data were not available, and aggregate consensus forecast data for the first and second quarters of 2024. Values in panel 3 are standardized by *z*-scores based on aggregate consensus forecast data as of the fourth quarter of 2023; larger values along a given axis signify more risks along that characteristic. A = assets; C = capital; DPS = dividends per share; E = earnings; EPS = earnings per share; GSIB = global systemically important bank; KRI = key risk indicator; L = liquidity; M = market; NYCB = New York Community Bancorp; PBB = Deutsche Pfandbriefbank; Q/Q = quarter over quarter; ROE = return on equity. See Chapter 2 and Chapter 2 Online Annex 2.1 for definitions of KRIs in the October 2023 *Global Financial Stability Report*.

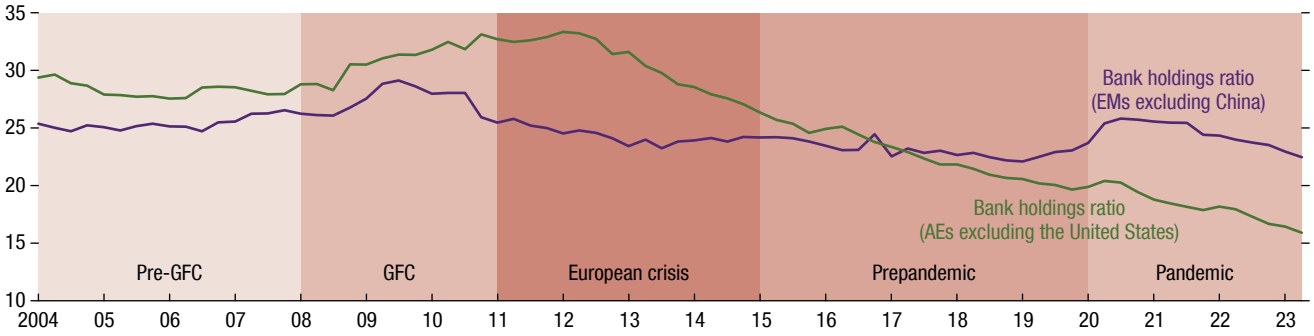
reinforce the "sovereign–bank nexus," a dynamic whereby the financial health of banks and sovereigns become intertwined, amplifying vulnerabilities in each sector. Specifically, banks whose balance sheets are saturated with sovereign bonds are susceptible to interest rate risks. Governments with already-high debt have less capacity to help ailing banks, or if they do, their borrowing costs may rise farther, forming a vicious cycle.

Taking a longer-term view, the bank-holdings-to-debt-outstanding ratio in 10 major advanced economies climbed precipitously before the global

Figure 1.30. Bank-Sovereign Nexus

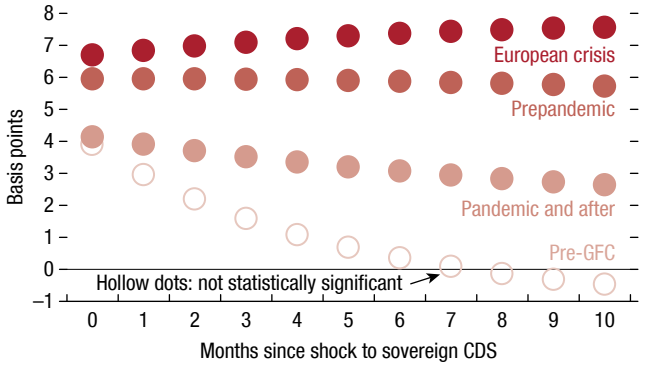
The bank share of sovereign bonds is once again on the decline.

1. Aggregate Bank Holdings-to-Debts Outstanding Ratio for 10 Major AEs and 12 Major EMs
(Percent of sovereign bond outstanding)



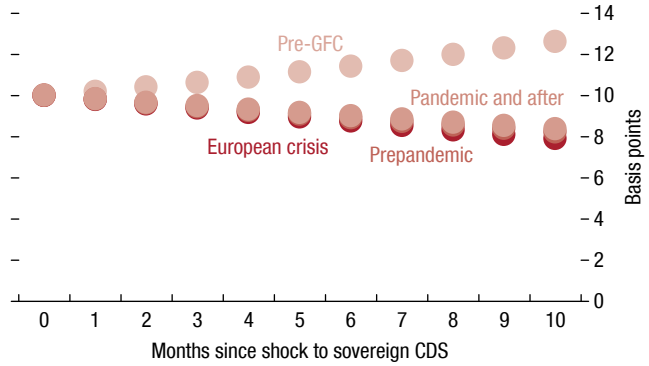
A shock to sovereign CDS spreads had large impact on bank CDS spreads in the past, more modest impact now ...

2. Response of Bank CDS Spreads to a One Standard Deviation Shock to Sovereign CDS Spreads
(Basis point change in bank CDS spreads)



... the spillback to sovereign spreads is also more modest now.

3. Response of Sovereign CDS Spreads to a One Standard Deviation Shock to Bank CDSs Spreads
(Basis point change in sovereign CDS spreads)



Sources: Arslanalp and Tsuda (2012, 2014); Bloomberg Finance L.P.; Capital IQ; and IMF staff calculations.
Note: The ten AE countries used in panels 1, 2 and 3 are Australia, Belgium, France, Germany, Italy, Japan, The Netherlands, Spain, Switzerland, the United Kingdom and the United States. Panel 2 shows the ratio of the aggregated bank holdings of sovereign debt across the ten AEs to aggregated sovereign debt outstanding. The 12 major EMs are Brazil, Chile, Colombia, Hungary, India, Indonesia, Malaysia, Mexico, the Philippines, Poland, South Africa, and Türkiye. Panels 2 and 3 show the impulse response functions to a 10-basis point sovereign spread shock from a panel VAR (1), with sovereign CDS spreads ordered before average bank CDS spreads. Fixed effects are included in the panel VAR. Within a country, CDS spreads for all Global Systemically Important Banks (GSIBs) are averaged. AE = advanced economy; CDS = credit default swap; EM = emerging market economy; GFC = global financial crisis; GSIBs = global systemically important banks; VAR = value at risk.

financial crisis until 2012—the height of the European sovereign crisis—then dropped in the middle part of the past decade before rising again at the onset of the pandemic (Figure 1.30, panel 1). Among 12 major emerging markets, the ratio was on a shallower decline until it spiked during the pandemic, but it has resumed the decline over the past three years. By this metric, the sovereign–bank nexus is now at its lowest point of the past two decades. A more holistic assessment that studies the spillovers and spillbacks between sovereign and bank risks confirms that this is the case. Using data from the same 10 major advanced economies, a panel vector autoregression that models the dynamic relationship between sovereign credit default swap (CDS) spreads and average bank CDS spreads shows that during the European crisis (2011–14), a 10-basis-point shock to sovereign spreads immediately raises average bank spreads by about 7 basis points (Figure 1.30, panel 2) with persistent effects: 10 months after the shock, bank spreads would still be about 8 basis points higher than had the shock not occurred. In the postpandemic period, however, the sovereign shock has affected banks

significantly less, raising bank CDS spreads by only 4 basis points at the outset. On the other hand, sovereign CDS-spread reactions to their own shock has been more or less the same over the past decade (Figure 1.30, panel 3). Nonetheless, it is evident that the nexus could rise quickly, as was the case during past economic downturns, and vigilant policies to lessen the nexus are needed in jurisdictions where the it poses systemic risks.

