3. The Australian Financial System

The Australian financial system has been resilient through the COVID-19 pandemic. The strong capital and liquidity positions of financial institutions are enabling them to continue supporting households and businesses through the latest lockdowns and will allow them to support the recovery to follow. Some banks have begun returning capital to shareholders through share buybacks, as capital had been accumulated in anticipation of pandemic-related losses that did not eventuate. Banks had provisioned against much larger expected losses, but have started to release these provisions due to better-than-expected economic conditions in late 2020 and the first half of 2021. Given the uncertainty around the effects of the latest lockdowns, they have begun to do so only gradually and provisions remain above pre-pandemic levels. There has been an increase in applications for loan payment deferrals and other support due to the current lockdowns, but these remain well below levels seen earlier in the pandemic in 2020.

Other financial institutions also remain resilient. The asset composition of superannuation funds has normalised following the temporary spike in demand for liquidity in 2020. Profits of insurers have increased, although some longer-term challenges remain. Regulators are engaging with financial market infrastructures on necessary steps to improve their resilience following recent incidents.

While the financial system has demonstrated its resilience to potential credit losses from virus-induced lockdowns, financial institutions face a number of other risks. The risks from information technology (IT) malfunctions and cyber-attacks are substantial, and it is possible that a significant disruption could threaten financial stability. Risks from climate change, while currently not substantial, will grow over time if not addressed. These risks relate to the physical damage to assets, and the value of assets from changes to policy and technology that are implemented to address climate change and to assist in the transition to a lower emissions economy. Agencies on the Council of Financial Regulators (CFR) are working with Australian financial institutions to help manage these risks and to promote informative disclosures (see 'Box A: Australian Financial Regulators' Actions on Climate Change-related Risks').

Banks have remained profitable and well provisioned against future losses

Banks' profitability increased over the first half of 2021, returning to the levels seen before the pandemic (Graph 3.1). Pre-provision profitability was supported by increased net interest income, which reflected a widening in banks' net interest margins as funding costs declined to historically low levels. However, lending and deposit rates have continued to drift lower and banks expect that the low interest rate environment and competitive pressures will weigh on margins going forward. A number of factors are likely to mitigate these effects, including lower bad and doubtful debt charges as lower interest rates reduce debt-servicing costs for borrowers, and stronger aggregate demand as expansionary policy settings continue to support the economic recovery.

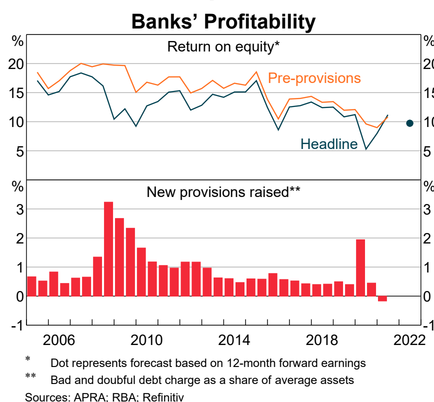
The release of provisions over the first half of the year also supported profitability. Banks increased provisions for credit impairments early in the pandemic in expectation of future losses. However, to date, losses have been minimal, and the share of loans that are non-performing has returned to pre-pandemic levels (Graph 3.2). This better-than-expected outcome largely reflects the strength of borrower balance sheets due to policy support and the economic recovery in late 2020 and the first half of 2021. Banks have maintained a prudent approach to provisioning to account for additional uncertainty in the current environment, and aggregate provision balances as a share of loans are around 25 per cent above pre-pandemic levels. While lockdowns have been reinstated in recent months in Australia's two most populous states (New South Wales and Victoria) due to virus outbreaks, the reinstatement of loan payment deferrals and associated regulatory relief from the Australian Prudential Regulation Authority (APRA) will temporarily support asset quality metrics. To date, the take-up of new loan payment deferrals is well below the levels seen in 2020 (see 'Chapter 2: Household and Business Finances in Australia').

Banks have strong capital positions, leading some to return capital to shareholders …

Australian banks' capital positions strengthened further over the first half of 2021, and are well in excess of regulatory capital requirements and APRA's 'unquestionably strong' benchmark (Graph 3.3; Graph 3.4). The four major banks' Common Equity Tier 1 (CET1) capital ratios have increased to be 1½ percentage points above pre-pandemic levels, and 2 percentage points above APRA's 'unquestionably strong' benchmark. The large CET1 capital buffers have come from retained earnings, reflecting high profitability and regulatory restrictions on returning profits to shareholders through dividends during 2020.

