

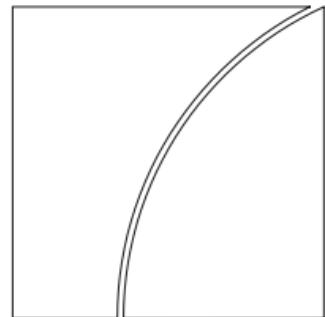


*The transformation of the life insurance industry: systemic risks and policy challenges*

Gaston Gelos

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## BIS Papers

No 161

The transformation of the life  
insurance industry: systemic risks  
and policy challenges

by Matteo Aquilina, Fabian Garavito, Gaston Gelos,  
Ulf Lewrick, Frank Packer, Gabor Pinter,  
Vladyslav Sushko and Karamfil Todorov

Monetary and Economic Department

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Keywords: Life insurance, non-bank financial  
institutions, systemic risk, reinsurance.

## Motivation

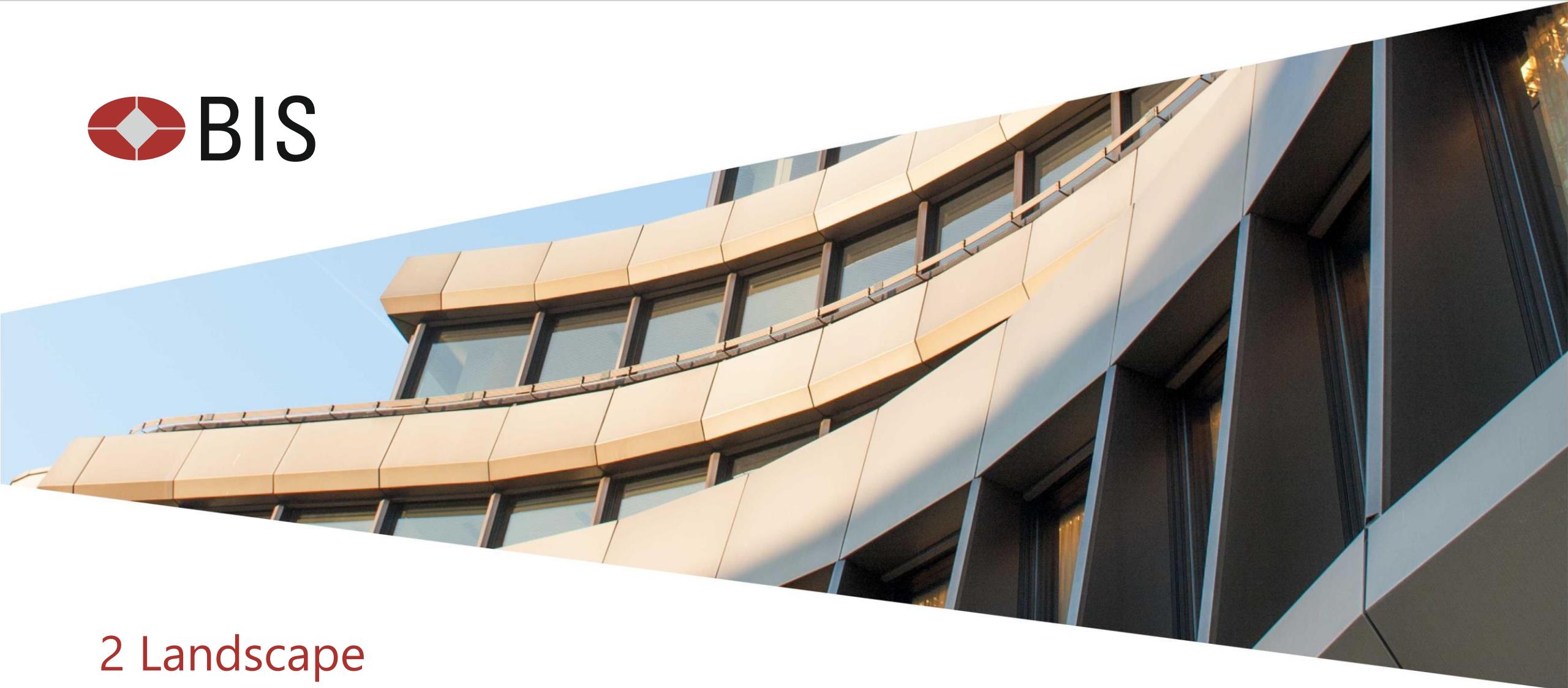
- Why take a new look at life insurers & systemic risks?
  - Sector traditionally stable, investing in low-risk assets & less runnable and longer duration liabilities than banks
  - But things have changed:
    - Since post-GFC period, more investment in riskier and less liquid assets
    - Liquidity risks increased: issuance of short-term liabilities, more derivatives usage
    - Private equity (PE) participation: benefits, but also new complexities and governance risks
    - Offshore “asset-intensive reinsurance”, often with PE has led to concentration and higher opacity
  - This combination of riskier assets, higher rollover risk, and complex structures raises the likelihood of idiosyncratic event being a “wake-up call” triggering exits and fire sales.
    - Amplified by common exposure and interconnectedness

## A road map for what follows

- Landscape
- Measures of systemic risk
- Use of derivatives and liquidity risks
- Structural shifts and related risks
  
- Policy implications can be discussed in Q&A
- [Boxes/Annexes (not presented here but complementary to messages of paper)]
  - *UK (work with BOE); Case study of failure (Eurovita), Euro area liquidity stresses (work with EIOPA); FX hedging by Chinese Taipei insurers*



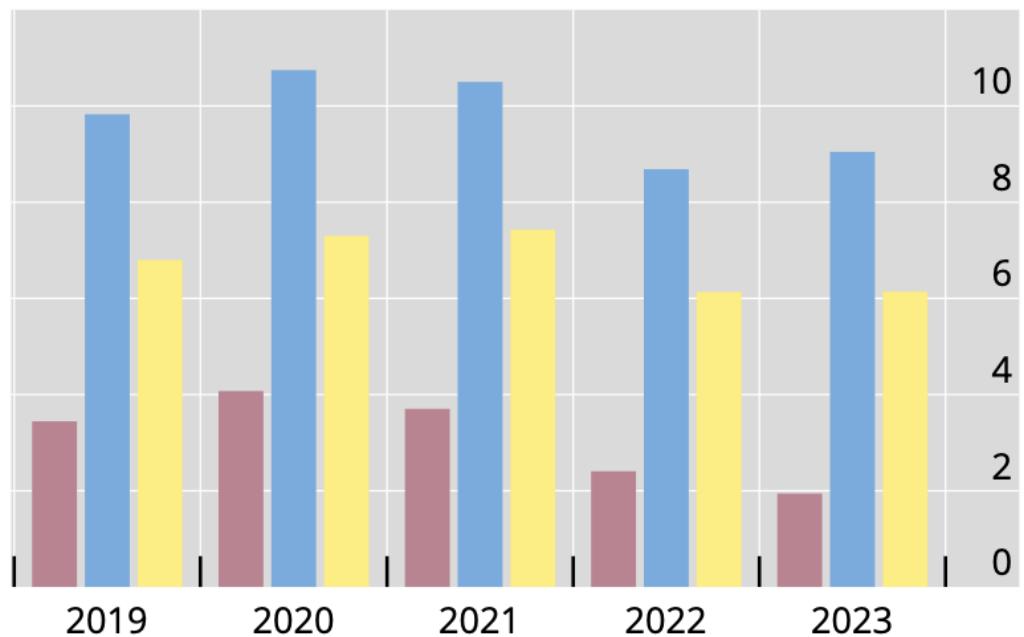
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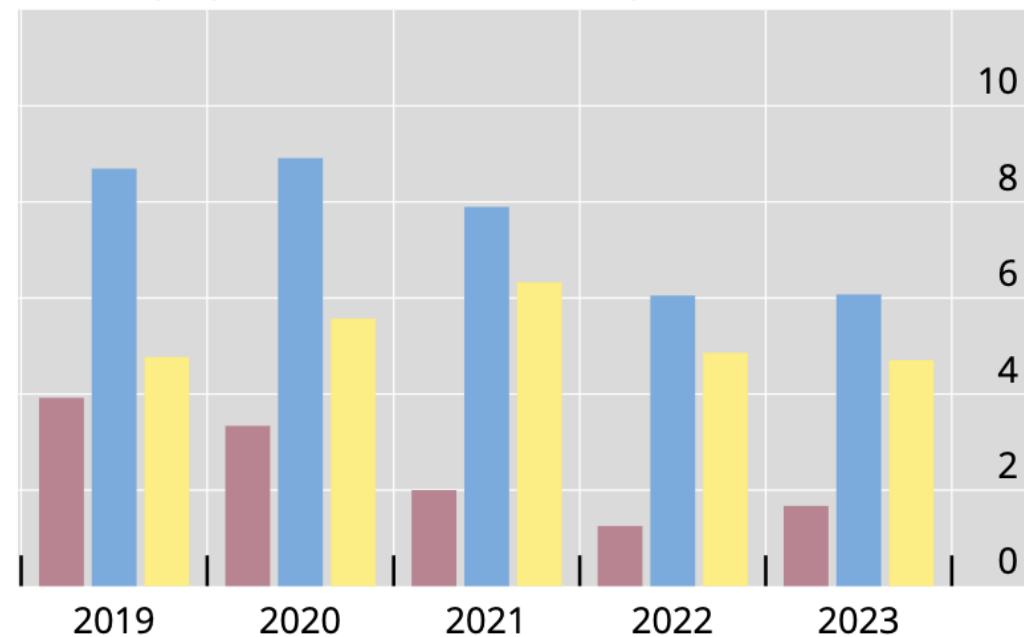
**2 Landscape**

