

## Markets adjust to “higher for longer”

Markets oscillated as monetary policy interest rate hikes appeared to be coming to an end. Long-term yields surged and then retreated on investors’ evolving perceptions of future policy actions.<sup>1</sup> After reaching highs in some cases not seen since the run-up to the Great Financial Crisis (GFC), yields declined rapidly in November. Developments in risky asset markets, as well as exchange rates and capital flows in emerging market economies (EMEs), were closely intertwined with the evolution of core bond markets.

The path of long-term yields reflected market participants’ strong reactions to statements by public authorities and news about the economic outlook. With inflation slowing, nominal and real yields followed similar paths in major advanced economies (AEs). Long-term yields started the review period under upward pressure from rising term premia, amid expectations of an increased supply of long-term debt, as announced earlier by the US Treasury. The rise in yields accelerated following the September Federal Open Market Committee (FOMC) meeting, as investors began to expect policy rates to stay high for longer than previously anticipated. Fixed income markets reversed course in November, when investors interpreted central bank communication and macroeconomic data releases as suggesting an earlier end to the hiking cycle. In addition, pressures on term premia eased on announcements of lower than expected issuance of long-dated Treasuries. Long-term yields in Japan reached highs not seen in a decade, with the central bank further relaxing its yield curve control (YCC) policy and the yen briefly depreciating to its lowest level since 1990. Bond spreads temporarily widened within the euro area on country-specific fiscal concerns.

Developments in risky asset markets were closely linked with those in fixed income markets. Stock prices declined for most of the review period and then rallied in November, in tandem with those of government bonds. The correlation between equity and government bond returns has remained positive since inflation took hold in 2021, thus weakening investor demand for bonds as a hedge and contributing to higher yields. Credit market conditions continued to be relatively benign, although credit spreads did widen temporarily. Fairly compressed credit spreads reflected relatively subdued corporate debt issuance, solid balance sheets for many corporates and possible lags in the transmission from higher policy rates to debt service burdens. Banks kept lending standards tight amid a pickup in default rates, while loan demand remained weak, especially in the euro area.

Emerging market economy (EME) financial markets continued to grapple with high US yields and the prospect of accelerating capital outflows, before getting some respite in November. Long-term local currency government bond yields increased, albeit less than in the United States, with term premia edging up, particularly in Latin America. EME portfolio flows were mostly negative, both in Asian and Latin American funds. While some EME currencies went through a short bout of depreciation against the US dollar, most ended up flat on net over the review period.

<sup>1</sup> The period under review is from 9 September through 24 November 2023.

### **Key takeaways**

- *Bond markets remained volatile, with yields oscillating on evolving investor perceptions of the future path of policy interest rates; announcements of sovereign debt issuance also played a role.*
- *Risky asset markets lost ground before recovering, following the path set by bond yields, while conditions in credit markets remained benign.*
- *EME financial markets grappled with swings in US yields and changing pressures on domestic currencies. Portfolio outflows continued, reflecting a divergence in expected interest rate paths.*

## US yields continued to set the tone for global bond markets

During the review period, developments in fixed income markets were underpinned by expectations of policy rate paths and sovereign debt issuance amid large fiscal deficits. The Federal Reserve and the ECB put policy rates on hold while reiterating their commitment to bring inflation back to target and re-affirming that rates may have to stay at higher levels than previously anticipated. Fixed income markets were volatile on the back of market participants' heightened sensitivity to central bank communications and macro news. Against the background of what they perceived to be data-dependent monetary policy, market participants kept revising their expectations, with yields rising through October and then declining in November. The effects of the outbreak of the war in the Middle East in early October were short-lived, and a flight to safety did not materialise.

By late October, yields on 10-year government bonds in major AEs reached levels not seen in more than a decade, and in some cases not since the run-up to the GFC. The rise in long-term yields accelerated following the 20 September FOMC meeting (Graph 1.A, line a), as market participants came to expect that policy rates would stay high for longer. With inflation receding, the paths of long-term government bond yields closely mirrored movements in inflation-adjusted, ie real, yields (Graph 1.B). In parallel, estimates of both the expectations and the term premium components of yields kept rising (Graph 1.C).<sup>2</sup> Estimates of the term premium began rising back in August, when the US Treasury surprised market participants with plans for a large increase in the supply of long-maturity securities.

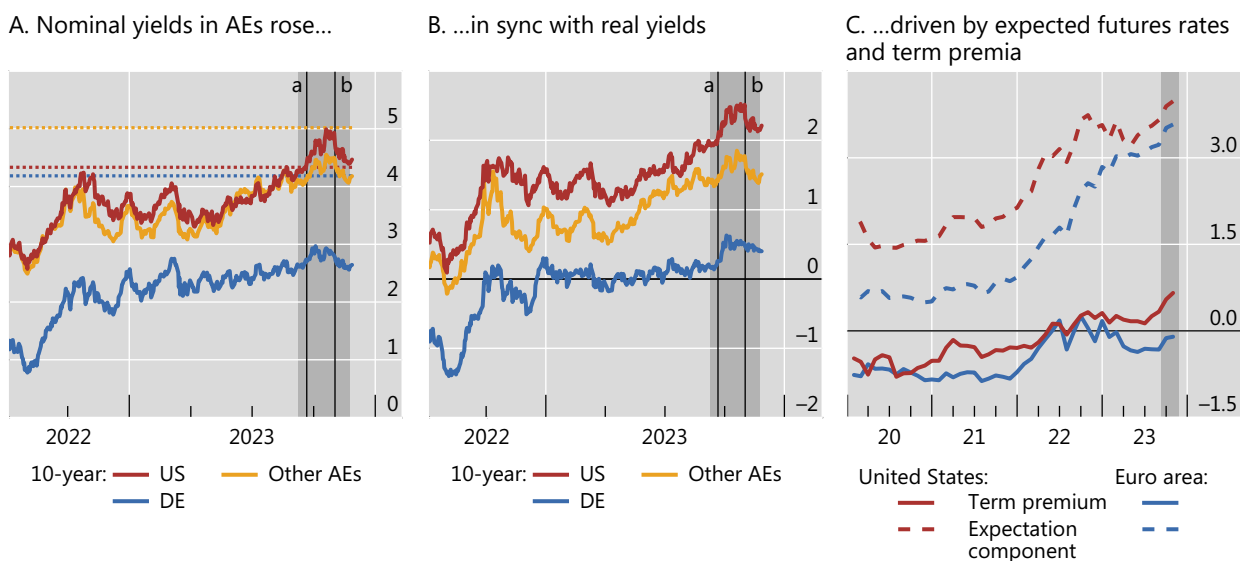
Bond yields retreated in November, as investors revised down their expectations of future rate paths and pressures on term premia eased. Investors were reassured by the 1 November FOMC press statement (Graph 1.A, line b), which suggested that tighter financial conditions made further policy rate hikes less likely. And the US

<sup>2</sup> The term premium is the excess return that investors demand for holding long-term bonds over short-term bonds. Estimates of term premia require the path of expected short-term rates to be stripped out from bond yields. Since the former are not unobservable, term premia are estimated with different econometric approaches. Some approaches rely only on the observed yield curve and model it through a set of common factors; others also include surveys and macroeconomic data. Results vary according to the different modelling assumptions, but a feature they all share is the wide uncertainty around the estimates. Still, different methods broadly agree that term premia have increased in recent months. For a review of methods and modes, see B Cohen, P Hördahl and D Xia, "Term premia: models and some stylised facts", *BIS Quarterly Review*, September 2018, pp 79–91.

## US yields set the tone for global bond markets<sup>1</sup>

In per cent

Graph 1



The shaded area indicates 9 September–24 November 2023 (period under review). The dotted horizontal lines indicate January 2007–June 2008 average.

<sup>a</sup> FOMC press conference (20 September 2023). <sup>b</sup> FOMC press conference and US Treasury quarterly refunding statement (1 November 2023).

<sup>1</sup> See technical annex for details.

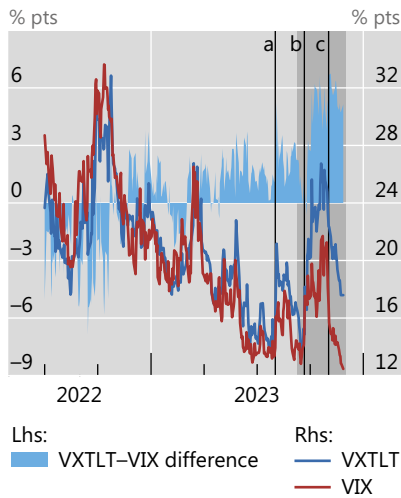
Sources: Hördahl and Tristani (2014); Bloomberg; Datastream; BIS.

Treasury surprised market participants again, this time by announcing a lower than expected increase in issuance of long-term debt. Yields kept falling through November, as a string of macroeconomic data releases pointed to softer activity and faster than expected disinflation progress, lending further support to investors' revised perceptions of the future path of policy rates. Similar support came from the release of the November FOMC minutes. In Europe, even though the ECB communications kept stressing that the fight against inflation was not over, markets still priced in rate cuts as early as the second quarter of 2024 amid weak growth outlook in the euro area.