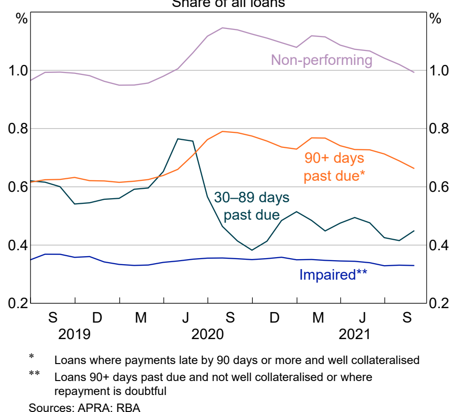
Given their strong capital positions and the improved economic outlook around the start of the year, APRA has removed restrictions on banks' capital distributions. Some banks have begun to return capital to shareholders through share buybacks and increased dividend payments. The impact on the CET1 ratios of the three major banks that have started share buybacks is expected to be a decline of between 35 and 130 basis points. For some, this will be partly offset by the completion of

Graph 3.1



Graph 3.2

Banks' Loan Performance



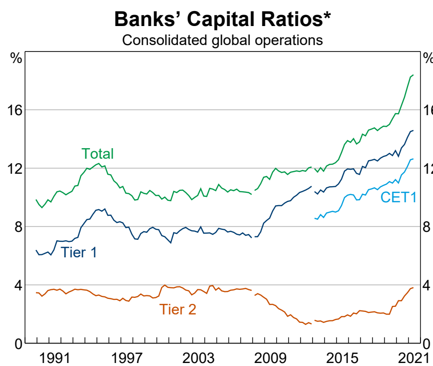
upcoming asset sales, including of insurance businesses to streamline operations. APRA's decision to allow banks to not record COVID-19-affected loans receiving payment deferrals as being in arrears will provide temporary support to bank capital positions.

Australian banks are also well positioned for upcoming capital regulatory reforms. These include the Reserve Bank of New Zealand's (RBNZ) higher capital requirements for New Zealand banks, which will affect their Australian parent banks, as well as changes to APRA's capital requirements for equity investments in

Graph 3.3

Banks' Capital Ratios*

Consolidated global operations



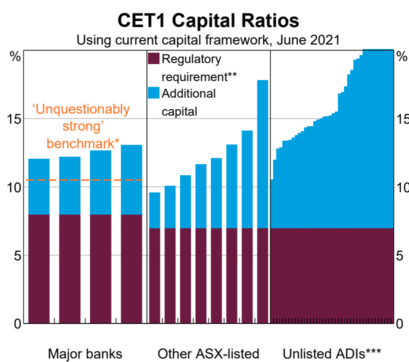
* Per cent of risk-weighted assets; breaks in 2008 and 2013 due to the introduction of Basel II and III for most ADIs; CET1 = ordinary share capital and retained earnings; Tier 1 = CET1 + perpetual subordinated debt; Tier 2 = dated subordinated debt

Source: APRA

Graph 3.4

CET1 Capital Ratios

Using current capital framework, June 2021



* APRA's benchmark of 10.5 per cent

** Includes capital conservation buffer for all banks and domestic systemically important bank (D-SIB) add-on for the major banks; excludes confidential Pillar II requirements

*** Some ADIs have capital ratios above 20 per cent (not shown)

Sources: APRA; RBA

banking subsidiaries to take effect in 2022. The four major banks have increased their Total Capital ratios, with Tier 2 capital increasing by 2 percentage points since mid 2019. These increases show progress towards APRA's requirement of a 3 percentage point increase in Total Capital by 2024, to increase loss-absorbing capacity to support orderly resolution in the unlikely event of a failure. Final prudential standards for APRA's comprehensive revisions to the banks' capital framework will be released in November 2021, and come into effect in 2023. The revisions will embed APRA's 'unquestionably strong' benchmark into the framework and improve the allocation of capital to risk.

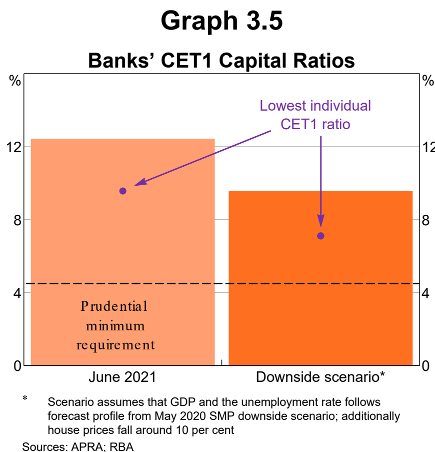
… and stress testing indicates that capital will remain above minimum requirements even in a severe economic contraction

