

Financial Stability Review

APRIL 2023



RESERVE BANK OF AUSTRALIA

Financial Stability Review

APRIL 2023

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The material in this *Financial Stability Review* was finalised on 6 April 2023 and uses data through to 6 April 2023.

The *Review* is published semiannually and is available on the Reserve Bank's website (www.rba.gov.au). The next *Review* is due for release on 6 October 2023. For copyright and disclaimer notices relating to data in the *Review*, see page 65 and the Bank's website.

The graphs in this publication were generated using Mathematica.

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ISSN 1449–3896 (Print)
ISSN 1449–5260 (Online)

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Overview

Vulnerabilities in parts of the global banking system have been exposed but the broader global banking system has remained resilient

Global financial stability risks have increased despite loan arrears remaining very low. Some regional banks in the United States failed in March because of weaknesses in their business models and risk-management practices. Heightened risk aversion led to an increase in volatility in some financial markets and to liquidity stress transmitting to other parts of the international banking system. This culminated in the regulator-facilitated takeover of Credit Suisse by UBS, following a lengthy period of concerns being raised about Credit Suisse's underlying profitability, risk controls and governance practices.

In the face of these high-profile bank failures – the most severe banking-system stress event since the global financial crisis – the broader global banking system has remained resilient. This has been supported by the prompt actions of authorities and earlier reforms ensuring that large banks maintain high levels of capital and liquidity. Regulators moved quickly to address the failing banks and, following a step-up in liquidity operations by central banks, financial conditions have stabilised.

A key risk is that a further substantial tightening in financial conditions leads to disorderly declines in asset prices and disruptions to financial system functioning

Confidence in some banks remains fragile – particularly those with business models that leave them susceptible to deposit flight – and if further stresses were to affect banks around the world, it would feed through to tighter financial conditions. Another catalyst for a sharp tightening in financial conditions would be financial market participants reassessing the likelihood of a soft landing. This could occur if inflation remains persistently high and financial markets price in a further substantial tightening in monetary policy in large advanced economies. Large and disorderly declines in financial asset and property prices resulting from higher interest rates and increased risk aversion could disrupt key funding markets and strain the balance sheets of some borrowers and lending institutions. Further increases in borrowing costs and reduced supply of credit to households and businesses could also accelerate a downturn in the broader credit-quality cycle. Indeed, the combination of tighter monetary policy, high inflation and slowing economic growth is already squeezing the cash flow positions of some households and businesses worldwide.

There is also the ongoing risk that any disruption in financial system functioning is amplified by liquidity mismatches at leveraged non-bank financial institutions – a risk highlighted by several events in recent years and one that

remains a key area of international supervisory focus.

The recent strains experienced in parts of the global banking system are likely to prompt banking regulators to revisit how best to ensure banks remain resilient to shocks in the digital era. This includes considering measures to forestall the risk of particularly rapid deposit runs. Recent events have also highlighted a number of other issues, including: risks relating to non-systemic institutions generating systemic spillovers; the possibility that the regulation and intensity of supervision of small banks may need to increase; and the need to continue international progress on resolution regimes.

The Australian financial system remains strong and well placed to support the economy

Australia is not immune from the deteriorating outlook for global financial stability; volatility in domestic financial markets picked up in March alongside developments abroad. However, the Australian financial system entered this more challenging period in a strong position and is well placed to continue supporting the domestic economy. Banks are well regulated, strongly capitalised, profitable and highly liquid. This leaves them well positioned to continue lending to Australian households and businesses. In recognition of recent global developments, the Australian Prudential Regulation Authority (APRA) has intensified its oversight of domestic financial institutions and together with the Bank and other Council of Financial Regulator agencies, is closely monitoring for any adverse effects on the broader financial system. Like other regulators around the world, APRA is also considering the lessons that should be drawn from recent events. It is important that financial institutions in Australia continue to invest in their capacity to absorb shocks by maintaining strong capital and liquidity buffers and increasing their operational

resilience, including to external threats like cyber-attacks.

Most households and businesses are resilient to the challenging economic environment, but this resilience is unevenly spread

Most Australian households and businesses are well placed to manage the impact of higher interest rates and inflation, supported by continued strength in the labour market and higher savings buffers. But this resilience is unevenly distributed. Some households and businesses are already experiencing financial stress, and the squeeze on household budgets is likely to continue for some time. The households most affected have been those on lower incomes, including many renters, and relatively recent borrowers who have larger debts (relative to income) and have had less time to build up savings buffers. Smaller businesses have more variable-rate debt and volatile income compared with larger firms, and so are more exposed to rising interest rates, while some building construction firms have faced ongoing margin pressures as a result of fixed-price contracts written before the sharp increase in input and labour costs. These businesses have accounted for a large proportion of the recent increase in company insolvencies. While insolvencies have returned to their pre-pandemic level, banks' non-performing business loans remain very low.

An increase in the share of households and firms falling into arrears on their loans is anticipated by lenders, but any increase in non-performing loans will be occurring from a very low level. Further, the share of banks' loans in or close to negative equity is negligible, which helps limit the losses to both borrowers and banks in the case of default. This reflects the generally sound lending standards and the large run-up in housing prices over recent years. The decline in national housing prices over the past year has

only partially reversed the earlier gains, and even if housing prices were to fall by as much again, the share of loans in negative equity would remain very low. If unemployment was to rise more sharply than expected, the share of households and businesses experiencing financial difficulties – and ultimately falling into arrears on their loans – would increase further still. Even then, stress-testing exercises continue to suggest that banks would remain resilient.

Threats from outside the financial system continue to pose risks to financial stability

Beyond the near-term risks to financial stability, there are other medium-term threats generated

from outside of the financial system that warrant ongoing attention from financial institutions and authorities in Australia and around the world. These include the increasing intensity of cyber-attacks on financial institutions, the potential for an escalation in geopolitical tensions that results in disruptions to trade and international capital flows, and potential climate-related disruptions to parts of the financial system (including but not limited to energy markets). How these risks might interact is an additional source of uncertainty. ✎

1. The Global Financial Environment

Summary

The recent failure of three US banks exposed vulnerabilities in parts of the global banking system and contributed to significant volatility in some financial markets. Further stress affecting banks would feed through to tighter financial conditions, resulting in higher borrowing costs and reduced supply of credit to households and businesses.

- Three regional banks in the United States failed in March. A run on their deposits, which were concentrated and largely uninsured, was in part due to concerns regarding large unrealised losses on these banks' bond holdings. These vulnerabilities appear to have been enabled by poor risk-management practices at some banks, coupled with a less stringent regulatory and supervisory regime than applied to larger US banks and many banks elsewhere (see 'Box A: Recent International Bank Failures – Causes, Regulatory Responses and Implications').
- Liquidity stress has transmitted through parts of the international banking system and financial markets, culminating in the regulator-facilitated takeover of Credit Suisse by its Swiss counterpart, UBS. Some financial markets have been volatile, especially government bond and bank equity and credit markets, and liquidity conditions deteriorated somewhat. Central banks stepped up their operations in financial markets in response. Market moves have the potential to be amplified by liquidity mismatches at leveraged non-bank financial institutions.
- High household and business indebtedness in some advanced economies is a key medium-term vulnerability, particularly in an environment of slowing economic growth and rising interest rates. While households and businesses have been resilient to higher interest rates and the squeeze on cash flows so far, risks are building and could be realised quickly if lending standards tighten significantly.
- In China, increased policy support and the reopening of the economy from COVID-19 lockdowns have lessened stress in the property sector, but longer term vulnerabilities remain.

Higher interest rates, slowing economic growth and high inflation are adding to financial stability risks

Interest rates have increased substantially since the start of 2022, following a period of historically low interest rates and increasing household, business and government indebtedness (Graph 1.1). Higher interest rates, high inflation and tightening lending standards will likely lead to stress among some borrowers, particularly if (as expected) economic growth slows and labour market conditions soften. In addition, a further escalation in geopolitical tensions remains a prominent risk to global economic activity and the outlook for financial stability.

Stress has emerged in parts of the global banking system

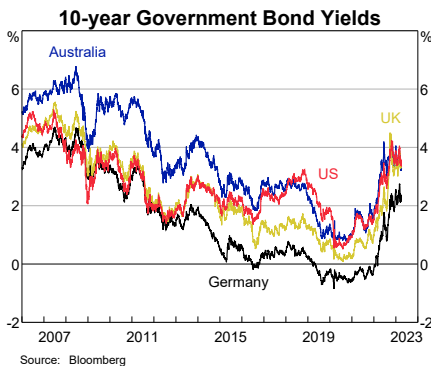
Three regional banks in the United States – Silvergate, Silicon Valley Bank and Signature Bank – failed in March, leading to the most serious stress event for the US banking system since the global financial crisis (GFC) (see ‘Box A: Recent International Bank Failures – Causes, Regulatory Responses and Implications’). The failures stemmed from a run on the banks’ concentrated deposit bases due to concerns that these banks’ capital positions were particularly vulnerable to rising interest rates.

Regulators responded quickly to these events and central banks increased their liquidity operations in financial markets. Despite these actions, the stress prompted an increase in risk aversion and spread to other regional US banks, including First Republic. Stress also spread to Credit Suisse, a global systemically important bank. In late March, Credit Suisse was taken over by UBS at the request of the Swiss authorities following a prolonged period of investor concern about its longer term viability. More broadly, investors and depositors have become more attuned to long-running vulnerabilities in the business models of some banks, as funding costs have increased while government yield curves (from which banks’ assets are priced) have inverted.

Conditions in short-term funding markets deteriorated in March alongside the increase in financial system stress and market volatility. Regional banks in the United States have sought liquidity assistance from the US Federal Reserve, with the combined outstanding balance of the Discount Window and the new Bank Term Funding Program reaching a record high of US\$165 billion in the week to 15 March (albeit First Republic accounted for a large share of this) and only decreasing slightly in the weeks after. Volatility in bank funding markets also resulted from the full write down of hybrid (Additional Tier 1 capital) securities issued by Credit Suisse. US money market funds that invest in highly conservative portfolios (such as short-dated government debt) have received large ‘safe haven’ inflows.

The cost of borrowing US dollars in the foreign exchange market also increased over this period. In response, the central banks of Canada, the euro area, Japan, Switzerland, the United Kingdom and the United States increased the frequency of their seven-day foreign exchange swap line operations from weekly to daily. However, strains in foreign exchange swap markets have since eased and were modest

Graph 1.1



compared with those experienced during the GFC.

Most banks have high capital and liquidity levels

The resilience of banking systems has improved markedly since 2008. Most banks in advanced economies have high levels of liquid asset holdings and capital as a result of post-GFC reforms (Graph 1.2). This, along with actions by regulators and central banks, helped to limit further contagion in the recent period of stress. Large banks' profitability rebounded strongly coming out of the worst of the COVID-19 pandemic; however, it declined in the second half of 2022 in a number of economies (the euro area and the United Kingdom being notable exceptions). A consistent theme has been the reduction in income from investment banking activity offsetting the increase in net interest income from rising interest rates. Provisions for non-performing loans (NPLs) have increased slightly in most advanced economy banks, though NPLs remain at low levels. The increase in provisions is because of expectations of a deterioration in credit quality, reflecting the effects of higher interest rates, high inflation and slower economic growth. Nevertheless, recent

bank stress tests continue to suggest that large banks in advanced economies have sufficient capital to ensure they will be resilient to a sharp economic downturn.

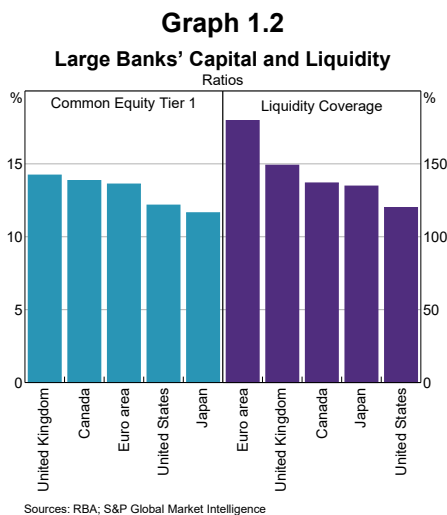
In 2022, several countries – including France, Germany and Norway – announced increases in their countercyclical capital buffers (CCyBs) to pre-pandemic rates. While economic activity has since slowed, regulators have not judged this sufficient to warrant a reversal of these planned increases. The Canadian regulator also recently announced an increase in the CCyB from 2.5 per cent to 3 per cent.

Banks' concentrated counterparty exposures are a potential vulnerability

Regulators including the Bank of England and the European Central Bank have recently warned that banks are not adequately managing risks from large and concentrated credit exposures to single counterparties, particularly in their prime brokerage and capital markets services to non-bank financial institutions (NBFIs). More broadly, the Basel Committee on Banking Supervision noted late last year that recent episodes of NBFI distress – including the collapse of the family investment office Archegos (which led to significant losses at Credit Suisse) and the inability of a large nickel producer to meet margin calls (see below) – highlighted vulnerabilities and deficiencies in banks' management of concentrated counterparty risk.

Stress in the US banking system has led to a sharp increase in volatility in government bond markets, but other markets have been resilient

Government bond markets were particularly volatile in March (Graph 1.3). In mid-March, two-year US Treasury yields recorded the largest daily decline since the 1980s, and two-year German bunds experienced the largest one-day fall in yields since 1990. The volatility has partly reflected rapidly changing expectations for the



path of policy rates in response to the US banking failures and resulting uncertainty. In some countries, this has been accompanied by the poorest liquidity conditions in government bond markets since the dysfunction experienced in March 2020. Given their key role as financial benchmarks, further large shocks to government bond markets could unsettle financial markets more generally and the institutions that participate in these markets.

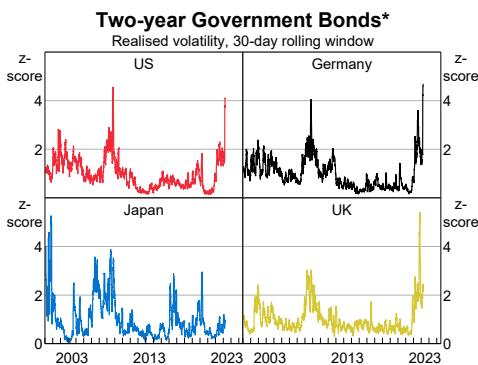
To date, stresses in bank funding markets have not spilled over into a substantial tightening of financial conditions (Graph 1.4). Credit and equity risk premiums suggest many investors continue to anticipate a soft landing from the current global monetary policy tightening cycle. Analyst expectations of corporate earnings over the next 12 months have remained strong. These developments are somewhat at odds with expectations for substantially weaker growth embedded in sharply inverted yield curves in most major markets; risk premiums could widen sharply if economic growth were to decline or slow sharply. Alternatively, higher-than-expected inflation could prompt further monetary policy tightening and lead to sharp price declines in corporate securities (credit and equity) and government bonds.

A key ongoing source of uncertainty and volatility in global financial markets is how central bank policy settings respond to a period of high inflation while growth is slowing and financial stability risks are elevated. One country-specific risk relates to the possibility of a sharp increase in bond yields in Japan, which could be triggered if the Bank of Japan decides to end its yield curve control policy. Some analysts have highlighted the possibility that higher yields in Japan could prompt Japanese investors to divest offshore asset holdings, which could destabilise some markets. For example, Japanese investors hold a substantial share of bonds issued by governments in many advanced economies, including Australia and the United States.

Volatility in financial markets could be amplified by institutions encountering liquidity stress

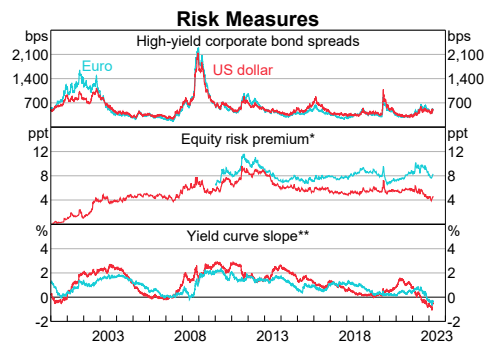
A key focus for international regulators for more than a decade has been the vulnerabilities posed by some NBFIs – a broad group that includes insurance companies, investment funds, broker-dealers, commodity trading houses and hedge funds – which have the potential to amplify shocks and trigger significant market dysfunction. These vulnera-

Graph 1.3



* Realised volatility is calculated on daily changes in two-year benchmark bond indices. Values have been standardised.
Sources: RBA; Refinitiv

Graph 1.4



* Calculated as the difference between the 12-month forward earnings yield and the real 10-year government bond yield.

** Calculated as the spread between the 10-year and two-year government bond yield.

Sources: Bloomberg; ICE Data is used with permission; Refinitiv

bilities came to the fore last year in several episodes (Graph 1.5):

- In March 2022, trading in the nickel futures market on the London Metal Exchange (LME) was suspended to allow for an orderly unwinding of large short positions and limit disruptions from very large margin calls.
- In September 2022, authorities in Europe and the United Kingdom announced liquidity support to energy companies (thereby insulating the financial institutions that had exposures to them) following a surge in gas prices, to ensure that large margin calls did not destabilise financial systems.
- In October 2022, the Bank of England intervened in the UK Government bond market after a sharp increase in government bond yields triggered large margin calls associated with the hedging activity of defined benefit pension funds.

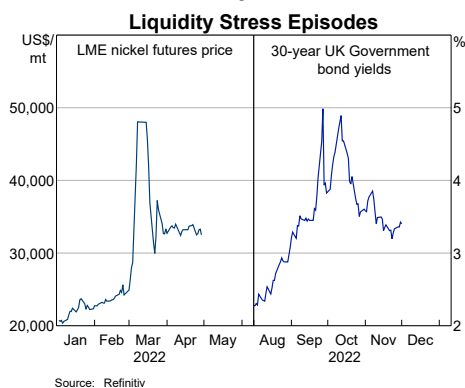
In each of these events, NBFIs were using leverage to finance trades. Because of this leverage, the institutions faced large margin calls when unexpected shocks triggered sharp price moves in underlying assets. The institutions could not meet these obligations without selling assets, leading to fire-sale dynamics and disorderly market conditions; the resulting threat to financial stability led to intervention by the

authorities or a central counterparty. This liquidity stress occurred despite very high levels of aggregate banking system liquidity.

Although some forms of NBF activity (also known as ‘shadow banking’) have been curtailed since the GFC, the underlying vulnerabilities that triggered these recent events remain. Some of these vulnerabilities relate to liquidity mismatches, where the liabilities of NBFIs may not be able to be repaid at short notice without destabilising underlying asset markets. Others relate to the use of derivatives and more direct forms of leverage that may not be fully visible to regulators (particularly if in over-the-counter markets). NBFIs account for nearly 50 per cent of global financial system assets and – as recent events have highlighted – the activities of NBFIs (or entities with similar financing structures) can have an outsized influence in certain markets.

Regulators continue to progress initiatives aimed at addressing vulnerabilities posed by NBFIs. This includes reassessing margining practices in non-centrally and centrally cleared markets, and whether such practices can be improved to dampen pro-cyclicality (where margin calls exacerbate already large market moves). Regulators are also working to improve visibility over certain NBF activities in systemically important markets. For example, the US Securities and Exchange Commission has proposed to increase central clearing of US Treasury securities, which would bring a broader range of trading activity (including hedge funds) within regulatory view. More generally, the Financial Stability Board continues to engage its international membership on the development of approaches to better assess and address longstanding NBF vulnerabilities relating to liquidity mismatches and (excessive and ‘hidden’) leverage.

Graph 1.5



Households have so far been resilient to the substantial tightening in monetary policy

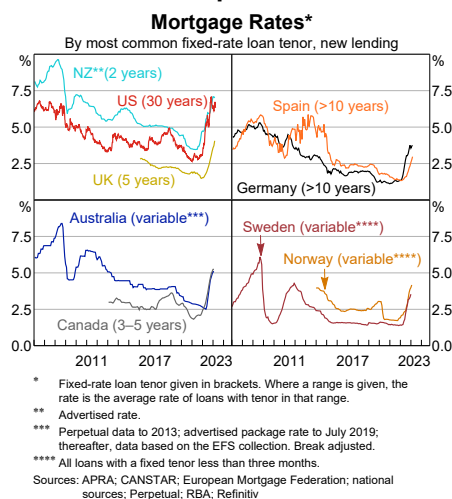
The confluence of higher interest rates, high inflation and tightening lending standards poses risks for household balance sheets, particularly if (as expected) economic growth slows and labour market conditions soften. This is particularly the case for households with little in the way of savings buffers and declining spare cash flow. Many borrowers in economies with high shares of variable-rate lending and/or shorter fixed-rate mortgage tenors – such as Australia, New Zealand, Norway and Sweden – are experiencing substantially higher required loan repayments than a year ago, and further increases are in prospect as earlier tightening by central banks filters through to borrowing rates. By contrast, in countries with longer fixed-rate mortgage tenors – such as the United States and most European countries – most borrowers will not face higher mortgage rates for several years despite mortgage rates for new borrowers having risen sharply (Graph 1.6).