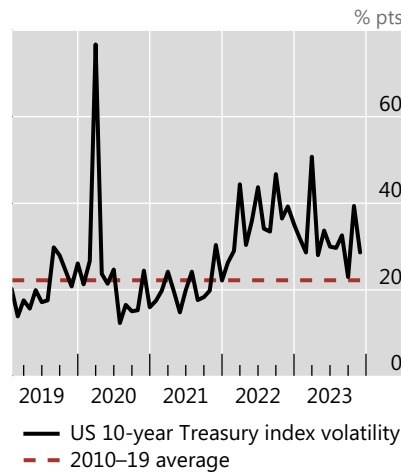
Volatility remained elevated amid rapidly changing conditions in fixed income markets. The option-implied gauge of US government bond return volatility increased after the September FOMC meeting, surpassing that of stock returns (Graph 2.A), although both metrics subsequently declined in November. The spike in volatility reflected the sensitivity of fixed income markets to US monetary and macro news.

Since high inflation took hold in mid-2021, the realised volatility of US government bond returns has hovered well above its average during the pre-pandemic decade of low inflation (Graph 2.B). When inflation surprises from a low level, it rarely prompts reassessments of possible monetary policy responses and, as a result, the volatility of bond returns does not co-move systematically with it (Graph 2.C, yellow dots and crosses). This changes at high levels of inflation: the bond volatility and inflation surprises were positively correlated in the recent period (red dots), similar to the 1980–94 period (blue dots). The co-movement is stronger when

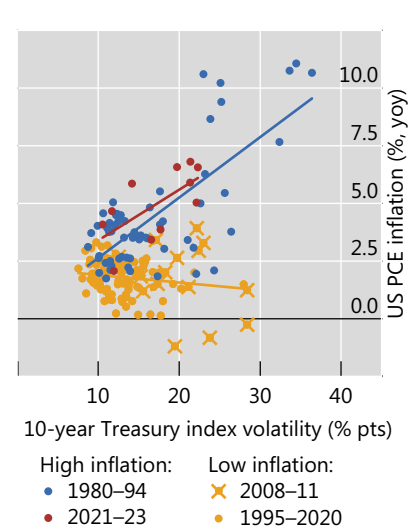
A. Implied volatility of bond returns well above that of equities



B. Realised volatility of bond returns well above the pre-Covid average<sup>1</sup>



C. Bond volatility is higher in periods of high inflation



The shaded area indicates 9 September–24 November 2023 (period under review).

<sup>a</sup> US Treasury announces increase in long-term securities issuance (2 August 2023). <sup>b</sup> FOMC press conference (20 September 2023). <sup>c</sup> FOMC press conference and US Treasury quarterly refunding statement (1 November 2023).

<sup>1</sup> See technical annex for details.

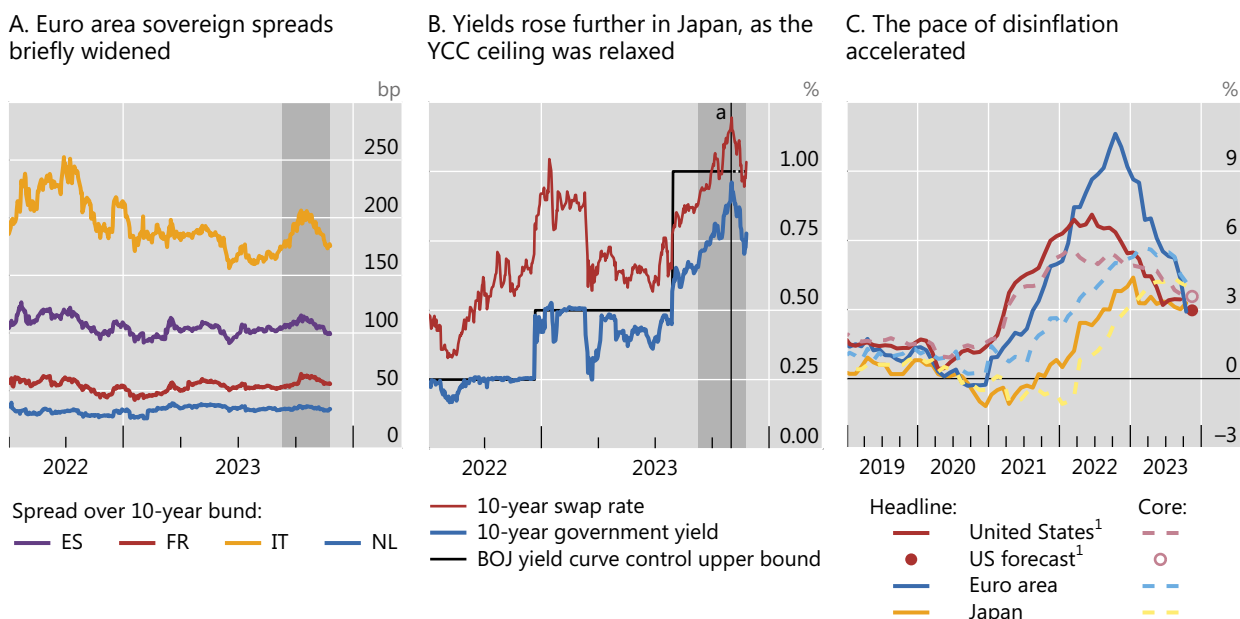
Sources: Bloomberg; Refinitiv; BIS.

inflation surprises on the upside, as the resulting decline in bond prices tends to raise volatility by more.<sup>3</sup>

In some euro area economies, fiscal concerns pushed up government bond yields further. On the back of rising budget deficits, spreads of Spanish and especially Italian sovereign bonds over German bunds widened by up to 40 basis points during the review period (Graph 3.A). The Italian sovereign spread once again exceeded 200 basis points in October before compressing in November, amid the broad-based fall in government bond yields and as a major ratings agency reported an improvement to Italy’s sovereign ratings outlook.

Japanese government bond (JGB) yields temporarily surged due to both domestic and external factors, reaching levels not seen in over a decade (Graph 3.B). This prompted the Bank of Japan to conduct an unscheduled bond operation in October to smooth market functioning. Part of the pressure on benchmark 10-year JGB yields came from higher expected future rates amid inflationary pressures (Graph 3.C). Domestic core CPI had exceeded the central bank’s inflation target for sufficiently long to lead market participants to expect monetary policy tightening in the near future. Still, the YCC policy imposed limits on the 10-year yield, which led the yen to depreciate to multi-decade lows on widening yield differentials with US Treasuries. Following its late October monetary policy meeting, the Bank of Japan

<sup>3</sup> Inflation news also has a mechanical effect on bond prices: when the principal and coupons of outstanding bonds are fixed in nominal terms, a rise in inflation erodes bonds’ real value.



The shaded area indicates 9 September–24 November 2023 (period under review).

<sup>a</sup> BOJ modifies its yield curve control by redefining the 1% upper bound for 10-year JGB yields as “a reference” (31 October 2023).

<sup>1</sup> See technical annex for details.

Sources: Federal Reserve Bank of Cleveland; Bloomberg; Datastream; BIS.

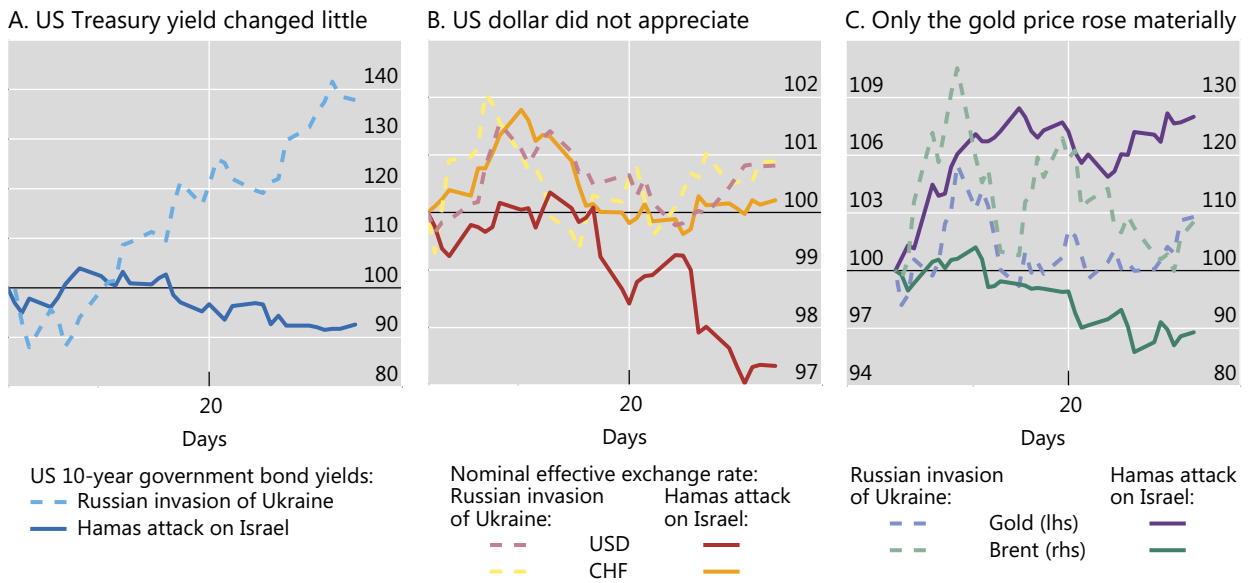
relaxed the YCC policy further, and revised upwards its inflation forecasts. In November, the yields on JGBs declined on reduced external pressures.

