Bulletin

SEPTEMBER 2021

RESERVE BANK OF AUSTRALIA

Bulletin

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Contents

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An Assessment of the Term Funding Facility

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Photo: Krisanapong Detraphiphat – Getty Images

Abstract

The Term Funding Facility (TFF) was announced by the Reserve Bank Board in March 2020 as part of a comprehensive policy package to support the Australian economy in response to the COVID-19 pandemic. The facility has provided low cost three-year funding to banks operating in Australia against high quality collateral. The TFF closed to new drawdowns at the end of June 2021, so the last of this funding will not mature until mid 2024. This article provides an overview of TFF usage by banks, considers the future refinancing task for the banking sector, and provides an assessment of the TFF with respect to its primary policy goals.

In March 2020, the Reserve Bank Board announced the Term Funding Facility (TFF) as part of a comprehensive policy package to support the Australian economy in response to the COVID-19 pandemic. The facility has provided low cost three-year funding to banks operating in Australia. As for all central bank funding, funds are lent against high-quality collateral. The TFF had three overall aims:

- Support the banking sector to continue to extend credit to households and businesses at a time when wholesale funding markets had been significantly disrupted
- Lower funding costs for banks and, in turn, lower borrowing rates for their business and household customers
- Encourage banks to increase their lending to businesses, particularly small and medium-sized enterprises (SMEs).

The TFF initially gave banks access to three-year funding at a cost of 0.25 per cent, with:[1]

- an 'initial allowance' equivalent to 3 per cent of each bank's total credit outstanding; banks could access their initial allowance until 30 September 2020

- an 'additional allowance', which was available until 31 March 2021 to any bank that managed to expand its business credit, particularly to SMEs – for every extra dollar lent (relative to a pre-pandemic baseline) to large businesses, a bank could access one additional dollar of funding from the Reserve Bank; for every extra dollar lent to SMEs, it had access to an additional five dollars of funding.

The Reserve Bank Board made a number of adjustments to the TFF in response to changes in economic and financial conditions:

- In September 2020, the TFF was expanded with a new supplementary allowance for each bank equivalent to 2 per cent of its credit outstanding, available to be drawn between 1 October 2020 and 30 June 2021. Also, the period for drawdowns for the additional allowance was extended by three months to 30 June 2021.
- In November 2020, the cost of new funding under the TFF was lowered to 0.1 per cent in line with reductions in the target cash rate and the three-year government bond yield target.

While the facility has now closed to new drawdowns, banks retain access to the funding they have drawn for up to three years when the final TFF borrowings mature in mid 2024.

This article provides an overview of TFF usage by banks, considers the future refinancing task for the banking sector, and provides an evaluation of the TFF with respect to its primary policy goals.

Banks accessed $188 billion of funding from the TFF

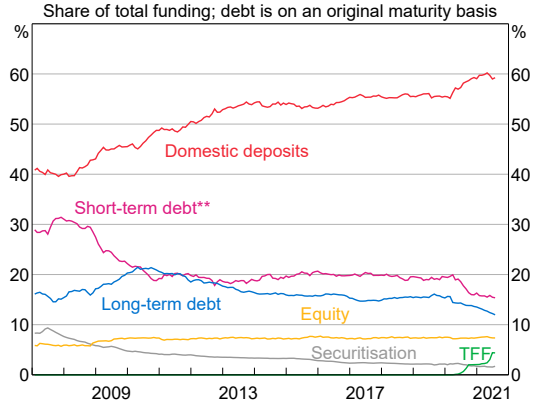
The TFF has provided $188 billion in funding to banks since its inception. This funding is equivalent to 4 per cent of banks' non-equity funding (Graph 1), or 6 per cent of credit. The facility was announced on 19 March 2020, a time of significant uncertainty for financial markets in Australia and globally. The announcement of the Bank's initial policy package, which included the TFF, contributed to an immediate reduction in volatility in markets and an improvement in sentiment, and the Bank's expanded open market operations during that period supported banking sector liquidity. As a result, by the time the first TFF drawdowns became available in early April, funding conditions for banks had already improved.[2] This allowed the banking sector to defer the bulk of drawdowns until closer to allowance deadlines, thereby locking in low-cost funding for as long as possible. Consistent with this, drawdowns were concentrated over two periods of heightened activity in the lead up to expiry dates for allowances (Graph 2).[3]

Total funding available over the life of the TFF was $213 billion. As a share of GDP, this was a similar amount to term lending facilities created by a number of other central banks, albeit smaller than the European Central Bank's targeted long-term refinancing operations and larger than the US Federal Reserve's Paycheck Protection Program

Graph 1

Banks' Funding Composition*

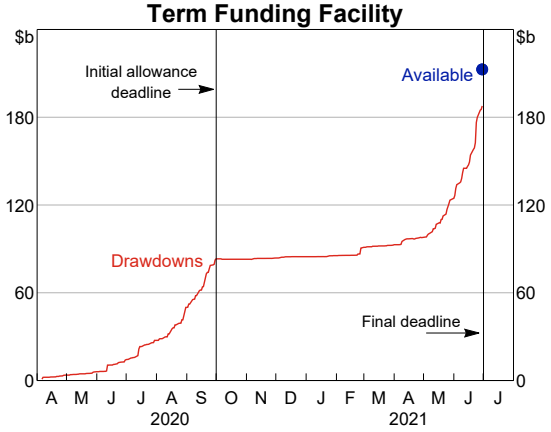
Share of total funding; debt is on an original maturity basis



* Adjusted for movements in foreign exchange rates
** Includes deposits and intragroup funding from non-residents
Sources: ABS; APRA; Bloomberg; RBA; Refinitiv

Graph 2

Term Funding Facility



Sources: APRA; RBA

Liquidity Facility (Graph 3). Use of the TFF has been somewhat higher than comparable schemes to date. However, all but the US facility remain open to new drawdowns, and these facilities vary in purpose and design across the different central banks.

Most banks took up most of their TFF allowances

In aggregate, banks drew down 88 per cent of the total funding available from the facility. The major banks and mid-sized Australian banks took up all of their allowances, while small banks and foreign banks took up a little over half of their total allowances (Graph 4). Data on the drawdown amounts and allowances of the top 10 users of the facility were published with the August 2021 *Statement of Monetary Policy* and are listed in the Appendix; these accounted for almost 90 per cent of drawdowns from the facility. These banks include the four major banks as well as some smaller Australian banks. Differences in the amount drawn from the TFF within this group largely reflect differences in banks' total credit outstanding; this is consistent with each bank's initial and supplementary allowances having been based on its credit outstanding when the allowances were set in March 2020 and September 2020. For some of the smaller banks, the additional allowances they accumulated were significant, reflecting strong growth in their loans to businesses (particularly SMEs) since early 2020.

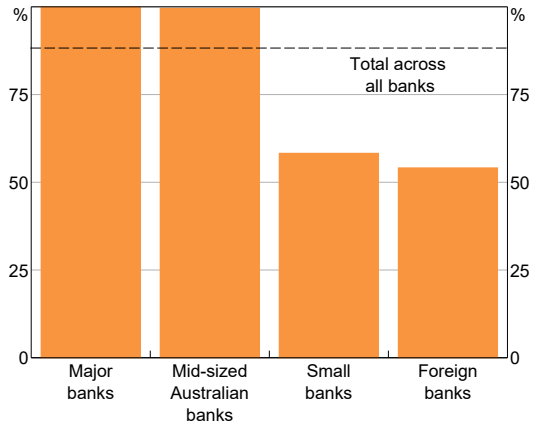
By number, 92 banks (around two-thirds of the 133 eligible banks) accessed the TFF.[4] The 41 banks that did not access the facility represented a very small share of allowances by value (Graph 5). In large part these banks were small Australian banks and foreign banks, many with very small allowances, and some with larger allowances but with less ready access to eligible collateral at a low cost.