The Reserve Bank's stress testing simulations indicate that the aggregate CET1 ratios for large and mid-sized banks would remain well above minimum required levels even if economic conditions were to deteriorate substantially (Graph 3.5). An example is the downside scenario for economic activity presented by the Bank at the beginning of the pandemic,[1] in which GDP falls by a little over 10 per cent and the unemployment rate increases to over 10 per cent. In addition, housing prices are assumed to fall by around 10 per cent. The resulting projected capital depletion for large and mid-sized banks is around 3 percentage points. In such a scenario, even after the recently announced capital returns by the major banks, CET1 ratios would remain substantially above prudential minimum requirements. Stress testing performed by APRA in 2020 also indicates that the banking system is able to withstand a severe downturn and remain above its prudential minimum requirement.[2]

Banks' liquidity positions remain strong

Banks have continued to hold significant buffers of liquid assets that could cover an unexpected surge in short-term cash outflows. Banks' holdings of high-quality liquid assets (HQLA) have increased since the onset of the pandemic. This has been facilitated by growth in deposits and Reserve Bank policy support, such as the Term Funding Facility (TFF) and bond purchases, which have contributed to higher Exchange Settlement balances at the Bank (Graph 3.6).

As banks' holdings of HQLA have increased, allocations under the Reserve Bank Committed Liquidity Facility (CLF) have declined, particularly for the four major banks.[3] The CLF complements available HQLA to ensure banks have sufficient access to liquid assets for a stressed period. The CLF has been required in Australia given the historically limited supply of HQLA due to low levels of Australian government debt. However, since early 2020, issuance of both Australian Government Securities (AGS) and securities issued by the central borrowing authorities of the states and territories (semis) have increased significantly to fund the fiscal policy response to the pandemic. As a result, there is a larger amount of AGS and semis that banks are able to hold – both in terms of value and issuance share – without adversely affecting market functioning. Since the start of the pandemic, the total size of the CLF has been reduced by $83 billion to $140 billion, and APRA expects the size of the CLF to decline to zero by the end of 2022.



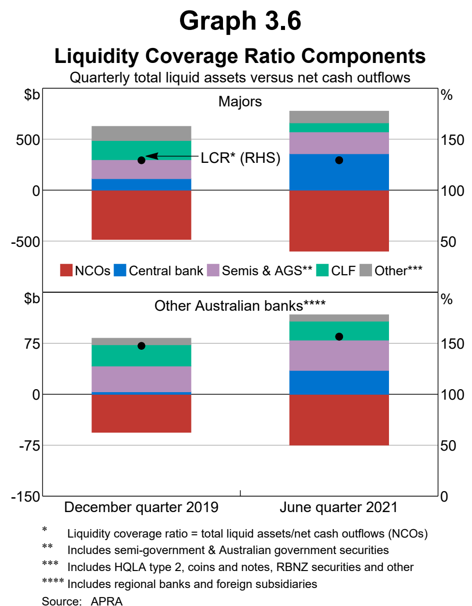
* Scenario assumes that GDP and the unemployment rate follows forecast profile from May 2020 SMP downside scenario; additionally house prices fall around 10 per cent

Sources: APRA; RBA

Banks' required holdings of liquid assets, which are intended to cover projected outflows in a stress scenario, have increased since the onset of the pandemic. This has been driven by an increase in banks' deposit funding and a shift of deposit funding from ('sticky') term deposits to (easy-to-withdraw) at-call deposits.[4] For the major banks, the increase in liquid assets has matched this increase in short-term liabilities, leaving the ratio of these – the Liquidity Coverage Ratio (LCR) – little changed since the beginning of the pandemic. For the smaller LCR banks, their LCRs have increased over this period as their liquid assets have increased by proportionately more.

Banks face a sizeable but manageable TFF refinancing task over the coming years

Over the next two to three years, banks will need to repay the $188 billion they have accessed



* Liquidity coverage ratio = total liquid assets/net cash outflows (NCOs)

** Includes semi-government & Australian government securities

*** Includes HQLA type 2, coins and notes, RBNZ securities and other

**** Includes regional banks and foreign subsidiaries

Source: APRA

from the Reserve Bank's TFF.[5] Banks' decisions about how to repay the funding will depend on a number of factors, including their asset growth and the price and availability of different funding sources. According to liaison, banks plan to raise most of the funds from wholesale debt markets. This, together with other bonds maturing, results in a debt issuance task in the six months around each TFF maturity date of approximately $130 billion, which is equivalent to around 3 per cent of banks' total liabilities (Graph 3.7).

The TFF refinancing task is unlikely to pose a significant challenge for the banking sector overall, provided there is no broader market disruption at the time. Liaison with banks and non-banks suggests that the cost of wholesale debt is expected to increase somewhat from their current lows as banks refinance their TFF funds, but financial conditions are expected to remain accommodative. Banks have indicated that they intend to smooth issuance of wholesale debt over a period of time, resulting in a steady stream of issuance similar to that seen prior to the pandemic. By spreading out the refinancing task, banks will have time to adjust their issuance plans should prevailing market conditions warrant. Further supporting the issuance task is the fact that Australian banks remain highly rated by global standards, reflecting their strong capital positions and continued profitability.