The immediate market reaction to the escalation in geopolitical tensions in the Middle East was muted and short-lived. There were few, if any, discernible signs of a flight to safety. Following the 7 October attack by Hamas, US Treasury yields hardly moved, unlike in 2022, when Russia invaded Ukraine (Graph 4.A). Similarly, the US dollar did not significantly appreciate (Graph 4.B), although the Swiss franc, another safe haven currency, did appreciate for about two weeks. Among commodities, oil prices did not react and only gold prices rose substantially and remained persistently higher (Graph 4.C).

## Limited signs of flight to safety amid escalation in geopolitical tensions

Beginning of the conflict<sup>1</sup> = 100

Graph 4



<sup>1</sup> 24 February 2022 and 7 October 2023, respectively.

Sources: Bloomberg; BIS.

## Risky asset markets tied to the rates outlook

Prices of risky assets were closely tied to developments in fixed income markets, in particular to expectations about future rates. Both equity and credit market prices declined in the first part of the review period, only to recoup losses in November. Conditions in credit markets remained relatively benign, although credit spreads widened temporarily. Bank lending standards continued to tighten, especially in Europe.

Stock indices declined across the board early in the review period, in some cases losing more than 10% since their summer highs. The reasons differed across regions. In the United States, the enthusiasm that characterised some tech stocks earlier in the year fizzled out, and even the tech-heavy Nasdaq index posted losses (Graph 5.A). More broadly, higher discount rates weighed on US equity valuations, even as expected earnings per share actually rose (Graph 5.B) amid positive macroeconomic surprises on balance (Graph 5.C). In Europe, disappointing macroeconomic data (blue line) helped explain the negative price action. However, equity markets rapidly recouped losses in November when investors judged that the likelihood of additional rate rises had diminished significantly. Such an environment – in which bad news for the economy were interpreted in relation to the implications for monetary policy – reinforced the positive correlation between stock and sovereign bond returns. A positive correlation between these key asset classes may, in turn, adversely affect investors' risk diversification opportunities (Box A).

## The correlation of equity and bond returns

Marco Lombardi and Vladyslav Sushko<sup>①</sup>

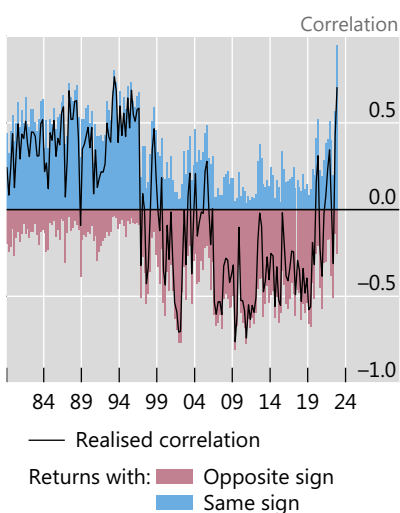
Amid a generalised increase in the volatility in fixed income markets and in sync with the inflation surge, the correlation between equity and bond returns has turned from negative to increasingly positive. A departure from the negative correlation between equity and bond returns, the typical configuration for the past two decades, weakens the diversification in the classical long-only asset allocation strategies of pension and investment funds. Specifically, it undermines the role of bonds as a hedge for the portfolio's equity portion. This box documents the recent persistence of positive correlations and explains it with reference to the inflation environment and the attendant uncertainty.

The correlation between US equity and government bond returns switched sign in mid-2021. Since then, the monthly realised correlation of the daily returns has become positive (Graph A1.A). One has to go back to the 1980s and the early 1990s to find a prolonged period with positive correlations.<sup>②</sup>

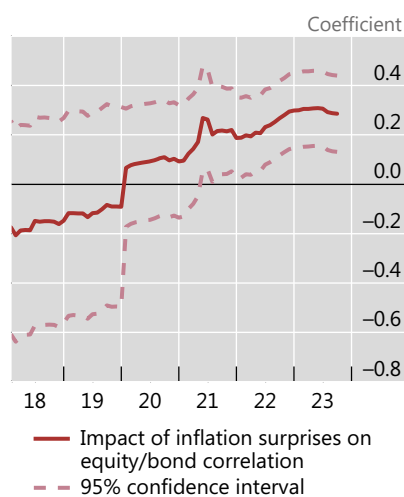
### Positive equity/bond correlation goes hand in hand with prominent inflation

Graph A1

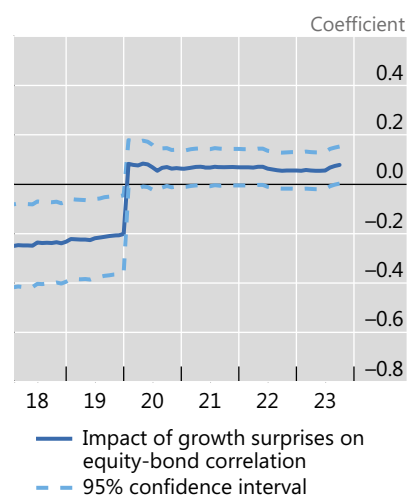
A. Correlation of S&P 500 and US Treasury returns: negative since mid-1990s<sup>1</sup>



B. The correlation became sensitive to inflation news...<sup>2</sup>



C. ...and insensitive to growth-related news<sup>2</sup>



<sup>1</sup> Sum of the daily products of S&P 500 and US Treasury returns over the preceding quarter. <sup>2</sup> Estimated coefficients of a recursive regression of the monthly realised correlation of S&P 500 and US Treasury returns on the absolute values of the Citi indices of inflation and economic surprise; the first (last) estimate is based on data from January 2003 to January 2018 (January 2003 to September 2023).

Sources: Bloomberg; Macrobond; Refinitiv; authors' calculations.

The inflation environment plays a key role in shaping the correlation of equity and bond returns through the expected response of monetary policy to news.<sup>③</sup> At times of low and stable inflation, market participants typically put more emphasis on growth-related news when forming expectations of monetary policy.<sup>④</sup> Growth surprising on the downside, for example, would depress equity prices due to lower expected earnings. Such a surprise would also raise expectations of a monetary policy easing, so that bond prices would be boosted by lower discount rates. Thus, in a low-inflation environment, a negative correlation between equity and bond returns prevails. By contrast, at times of high and volatile inflation, it is the inflation outlook that takes centre stage in shaping the expected path of monetary policy rates. Positive inflation surprises, for example, depress the price of outstanding bonds, since their principal and coupons are expressed in nominal terms. Positive inflation surprises also raise expectations of rate hikes and give central banks less scope to cut interest rates if growth falters. This depresses future earnings and equity prices. In such an environment, the correlation between equity and bond returns would thus be positive.

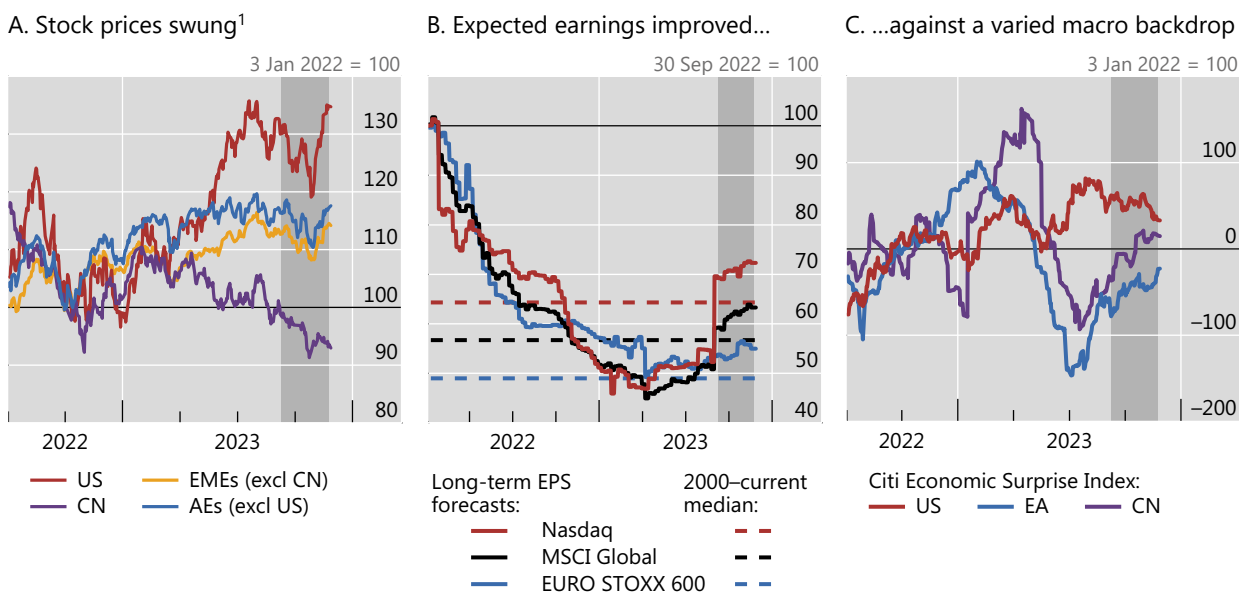
Empirical evidence confirms that the inflation environment affects the correlation of equity and bond returns. The coefficient on inflation surprises turned positive and statistically significant in mid-2021 (Graph A1.B). By contrast, the coefficient on growth news, while significant and negative in the period prior to mid-2021, has become statistically insignificant more recently (Graph A1.C).