Self-securitisation notes (backed by pools of loans) were eligible to be used as collateral for TFF funding, in contrast to repo funding available through the Bank in open market operations.[5] This ensured the banking system would have sufficient collateral to access the TFF at scale without having to draw upon large amounts of other securities to

Graph 4

TFF Usage

Share of total allowances

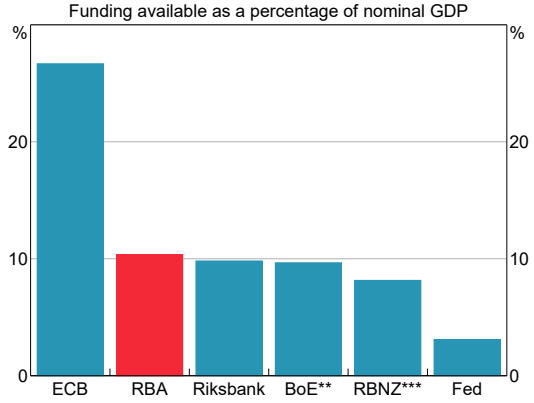


Sources: APRA; RBA

Graph 3

Size of Selected Term Funding Schemes*

Funding available as a percentage of nominal GDP



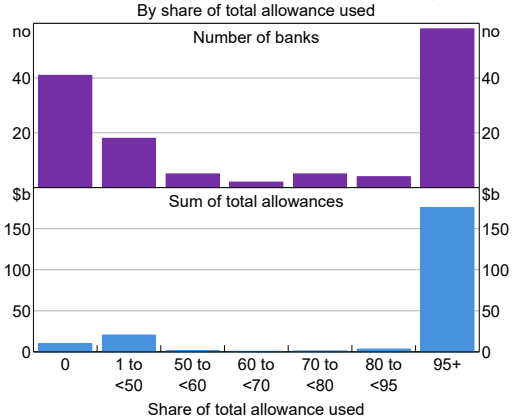
* Schemes created in response to COVID-19 pandemic
** Initial allowance only
*** Funding for Lending program only

Sources: Central Banks; RBA; UBS

Graph 5

Distribution of TFF Allowance Usage*

By share of total allowance used



* Includes 133 eligible banks as at the end of the drawdown period

Sources: APRA; RBA

provide to the RBA, which might have otherwise disrupted these markets in the process.[6]

Self-securitisations were generally the most cost-effective collateral eligible for banks to use for the TFF, as this type of collateral involves banks pledging AAA-rated notes backed by loans that are already on their balance sheets, rather than other, lower-yielding securities. As a result, those banks with self-securitisations available used them as much as possible (and some banks even created new self-securitisations to access the facility). Indeed, over 90 per cent of collateral pledged for the TFF by value was of this type (Graph 6). Conversely, those banks without self-securitisations generally accessed less TFF funding, pledging collateral such as Australian Government securities, semi-government bonds, bank bonds issued by other banks, or marketed residential mortgage-backed securities (RMBS).

A small number of banks terminated previously drawn TFF funding, although terminations during the drawdown window amounted to less than $1 billion.[7] The majority of terminations occurred following the November 2020 reduction in the interest rate on new TFF drawdowns. Banks that terminated at this time generally had limited low-cost collateral to access their full allowance and so it made sense for them to refinance part or all of their existing drawdowns with a new TFF drawdown at the lower rate of 0.10 per cent. Also, a number of small Australian banks terminated TFF funding citing excess liquidity, particularly the availability of plentiful low-cost deposits.

TFF allowances grew towards the end of the drawdown window, driven by SME lending by some banks

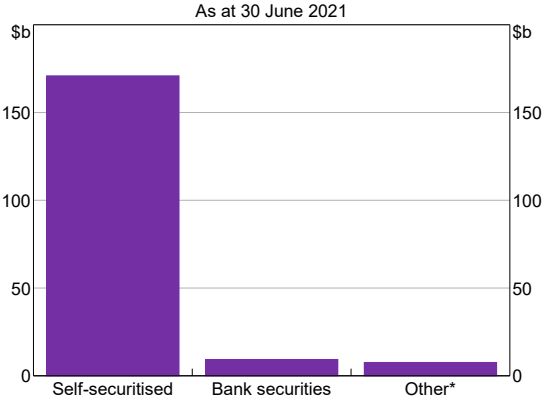
Total funding of $213 billion available over the life of the facility comprised: initial allowances of $84 billion (which closed in September 2020, and of which $80 billion was drawn down); $57 billion of supplementary allowances; and $72 billion of additional allowances. The availability of the supplementary allowance until 30 June 2021 ensured that banks that did not have any additional allowance kept access to the facility after the initial allowance closed.

In contrast to the initial and supplementary allowances, the additional allowance varied over the life of the TFF, depending on each bank's increase in lending to businesses relative to early 2020. Additional allowances rose strongly in the first few months following the commencement of the TFF (Graph 7). This reflected a sharp pick-up in large business lending, as businesses drew on revolving credit facilities for precautionary reasons in response to the COVID-19 shock. As businesses repaid the buffers they had drawn down and business credit declined, additional allowances declined through to early 2021 (Graph 8).

Graph 6

TFF Collateral

As at 30 June 2021

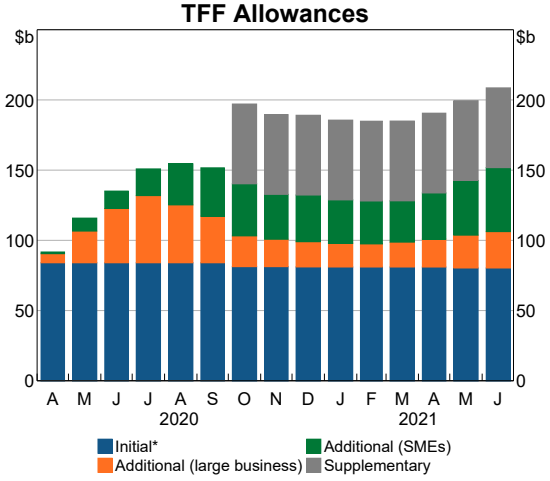


* Includes marketed RMBS/ABS, corporate bonds, AGS and semis

Source: RBA

Graph 7

TFF Allowances



* Represents final usage from October 2020 onwards, as the drawdown period for the initial allowance closed on 30 September 2020

Sources: APRA; RBA

Since then, and prior to the TFF allowances being finalised, aggregate lending to businesses by banks had been little changed. Nevertheless, additional allowances increased over the last few months of the TFF, driven by a number of banks that increased their business lending, particularly to SMEs. Consistent with this, the bulk of additional allowances available in June 2021 was due to increases in SME lending by some banks.

Overall commitments for new business loans increased over the three months to June 2021, as well as growth in business credit outstanding. Liaison with banks suggests that businesses had shown a bit more appetite to borrow, consistent with both improved economic conditions and the cessation of a number of measures that had supported cashflows – most notably the JobKeeper program, which concluded at the end of March 2021. However, this period largely predates the lockdowns across the eastern states in response to COVID-19 outbreaks.