Liquidity Mismatch at Open-End Investment Funds Is Rising

Open-end investment funds often invest in less-liquid assets while allowing investors to redeem investments daily. Although these funds are integral to the financial system, they could also be viewed as a vehicle for liquidity mismatches and could amplify financial shocks. The amplification mechanism becomes stronger if (1) investment funds hold a substantial share of a given markets' assets, (2) the investment funds are subject to volatile redemption flows, and (3) the underlying market is relatively illiquid, so that any forced sales would have an outsized effect on the market (see Chapter 3 of the October 2022 *Global Financial Stability Report*). High-yield corporate bond, leveraged-loan, and emerging market hard currency bond funds stand out according to these three dimensions because these markets are relatively illiquid, and the funds have historically been subject to large peak outflows (Figure 1.31, panel 1).[31]

The liquidity mismatch at open-end bond funds is a rising concern. Government and investment-grade corporate bond funds have seen strong inflows in recent years (Figure 1.31, panel 2). With interest rates volatile and bond market liquidity low (see the October 2023 *Global Financial Stability Report*), funds could have trouble paying redeeming customers, triggering further outflow pressures.

Large fund outflows are commonly associated with periods of acute market stress, yet economic drivers can lead to large and sustained outflows. For example, in 2021 and 2022, inflation-linked bond funds initially experienced large inflows as inflationary pressures mounted but subsequently faced substantial drawdowns and peak outflows as inflationary pressures subsided (Figure 1.31, panel 2). Fund types with larger prolonged drawdowns also typically have large peak outflows (Figure 1.31, panel 3).[32]

Certain fund types have experienced significant inflows since the onset of the pandemic. Of particular note is the influx of funds dedicated to investment-grade US corporate bonds, which have received close to 70 percent of their prepandemic net asset value in inflows. This surge in inflows adds risks to the financial system, considering the potential for corporate bond liquidity to evaporate during times of stress. Fund flows are highly sensitive to changes in market sentiment and are closely correlated with the performance of the relevant asset class (Figure 1.31, panel 4). Consequently, fund flows can amplify a sell-off, and a sell-off can reinforce fund flows. This relationship is particularly pronounced in the high-yield corporate bond market compared with investment-grade corporate bonds, although it exists for both types of funds.

Policy Recommendations

The global effort to bring inflation back to target seems to have entered its last mile, as favorable supply-side developments and monetary policy tightening appear to have restrained price pressures. Yet, core inflation and wage pressures remain elevated in many economies, and substantial uncertainty remains regarding future inflation developments. Bumps along the road—most notably a stalling of the disinflationary process—may surprise investors who are increasingly convinced that the battle against inflation has been already won and that low rates will once again prevail. With economic growth and progress on disinflation differentiated across regions and countries, the stance of monetary policy should reflect country-specific circumstances. In economies still experiencing persistent inflation, central banks should not prematurely ease to avoid backpedaling later. Central banks should also push against overly optimistic investor expectations for monetary policy easing. Where progress on disinflation

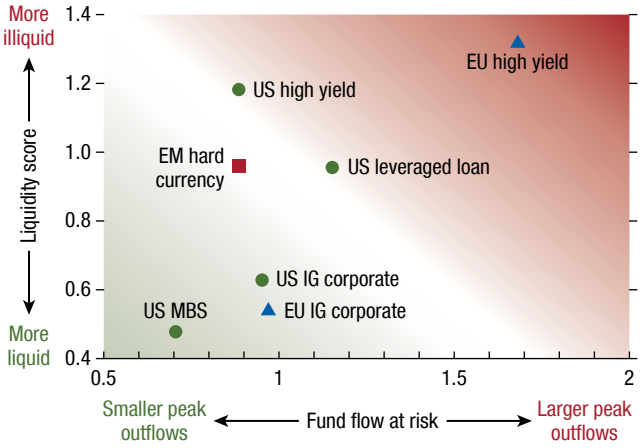
[31]High-yield corporate bond funds and emerging market bond funds also have a relatively large footprint in the underlying market, which contributes further to their potential to dislocate markets in times of stress (see Chapter 1 of the October 2023 *Global Financial Stability Report*).

[32]The 5 percent fund flow at risk was defined in Chapter 1 of the October 2023 *Global Financial Stability Report*. The value reflects that, historically, outflows surpassed this value, expressed in terms of net asset value, 5 percent of the time.

Figure 1.31. Open-Ended Funds

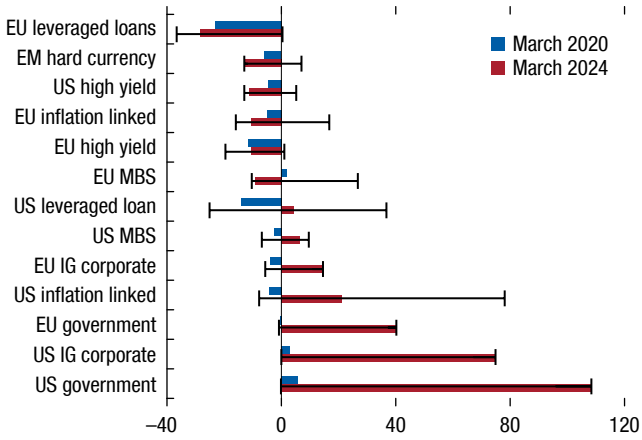
Fund flows for illiquid assets like high-yield bond, leveraged loan, and emerging market hard currency bond funds are more at risk.