A positive correlation between equity and bond returns can partly explain the increase in bond yields observed over the past months. The hallmark portfolio structure of passive investors includes government bonds as a hedge against the swings of riskier assets such as equities. However, if returns on bonds and equities are positively correlated, the former will no longer work as a hedge, and investors will require a higher term premium – ie compensation for undiversified risk in government bonds. Hence, the switch in the sign of correlations between equity and bond returns has contributed to the recent increase in bond yields by pushing up the term premium.<sup>③</sup>

① The views expressed are those of the authors and do not necessarily reflect the views of the BIS. ② The shift from a positive to a negative correlation in the late 1990s has been widely documented and researched. More specifically, it has been associated with phases of monetary tightening at times of low inflation (see for example L Beale and F Van Holle, “Stock-bond correlations, macroeconomic regimes and monetary policy”, *SSRN Working Paper*, October 2017), or more broadly to a change in the relationship between monetary policy and the business cycle (see J Campbell, C Pflueger and L Viceira, “Macroeconomic drivers of bond and equity risks”, *Journal of Political Economy*, vol 128, no 8, August 2020). ③ See also A Cieslak and A Schrimpf, “Non-monetary news in central bank communication”, *Journal of International Economics*, vol 118, May 2019. ④ In a low-inflation environment, as inflation fluctuations around target are typically small and short-lived, they do not necessarily elicit a monetary policy response. In fact, inflation may be driven largely by relative price changes, which monetary policy could safely overlook; see C Borio, M Lombardi, E Zakrajšek and J Yetman, “The two-regime view of inflation”, *BIS Papers*, no 133, March 2023. ⑤ The same point was made, in the context of low inflation, by R Clarida, “Monetary policy, price stability and equilibrium bond yields: success and consequences”, speech at the *High-level conference on global risk, uncertainty and volatility*, Zurich, November 2019.

## Global equity markets followed the path set by bond yields

Graph 5



The shaded area indicates 9 September–24 November 2023 (period under review).

<sup>1</sup> See technical annex for details.

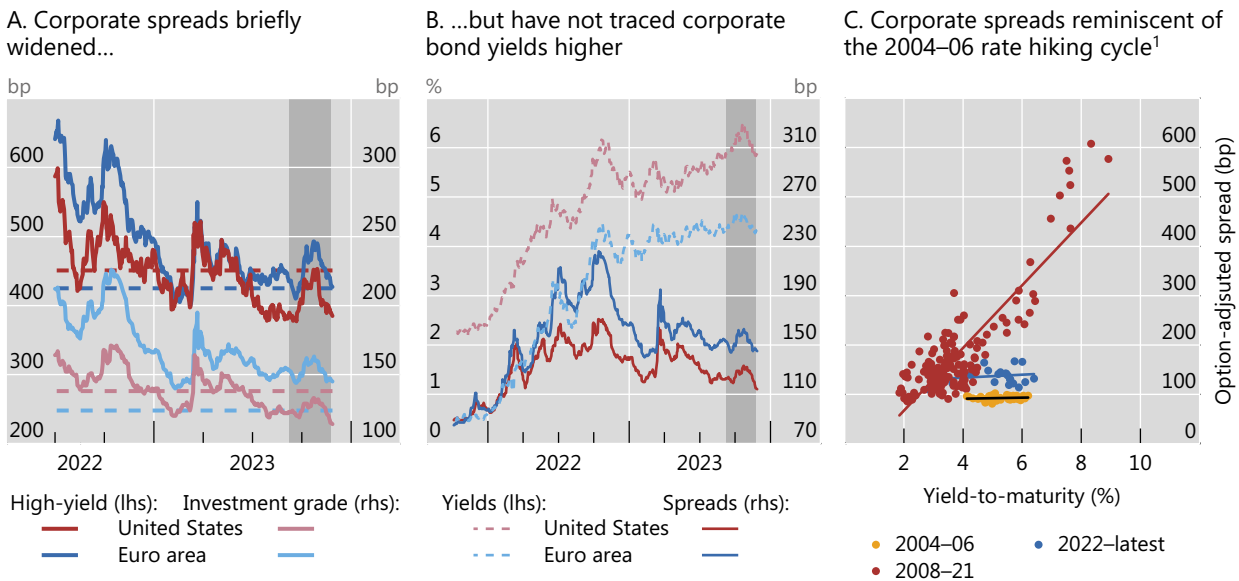
Sources: IMF; Bloomberg; Datastream; Macrobond; BIS.



Credit spreads remained compressed, despite the high level of yields. Spreads temporarily ticked up during the review period, and in the euro area were above their historical averages, both for investment grade and the high-yield segment (Graph 6.A). Still, even with their modest widening, credit spreads remained tight given the high level of corporate yields (Graph 6.B). This behaviour, visible in both the United States and the euro area, is uncharacteristic of the past decade and was last observed during the 2004–06 monetary policy tightening cycle (Graph 6.C).

## Corporate issuers yet to feel the impact of higher funding costs

Graph 6



The shaded area indicates 9 September–24 November 2023 (period under review). The horizontal lines indicate 2005–current medians.

<sup>1</sup> Based on monthly averages.

Sources: ICE BoAML indices; BIS.

At least two factors may explain why credit spreads have not widened materially despite rising corporate funding costs. First, many corporates termed out their debt issuance profile in recent years and appear to still have large cash buffers (raised when interest rates were lower). This has allowed them to avoid refinancing at the current high borrowing rates (Graph 7.A). Second, the rise in corporate bond yields has coincided with an increase in the earnings outlook, a combination that has an ambiguous net effect on creditworthiness and, thus, credit spreads.

Nonetheless, tensions in corporate credit markets may lie ahead. A substantial amount of debt will become due in the next few years and will need to be refinanced at significantly higher rates. Small corporates are particularly vulnerable to such a scenario (Box B). The actual refinancing costs could increase further if credit spreads widen during a refinancing wave.

## How does the rise in interest rates affect debt rollover across non-financial firms?

Matteo Aquilina, Ryan Banerjee and Andreas Schrimpf<sup>①</sup>

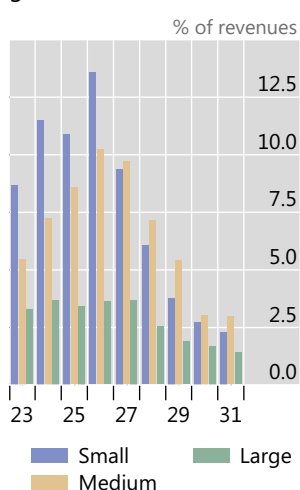
Non-financial firms took advantage of ample cheap credit in the low rate environment. Amid extraordinary policy stimulus, flat yield curves and low corporate spreads incentivised firms to lengthen the maturity of their debt and borrow at fixed interest rates.<sup>②</sup> However, the rapid rise in interest rates over the past 18 months has tightened financial conditions. This will adversely affect firms' ability to roll over maturing debt.

To assess debt rollover needs, we examine over 83,000 debt instruments that were outstanding as of 2023 and were issued by over 18,000 non-financial firms in 53 countries. Our sample extends to firms without credit ratings, thus broadening the canvas relative to that underpinning many other analyses. It also contains relatively small firms. For example, the smallest 5% of the firms in our sample have annual revenues of around \$2 million – the threshold below which firms are commonly regarded as micro-sized in the United States and European Union. Nevertheless, our sample is tilted towards larger firms, which are more likely to disclose detailed information on debt liabilities.

