5.4 Focus Topic: Interest Rate Risk

The Reserve Bank has tightened monetary policy sharply in response to high inflation, resulting in a significant increase in short-term interest rates since April 2022. This follows a long period of historically low interest rates. As international experience has shown, increases in interest rates have the potential to cause stress in financial institutions if interest rate risk has not been well managed. This in turn can affect other institutions or parts of the financial system.

This Focus Topic explains how Australian financial institutions are exposed to interest rate risk and how this risk is managed.

Interest rates affect financial institutions through several channels.

Interest rate risk arises from mismatches in the interest rate sensitivity of entities' assets compared with their liabilities. The channels through which this can occur are summarised in Table 5.4.1 in the case of an increase in interest rates.

Financial institutions manage interest rate risk within a strong regulatory framework in Australia. The Australian Prudential Regulation Authority (APRA) sets prudential standards for risk management at banks, superannuation funds and insurers, and closely monitors institutions' risk management practices. The Reserve Bank sets Financial Stability Standards for clearing and settlement facilities, including central counterparties (CCPs). These are standards set at high levels, reflecting the critical role these institutions play in the Australian financial system.

Financial institutions use a variety of tools, often in combination, to manage interest rate risk. This includes:

- matching the interest rate sensitivity of their assets to the interest rate sensitivity of their liabilities, so that when interest rates change, gains on one side of their balance sheet offset losses on the other side
- using derivatives, including interest rate swaps that are commonly used to convert one type of interest payment into another (e.g. to convert a fixed-rate payment into a variable-rate payment) to align the interest sensitivity of assets and liabilities more closely
- holding buffers of liquid assets that can be used to meet cash outflows caused by changes in interest rates, including from margin calls on derivatives and repurchase agreements
- holding high levels of capital that can be used to absorb unexpected losses from changes in interest rates.

Banks experience both direct and indirect effects of interest rate changes.

The composition of Australian banks' balance sheets and their use of hedging instruments limits their direct exposure to interest rate risk. In Australia, the interest rate banks earn on their assets tends to move with short-term interest rates, as most of their assets reprice within one month (Graph 5.4.1). This is because banks' assets are primarily variable-rate mortgages, or business loans that are repriced in

Table 5.4.1: Channels of Interest Rate Risk

Institution type	Effect of an increase in interest rates
Banks	*Earnings:* • Higher in the near term as interest income from assets typically increases by more than interest expenses on liabilities. • Slower credit growth and higher credit losses weigh on profits in the medium to long term. *Value of assets and liabilities:* • The present value of some fixed-rate assets and liabilities, such as bonds and fixed-rate mortgages, declines. *Credit risk:* • Increases with higher probability of defaults and lower collateral values (higher interest rates weigh on asset values). *Liquidity risk:* • Margin calls on derivatives and repurchase agreements (net effect depends on positions held). • Increases due to lower value of high-quality liquid assets (HQLA).
Insurers	• Higher yield on interest-bearing investments. • Mark-to-market losses on some assets, particularly long duration assets. • Reduction in the discounted value of assets net of liabilities. • Margin calls on derivatives (net effect depends on positions held).
Superannuation funds (defined contribution)	• Higher yield on interest-bearing investments. • Mark-to-market losses on some assets, particularly long duration assets. • Margin calls on derivatives (net effect depends on positions held).
Central counterparties	• Indirectly exposed through the risk of counterparty default.

Source: RBA.

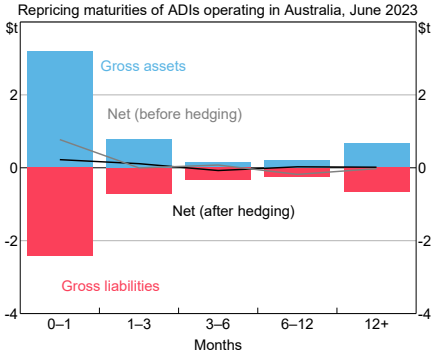
line with the bank bill swap rate. The interest rate banks pay on their liabilities tends to change more slowly, since a larger share of banks' liabilities is based on fixed rates such as bonds or rate-insensitive deposits. Banks typically use interest rate swaps to convert their fixed-rate liabilities into variable-rate liabilities, so they reprice more in line with their assets. As a result, Australian banks' net interest margins – a measure of the difference between interest earned on banks' assets and interest paid on banks' liabilities – have been relatively stable over time, despite large movements in the cash rate.[1]

Banks also hold other types of interest-rate-sensitive financial assets, such as bonds. Bonds issued by the Australian Government and the states and territories are held by banks primarily as a buffer of HQLA that can be used to meet cash outflows. An increase in interest rates reduces the value of these securities, leading to financial losses and a decrease in the value of