The TFF has contributed to lower funding costs for banks and non-banks …

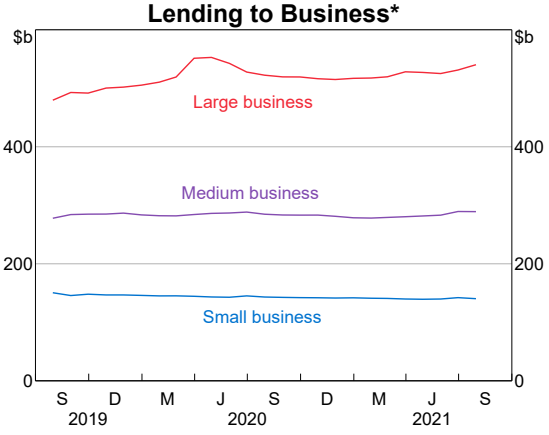
The TFF provided a degree of funding certainty for banks and has lowered bank funding costs by providing a low-cost source of funds. In particular, the TFF provided access to funds for three years at a cost that has been well below that of wholesale debt for the same term. The estimated cost of sourcing three-year unsecured funding in domestic wholesale debt markets for the major banks was around 0.6 per cent at the end of June 2021, compared with 0.1 per cent for TFF funding (Graph 9). Taking into account the lower cost of funds and the share of bank funding provided, our estimates suggest that the direct effect of the TFF has been to lower major bank funding costs by around 5 basis points.[8] Smaller banks pay higher rates to borrow in wholesale markets, so the difference between their wholesale funding costs and 0.1 per cent is larger. Since the last of this low-cost funding is not due to mature until mid 2024, the TFF will keep bank funding costs lower than otherwise for a number of years.

The TFF has also had an indirect effect on banks' funding costs. As banks have drawn on the TFF, they have largely refrained from issuing new senior unsecured debt in wholesale funding markets, so the total stock of bank bonds has declined as existing bonds have matured (Graph 10). The lower supply of bank bonds has led to a decline in spreads on these bonds in the secondary market.

Moreover, the TFF has also contributed to reduced spreads on securities issued by non-banks, which are close substitutes for bank bonds. Hence, the cost of issuing new bonds has declined for both banks and non-banks. In particular, spreads on newly issued non-bank RMBS to the bank bill swap rate (BBSW) have declined to their lowest level in over a decade (Graph 11). Non-bank lenders have responded by issuing large volumes of RMBS, and their market share in housing lending has

Graph 8

Lending to Business*

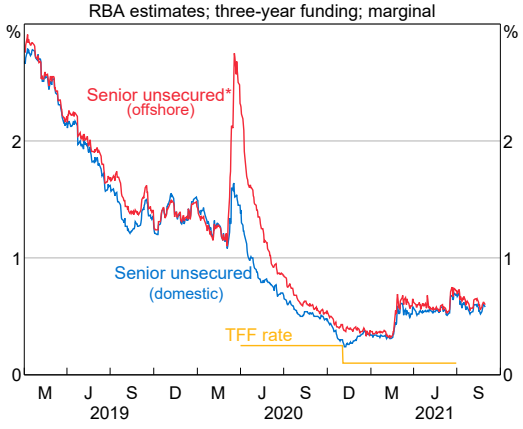


* Data cover financial institutions with $2 billion or more in business credit
Sources: APRA; RBA

Graph 9

Cost of Major Banks' Funding Sources

RBA estimates; three-year funding; marginal



* Adjusted for cross-currency hedging
Sources: Bloomberg; RBA

rebounded from the modest decline around the middle of last year (Graph 12).

It is difficult to estimate the size of this indirect effect of the TFF on wholesale funding markets because the TFF was announced as part of a broader policy package in a period of significant market dysfunction. However, following the announcement of the TFF, along with other policy measures at the time, bank bond spreads fell by around 50 basis points more than the spreads of similarly rated non-bank and non-financial corporate bonds (Graph 13). This is broadly consistent with research that shows the Bank of England's Funding for Lending Scheme contributed to a narrowing in bank bond spreads compared with bonds issued by non-banks.

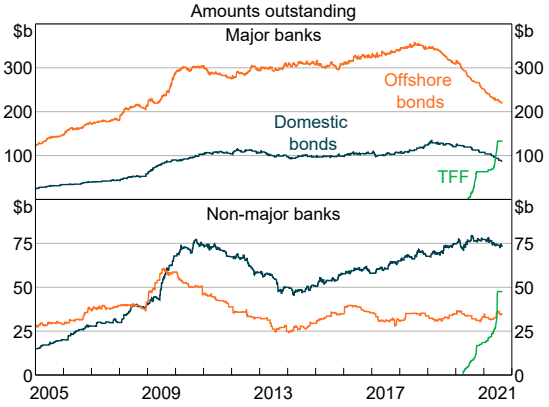
Another indirect effect of the TFF on bank funding costs is that it has contributed to the growth in deposits. With bank bonds maturing in sizeable volumes, banks repaid bondholders, who then returned these funds to the banking sector in the form of low-cost deposits.

… and, in turn, lower lending rates

As a result of the Reserve Bank's package of policy measures, including the TFF, bank funding costs have declined to historically low levels. This decline has, in turn, been passed through to lending rates, which are also historically low. On average, lending rates have declined in line with banks' overall funding costs, although the extent of reductions in interest rates has varied across different types of housing and business loans (Graph 14).

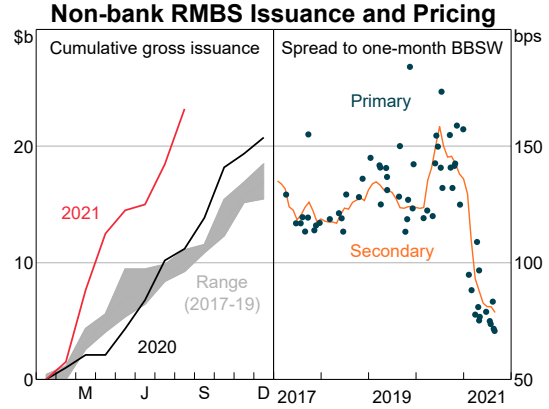
Since the end of February 2020, interest rates on variable-rate loans to SMEs and large businesses have declined by around 95 basis points. Interest

Graph 10
Banks' Wholesale Funding
Amounts outstanding



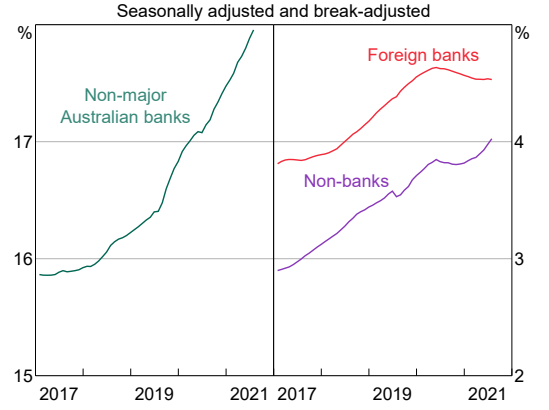
Sources: Bloomberg; RBA

Graph 11
Non-bank RMBS Issuance and Pricing



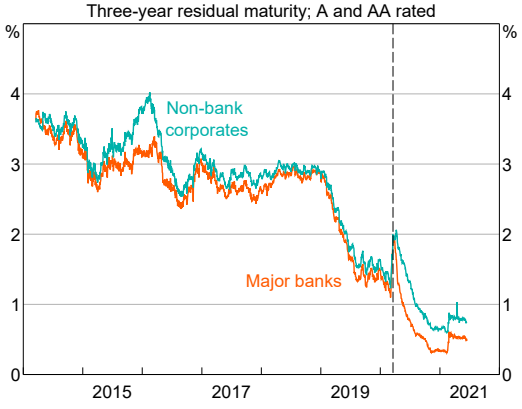
Sources: Bloomberg; ICE; KangaNews; RBA

Graph 12
Market Share of Housing Credit*
Seasonally adjusted and break-adjusted



* Major banks make up the remainder of market share
Sources: APRA; RBA

Graph 13
Bond Yields*
Three-year residual maturity; A and AA rated



* Dotted line indicates annoucement date of TFF
Sources: Bloomberg; RBA

rates on fixed-rate loans to SMEs and large businesses have declined by around 80 and 60 basis points, respectively.

Rates on outstanding variable-rate housing loans have declined by around 55 basis points since February 2020, while interest rates on outstanding fixed-rate housing loans have declined by around 140 basis points.