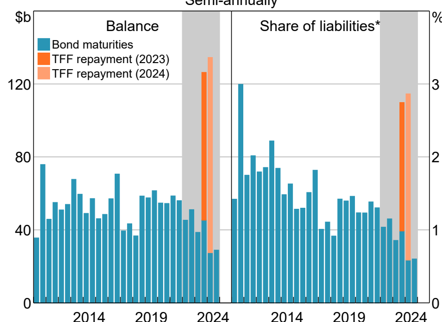
Risks from non-bank lenders remain limited

Over recent months, non-bank lending to households has picked up significantly alongside strong demand for housing credit; however, the stock of this lending remains small (Graph 3.8). Information from liaison suggests that non-banks have maintained sound lending standards, but this lending could potentially entail risks given the lighter regulation of non-banks relative to banks. However, the broader risks arising from this sector remain limited. Non-bank debt financing represents less than 10 per cent of financial system assets and a similar share of new housing lending, and the risk of contagion from non-banks to the banking sector is low. The banking system's exposure to non-banks is small at around 4 per cent of total assets, having declined in recent years from a peak of just under 10 per cent in 2008.

Graph 3.7

Banks' Refinancing Task

Semi-annually

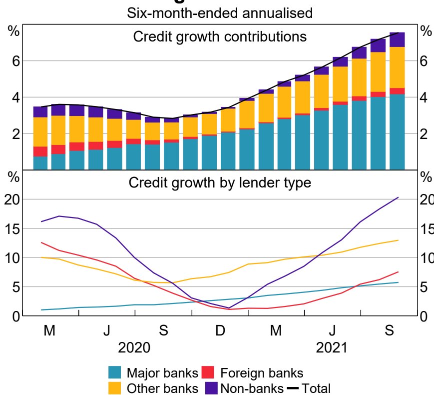


* Includes deposits, unsecured and secured funding, interest-bearing liabilities and other funding types; forecast is based on banks' reported 36 month funding growth projection

Sources: Bloomberg; RBA

Graph 3.8

Housing Credit Growth*



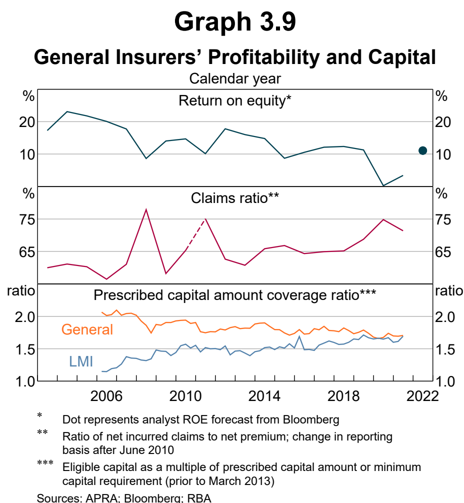
* Seasonally adjusted and break-adjusted

Sources: APRA; RBA

Insurers' profits have increased but there remain longer-term issues to address

General insurers' profits in the year to date have more than made up for the large losses experienced in 2020, which analysts attributed to exceptional factors (such as natural disasters and excess provisioning) (Graph 3.9). The recovery in profits so far this year has mostly reflected the release of excess provisions. Insurers have increased their reinsurance cover following the catastrophic bushfires and severe storms experienced in 2019 and 2020, which will cap their exposures over the life of these reinsurance policies. Further, general insurers' strong capital positions leave them well placed to absorb the impact of potentially higher claims and investment losses in the near future. The overall industry capital position is equivalent to 1.7 times APRA's prescribed capital amount.

The profitability of lenders mortgage insurers (LMIs) has also increased, underpinned by Australian Government stimulus payments to households and a resilient housing market. LMIs remain well provisioned and retain a strong capital position, and their internal stress tests suggest they can withstand a substantial rise in insurance payouts. APRA's stress tests found that the LMI industry as a whole is able to withstand a severe downside scenario; however, the resilience of some individual insurers was challenged.[6]



Insurers continue to face some longer-term challenges that could affect profitability. The low interest rate environment presents longer-term risks to general insurers if they do not reprice policies in response to expected lower investment returns. Low interest rates pose a challenge for insurance policies that face ongoing claim payments for many years after premiums are received, such as compulsory third party motor vehicle, product and public liability, professional indemnity and workers compensation. Another longer-term issue relates to insurers' exposures to risks arising from climate change due to the protection offered to customers against natural disasters (discussed below).