## Interest rate risk: Large duration gap

A. Advanced economies



B. Emerging market and developing economies



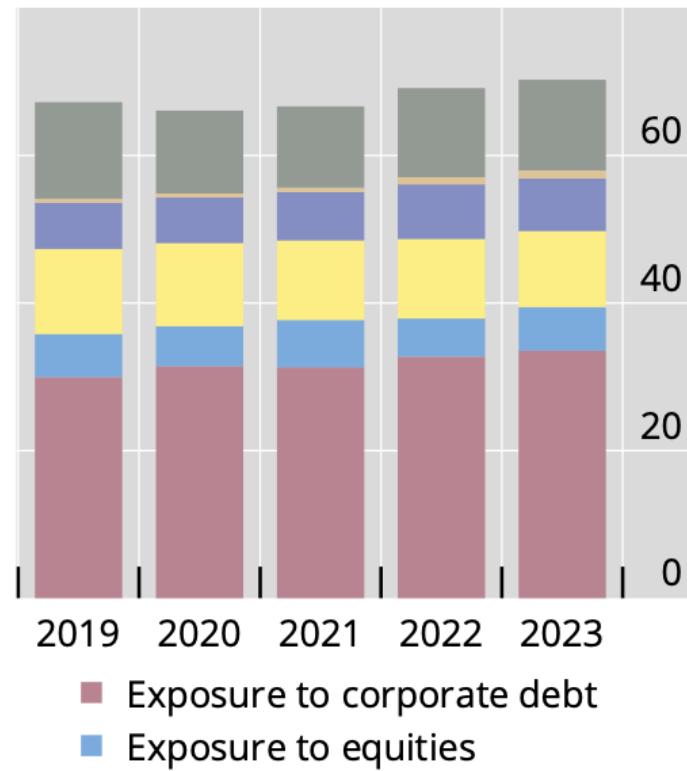
Duration:

- Gap
- Liabilities
- Assets

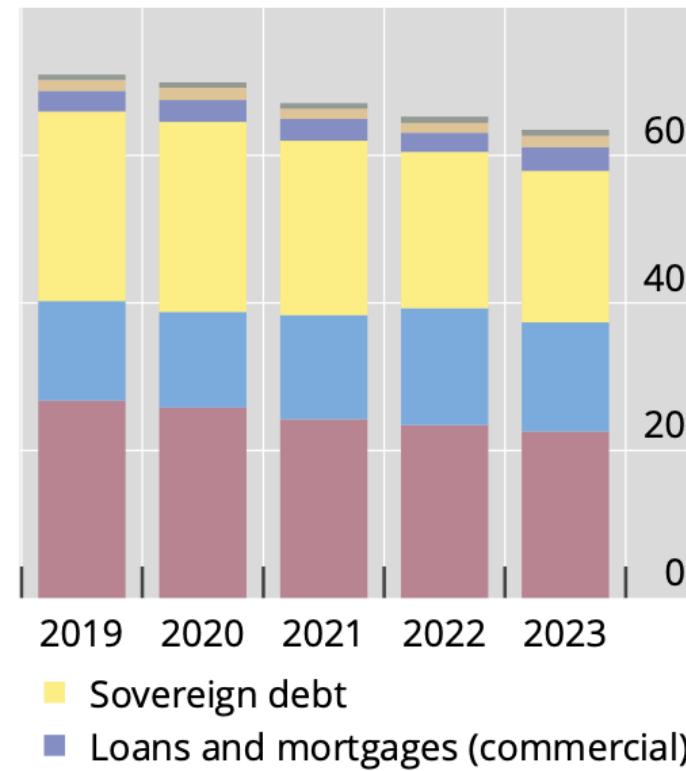
<sup>1</sup> Median values.