1. Fund Flow at Risk and Market Liquidity
(Liquidity score, y-axis; arbitrary units, percentage, x-axis)



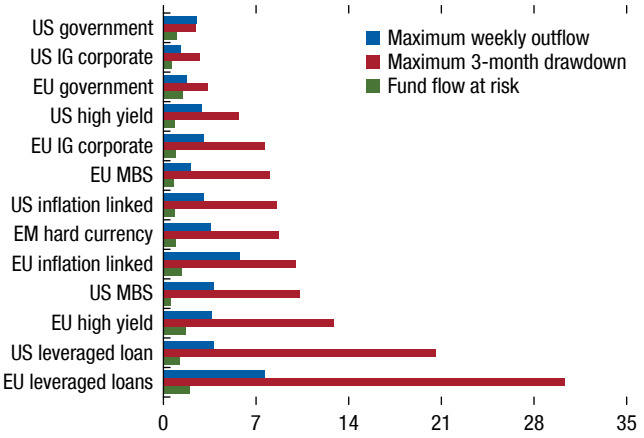
Liquidity transformation is back as some asset classes saw sizeable cumulative inflows.

2. Cumulative Fund Flows since January 2020
(Percentage of net asset value; black lines with whiskers indicate the minimum and maximum since January 2020)



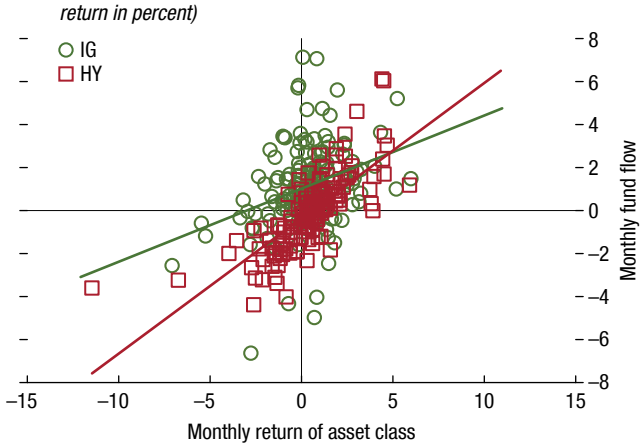
Funds with highest peak outflows typically saw most prolonged drawdowns ...

3. Peak Fund Outflows and Peak Drawdowns since January 2020
(Percentage of net asset value)



... and flows can suddenly turn around with a change in market sentiment.

4. US Corporate Bond Fund Flows and Asset Class Returns
(Fund flows as percentage of assets under management, return in percent)



Sources: Barclays; EPFR; Haver Analytics; and IMF staff calculations.
Note: Panel 1 focuses on mutual fund flows, while panels 2 and 3 reflect both mutual fund and ETF flows. Fund flow at risk reflects the 5th percentile of weekly fund flows—that is, in 5 percent of the time, fund outflows surpass the fund flow at risk. EU stands for Western Europe, following EPFR's classification. The label "US leveraged loan" links to the EPFR classification of "bank loan funds." In panel 4, asset class performance is based on the Bloomberg Barclays total return indices for US investment grade and high yield corporate bonds. IG = investment grade; HY = high yield; MBS = mortgage-backed securities.

is evident enough to suggest inflation is moving sustainably toward targets, central banks should gradually move to a more neutral policy stance (see Chapter 1 of the April 2024 *World Economic Outlook*). In either case, clear communication remains crucial to avoid unwarranted volatility in markets.

The reduction of central banks' balance sheets has so far been orderly. But central banks should carefully monitor any possible market functioning issues using a broad spectrum of indicators encompassing both liquidity conditions and funding rates in money markets, while standing ready to address market stresses if needed. Authorities should be especially attuned to possible risks from the uneven distribution of liquidity and central bank reserves across banks. Policymakers should clearly communicate the objectives and steps

for removing liquidity, emphasizing the willingness to use all other available liquidity support tools. Clear and timely communication is especially crucial if adjustments are deemed necessary in response to shifts in the macroeconomic outlook or financial market developments, and if the quantitative tightening process continues after central banks start cutting their policy interest rates.

Given that sovereign debt and deficits remain higher than they were before the COVID-19 pandemic, investors might demand higher term premiums, and consequently yields, to hold government debt in both advanced economies and emerging markets. Authorities should closely monitor the changing composition of the demand base for government bonds and assess potential risks associated with this shift. In the United States, the Securities and Exchange Commission recently adopted rules that mandate central clearing in Treasury markets to improve their resilience and transparency. It is crucial to continue developing rules for access to the clearing house and evaluating potential transaction costs to fully realize the benefits of this measure.

Fiscal adjustment can support the last mile of disinflation as central banks take steps to achieve mandated inflation objectives. Fiscal adjustments should primarily focus on rebuilding buffers, lowering term premiums, and containing the rise in debt. The pace and composition of adjustments should depend on the strength of aggregate demand and the available fiscal space. Within budget constraints, governments should reprioritize spending to protect the most vulnerable populations (see Chapter 1 of the April 2024 *Fiscal Monitor* and *World Economic Outlook*).

Continued vigilance is warranted to monitor vulnerabilities in the CRE sector to minimize potential financial stability risks. To ensure resilience in the banking system and inform decisions regarding the adequacy of capital buffers for CRE exposures, authorities should conduct stress-testing exercises that incorporate scenarios of large CRE price declines. These stress tests should include smaller banks with material exposure to CREs. Supervisors should also review banks' CRE valuation assumptions and ensure that provisions are adequate. There is an urgent need to reduce CRE-related systemic risks stemming from nonbank financial institutions by ensuring the effectiveness of liquidity management tools, considering leverage limits, and enhancing data collection. CRE funds should redeem shares at lower frequency and require long notice or settlement periods. Depending on further analysis, the authorities should also consider requiring that such funds be structured as closed-end funds. Authorities should continue to build buffers to help guard against future losses in the financial sector and to support the provision of credit through periods of stress. For example, authorities may raise countercyclical capital buffers or sectoral systemic risk buffers, should circumstances allow. Such buffers could be released if stresses, such as increased defaults, were to materialize. To avoid procyclical effects, the raising of buffers should be conditioned on the absence of signs that credit is already being constrained by the adequacy of banks' capital.

In China, to durably improve confidence and alleviate disinflationary pressures, accommodative macroeconomic policies along with structural and pro-market reforms are needed to bolster near-term activity, mitigate risks, and ensure a smooth transition toward higher-quality and more balanced growth over the medium term. Property sector policies, in particular, should prioritize completing housing and restructuring troubled property developers in a timely manner. Additional monetary policy easing, especially through lower interest rates, and reorientation of public expenditures toward households could bolster near-term recovery, while comprehensive fiscal reforms are needed to ensure the sustainability of local government finances and prevent adverse spillovers to the broader economy. Authorities have made progress in reducing risks in the nonbank financial sector, but additional measures to enhance liquidity and maturity risk management, as well as to close regulatory and data gaps, could help contain future systemic risks. For the banking sector, it is critical to strictly enforce prudential policies, including by phasing out forbearance measures and maintaining adequate loss-absorbing buffers, to strengthen efforts by the authorities to restructure weak banks and safeguard financial stability risks. Authorities should continue to closely monitor developments in the equity market to avoid spillover to the broader financial system.