Longstanding issues with individual disability income insurance (DII) continue to affect life insurers' profitability. Substantial under-pricing, loose product definitions and higher-than-expected claims have resulted in DII being the main contributor to the poor profitability of the industry over the past few years, notwithstanding a more recent improvement in the performance of most risk products (Graph 3.10). The adequacy of life insurers' responses to these issues continues to be assessed by APRA. Due to the long-term nature of these insurance contracts and the associated large ongoing exposure to historical policies, as well as the potential for increased mental health issues arising from the pandemic and the pressure to retain market share in a competitive industry, it is anticipated that these issues will persist for some time.

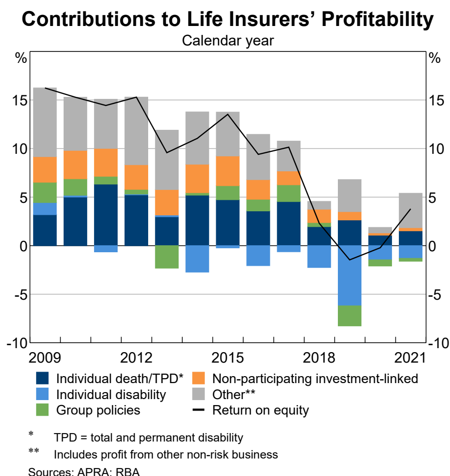
Superannuation funds' assets have increased to be above pre-pandemic levels

Superannuation funds' total assets have grown to exceed pre-pandemic levels, after falling to 2018 levels last year in part due to exceptional member withdrawals (Graph 3.11). These withdrawals made up one portion of a large increase in liquidity demand faced by funds in 2020[7] – demand that was met by selling fixed income securities and equities. Since then, funds have returned to investing in riskier assets (such as equities) in favourable market conditions, and the size of their balance sheets has increased to be above pre-pandemic levels. Overall, the industry demonstrated in 2020 that it is well positioned to accommodate future liquidity challenges due to its robust liquidity management practices, liquid asset holdings and APRA's prudential oversight.

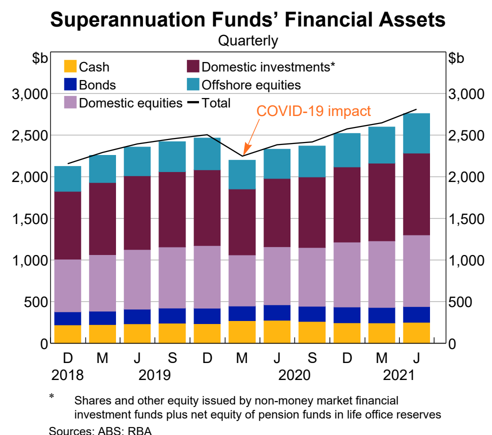
Self-managed superannuation funds (SMSFs) increased their holdings of risky leveraged property loans, known as 'limited recourse borrowing arrangements' (LRBA), by 8 per cent over the past year. Such borrowing arrangements allow an SMSF trustee to borrow for investment purposes. If the trustee defaults on the loan, the lender's rights are limited to the specific asset bought with the loan and there is no recourse to other assets held in the SMSF. Assets funded with LRBA represent 7 per cent of total SMSF asset holdings. While the major banks and other main lenders have withdrawn from providing LRBA, finance provided by non-bank lenders has grown alongside higher property prices and the low interest rate environment. APRA has noted concerns around this product because the additional direct leverage exposes SMSF members to greater financial risks.

Financial market infrastructures continue to focus on improving resilience in light of recent incidents

Financial market infrastructures (FMIs), such as central counterparties (CCPs), securities settlement facilities and high-value payment systems, enable financial system participants to manage credit and liquidity risks. Resilient FMIs help to underpin confidence in the operation of capital markets. The Reserve Bank's recent assessments of Australian FMIs concluded that, on balance, they have all conducted their affairs in a way that promotes overall stability in the Australian financial system. However, these reviews identified several areas in which the resilience of FMIs could be further strengthened.



* TPD = total and permanent disability
** Includes profit from other non-risk business
Sources: APRA; RBA



* 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

An independent review of the project to upgrade ASX Trade – the core equity trading platform of the Australian Securities Exchange (ASX) – was released in August 2021. The ASX experienced a number of significant operational incidents in late 2020 that affected the availability of systems used in the trading and settlement of ASX equities and equity options, including the closure of the ASX market for most of 16 November 2020. This incident followed a major upgrade to ASX Trade. The review was commissioned by ASX in line with the expectations of its regulators – the Australian Securities and Investments Commission (ASIC) and the Reserve Bank. The review found that, while the project met a majority of expected industry standards, there were a number of key shortcomings that should be addressed. ASIC and the Bank are engaging with ASX on its response to the review, and expect that insights from the review will be incorporated into projects across the ASX Group, including the ongoing project to replace the CHESS system for clearing and settlement of equities.[8]

The Bank's 2021 assessment of Australia's high-value payment system – the Reserve Bank Information and Transfer System (RITS) – noted the importance of completing a program of improvements to physical data centre infrastructure and oversight of maintenance arrangements. These improvements were identified in the Bank's review of lessons learned from a 2020 data centre power outage that was triggered by maintenance to a fire control system, resulting in a short interruption to settlement in RITS.