# Investment risk: Significant jurisdictional differences in life insurers' portfolios

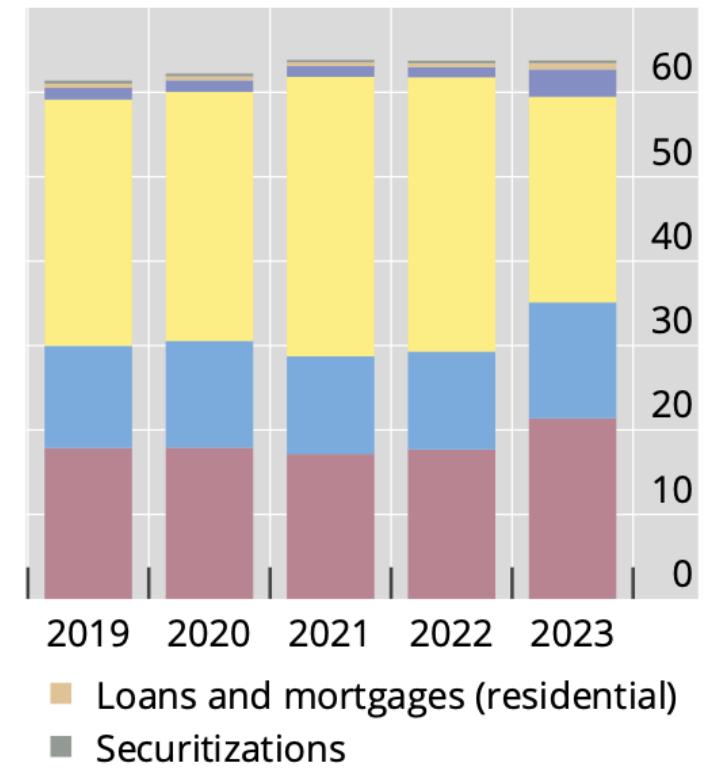
A. Americas



B. Europe and Africa

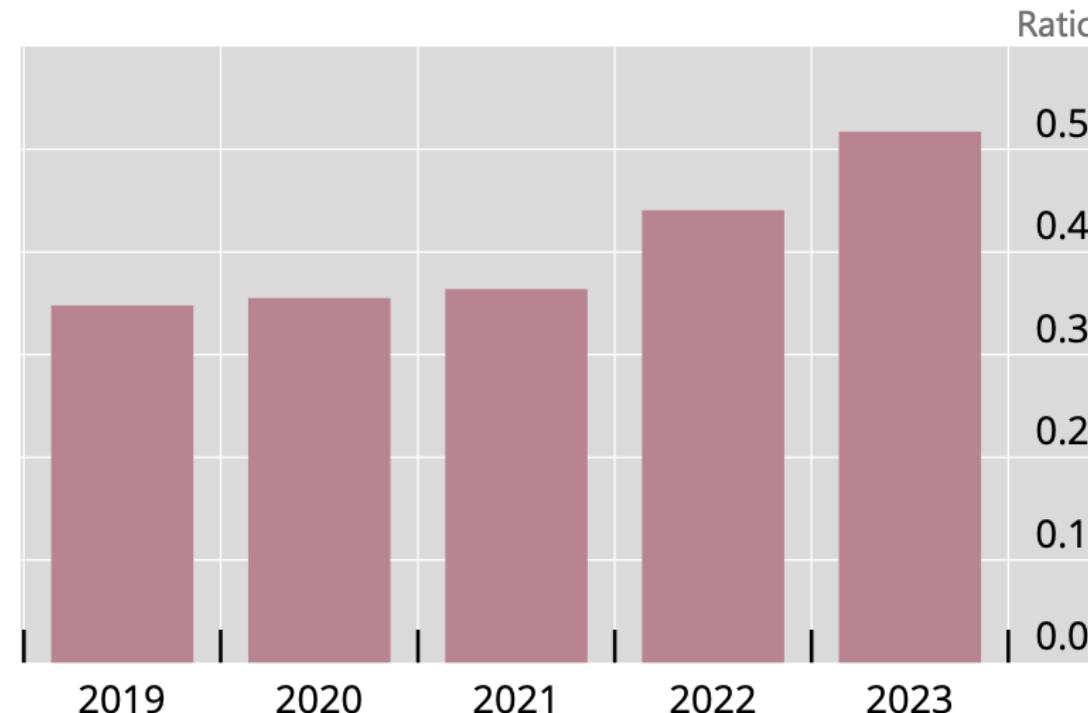


C. Asia and Oceania



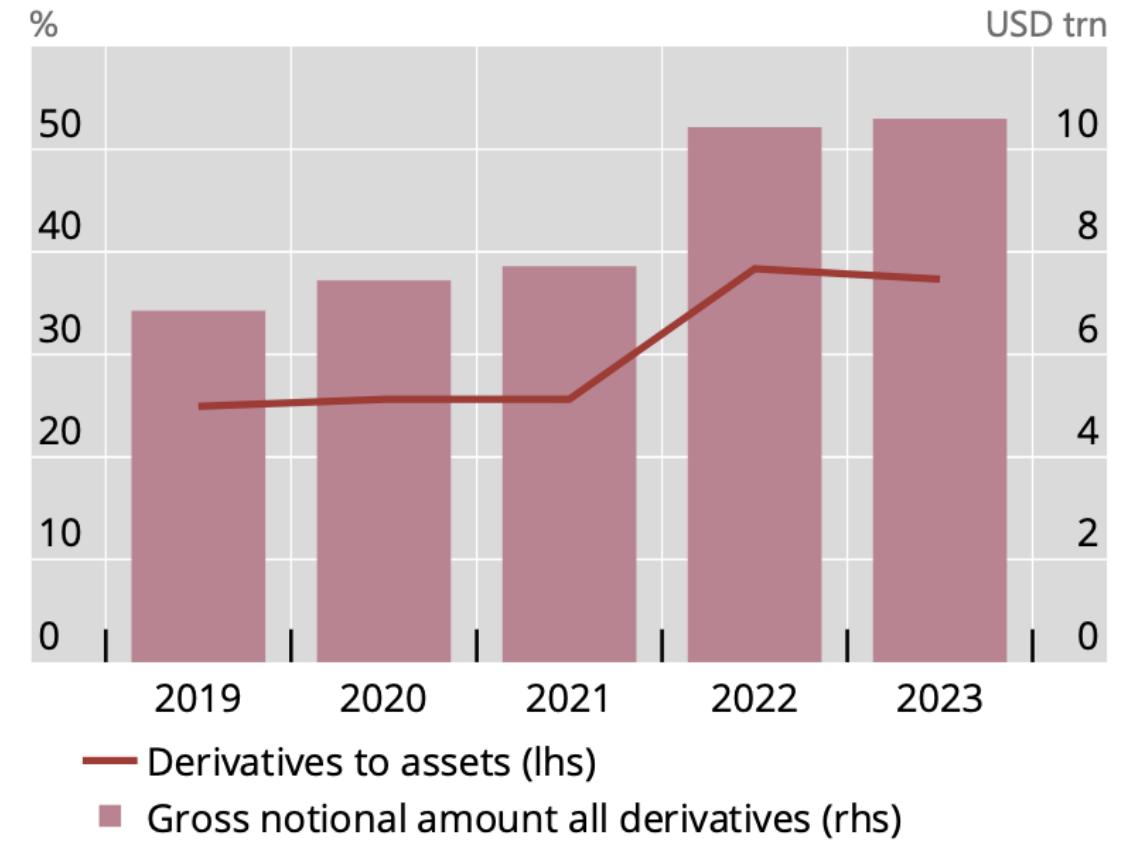
## Liquidity risks: Surrenders and margin calls

A. Provisions surrendered to net written premiums



■ Provisions surrendered / net written premiums

B. Derivatives

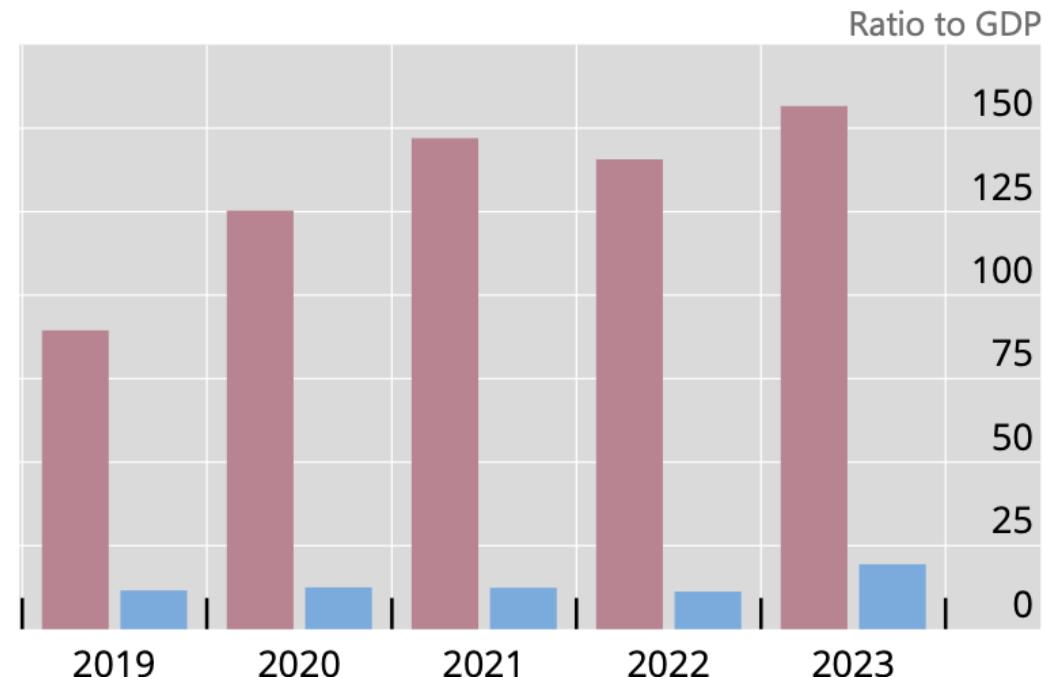


— Derivatives to assets (lhs)

■ Gross notional amount all derivatives (rhs)

## Growing importance of reinsurance and offshore centres

A. Life insurance sector assets to GDP



Total assets life:  
■ Bermuda  
■ Cayman Islands

B. Surge in risks shifted offshore



— Offshore ceded reserves (lhs)

Reserves ceded to (rhs):  
■ Onshore reinsurers  
■ Offshore affiliates  
■ Offshore non-affiliates

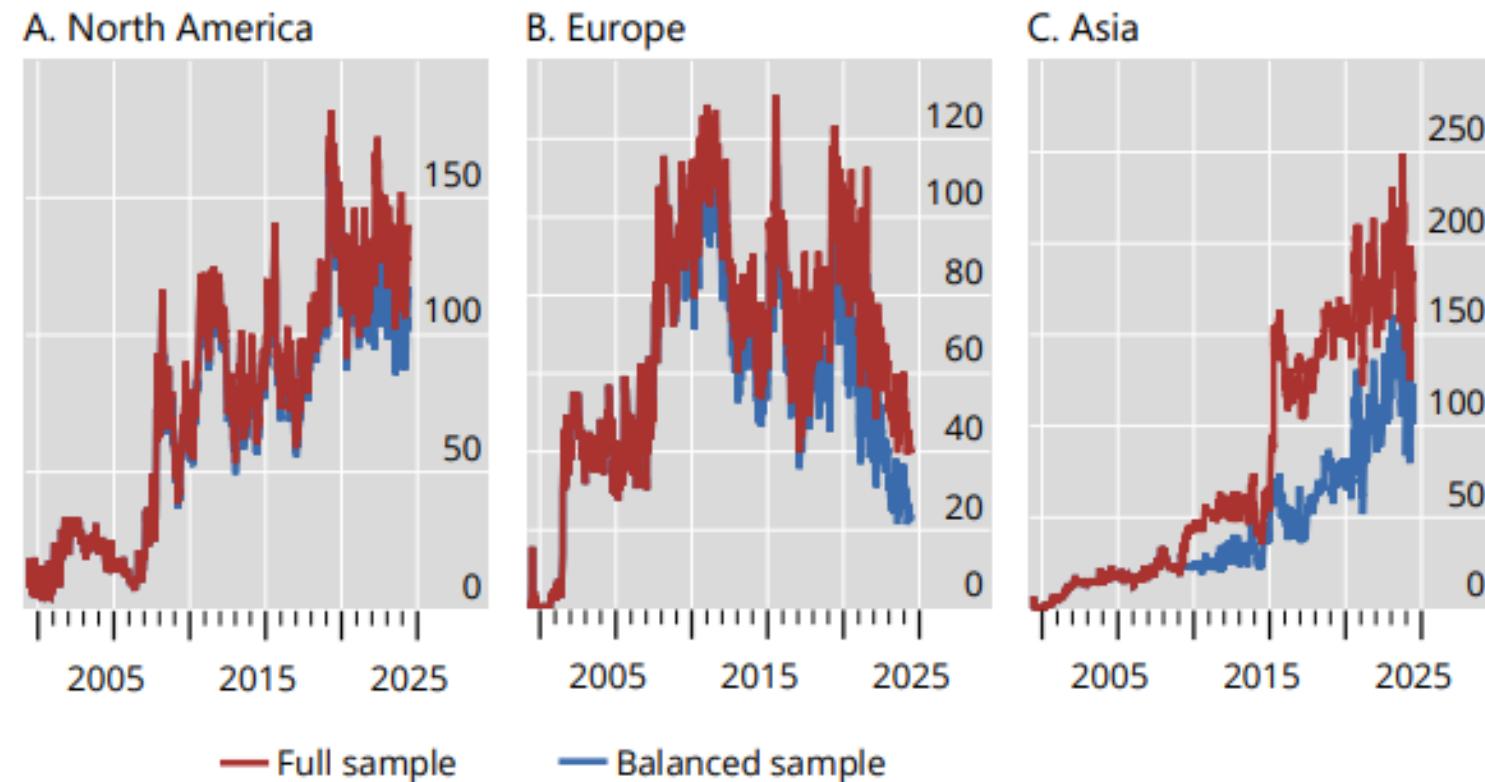
A close-up photograph of a modern building's exterior. The building features a curved, light-colored facade with a grid of windows. The warm, golden light of the setting sun highlights the building's architectural details, creating a sense of depth and perspective. The sky above is a clear, pale blue.