Progress on inflation in many emerging markets has been notable, but central banks should be cautious about easing policy rates too aggressively to ensure inflation targets are met and to help preserve resilience against external pressures. Countries should integrate their policies, where applicable, using the IMF's Integrated Policy Framework. The use of foreign exchange

interventions may be appropriate as conditions warrant and provided intervention does not impair the credibility of macroeconomic policies or substitute for their necessary adjustment.[33] In the event of imminent crises, capital flow management measures may be an option for some countries as part of a broader policy package to lessen outflow pressures. But those measures should not substitute for warranted macroeconomic adjustments or the development of domestic macroprudential policies which can help contain systemic risks from capital flows. Any such measures should be part of a plan that resolves underlying macroeconomic imbalances and allows for needed adjustments.

Sovereign borrowers in emerging market economies, frontier economies, and low-income countries should strengthen efforts to contain risks associated with their high debt vulnerabilities, including through communications with creditors, multilateral cooperation, and support from the international community. Countries near debt distress should enhance early contact with creditors. Bilateral and private sector creditors should find ways to coordinate preemptive and orderly restructuring to avoid costly hard defaults and prolonged loss of market access. The Group of Twenty (G20) Common Framework should be used where applicable, including in preemptive restructurings, and further efforts should be made to improve the forum's effectiveness. Continued use of enhanced collective action clauses in international sovereign bonds and the development of majority voting provisions in syndicated loans would help facilitate future debt restructurings. Countries able to access funding should borrow prudently and avoid excessive debt issuance that may compromise medium-term sustainability.

Policymakers should promote the depth of local currency markets in emerging markets and foster a stable and diversified investor base. Emerging market economies with market developmental gaps should strive to (1) establish a sound legal and regulatory framework for securities, (2) develop efficient money markets, (3) improve the transparency of both primary and secondary markets, (4) improve the predictability of issuance, (5) bolster market liquidity, and (6) develop robust market infrastructure. Sustained efforts to deepen domestic markets become more critical as interest differentials between advanced economies and emerging markets narrow further.

For a comprehensive and timely assessment of risks in credit markets, authorities must ensure access to sufficient and reliable data to analyze vulnerabilities stemming from origination practices and chains of bank and nonbank intermediation in the corporate debt market. With private credit playing an increasingly significant role in financial markets, it is imperative to enhance reporting requirements to improve monitoring and risk management of credit, liquidity, leverage, valuations, and interconnectedness risks. Given the potential macro-criticality of private credit, coupled with its exponential growth and increasing retail participation, authorities may consider adopting a more intrusive supervisory and regulatory approach, as discussed in Chapter 2.

The sizable tail of weak banks in the global financial system and the risk of contagion to healthy institutions highlight the urgent need to enhance financial sector regulation and supervision. Supervisors should ensure that banks have corporate governance and risk management processes commensurate with their risk profile, including risk monitoring by bank boards and capital and liquidity stress tests. In current conditions of deteriorating asset quality, authorities should pay attention to bank asset classification and provisions and to exposures to interest rate and liquidity risks. Full, timely, and consistent implementation of international standards remains an important step to enhance prudential frameworks.

Despite repeated calls from the G20, some major jurisdictions that are members of the Basel Committee on Banking Supervision have delayed implementing the remaining elements of Basel III or have introduced deviations, which could undermine the effectiveness of the standard-setting process and increase regulatory fragmentation. As a first step toward enhancing prudential frameworks, authorities should prioritize the full, timely, and consistent implementation of internationally agreed-upon prudential standards.

Authorities should prepare to deal with financial instability, including by ensuring that banks are prepared to access central bank liquidity and by intervening early to address liquidity stress in the financial sector. All banks should be required to periodically test their access to central bank instruments. Central banks should set up their emergency liquidity assistance frameworks in normal times, anticipating that they would have to

[33]See the IMF Integrated Policy Framework (https://www.imf.org/en/Topics/IPF-Integrated-Policy-Framework).

intervene in a crisis. Central banks should be ready to provide liquidity against a broad universe of assets while abiding by the appropriate principles concerning collateralization, conditions, and state guarantees.

Further progress on adopting and implementing recovery and resolution frameworks is critical to proactively address the problems of weak or failing banks without undermining financial stability or risking public funds. International resolution standards apply to all banks that may prove to be systemic in times of wider stress. However, planning and preparation for resolution has focused mainly on the largest banks. In many countries the scope of this work should be expanded. Resolution plans must also be more flexible and public backstop funding mechanisms for resolution strengthened. In addition, resolution regimes for systemic and other large nonbank financial institutions, including central counterparties and insurers, should be introduced or further developed.

Regulatory coordination across sectors and jurisdictions is essential to identify risks, undertake effective actions, and manage crisis situations. Internationally coordinated reforms can reduce the risks of cross-border spillovers, regulatory arbitrage, and market fragmentation. Jurisdictions should ensure that their data-sharing arrangements allow for timely coordination to identify cross-sectoral risks and determine further action as needed.

Given the strength and multifaceted nature of the sovereign–bank nexus in certain countries, the policy response must encompass a range of strategies tailored to their specific circumstances. This response should include strengthening medium-term fiscal frameworks in countries with limited fiscal space (see Chapter 1 of the April 2024 *Fiscal Monitor*). Authorities in countries where sovereign-bank nexus could present systemic risks should also consider options to weaken the nexus, such as implementing capital surcharges on banks' holdings of sovereign bonds above specific thresholds and enhancing the banking crisis management framework. Continued efforts to foster a deep and diversified investor base are essential to enhance resilience, particularly in countries with underdeveloped local currency bond markets.

A comprehensive policy and regulatory response are needed to address the risks posed by crypto assets. While some newly launched products, such as spot bitcoin exchange-traded products in the United States, mitigate certain risks for investors (including money laundering, the financing of terrorism, and operational and cyber risks), the spot market remains unregulated, exposing investors to significant risks. Exchange-traded products can attract both retail and institutional investors, increasing their exposure to crypto markets. Authorities should enhance monitoring of the growing linkages between traditional financial institutions and the crypto ecosystem.