There has also been a sustained focus by the Bank over recent years on operational risk management at LCH Limited (LCH Ltd), a London-based CCP providing clearing services to Australian participants via its SwapClear service. In February 2021, there was an operational incident in SwapClear that led to a temporary disruption to service. The Bank is satisfied with the steps being taken by LCH Ltd to prevent similar incidents from reoccurring and will continue to monitor remediation actions as part of its regular supervisory activities.

Financial institutions continue to work on managing financial risks from climate change …

Climate change directly affects the Australian financial system through the physical risks to assets, as well as the transition risks that arise from policies and technologies implemented to address climate change and assist in the transition to a lower emissions economy. Australian financial institutions are vulnerable to these growing risks and, if not adequately managed, there could be considerable implications for financial stability.[9] With increased focus on the risks from climate change, especially internationally, CFR agencies are working with Australian financial institutions and corporations to understand and manage the associated financial risks (see 'Box A: Australian Financial Regulators' Actions on Climate Change-related Risks').

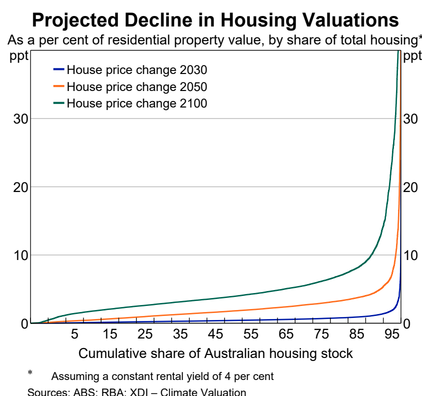
There is significant uncertainty about the magnitude of risks to banks from climate change. However, the larger the change in the global and local climate from historic patterns, the greater the increased physical risks from more frequent and intense extreme weather events and higher average temperatures, which in turn are likely to reduce the value of some banks' assets and income streams. Mortgages account for approximately two-thirds of banks' credit portfolios and so potentially represent a significant source of exposure to the effects of climate change. To the extent that the current prices of some dwellings (which are used as collateral for loans) do not fully reflect the longer-term risks of climate change, future price falls in recognition of climate risk could leave banks with less protection than expected

against borrower default. The risk of credit losses borne by banks is further increased if properties are not fully insured or become uninsurable (which itself may be exacerbated by changing climate risks).

Estimates of the impact on Australia's five largest banks of two potential climate scenarios will be provided in the Climate Vulnerability Assessment (CVA) currently being led by APRA. Using an alternative approach, preliminary analysis by the Bank suggests that these risks are likely to be concentrated in a small number of geographical areas, such as agricultural and farming regions in New South Wales and Queensland, and metropolitan areas adjacent to the ocean and waterways.[10] The analysis suggests that by 2050, just over 1 per cent of properties are expected to experience a decline in value of 10 per cent or more relative to current prices (and holding all else equal) (Graph 3.12). The risk to banks would be larger if incomes also decline in these regions because of the difficulty of adapting to climate change.

Insurers are more exposed to physical risks from climate change than banks because their policies cover natural disaster damage to property, motor vehicles, crops and other assets. An increase in the frequency and severity of natural disasters is expected to result in higher payouts. However, Australian insurers have been

Graph 3.12



managing this risk by increasing their reinsurance cover provided by large global firms, which caps their exposures to unforeseen increases in natural disaster claims. The cost of this reinsurance will rise over time if more frequent and extreme weather events increase these claims. Similarly, the cost of consumer insurance policies would rise, shifting the burden of adverse climatic change on to consumers (including that insurance may not be available in areas where the risks are seen to be too large by insurers).

Policy and technological changes that address climate change will moderate these physical risks, but may increase the 'transition risks' associated with the move to a lower emissions global economy. Sudden or unexpected changes in regulations, technology or consumer preferences could quickly lower the value of assets or businesses in emissions-intensive industries, some of which may become economically unviable or 'stranded'. Preliminary estimates by the Bank are that lending to such industries (but including some assets in these industries that are not emissions intensive) accounts for around 20 per cent of banks' business loans exposure; these industries include electricity, agriculture, and oil and gas (Graph 3.13). There will also be indirect transition risks as the economy adjusts. Financial institutions need to measure, disclose and actively manage these risks, ensuring they have appropriate information to do so and price their products accordingly.