Financial stability concerns raised by regulators mostly relate to highly indebted households, particularly recent borrowers who purchased

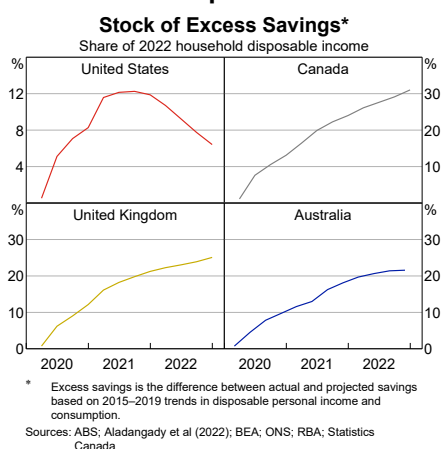
closer to the peak of the housing price cycle and may be paying interest rates above those used to test their debt-servicing capacity at the time of loan origination. For example, in New Zealand, mortgage rates are currently 1 percentage point above the minimum serviceability rate of around 6 per cent used in the first half of 2021, and housing prices have declined since that time. In Canada and New Zealand, regulators have also highlighted risks associated with households that borrowed during the housing upswing at relatively high debt-to-income multiples.

Despite these challenges, there are few signs of widespread household stress in advanced economies. Mortgage and consumer loan arrears rates are low, although consumer loan arrears have ticked higher in Canada, New Zealand and the United States. Household financial resilience has been supported by very low unemployment and the fact that many households entered the period of higher inflation and rising interest rates in a strong financial position. In aggregate, households in advanced economies built up significant savings buffers during the pandemic, although these buffers are unevenly distributed and in some cases are being drawn down, including in the United States (Graph 1.7).

Graph 1.6



Graph 1.7



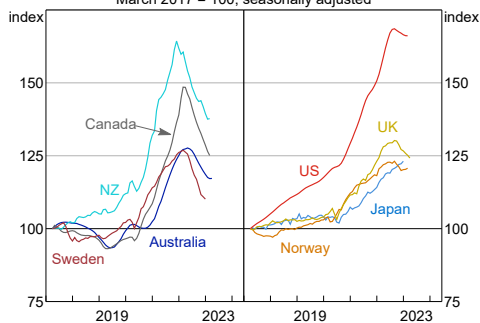
Housing prices have declined in many advanced economies

Housing prices have declined following very strong growth in recent years (Graph 1.8). Prices have declined by 16 per cent from their peak in Canada and New Zealand, 13 per cent in Sweden, 5 per cent in the United Kingdom and 1 per cent in the United States; the 8 per cent decline in Australia sits in the middle of this range. Central banks generally anticipate further declines in housing prices in the period ahead, reflecting higher borrowing costs and softening labour market conditions. Lower housing prices are likely to weigh on economic activity to the extent that indebted households respond to their declining wealth by decreasing their consumption, and lower housing turnover reduces housing-related spending. While housing prices remain well above 2020 levels in many advanced economies, recent borrowers are at greater risk of falling into negative equity because they purchased closer to the peak of the price cycle. Authorities are closely monitoring the incidence of negative equity; previous cycles have demonstrated that negative equity increases the likelihood that a borrower who encounters a debt-servicing shock (such as job loss or relationship breakdown) will default on their mortgage, thereby increasing losses to lenders.

Graph 1.8

Housing Price Indices

March 2017 = 100, seasonally adjusted



Sources: national sources; RBA; Refinitiv

Smaller and lower rated corporations are more at risk from rising interest rates, tightening lending standards and slowing economic growth

Like households, most corporate balance sheets are yet to show material signs of stress. Arrears rates on corporate loans generally remain low, as do corporate bond default rates, although default rates on European bonds have increased to pre-pandemic levels. The low level of arrears across most jurisdictions partly reflects that many large businesses have cash balances (relative to total assets) around all-time highs, and these businesses tend to have fixed-rate loans that are yet to roll on to higher interest rates. By contrast, smaller businesses appear more exposed to the softening outlook. The share of debt held by small firms with interest coverage ratios less than 2 (indicating interest expenses are at least half as large as earnings) is already high and increasing (Graph 1.9). Cash balances of smaller firms also remain well below pre-pandemic levels. Sectors that were adversely affected by the pandemic, such as consumer discretionary and real estate, also have a relatively high share of firms with low interest coverage ratios. Debt-servicing challenges will continue to grow for some firms alongside higher interest rates and slowing economic activity.

Debt-servicing vulnerabilities are also more pronounced for lower grade corporations. Lower grade corporate debt is characterised by more variable-rate lending, including leveraged loans, and is dominated by sectors that are more exposed to a cyclical downturn – such as consumer services, leisure, and technology. For lower grade corporations that borrowed by issuing fixed-rate bonds, the pass-through of higher interest rates will occur with some delay; refinancing risk will be concentrated between 2025 and 2026, when the bulk of fixed-rate bond maturities occurs. Investment-grade issuers have a relatively even spread of maturities over the

years ahead, which will reduce refinancing risk for these borrowers.

Commercial real estate markets are facing challenging conditions

Higher interest rates, slowing growth and longer term preference shifts among end-users pose risks for lenders in commercial real estate (CRE) markets. Valuations of CRE investment trusts have in many cases declined by between 30 per cent and 50 per cent since their peak in late 2021/early 2022. Office and retail CRE prices have been under the greatest pressure due to structural changes in demand, such as remote working and online shopping (Graph 1.10). European authorities have warned about elevated risks stemming from CRE, including high bank exposures and large shares of high loan-to-income lending. CRE loans are often extended at variable rates in many European countries, adding to debt-servicing risks at a time when structural changes and slowing growth will weigh on incomes for some CRE borrowers. A further slowdown in CRE would also add to risks for smaller US banks, which have relatively large CRE exposures (17 per cent of total assets, or 22 per cent including commercial construction and land develop-

ment); this exposure is more than four times that of large US banks.

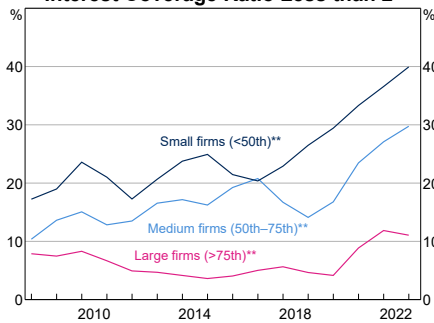
CRE markets are also vulnerable to liquidity mismatches at investment funds. This is because some open-ended CRE investment funds offer redemption terms to investors at much shorter terms (including daily) compared with the length of time it takes to sell the underlying assets held by the fund. While these funds maintain liquidity pools that are designed to accommodate an increase in redemption requests, an unusually large spike in redemptions could lead to the imposition of investor gates (where access to investor funds is limited for a period) or generate fire sales of highly illiquid assets. In addition, private market valuations have diverged from their public counterparts – substantially so in some cases – raising concerns that the former are not being marked at realistic secondary market prices. This also increases the risk that investors could abruptly redeem their capital from the asset class.

The earlier tightening in financial conditions in emerging markets has eased

Since October, emerging market economy (EME) financial conditions have eased alongside US dollar depreciation and a better near-term

Graph 1.9

Share of Debt Held by Firms with Interest Coverage Ratio Less than 2*

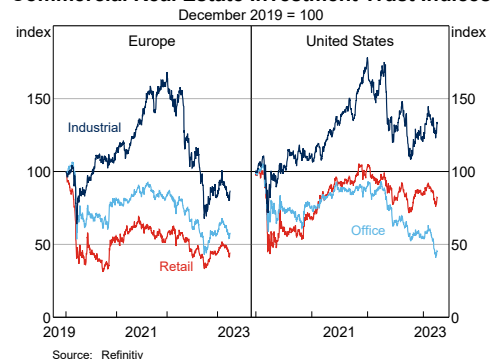


* Series represent two calendar year moving averages for private and public non-financial corporations in Canada, Japan, New Zealand, the United Kingdom, the United States and 18 euro area countries.
 ** Firms are non-financial corporations grouped into size percentiles by total assets.

Sources: RBA; S&P Capital IQ

Graph 1.10

Commercial Real Estate Investment Trust Indices



Source: Refinitiv

outlook for China (see below). As a result, EMEs have received portfolio inflows. EMEs have been relatively unaffected by the recent stress at some banks in advanced economies. Nonetheless, some EMEs remain vulnerable if changes to the global outlook result in a sudden repricing of assets. Some EMEs have large fiscal deficits, high levels of debt and/or a greater reliance on shorter term and external financing. A significant share of new sovereign bond issuance among EMEs in 2022 and early 2023 were at shorter maturities, raising the risk associated with rolling over and refinancing debt. In addition, the share of US dollar denominated debt remains high in Latin America and Türkiye, making these economies vulnerable to exchange rate movements. EMEs in the Asia-Pacific region appear less vulnerable to this risk, reflecting reduced reliance on external financing and larger holdings of foreign exchange reserves.

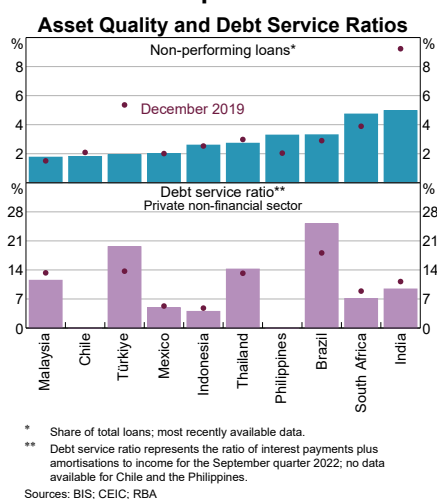
Lower growth, high inflation and higher borrowing costs have added to concerns over debt serviceability and weaker asset quality in EMEs (Graph 1.11). Around 8–10 per cent of bank loans are still under pandemic-related moratoriums in Indonesia and Thailand, with some having expired earlier this year. However, capital levels are expected to be high enough to allow banks to absorb credit losses under most scenarios, particularly in Asia: the average Common Equity Tier 1 capital ratio is 4 percentage points higher in emerging Asian economies than in other EMEs.

Stress in China’s property sector is less acute, but longer term vulnerabilities remain

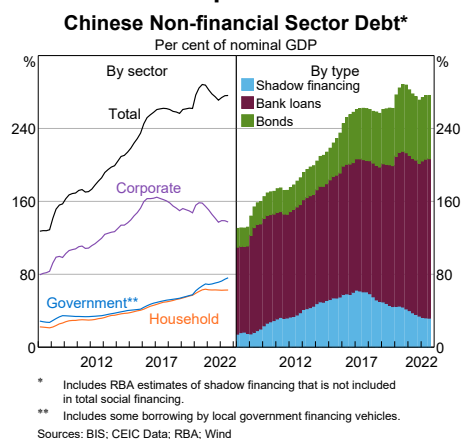
China’s near-term growth outlook has improved significantly following the removal of COVID-19 restrictions in late 2022. Chinese authorities have since increased policy support for the economy and provided additional support for the distressed property sector. Authorities are balancing efforts to support growth against

many longer term financial vulnerabilities, including high debt levels and perceptions of implicit guarantees, which result in the mispricing of risk. Allowing insolvent entities to fail would help achieve the longstanding priority of breaking perceptions of implicit guarantees, but it risks causing significant stress in the short term. Authorities appear to have lessened their focus on deleveraging over the past year; government debt as a share of GDP increased by nearly 5 percentage points during the first three quarters of 2022 (Graph 1.12).

Graph 1.11



Graph 1.12



Authorities have implemented several measures to lower stress in the highly indebted property sector, including by directing financial institutions to provide liquidity support to assist in the delivery of stalled projects and to implement policies to stimulate home buyer demand. Such support has started to ease acute short-term liquidity stress, and market expectations for developer defaults have declined as a result (although to a lesser extent for lower quality developers). However, bond prices for many developers remain well below par, reflecting considerable uncertainty about whether the support to date will be sufficient to restore confidence in the housing market and allow developers to refinance the significant amount of debt maturing this year (US\$80 billion in bond financing).

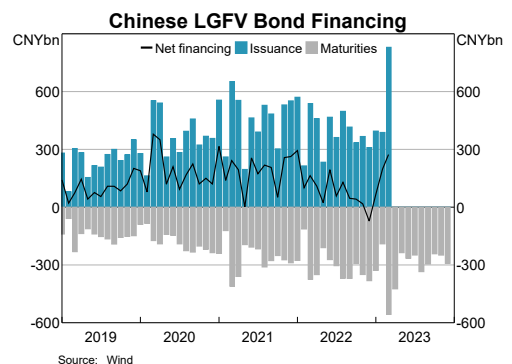
Property sector stress has exacerbated vulnerabilities in local government balance sheets. In 2022, local governments increased their reliance on local government financing vehicles (LGFVs) to replace developer demand in land auctions, which are an important source of government revenue; LGFV purchases accounted for 65 per cent of total sales in late 2022, up from 20 per cent in 2021. This has conflicted with authorities' attempts to reduce leverage among LGFVs, which hold debt around half the size of China's GDP. LGFVs use land as collateral when borrowing, so a sharp fall in land prices would likely lead to losses for LGFV creditors in the event of a default. LGFVs faced a tightening in financial conditions at the end of 2022 as spreads widened significantly and net bond issuance turned negative (Graph 1.13).

The number of defaults by LGFVs and developers on 'shadow banking' products, including trust loans and wealth management products (WMPs), has increased. In November, widespread WMP redemptions exacerbated bond market volatility, which prompted intervention by authorities. Shadow banking remains a source of financial fragility in China as

it is opaque, undercapitalised and has interlinkages with the wider financial system (especially banks). This is despite a campaign by authorities to de-risk the sector and a further 2 percentage point contraction in its size relative to GDP over the first three quarters of 2022.

The increased support for the property sector has been delivered via banks, asset management companies, trust companies and other NBFIs, increasing their exposure to stress in the sector. This exposure, combined with stringent pandemic-containment measures, has exacerbated asset-quality risks for the banking system. While large Chinese banks have strong capital positions, smaller banks are more exposed to the property sector and small to medium-sized enterprises, have much higher NPL ratios, weaker provision coverage and capital adequacy, and are more closely linked to shadow banks. Moreover, NPL ratios are widely believed to be under-reported, and forbearance continues to mask true asset quality. Ratings agencies estimate the share of NPLs to be as high as 8 per cent of total loans – much higher than the officially reported 1.6 per cent – and have downgraded their outlook for Chinese banks. Authorities have announced new NPL reporting, stress-testing and capital adequacy requirements to strengthen identification and management of risk and to better account for off-balance sheet exposures.

Graph 1.13



Authorities have announced plans to consolidate the supervision and coordination of financial regulation in an effort to strengthen oversight. The new National Financial Regulatory

Administration will replace the current banking and insurance regulator and will take over some responsibilities from the People's Bank of China and the securities regulator. ✎

Box A

Recent International Bank Failures – Causes, Regulatory Responses and Implications

Three US banks failed in March 2023:

- **Silvergate Bank** (Silvergate), a crypto-focused bank, announced its intent to wind down operations and voluntarily liquidate the bank in an orderly manner.
- **Silicon Valley Bank** (SVB) was closed by US regulators, with the Federal Deposit Insurance Corporation (FDIC) appointed as receiver. UK regulators also facilitated the sale of SVB's UK subsidiary. SVB's customers were primarily technology and life science companies (including startups).
- **Signature Bank** (Signature) was closed by US regulators, with the FDIC appointed as receiver. Signature served mainly commercial customers across a range of industries but had been increasingly focused on serving crypto customers in recent years.

A run on these banks' deposit bases, which were concentrated and largely uninsured, was in part due to concerns that large unrealised losses on banks' asset holdings would impair their capital positions (particularly for SVB). These failures were in part enabled by poor risk-management practices and a less stringent regulatory regime. They also caused spillovers to other banks, particularly those with pre-existing vulnerabilities:

- **Credit Suisse** was taken over by UBS on 19 March in a 'voluntary transfer' resolution orchestrated by Swiss authorities. While Credit Suisse did not

have the same vulnerabilities as the US banks above, it had faced multiple high-profile risk and governance-related incidents over many years that had severely damaged the bank's profitability and reputation.

- Certain other regional US banks have remained under stress, most notably **First Republic Bank** (First Republic). These banks have generally shared similar (though less pronounced) vulnerabilities in their asset and funding mix as the failed US banks.

Central banks and banking regulators responded promptly to these events, stepping up liquidity support for solvent financial institutions and taking measures to ensure bank resolutions are conducted in a way that preserves the stability of the financial system. Most banks, including global systemically important banks, have entered this period with strong capital and liquidity positions as a result of post-GFC reforms. Nevertheless, regulators internationally – including in Australia – are considering the lessons to be drawn from this episode. Investor and depositor confidence is likely to remain fragile for some time, particularly for banks with pre-existing vulnerabilities or that have a business model more exposed to risks from higher interest rates. There is also a plausible risk that recent events will result in a tightening of credit conditions, which will further weigh on economic activity – and ultimately affect loan quality – in the period ahead.

Australian banks are entering this more challenging environment for global financial stability in a strong position. This is a result of banks' significant capital and liquidity buffers, well-established risk controls and a strong domestic regulatory and supervisory framework administered by the Australian Prudential Regulation Authority (APRA).

The US bank failures were triggered by similar vulnerabilities

Concentrated deposits

The failures of SVB, Signature and Silvergate were triggered by a run on their deposit bases. All three banks had a large share of uninsured deposits (i.e. those above the \$250,000 threshold for deposit insurance in the United States), which were largely held by commercial customers concentrated in a relatively small number of (mostly technology-related) industries (Graph A.1). This concentration risk had two elements: first, depositors were more likely to respond quickly and in a common way to signs of potential stress at these banks; and second, the banks were exposed to a narrow set of shocks that affected most of their depositors at the same time. For example, the collapse of the crypto exchange FTX in November 2022 resulted in deposit outflows and investor nervousness for Silvergate and Signature, which had provided banking services to the exchange.

Large valuation losses on securities holdings

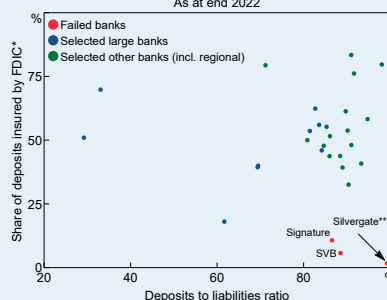
The key trigger for stress at SVB and Silvergate was large valuation losses on their unhedged holdings of long-term fixed-rate debt securities (e.g. government and mortgage-backed bonds) as interest rates

increased. For SVB, the debt securities were primarily classified as 'held to maturity'. Under US and international accounting standards, banks are not required to recognise changes in the value of held-to-maturity portfolios as income (although the interest rate risk on these positions can have regulatory capital implications, particularly for large banks). This is because, although the value of the underlying securities can fluctuate over time, they have a known fixed rate of return if held to maturity (Graph A.2). However, a bank may need to recognise 'mark-to-market' gains or losses if the portfolio is reclassified as 'available for sale' (e.g. to meet deposit outflows). If these losses are large, they could leave the bank undercapitalised.

Most banks hold long-term debt securities and have sustained valuation losses on their securities portfolios over the past year. However, for SVB the valuation losses were unhedged and very large – around 130 per cent of the bank's Common Equity Tier 1 (CET1) capital – which gave rise to concerns about the solvency of the bank if the losses had to be realised (by selling bonds whose price had fallen well below the purchase price to meet deposit outflows).

Graph A.1

US Bank Deposits
As at end 2022



* FDIC estimates.

** Silvergate data is from the end of 2021, as deposits began to fall sharply after this date.

Sources: FDIC; RBA; S&P Global Market Intelligence

The likelihood that SVB would need to realise these losses was increased by its concentrated and largely uninsured deposit base. By contrast, other US and global banks – particularly larger banks – tend to have more diversified deposits with a higher share of insured retail customers, as well as higher capital levels and access to a broader range of funding sources.