Box 1.1. Approval of Spot Bitcoin Exchange-Traded Products Expands the Investor Base

The approval of spot bitcoin exchange-traded products (ETPs) by the US Securities and Exchange Commission in early January 2024 led to a record-breaking volume of inflows, widening the adoption of bitcoin. Net inflows in the top 12 bitcoin funds reached more than $12 billion in the first quarter after the approval (Figure 1.1.1, panel 1).[1] The bitcoin price has rallied significantly since 2023 to reach a new all-time high of $73,805 on March 14, 2024 (Figure 1.1.1, panel 2). ETPs have removed certain frictions related to investing in bitcoin, widening the potential investor base. This could drive large shifts in asset allocation by investors as they incorporate Bitcoin into their portfolios.

An efficient frontier analysis can be used to assess whether allocation toward this asset class may be attractive from a portfolio optimization standpoint. A hypothetical investment universe may comprise, for instance, gold, US Treasuries, investment-grade and high-yield bonds, and S&P 500 equity returns in addition to bitcoin. Historical year-by-year realized returns are applied to a standard portfolio selection technique: maximizing the portfolio Sharpe ratio (Markowitz 1952; Martin 2021). There have been pronounced fluctuations in the optimal portfolio allocation toward Bitcoin, with minimal or zero exposures in almost half of the years between 2011 and 2023 (Figure 1.1.1, panel 3). This reflects the extreme volatility of the asset class over the sample period.

This volatility could change as the bitcoin ecosystem develops. And while financial stability risks do not appear yet to be systemic (see the October 2021 *Global Financial Stability Report*), there is evidence of growing interdependence between financial and crypto assets, suggesting the latter would serve as a conduit for shocks (IMF 2023). The approval of Bitcoin ETPs may lead to a surge in portfolio allocation, potentially adding selling pressure on other asset classes as investors shed other assets to make room for bitcoin investments. In addition, the reduction in frictions to invest can increase interconnectedness, potentially amplifying systemic risk via contagion from crypto markets into other asset classes, particularly if large swings in crypto prices drive large portfolio losses, forcing investors to liquidate positions in other assets.

This box was prepared by Gonzalo Fernandez Dionis and Yiran Li.

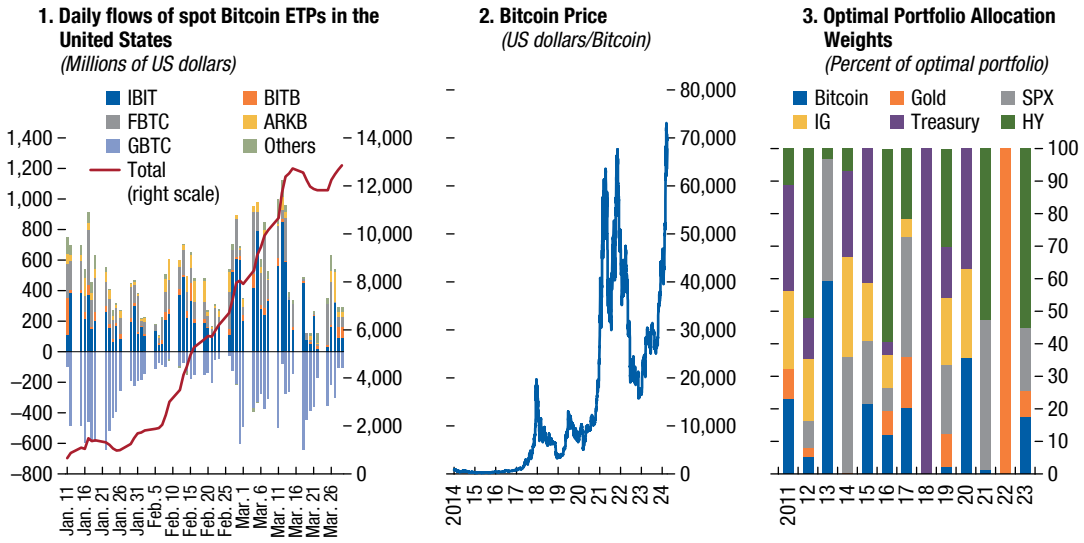
[1]Funds included in the analysis are Ark21 Shares Bitcoin ETF, Franklin Bitcoin ETF, Franklin Bitcoin ETF, Grayscale Bitcoin Trust Btc., Hashdex Bitcoin Futures ETF, Invsco Glxy Btcn ETF, Ishares Bitcoin Trust, Fidelity Wise Origin Bitcoin, Proshares Bitcoin Strategy E, Valkyrie Bitcoin Fund, Vaneck Bitcoin Trust, and WisdomTree Bitcoin Fund.

Figure 1.1.1. Bitcoin Performance

Net inflows into Bitcoin funds reached $12 billion in the first quarter after approval.

Bitcoin rally surpassed its 2022 peak.

Year-by-year portfolio allocation to Bitcoin would be minimal for most periods.



Sources: Bloomberg Finance L.P.; CoinGecko; Martin 2021.
Note: ARKB = ARK 21Shares Bitcoin ETF; BITB = Bitwise Bitcoin ETF; ETPs = exchange-traded products; FBTC = Fidelity Wise Origin Bitcoin Fund; GBTC = Grayscale Bitcoin Trust; HY = high yield; IBIT = iShares Bitcoin Trust; IG = investment grade.

Box 1.2. Intertemporal Risk Trade-Offs to US Growth under Alternative Scenarios of Credit Growth

Investors are anticipating that major advance economy central banks will pivot from current monetary policy tightening. Financial conditions—broadly reflecting price of risk—have consequently continued to ease. Easing financial conditions, while stimulating economic activity, could result in policymakers facing an intertemporal trade-off in terms of downside risks to growth. Easy financial conditions may not only alleviate downside risks over the near term but may also come at the expense of higher downside risks over the medium term, for instance, as households and corporates take on more debt. Increasing leverage represents a financial vulnerability—making economies more susceptible to shocks. Amid heightened vulnerabilities, a materialization of an adverse shock may lead to abrupt deleveraging, possibly involving asset fire sales, deteriorating market liquidity, and higher risk premiums (Brunnermeier and Pedersen 2009; Greenwood, Landier, and Thesmar 2015).

In this box, the intertemporal risk trade-off between near- and medium-term horizons is examined in the case of US growth using the IMF's growth-at-risk framework (Adrian and others 2019, 2022); first, given the current state of financial conditions and credit growth (that is, the baseline), and then, under a hypothetical scenario for corporate and household sector credit growth. Specifically, this scenario (Scenario 1) is calibrated on the average quarterly credit growth over the two-year period following the 1972–74, 1977–80, and 1980–81 tightening cycles (Figure 1.2.1, panel 1). These episodes provide a useful parallel to the current period, given all were preceded by high inflation.