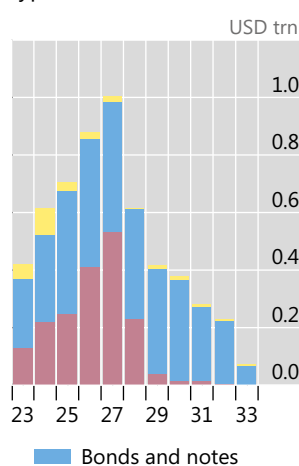
### Rollover needs loom larger for small firms and more bank-dependent systems

Graph B1

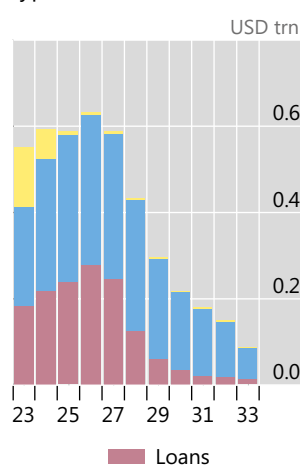
A. Smaller firms have greater rollover needs<sup>1</sup>



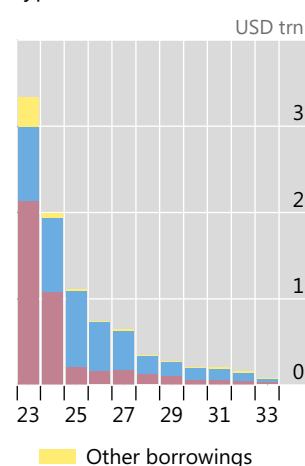
B. Maturity profile by debt type: United States



C. Maturity profile by debt type: other AEs



D. Maturity profile by debt type: EMEs



<sup>1</sup> Small/medium/large = in the bottom/middle/top tercile of 2022 revenues in the respective country.

Sources: S&P Capital IQ; authors' calculations.

Differences in debt refinancing needs by firm size suggest that the current tightening episode will have highly uneven effects across firms. Smaller firms are likely to be subject to significantly larger refinancing pressures than larger ones. In each of the next four years, the bottom tercile of firms – as measured by revenues – has debt coming due in excess of 10% of total annual revenues (Graph B1.A) and over four times annual earnings before interest, taxes, depreciation and amortisation (EBITDA). Although the refinancing needs of medium-sized firms are relatively contained in the near term, they too will rise to around 10% of annual revenues and 40% of annual EBITDA by 2026. The refinancing needs of large firms are lower, at around 3% of annual revenues and only 20% of annual EBITDA. Relative to 2019, the debts coming due over the next two years are around 1 percentage point higher as a share of revenues for large firms but 2 percentage points higher for small and medium-sized firms.

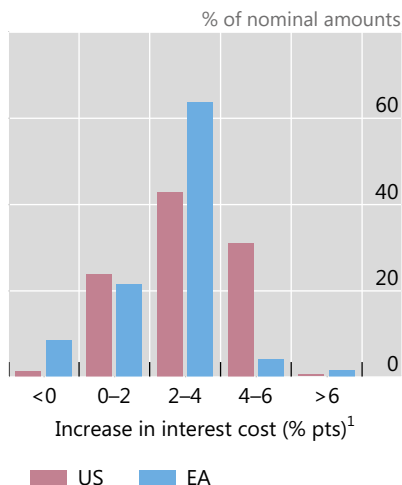
The relative importance of bank and bond finance for non-financial corporates creates important cross-country differences. This is because bank loans tend to be of shorter maturity. In the United States, the greater use of corporate bonds suggests that immediate debt refinancing needs may be muted and will only grow gradually, peaking in around five years (Graph B1.B). By contrast, greater dependence on bank loans and other types of short-term borrowing will

front-load the refinancing needs of firms in other advanced economies and especially in EMEs (Graphs B1.C and B1.D). The refinancing wave has already started for firms in these jurisdictions.

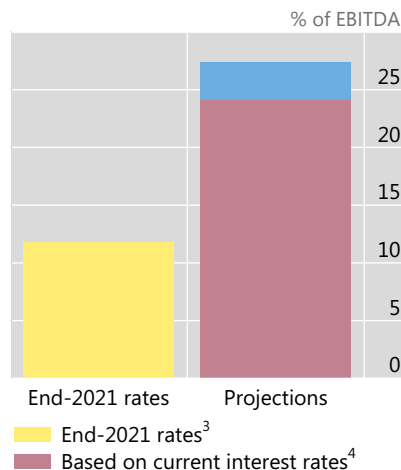
## Debt service burdens under different scenarios

Graph B2

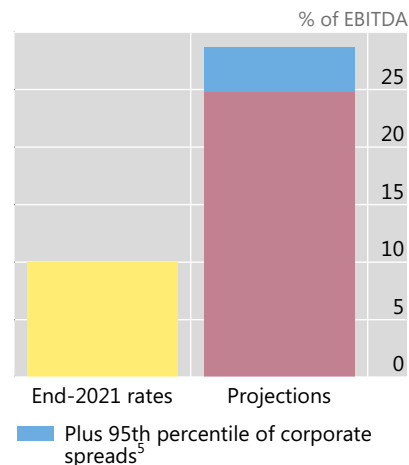
### A. Firms to pay significantly higher rates to refinance maturing bonds



### B. Interest payments on NFC debt in different interest rate scenarios: US<sup>2</sup>



### C. Interest payments on NFC debt in different interest rate scenarios: EU<sup>2</sup>



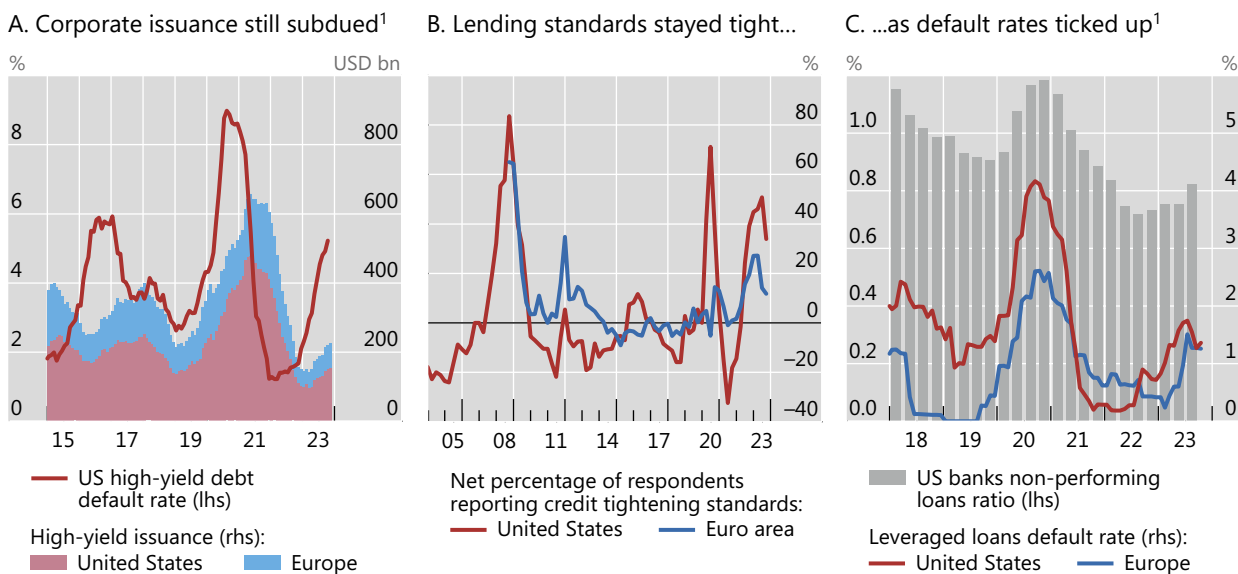
<sup>1</sup> Difference between the current secondary market yield and the corresponding coupon on corporate bonds maturing within the next 24 months. <sup>2</sup> Based on total debt across firms in Q2 2022 relative to 2021 EBITDA. <sup>3</sup> Interest payments on total debt. <sup>4</sup> Interest payments based on end-2021 rates plus additional interest payments, reflecting the change in the yield to maturity of the ICE Bank of America Merrill Lynch 10-year corporate bond index from end-2021 to September 2023. <sup>5</sup> Based on OAS historical distribution since 1997.

Sources: Bank of America Merrill Lynch; S&P Capital IQ; iBoxx; authors' calculations.

Finally, the extent of monetary tightening in specific jurisdictions could make a difference across firms. As the United States has experienced the largest increase in interest rates among the major advanced economies, the extra cost of rolling over maturing US dollar-denominated debt is likely to be higher than debt denominated in other major currencies. To give a sense of the potential upward pressure on refinancing costs, we compare current yields on corporate bonds in secondary markets with those prevailing at the time of issuance. This suggests that over 30% of the total amount of US dollar bonds maturing in 2024/25, if they are to be refinanced, will have interest rates that are 4 or more percentage points higher than what firms were paying in late 2021 (Graph B2.A). By contrast, the corresponding share for euro-denominated bonds is only 6%. Nevertheless, secondary market yields suggest that at least 60% of maturing euro-denominated corporate bonds will face interest rates that are between 2 and 4 percentage points higher than in late 2021 if they are refinanced (Graph B2.B).

Servicing existing debt at current interest rate levels could be challenging for many firms. Simulations suggest that debt servicing costs relative to earnings could more than double if yields remain at current levels and firms refinance the totality of their debt (Graphs B2.B and C, yellow and red bars). Moreover, should the currently compressed credit spreads widen, firms' debt servicing challenges would worsen. For instance, if credit spreads were to increase to the 95th percentile of the historical distribution, this could increase debt service-to-EBITDA ratios by an additional 3.5 percentage points, in both the United States and the European Union (Graph B2.C and D, blue bars).