The effectiveness of the additional allowance in encouraging business lending is difficult to assess

The TFF's additional allowance was designed to encourage banks to lend to businesses, particularly SMEs. As outlined above, a bank was provided with $1 of additional funding for every extra dollar it lent to large businesses, and $5 for every extra dollar it lent to SMEs. Overall, the banks that had access to additional allowances generated $26 billion of additional new lending to large businesses and $9 billion to SMEs.

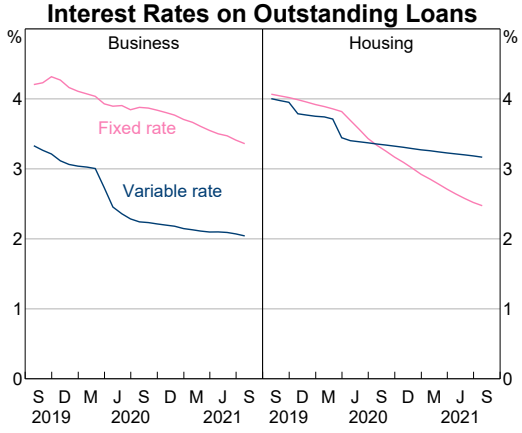
The effectiveness of the additional allowance in supporting aggregate growth of business credit growth is difficult to assess. Nevertheless, a number of banks that significantly increased their lending to SMEs reported in liaison that this was influenced by the incentive of the additional allowance. Overall business lending was little changed, with lending by a number of banks declining. Econometric estimates by Bank staff suggest there was little observable effect from the larger incentive for lending to SMEs compared with lending to large business.[9] However, it is difficult to control for other important factors that influenced the demand for business credit, such as the fact that SMEs were disproportionately in industries that were more severely affected by the pandemic, adversely affecting both the supply of and demand for credit. Also, SMEs received sizeable government support, via initiatives such as JobKeeper, which reduced the need for credit. It is worth noting that business credit has held up better during the sharp downturn in economic activity in 2020 than during the global financial crisis and earlier recessions (Graph 15). At least part of this difference may be attributable to the incentives to lend to businesses under the TFF.

The TFF refinancing task that banks will face in two to three years is sizeable but manageable

Over the next two to three years, banks will need to repay the funding they have accessed from the TFF. Bank decisions about how to repay the funding will depend on a number of factors, including their asset growth and the price and availability of the full range of funding sources, including deposits. According to liaison, banks' current plans are to raise a sizeable amount of funds to repay TFF funding (on or before maturity) from wholesale debt markets, thereby at least partly reversing the process whereby debt issuance declined as TFF drawdowns increased. The bulk of scheduled TFF maturities occur in the September 2023 and June

Graph 14

Interest Rates on Outstanding Loans

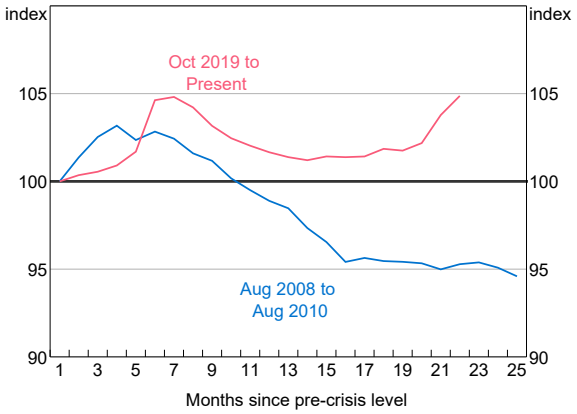


Sources: APRA; RBA

Graph 15

Business Credit*

Pre-crisis levels indexed to 100



* Seasonally adjusted and break-adjusted

Sources: APRA; RBA

2024 quarters (Graph 16). If banks issue new debt to replace TFF drawdowns in the quarter of maturity, this would require quarterly issuance as a share of assets at levels not seen in over a decade (Graph 17; top panel).

However, banks are unlikely to refinance their TFF drawdowns right at the time they are scheduled to mature. In liaison, banks have flagged plans to issue bonds earlier than scheduled TFF maturities ('pre-funding').[10] Banks can also terminate TFF repos early without any additional cost. Indeed, some banks have indicated willingness to terminate early and issue bonds at around the same time. These strategies would allow banks to spread the refinancing task over a period of time, as illustrated by way of a hypothetical example in the bottom panel of Graph 17. This would serve to reduce the effect of refinancing on market conditions as well as offset the effect of approaching TFF maturities on their regulatory liquidity ratios.

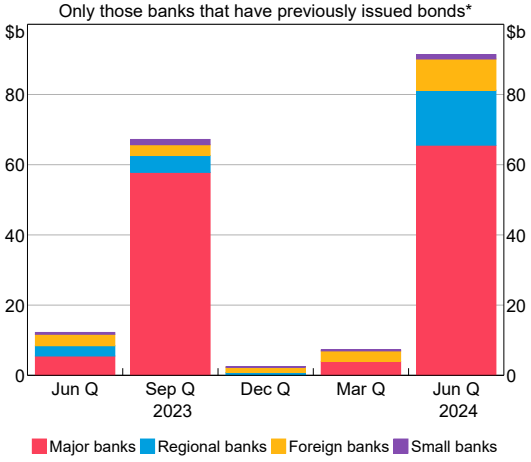
From the outset of the TFF, the RBA has been in regular contact with the Australian Prudential Regulation Authority (APRA) about this refinancing issue. APRA has been and will continue to engage closely with banks on their liquidity management. Based on aggregate flows, we do not anticipate that this refinancing task poses a significant challenge for the banking sector overall, provided there is no episode of broader market disruption at the time. Australian banks have issued similarly large volumes of bonds as a share of assets in the past without a large effect on the cost. They are highly rated by global standards and remain highly profitable. Liaison indicates that banks are planning carefully for this period, particularly in considering early repayments and ensuring that investors remain engaged.

Nonetheless, the aggregate nominal funding task is sizeable, and there is always uncertainty around the outlook three years ahead. The Bank and APRA will continue to monitor this issue closely.

Graph 16

Scheduled TFF Maturities

Only those banks that have previously issued bonds*



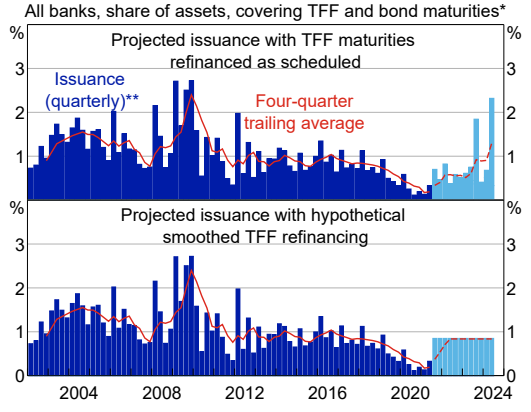
* These banks account for 96% of TFF drawdowns; maturities on 1 July 2024 included in June 2024 quarter value

Source: RBA

Graph 17

Bank Bond Issuance Scenarios

All banks, share of assets, covering TFF and bond maturities*



* Assumes 4 per cent annual asset growth

** During the period late 2008 to early 2010 considerable issuance was guaranteed under the Australian Government Guarantee Scheme

Sources: APRA; Bloomberg; RBA

The evidence suggests the TFF has met its goals and helped to support the Australian economy in the wake of the pandemic

With financial markets in Australia operating well, the TFF closed to new drawdowns on 30 June 2021 as scheduled. Banks drew $188 billion from the facility. With the TFF providing funding for three years, it will continue to support low funding costs for the banking sector until mid 2024.