Under the baseline, medium-term risks are forecast to be elevated compared with near-term risks given the current state of household and corporate sector credit growth (Figure 1.2.1, panels 3 and 4). Under Scenario 1, household credit grows by about 1.8 percent per quarter, improving risks over the near term, whereas medium-term risks may remain elevated at around the baseline (Figure 1.2.1, panel 3). The same scenario applied to corporate sector credit, where growth is equal to 2.3%, which suggests a shift in intertemporal trade-off with what could typically be expected if vulnerabilities mounted, making the sector (and system) more sensitive to adverse shocks in the medium term (Figure 1.2.1, panel 4). The more pronounced deterioration in medium-term risks owing to higher corporate sector credit may largely be related to shorter average maturity of debt (around eight years for corporate bonds and syndicated loans outstanding; see also Poeschl 2023) than in the household sector, where 30-year mortgage loans make up a large share of debt. Higher household credit growth may instead lead to risks beyond the medium term (Mian, Sufi, and Verner 2017; Jensen and others 2020).

Under an alternative scenario (Scenario 2) in which credit growth is calibrated to the minimum quarterly credit growth over the two-year period after the aforementioned cycles (Figure 1.2.1, panel 2), households' near-term risks would deteriorate considerably relative to baseline, with negligible improvement in medium-term risks (Figure 1.2.1, panel 3).

This box was prepared by Harrison Kraus and Corrado Macchiarelli.

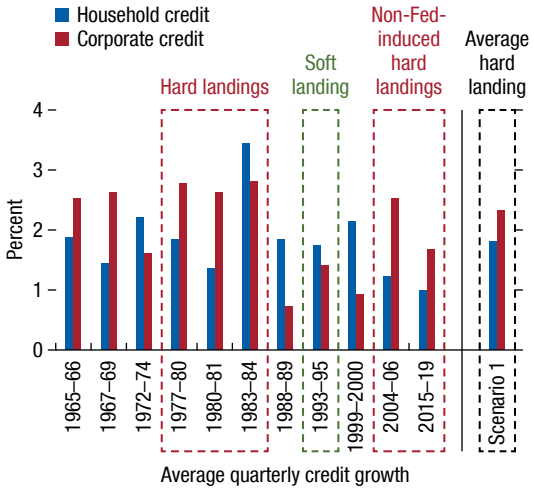
Box 1.2 *(continued)*

Figure 1.2.1. Growth-at-Risk for the United States

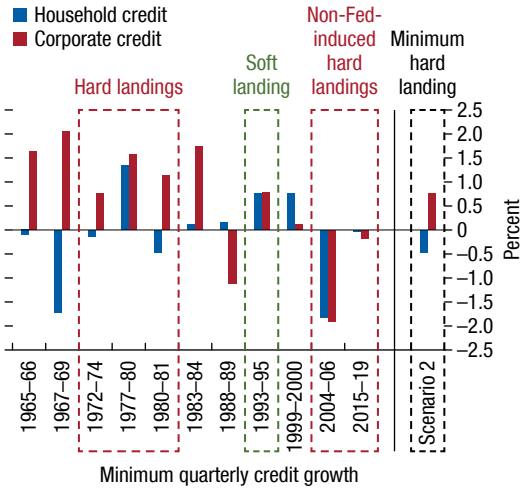
A hypothetical scenario (Scenario 1) is calibrated on the average quarterly credit growth over a two-year period after the end of the 1974, 1980, and 1981 tightening cycles.

Alternatively, in scenario 2, credit growth is calibrated on the minimum quarterly credit growth over two years after these cycles.

1. Average Quarterly Credit Growth after Monetary Policy Peak: Two-Year Ahead
(Tightening cycles identified as in Blinder (2023); average quarterly growth)

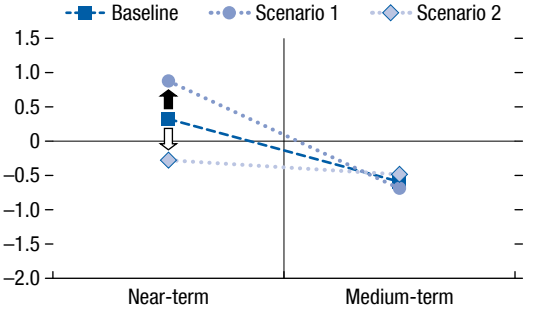


2. Minimum Quarterly Credit Growth after Monetary Policy Peak
(Tightening cycles identified as in Blinder (2023); minimum quarterly growth)

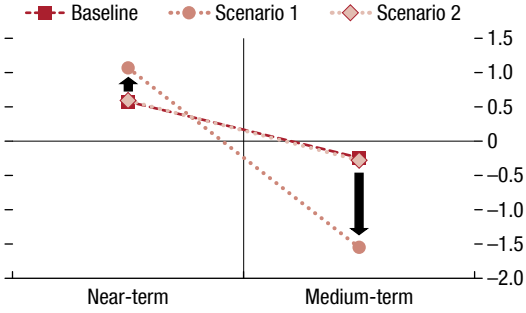


Under the baseline, medium-term risks are elevated, relative to near-term risks. Under Scenario 1, near-term downside risk improves, given developments in household credit. For the corporate sector, improvement in near-term risk is accompanied by more than proportionate deterioration in medium-term risk. Under Scenario 2, near-term risk deteriorates owing to household credit contraction.

3. Near- and Medium-Term Risks for Households, and Impact of Change in Credit Growth
(Term structure of fifth percentiles [GaR] of growth forecast distribution; household quarterly credit growth at 1.8 percent, Scenario 1, and –0.5 percent, Scenario 2)



4. Near- and Medium-Term Risks for Corporates, and Impact of Change in Credit Growth
(Term structure of fifth percentiles [GaR] of growth forecast distribution; corporate quarterly credit growth at 2.3 percent, Scenario 1, and 0.8 percent, Scenario 2)



Sources: Bank for International Settlements; Federal Reserve Bank of Chicago; IMF, International Financial Statistics database; and IMF staff calculations.
Note: The definition and identification of tightening cycles in panels 1 and 2 follows Blinder (2023). The conditional forecast density model employed for the United States in panels 3 and 4 augments information on current-quarter credit growth and financial conditions (see the October 2023 *Global Financial Stability Report*) with quarterly credit growth rates for corporate and household sector provided by domestic banks and all other sectors of the economy. Credit data are sourced from the Bank for International Settlements. The medium term is calculated as the average between years 4 and 8. GaR = growth-at-risk.