Poor risk management and less stringent regulation and supervision

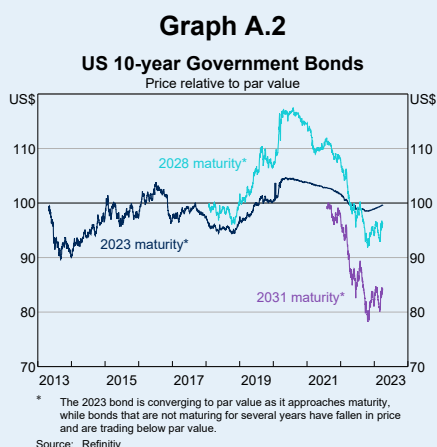
These vulnerabilities were exacerbated by poor risk management practices, combined with a less stringent regulatory and supervisory regime relative to larger US banks and many banks overseas. SVB and Silvergate were particularly sensitive to a rise in interest rates, both directly (via large unhedged exposures to long-term fixed-rate debt securities) and indirectly (because higher interest rates increased pressures in the crypto and technology start-up sectors that accounted for much of their deposit base). All three banks were below the \$250 billion asset threshold to be considered systemically important in the United States (following an increase in this threshold from \$50 billion in

2018) and were subject to less stringent regulatory and supervisory requirements as a result. This included exemptions from maintaining and publicly reporting standard risk metrics like the Liquidity Coverage Ratio (LCR) or Net Stable Funding Ratio (NSFR).

US regulators intervened promptly, but damage to market sentiment caused spillovers to some other US banks ...

As deposit flight ensued, US regulators took prompt action to limit the potential for system-wide stress:

- **Authorities increased the coverage of deposit guarantees.** The US Treasury, the Federal Reserve and the FDIC issued a joint statement announcing a ‘systemic risk exception’ for SVB and Signature, which allowed the FDIC to guarantee all deposits at the banks (including balances above US\$250,000). The announcement set out that while no losses would be directly borne by taxpayers, shareholders and certain unsecured debtholders would suffer losses; losses arising from the protection of uninsured depositors would be recovered by levying a ‘special assessment’ on banks. Losses from the sale of SVB are expected to be around US\$20 billion.
- **The US Federal Reserve announced a new liquidity facility,** the Bank Term Funding Program (BTFP). Similar to the Federal Reserve’s Discount Window facility, the BTFP is a secured lending facility open to depository institutions in generally sound financial condition. Loans under the BTFP can be up to one year and collateral is valued at ‘par’. The latter feature increases the borrowing capacity of some banks under the BTFP,



as a large share of outstanding eligible collateral is trading below par due to increases in interest rates.

Despite these interventions, some regional US banks with vulnerabilities in their asset and funding mix (though less pronounced than SVB) have remained under stress since the failures. Most notably, First Republic's share price declined by nearly 90 per cent since SVB's failure, alongside a reported 40 per cent decline in its deposits since the start of 2023 and large unrealised losses on its securities and real estate lending portfolios. The bank remained under stress despite 11 large US banks depositing \$30 billion to improve the bank's liquidity and shore up depositor confidence. First Republic and other US regional banks have sought liquidity assistance from the US Federal Reserve, with the combined outstanding balance of the Discount Window and BTFP reaching a record high of US\$165 billion in the week to 15 March and only decreasing slightly in the weeks after (Graph A.3).

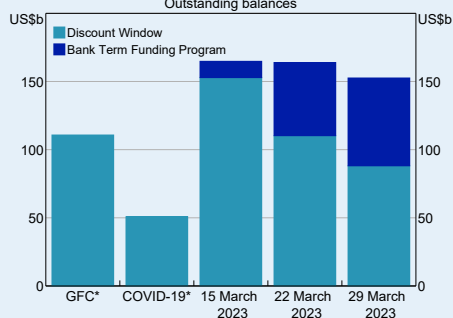
... and contributed to the failure of Credit Suisse after a prolonged period of low profitability, amid risk control and governance concerns

Global market sentiment deteriorated in the week following SVB's failure, at which time Credit Suisse, a global systemically important bank, came under severe stress. Credit Suisse did not have the same vulnerabilities as SVB – for example, the bank's securities portfolio comprised a much smaller share of total assets (around 25 per cent), it had hedged a large share of its interest rate risk and had high levels of capital and liquidity. However, it had faced multiple high-profile incidents over several years, including large losses from the failures of Archegos and Greensill Capital. These incidents severely damaged the bank's profitability and reputation. Some business lines had also experienced profitability challenges for some time and analyst commentary had focused on the need for Credit Suisse to exit certain activities as a result. Prior to SVB's failure, Credit Suisse's market capitalisation had already declined by around 75 per cent since January 2018, resulting in a price-to-book ratio of 25 per cent at the beginning of March 2023 (Graph A.4). It had also experienced previous episodes of more acute stress, including deposit outflows and a sharp rise in its credit default swap spreads in October 2022 (indicating elevated market expectations of default).

In the week after SVB's collapse, Credit Suisse's equity price dropped by more than 20 per cent and its bond prices fell sharply to distressed levels. Sentiment worsened when the bank's largest shareholder indicated it was not willing to provide any additional capital. Daily deposit outflows reportedly exceeded CHF10 billion (relative to total

Graph A.3

US Federal Reserve Liquidity Facility Usage
Outstanding balances



* Peak outstanding balances during previous stress periods.
Source: US Federal Reserve

deposits of CHF233 billion as of end-2022) in the few days before its failure. This continued despite the Swiss National Bank (SNB) announcing it would provide liquidity to the bank, and Credit Suisse announcing it was planning to exercise this option by borrowing CHF50 billion.

Regulators were concerned that allowing the bank to continue trading could see it rapidly become illiquid or insolvent, which would have had severe consequences for the bank's customers and the stability of the broader domestic and global financial system. In response, UBS announced on 19 March that it would be taking over Credit Suisse at the request of Swiss authorities, supported by measures taken by the Swiss Government and regulators:

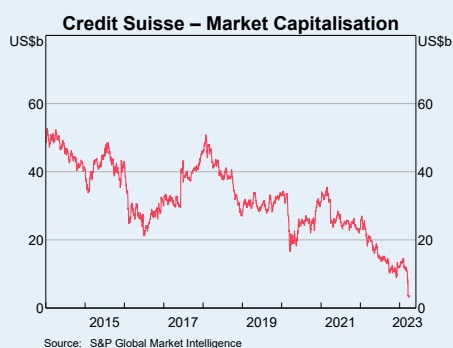
- Swiss regulators applied emergency rules to allow UBS and Credit Suisse to expedite the takeover (e.g. by allowing it to occur without the approval of shareholders).
- The SNB provided each bank with access to an unsecured liquidity assistance loan for a total amount of up to CHF100 billion. These loans would have 'privileged creditor status' in bankruptcy (behind certain highly preferential claims

such as employees and pension funds). The SNB also provided Credit Suisse with an additional unsecured liquidity assistance loan of up to CHF100 billion, which was backed by a federal government default guarantee.

- The Swiss Government provided UBS with a CHF9 billion guarantee against potential losses from the wind-down of certain Credit Suisse assets above a CHF5 billion threshold.
- Switzerland's financial regulator determined that the extraordinary government support provided would trigger a full writedown of Credit Suisse's Additional Tier 1 (AT1) capital of around CHF16 billion. This resulted in losses for investors and initially triggered sharp falls in prices of AT1 securities for banks in Europe and other overseas jurisdictions (although not in Australia where AT1 securities tend to have a different conversion structure to those issued by Credit Suisse). Sentiment around AT1 instruments stabilised following comments from Canadian, EU, Hong Kong, Singaporean and UK authorities clarifying that shareholders would bear losses ahead of AT1 security holders in their jurisdictions.

The merger of Credit Suisse and UBS will be highly complex given the size and global reach of the two banks. The transaction will require parliamentary approval in Switzerland and regulatory approval in many overseas jurisdictions, though it is expected to close towards the end of 2023. UBS' capital requirements will increase following the merger due to its increased size, although the Swiss financial regulator has granted UBS 'appropriate transitional periods' to build this capital.

Graph A.4



Post-GFC reforms have strengthened the resilience of banking systems and limited contagion from the failures, but confidence in some banks remains fragile

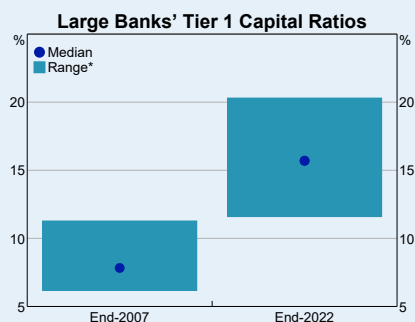
The failures of Credit Suisse, SVB, Signature and Silvergate represent the most severe stress event for the global banking system since 2008. Global regulators – including APRA in Australia – are considering the implications of the failures for banking regulatory frameworks, and US regulators have stated that they are considering strengthening regulatory requirements (particularly for mid-size and small banks). Nevertheless, the failures have been significantly less disruptive than the 2008 episode of bank stress. This reflects several factors:

- The failure of Lehman Brothers in 2008 precipitated larger losses and extreme liquidity stress across the banking system, at a time when underlying loan quality was already under pressure. Banks' large and opaque exposures to the subprime mortgage and structured credit markets, and the difficulty in valuing these assets in a timely fashion, led to extreme uncertainty and risk aversion. This resulted in an abrupt disruption to the interbank funding markets, and bank liquidity and capital buffers proved inadequate. By contrast, the 2023 bank failures have not resulted in material losses to other banks, and banks' mark-to-market losses on securities portfolios are largely known and manageable.
- The resilience of the global banking system has improved significantly since 2008 as a result of post-GFC reforms. Bank CET1 capital ratios have increased by

8 percentage points on average across advanced economies since 2008 (Graph A.5). Banks are also required to hold much higher levels of liquidity (governed by the LCR requirement) and to maintain stable funding sources that better align with the duration of their asset holdings (as captured by the NSFR requirement). Banks are required to maintain updated recovery plans, and regulators have access to a wider range of supervisory and resolution tools that both decrease the probability of bank failure and minimise the impact (including on taxpayers) should a failure occur. This improved resilience increases confidence in the ability of the banking system as a whole to absorb major shocks, thereby reducing the likelihood of severe contagion.

Nevertheless, sentiment is likely to remain fragile for some time and, in such an environment, the security prices of even strongly capitalised and liquid banks could also come under pressure. The equity prices of many banks have fallen sharply across advanced economies, reflecting increased investor risk aversion and the possibility that

Graph A.5



* 5th to 95th percentile of Tier 1 capital ratios across 74 large advanced economy banks from Australia (4), Canada (6), the United Kingdom (4), the United States (10), Japan (4), euro area (34) and other Europe (12).

Sources: RBA; S&P Global Market Intelligence

the failures could lower bank profitability in the period ahead due to higher funding costs and a weaker economic outlook (Graph A.6). Volatility in bank funding markets has also picked up, prompting the US Federal Reserve and five other central banks to increase the frequency of US dollar swap line operations; so far, this move has been viewed as largely precautionary in nature, with few drawdowns (see 'Chapter 1: The Global Financial Environment').

Australian banks have been less affected than those overseas

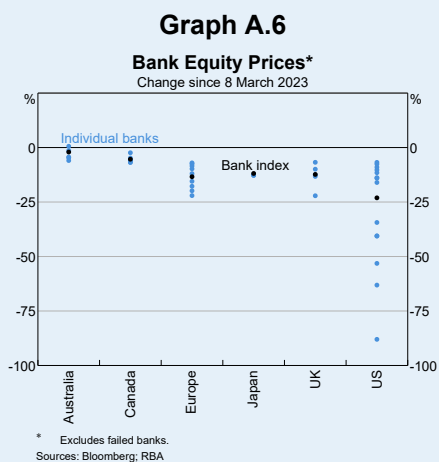
There have been limited flow-on effects to Australian banks from recent events in the United States and Europe. Australian banks' strong capital and liquidity positions, a robust domestic regulatory and supervisory framework involving close oversight by APRA, and the different nature of Australian banks' main activities make it less likely that the issues unfolding internationally will surface domestically. The market reaction to date reflects this, with Australian bank share and bond prices falling by considerably less than for banks in the United States and Europe,

and there is no sign of stress in the Australian interbank and money markets (Graph A.6).

Australian banks have high levels of resiliency to liquidity and funding shocks

The strength of Australian banks reflects both the voluntary (precautionary) response by banks to the GFC and their response to new regulations (see 'Chapter 2: The Australian Financial System'). After the GFC, banks reduced their reliance on short-term offshore wholesale funding because of the higher rollover risk associated with this funding source (particularly in periods of generalised liquidity stress); instead, they shifted towards more stable funding sources such as domestic deposits. Within deposit funding, a large share of Australian banks' deposits are from households, which tend to be more stable compared with other sources of deposits (Graph A.7). The Basel III liquidity reforms require banks to ensure they have sufficient high-quality liquid assets (HQLA) to meet cash outflows over a stress period (the LCR requirement) and a minimum level of stable funding for their assets (the NSFR requirement). Australian banks have maintained ratios comfortably above regulatory requirements for some time, supporting their resiliency to funding shocks.

Australian banks' capital positions are robust. APRA's 'unquestionably strong' capital framework came into effect on 1 January 2023, which has strengthened the resiliency of Australian banks to shocks. Banks hold levels of capital that are well in excess of these requirements and are high by international standards, further enhancing their loss-absorbing capacity.



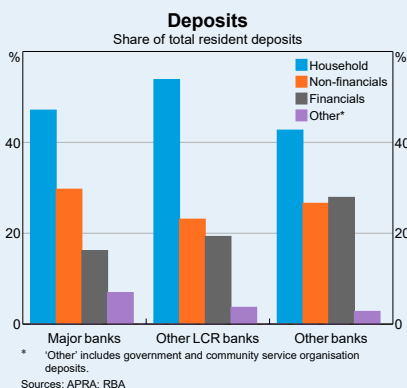
Australian banks' balance sheets are relatively less exposed to interest rate risk

One of the issues highlighted by the SVB failure was banks' sensitivity to interest rate risk resulting from large holdings of fixed-income securities. Holdings of securities tend to be a smaller share of Australian banks' assets, so they are relatively less exposed to this risk. On average, Australian banks' holdings of securities represent about 9 per cent of their domestic assets (Graph A.8). Australian banks' securities portfolios are also shorter duration than was the case for SVB, which further reduces exposure to interest rate risk. Australian bank balance sheets are also in part naturally hedged as a result of holding assets (such as variable-rate mortgages) that can be repriced quickly following increases in funding costs. Regulation in Australia requires banks to hold capital for interest rate risk in the banking book, which also incentivises banks to hedge their residual interest-rate risk exposure, leaving little interest rate risk on their balance sheet. Australian banks that are required to meet the LCR must include their holdings of HQLA at market value when calculating compliance with regulatory requirements.

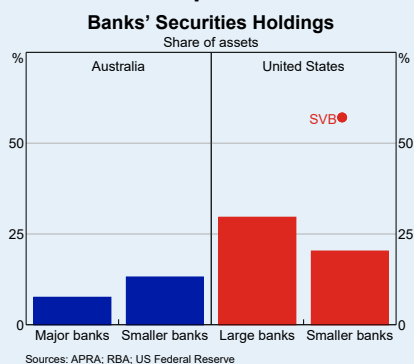
Australia has a robust domestic regulatory and supervisory framework

All Australian banks are held to high liquidity and capital standards, and are closely monitored by APRA. Banks required to meet the LCR and NSFR account for 86 per cent of Australian banking system assets. The remaining banks are also subject to prudent liquidity management requirements, including the minimum liquidity holdings requirement. APRA closely supervises banks and can require them to hold additional liquidity or capital if it has concerns about the bank's risk profile or the quality of its risk management. This is in contrast with the United States, where banks with less than \$250 billion in assets and less than \$50 billion in weighted short-term wholesale funding are exempt from standardised liquidity requirements, including the LCR and NSFR. Some of these banks – including the failed US banks – are still required to report certain liquidity metrics monthly and conduct internal liquidity stress tests, although the smallest US banks are also exempt from those requirements. Even with the strong regulatory framework in place in Australia, APRA, like other regulators around the world, is considering the lessons to be drawn from the recent bank failures. ✎

Graph A.7



Graph A.8



2. The Australian Financial System

Summary

The Australian financial system is strong. There are several features that leave it well placed to support economic activity through the current challenging economic and financial environment.

- Australia has a resilient, well-capitalised and profitable banking system that has strong liquidity coverage. During the recent period of stress in parts of the global banking system, the Australian Prudential Regulation Authority (APRA) has stepped up its supervision of banks in Australia and, together with other agencies on the Council of Financial Regulators (CFR), is closely monitoring the broader financial system. Prudential requirements for banks operating in Australia are equivalent to, and in some instances stronger than, Basel III requirements; the banking system holds levels of capital and liquidity that are well in excess of these requirements.^[1] Over the period ahead, banks anticipate an increase in non-performing loans (from historically low levels) in response to pressure on household budgets from higher interest rates and inflation. Banks are well placed to manage this while continuing to lend to households and businesses.
- Other large financial institutions in Australia also remain resilient. Superannuation funds have navigated periods of volatility in asset markets without inducing disruptions of the like seen in the United Kingdom bond market late last year. Nevertheless, recent events have continued to highlight the importance of Australian superannuation and investment funds maintaining robust liquidity management practices; this issue remains a key area of focus for regulators domestically and abroad. Insurers' capital levels also remain well above regulatory requirements, but the cost of claims has increased due to inflation and higher-than-expected natural disaster claims.
- Cyber resilience continues to be a key focus area for financial institutions and regulators. Recent high-profile cyber-attacks demonstrate the potential for these attacks to not only harm the individuals affected but to spill over to other organisations and the financial system more broadly.

Banks have high levels of capital, and the ‘unquestionably strong’ capital framework further enhances banks’ resilience

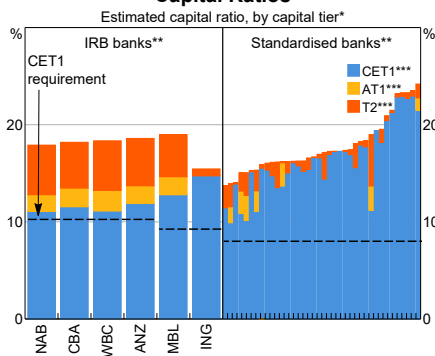
Prudential requirements for banks operating in Australia are at least equivalent to, and in many instances stronger than, Basel III requirements.^[2] Banks’ capital ratios remain well above regulatory minimum requirements (Graph 2.1). Over the six months to December 2022, banks’ capital increased further as growth in retained profits more than offset an increase in risk-weighted assets. Regulation in Australia requires banks to hold capital against interest rate risk in the banking book, which also incentivises banks to hedge residual interest rate exposures, leaving little interest rate risk on their balance sheets. As a result, capital levels in the Australian banking system have been less vulnerable to rising interest rates compared with some other jurisdictions.

APRA’s ‘unquestionably strong’ capital framework took effect in January 2023 with two main aims: to further strengthen the resilience of banks; and to more closely align Australia’s regulatory regime with Basel III standards. It

includes a larger capital conservation buffer (CCB) for large banks (over the minimum prudential capital requirement) and a 1 per cent countercyclical capital buffer (CCyB) that can be reduced by APRA in periods of stress.^[3] Under the new framework, banks’ Common Equity Tier 1 (CET1) ratios are expected to increase slightly, due to a lower average risk weight (banks’ capital positions under the new standards are due to be published by APRA in May). To better calibrate capital charges with underlying risk profiles, risk weights for some loans to small and medium-sized enterprises (SMEs) have declined, while risk weights for higher risk mortgages (such as investor, interest-only and highly leveraged loans) have increased.

Under APRA’s 2026 loss-absorbing capacity requirement, large banks are required to hold at least 18.25 per cent in total capital against risk-weighted assets. Consistent with this, large banks have been raising non-equity capital over recent years, mainly through Tier 2 instruments; these rank higher in the capital structure than CET1 and Additional Tier 1 (AT1) hybrid instruments, and so are issued by banks at lower cost. Banks have front-loaded their issuance of loss-absorbing capital to the extent that they are already slightly ahead of their 2026 requirements. Australian banks are unlikely to need to raise significant amounts of AT1 given issuance to date and due to the perpetual structure of these instruments. Secondary market prices for Australian banks’ AT1 instruments fell by less than those abroad following the write-down of Credit Suisse’s AT1 securities, which had a different conversion structure to the securities that tend to be issued in Australia (see ‘Box A: Recent International Bank Failures – Causes, Regulatory Responses and Implications’).

Graph 2.1
Capital Ratios



* Dashed line refers to APRA’s ‘Unquestionably Strong’ Framework for CET1 (10.25 per cent for major banks, 9.25 per cent for other IRB banks; 8 per cent for standardised banks).

** Internal ratings based (IRB) banks compute risk-weights internally; standardised banks set risk-weights in accordance with APRA’s risk-weight schedules.

*** Common Equity Tier 1 (CET1) is ordinary share capital and retained earnings; Additional Tier 1 (AT1) is perpetual subordinated debt; Tier 2 (T2) is dated subordinated debt.