Along with the other monetary policy measures announced in March 2020, the TFF helped to stabilise funding markets and provide banks with a degree of funding certainty that supported the provision of credit to households and businesses. It has directly reduced funding costs for banks, and indirectly for other institutions issuing debt in wholesale funding markets. In turn, the facility – along with the Bank's other policy measures – has

contributed to lower lending rates for households and businesses. The incentive for banks to lend to businesses, particularly SMEs, supported business credit. Some banks increased their lending to SMEs, and received additional funding in line with this incentive. However, business lending overall was little changed over the TFF drawdown window in an environment of soft demand for business finance and government policy providing significant support to businesses' cash flows.

Appendix

A.1: Top Ten Largest Drawdowns of the Term Funding Facility

Table A.1: Top Ten Largest Drawdowns of the Term Funding Facility by Bank

	Total Allowance		*of which*			
			Initial[(a)]		Supplementary and Additional[(b)]	
Bank name	**Drawn-down** ($ billion)	**Share of allowance** (Per cent)	**Drawn-down** ($ billion)	**Share of allowance** (Per cent)	**Drawn-down** ($ billion)	**Share of allowance** (Per cent)
CBA	51.14	100.0	19.15	100.0	31.99	100.0
NAB	31.87	100.0	14.27	100.0	17.60	100.0
Westpac	29.78	100.0	17.90	100.0	11.89	100.0
ANZ	20.09	100.0	12.00	99.8	8.09	99.9
Macquarie	11.26	99.1	1.72	100.0	9.53	98.9
ING Bank (Aust.)	5.42	100.0	1.87	100.0	3.55	99.9
Bendigo Bank	4.72	100.0	1.83	100.0	2.89	100.0
Suncorp	4.13	100.0	1.74	100.0	2.39	100.0
Judo Bank	2.86	33.1	0.03	99.8	2.83	32.9
BoQ	2.15	100.0	1.24	100.0	0.92	100.0

(a) Closed on 30 September 2020.

(b) Closed on 30 June 2021. For more information on these allowances, see RBA, 'TFF Operational Notes'. Available at <https://www.rba.gov.au/mkt-operations/term-funding-facility/operational-notes.html>

Source: RBA

Footnotes

[*] The authors are from Domestic Markets department.

[1] For more detail on this initial phase of the TFF, see Lowe (2020), RBA (2020a), RBA (2020b) and Alston *et al* (2020).

[2] Banks could also count undrawn TFF allowances during the window they were available to be drawn as liquid assets to meet their regulatory liquidity requirements, to the extent they had eligible collateral that would not otherwise be counted (such as the debt of other banks). As a result, the TFF also immediately eased liquidity needs for some banks.

[3] For more information on why banks might delay TFF drawdowns until close to the deadline, see Kent (2020).

[4] While there are around 145 banks registered with APRA, only 133 are currently members of the Reserve Bank Information and Transfer System (RITS) for settlement of high-value payments and thus eligible counterparties for RBA financial market operations.

[5] Self-securitisations are structured pools of assets, such as residential mortgages, created by banks specifically to use as collateral to access liquidity from the Reserve Bank (Cole and de Roure 2020).

[6] Self-securitisations are eligible for the Bank's Committed Liquidity Facility (CLF) under the same rationale.

[7] Banks can terminate TFF funding at any time with no additional cost.

[8] Hedging the TFF from fixed to variable was also very cheap through late 2020 and most of 2021; the elevated swap rate meant the initial cost of drawing down the TFF

was negative. This benefit will become a cost should interest rates rise, but interest from banks' variable rate assets would also rise.

[9] These estimates are broadly consistent with the OECD's assessment of a similar incentive in the Bank of England's Funding for Lending scheme (Havrylchyk 2016).

[10] Banks can also 'post-fund' if they accumulate excess liquid assets prior to maturity (and then, following TFF repayment, accumulate liquid assets back to the desired level).

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Small Business Finance and COVID-19 Outbreaks

Susan Black, Kevin Lane and Laura Nunn[*]

Photo: Trevor Williams – Getty Images

Abstract

Economic conditions for small and medium-sized enterprises (SMEs) improved in the second half of 2020 and early 2021, although measures to contain the recent outbreaks of COVID-19 have affected firms in much of Australia. SMEs are being supported by policy measures, including a number of initiatives that continue to encourage lending to smaller firms. Nonetheless, the volume of SME lending has been little changed for some time, and access to finance continues to be a challenge for small businesses.

Access to finance for small businesses has been a longstanding focus for the Reserve Bank of Australia (RBA). Each year, the RBA convenes a Small Business Finance Advisory Panel to better understand the challenges faced by small businesses; 2021 marked the 29th annual panel. This year's panel convened in early July and focused on the ongoing economic effects of the COVID-19 pandemic. This article summarises recent developments in small business finance, drawing on the panel's discussions, as well as official survey data and the RBA's liaison with businesses and lenders.

Economic conditions for small businesses had improved, but remain challenging

Small businesses have been disproportionately affected by the COVID-19 pandemic because they are more likely to be in industries that have been harder hit by restrictions on movement, such as cafes, restaurants, arts and recreation.

In the second half of 2020 and the first half of 2021, the broader economic recovery had led to an improvement in conditions for many businesses, large and small. As the recovery gained momentum, many small businesses grew more confident about their outlook (Graph 1). However, conditions have been uneven across industries, and demand has

been variable since the beginning of 2020 for many small firms. Indeed, sales at smaller retailers declined noticeably in early 2020 before picking up towards the end of the year as conditions improved, while sales at larger retailers have generally been resilient throughout the pandemic (Graph 2).[1]

Recent experience has highlighted that, once the virus outbreaks are contained and the restrictions on activity are lifted, activity can bounce back quickly (Ellis 2021). However, recent restrictions on movement in order to contain the spread of the Delta variant of COVID-19 in a number of states have disrupted economic activity and increased uncertainty about the near-term economic outlook (RBA 2021).

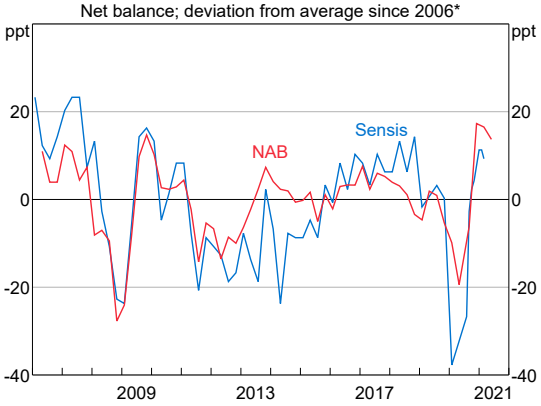
The economic disruption from COVID-19, and the associated movement restrictions, affected businesses to varying degrees. At this year's meeting, some panellists noted that the ongoing COVID-19 outbreaks and associated containment measures have led to orders being cancelled, revenue declining and staff being laid off and/or stood down. On the other hand, some businesses experienced growth in sales, such as for some goods and services distributed through supermarkets and/or online channels.