Box 1.3. Are Regional Banks in the United States "Out of the Woods"?

Regional banks in the United States have broadly recovered since the turmoil of March 2023.[1] After the acute stress triggered by the collapse of Silicon Valley Bank, the aggregate financial indicators of these regional banks have improved: between March 2023 and January 31, 2024, deposit outflows stabilized (+3 percent) and the US regional bank equity index rebounded (+19 percent) (see Figure 1.29, panel 1).

However, some investors and analysts express fears that the failure of another regional institution could precipitate a broader loss of confidence in the sector. In January 2024, shifts in market expectations regarding the timing and pace of interest rate cuts in the United States, coupled with substantial losses announced by a major US regional bank heavily exposed to commercial real estate (CRE), prompted a 10 percent decline in the regional bank stock index. Concerns may be especially salient regarding banks that have a high level of unrealized bond losses stemming from the recent interest rate increase, concentrated exposures to CRE, and large potential liquidity pressures arising from uninsured deposits and other forms of less-stable funding.

Unrealized losses continued to mount alongside rising interest rates and remained elevated at $477 billion in the fourth quarter of 2023, even after posting a significant drop as a result of the repricing of forward rates in December 2023. The median ratio of unrealized losses to Tier 1 capital is high, and there are large dispersions across banks (Figure 1.3.1, panel 1). One-third of US banks, mostly small and medium-sized

This box was prepared by Silvia Ramirez and Yiran Li.

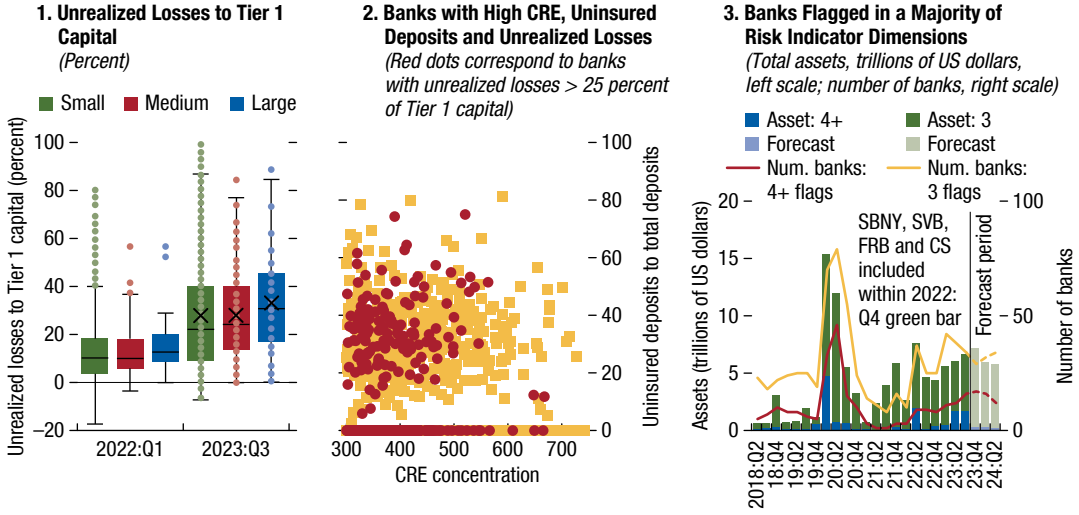
[1]Based on a data set including 4,528 deposit insured banks, accounting for 99.8 percent of total bank assets in the third quarter of 2023. For the purposes of this box, following the Federal Reserve's definitions, small banks are those with less than $10 billion in total assets, medium banks are those with assets between $10 billion and $100 billion, and large banks are those with assets above $100 billion. For more details, see Board of Governors of the Federal Reserve System, "Understanding Federal Reserve Supervision," https://www.federalreserve.gov/supervisionreg/approaches-to-bank-supervision.htm (accessed February 26, 2024).

Figure 1.3.1. Banking Sector Challenges for the United States, High Share of Unrealized Losses and Commercial Real Estate Exposures

Unrealized losses increased as interest rates climbed.

A significant number of US banks have high CRE concentration, high share of uninsured deposits, and large unrealized losses.

The weak tail of banks remains elevated in the first half of 2024.



Sources: S&P Capital IQ; Visible Alpha; and IMF staff estimates.
Note: In panels 1 and 2, unrealized losses and CRE concentration are based on a data set including 4,528 or 98 percent of deposit insured banks, accounting for 99.8 percent of total bank assets in third quarter of 2023. Small banks correspond to banks with less than $10 billion in total assets, regionals correspond to banks with assets between $10 billion and $100 billion, and large banks correspond to banks with assets above $100 billion. Panel 2, high CRE concentration measured by CRE exposure to Tier 1 capital plus the allowance for credit losses above 300 percent, uninsured deposits based on call report data for banks with total assets of more than $1 billion, and red dots correspond to unrealized losses of 25 percent or more of Tier 1 capital as of fourth quarter 2023.
CRE = commercial real estate; CS = Credit Suisse; FRB = First Republic Bank; SBNY = Signature Bank of New York; SVB = Silicon Valley Bank.

Box 1.3 *(continued)*

ones, hold exposures to CRE exceeding 300 percent of their capital plus the allowance for credit losses, representing 16 percent of total banking system assets. It is of concern that more than 100 banks, which represent about 3 percent of banking system assets, have the triple-whammy of a high concentration in CRE exposure, unrealized losses greater than 25 percent of Tier 1 capital, and a ratio of uninsured deposits to total deposits greater than 25 percent (Figure 1.3.1, panel 2, see also Adrian and others 2024).

In the first quarter of 2024, the number of US banks classified on the IMF's monitoring list on the basis of key risk indicators was expected to remain elevated, as analysts expected significant challenges in earnings, liquidity, and other key risk dimensions. This weak tail of banks, mainly small and medium-sized banks, collectively represents an estimated $5.5 trillion in total assets, accounting for almost 23 percent of total banking system assets (Figure 1.3.1, panel 3).

References

Adrian, Tobias, Nina Boyarchenko, and Domenico Giannone. 2019. "Vulnerable Growth." *American Economic Review* 109 (4): 1263–89.

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.

Adrian, Tobias, Nassira Abbas, Silvia L. Ramirez, and Gonzalo Fernandez Dionis. 2024. "The US Banking Sector since the March 2023 Turmoil: Navigating the Aftermath." Global Financial Stability Note 2024/001, International Monetary Fund, Washington, DC.

Adrian, Tobias, Richard K. Crump, and Emanuel Moench. 2013. "Pricing the Term Structure with Linear Regressions." *Journal of Financial Economics* 110 (1): 110–38.