Sources: APRA; RBA

Banks appear resilient to more challenging conditions

Retained earnings have contributed to strengthening the capital base of Australian banks over recent years. Bank profitability over the past couple of years has been supported by growth in lending, low levels of non-performing loans (NPLs) and, more recently, an uptick in net interest margins (NIMs) (Graph 2.2). The increase in NIMs over the past year has been modest in the context of the preceding decline and has reflected the effect of higher interest rates on non-loan interest-earning assets, such as earnings on banks' interest rate hedges and holdings of high-quality liquid assets (HQLA). At the same time, strong competition among banks for high-quality borrowers has weighed on NIMs.^[4]

Market analysts expect bank profitability to decrease a little over the coming year. This reflects expectations of a further slowing in credit growth, particularly for housing, and an increase in credit losses as unemployment rises in response to higher interest rates. Slower loan growth is also leading to greater competition among lenders, which, if sustained, could put further pressure on NIMs.

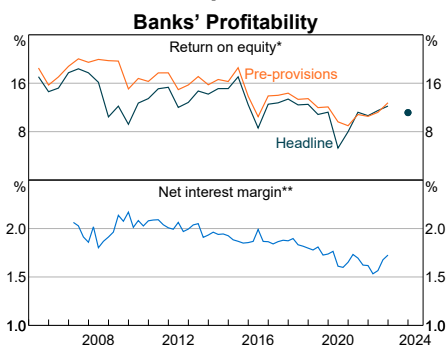
Stress-testing simulations suggest that banks would be able to continue extending credit to

households and businesses even if economic conditions were to be materially worse than expected. Banks' current profitability and high initial capital levels would support capital ratios in an economic downturn. While exercises of this type contain considerable uncertainty, they give an indication of the impact on banks of a severe economic downturn. In a scenario where the level of GDP falls by around 5 per cent, the unemployment rate rises to 5½ per cent and property prices fall by around another 10 per cent by December 2023, large and mid-sized banks' CET1 ratios would fall by around 160 basis points but would still be above minimum capital requirements (Graph 2.3).^[5] Smaller banks are also expected to be resilient to the deteriorating economic conditions in this scenario. While smaller banks' exposures are typically more concentrated in mortgages, high initial capital levels indicate that smaller banks in general could absorb losses associated with weaker macroeconomic conditions for a time while maintaining CET1 ratios above minimum requirements.

Loan arrears remain low but are expected to increase

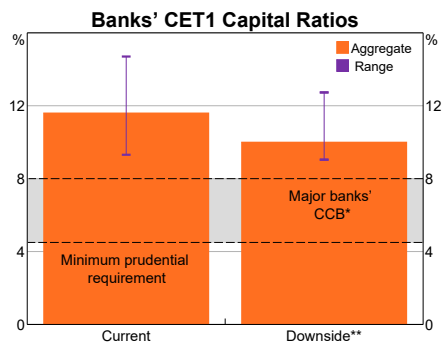
NPLs as a share of outstanding loans remain around the lowest level over the past decade,

Graph 2.2



* Dot represents forecast based on 12-month forward earnings.
 ** Interest income received less interest expenses paid, expressed as a percentage of assets.
 Sources: APRA; RBA; Refinitiv

Graph 2.3



* Includes the 2.5 per cent capital conservation buffer (CCB) and the additional 1 per cent D-SIB buffer.
 ** Scenario assumes that GDP falls around 5 per cent, the unemployment rate increases to 5.5 per cent, and property prices fall around 10 per cent by December 2023.
 Sources: APRA; RBA

and no banks are reporting a material increase in NPLs (Graph 2.4). The share of mortgages with repayments that are 30–89 days past due has, however, increased slightly from a low base. Liaison with banks indicates that part of the increase could be seasonal given the holiday period over December and January.

Banks’ strong asset quality has been supported by low unemployment, high levels of saving and prepayment buffers, and sound lending standards over recent years. The share of banks’ loans in, or close to, negative equity is very low and well below pre-pandemic levels, which supports both borrower and bank resilience by limiting losses in the case of a loan default. However, liaison with banks indicates that financial stress is increasing for some households, consistent with higher interest rates and inflation putting pressure on borrowers’ budgets (see ‘Chapter 3: Household and Business Finances in Australia’ and ‘Box B: Scenario Analysis on Indebted Households’ Spare Cash Flows and Prepayment Buffers’). As such, NPLs are expected to increase over the coming year. While banks have increased provisions for loan losses, the stock of provisions is still below the historical average and much

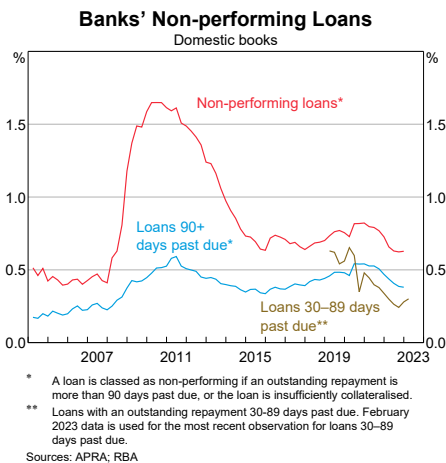
lower than the provisions held during the pandemic (Graph 2.5).

Banks have high levels of liquidity

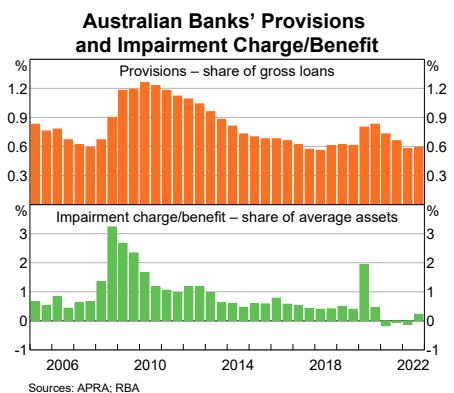
Banks have high levels of liquid assets that are well above regulatory minimums to support them through adverse liquidity conditions. The recent experience in the United States highlights the importance of banks having strong risk-management processes and maintaining ample liquidity to meet cash outflows (see ‘Box A: Recent International Bank Failures – Causes, Regulatory Responses and Implications’). APRA requires 13 large and complex Australian banks to meet a Liquidity Coverage Ratio (LCR), which under the Basel III reforms requires that banks have sufficient HQLA to meet cash outflows in a severe stress scenario. All of these banks have maintained LCRs comfortably above regulatory requirements for some time (Graph 2.6). Furthermore, these banks’ holdings of HQLA are valued at market rates, meaning mark-to-market gains or losses are recognised on bank balance sheets in a timely fashion. As discussed above, APRA also requires banks to hold capital against interest rate risk.

Smaller and less complex banks in Australia are also subject to a strong regulatory regime and are required to maintain ample liquidity

Graph 2.4



Graph 2.5



positions. APRA requires such banks to have in place a robust liquidity risk-management framework and to maintain a large portfolio of liquid assets (to meet a minimum liquidity holding ratio (MLH)) that can be easily and quickly converted to cash should the need arise. These banks must maintain a minimum holding of 9 per cent of their liabilities in specified liquid assets. Banks' MLH remain comfortably above regulatory requirements (Graph 2.7).

Exchange Settlement (ES) balances will decline as the Reserve Bank's Term Funding Facility (TFF) and Bond Purchase Program wind down, requiring banks to increase their holdings of

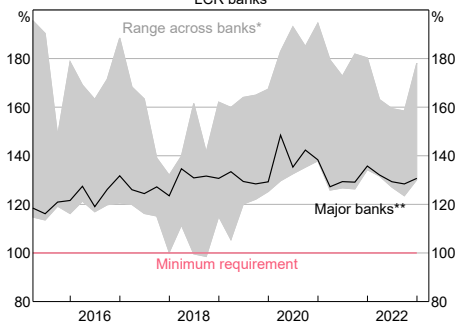
other forms of HQLA to maintain their stock of liquid assets. While replacing amounts borrowed under the TFF represents a sizeable funding task for banks over the next 15 months, they have been making related preparations for some time (see below).

A previous element of Australia's liquidity framework – the Committed Liquidity Facility (CLF) – was phased out over 2022. This followed a decision by APRA and the Reserve Bank in late 2021 that the CLF was no longer required to support so-called 'LCR banks' to meet their liquidity requirements, given the increased availability of HQLA in Australia.^[6] Bank CLF allocations were reduced from \$136 billion at the end of 2021 to zero on 1 January 2023, and mostly replaced with additional holdings of Australian Government Securities (AGS), securities issued by the state and territory borrowing authorities ('semis') and ES balances. This process went smoothly.

Larger banks are also required to meet a Net Stable Funding Ratio (NSFR) requirement, which enhances banks' longer term funding resilience. This ensures they have stable long-term funding profiles, which support their resilience to prolonged liquidity pressures. Banks' NSFRs comfortably meet regulatory requirements.

Graph 2.6

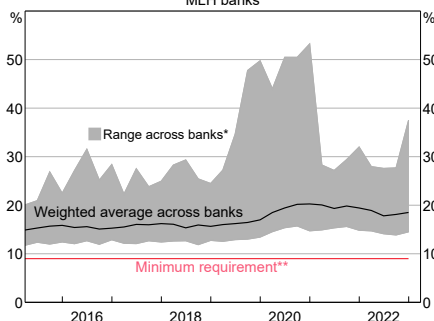
Liquidity Coverage Ratio
LCR banks



* From the 10th to 90th percentile of banks' liquidity coverage ratios.
** Weighted average of the major banks' ratios.
Sources: APRA; RBA

Graph 2.7

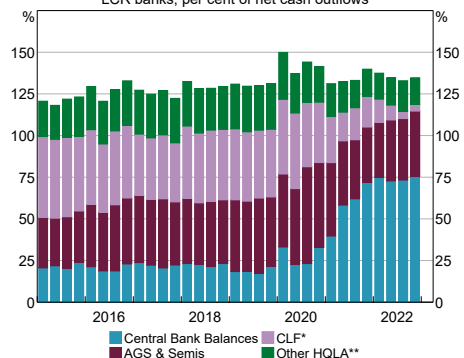
Minimum Liquidity Holding Ratio
MLH banks



* From the 10th to 90th percentile of banks' minimum liquidity holding ratios.
** Minimum requirements are higher for some banks.
Sources: APRA; RBA

Graph 2.8

High Quality Liquid Assets
LCR banks, per cent of net cash outflows



* Refers to eligible amount for LCR calculation.
** Includes HQLA type 2, coins and notes, RBNZ securities and other.
Sources: APRA; RBA

Banks are well advanced in preparing for their sizeable funding task

Over the next 15 months, Australian banks will need to repay a larger-than-usual amount of funding as funds borrowed from the Reserve Bank’s TFF mature (Graph 2.9). The TFF was part of a monetary policy package designed to reduce funding costs across the economy and to support lending, especially to SMEs, during the pandemic.^[7] Banks borrowed \$188 billion of low-cost, three-year term funding from the TFF; as of December 2022, this funding accounted for 4 per cent of banks’ overall funding. Much of this funding will need to be refinanced because banks will need to obtain other HQLA to replace ES balances (discussed above).^[8] This refinancing task is manageable, provided banks continue to adequately prepare and ensure their funding requirements are met well in advance to reduce their vulnerability to a prolonged period of dislocation in wholesale funding markets.

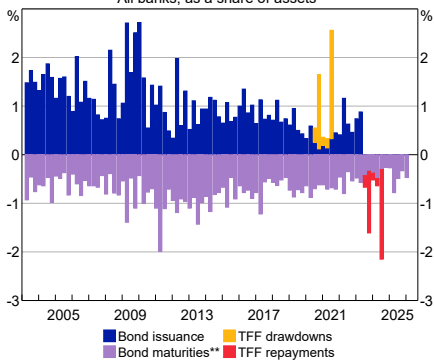
Indeed, Australian banks are generally comfortably ahead in their funding plans, which affords them flexibility to defer bond issuance for a period if there are renewed strains in global funding markets. Prior to the failure of some banks in the United States in early March,

Australian banks had already raised a large amount of wholesale debt funding; this amounted to net bond issuance of \$20 billion over the preceding six months (Graph 2.10). This large volume of bank bond issuance was comfortably absorbed by domestic and offshore bond markets. However, the cost of issuance increased alongside the widening in bond spreads internationally. Australian banks have long been viewed as attractive by domestic and international bond investors as a result of the strong regulatory environment in which they operate, their strong balance sheets, high credit ratings and record of investor engagement. Smaller Australian banks tend to issue domestically only, though conditions in offshore markets can affect these banks indirectly; if larger banks choose to step up issuance offshore instead of domestically, smaller banks benefit from the lower supply of bank bonds into the domestic market.

Over many years, Australian banks have demonstrated their ability to adjust their funding sources as conditions evolve. For example, in response to the market volatility associated with COVID-19 and Russia’s invasion of Ukraine, banks issued bonds with shortened tenors in line with investors’ preferences for reduced duration exposure; they also shifted towards issuing covered bonds (Graph 2.11).

Graph 2.9

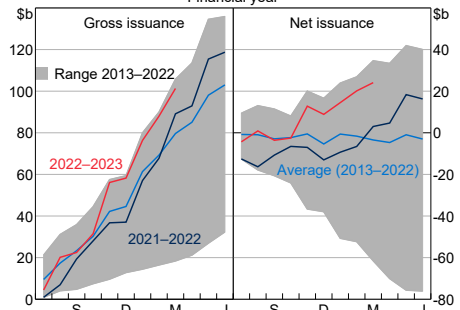
Bank Bonds and the TFF
All banks, as a share of assets*



* Assumes 4 per cent annual asset growth.
** Excludes buybacks.
Sources: APRA; Bloomberg; RBA

Graph 2.10

Cumulative Australian Bank Bond Issuance*
Financial year



* Includes senior unsecured and covered issuance.
Sources: Bloomberg; Private Placement Monitor; RBA

While there is a regulatory limit to the amount of funding that banks can raise through covered bonds, there is still capacity to issue these instruments should conditions warrant.

Non-bank housing credit growth has slowed ...

Non-bank housing credit contracted slightly in early 2023 after reaching growth of 21 per cent (on a six-month-ended annualised basis) in mid-2022 (Graph 2.12). The slowdown is in part due to the broader slowdown in the housing market, which has reduced demand for housing credit. In addition, strong pricing competition for borrowers from banks and rising funding costs for non-banks (which do not have access to low-rate deposit funding) have weighed on non-banks' ability and appetite to originate new loans.

Non-banks, relative to banks, tend to lend more to borrowers that are self-employed, work in industries more sensitive to economic conditions and at higher loan-to-income ratios. However, risks to financial stability arising from non-bank lending for housing are low.^[9] Non-banks' share of total housing lending remains small at less than 5 per cent. Additionally, lending standards appear to have been maintained by non-bank lenders during the

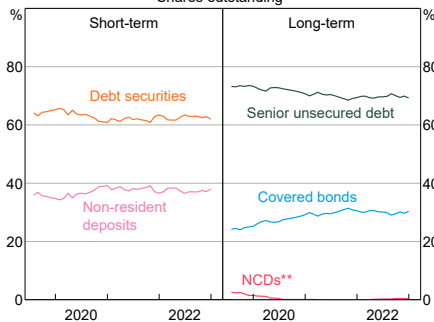
earlier period of rapid credit growth between 2020 and mid-2022, including because of the discipline imposed by their warehouse funders (which are often banks) and investors in residential mortgage-backed securities. The recent slowing of non-bank credit growth also suggests that non-banks have not unduly lowered their lending standards in an effort to maintain housing market share. Non-banks' 90-day loan arrears are around historical lows and are similar to arrears rates at banks, in part due to the strong labour market. As with banks, though, loan arrears are likely to gradually pick up over the period ahead given the more challenging economic environment.

... while non-bank business credit growth has increased sharply

While non-banks' housing credit growth has slowed, business credit growth has increased sharply, reaching 25 per cent (on a six-month-ended annualised basis) in early 2023 (Graph 2.12). Growth in non-banks' business lending has been particularly strong for property lending, which is recorded separately from housing credit and includes loans to self-managed superannuation funds. Over recent years, banks have been pulling away from some forms of higher risk business lending – such as construction, property and vehicles – while non-banks have increased their market share in these

Graph 2.11

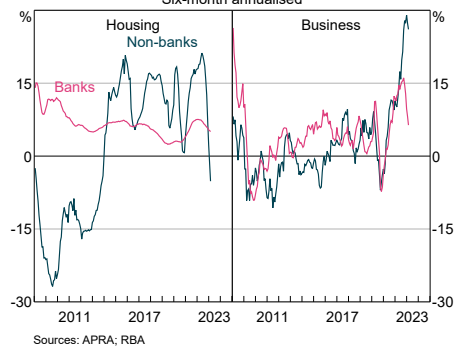
Banks' Wholesale Debt Funding
Shares outstanding*



* Original maturity basis, excluding hybrids.
** Negotiable certificates of deposit.
Sources: ABS; APRA; Bloomberg; RBA; Refinitiv

Graph 2.12

Credit Growth
Six-month annualised



Sources: APRA; RBA

sectors. The relative riskiness of non-banks' business lending is reflected in the interest rate charged by non-banks being 270 basis points higher on average than that charged by banks.

Non-banks' share of total business credit is small at about 8 per cent, which helps to limit risks to financial stability. However, there is limited data on the credit quality of these loans and on broader non-bank business lending activity and their funding models, given this activity occurs largely outside the prudential regulatory perimeter. While some business lending is funded through securitisation, where credit quality is closely scrutinised by investors and credit rating agencies, some is funded by private equity or via specialist funds where lending practices are less transparent.

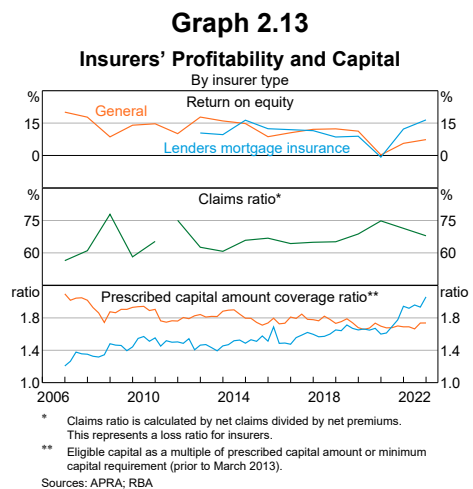
In general, non-bank lending can be more concentrated, riskier and more procyclical than bank lending, which can amplify credit and price cycles, particularly for property. Non-banks have the potential to contribute to systemic risk because their business models tend to involve liquidity and maturity mismatches and the use of leverage, which can amplify liquidity risks from large movements in asset prices (see 'Chapter 1: The Global Financial Environment'). Since the global financial crisis, when so-called 'shadow banking' activity severely disrupted the financial system, work has continued across many economies to increase regulators' visibility and understanding of non-bank lending activity. Compared with some other jurisdictions, however, this activity does not account for a large share of overall financing in the Australian economy.

Insurers' capital remains strong despite claims related to climate events

Insurers' capital positions remain well above APRA's prescribed capital amount and profits have continued to recover over the past six months (Graph 2.13). Insurers' profits have been supported by a recovery in investment income,

driven by higher interest earnings on fixed-income securities, while increases in premiums have only partly offset the rise in costs associated with claims. Meanwhile, low unemployment has continued to support profits for lenders mortgage insurers (LMI).

Claims from natural disasters remain at a high level; the NSW floods in 2022 are estimated to be Australia's most expensive natural disaster on record (in inflation-adjusted dollars). This pattern has continued into 2023, with Australian-based insurers facing large claims from flooding and cyclone-related damage in New Zealand. The cost of reinsurance – which domestic insurers use to protect themselves against large events – has increased sharply, reflecting larger payouts in Australia and globally. Insurers have passed these costs on to customers via increased premiums, raising concerns about the availability and affordability of insurance in some locations. Reduced insurance coverage exposes borrowers in the event of a natural disaster and may also expose lenders in cases where affected assets are used as collateral.



Superannuation funds have navigated a period of asset price volatility

Superannuation funds' assets and returns stabilised over the second half of 2022, after falling sharply earlier in the year (Graph 2.14). The modest recovery in equity prices and positive net contributions supported growth in funds' assets, though this was mostly offset by declining property valuations. Quarterly returns were positive in December 2022 for the first time since 2021; five-year annualised returns for the industry are around 5 per cent.