## 3 Measures of systemic risk

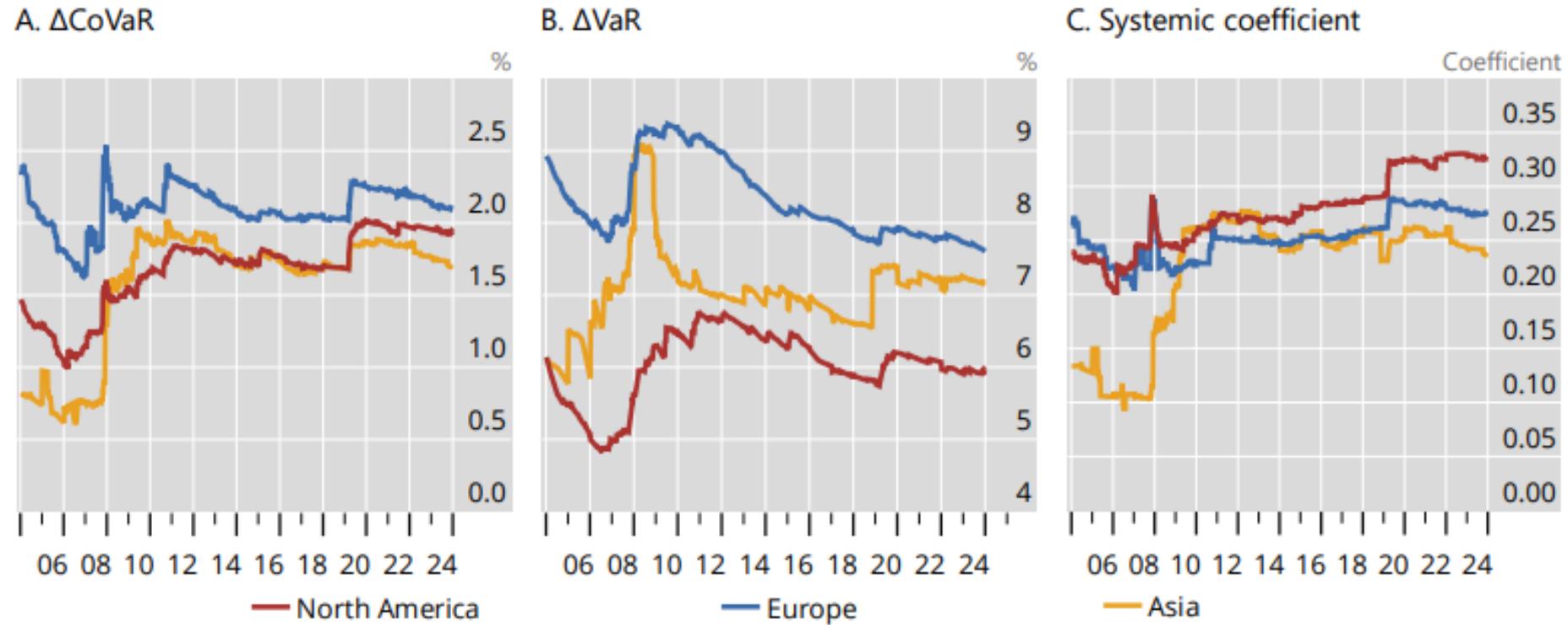
## We use SRISK and $\Delta$ CoVar to measure systemic risk

- Aggregate measures of systemic risk can shed light on high-level trends in the sector, and compare them to other sectors.
- SRISK: expected capital shortfall (of an insurance company) conditional on a severe market decline.
  - Total SRISK is the total amount of money that taxpayers would need to pay to *bail out* the sector
- $\Delta$ CoVar: given that an institution is in distress how does the system's value-at-risk (VaR) change?
  - The sum of  $\Delta$ CoVar (weighed by market cap) shows the % Value at Risk
- These measures together look at systemic risk from two complementary angles.

SRISK of life ICs increasing, because of trend in North America and Asia. SRISK in Europe declined.



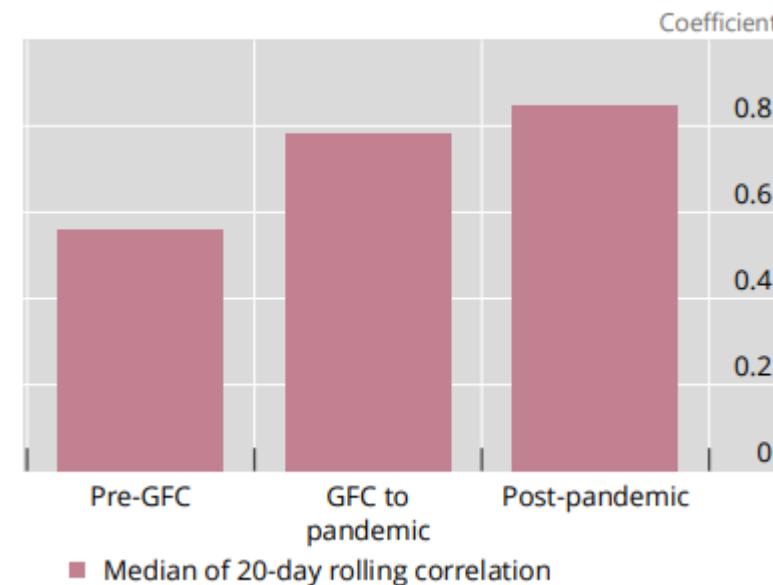
$\Delta\text{CoVar}$  aligned with SRIS, but somewhat flatter. Two opposite patterns: lower  $\Delta\text{Var}$  and higher systemic coefficient



## SRISK of life insurers and banks becoming more correlated over time

- Pre-GFC correlation of SRISK among banks and life insurers was ~55%, since the pandemic it went up to ~85%
- Similar results found by Acharya et al (2024) for NBFI as a whole

B. Correlation of life insurers' and banks' SRISK





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## 4 Use of derivatives and liquidity risks