Graph 5.4.1

Mismatch of Assets and Liabilities

Repricing maturities of ADIs operating in Australia, June 2023



Sources: APRA; RBA.

banks' liquid assets. Australian banks hedge against financial losses on these securities using government bond futures or interest rate swaps.[2] Silicon Valley Bank, a mid-sized US bank, failed in March 2023 in part due to large losses on its securities portfolio, which was not hedged against an increase in interest rates.[3]

Banks are required to hold capital against interest rate risk under the Interest Rate Risk in the Banking Book (IRRBB) framework for banking book items, and under the market risk framework for trading book items.[4] This incentivises banks to hedge interest rate risk, as described above. Australian banks that use internal models to measure credit risk are required to hold capital for IRRBB as part of their minimum capital requirements.[5] The standard international approach is for banks to hold capital for IRRBB in addition to their minimum capital requirements at the discretion of supervisors. This approach is used for smaller Australian banks.

As an indirect effect, higher interest rates weigh on banks' profits and potentially increase credit losses. An important transmission channel of tighter monetary policy is to reduce consumption and investment in the economy, and thereby demand for new credit, by increasing the cost of borrowing. Higher interest rates result in weaker demand for credit, which dampens banks' balance sheet growth and, in turn, profit. Lower growth in credit may lead to greater competition for borrowers among lenders and reduced margins. At the same time, it is more difficult for borrowers to service their debt due to higher interest payments, slower income growth and higher unemployment, which are themselves the result of higher interest rates. Ultimately, the number of borrowers unable to repay their debt increases, potentially leading to credit losses for banks. Banks hold provisions to absorb potential future credit losses, partly based on models of expected credit loss and additional overlays based on judgement of risks.

Higher interest rates also weigh on the value of collateral banks hold to protect against credit losses. Interest rates influence asset prices, which affect banks' balance sheets through the value of collateral. Banks hold collateral to protect against losses if a counterparty defaults. In the case of a mortgage, the bank has rights to property that, in the event of default, can be sold to repay the debt owed by the borrower. When interest rates rise, property prices tend to fall, which reduces the value of collateral held by the bank, potentially below the value of the borrower's debts. Banks mitigate this risk by lending an amount less than the value of the collateral and hold capital to absorb losses. They also use collateral to reduce potential losses in repurchase agreements and derivatives transactions. In this case, changes in the value of collateral relative to exposures in response to interest rates are corrected via margining (see Box: Interest rate risk is strongly linked to other financial risks).

Australian insurance companies tend to have little exposure to interest rate risk due to the composition of their balance sheets.

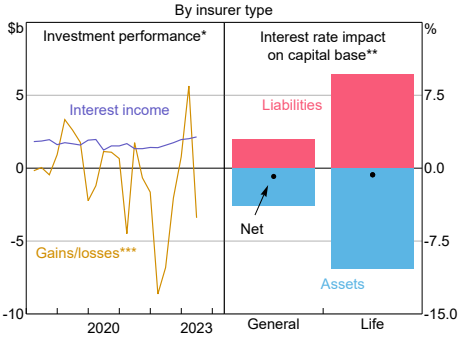
Increases in interest rates affect insurers' investment returns and the values of their assets and liabilities. General insurers hold around 80 per cent of their investment portfolio in interest-earning investments, primarily fixed-income securities issued by corporations and governments. Higher interest rates take time to fully flow through to interest income, as lower yielding fixed-income securities mature and are replaced with higher yielding securities. By contrast, higher interest rates immediately lower the value of insurers' assets and liabilities (Graph 5.4.2). Since the duration of general insurers' assets is similar to their liabilities, the effect on their capital is small; the value of their

investment portfolios declines, but so does the value of their liabilities due to policyholders. There is an additional effect for insurers whose liabilities are sensitive to inflation; if an increase in interest rates is accompanied by an increase in inflation, then the value of expected future payouts increases. Insurers can mitigate this by investing in inflation-linked securities. Insurers are required to hold capital against the effect of an interest rate shock on their capital base, which incentivises them to manage the mismatch in interest rate sensitivity of their assets and liabilities.

Graph 5.4.2

Insurers' Performance

By insurer type



* Sum of general and life insurance companies.
** Increase of the larger of 3 percentage points or one-quarter of the risk-free rate; as a share of insurers' capital base.
*** Gains and losses from movements in the market price of insurers' fixed-income investments.
Sources: APRA; RBA.

Box: Interest rate risk is strongly linked to other financial risks

Interest rate risk often interacts with other financial risks, particularly credit and liquidity risk. This is especially true when changes in interest rates affect the prices of assets used as collateral, which has implications for both credit and liquidity risk.