Disruptions in the UK bond market emanating from the pension fund sector in September 2022 highlighted how leverage from derivatives can amplify liquidity risks coinciding with large movements in asset prices.^[10] The episode also demonstrated the importance of robust liquidity management practices. There are key differences between the UK pension fund industry and the Australian superannuation industry:

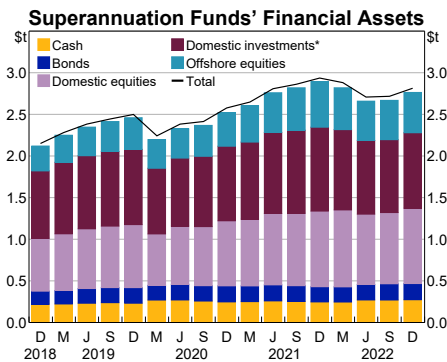
- Australian funds are mostly defined contribution (80 per cent of assets), where investment risk is directly passed through to members. By contrast, UK funds are predominantly defined benefit (90 per cent of assets), where member payments are guaranteed. This requires UK funds to align

the interest rate sensitivity of their assets and liabilities, which is typically done through the use of interest rate swaps and results in embedded leverage.

- While Australian superannuation funds use derivatives for risk-management purposes, they do so in a more moderate fashion compared with UK funds (21 per cent of assets compared with 62 per cent in the United Kingdom). This tempers the risk of margin calls causing a liquidity shock for superannuation funds, which could otherwise result in a need to engage in asset fire sales to urgently raise liquidity.
- Australian funds' cash holdings (12 per cent of assets) are much larger than UK funds' (2 per cent of assets). This also supports their ability to meet margin calls in an orderly fashion (Graph 2.15).

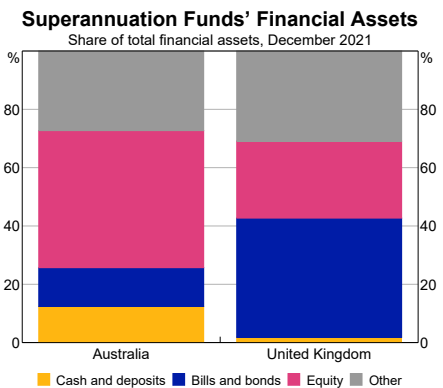
Nevertheless, Australian funds' use of foreign exchange derivatives to hedge foreign asset holdings requires them to provision for margin calls in the event of large exchange rate movements; investments that are denominated in foreign currencies account for over 35 per cent of total superannuation fund assets (Graph 2.16). The sector's ability to handle liquidity shocks was tested during the pandemic, when a 14 per cent depreciation in

Graph 2.14



* Shares and other equity issued by non-money market financial investment funds plus net equity of pension funds in life office reserves.
Sources: ABS; RBA

Graph 2.15



Sources: OECD Global Pension Statistics; RBA

the value of the Australia dollar in a single week prompted margin calls on foreign exchange derivative positions of \$17 billion.^[11] In addition, some superannuation funds were required to sell liquid assets during the pandemic to meet increased member switching towards safer assets and sizeable member withdrawals following the government’s COVID-19 early release of superannuation scheme. While these periods presented a challenge to the liquidity risk-management practices of superannuation funds, they were navigated without disrupting underlying asset markets.

APRA’s updated investment governance standards, which came into effect in early 2023, are designed to further increase the robustness of funds’ investment stress testing, liquidity risk-management practices and asset valuations by ensuring internal processes are well defined, regularly reviewed and performed with adequate frequency. Liquidity stress tests are also required under the new standards. More broadly, this effort is in keeping with moves by regulators internationally, where investment funds are being subjected to more onerous liquidity stress-testing requirements.

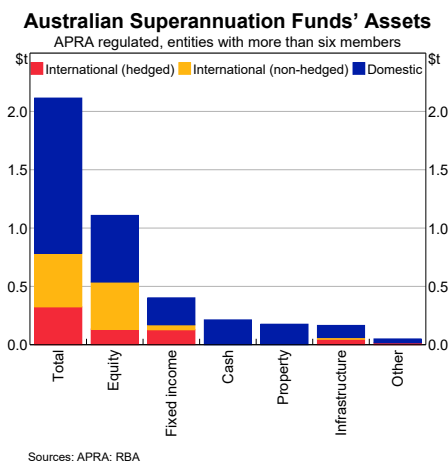
Operational resiliency and security of financial market infrastructures remains in focus

Recent operational and cyber incidents, both domestically and internationally, highlight the importance of financial market infrastructures continually assessing and improving their operational resilience and security. This is critical to underpinning stability in the financial system and remains a key area of supervisory focus (see ‘Chapter 4: Domestic Regulatory Developments’).

On 12 October 2022, the Reserve Bank Information and Transfer System (RITS) experienced a technology outage that disrupted the settlement services for New Payments Platform payments and for some other low-value payments systems. This caused significant delays for a large number of payments. The Bank has commissioned an external review of the incident and the operational risk environment for RITS. The Bank is also undertaking a targeted self-assessment of RITS to determine whether further actions may be required to improve observance of the relevant global standard – the ‘Principles for Financial Market Infrastructures’.

The Bank has continued to place particular emphasis on the operational resilience of clearing and settlement facilities. In November, ASX (Australia’s major stock exchange) announced its decision to pause and reassess all aspects of the replacement solution for CHES, the system that has supported clearing and settlement for Australia’s cash equities markets since 1994. The Bank and the Australian Securities and Investments Commission (ASIC) have publicly stated their expectations that ASX must continue to support and maintain CHES until the system can be safely replaced by ASX and its users. As a result, ASX has committed to maintain the resources and capabilities to ensure the ongoing stable and reliable operation and security of CHES. This will remain a regulatory focus for the Bank and ASIC as co-

Graph 2.16



supervisors of ASX's clearing and settlement facilities.

Cyber risk remains elevated

Cyber risk is one of the key risks facing the global financial system. A number of high-profile cyber-attacks have occurred in Australia recently, including the attack this year on Latitude Financial. The cyber-attacks on Optus and Medibank Private in late 2022 demonstrated the potential for spillovers to the broader financial system, even when the incident originates outside the financial system. This is in addition to the harm that can be caused to affected individuals. Similarly, the cyber-attack on ION Trading UK demonstrated how an attack on common third-party infrastructure can have widespread impacts across markets and jurisdictions.

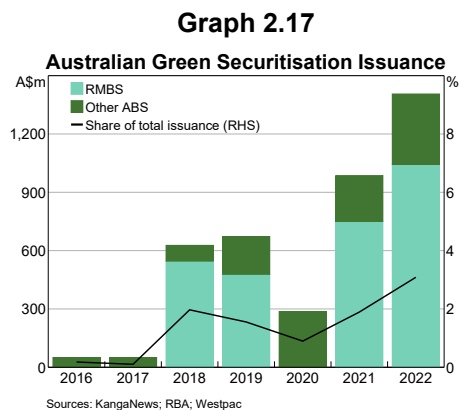
Banks in Australia continue to report a heightened level of fraud and scams, and information from liaison indicates that cybercriminal activity continues to increase in sophistication. Financial institutions are continuing to invest in their cybersecurity and response capabilities, aligning their systems and procedures with best practices to mitigate cyber risks. The government and regulators are also continuing to work with financial institutions to further develop the resilience of the financial system (see 'Chapter 4: Domestic Regulatory Developments').

Management of climate change financial risk continues to evolve

Climate change is another key long-term risk to the financial system that will need to be carefully managed by financial institutions and monitored by regulatory agencies. The financial system is affected through the direct physical risks to assets from climate events, as well as through the transition risks that arise from policies and technologies implemented to address climate change and assist in the

transition to a lower emissions economy. The major Australian banks continue to invest in their internal climate-risk monitoring capabilities, and all have now released reports outlining their climate strategies and detailing progress on meeting their climate targets. Australia's 'green' financial markets continued to develop in 2022 with record issuance of 'green' asset-backed securities, where the underlying loans are used for activities such as purchasing properties with high energy ratings or installing solar panels (Graph 2.17).^[12] Australia uses a market-based classification system in which investors assess the 'green' criteria of the underlying loans as disclosed by issuers. This is often provided by third-party certification of green securities, which is also common practice in the United States. By contrast, in Europe the taxonomy of 'green activities' is prescribed.

Public and private sector organisations around the world are working to better measure, monitor and manage the significant risks arising from climate change. For example, the recent Climate Vulnerability Assessment conducted by APRA on behalf of the CFR estimated the impact of two potential climate scenarios on Australia's five largest banks. The results suggest that neither climate scenario was likely to result in severe stress to banks, although pockets of stress did emerge for both mortgage and business exposures. In addition, the potential for higher



losses arising from climate change could lead to the banking sector being more vulnerable to future economic downturns. The Reserve Bank has published complementary top-down analysis that yielded similar conclusions and has

also highlighted the need for further work in this area.^[13] See 'Chapter 4: Domestic Regulatory Developments' for work underway by CFR agencies. ✎

Endnotes

- [1] See APRA (2021), 'Response to Submissions: Finalising Bank Capital Reforms', November.
- [2] See Lonsdale J (2023), 'APRA Chair John Lonsdale – Speech to AFR Banking Summit 2023', Sydney, 28 March.
- [3] The CCB is an additional reserve of capital (ranging from 2.5–4.75 percentage points) required to be held above the minimum prudential capital ratio of 4.5 per cent for all banks. The CCyB is a releasable reserve of capital with a baseline setting of 1 per cent, which may be varied by APRA in the range of 0–350 basis points.
- [4] See Carse V, A Faferko and R Fitzpatrick (2023), 'Developments in Banks Funding Costs and Lending Rates', *RBA Bulletin*, March.
- [5] For more details on the Reserve Bank stress-testing model, see Garvin N, S Kurian, M Major and D Norman (2022), 'Macrofinancial Stress Testing on Australian Banks', RBA Research Discussion Paper No 2022-03.
- [6] See APRA (2023), 'APRA Phases Out Aggregate Committed Liquidity Facility', News Release, 9 January. The CLF complemented available HQLA to ensure banks had sufficient access to liquid assets during a period of stress. Banks were able to use CLF allocations towards meeting their LCR requirements. The CLF had been required in Australia given the historically limited supply of HQLA due to low levels of HQLA securities (AGS and semis) on issue. See Brischetto A and L Jurkovic (2021), 'The Committed Liquidity Facility', *RBA Bulletin*, June.
- [7] See Alston M, S Black, B Jackman and C Schwartz (2020), 'The Term Funding Facility', *RBA Bulletin*, December.
- [8] See Kent C (2023), 'Long and Variable Monetary Policy Lags', Speech to the KangaNews DCM Summit, Sydney, 20 March.
- [9] See Hudson C, S Kurian and M Lewis (2023), 'Non-bank Lending in Australia and the Implications for Financial Stability', *RBA Bulletin*, March.
- [10] The sharp increase in UK Government bond yields after the government's mini-budget in September 2022 led to large margin calls on UK funds' interest rate derivatives. UK funds were forced to sell assets to meet the margin calls, which caused market dislocation and resulted in the Bank of England intervening. See Breeden S (2022), 'Risks from Leverage: How Did a Small Corner of the Pensions Industry Threaten Financial Stability?', Speech to ISDA and AIMA, 7 November.
- [11] For more information on Australian superannuation funds during the onset of the pandemic, see RBA (2021), 'Box C: What Did 2020 Reveal about Liquidity Challenges Facing Superannuation Funds?', *Financial Stability Review*, April.
- [12] See Kearns J (2022), 'Securitisation: Past, Present and Future', Speech to the Australian Securitisation Conference, Sydney, 30 November.
- [13] See Kurian S, G Reid and M Sutton (2023), 'Climate Change and Financial Risk', *RBA Bulletin*, June.

3. Household and Business Finances in Australia

Summary

Most households and businesses are well placed to manage the impact of higher interest rates and inflation, supported by continued strength in the labour market and sizeable savings buffers.

- However, the resilience of households and businesses is unevenly spread; some are already experiencing financial stress from higher interest rates and inflation, and the squeeze on household budgets is likely to continue for some time.
- Early-stage mortgage arrears have increased slightly from very low levels and lenders are provisioning for an increase in the period ahead. If unemployment were to rise more sharply than expected, the share of households and businesses experiencing financial difficulties – and ultimately falling into arrears on their loans – would increase further.

Higher interest rates and inflation are putting pressure on household budgets ...

Higher interest rates and inflation have increased household expenses considerably over the past year. This, in turn, has reduced the spare cash flow – that is, the income available to spend or save after meeting housing costs and essential living expenses – of most renting and mortgagor households. The impact on household budgets has been uneven, however. Lower income households, including many renters, have been most affected as they tend to have lower spare cash flows and savings available to absorb rising costs. Relatively recent borrowers, including first home buyers, are also likely to be more affected as they tend to have larger debts (relative to income) than other borrowers and have had less time to build up savings buffers (discussed below).

Higher interest rates and inflation have started to dampen growth in consumption and saving. Timely indicators suggest that real household spending growth remained subdued in the March quarter, while information from retailers in liaison indicates that consumers are cutting back on their spending ‘wants’ and are searching for more value. The household saving rate has also declined from the very high levels of recent years to be a little below its pre-pandemic average, and the pace of inflows to offset and redraw accounts has eased in recent months (discussed below). Consistent with these trends, consumer sentiment is at historically low levels, particularly for those with mortgages (Graph 3.1).

For those households with mortgage debt, higher scheduled mortgage payments are a key driver of declines in spare cash flow. Borrowers with variable-rate loans – including those who

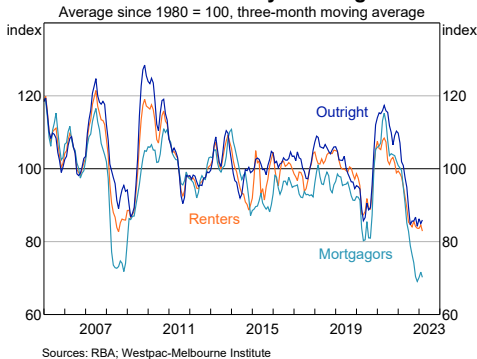
have already rolled off very low fixed-rate loans – have experienced large increases in their scheduled loan payments (typically between 30 and 50 per cent). The remaining borrowers, accounting for around one-third of all housing credit, continue to benefit from low fixed rates. However, like earlier cohorts that have already rolled off fixed rates, these borrowers will face large discrete increases in their loan payments when their fixed rate expires, mostly over 2023 and 2024.

Pressures on household budgets will build further as previous increases in the cash rate continue to pass through to variable-rate borrowers – increases in the cash rate affect mortgage payments with a delay of a few months – and fixed-rate loans roll off onto higher variable rates. Total scheduled interest and principal payments are expected to increase to around 9¾ per cent of household disposable income by the end of 2024 (Graph 3.2). This would be around the level of total payments (including prepayments into offset and redraw accounts) that households have been making over the past year.

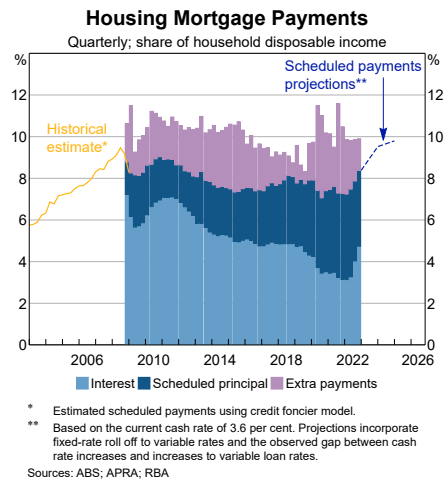
... and there are some early signs of financial stress among some borrowers ...

To date, the vast majority of borrowers have continued to service their debts as required, including by adjusting their spending and saving patterns. Early-stage mortgage arrears rates (i.e. 30–89 days past due) have increased slightly from very low levels, though this is likely in part due to seasonal effects (see ‘Chapter 2: The Australian Financial System’). The share of credit card balances accruing interest – another indicator that could signal emerging financial stress – has been little changed over recent months. Nevertheless, liaison with community groups suggests there has been increasing demand from households for assistance with meeting their debt obligations. The share of low-income mortgagors (defined as the bottom quartile of mortgagor incomes) devoting more than one-third of their income to servicing their housing loan has increased from around one-quarter before the first increase in interest rates in May 2022 to around 45 per cent in January 2023. By contrast, around 5 per cent of borrowers in the highest income quartile spend more than one-third of their income on servicing their housing loan; however, these

Graph 3.1
Consumer Sentiment by Housing Tenure
Average since 1980 = 100, three-month moving average



Graph 3.2



borrowers can generally meet larger debt-servicing costs relative to their incomes as they tend to spend a smaller share of their income on essential living expenses.

While borrowers in aggregate have continued to add to their savings in recent times (as discussed below), there has also been a pick-up in the share of borrowers who are drawing on their prepayment buffers. The share of owner-occupier variable-rate loans where borrowers have drawn on their buffers for three consecutive months has increased compared with the range of recent years (Graph 3.3). A higher share of borrowers are also making relatively small withdrawals compared with previous years, which could suggest that more borrowers are drawing on their buffers to fund regular expenses (as opposed to large discretionary expenses, such as holidays).

... but most households continue to add to their savings buffers and are well placed to navigate a period of more challenging financial conditions

In aggregate, the household sector balance sheet remained strong as at the end of December 2022 (the period for which the most recent comprehensive data are available). The value of household assets fell by 2 per cent in

2022 due to the decline in housing and equity prices; however, it remained 25 per cent higher in December 2022 than at the end of 2019 (just prior to the pandemic) and around six times larger than the value of household debt.

Households also have a large stock of liquid assets that is roughly equal to the total value of their liabilities. Furthermore, households continued to add to their savings over 2022 – including in the form of mortgage prepayments – albeit at a slower pace than in the preceding two years.

Household finances have been supported by the strong labour market, which has underpinned growth in nominal incomes. Consistent with this, indebted households across the income distribution have continued to add to their offset and redraw account balances, particularly those on lower and middle incomes. At the same time, most borrowers have experienced large increases in their scheduled loan payments, which means the number of months of scheduled loan payments that a given offset and redraw account balance can cover has declined. Accordingly, in early 2023, more than 60 per cent of all loans had balances in offset and redraw accounts equivalent to more than three months of their scheduled payments and almost half had buffers equivalent to more than a year (Graph 3.4). These shares are largely unchanged from the first increase in interest rates last May. Broader measures of liquid savings (beyond funds held in redraw and offset accounts) indicate an even larger degree of resilience to rising interest rates and higher costs of living (see below).

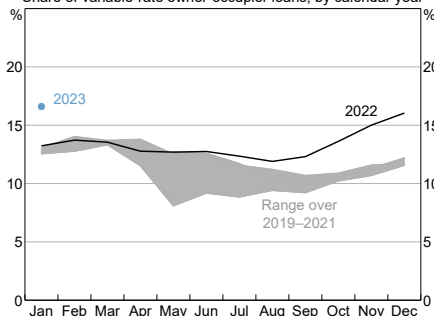
Borrowers who have low liquidity buffers face the highest debt-servicing risks ...

While many borrowers have significant buffers, around 40 per cent of loans have less than three months of prepayment buffer. Borrowers with these loans are potentially more at risk of

Graph 3.3

Withdrawals from Mortgage Prepayments*

Share of variable-rate owner-occupier loans, by calendar year



* Share of borrowers that reduce their offset and/or redraw balances over preceding three consecutive months.

Sources: RBA; Securitisation System

struggling to service their debts, particularly if they experience shocks to their income or expenses. However, not all loans with low prepayment buffers are equally risky:

- Over half of these 'low-buffer' loans are fixed-rate or investor loans (Graph 3.4, red bar). Borrowers with these loans are less likely to hold their savings in mortgage redraw or offset accounts, and so the full scope of liquid savings buffers held by these borrowers cannot be observed in loan-level data. Private survey data that include broader forms of saving indicate that fixed-rate borrowers have substantial savings outside their mortgages (see below).^[1] Historically, investors have tended to have larger pools of liquid assets to draw on compared with owner-occupiers.^[2]
- The 15 per cent of low-buffer loans extended to owner-occupiers at very low variable rates (between March 2020 and April 2022) are potentially riskier loans (Graph 3.4, yellow bar). Given the increase in interest rates since these mortgages were taken out, these borrowers' scheduled payments are now more likely to be close to or above the maximum level that their

lender assessed they could afford when the loan was originated. These borrowers are also less likely to hold savings outside their mortgages than comparable fixed-rate borrowers. This group includes some first home buyers, although they are not over-represented.

- Around one-third of low-buffer loans ('other' loans) are older loans (Graph 3.4, blue bar). These loans can also be riskier than others, to the extent they reflect borrowers who consistently have little spare cash flow to save.