Managed funds are exposed to physical and transition risks from climate change through their investment portfolios. Australian superannuation funds, which account for a large share of the managed funds sector, are overwhelmingly defined contribution funds and unleveraged. As such, the risk from declining asset values is borne by members rather than funds themselves, meaning that risks to the real economy and financial stability are transmitted

through losses in household wealth. However, there could be other spillovers from falls in asset values, including through managed funds rebalancing their portfolios away from banking assets in response to climate-related losses; managed funds account for 9 per cent of banks' funding.

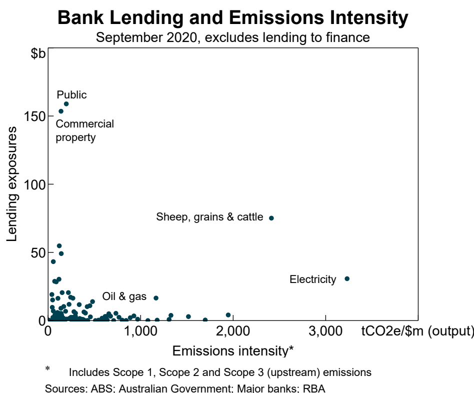
… in addition to technology risks

The risks to IT systems from both malfunctions and cyber-attacks are rated as a key concern by financial institutions, regulators and governments. These risks have grown as digital platforms and service channels have become more important to economies and are increasingly interconnected and complex. Changes to business operations due to the pandemic have increased vulnerabilities through a higher prevalence of remote working by employees.[11] In addition to inherent system vulnerabilities, risks from cyber-attacks are growing, reflecting increased technological capability and sophistication of highly organised cyber criminals and state-sponsored attackers. In recognition of this, Australian regulators are working together to support financial institutions' efforts to strengthen cyber resilience (see 'Chapter 4: Domestic Regulatory Developments').

To date, cyber incidents have caused only limited disruptions and financial losses for a small number of institutions. Nevertheless, the Australian Cyber Security Centre (ACSC) observed that in the 2020/21 financial year, cyber incidents affecting the Australian financial sector had on average a greater impact compared with the prior year, a trend also seen in other sectors (Graph 3.14).[12] There were several large-scale, high-profile attacks in the financial year – including those affecting Accellion, Microsoft Exchange and SolarWinds – as well as instances of system malfunctions leading to the release of confidential information by the cryptocurrency exchange BTC Markets and financial research firm Morningstar.

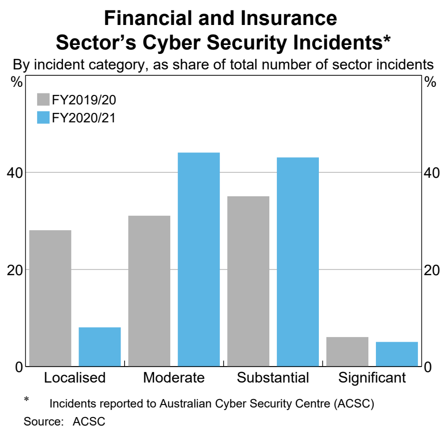
While the impact of incidents to date has been limited, given the large number of attempts a significant cyber event that has the potential for systemic implications is at some point inevitable.[13] A resulting loss of public confidence could lead to wide-spread stress in the financial system. Compromised confidential information could lead to severe reputational damage and reluctance from market participants to extend liquidity or credit. The increased level of interconnectedness in the financial system – including through a network

Graph 3.13



* Includes Scope 1, Scope 2 and Scope 3 (upstream) emissions
Sources: ABS; Australian Government; Major banks; RBA

Graph 3.14



* Incidents reported to Australian Cyber Security Centre (ACSC)
Source: ACSC

of third-party service providers, critical FMIs, lenders and counterparties – could rapidly transmit the impact of a cyber incident from one institution to another. For example, several banks may rely on real-time payments from a major participant in the wholesale settlement system, which if incapacitated for a prolonged period of time could put pressure on intraday liquidity. In addition, an inability to substitute away from a key institution or service provider could cause severe operational disruptions at other institutions along the supply chain.

Sound culture and governance practices support robust risk management and decision-making

Failures of culture and appropriate governance can encourage excessive risk-taking and poor decision-making practices, leading to the erosion of public trust in financial institutions. Such failures, including when interacting with other vulnerabilities (such as climate change and cyber risks), could have serious financial implications. In the past this has included large remediation costs and penalties, and regulators tightening restrictions on the operations of financial institutions.