## Derivatives books and the solvency-liquidity trade-off

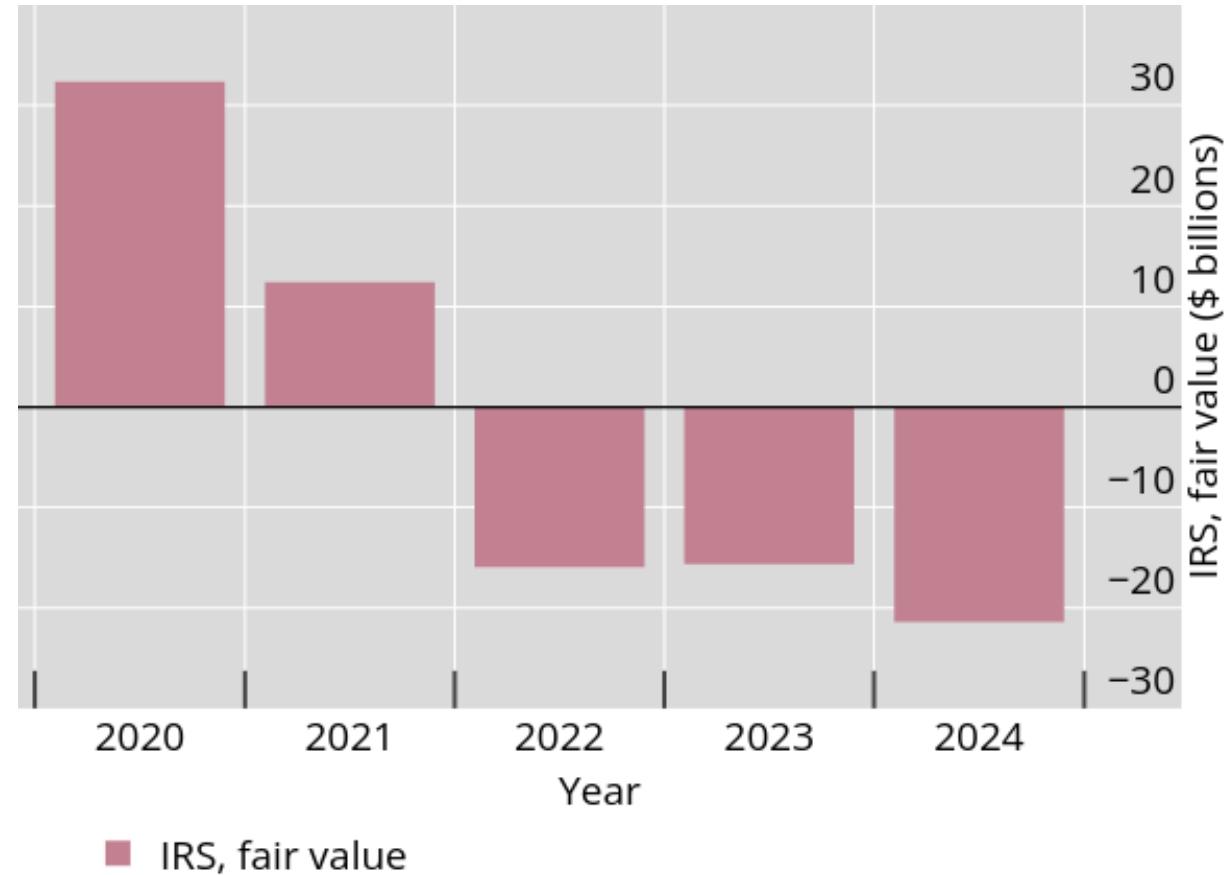
- Insurers' derivatives books have grown significantly
  - Expansion of investment portfolios, hedging needs due to a shift towards risk-based capital requirements, and greater complexity of their investments
- Life insurers turn to derivatives to manage risks to solvency, eg duration or currency risk:
  - A trade-off of solvency risk for liquidity risk (margin & collateral calls)
- Life insurance sector typically not associated with liquidity risk:
  - Regulators focus on solvency, hence *risk-based capital requirements* (eg Solvency II)
  - ... but not on liquidity, hence *no regulatory liquidity requirements*
- Growing number of central banks granting insurers access to contingent liquidity facilities
  - A de-facto recognition that liquidity risk in the sector can have systemic implications
  - SNB, BOC (since 2020), BoE (after LDI crisis); non-CB liquidity backstops: JP DICJ, US FHLBs

## Main takeaways

- Liquidity risks from interest rate hedging can correlate with liquidity risks from policy surrenders
  - When rates rise, market values of pay fixed swaps (duration mismatch hedges) turn negative
  - When rates rise, policy surrender risks rise (slower passthrough an ameliorating factor)
- Insurers visibly try to economise on liquidity needs from their derivatives exposures
  - eg *Tendency to clear interest rate swaps bilaterally*, especially by PE-linked life insurers
  - Asset encumbrance can bind (eg during Covid-19, US lifers' UST holdings encumbered)
- Strict FX hedging requirements introduces rollover risk and high cost in dollar funding squeezes
  - Korean authorities relaxed FX risk limits and pushed longer-term hedges after March 2020
- Under-hedging of FX risk introduces “wrong-way risk” when home currency appreciates
  - In extreme cases can threaten solvency: eg Taiwan life insurers in May 2025
  - Insurers reduce hedging when costs rise, so deviate from risk-minimising portfolio hedging

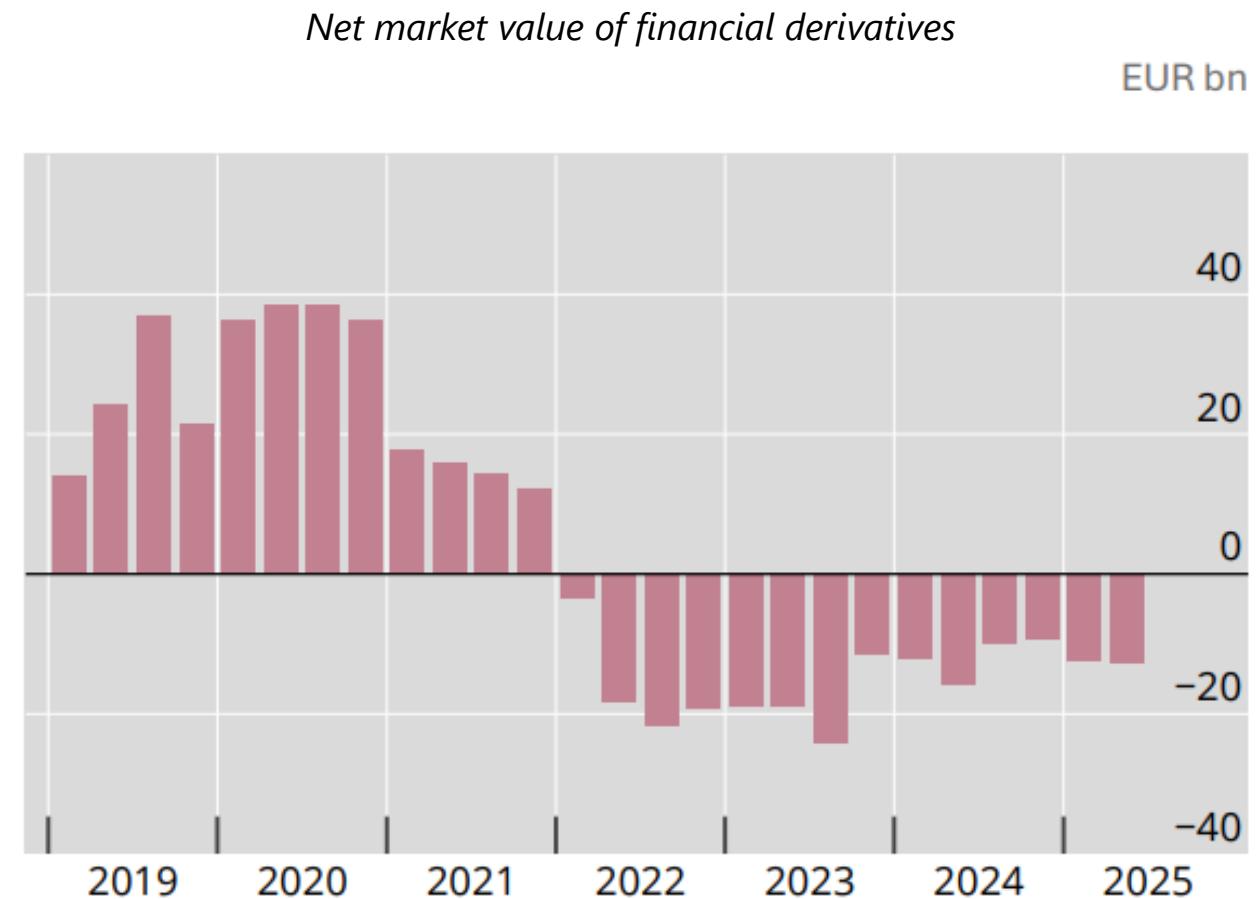
## Interest rate hedging and liquidity drain amid rising rates (US)

- Fair value of US life insurers interest rate swap positions turned negative amid rising interest rates
- Consistent with the insurance companies using IR derivatives to hedge against rate declines
- .. and then facing rising cash needs to meet collateral and margin calls
  - *at a time when liquidity needs due to policy surrenders also rise*