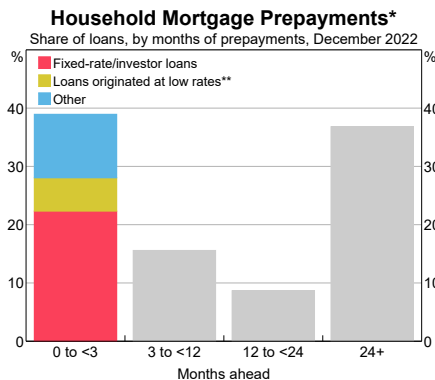
... especially if they also have high debt and low incomes

Those borrowers with low mortgage prepayments who are also highly indebted are more likely to experience debt-servicing challenges. This risk is highest for those who also have low incomes. This is because low-income households typically have less ability to draw on wealth or cut back on discretionary consumption to free up cash flow for debt servicing. A little less than 2 per cent of variable-rate owner-occupier loans have fewer than three months of prepayments and a loan balance that is more than six times the borrowers' annual income (Graph 3.5). A large proportion of these loans are held by low-income borrowers.

Most variable-rate borrowers are expected to remain resilient to rising interest expenses, but there is a group who will come under increasing stress

Scenario analysis can be used to gauge the resilience of variable-rate owner-occupier borrowers to higher interest rates and cost-of-living pressures (see 'Box B: Scenario Analysis on Indebted Households' Cash Flows and Prepayment Buffers'). This work suggests that, in a scenario where the economy is assumed to evolve in line with forecasts from the February *Statement on Monetary Policy*, the bulk of these

Graph 3.4



* Months ahead expressed as number of months that prepayments (including offset and redraw balances) can cover minimum scheduled payments. Includes split loans. Only loans with less than 3 months of prepayments are broken down by loan type.

** Includes variable-rate and split owner-occupier loans originated from March 2020 to April 2022. Fixed-rate and investor loans originated in this period are in the fixed-rate/investor category.

Sources: RBA; Securitisation System

borrowers will be able to continue to service their debts through some combination of lower non-essential spending, lower saving and drawing down on existing savings buffers. However, there is a group of borrowers who, even if they cut back sharply on non-essential spending, will be at risk of exhausting their savings buffers within six months unless they can make other adjustments to their income or essential spending. As discussed above, those on lower incomes and recent first home buyers are over-represented in this group.

Most borrowers on fixed rates appear well placed for the step-up to higher rates when their fixed-rate term expires

The one-quarter of loans that are still on fixed rates will face large increases in their scheduled payments when they roll off onto much higher interest rates over the next two years.^[3]

Borrowers with these loans will be aided in this transition by the following factors:

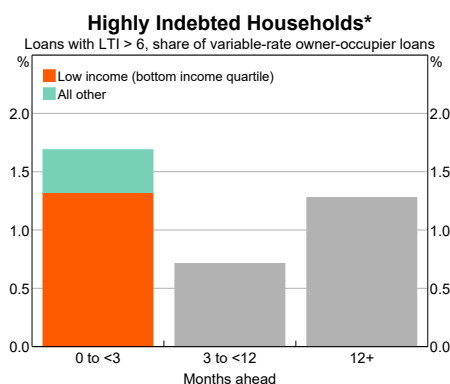
- *They have had considerable time to prepare for the coming increase in their mortgage payments.* By having fixed at a low rate, rather than paying the variable rate, they will have avoided making mortgage payments

equivalent to several months of their new scheduled payment after their fixed rate expires.

- *Most have substantial savings, in both mortgage prepayments and other forms.* The one-half of fixed-rate loans that are 'split' (with a fixed and variable component) have similar levels of mortgage prepayments to fully variable-rate loans. In addition, private survey data suggest that when non-mortgage savings are accounted for, borrowers tend to have similar levels of savings regardless of the type of interest rate on their loan (Graph 3.6).

However, on some metrics fixed-rate loans appear a little riskier than variable-rate loans. As set out in a recent *Bulletin* article on the characteristics of expiring fixed-rate housing loans,^[4] borrowers on fixed rates tend to have larger balances relative to borrower incomes and higher loan-to-valuation ratios (LVRs) than variable-rate loans. Although the differences are not large and partly reflect that fixed-rate loans are newer than variable-rate loans and so borrowers have had less time to accumulate equity or liquidity buffers, some borrowers on fixed rates could be at higher risk of entering

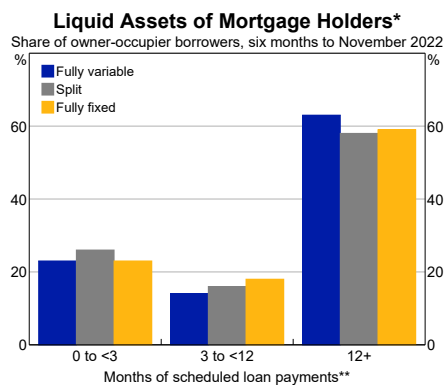
Graph 3.5



* Loan-to-income (LTI) is measured as the ratio of households' current loan value (net of redraw balances) relative to their income in January 2023. Months ahead expressed as number of months that prepayments (including offset and redraw balances) can cover minimum scheduled payments. Only loans with less than three months of prepayments are broken down by income quartile.

Sources: ABS; RBA; Securitisation System

Graph 3.6



* Liquid assets include balances held in deposit accounts (including offset accounts), shares and holdings in managed funds; exclude balances available for redraw from the loan.

** Monthly scheduled payment calculated using credit foncier model assuming all borrowers face the outstanding variable rate as at December 2022.

Sources: DBM Atlas; RBA

financial stress when their mortgage payments increase.

Housing prices have fallen sharply at the national level, but most indebted households still have large equity buffers

Most borrowers have large equity buffers in their properties, giving them the option to sell their property and repay their loan if it becomes too difficult to service the loan. This reflects several factors:

- The decline in housing prices over the past year has in many cases only partially reversed the gains of recent years.
- Generally strong lending standards over recent years mean only a small share of loans have been originated at high LVRs – that is, with small equity buffers.
- Most borrowers have made sizeable mortgage prepayments and therefore paid down the principal on their loans faster than required.

As at January 2023, 2 per cent of loan balances (by value) were estimated to have an outstanding LVR greater than 90 per cent (Graph 3.7). This share has increased by 1½ percentage points over the past year but remains well below levels observed in January 2020. The share of loans (by number and value) in negative equity (LVR > 100 per cent) remains negligible and much lower than prior to the pandemic.

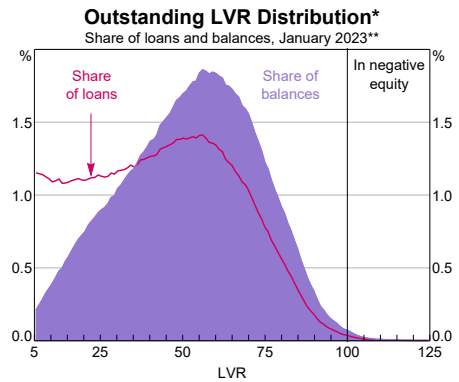
If housing prices fell a further 10 per cent from January 2023 levels, the share of loan balances (by value) in negative equity is estimated to rise to 2 per cent (Graph 3.8). Around 90 per cent of these loans (by number) in negative equity have low prepayment buffers and would therefore be at a higher risk of default if these borrowers became unable to service their debts. In this situation, it is newer loans that are more likely to enter negative equity because their borrowers

have benefited less (if at all) from earlier housing price increases and have had less time to accumulate equity and savings buffers. This includes a high share of recent first home buyers, who are more likely to have taken out loans at relatively high LVRs (because they are typically more deposit constrained).

Credit conditions have tightened with the increase in interest rates

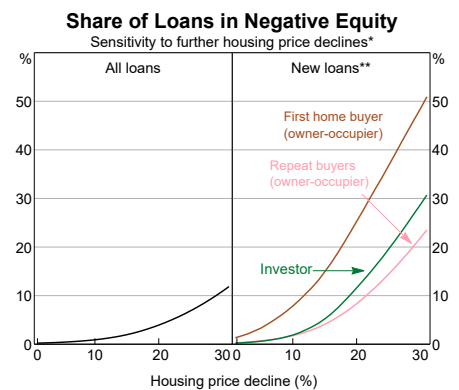
The growth in housing credit has continued to moderate, and the share of new, higher risk

Graph 3.7



* Loan balances adjusted for redraw and offset account balances; property prices estimated using SA3 price indices.
** Excluding LVR < 5 per cent
Sources: ABS; CoreLogic; RBA; Securitisation System

Graph 3.8



* Each percentage decline is applied to the price levels that prevailed in each SA3 region during January 2023, separately for houses and apartments.
** New loans are those originated since January 2020. These are somewhat under-represented in the Securitisation data as new loans can take some time to be securitised.
Sources: ABS; CoreLogic; RBA; Securitisation System

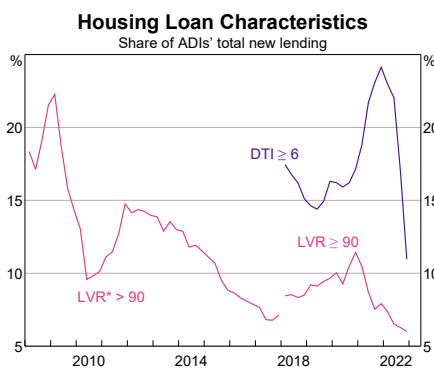
lending has continued to fall as interest rates have increased. For a given borrower, the maximum allowable size of a new loan (that passes a lender's serviceability assessment) has declined by around 30 per cent since the first cash rate increase in May 2022. Accordingly, the share of new lending to borrowers at a debt-to-income (DTI) ratio greater than six has fallen further and is now less than half of its late-2021 peak (Graph 3.9).^[5] Lending at a LVR greater than 90 per cent has also continued to decline to new lows. Non-bank lenders have maintained similar lending standards to regulated lenders since the onset of the pandemic and have recently experienced materially slower growth in new lending compared with banks; this suggests there is little migration of housing credit risk away from regulated lenders (see 'Chapter 2: The Australian Financial System').

There is nevertheless strong competition amongst lenders, particularly for high-quality borrowers, with lenders offering discounted interest rates and cashbacks on new and refinanced loans. While rising interest rates have meant that some existing borrowers have become unable to refinance with a new lender because they cannot meet the serviceability criteria that lenders use to assess new and refinanced loans (which factor in an interest rate

buffer of at least 300 basis points to the current loan rate), many existing borrowers have been able to refinance with a new lender on more favourable terms or achieve the same outcome by renegotiating and staying with their current lender. Estimates suggest around 16 per cent of existing loans are unable to meet serviceability assessments conducted at current interest rates (Graph 3.10). If mortgage rates were to increase by a further 1 percentage point, the share of loans unable to refinance with another lender is estimated to increase to around 20 per cent. Newer borrowers are over-represented in this cohort, especially the small share who borrowed close to their maximum capacity when interest rates were very low.

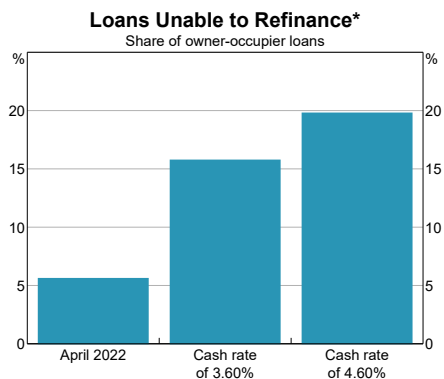
Rather than moving to another lender, many borrowers have been negotiating a larger discount from the reference rate with their existing lender. Around one-third of outstanding variable-rate owner-occupiers have renegotiated the discount on their loan since May 2022. Information from liaison suggests that most borrowers who are unable to refinance with another lender are still able to negotiate discounts with their existing lender, provided they meet other criteria including in relation to loan size and LVRs.

Graph 3.9



* LVR series breaks at March 2018 due to reporting changes.
Sources: APRA; RBA

Graph 3.10



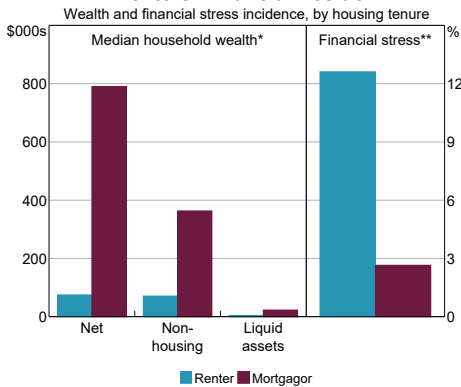
* Loans that would fail a serviceability assessment to take out a new loan equal to the current balance. Estimated using income at origination grown forward using growth in the Wage Price Index (WPI) and expenses in line with the Household Expenditure Measure (HEM).
Sources: ABS; Melbourne Institute; RBA; Securitisation System

Renters are facing challenges from strong rental inflation and cost-of-living pressures

Strong growth in rents has put pressure on the budgets of renters who have signed new leases over the past year or so.^[6] As renters tend to have lower incomes than other households and so spend a larger share of their income on essential items, they are less able to adjust their spending behaviour in response to high inflation. In addition, renters have historically been more likely to lose work during downturns. Since renters also tend to have fewer liquid assets and lower net wealth, they have historically been considerably more likely to experience financial hardship than other households (Graph 3.11). In line with this, liaison information suggests that increased demand for community services over recent quarters has primarily come from renters. While renters do not pose direct financial stability risks, if a large share of renters were to sharply reduce their consumption it could contribute to a more material economic downturn.

Graph 3.11

Renters' Financial Position



* SIH 2019/20 release.

** Share of households reporting at least three financial stress events in HILDA wave 21, including being unable to pay bills on time, being unable to pay mortgage or rent on time, pawning or selling household items, being unable to heat home, going without meals, asking for financial help from friends or family, or asking for help from welfare or community organisations.

Sources: ABS; HILDA; RBA

The business sector has a stronger balance sheet than before the pandemic

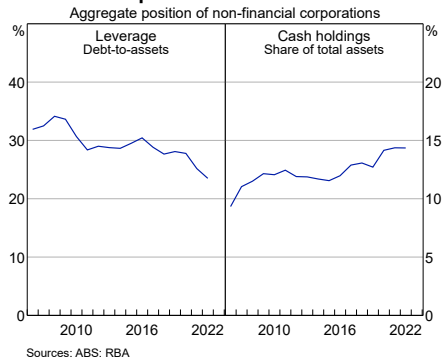
In aggregate, non-financial businesses' balance sheets strengthened over the three years to June 2022 (the latest available annual data). Aggregate leverage (measured by the debt-to-assets ratio) continued to decline, while cash buffers (measured by the ratio of cash holdings to total assets) increased further (Graph 3.12). However, the rate of accumulation of cash buffers has slowed since early in the pandemic and has been distributed unevenly across businesses. Data on bank deposits suggest that larger businesses' cash buffers have expanded by proportionally more than those of smaller businesses.

Most businesses were able to pass on higher input costs to rebuild their profit margins after the pandemic

Firm-level data suggest strong demand following the pandemic allowed most businesses to rebuild their operating profit margins, despite rising input costs. As of the September quarter of 2022 (the latest available quarterly data), the median operating profit margin had recovered to around pre-pandemic levels (Graph 3.13). This trend is broadly consistent with large listed companies' profit

Graph 3.12

Corporate Balance Sheet



results for the second half of 2022. However, not all businesses were able to rebuild their margins by this time. Operating profit margins remained lower for firms in the building construction industry, as builders continued to work through fixed-price contracts that were written before input costs rose substantially.^[7] However, higher energy costs do not appear to have had a substantial effect on firms' margins. Most energy-intensive firms were able to maintain their operating profit margins, including those in the transport industry.

Indebted small businesses are more exposed to higher interest rates than larger businesses

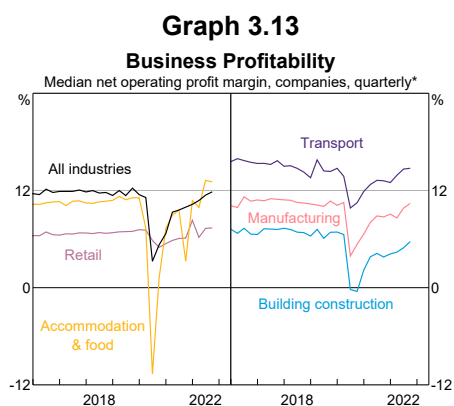
Indebted smaller businesses are more exposed to rising interest rates than larger businesses. Around half of small business lending is collateralised with a residential mortgage, and most of these loans are on variable rates, meaning higher interest rates have already passed through to these borrowers' scheduled payments. Given smaller businesses have also been more affected by ongoing cost pressures, some may have difficulty servicing these higher interest expenses, particularly as small business income tends to be volatile from quarter to quarter. The non-performing share of banks'

business loans remains low. For those with loans secured by residential property, some will face difficulties meeting serviceability criteria for external refinancing, similar to households. In addition, recent declines in housing prices may limit the ability of these businesses to resolve serviceability issues by restructuring their loans (e.g. by accessing additional equity from their home). In contrast to the household sector, small businesses do not appear to face a large and concentrated volume of fixed-rate loan expiries over the next few years. Although fixed-rate loans account for around 35 per cent of outstanding small business lending, these loans tend to be relatively small (e.g. for equipment finance), have shorter maturities and are likely to be fully repaid by the time they mature.

The average variable rate on large businesses' outstanding loans increased by around 320 basis points between April 2022 and February 2023. However, the debt-servicing costs of many ASX-listed companies have increased by much less than this and remain low by historical standards (Graph 3.14). This is because many large companies hedge their interest rate exposures. Many also issued long-term fixed-rate debt prior to the increase in interest rates, which will delay the pass-through of higher interest rates to interest expenses; for most issuers only a small share of bonds is due to expire in the next 12 months. Moreover, as of December 2022, the majority of ASX-listed companies had ample liquidity and annual profits that were at least double their interest expenses, while 60 per cent of unprofitable companies had enough cash to cover their liabilities.

Company insolvencies have increased to around pre-pandemic levels, but remain low

Company insolvencies have returned to close to pre-pandemic levels (Graph 3.15). Almost all insolvencies over the past year were relatively small companies, typically with an annual

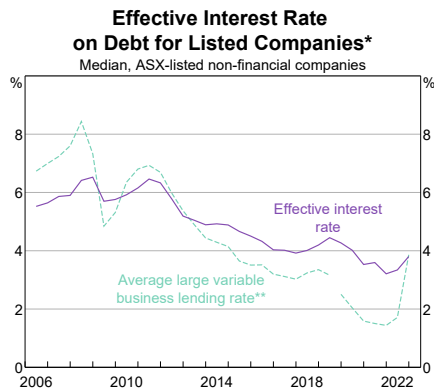


* Selected industries; net profits as operating revenue less operating costs and wages; not including government payments (e.g. JobKeeper); includes ~250,000 GST-remitting companies; seasonally adjusted.

Sources: ABS; RBA

turnover less than \$2 million and limited potential for spillovers to households and other businesses. The construction sector continues to account for around 30 per cent of company insolvencies, reflecting ongoing margin pressures as builders work through fixed-price contracts that were written before input and labour costs rose substantially, with labour and materials shortages having added costly delays. The increase in interest rates has also raised debt-servicing costs for many firms. While the direct implications for the financial system are limited because banks have very small exposures to builders, there is potential for financial stress to spread to other businesses within the broader construction industry and to some households.^[8] More broadly, insolvencies are expected to rise further as small businesses face ongoing pressures, as discussed above. However, the impact on the financial system and the broader economy is unlikely to be material unless there is an increase in large company insolvencies (which are more likely to transmit stress to households and other businesses).

Graph 3.14



* Effective interest rate is annual interest expenses over interest bearing liabilities. Excludes companies with a ratio of debt to assets less than 10 per cent.
 ** Six-month average. Series break in 2019 due to a change in the definition of a large business loan.
 Sources: APRA; Morningstar; RBA

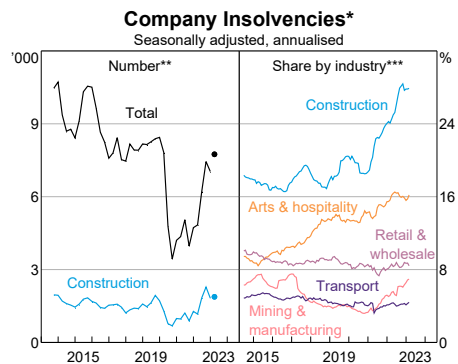
A sharp slowing in demand is a key risk for businesses with inflexible cost bases

Weaker demand could constrain businesses' ability to pass on increases in input costs, putting pressure on margins. A sharp decrease in demand would create challenges for businesses that cannot reduce costs quickly when revenues fall. Based on a sample of larger firms (with annual revenue of at least \$10 million), those in the arts and recreation, and business services industries have tended to have less flexible operating costs than other firms (Graph 3.16). By comparison, retail, transport and wholesale firms have tended to have more flexible operating costs.