① The views expressed are those of the authors and do not necessarily reflect the views of the BIS. ② See M Ampudia, E Eren and M Lombardi, "Non-financial corporates' balance sheets and monetary policy tightening, *BIS Quarterly Review*, September 2023, pp 9–10.



<sup>1</sup> See technical annex for details.

Sources: Board of Governors of the Federal Reserve System; BankRegData; Datastream; Dealogic; Moody's; PitchBook | LCD; BIS.

Bank lending remained subdued because of both supply and demand factors. Banks continued to extend credit with caution, keeping lending standards tight in both the United States and euro area (Graph 7.B). According to market sources, rising credit losses and funding pressures were recurring topics at recent earnings calls.<sup>4</sup> Indeed, the non-performing loan ratios of US banks ticked up in the third quarter (Graph 7.C), particularly for commercial real estate, credit cards and auto loans. At the same time, default rates on leveraged loans in both the United States and the euro area moderated. In addition, loan demand fell in both the United States and the euro area alike: 60% of US banks cited weaker demand for home mortgages in the third quarter, up from 43% in the previous quarter.

## EMEs feel the effects of global conditions

Developments in EME financial markets were closely intertwined with the global environment. Portfolio outflows continued for most of the review period, exerting pressure on local currencies, bond and equity markets. In China, macroeconomic conditions remained fragile, with positive and negative macroeconomic surprises alternating. Similar to AEs, November brought some respite across EMEs, as US long-term yields declined and the US dollar depreciated.

EME currencies ended the review period broadly unchanged against the US dollar, but differed from each other in terms of the path they followed. Latin American currencies depreciated substantially in September and October (Graph 8.A), reflecting expectations of rate cuts and rising US yields. They recovered in November amid a robust domestic macro outlook and a rapid decline in US yields. Incentives for carry

<sup>4</sup> For persistent headwinds in the life insurance sector, see Box C.

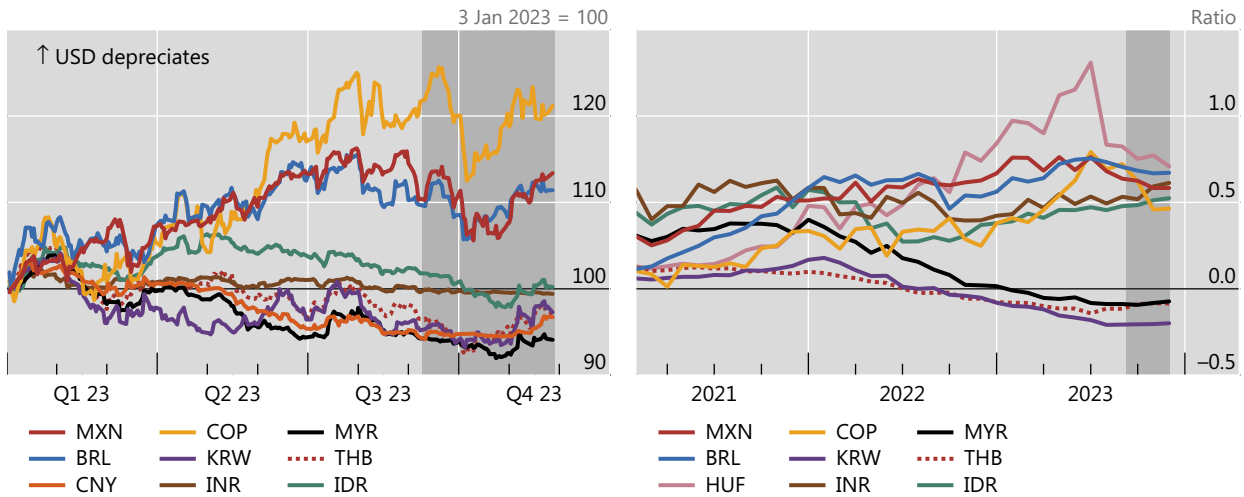
trades partly explain these exchange rate movements, as Latin America had received substantial inflows earlier in the year, but carry-to-risk ratios subsequently declined (Graph 8.B), prompting some outflows. Asian currencies, by contrast, were much more stable throughout, in part also due to foreign exchange interventions by central banks in the region (see below).

## EME exchange rate movements followed changes in yields

Graph 8

### A. Currencies more volatile in Latin America than in Asia

### B. Carry-to-risk ratios declined<sup>1</sup>



The shaded area indicates 9 September–24 November 2023 (period under review).

<sup>1</sup> See technical annex for details.

Sources: Bloomberg; Datastream; JPMorgan; BIS.

Sovereign bond yields in a number of EMEs rose amid investor selling pressures and then declined. Yields on 10-year government bonds increased substantially in Latin America, and to a lesser extent in European and Asian EMEs before recovering some ground in November (Graph 9.A). Brazil also saw an increase in real yields, despite renewed policy rate cuts (Graph 9.B). Estimates of term premia widened in Latin America more generally (Graph 9.C), as investor demand for local currency bonds decreased.

## Life insurance companies – the missing relief from rising interest rates

Bettina Farkas, Ulf Lewrick, Tomas Stastny and Nikola Tarashev <sup>①</sup>

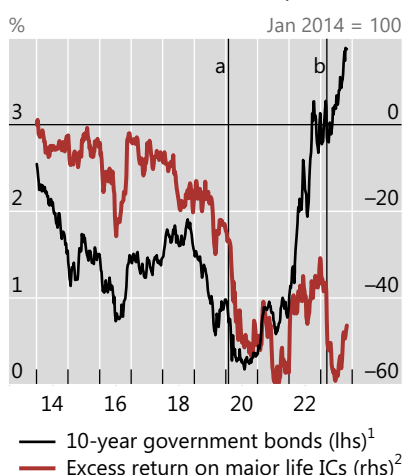
Given that life insurance companies' (ICs) valuations came under pressure during the low-for-long era, a natural question is whether the global monetary policy tightening has brought relief. Since life ICs' liabilities are generally of longer maturity than their assets, a decline in bond yields tends to make the discounted present value of these liabilities rise by more than that of the assets (a "negative duration gap"). To the extent that it remains unhedged, the negative duration gap would be an important headwind, thus helping to explain the underperformance of life ICs' stock prices relative to broader indices up to end-2020. However, this underperformance has not gone into reverse with the rise in yields as policy rates soared over the past two years (Graph C1.A).

In this box, we discuss potential reasons for the lack of relief for life ICs' stock prices. We point to the evolution of the shape of the yield curve and to the risk that – similar to banks' experience in March 2023 – liquidity needs force life ICs to recognise yet unrecognised losses. We conclude by highlighting challenges that life ICs may need to overcome as the effects of monetary tightening play out through the system.

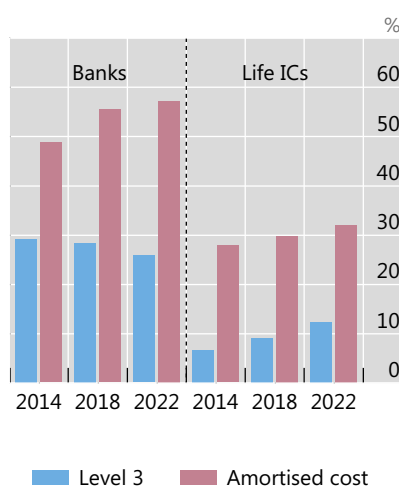
### Life insurance companies (ICs): valuation pressures despite rising rates

Graph C1

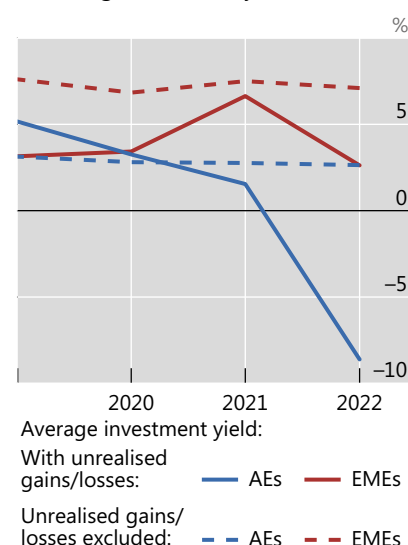
#### A. Life IC stocks still underperform



#### B. Difficult-to-value assets<sup>3</sup>



#### C. Sliding investment yields<sup>4</sup>



<sup>a</sup> World Health Organization declares an international public health emergency (30 January 2020). <sup>b</sup> Silicon Valley Bank fails (10 March 2023).