The closure of Australia's international borders has prevented firms from hiring foreign workers, exacerbating labour shortages in specific fields (Lowe 2021). This message was echoed by some panellists, who reported a large decline in the number of applicants for each vacant job, making it difficult to hire new staff, particularly those with specific skills such as those working in IT. Similarly, in the most recent NAB Quarterly Business survey, the availability of suitable labour was reported to be increasingly constraining output. Some panellists also noted that they were affected by supply shortages due to bottlenecks and delays throughout global supply chains, with global manufacturing delivery times and shipping prices increasing throughout most of the first half of 2021.[2]

Graph 1

Small Business Confidence

Net balance; deviation from average since 2006*



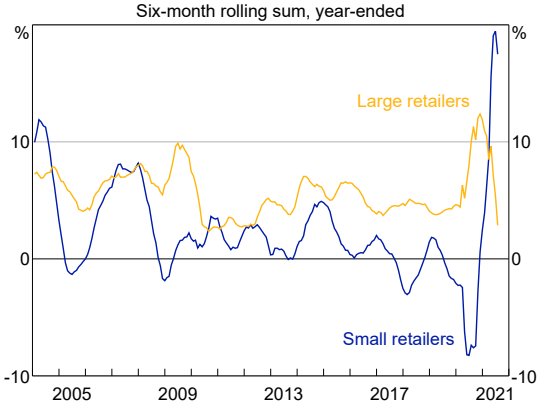
* The net balance is the difference between the percentage of positive responses and the percentage of negative responses

Sources: NAB; RBA; Sensis

Graph 2

Retail Sales Growth by Size

Six-month rolling sum, year-ended



Sources: ABS; RBA

The appetite for taking on new loans had picked up for some businesses, though demand for finance continues to be soft

Following a period of relatively soft demand for finance last year, liaison with banks suggested there had been a growing appetite for business borrowing in the period prior to the recent lockdowns. Consistent with this, non-mining business' investment expectations for the 2021/22 financial year have picked up from late last year. More recently, banks have indicated that demand for new debt is likely to be soft in the coming months, as firms adopt a cautious approach while restrictions remain in place.

The volume of lending to SMEs increased in the June quarter, after having been little changed for an extended period (Graph 3; Graph 4). The pick-up in business lending was consistent with improvements in economic conditions over the first half of 2021 and an increase in business confidence.

However, this increase in the stock of outstanding business credit largely predates recent lockdowns due to COVID-19 outbreaks. These restrictions to contain the spread of the virus will adversely affect a range of businesses and may reduce demand for debt for some time.

During 2020 and the first part of 2021, many businesses also had a reduced need for external finance because they made use of government support measures and temporary changes to stand down rules to help manage operating costs (discussed further below), and built up and maintained cash buffers – in part, reflecting ongoing uncertainty about the economic outlook. These messages were reinforced by panellists, with some noting that many small businesses are unwilling to take on new debt and are withholding investment until conditions improve further.

The Australian Government's $40 billion SME Guarantee Scheme, which started in late March 2020 and was enhanced in October 2020, closed to new applications at the end of June 2021. Overall, take-up of the scheme was low, with around $6.5 billion of loan commitments made to around 66,000 businesses. In April 2021, the government introduced the SME Recovery Scheme, which is an enhanced and extended loan guarantee scheme for SMEs. The SME Recovery Scheme was initially open only to firms that had received JobKeeper payments in the March quarter of 2021 or were affected by the floods in NSW in March 2021, although in late August the government announced this requirement would be removed. Advertised interest rates on loans under the Recovery Scheme are generally below those under the original scheme. Liaison suggests that take-up of the Recovery Scheme has been low to date – in part because those businesses that received JobKeeper earlier this year have been reluctant to take on more debt.

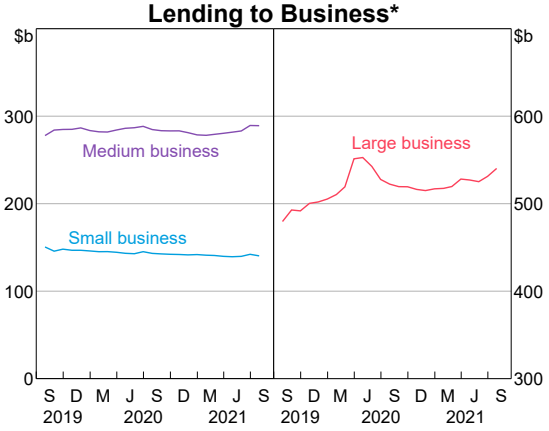
Small businesses have reported for many years that access to finance is difficult

Notwithstanding limited demand for debt in the current environment, for many years small businesses have reported that they find it difficult to access finance on terms that suit their needs. Small businesses tend to face a number of difficulties accessing finance associated with their smaller scale, less diversified nature and lack of collateral. Businesses are often required to provide collateral or personal guarantees to receive finance from banks. Small businesses have previously commented that they find it difficult to borrow more than around $100,000 on an unsecured basis and are often required to provide residential property as collateral for a business loan, with many reluctant to do so (Connolly and Bank 2018). Data provided by banks show that over 95 per cent of SME lending is secured, whereas only 70 per cent of lending to large business is secured.

Survey measures of small business' perceptions of their access to finance deteriorated sharply a few years ago (Graph 5).[3] More recently, surveys of

Graph 3

Lending to Business*



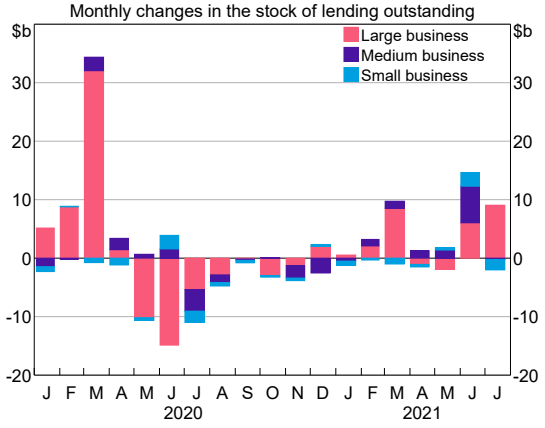
* Data cover financial institutions with $2 billion or more of business credit; not seasonally adjusted

Sources: APRA; RBA

Graph 4

Lending to Business*

Monthly changes in the stock of lending outstanding



* Data cover financial institutions with $2 billion or more of business credit; not seasonally adjusted

Sources: APRA; RBA

small businesses indicate that access to finance has become less difficult since mid 2020, in part reflecting the improved economic outlook. Consistent with this, banks reported in liaison that they had been seeking more opportunities to lend to businesses, including smaller businesses. This followed a tightening in access to finance in early 2020 and longer-than-usual loan approval times, as banks became more cautious about lending to new customers and to affected sectors. At the same time, banks were managing operational constraints due to a higher volume of customer enquiries.

Smaller businesses tend to face higher borrowing costs than large businesses. One reason for this is that smaller businesses typically have a higher risk profile (Graph 6). The major banks' estimates of default probabilities, which are based on historical experience prior to the pandemic, suggest that small businesses are more than twice as likely to default on loans as standard mortgage customers and large corporations.

Many small businesses have benefited from support measures introduced in response to the virus outbreaks

Initiatives introduced by the federal, state and territory governments as well as lenders and landlords have supported cash flows and balance sheets of SMEs during the pandemic. Australian Government measures initiated in 2020 – such as JobKeeper, Boosting Cash Flow for Employers and the accelerated depreciation schemes – reduced labour costs and provided direct tax subsidies. State governments provided relief and support to SMEs through a number of targeted support measures, with some state governments introducing industry support packages, payroll tax cuts and waivers, advisory and support programs, and rental assistance to landlords and tenants. Similarly, lenders and landlords provided relief from loan and rental payments.

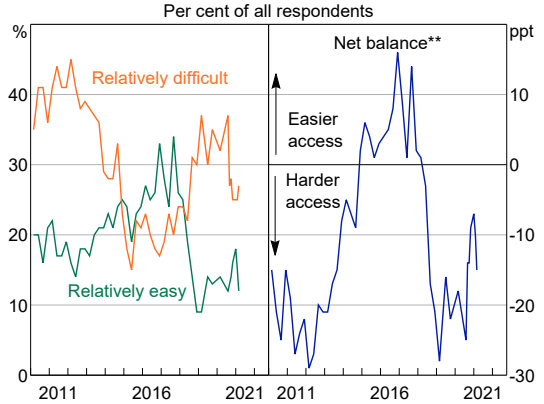
Most of the broader cashflow support measures and relief measures that were introduced in 2020 were phased out or were due to be phased out in time, alongside the initial economic recovery. More recently, new support measures have been introduced, including payments to businesses that have been negatively affected by the recent lockdowns (Appendix – Table A1). Many banks have also reintroduced support measures, in particular deferrals for loan payments, and the Australian Prudential Regulation Authority reinstated the regulatory support for loans affected by the lockdowns, as was the case in mid 2020.