Leasing conditions in retail and office markets remain challenging and valuations are expected to decline further

Vacancy rates remain high for office and most retail properties, especially in Central Business Districts (CBDs). Reflecting high vacancies, market rents in these sectors remain around 10 per cent below their levels in 2019 (Graph 3.17). By contrast, tenant demand for industrial property remains strong and rents have elevated as the shift to e-commerce

Graph 3.15



* New external administrations and controller appointments.
 ** The dots are March quarter estimates based on monthly observations for January and February 2023.
 *** 12-month rolling basis; selected industries.
 Sources: ASIC; RBA

continues to support the demand for distribution and warehouse space.

Following a strong run-up in office and industrial valuations in previous years, valuations have recently come under pressure across all segments in response to higher interest rates. If the outlook for tenant demand deteriorates, this will further depress valuations. Based on measures that are largely modelled and therefore are only partly informed by the small number of recent transactions, valuations fell by 2–5 per cent across the office, retail and

industrial segments in the second half of 2022. Further recorded falls are likely as more transactions occur (at lower prices) in a higher interest rate environment, with the recent increase in volatility in financial markets adding to uncertainty about the likely magnitude of declines. The marking down of asset book values may put pressure on the balance sheets of some commercial real estate owners and lenders.

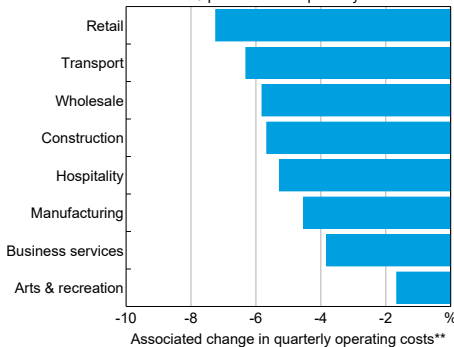
Commercial property risks would increase if economic conditions were to deteriorate substantially

Landlords appear to be coping with soft leasing conditions and higher interest rates; however, if rental income were to fall sharply in an economic downturn, some landlords are likely to become financially distressed. Listed A-REITs (Australian Real Estate Investment Trusts) – which directly own around 10 per cent of office space and 60 per cent of retail properties, and are exposed to some property developments – are generally well placed to weather a decline in rental income and valuations because they have strong balance sheets. In general, A-REITs are not highly leveraged, although their leverage will increase if declining valuations lead to mark-downs of the book value of their properties. Little information is available on the financial health of smaller landlords, but liaison with banks suggests the vast majority of those with bank loans continue to meet rising debt payments.

The risk of forced property sales (or in severe instances, defaults) could emerge if some leveraged investors cannot refinance expiring loans. This could occur if higher interest rates cause some existing loans to fall below minimum interest coverage or maximum LVR requirements and the investor cannot contribute more equity to the property to offset this. Liaison information suggests most borrowers who are unable to refinance with

Graph 3.16

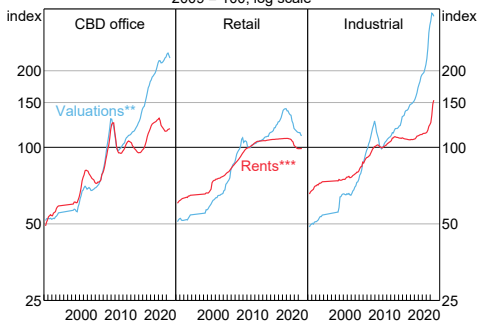
Response of Businesses' Costs
To a 10 per cent fall in quarterly revenue*



* Selected industries; based on sample of companies (annual turnover >\$10 million) covering 2017–2019; estimated using a generalised additive model (GAM).
** Includes wages and other operating expenses.
Sources: ABS; RBA

Graph 3.17

Commercial Property*
2009 = 100, log scale



* CBD office and industrial are prime property; retail is regional (large) centres.
** JLL Capital Value Indicator.
*** CBD office is effective rents; industrial and retail are face rents.
Sources: ABS; JLL Research; RBA

banks are currently still able to refinance with non-banks, although at higher interest rates. Australian commercial property investors who borrow in global capital markets (including most large A-REITS) could also face refinancing difficulty if liquidity in these markets is significantly reduced.

For banks operating in Australia, direct exposures to commercial property represent only 6 per cent of total assets and non-performing bank exposures to commercial property remain negligible. Moreover, banks have significant protection against declining commercial property valuations, owing to conservative credit policies. Banks typically only extend commercial property loans at low LVRs (less than 65 per cent) and require borrowers to have certain debt-servicing capabilities (e.g.

ratios for minimum interest coverage and maximum debt-to-assets).

Little information is available on the exposures to commercial property outside the banking sector. The commercial property sector is funded in part by institutions that are typically not highly leveraged (including foreign sovereign wealth and pension funds, and domestic superannuation funds). Liaison suggests that non-bank lenders also have some exposure to commercial real estate, and on slightly different terms to banks. However, broader systemic risks posed by the non-bank sector are limited by its relatively small size in Australia (see 'Chapter 2: The Australian Financial System'). ❖

Endnotes

- [1] Lovicu G-P, J Lim, A Faferko, A Gao, A Suthakar and D Twohig (2023), 'Fixed-rate Housing Loans: Monetary Policy Transmission and Financial Stability Risks', *RBA Bulletin*, March.
- [2] La Cava G and L Wang (2021), 'The Rise in Household Liquidity', *RBA Research Discussion Paper No 2021-10*.
- [3] See Lovicu *et al*, n 1.
- [4] Lovicu *et al*, n 1.
- [5] The sharp decline in new high-DTI lending is also evident after excluding borrowers who have refinanced their existing loan with a new lender (refinancing activity tends to be at a lower DTI).
- [6] See Agarwal N, R Gao and M Garner (2023), 'Renters, Rent Inflation and Renter Stress', *RBA Bulletin*, March.
- [7] See RBA (2022), 'Box C: Financial Stress and Contagion Risks in the Residential Construction Industry', *Financial Stability Review*, October.
- [8] See RBA, n 7.

Box B

Scenario Analysis on Indebted Households' Spare Cash Flows and Prepayment Buffers

Scenario analysis can be used to gauge the effects of different paths for interest rates, inflation and unemployment on indebted households over the period ahead. This scenario analysis suggests that the bulk of owner-occupier variable-rate borrowers will be able to continue to service their debts through some combination of lower non-essential spending, lower saving and drawing down on existing savings buffers. This is the case in a scenario where the economy evolves in line with the economic outlook as presented in the February *Statement on Monetary Policy*, as well as in the case of a more substantial increase in unemployment. While a deterioration in labour market conditions would have a material impact on those households that lose work, with many at risk of falling behind on their mortgage payments, this analysis suggests that even in the case of a marked increase in unemployment, there are unlikely to be system-wide financial stability implications.

The scenarios

Our scenario analysis considers owner-occupiers with variable-rate mortgages (making up around two-fifths of outstanding housing credit) using loan-level data from the Bank's Securitisation dataset. These borrowers tend to hold savings in the form of mortgage offset and redraw accounts, both of which are visible in the dataset (unlike other forms of liquid savings).

The analysis examines how these households' *spare cash flows* – that is, their

income available to spend and/or save after meeting loan payments and essential living expenses – would evolve by the end of 2023 and how long their *existing savings buffers* would allow them to meet their loan payment and essential expenses beyond that point under two different scenarios. The scenarios and the underlying assumptions to the analysis are discussed in detail in the Technical Appendix below.

Baseline scenario

In the baseline scenario, the economy evolves over 2023 in line with the economic outlook as presented in the February 2023 *Statement on Monetary Policy*:

- Borrowers' incomes grow by 4¼ per cent over 2023 in line with growth in the Wage Price Index (WPI), and their expenditures increase by 4¾ per cent in line with inflation as measured by the Consumer Price Index (CPI).
- The unemployment rate rises by ¼ percentage point to 3¾ per cent.
- The cash rate is assumed to peak at around 3¾ per cent in line with survey-based forecasts and market pricing at the time of the February *Statement*.

Adverse scenario

The adverse scenario involves a larger increase in the unemployment rate in 2023. This scenario is calibrated from a decline in real GDP in the Bank's MARTIN model:

- The unemployment rate increases by 2 percentage points to 5½ per cent by December 2023. While not historically considered to be a high unemployment rate, this is calibrated to be a large shock over a short space of time, at just above the 90 per cent confidence interval around the baseline unemployment rate forecast.
- The underemployment rate rises by 2 percentage points to 8 per cent – that is, an equal share of workers to those who become unemployed manage to retain their jobs but have their hours reduced.
- WPI growth and CPI inflation are more moderate than in the baseline scenario due to weaker labour market conditions, at 3½ per cent and 3¾ per cent in year-ended terms, respectively, by December 2023.
- The cash rate assumption is unchanged from the baseline scenario. As is standard in sensitivity analysis, to assess how well borrowers could cope with a large shock we assume the cash rate does not decline as it might be expected to in such a downturn (see discussion below).

Households are assigned different probabilities of experiencing job loss (and in the case of the adverse scenario, hour losses) based on their income and whether they have a mortgage. Mortgagors and higher income earners (indebted or not) have historically been 40 per cent and 60 per cent less likely than non-mortgagors and low-income earners, respectively, to lose work in a downturn.

Most indebted households are expected to maintain positive spare cash flows in both scenarios ...

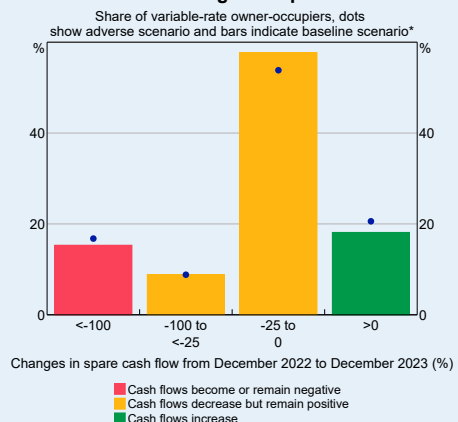
In **both scenarios**, most borrowers would see their spare cash flows decline but remain positive at the end of 2023, with some households also seeing their spare cash flows increase (Graph B.1).^[1]

In the **baseline scenario**, the share of borrowers with negative spare cash flow – that is, those whose scheduled mortgage payments and essential living expenses are projected to exceed their household disposable income – would reach around 15 per cent by the end of 2023, with many of these borrowers already projected to be in this position under the assumptions used in this model.

In the **adverse scenario**, the share of borrowers experiencing negative spare cash flows by December 2023 would increase slightly to 17 per cent.

Graph B.1

Distribution of Changes in Spare Cash Flow



* Baseline scenario assumes wages, inflation and unemployment evolve in line with February 2023 SMP forecasts. Adverse scenario assumes the unemployment rate and underemployment rate increase by 2 percentage points from December levels and wages and inflation moderate. Both scenarios assume the cash rate is held at around 3½ per cent.

Sources: ABS; HILDA Survey Release 21.0; Melbourne Institute; RBA; Securitisation System

... and while most have sufficient buffers, some would be at serious risk of financial stress

Borrowers with negative spare cash flow will need to draw down on their accumulated savings to finance their essential debt and living expenses, or they will need to make other adjustments, which could include increasing hours worked, cutting discretionary spending or substituting essential spending towards cheaper goods and services.

In the **baseline scenario**, assuming that households are unable to make adjustments to their working hours or essential spending, the analysis suggests that:

- around 14 per cent of borrowers would deplete their savings buffers by mid-2024 if they chose not to reduce their non-essential spending (Graph B.2)
- around 9 per cent of borrowers would still be at risk of depleting their savings over the same period, even if they reduced their non-essential spending by relatively extreme amounts (i.e. by 40–80 per cent).

In the **adverse scenario**, these shares are only slightly higher, with around 10 per cent of households depleting their buffers within six months even if they reduced their non-essential spending by 40–80 per cent. This increase is less than proportionate with the increase in unemployment because around half of households have sufficient buffers to weather even an extended period of unemployment (see below).

The risk of negative spare cash flows and insufficient buffers is unevenly distributed. As lower income borrowers tend to have lower spare cash flows and hold lower savings, they are generally more at risk of seeing their

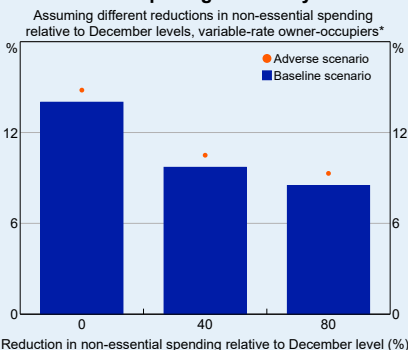
expenses exceed their income and their savings buffers being insufficient to weather periods of stress. First home buyers and borrowers with high debt relative to their income are also more at risk of having insufficient buffers if their spare cash flow becomes negative.

For most indebted households that lose work, spare cash flows become deeply negative, and many are at risk of depleting their buffers ...

Around two-fifths of households that experience job loss in either scenario would see their incomes fall by at least 40 per cent, while one-third of those that experience a loss of hours would record an income fall of at least 20 per cent by the end of 2023. The size of income shocks across households largely depends on the number of income earners per household, with single-income households (making up around two-fifths of all borrower households) accounting for two-thirds of households that see a fall in income of 40 per cent or more.

Graph B.2

Households Depleting Buffers by Mid-2024



* Baseline scenario assumes wages, inflation and unemployment evolve in line with February 2023 SMP forecasts. Adverse scenario assumes the unemployment rate and underemployment rate increase by 2 percentage points from December 2022 levels and wages and inflation moderate. Both scenarios assume the cash rate is held at around 3½ per cent.

Sources: ABS; HILDA Survey Release 21.0; Melbourne Institute; RBA; Securitisation System

Given the large declines in incomes, most indebted households that experience job loss or reduced hours would end up with negative spare cash flows (Graph B.3):

- More than 80 per cent of households that experience job loss would have negative spare cash flows.
- Around half of households that lose a share of their hours would have negative spare cash flows.
- The rest of the households affected by job loss or reduced hours would retain positive (but generally declining) spare cash flows. Many of these are dual-income households that experience job or hour loss of a second-income earner (whose income makes up a small share of total household income) or that have low scheduled mortgage payments and expenses relative to their incomes.

With spare cash flows becoming deeply negative for most of these mortgagors, their ability to weather an extended period of unemployment depends in large part on the size of their existing prepayment buffers. The analysis suggests that around half of

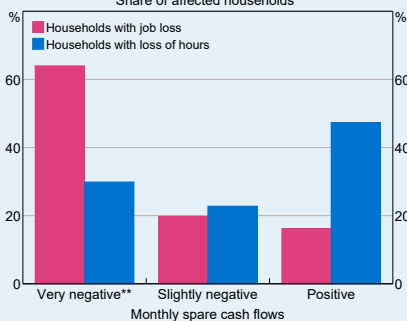
mortgagor households that experience job loss would have sufficient buffers to sustain their essential spending and minimum mortgage payments for *more* than six months if they were to maintain their current levels of non-essential spending (Graph B.4). If affected households were to cut their non-essential spending by 80 per cent, this share would increase to around 60 per cent. However, the remaining 40 per cent of indebted households experiencing job loss would be at risk of depleting their buffers within six months, even with substantial reductions in non-essential spending, unless they were able to find a new job quickly. For households experiencing loss in working hours, the share of borrowers who are at high risk of depleting their buffers within six months (after sharply cutting back on any non-essential expenditure) is smaller, at nearly 30 per cent.

... but the broader financial stability implications are likely to be limited

It is possible that the extent of financial stress could be larger than estimated in these scenarios. In the adverse scenario, for

Graph B.3

Distribution of Household Spare Cash Flow
Share of affected households*



* Only shows households for which at least one member experiences either shock; other members of households will see income continue to grow in line with the scenario's overall income growth assumption.

** Negative cash flow exceeding \$1,000 per month.

Sources: ABS; HILDA Survey Release 21.0; Melbourne Institute; RBA; Securitisation System

Graph B.4

Unemployed Households Depleting Buffers by Mid-2024
Share of households experiencing unemployment*



* Assumes different reductions in non-essential spending relative to December 2022 levels.

Sources: ABS; HILDA Survey Release 21.0; Melbourne Institute; RBA; Securitisation System

example, the increase in unemployment could lead to a larger-than-usual decline in wages growth than captured by the Bank's MARTIN model. Furthermore, the analysis only considers households' buffers until mid-2024; a prolonged period of high interest rates, inflation or unemployment beyond that horizon would result in more households eventually exhausting their savings buffers.

However, there are also several factors not accounted for in the scenarios that could work in the other direction, suggesting the increase in at-risk borrowers could be lower than presented above:

- *The adverse scenario does not allow for any monetary (or fiscal) policy response to the adverse economic conditions.* If the cash rate was to be lower than assumed in the scenario, it would reduce borrowers' minimum required mortgage payments. While this is unlikely to materially change the circumstances of many households that lose a job or have hours reduced given the large decline in income, it will ease financial pressures across households more broadly.
- *Even though the chances of finding new or additional employment may be reduced during severe downturns, not all individuals will remain unemployed or underemployed for long.* Households where a secondary (or other) income earner does not work full-time may be able to increase their labour supply and compensate for the fall in income from a primary income earner who has lost their job or hours.
- *The estimates make conservative assumptions about borrowers' incomes, expenditures and savings and are likely a lower bound of their available spare cash flows and an upper bound of how quickly*

households would deplete their buffers. For instance, all borrowers' incomes are assumed to grow in line with growth in the WPI from loan origination; however, broader measures of income tend to grow at a faster pace than WPI when the labour market is strong. Essential living expenses also capture a small share of discretionary expenditure.

- *The scenarios incorporate households' savings buffers as at the end of 2022, but many households have continued to add to their prepayment balances since the start of 2023.* If households that maintain positive cash flows over 2023 continue to save, their buffers will be higher than assumed under the scenarios. Additionally, the scenarios do not allow for savings outside of those held as prepayment buffers to be used to absorb shocks – if other sources of liquid savings or wealth can be drawn on, this would increase the resilience of borrowers to the loss of hours or employment.
- *The response of lenders could help to ease financial stress in the event of losing work.* For example, borrowers affected by income losses would qualify for hardship arrangements from their lenders. This could include temporary mortgage holidays, switching temporarily to interest-only mortgage arrangements or extending the loan term.

However, even with policy responding and hardship arrangements in place, some borrowers will not feasibly be able to service their loan. In this case, provided their property can be sold for more than their loan amount (i.e. they are not in negative equity), these borrowers could sell their property and pay back their loan without going into default. The share of borrowers in negative

equity remains extremely low due to strong housing price growth and generally sound lending standards over recent years. This allows the homeowner to sell the property without loss and limits the extent of defaults that would lead to bank losses. Indeed, previous stress-testing exercises for the Australian banking system indicate that there are unlikely to be system-wide financial stability implications from a much larger deterioration in the labour market than considered in the adverse scenario here, given banks' strong capital positions and lending standards.^[2]

Technical Appendix

This Technical Appendix outlines the methodology and assumptions underpinning the scenario analysis above. The scenario analysis is designed to be illustrative due to the many assumptions that underpin the methodology. It draws on loan-level data from the Bank's Securitisation dataset as of December 2022 for approximately 1.5 million owner-occupier variable-rate loan facilities, covering around one-third of this segment of the Australian mortgage market by value.

Modelling borrowers' spare cash flows and buffers

The aim of the scenario analysis is to assess the ability of borrowers to service their loans and meet their essential consumption needs under different assumptions for mortgage payments, growth in income and inflation. This is captured by modelling spare cash flows (SCF), defined as:

$$SCF = \text{disposable income} - \text{scheduled mortgage payments} - \text{essential spending}$$

Borrowers with positive SCF can choose what share of their SCF to devote to non-essential

spending and what share to save. Higher interest rates, inflation and adverse income shocks (such as unemployment) all cause SCFs to fall:

- **Borrowers whose SCF declines but remains positive** will need to adjust through some combination of reducing their non-essential spending, reducing how much they save and drawing down on their prepayment buffers.
- **Borrowers whose SCF becomes negative** can no longer save and *must* draw down on their prepayment buffers (assuming they cannot adjust scheduled mortgage payments and/or essential spending, see discussion below). These borrowers will not necessarily have to reduce their non-essential spending, provided they have sufficient stocks of prepayment buffers and are willing to reduce these buffers more quickly than otherwise.

The scenarios

Two scenarios are considered: a baseline scenario; and an adverse scenario.

Baseline scenario

In the baseline scenario, the economy evolves over 2023 in line with the central forecast from the February 2023 *Statement on Monetary Policy*. In this scenario, it is assumed that:

- Borrowers' gross incomes grow by 4¼ per cent, in line with the forecast for the WPI from the December quarter of 2022 to the December quarter of 2023.
- Borrowers' expenditures (in the absence of any reduction in quantities consumed) are assumed to increase by 4¾ per cent, in line with the forecast for CPI inflation

from the December quarter of 2022 to the December quarter of 2023.