<sup>1</sup> Average across the same ICs' home jurisdictions, using the same weights as for excess returns. <sup>2</sup> Cumulative equity returns relative to the domestic stock market since January 2014; asset-weighted average across 14 large life ICs from eight AEs. <sup>3</sup> Asset-weighted average for a balanced sample of 33 life ICs and 601 banks from 40 countries. Level 3 assets are highly illiquid and their valuation relies on modelled estimates; amortised cost assets are reported at historical cost, abstracting from temporary valuation changes. <sup>4</sup> Investment income, divided by the sum of cash and invested assets; weighted averages across jurisdictions, with weights based on national insurance sectors' assets.

Sources: IAIS (SWM and IIM data); Bloomberg; S&P Capital IQ; national data; authors' calculations.

Our analysis draws on several data sources. Two come from the International Association of Insurance Supervisors (IAIS) and underpin its monitoring of risks in the global insurance sector.<sup>②</sup> The first data source, Sector-Wide Monitoring (SWM), is at the national insurance sector level. It covers 30 advanced economies (AEs) and 15 emerging market economies (EMEs), with life ICs accounting for over 70% of total assets in the median country.<sup>③</sup> The second source, Individual Insurer Monitoring (IIM), is at the consolidated group level. From it, we obtain data on nearly 50 major life and composite ICs headquartered in 11 AEs and seven EMEs. We complement these yearly data sets, which extend from 2019 to 2022, with longer market and balance sheet data on life ICs and banks.

When it comes to the value of life ICs' equity, there are signs that the level and shape of the yield curve have been pulling in opposite directions. On the one hand, given generally negative duration gaps – two years on average across major life ICs – a parallel upward shift in the yield curve, as observed at the start of the monetary tightening cycle in early 2022, would have boosted the value of equity. On the other hand, the rise of yields at the shorter end of the curve *above* those at the longer end – ie the inversion of the curve as of late-2022 – could have partly offset this effect by imposing a higher discount rate for life ICs' fixed income assets than for their liabilities. Depending on the specific composition of individual ICs' balance sheets, the asset losses can even surpass benefits on the liability side.

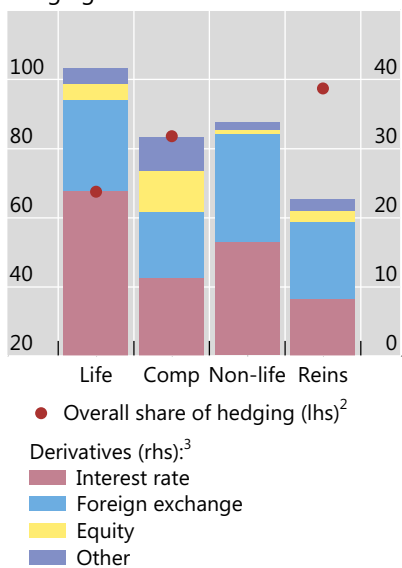
With the surge in discount rates, the exposure of investors in life ICs' equity to *unrealised* losses – which accumulate on various assets not measured at fair value through profit or loss – has also gained in importance. The level of such losses is inherently difficult to assess for so-called Level 3 assets (ie complex or highly illiquid instruments), for which balance sheet values are typically based on model estimates. There are similar difficulties with assets held at amortised cost (typically loans and mortgages without an active market), which do not reflect changes in market valuations viewed as temporary. The shares of Level 3 and amortised cost assets on life ICs' balance sheets stood at 12% and 32% in 2022, respectively, compared with 26% and 57% for banks (Graph C1.B). By contrast, unrealised losses are known for those securities whose market value affects book equity but not accounting profits. For example, this is the case for parts of sovereign and corporate bond portfolios, with the overall size of these portfolios representing about half of the total investments covered by the IIM data set.<sup>4</sup> Unrealised losses in such portfolios built up in the course of 2022 for life ICs, especially AE entities (Graph C1.C). In all these cases, the key underlying question is whether the accumulated losses may undermine life ICs' performance and capital positions if liquidity needs force them to sell the underlying assets.

## Sources of liquidity risk<sup>1</sup>

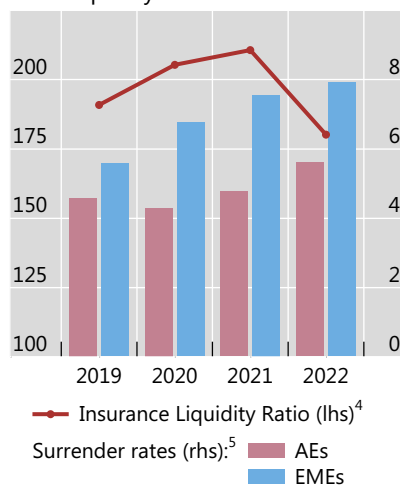
In per cent

Graph C2

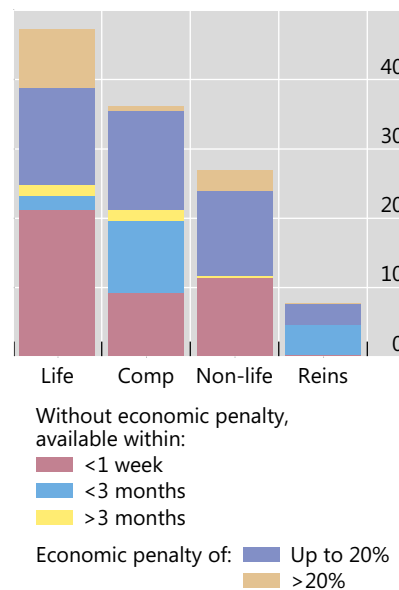
A. ICs' derivatives: mostly for hedging



B. Surrender rates have been rising while liquidity ratios have worsened



C. Surrender potential still high<sup>5</sup>



Comp = composite; Reins = reinsurance.

<sup>1</sup> The "life" and "non-life" designation is applied to companies with predominantly life and non-life lines of business, respectively. <sup>2</sup> In total gross notional amounts; not available for non-life ICs due to data gaps. <sup>3</sup> Gross notional amounts relative to total assets. <sup>4</sup> One-year Insurance Liquidity Ratio, which equals an IC's liquidity resources divided by its liquidity needs under stress over a one-year horizon. This ratio is one of several metrics that together constitute the IAIS's ancillary indicator for liquidity risk monitoring; weighted averages across a balanced sample of 38 life and composite ICs. <sup>5</sup> As a share of total assets including general and separate accounts.

Sources: IAIS (SWM and IIM data); authors' calculations.

One potential source of liquidity needs are derivatives-related margin calls. ICs in general, and life ICs in particular, hold material gross derivatives positions, mostly for hedging purposes (Graph C2.A). Given their negative duration gap, the risk of *falling* interest rates is one of the main risks that life ICs seek to hedge, at least partially – about half of their derivatives portfolio is comprised of interest rate derivatives, with a gross notional amount equivalent to about 20% of total assets on average. When interest rates *rise*, however, ICs incur losses on their derivatives' market value and have to post variation margins. High volatility can lead to additional, initial margin requirements. In each case, margins drain the entity's liquidity.

Liquidity pressure on life ICs could also arise from policy surrenders, which are on the increase. In 2022, the share of surrenders in outstanding life policies reached 5.5% in AEs and 8% in EMEs (Graph C2.B, bars). Policies with guaranteed but low rates, such as those issued during the low-for-long era, could prove particularly susceptible to surrenders, given the availability of alternative investments with higher returns (eg term deposits, investment funds). In the face of surrenders, ICs experience either a decline in liquid assets, if policies are not replaced, or a decline in profits, if policyholders switch to new policies that offer higher benefits.

Even though ICs generally have buffers to cushion an increase in liquidity needs, so that they can avoid realising losses on assets they do not intend to sell, there seem to be pockets of vulnerability. In 2022, a key measure of these buffers, the one-year Insurance Liquidity Ratio (ILR), averaged 180% across the life and composite ICs in the IIM (Graph C2.B, line). This is despite a sharp decline in that year, due to higher interest rates depressing the value of ICs' liquid assets (the ILR numerator) amid rising liquidity needs, eg because of surrenders (the ILR denominator). That said, four of these ICs reported an ILR of less than 100% at end-2022, indicating potential liquidity shortage under stress.