## Interest rate hedging and liquidity drain amid rising rates (Euro area)

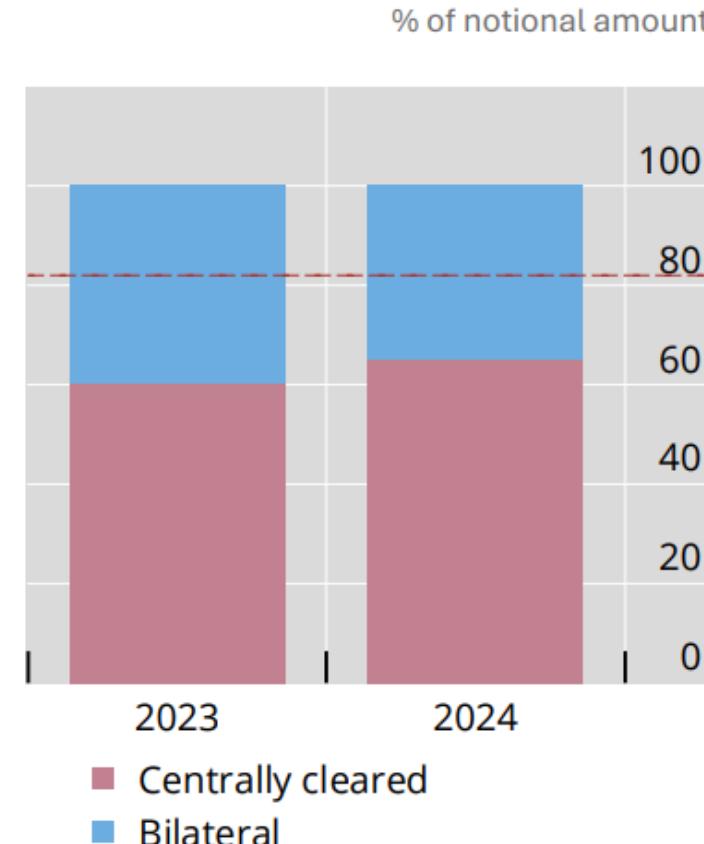
- Similarly, in the euro area, an outsized impact of rising rates on the valuation of derivatives book;
- Market values fell sharply with rising rates
  - Value change large % of cash
- Surrender-driven liquidity drain also large in 2022/23



## Disproportionate use of bilateral clearing for interest rate swaps (US)

- US life insurers exhibit a greater share of non-centrally cleared positions in their swap books compared to the overall market
- In 2024, 35% of the sector's interest rate swaps were bilaterally cleared, compared to 18% in the BIS OTC derivatives data of USD interest rate swaps
- PE-linked (more liquidity constrained) insurers, bilateral share was 59% in 2024
- Dealers may offer greater flexibility in margining than CCPs, but pose higher systemic risks

**All US life insurers**



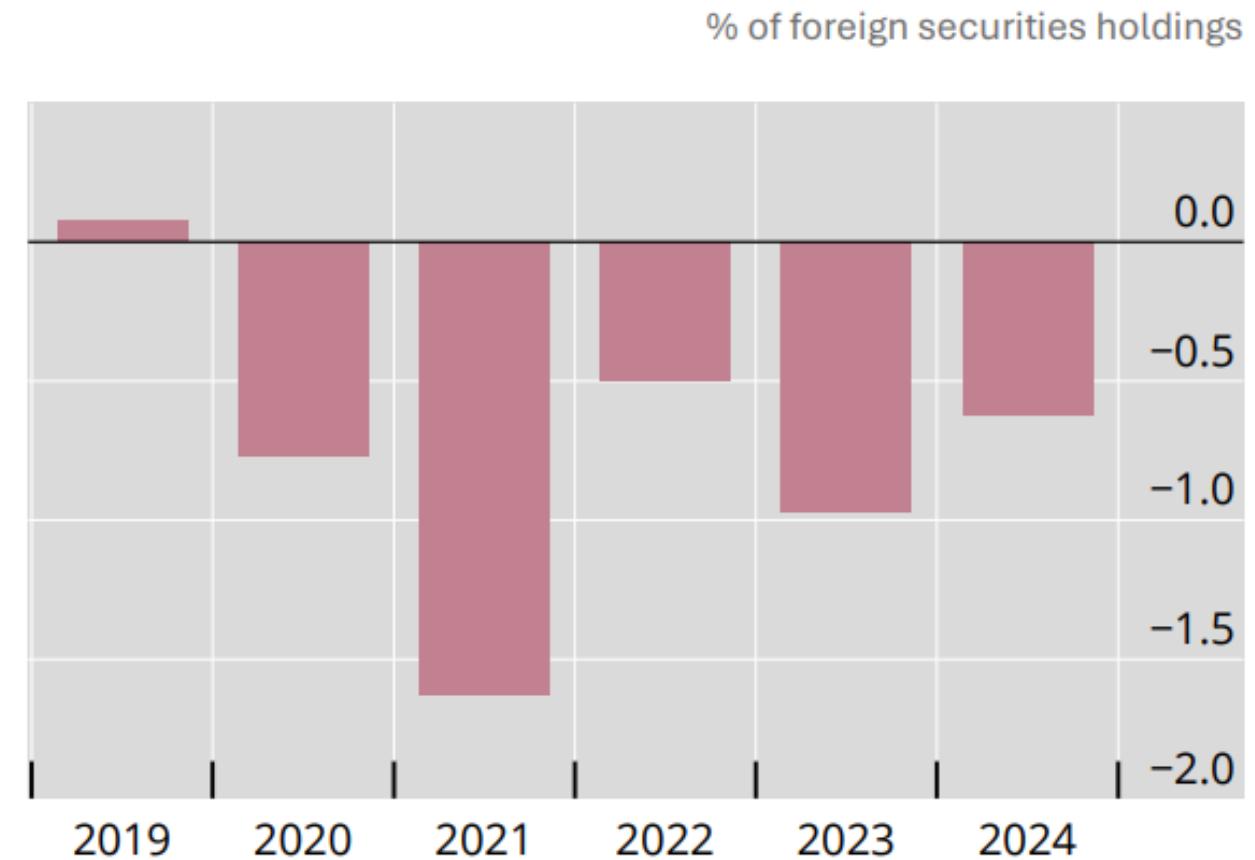
**PE-linked US life insurers**

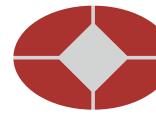


# US dollar liquidity drain on FX hedges amid strong dollar (Japan)

- Persistent losses on short USD FX swap & forward positions
- Dollar liquidity needs due to fund margin calls or to roll into new FX swaps to cover same exposure
- Annual liquidity needs of up to 1.5% of value of foreign securities holdings

**Gains & losses on derivatives /Foreign securities holdings**





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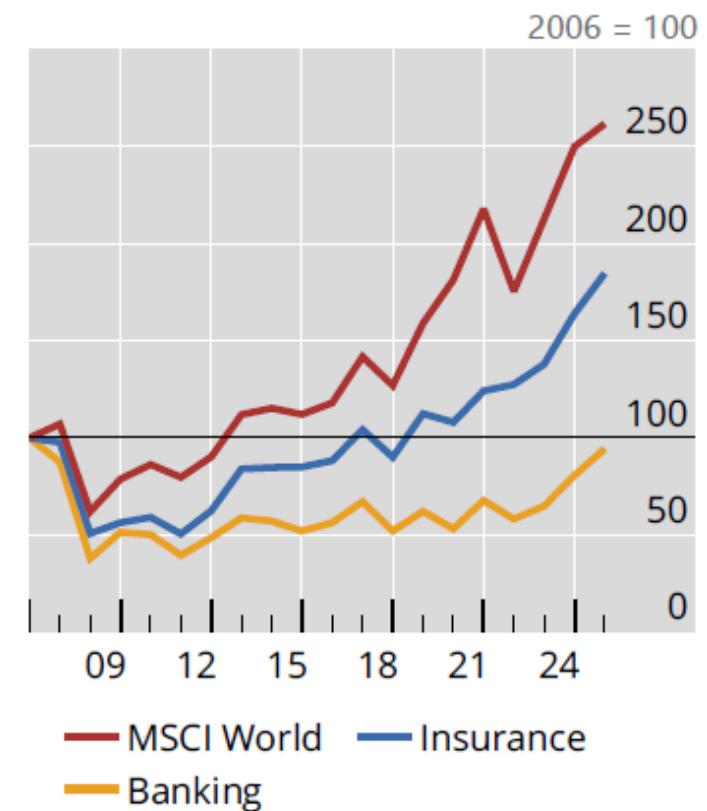