Small businesses reported that the various measures adopted in 2020 were important in underpinning employment levels and sustaining operations; in a survey conducted in October 2020, over 40 per cent of small businesses that were accessing JobKeeper reported that their business had survived because of the scheme. There is some

Graph 5

Small Business Perception of Access to Finance*

Per cent of all respondents



* Survey has asked about perceptions of changes in access to finance relative to a previous period since July 2019; before that the survey asked for point-in-time assessments

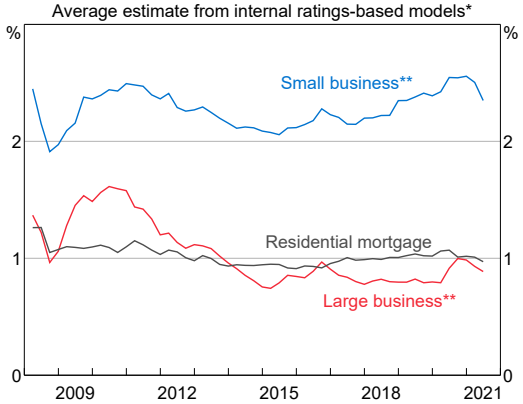
** Net balance is the difference between the percentage of firms indicating access is relatively easy and the percentage of firms indicating access is relatively difficult

Sources: RBA; Sensis

Graph 6

Business Lending Default Probabilities

Average estimate from internal ratings-based models*



* On-balance sheet exposures of major banks

** Small business is the SME retail and SME corporate categories in APRA's capital framework; Large business is the corporate category

Sources: APRA; RBA

evidence that these measures have been more important for SMEs than large businesses, including because SMEs have been disproportionally affected by containment measures and because large businesses were not eligible for some support measures (such as the Boosting Cash Flow for Employers scheme).

In mid 2020, a peak of around 13 per cent of all SME borrowers had a loan deferral arrangement in place and more than 225,000 business loans were deferred, although this share had declined to around 1 per cent by early 2021. Data published by the Australian Banking Association in early August indicate that, since 8 July 2021, more than 600 business loans have been deferred. Of these deferred loans, around 80 per cent are for businesses from New South Wales. Bank liaison suggests there has been an uptick in customer enquiries since loan deferral arrangements were reintroduced, but this increase was less than expected and well below the peak number of calls received last year.

Policy measures by the RBA have supported the supply of credit to SMEs. As a result of the RBA's package of monetary policy measures, interest rates on SME loans have declined to historically low levels (Graph 7). Since February 2020, interest rates on variable-rate loans and fixed-rate loans to SMEs have declined by around 95 basis points and 80 basis points, respectively. There has been elevated refinancing activity among businesses to access the lower interest rates on offer. Moreover, the Term Funding Facility (TFF) – which provided low-cost funding to banks for terms of three years – included an incentive for banks to increase their lending to businesses, especially SMEs.[4]

The Australian Government also introduced measures to encourage lending to SMEs, including the establishment of the $15 billion Structured Finance Support Fund (SFSF), which supplements investments in securitisations that are issued by smaller banks and non-bank lenders. As at 30 June 2021, the SFSF has made $3.8 billion in investment commitments (Australian Office of Financial Management 2021). As discussed above, the Australian Government also introduced the $40 billion SME Loan Guarantee Scheme and SME Loan Recovery Scheme to enable participating lenders to issue cheaper loans to SMEs (Treasury Department 2021).

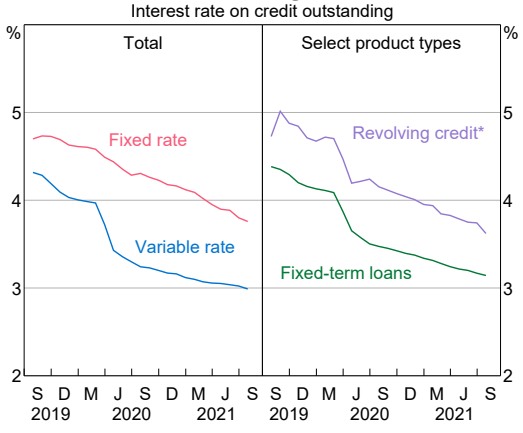
There are a number of ongoing measures that continue to provide support to small businesses

Other initiatives introduced by the Australian Government will provide ongoing support to small businesses, some of which were introduced or announced prior to the pandemic. Recent initiatives include the $2 billion Australian Business Securitisation Fund, which invests in securitisations that are backed by SME loans and issued by smaller banks and non-bank lenders. The first investment through this fund (worth $250 million) was announced in April 2020. As discussed below, the $540 million Australian Business Growth Fund was formally launched in October 2020; the fund will provide longer-term equity funding to established small businesses looking to expand. In January 2021, the government launched a new framework for insolvency laws, which has been designed to help more small businesses survive insolvency proceedings. At the same time, the compulsory Payment Times Reporting Scheme commenced, requiring larger corporations to publicise how quickly they pay invoices issued by small businesses.

Graph 7

SME Lending Rates

Interest rate on credit outstanding



* Excluding credit cards and margin loans

Sources: APRA; RBA

Small businesses' use of non-bank finance is expanding, but from a low base

Equity

Small businesses typically have access to a narrower pool of equity funding than larger companies. Australian private companies can only raise equity from professional and sophisticated investors (such as angel investors or venture capitalists), small-scale personal offers or crowd-sourced equity funding.

As in previous years, some panellists reported being approached by private equity investors in the past year. This aligns with reports from industry surveys that venture capital and private equity deals have been resilient throughout the pandemic, and that Australia-focused capital fundraising increased in 2020 (Preqin and Australian Investment Council 2021). Some small businesses have noted that private equity is attractive due to the flexibility it can offer, low collateral requirements, and the ability to make use of expertise and support from entities involved in providing the equity. However, for some years, small businesses have raised concerns with selling equity as this can involve relinquishing significant control over their business (Connolly and Jackman 2017).

The $540 million Australian Business Growth Fund (ABGF), which was formally launched in October 2020, will provide an alternative source of longer-term equity funding to established SMEs (Treasury Department 2020). The ABGF will provide businesses with equity capital of between $5 million and $15 million, up to a 49 per cent minority equity stake in the business. Additionally, the business will be required to appoint a member of the ABGF and an independent, non-executive chair to the business' board of directors.

Non-traditional finance

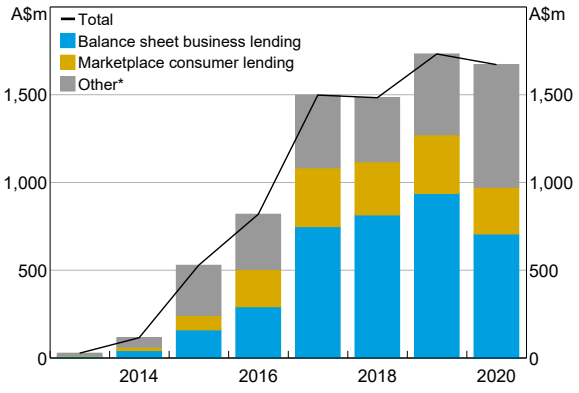
Australian small businesses have increased their use of non-traditional finance sources over recent years – although it remains small as a share of overall business funding, at less than 2 per cent of loan commitments (Graph 8). Based on the most recent survey from 2020, the largest source of non-traditional finance remains business balance-sheet lending, which is where an online platform provider uses the customer information (such as transactional data) from its platform to identify credit-worthy borrowers and provide loans and trade credit from its own balance sheet. Credit limits are typically generated based on previous sales data, thereby speeding up processing times, and repayments are often automatically deducted from the proceeds of the borrower's sales. However, interest rates on this type of (unsecured) borrowing tend to be much higher than on (secured) bank loans, depending on the assessment of the risk of the business. As such, this is generally used for short-term liquidity needs.