Regulators' focus on culture, compliance and governance has continued in recent months. APRA has released its final remuneration prudential standard for financial institutions.[14] This includes a requirement to give material weight to non-financial metrics in determining variable remuneration and increased board oversight of remuneration outcomes, which together help incentivise bank executives to prioritise prudent risk management and thereby foster financial resilience. The Reserve Bank has undertaken a detailed review of the governance of the ASX's CCPs and securities settlement facilities as part of its 2021 ASX assessment.[15] While the review concluded that the ASX has a skilled and experienced board, it made a number of recommendations for improvement. These include: increasing the attention given to the CCPs and securities settlement facilities within the broader ASX Group; making lines of executive responsibility and accountability clearer; and improving the oversight of technology projects and focus on stakeholder management. Finally, the RBNZ issued a formal warning to the New Zealand subsidiary of Westpac for failing to report transactions as required by anti-money laundering and counter-terrorism financing requirements.

Endnotes

[1] See RBA (2020), *Statement on Monetary Policy*, May.

[2] APRA (2020), 'Stress Testing Banks during COVID-19', Information Paper, December. Available at <https://www.apra.gov.au/stress-testing-banks-during-covid-19>.

[3] For more detail, see Brischetto A and L Jurkovic (2021), 'The Committed Liquidity Facility', RBA *Bulletin*, June.

[4] For more detail on recent trends in bank funding, see Garner, M and A Suthakar (2021), 'Developments in Banks' Funding Costs and Lending Rates', RBA *Bulletin*, March.

[5] See Black S, B Jackman and C Schwartz (2021), 'An Assessment of the Term Funding Facility', RBA *Bulletin*, September.

[6] See APRA (2021), 'Stress Testing Insurers during COVID-19: Results and Key Learnings', Insight, 3 August. Available at <https://www.apra.gov.au/news-and-publications/stress-testing-insurers-during-covid-19-results-and-key-learnings>.

[7] See RBA (2021), 'Box C: What did 2020 Reveal About Liquidity Challenges Facing Superannuation Funds ?', *Financial Stability Review*, April.

[8] For more detail, see RBA (2021), 'Update on the Independent Expert Review of November's ASX Trade Outage', Media Release No 2021-17, 23 August.

[9] Financial institutions are also exposed to liability risks, which stem from the potential for litigation (and resulting business disruptions and penalties) for not adequately considering or responding to the impacts of climate change. See APRA (2021), 'Draft CPG

229 Climate Change Financial Risks', Prudential Practice Guide, April. Available at <https://www.apra.gov.au/sites/default/files/2021-04/Draft%20CPG%20229%20Climate%20Change%20Financial%20Risks_1.pdf>.

[10] There are considerable uncertainties and limitations that prevent more definitive conclusions from being reached. See Bellrose K, D Norman and M Royters (2021), 'Climate Risks to Australian Banks', RBA *Bulletin*, September.

[11] See Aldasoro I, J Frost, L Gambacorta and D Whyte (2021), 'Covid-19 and Cyber Risk in the Financial Sector', *BIS Bulletin*, No 37, January. Available at <https://www.bis.org/publ/bisbull37.pdf>.

[12] Data provided by ACSC on 10 August 2021. ACSC categorises reported incidents based on the severity of impact and extent of compromise; for details, see ACSC (2021), 'ACSC Annual Cyber Threat Report 1 July 2020 to 30 June 2021', September. Available at <https://www.cyber.gov.au/sites/default/files/2021-09/ACSC%20Annual%20Cyber%20Threat%20Report%20-%202020-2021.pdf>. The incident categories include: (1) national cyber incident (generally affecting national security, Australian essential services, critical infrastructure or impacting a large number of individuals or organisations); (2) highly significant incident (generally affecting the Commonwealth government, national infrastructure, the supply chain of critical national infrastructure, national security, Australian essential services, or a large number of individuals or organisations); (3) significant incident (generally affecting Commonwealth or state governments, large organisations or the supply chain of critical national infrastructure); (4) substantial incident (generally affecting medium or large organisations, Commonwealth or state governments or academia); (5) moderate incident (generally affecting small to medium organisations); and (6) localised incident (generally affecting individuals or small organisations).

[13] For a discussion on the cyber risks globally, see Maurer T and A Nelson (2021), 'The Global Cyber Threat', *IMF Finance & Development*, March. Available at <https://www.imf.org/external/pubs/ft/fandd/2021/03/pdf/global-cyber-threat-to-financial-systems-maurer.pdf>. For a recent discussion on the cyber risks facing Australian banks, see Byres W (2021), 'Speech to the 2021 AFR Banking Summit', 30 March. Available at <https://www.apra.gov.au/news-and-publications/apra-chair-wayne-byres-speech-to-2021-afr-banking-summit>.

[14] APRA (2021), 'Response Paper – Strengthening Prudential Requirements for Remuneration', August. Available at <https://www.apra.gov.au/consultation-on-remuneration-requirements-for-all-apra-regulated-entities>.

[15] See RBA (2021), 'Annual Assessment of ASX', September.