## 5 Structural shifts and related risks

# Evolving business models: legacy of low rates

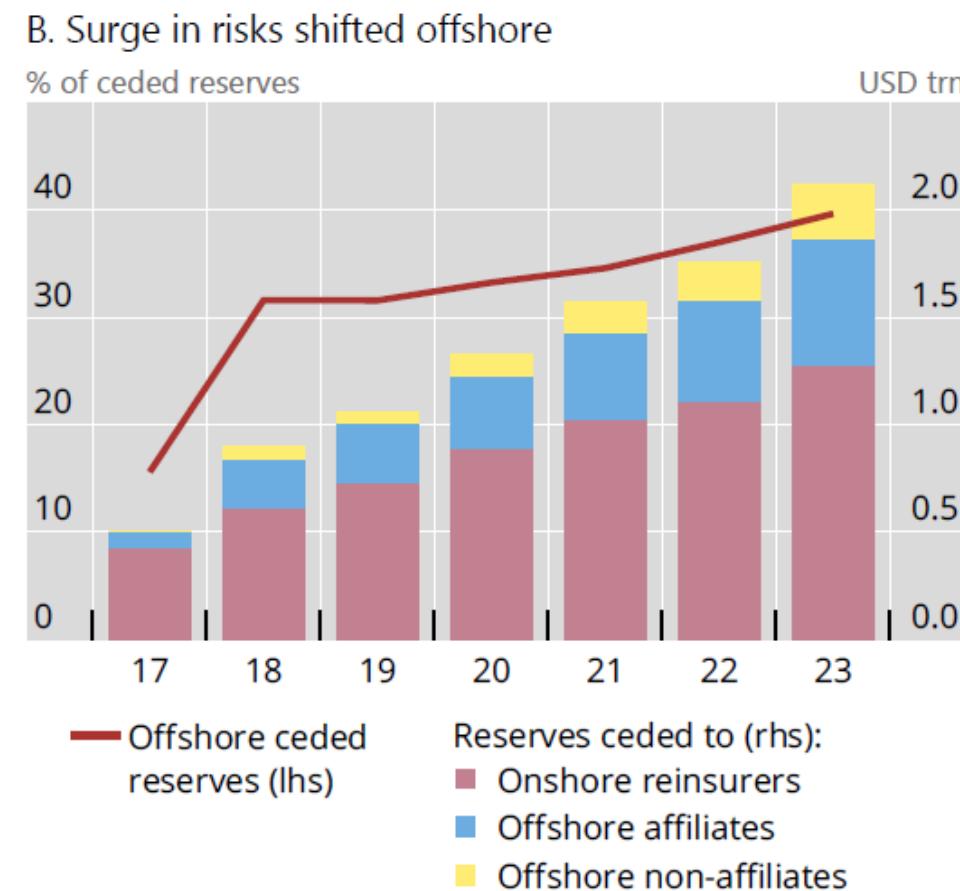
- Low-for-long compressed margins and weighed on valuations, spurring a shift into higher-yield assets
- Larger allocations to **structured credit, direct lending and infrastructure** persisted even as rates rose
- **Non-traditional funding** (eg FABS, FHLB advances) expanded
  - Funding agreement-backed securities 200bn; FHLB advances 150bn (2024)
  - Short-term/wholesale funding adds rollover risk that can force procyclical asset sales

A. Low-for-long weighs on insurers' market valuations<sup>1</sup>



# Rise of asset-intensive reinsurance (AIR)

- AIR **transfers liability and asset risks to reinsurers**, easing capital strain at cedants (insurers who are using AIR)
- Offshore frameworks (eg Bermuda) allow more lenient assumptions, supporting capital relief
- AIR centralises risk management but adds cross-border complexity and opacity
- Key risks: **collateral quality, lenient assumptions, and governance across entities**



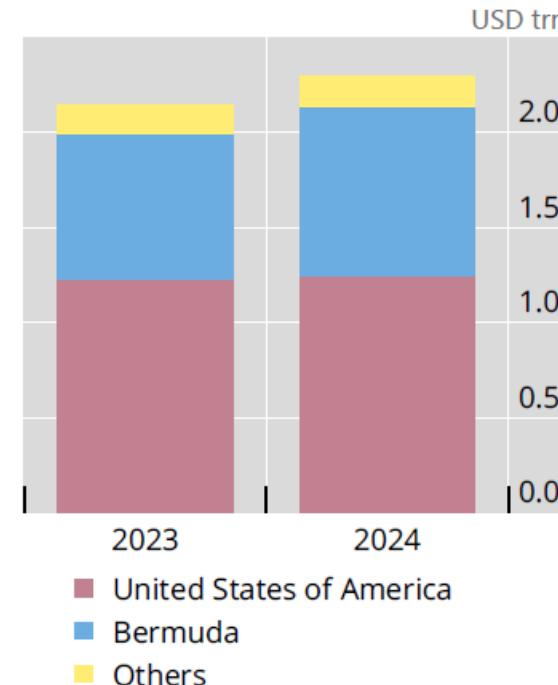
# Bermuda is the largest non-US ceding jurisdiction, with high concentration

- Geographic/operational concentration raises **tail losses** if a major **reinsurer falters**

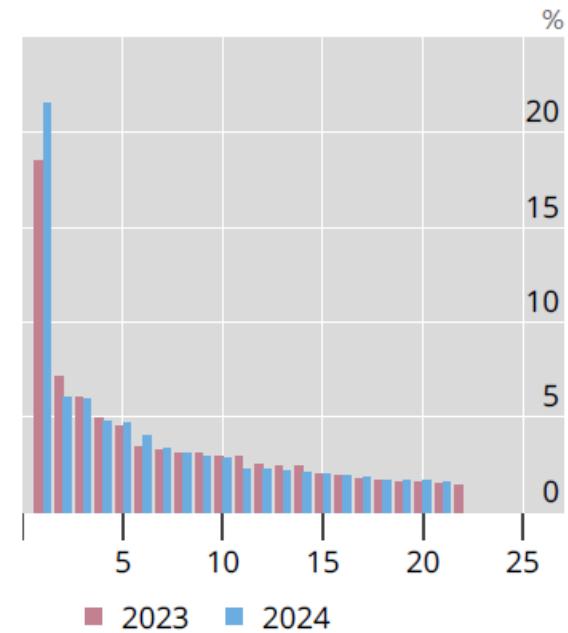
- Bermuda is the largest** non-US ceding jurisdiction
  - More than 20% of reserves in a single entity

- Recapture triggers may be procyclical; broad activation can prompt **fire sales by cedants**

B. US reserves ceded<sup>2</sup>



C. Share of total assumed US liabilities by different reinsurers in Bermuda



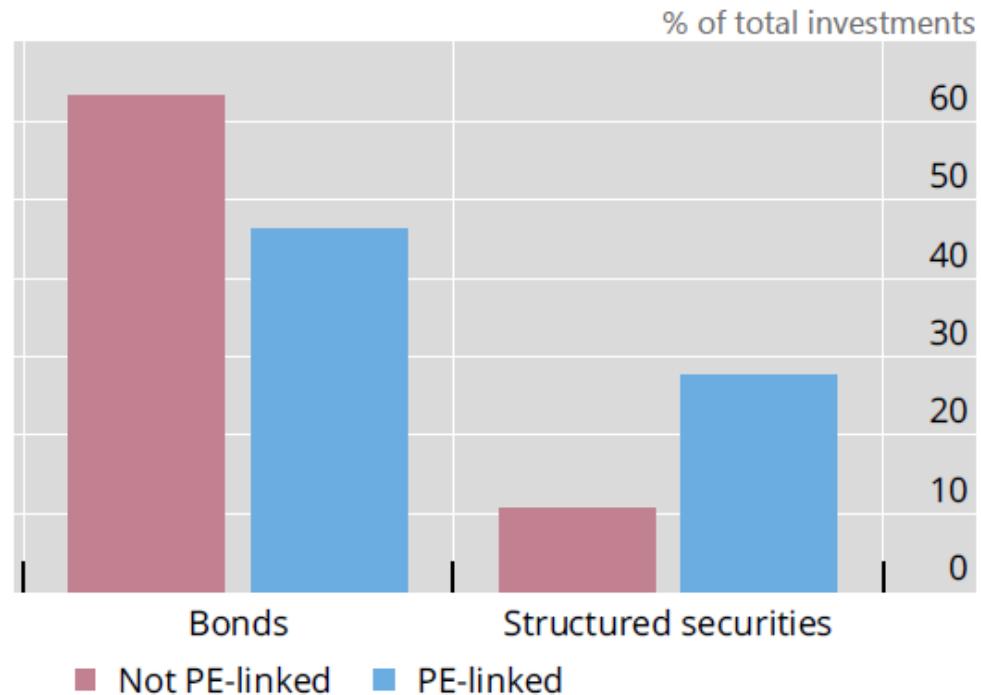
## Growing influence of PE in life insurance

- PE strategies: **acquire primary insurers, use affiliated reinsurers (AIR), and originate private assets**
- Governance tension: fee-driven origination and investment decisions vs policyholder interests