- The cash rate peaks at around 3¾ per cent in line with expectations derived from surveys of professional economists and financial market pricing at the time of the February *Statement*. Rate rises are assumed to be fully passed through to variable-rate loan payments. Borrowers' scheduled mortgage payments are adjusted for higher mortgage rates using the credit foncier model.^[3]
- The unemployment rate rises to 3¾ per cent by the end of 2024.

Adverse scenario

The adverse scenario assumes a very sharp drop in aggregate demand, leading to a larger-than-expected increase in unemployment. Informed by the Bank's MARTIN model, the scenario assumes that:^[4]

- The unemployment rate increases by 2 percentage points from its December 2022 level to 5½ per cent. This is a slightly larger increase than the 90 per cent confidence interval around the baseline forecast. All individuals who lose their job see their after-tax income fall to the level of unemployment benefits.
- The underemployment rate also increases by 2 percentage points.^[5] Informed by historical experience (as observed in the Melbourne Institute's Household, Income and Labour Dynamics in Australia (HILDA) Survey), 35 per cent of individuals who experience a decline in working hours are assumed to lose 10 per cent of their hours (and hence pre-tax income), while 40 per cent of individuals lose 35 per cent of their

hours and the remaining 25 per cent lose 70 per cent of their hours.^[6] These individuals are assumed to also experience a nominal wage freeze.^[7]

- The weaker labour market weighs on wages growth and inflation. Wages growth is ¾ of a percentage point below the February 2023 *Statement* baseline forecast over 2023 and CPI inflation is 1 percentage point below the baseline forecast over the same period.
- The path of interest rates is unchanged from the baseline scenario; this allows us to gauge the magnitude of the effects of the downturn in the absence of any policy response.

The assumptions for wages growth, inflation and changes in interest rates affect all borrowers. By contrast, job loss or reduced working hours affect only some individuals and not all individuals are equally at risk of losing their job or working hours during economic downturns. In general, mortgagors are less likely to lose work than non-mortgagors, and lower income workers are more likely to lose work than those on higher incomes. Therefore, each borrower in the data is assigned a probability of becoming unemployed or underemployed depending on these characteristics. To inform these probabilities, a logit model of the probability of job (or hours) loss as a function of worker characteristics is estimated using data from the HILDA Survey (Table B.1).

Informed by these regression results, it is assumed that borrowers in the lowest income quintile are twice as likely to become unemployed as those in the top three income quintiles, and borrowers in the second income quintile are 1½ times more likely to lose their job than those in the top three income quintiles. A broadly similar

Table B1: Unemployment Model Estimates

Probability of becoming unemployed

Odds ratios	
Income quintile 1	2.18***
Income quintile 2	1.39***
Income quintile 3	1.07
Income quintile 4	0.83*
Income quintile 5	Excluded category
Mortgagor	0.62***
Individual-level fixed effects	No
N	176,935

(a) Note: ***, * denote statistically significant at the 1 and 10 per cent levels, respectively.

Sources: HILDA Survey Wave 21; RBA

pattern is observed and therefore assumed for losses in working hours. Further, indebted mortgagors are estimated to be around 40 per cent less likely to experience job loss than renters or outright owners (independent of their level of income). Job and working hour losses are assigned to individual income-earners in the loan-level data using a Monte Carlo simulation with 1,000 draws accounting for their individual probability of becoming unemployed or underemployed. The graphs in Box B show average outcomes over all 1,000 draws.

Additional assumptions and data limitations

The Securitisation dataset reports data for individual loan facilities, not households.

For simplicity, it is assumed that each facility belongs to a different household unless different loans can be uniquely assigned to one household.^[8] As some mortgagors have multiple loan facilities, including on investment properties, they may have larger assets (and larger debts) than captured in this exercise. While they are more exposed to higher mortgage rates and could see their

SCFs become more deeply negative, these mortgagors may therefore also have more scope to service the loan on their owner-occupier property – for instance, by selling any investment properties.

Income (pre-tax) is reported in the Securitisation data only at loan

origination. Borrowers' incomes are grown forward from the point of origination until December 2022 in line with observed WPI growth.^[9] After-tax income is calculated using individual income tax rate brackets for the 2022/23 financial year. The sum of primary and non-primary borrowers' after-tax incomes is used as a proxy for household disposable income. These assumptions have the following bearings on the estimates:

- WPI growth is a conservative measure of income growth. Household disposable income when measured by compensation of employees or average earnings from the National Accounts tends to outpace WPI growth when the labour market is strong.
- The income estimate will be less accurate for older loans as individual borrowers

experience different income growth paths not captured by the WPI, idiosyncratic shocks and changes to their living arrangements over time. Older loans are, however, on average less risky as these borrowers have demonstrated repayment ability and have had more time to build buffers and equity in their home.

- It is known that some borrowers under-report their income when applying for loans, in particular by omitting more complex income sources (such as investment income) if this is not needed for the loan to be approved. This is arguably more likely for borrowers with higher incomes. As a result, these borrowers will likely have larger spare cash flows and so would tend to face less financial stress than estimated.

Living expenses cannot be directly observed from the Securitisation data.

Essential living expenses are proxied by the Melbourne Institute's Household Expenditure Measure (HEM), which is the minimum living expenses measure used by the Australian banks in assessing loan serviceability. The measure captures the median household's expenditure on 'absolute basics' (e.g. most food items, utilities and transport costs) and the 25th percentile of spending on 'discretionary basics' (e.g. take-away food, restaurants and entertainment). Living expenses are assumed to rise in line with actual and expected CPI and are mapped to each loan facility using borrower incomes and the number of debtors. Further assumptions include:

- When estimating expenses, loans with only one debtor are assumed to be single households with zero dependants and loans with multiple debtors are taken to

be couple households with two dependants. These assumptions reflect the most common number of dependants in each family type. In practice, living expenses could be higher or lower than what is assumed in this exercise depending on the actual number of dependants in a family.

- A relatively broad measure of essential consumption is used to factor in some other expenses that are excluded from the HEM (mainly private health insurance and school fees). To do this, the HEM benchmark is scaled up using scaling factors derived from the Household Expenditure Survey (HES).^[10] The adjustment suggests that households may have additional scope to cut back their 'essential' spending if necessary.

Saving flows (a component of SCF) can be estimated by assuming that all saving for owner-occupiers with variable-rate loans is in the form of mortgage prepayments and then observing the month-on-month change in prepayments for a given loan.

Under this approach, non-essential spending can therefore be computed as the residual from the household budget constraint.

Saving flows are, however, highly seasonal and volatile. To remove seasonality and volatility in savings, the data is cleaned as follows:

- For each loan, the average saving share (i.e. the share of SCF dedicated to saving) over the past 12 months or, if the loan was securitised within the past 12 months, over its history is computed. The remainder is the share of SCF dedicated to non-essential spending.
- For December 2022, the distribution of the saving shares is constructed for each

Table B2: Share of Spare Cash Flow Dedicated to Saving

Interquartile for each group

Originated since March 2020	LTI ratio greater than 4	SCF as a share of income greater than 50 per cent	25th percentile	75th percentile
Yes	No	No	0.09	0.55
Yes	No	Yes	0.04	0.38
Yes	Yes	No	0.12	0.57
Yes	Yes	Yes	0.05	0.12
No	No	No	0.10	0.54
No	No	Yes	0.03	0.29
No	Yes	No	0.14	0.62
No	Yes	Yes	0.04	0.39

Sources: RBA; Securitisation System

combination of the following binary classifiers (eight combinations in total):

- loan originated since March 2020
- LTI ratio greater than 4
- SCF as a share of income greater than 50 per cent.
- The interquartile range of the share of spare cash flow devoted to saving is calculated for each of those combinations. Loans with saving shares above (below) the interquartile range are assigned the 75th (25th) percentile of the saving share (Table B.2).^[11]

Households with negative SCFs are assumed to no longer save and reduce their non-essential spending (to different extents shown in the graphs in Box B).

Households with smaller but positive SCFs in December 2023 than in December 2022 are assumed to first reduce their saving inflows to maintain their non-essential spending to the largest extent possible. If their SCF is no longer sufficient to maintain their December 2022 non-essential spending levels even after

ceasing to save, they are assumed to reduce their non-essential spending at the same rate as households with negative SCFs.

Households' prepayment buffers are observed in December 2022 and are assumed to remain unchanged over 2023.

This is for simplicity as the evolution of SCFs over each month in 2023 is not modelled. As borrowers with high SCFs over 2023 are more likely to build buffers than those with low SCFs, it will understate the amount of buffers for the former and overstate them for the latter. Borrowers with negative SCFs over 2023 will likely start with smaller buffers than assumed.

Households are assumed to have no other liquid financial assets to draw down. This will generally understate the amount of buffers available to households.

It is assumed that borrowers cannot adjust their essential spending or scheduled mortgage payments, and that any unemployment shocks are persistent.

These assumptions are likely unrealistic in

practice with households – at least in the medium term – usually able to reduce their essential spending somewhat (e.g. by substituting towards less expensive items or delaying some purchases) and possibly regaining employment or additional hours. In the short term, lenders also face incentives to

work with borrowers to avoid default on loans, and could provide short-term mortgage payment relief in some circumstances. ↘

Endnotes

- [1] Households spare cash flow can increase if their income growth exceeds increases in essential expenditures and scheduled mortgage payments. Most households that experience increases in spare cash flows have high incomes and spend a lower share of their income on essential expenditures and scheduled mortgage payments. The share of households with increasing spare cash flows is larger in the adverse scenario as real income growth is marginally stronger than in the baseline scenario.
- [2] See RBA (2022), 'Box D: Stress Testing and Australian Bank Resilience', *Financial Stability Review*, October.
- [3] A credit-foncier loan requires a constant annual payment (M) over the life of the loan, which is calculated as $M = \frac{Vr}{1 - (1+r)^{-N}}$ where V is the loan balance at origination, r is the (annual) nominal interest rate and N is the number of years remaining in the term of the loan. See La Cava G, H Hughson and G Kaplan (2016), 'The Household Cash Flow Channel of Monetary Policy', RBA Research Discussion Paper No 2016-12.
- [4] The scenario is calibrated by imposing a 4¾ per cent fall in real GDP in the March quarter of 2023, which is sustained over three quarters relative to the baseline, based on a 3¾ per cent fall in consumption, and around 20 per cent declines in business, dwelling and government investment. The declines in these GDP components are in line with or slightly bigger than most declines since 1990, but the shock to real GDP is historically large due to the joint occurrence of the declines in the subcomponents.
- [5] This is broadly in line with the historical co-movement between the two series. It is assumed that all the adjustment in unemployment and underemployment rates comes through job and hour losses rather than changes to labour supply (i.e. changes in the participation rate or population growth) or the job finding rate.
- [6] This is a rough approximation of the distribution of involuntary, annual falls in working hours at the individual worker level between 2001 and 2021.
- [7] It is assumed that individuals who experience a reduction in working hours would retain their job rather than moving into unemployment even if their reduced income falls below unemployment benefits.
- [8] Borrower IDs are available in the data, but these are not always unique. If borrowers have loans with the same lender, these loans can be identified and grouped, but this is generally not possible for borrowers who hold loans with multiple lenders.
- [9] The choice to use WPI rather than a broader measure of household income growth to grow income forward reflects a judgement that non-wage sources of income such as social assistance benefits or investment income (including from superannuation) that are included in broader measures of income are less likely to be the main sources of income for indebted households compared with renters and outright owners. It is also a conservative choice in that growth in the WPI typically lags that of broader measures of labour compensation during strong labour market conditions.
- [10] To derive scaling factors, expenses in the HES are classified as best as possible into 'absolute' and 'discretionary basic' expenses. Using these

updated categories, the median absolute basic spending plus the 25th percentile of discretionary basic expenditures is calculated for households within each income quintile. Each household's HEM estimate is then multiplied by the ratio between this new calculated spending measure

and the HEM across households in the respective income quintile.

- [11] The results in Box B are robust to removing outliers or assigning the median saving share to those outliers.

4. Domestic Regulatory Developments

The Council of Financial Regulators (CFR) is the forum for coordination between Australia's key financial regulatory agencies: the Australian Prudential Regulation Authority (APRA); the Australian Securities and Investments Commission (ASIC); the Australian Treasury; and the Reserve Bank of Australia. The CFR is chaired by the Bank, which also provides the secretariat. CFR agency heads typically meet quarterly, but inter-agency coordination and collaboration is ongoing, through CFR working groups and bilateral engagement on a range of subjects.

Following the emergence of stress in parts of the global banking system in March, the CFR agencies have been working closely to monitor for any adverse effects on the Australian financial system. More broadly, over the past six months the CFR has continued to assess the effects of higher interest rates and inflation on Australian households, businesses and the financial system. Cybersecurity and operational resilience in the financial system also remain a key focus for the CFR, with work underway across a range of government agencies to strengthen preparedness for and resilience to cyber-attacks. The financial risks associated with climate change are another area of ongoing focus, as is the CFR's continued support of initiatives to modernise financial regulation in Australia in response to innovation in the sector.

The Australian banking system has been resilient to the recent stress in the global banking system, but there are still lessons to be drawn

As discussed in preceding chapters, Australia's banks are strongly capitalised and highly liquid. APRA's prudential framework means that the requirements for banks operating in Australia are equivalent to – and, in some instances, stronger than – global requirements. In light of recent global banking developments, APRA is supervising domestic financial institutions more intensively than usual and, together with the other CFR agencies, is closely monitoring for any adverse effects on the broader financial system. It is important that financial institutions continue to invest in their capacity to absorb shocks, by maintaining strong capital and liquidity buffers.

CFR agencies are engaged in international regulatory discussions about the recent banking stresses, what went wrong and what lessons can be drawn for the regulatory regime to further strengthen the global banking system. Even though Australia's prudential framework is stronger than many of its overseas counterparts, APRA (together with the other CFR agencies) is reviewing the lessons learned from this episode to ensure Australia's regulatory regime remains fit for purpose and our financial system remains resilient as the environment changes over time.

The CFR continues to monitor the effects of higher interest rates and inflation on Australian households and businesses

The combination of higher interest rates and inflation is putting pressure on the budgets of Australian households and businesses. Overall, households have remained resilient, with household finances supported by strong labour market conditions and high levels of accumulated savings. However, the CFR recognises there is significant variation in experience among borrowers. There is already a small share of households experiencing debt-servicing challenges, and higher interest rates and a slowing economy are expected to result in an increase in non-performing housing and business loans over the period ahead – albeit from a very low level. Recognising the risks around the economic outlook, the CFR will continue its close monitoring of credit growth, asset price developments, lending standards and lenders' approaches to supporting customers experiencing hardship or other changes in financial circumstances.

In December 2022, the CFR undertook its annual review of non-bank financial intermediation. Non-bank lending for housing grew strongly over the year, though it has slowed more recently; on the other hand, non-bank business credit growth has increased sharply (see 'Chapter 2: The Australian Financial System'). Importantly, lending standards have been broadly maintained and CFR agencies agreed it was important this remains the case. The non-bank sector has a relatively small proportion of system-wide lending in Australia and has limited direct links with the banking system. Even so, the CFR continues to monitor this sector closely. In December, the CFR also discussed the disruptions in the UK pension fund sector, which highlighted how embedded leverage in some derivatives can amplify liquidity risks from large movements in asset prices. The CFR recognised

the important differences between UK pension funds and Australian superannuation funds; it also noted that APRA had strengthened investment governance standards for superannuation funds, which took effect in early 2023.

The CFR continues its work in enhancing cyber resilience in the Australian financial system

Recent cyber-attacks on Optus, Medibank and Latitude Financial have highlighted the ongoing threats and the potential for spillovers to the Australian financial system, even when the incident originates from outside the financial system. With cybercrime as one of the key risks facing both the global and domestic financial systems, the CFR continues to pursue a program of work aimed at further improving the cyber resilience of the Australian financial system. The scope of work of the CFR's Cyber Security Working Group (CSWG) has been expanded to include sector-wide operational resilience principles. This broader scope will enhance the CFR's capability to respond to future material operational incidents that affect day-to-day operations and payments systems. The CSWG also has a number of joint initiatives underway with other agencies, and APRA and ASIC have initiatives underway to further assess cyber resilience and preparedness across regulated entities. Moreover, the CFR has endorsed a work program to enhance the resilience of the financial system to geopolitical events.

CFR agencies have strengthened cooperation on cybersecurity over recent years, including via the agreement on cyber-attack protocols with New Zealand agencies. The agreement enhances communication and co-ordination between jurisdictions in the event of a significant cyber-attack on the Australian financial system.

The CFR has also continued its development of the Cyber Operational Resilience Intelligence-

led Exercises (CORIE) framework, to aid the preparation and execution of industry cyber resilience exercises. CORIE uses intelligence gathered on adversaries to simulate their modes of operation and assess the overall maturity of a financial institution's cyber defence and response capability. The CFR continues to remind financial institutions of the importance of stepping up measures to strengthen their cyber resilience in light of growing threats. Financial institutions can use the latest CORIE framework (published on the CFR website) to support their own testing programs.

ASIC and the Bank will continue to closely monitor ASX's compliance with its regulatory obligations and hold it publicly accountable

The Bank and ASIC have joint supervisory responsibility for the four clearing and settlement facilities in the ASX Group, which involves extensive coordination between ASIC and the Bank. Regulatory coordination also occurs through the CFR's Financial Market Infrastructure Steering Committee, as well as the CFR itself.

At the December meeting, the CFR discussed ASX's announcement to reassess all aspects of the CHES Replacement program. As the outcome of this project affects an important piece of national financial infrastructure, it is vital that ASX continues to invest and maintain the current CHES. CHES must continue to service Australia's cash equities markets reliably until its replacement can be safely delivered by ASX and users of CHES. ASIC and the Bank have taken regulatory actions since ASX's announcement and will continue to closely monitor the ASX's compliance with its regulatory obligations. The CFR also welcomed the government's announcement to implement legislative reforms to enhance CFR agencies' ability to effectively regulate financial market infrastructures, to enforce requirements for a monopoly provider

of clearing and settlement services to achieve competitive outcomes and to promote safe and effective competition for the clearing and settlement of cash equities.

CFR agencies continue to support and promote the management of risks to the financial system from climate change

The CFR and the Australian Government are committed to helping corporate and financial institutions improve their ability to manage the financial risks associated with climate change. In December 2022, the CFR welcomed the government's announcement of a sustainable finance agenda, which is designed to improve the transparency of financial reporting, deepen Australia's green finance markets and take advantage of opportunities in sustainable finance. The CFR will continue to monitor risks, coordinate regulatory responses and ensure Australia's financial system is well positioned to support climate transition-related initiatives outlined by the government over the period ahead. This work builds on related workstreams already underway.^[1]

The CFR continues to support the modernisation of financial regulation in response to technological advancements

The CFR and the Australian Government recognise the need to have flexible and forward-looking regulatory frameworks that are equipped to deal with the introduction of a wide range of innovative products, including crypto-assets, stablecoins and central bank digital currency (CBDC). The government has announced a series of reforms intended to modernise elements of the regulatory framework, in order to support both innovation and consumer protection. The CFR has discussed the government's proposed reforms, which include: developing a strategic plan for

the payments system; developing a new tiered payments licensing framework; consulting on a licensing and custody framework for crypto-asset service providers; and modernisation of the *Payment Systems (Regulation) Act 1998*. The Treasury, supported by other CFR agencies, is undertaking much of this work. In addition, public consultation on the taxation of digital assets and transactions commenced in August 2022 and will be reported on by the Board of Taxation by 30 September 2023; public consultation on token mapping commenced in March 2023.

Separately, the CFR discussed progress on the Bank's research project with the Digital Finance Cooperative Research Centre that is exploring potential use cases and economic benefits of a

CBDC in Australia. The project, which began in mid-2022, involves industry participants demonstrating potential use cases for a CBDC using a limited-scale pilot CBDC that is a real digital claim on the Reserve Bank. There has been significant interest in the project and a number of industry participants were recently selected to participate in the live pilot, which will take place over the next few months. Given the nature of the pilot CBDC as a claim on the Bank, there has also been strong engagement with regulators on the regulatory implications of the use cases to be tested as part of the pilot. The CFR agencies have reiterated their support for the Bank's ongoing research on CBDC, and the CFR maintains an open mind as to whether there will be a case for issuing a CBDC in Australia at some point in the future. ✎

Endnotes

- [1] See CFR Climate Working Group (2022), 'Council of Financial Regulators Climate Change Activity Stocktake', September.

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Blade Disclaimer

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