Going forward, the performance of life ICs will depend on how they manage liquidity as well as credit risks. Liquidity management would need to address the risk of margin calls, which are an inherent feature of derivatives positions, as well as surrender risk. For major life ICs, the policies that allow surrenders amount on average to nearly 50% of total assets, a higher share than for non-life and other ICs (Graph C2.C). For about half of these, contractual penalties on policyholders provide protection to the insurer against surrenders; for the other half, any protection stems mainly from tax treatments that raise the effective cost of surrenders. Alongside the risk of liquidity needs, credit risk has come to the fore, as debt servicing costs have increased for many borrowers on the back of soaring interest rates. While life ICs typically focus on highly rated securities, credit losses could emerge from exposure to real estate, a sector particularly hit by the pandemic and monetary policy tightening. Losses could also materialise in private credit, an opaque corner of the system where some life ICs sought to compensate for meagre interest income during the low-for-long era.<sup>⑤</sup>

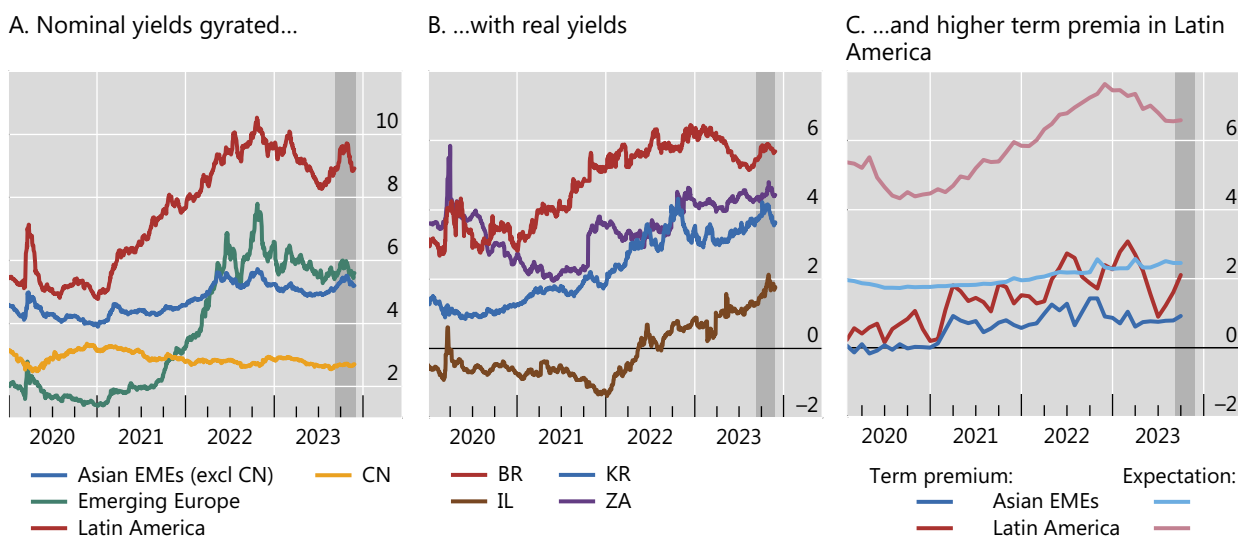
① The views expressed are those of the authors and do not necessarily represent the views of the Bank for International Settlements or the International Association of Insurance Supervisors (IAIS). ② For a discussion of the IAIS's most recent Global Monitoring Exercise, see IAIS, *Global insurance market report 2023*, forthcoming. ③ Non-life ICs are as far as possible excluded from the analysis (they are not separated from life ICs only in Graph C1.C), as they are less exposed to the factors discussed in this box. Major non-life ICs report an average duration of liabilities of eight years and a duration gap of –1.5 years as of end-2022. These numbers are 11 and –2 years for major life ICs. ④ In principle, some sovereign or corporate bonds may be held at amortised cost, where unrealised losses affect neither accounting profits nor capital. However, this accounting treatment is reportedly less prevalent among life ICs than banks. ⑤ For a recent analysis of the decline in European ICs' credit quality, see J Brinkhoff and J Sole, "Did insurers become risk-loving during 'low-for-long'? The role of returns, ratings, and regulation", *IMF Working Papers*, no 2022/202, 2022.



## Long-term yields in EMEs moved with real yields; term premia rose<sup>1</sup>

In per cent

Graph 9



The shaded area indicates 9 September–24 November 2023 (period under review).

<sup>1</sup> See technical annex for details.

Sources: S Joslin et al (2011); Bloomberg; Datastream; Refinitiv; BIS.

Fund flow data suggested that foreign investors' appetite for EME risk diminished. Portfolio outflows accelerated for most of the review period but have recently moderated in Asia and reversed in Latin America. Outflows in Latin America affected both bond and equity funds (Graph 10.A) continuing a trend since the summer. In Asia, outflows were concentrated in bond funds reflecting lower local yields than in the United States and other AEs (Graph 10.B).

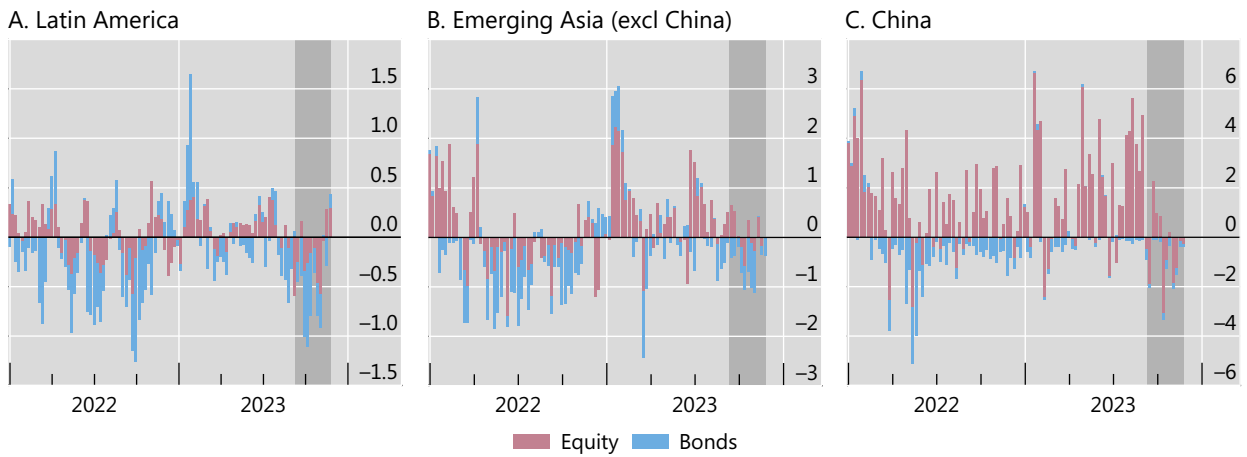
Foreign investor retrenchment from China went hand in hand with the country's changing macroeconomic news. As positive surprises early and late in the review period were not sufficient to reassure investors, outflows from both bond and equity funds featured throughout the review period (Graph 10.C). Amid a generally weak growth outlook, local currency bond yields remained significantly below those in other major economies, as the central bank continued to stimulate the economy.

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## Most of the review period featured portfolio outflows from EMEs

In billions of US dollars

Graph 10



The shaded area indicates 9 September–24 November 2023 (period under review).

Sources: EPFR; BIS.

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EME authorities have been actively managing exchange rate pressures. Some central banks reportedly intervened in FX markets, as suggested by declining FX reserves, to contain effects on local currencies. Others raised policy rates to help preserve external stability, notwithstanding a benign domestic inflation outlook. Authorities in a number of EME jurisdictions have drawn from a broad policy toolkit that includes interventions in currency spot, derivatives and local bond markets.

Some EME central banks have been adding to or adjusting the set of tools they use. For example, Bank Indonesia started issuing securities with interest rates linked to US dollar rates to attract foreign investors and replenish foreign exchange reserves. In turn, the Bank of Mexico has reduced the size of its foreign exchange hedging programme, as conditions on the peso-dollar market stabilised.

## Technical annex

Graph 1.A and 1.B: Other AEs based on simple average of AU, CA and GB.

Graph 1.C: Ten-year maturity. Monthly data up to end-October 2023. Estimates based on the joint macroeconomic and term structure model of P Hördahl and O Tristani, "Inflation risk premia in the euro area and the United States", *International Journal of Central Banking*, vol 10, no 3, September 2014.

Graph 2.B: Computed as the annualised monthly sum of daily squared returns on the Refinitiv 10-year government benchmark index. The monthly volatility for November 2023 was computed using data up to 24 November.

Graph 3.C: PCE for headline and PCE excluding food and energy for core. Forecasts from Cleveland Fed NowCast.

Graph 5.A: US = Nasdaq composite index; CN = Shanghai Shenzhen CSI 300 index. Country group aggregates based on GDP-weighted averages.

Graph 7.A: US high-yield default rate based on Moody's 12-month rolling US speculative grade default rates. High-yield issuance based on a 12-month rolling sum.

Graph 7.C: Twelve-month rolling leveraged loan default rates based, respectively, on Morningstar LSTA US Leveraged Loan Index (LLI) and Morningstar European Leveraged Loan Index (ELLI).

Graph 8.B: One-month interest rate differential divided by the implied volatility of one-month at-the-money currency options.

Graph 9.A: Ten-year maturity. Asian EMEs (excl CN) = simple average of ID, IN, MY and TH; emerging Europe = simple average of CZ, HU, PL, RO and SK; Latin America = simple average of BR, CL, CO, MX and PE.

Graph 9.B: Ten-year maturity.

Graph 9.C: Estimates based on the term structure model of S Joslin, K Singleton and H Zhu, "A new perspective on Gaussian dynamic term structure models", *Review of Financial Studies*, vol 24, no 3, 2011. Regional unweighted averages of estimated term premia and expectations components, estimated using zero coupon local currency bond yields for each market. Other AEs: AU, CA, CH, GB and SE; Asian EMEs: HK, ID, IN, KR, SG and TH; Latin America: BR, CL, CO, MX and PE.