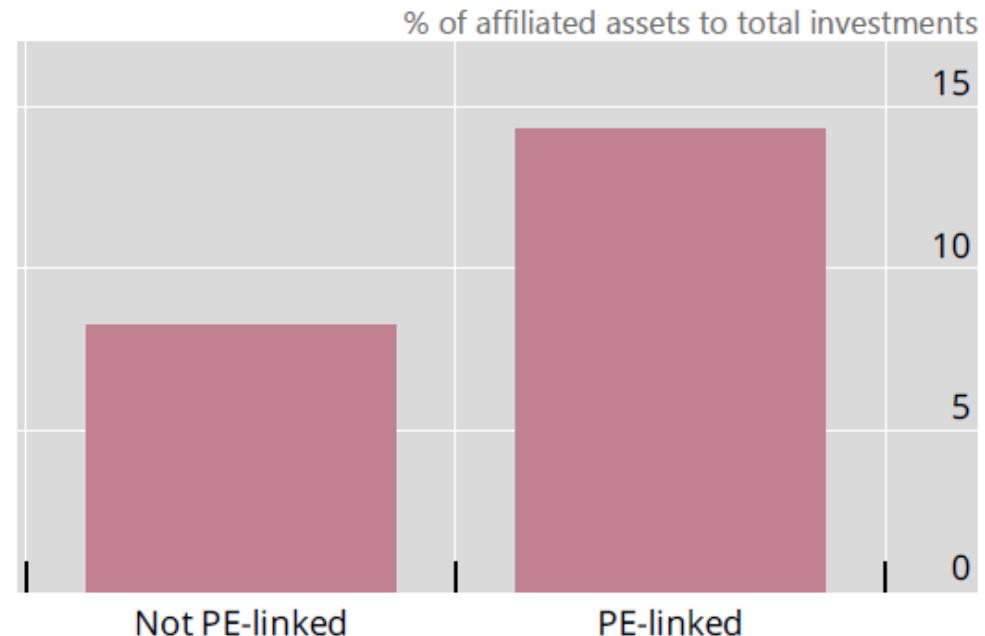
# PE-linked portfolios and structured securities

- **Higher weights in structured securities** (26% vs 11%); lower in corporate bonds (46% vs 62%).
- **Affiliated assets are larger** (14% vs 8%), increasing conflict-of-interest risks.

A. PE-linked insurers invest more in structured products



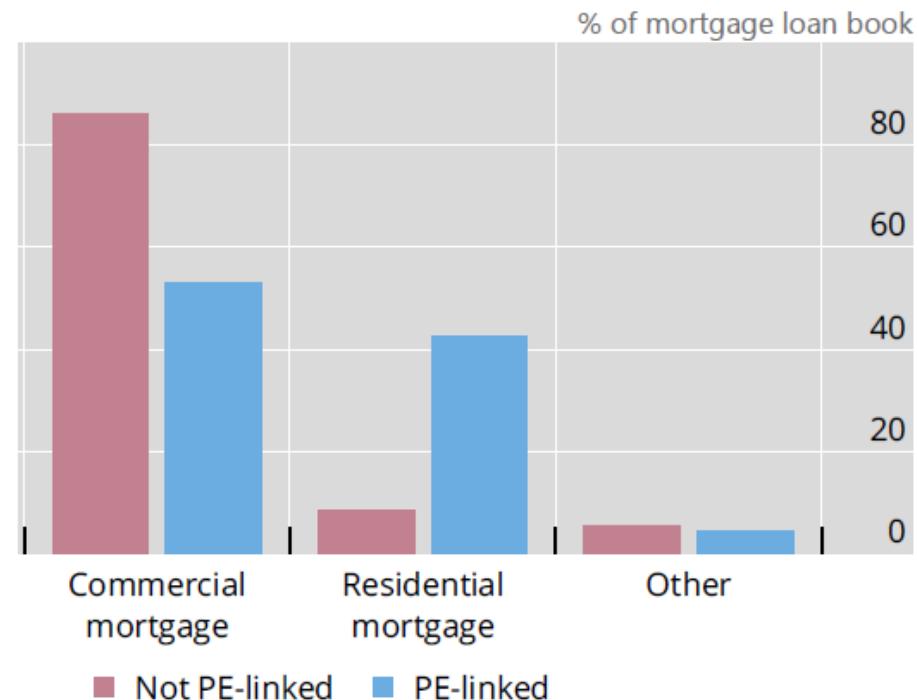
B. Affiliated assets as a percentage of total assets held by each group



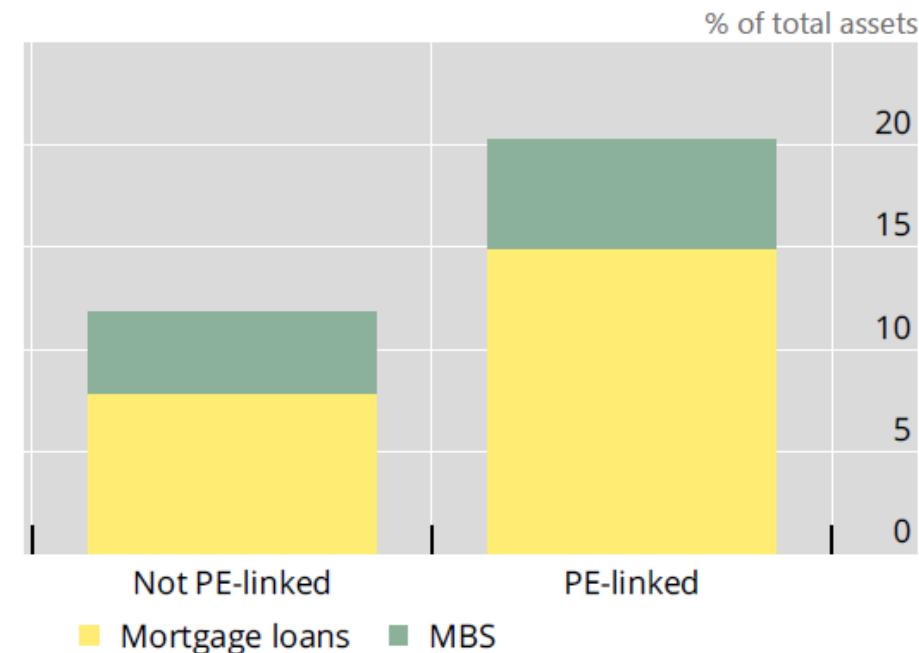
# PE-linked portfolios and mortgages

- **PE-linked insurers' mortgage exposure is larger**, with more direct residential and non-QM loans
- Vertical integration (owning multiple steps of the mortgage chain to capture fees and spreads) increases operational and credit risk if housing weakens

A. Breakdown of mortgage loan book by type



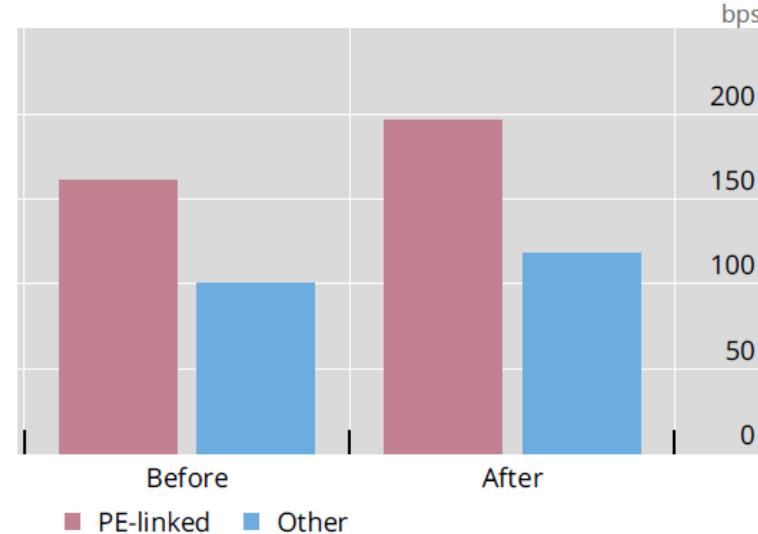
B. Mortgage exposure as a percentage of total assets



# Challenges in credit risk assessment

- Private (non-public) ratings are higher at PE-linked insurers (23% of assets vs 8%); **opacity hampers validation** and invites **ratings shopping**
- **Smaller agencies may understate** risk; capital charges can be understated
- Spreads of securities issued by PE-linked insurers spike in stress times (April 2025)

A. Spread of fixed income securities issued by life insurance companies around liberation day<sup>1</sup>



B. Percentage of investments identifiable in Refinitiv with private credit ratings