An increase in interest rates can increase credit risk. As noted above, increases in interest rates can reduce the value of collateral held against loans and increase the probability that it will not be sufficient to cover the lender's exposure. Higher interest rates could also lead market participants and credit rating agencies to reassess the credit quality of some institutions that issue debt securities. This could further reduce the value of those securities as investors demand higher returns to compensate for the increased credit risk.

An increase in interest rates can also increase liquidity risk. Derivatives and repurchase agreements have two main collateral ('margin') requirements, where typically cash or securities are transferred between the counterparties:

1. *initial margin* is intended to cover potential future exposure if a counterparty defaults
2. *variation margin* is exchanged daily to prevent the build-up of exposure due to changes in the market value of the transaction.

Margin requirements generally increase with market price volatility.[6] Therefore, increases in the level and volatility of interest rates can trigger large transfers of cash or securities, which presents liquidity risk for the margin payer. Australian banks manage potential outflows from margin payments under their liquidity management framework, and by meeting prudential standards set by APRA, including by holding buffers of HQLA. If many institutions need to pay margin, their collective efforts to obtain liquidity can have systemic consequences. For example, in 2022, UK pension funds faced large margin payments due to sharp changes in UK Government bond (Gilt) yields. The resulting dash for liquidity led to disruptions in the Gilt market and intervention by the Bank of England to restore proper market functioning.

Australian superannuation fund members bear most risks of higher interest rates.

Most superannuation funds in Australia are defined contribution schemes – where the benefit due to policyholders is determined by the fund's uncertain future investment return – so investment losses from increases in interest rates are borne by policyholders. By contrast, defined benefit funds – where the benefit due to policyholders is guaranteed – must manage the interest rate risk associated with long-term liabilities. This requires defined benefit funds to align the interest rate sensitivity of their assets and liabilities.

Superannuation funds use derivatives, primarily interest rate and foreign exchange swaps, which exposes funds to potentially very large outflows of cash due to margining of derivatives transactions. Australian superannuation funds use derivatives to a much lesser extent than pension funds in some overseas jurisdictions (as they are not guaranteeing returns) and use minimal leverage. Even so, large margin flows can still be created by large market moves, although Australian funds have proven resilient to these given liquidity management practices. APRA also introduced updated investment governance standards in 2023, designed to further strengthen practices.[7]

Central counterparties are generally not directly exposed to interest rate risk, but they may face losses if a counterparty defaults.

CCPs act as the buyer to every seller and the seller to every buyer in derivatives transactions so their exposures (including to interest rates) are offset – unless a counterparty defaults. CCPs collect both variation margin and initial margin to help protect against losses in this situation. If this is insufficient, then the CCP has other means to absorb the losses, including using its own capital.

Endnotes

[1] See also Windsor C, T Jokipii and M Bussiere (2023), 'The Impact of Interest Rates on Bank Profitability: A Retrospective Assessment Using New Cross-country Bank-level Data', RBA Research Discussion Paper No 2023-05.

[2] This may still expose the bank to basis risk, which is the risk that the price of the hedging instrument moves differently to the price of the security being hedged. For example, a bank could hedge the interest rate risk of a government bond using an interest rate swap where the bank pays a fixed rate and receives a variable rate. However, movements in the yield curve used to price the government bond are unlikely to exactly match movements in the interest rate curve used to price the swap.

[3] Silicon Valley Bank (SVB) had a large portfolio of securities that were classified as 'held-to-maturity', which were not required to be revalued when market prices changed (marked-to-market) under accounting rules unless they were reclassified (including if they were sold). Investors and depositors became aware of the unrealised losses when SVB sold some of their securities at a loss. Most securities held by banks in Australia are marked-to-market and are required to be valued at market price for the calculation of regulatory liquidity ratios.

[4] 'Trading book' generally refers to balance sheet items that are intended to be held shorter term (e.g. securities held as part of a bank's broking and market-making activities) and 'banking book' items are held longer term (e.g. residential mortgages).

[5] The IRRBB capital requirement is based on changes in the *economic value of the banking book*, which is the net present value of all expected future principal and interest cash flows for banking book items. This is a measure of expected future profitability and is sensitive to the mismatch in banks' repricing profiles. See Prudential Standard APS 117 Capital Adequacy: Interest Rate Risk in the Banking Book (Advanced ADIs).

[6] See Carter L and D Cole (2017), 'Central Counterparty Margin Frameworks', RBA *Bulletin*, December.

[7] See RBA (2023), 'Chapter 2: The Australian Financial System', *Financial Stability Review*, April.