Afonso, Gara, Domenico Giannone, Gabriele La Spada, and John C. Williams. 2023. "Scarce, Abundant, or Ample? A Time-Varying Model of the Reserve Demand Curve." Federal Reserve Bank of New York Staff Reports No. 1019, June.

Arslanalp, Serkan, and Takahiro Tsuda. 2012. "Tracking Global Demand for Advanced Economy Sovereign Debt." IMF Working Paper 12/284, International Monetary Fund, Washington, DC.

Arslanalp, Serkan, and Takahiro Tsuda. 2014. "Tracking Global Demand for Emerging Market Sovereign Debt." IMF Working Paper 14/039, International Monetary Fund, Washington, DC.

Bank of England. 2017. "An Improved Model for Understanding Equity Prices." *Quarterly Bulletin* Q2: 86–97.

Bank of England. 2023a. "Financial Stability Report." December. https://www.bankofengland.co.uk/-/media/boe/files/financial-stability-report/2023/financial-stability-report-december-2023.pdf.

Bank of England. 2023b. "Less Is More or Less Is Bore? Re-calibrating the Role of Central Bank Reserves." Speech by Andrew Hauser. https://www.bankofengland.co.uk/speech/2023/november/andrew-hauser-keynote-speech-bank-of-england-watchers-conference.

Bank of Japan. 2023. "Financial Systems Report." October. https://www.boj.or.jp/en/research/brp/fsr/data/fsr231020a.pdf.

Blinder, Alan S. 2023. "Landings, Soft and Hard: The Federal Reserve, 1965–2022." *Journal of Economic Perspectives* 37 (1): 101–20.

Brunnermeier, Markus K., and Lasse Heje Pedersen. 2009. "Market Liquidity and Funding Liquidity." *Review of Financial Studies* 22 (6): 2201–38.

Deghi, Andrea, Junghwan Mok, and Tomohiro Tsuruga. 2021. "Commercial Real Estate and Macrofinancial Stability During COVID-19." IMF Working Paper 2021/264, International Monetary Fund, Washington, DC.

Deghi, Andrea, Fabio Natalucci, and Mahvash S. Qureshi. 2022. "Commercial Real Estate Prices during COVID-19: What Is Driving the Divergence?" Global Financial Stability Note 2022/02, International Monetary Fund, Washington, DC.

Deghi, Andrea, Fabio Natalucci, and Mahvash S. Qureshi. 2024. "US Commercial Real Estate Remains a Risk Despite Investor Hopes for Soft Landing." *IMF Blog,* January 18. https://www.imf.org/en/Blogs/Articles/2024/01/17/us-commercial-real-estate-remains-a-risk-despite-investor-hopes-for-soft-landing.

Deutsche Bundesbank. 2023. "Financial Stability Review 2023." Deutsche Bundesbank, Frankfurt, Germany, November. https://www.bundesbank.de/resource/blob/918848/fde3aecb449b4d92c2d2d9ed61d85896/mL/2023-finanzstabilitaetsbericht-data.pdf.

Diebold, Francis X., and Kamil Yilmaz. 2009. "Measuring Financial Asset Return and Volatility Spillovers, with Application to Global Equity Markets." *The Economic Journal* (119): 158–71.

Duan, Jin-Chuan, Weimin Miao, Jorge A. Chan-Lau, and the Credit Research Initiative Team of the National University of Singapore. 2022. "BuDA: A Bottom-Up Default Analysis Framework, version 3.5.1." National University of Singapore, Singapore.

European Central Bank. 2023. "Special Feature B: Real Estate Markets in an Environment of High Financing Costs." *Financial Stability Review*, November. https://www.ecb.europa.eu/pub/pdf/fsr/ecb.fsr202311~bfe9d7c565.en.pdf.

Fratzscher, Marcel. 2012. "Capital Flows, Push versus Pull Factors and the Global Financial Crisis." *Journal of International Economics* 88 (2): 341–56.

Glancy, David, and J. Christina Wang. 2023. "Lease Expirations and CRE Property Performance." Research Department Working Paper 23-10, Federal Reserve Bank, Boston. https://www.bostonfed.org/publications/research-department-working-paper/2023/lease-expirations-and-cre-property-performance.aspx.

Glicoes, Jonathan, Benjamin Iorio, Phillip J. Monin, and Lubomir Petrasek. 2024. "Quantifying Treasury Cash-Futures Basis Trades." FEDS Notes, Board of Governors of the Federal Reserve System, March 8.

Greenwood, Robin, Augustin Landier, and David Thesmar. 2015. "Vulnerable Banks." *Journal of Financial Economics* 115 (3): 471–85.

Gupta, Arpit, Vrinda Mittal, and Stijn Van Nieuwerburgh. 2022. "Work from Home and the Office Real Estate Apocalypse." Working Paper 30526, National Bureau of Economic Research, Cambridge, MA.

International Monetary Fund (IMF). 2019. "Online Annex 1.1. Technical Note." In *Global Financial Stability Report*, Washington, DC, April.

International Monetary Fund (IMF). 2021. "Commercial Real Estate: Financial Stability Risks during the COVID-19 Crisis and beyond." In *Global Financial Stability Report* (Chapter 2), Washington, DC, April.

International Monetary Fund (IMF). 2023. "Selected Issues for the 2023 Article IV Consultation with the People's Republic of China." IMF Country Report 23/81, Washington, DC.

Jensen, Henrik, Ivan Petrella, Søren Hove Ravn, and Emiliano Santoro. 2020. "Leverage and Deepening Business-Cycle Skewness." *American Economic Journal: Macroeconomics* 12 (1): 245–81.

Mandzy, Orest. 2023. "The Year End 2023 Report: CRE at a Crossroads." Trepp, New York, January 8. https://www.trepp.com/trepptalk/the-year-end-2023-cre-at-a-crossroads.

Markowitz, Harry. 1952. "Portfolio Selection." *Journal of Finance* 7 (1): 77–91.

Martin, Robert Andrew. 2021. "PyPortfolioOpt: Portfolio Optimization in Python." *Journal of Open Source Software* 6 (61): 3066.

Mian, Atif, Amir Sufi, and Emil Verner. 2017. "Household Debt and Business Cycles Worldwide." *Quarterly Journal of Economics* 132 (4): 1755–1817.

Panigirtzoglou, Nikolaos and others. 2023. "Bond Markets Had Been Trading Increasingly Long before This Week." *Flows & Liquidity.* JPMorgan Global Markets Strategy, August 24.

Poeschl, Johannes. 2023. "Corporate Debt Maturity and Investment over the Business Cycle." *European Economic Review* 152: 104348.