Other forms of non-traditional finance have grown in recent years. Marketplace lending, the second largest source of non-traditional finance, is a type of alternative finance platform that connects fundraisers directly with funding sources (peer-to-peer). The aim is to avoid the costs and delays involved in traditional intermediated finance. This lending may be secured or unsecured. Donation and rewards-based crowdfunding – which allows individuals and businesses to raise funds as a donation – or in exchange for non-monetary rewards or products, saw significant growth globally in 2020. This was largely due to COVID-19-related charitable, community and health-related online fundraising activities around the world. In Australia, donation-based crowdfunding grew by over 140 per cent between 2019 and 2020.

Graph 8

Non-Traditional Finance

Transaction volume



* Includes balance sheet consumer lending, marketplace business lending, property lending, invoice trading, crowdfunding, and other models

Sources: Cambridge Centre for Alternative Finance; RBA

Appendix A

Table A1: Selected 2021 Policy Responses to the COVID-19 Pandemic Targeted at SMEs[(a)]

State	Agency	Measure	Timeframe
NSW	Australian and NSW Govts	Payments of between $1,500 and $100,000 per week (up to 40 per cent of a businesses' payroll) made to NSW businesses that experienced a decline in turnover of more than 30 per cent, available to businesses with turnover between $75,000 and $250 million, contingent on the business maintaining its mid-July 2021 staffing levels.	18 July to present
	NSW Govt	Payments of up to $300,000 (up to 40 per cent of a businesses' payroll) to businesses with turnover between $250 million and $500 million, available to tourism, hospitality or recreation businesses that experienced a decline in turnover of more than 50 per cent, contingent on the business maintaining its staffing levels prior to the decline in revenue.	26 June to present
	NSW Govt	Payments of up to $500,000 (up to 40 per cent of a businesses' payroll) to businesses with turnover between $500 million and $1 billion, available to tourism, hospitality or recreation businesses that experienced a decline in turnover of more than 70 per cent, contingent on the business maintaining its staffing levels prior to the decline in revenue.	26 June to present
	NSW Govt	2021 COVID-19 business grants offering one-off payments to businesses of between $7,500 and $15,000 based on their decline in turnover, available to businesses with turnover between $75,000 and $50 million, contingent on the business maintaining its employee headcount.	26 June to 17 July
	NSW Govt	COVID-19 micro-business support grants providing payments of $1,500 a fortnight to businesses with turnover between $30,000 and $75,000 that experienced a decline in turnover of more than 30 per cent.	1 June to present
	NSW Govt	Payroll tax waivers of 50 per cent for businesses with wage liabilities between $1.2 and $10 million that experienced a 30 per cent or more decline in turnover. Additionally, businesses will have the option to defer payroll tax payment.	2020/21 Financial Year
	Australian Govt	NSW small business grants and small business support payments will be tax exempt.	2020/21 Financial Year
WA	WA Govt	Once-off payments of $2,000 to businesses affected by the ANZAC Day long weekend restrictions, available to businesses with payroll less than $4 million and turnover greater than $75,000.	23 April to 26 April
	WA Govt	Once-off payments of $3,000 to businesses affected by the four-day lockdown, available to businesses with payroll less than $4 million and turnover greater than $75,000.	29 June to 3 July
SA	SA Govt	Once-off payments of $3,000 to businesses that experienced a decline of 30 per cent or more in turnover, available to businesses with payroll less than $10 million and turnover greater than $75,000.	20 July to 27 July
	Australian and SA Govts	Once-off payments of $3,000 to businesses and $1,000 to sole traders in eligible industry sectors, available to businesses that experienced a decline in turnover of 30 per cent or more. Businesses based in the Adelaide CBD may be eligible for an additional $1,000.	28 July to 10 August
VIC	VIC Govt	Once-off payments of $2,500, $5,000 or $7,000 to businesses impacted by movement restrictions under phase two of the Business Costs Assistance Program, available to businesses with payroll less than $10 million.	28 May to 10 June
	VIC Govt	Once-off payments of $3,500 or $7,000 per premise to licensed hospitality businesses.	28 May to 10 June
	VIC Govt	Once-off payments of $4,800 to businesses that were eligible for but did not previously apply for phase two of the Business Costs Assistance Program.	15 July to 27 July
	VIC Govt	Four top-up payments of $2,500, $2,000 and $2,800 to businesses that were recipients of phase two of the Business Costs Assistance Program and that were impacted by restrictions at the time of the top-up.	4 June to 28 July
	Australian and VIC Govts	Once-off payments of up to $20,000 to businesses that experienced a drop in revenue of 70 per cent or more and that have not previously received funding under any of the Victorian Government COVID-19 support packages launched on or after 27 May 2021, available to businesses with payroll less than $10 million.	15 July to present

State	Agency	Measure	Timeframe
	Australian and VIC Govts	Once-off payments of $5,000 to businesses that remain affected by capacity limits and other restrictions, available to businesses in 24 eligible sectors that were eligible for Victoria's previous assistance programs.(b)	15 July to 27 July
	Australian and VIC Govts	Once-off payments of up to $20,000 to licensed hospitality businesses that are still operating under capacity limits.	15 July to 27 July
	Australian and VIC Govts	Four top-up payments of $5,000, $10,000 or $20,000 based on the capacity of the premises to licensed hospitality businesses that have previously received or been approved grants under the Licensed Hospitality Venue Fund program.	28 July to 2 September
	Australian and VIC Govts	Once-off payments up to $14,000 to businesses that were eligible for payments under phases one and two of the Business Costs Assistance Program.	5 August to 2 September
	Australian and VIC Govts	Payments of $5,000, $10,000 or $20,000 per week based on the capacity of the premises to licensed hospitality businesses that have previously received or been approved grants under the Licensed Hospitality Venue Fund program.	4 September to present
	Australian and VIC Govts	Payments of $2,800, $5,600 or $8,400 per week to businesses that were eligible for payments under phases one, two and three of the Business Costs Assistance Program.	4 September to present
QLD	Australian and QLD Govts	Once-off payments between $10,000 and $30,000 to businesses and $1,000 to sole traders that were impacted by the South East Queensland lockdown or the Cairns and Yarrabah lockdown, available to businesses with turnover greater than $75,000 and payroll less than $10 million.	31 July to 11 August
ACT	ACT Govt	Once-off payments of up to $20,000 for employing businesses and up to $7,500 for non-employing businesses that experienced a decline in turnover of 30 per cent or more, available to businesses with turnover greater than $75,000 and payroll less than $10 million.	13 August to 17 September
NT	NT Govt	Once-off payments of $1,000 to businesses impacted by the Greater Darwin and Katherine lockdown, available to businesses with turnover between $75,000 and $10 million and with fewer than 20 full-time employees.	16 August to 20 August
Federal	Banks	Loan deferrals of up to three months for small businesses.	8 July – present

(a) As at 6 September 2021

(b) Twenty-four sectors are eligible for the grant including gyms, cafes, restaurants, catering services and hairdressers

Sources: Media reports; RBA

Footnotes

[*] The authors are from Domestic Markets Department.

[1] Kent (2021) provides a discussion of conditions facing small businesses as the economy recovered in late 2020 and early 2021.

[2] See Ellis (2021) for further discussion on the impact of the pandemic on global supply chains.

[3] For more information, see Lewis and Liu (2020).

[4] See Black, Jackman and Schwartz (2021) for further discussion of the TFF.

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Climate Change Risks to Australian Banks

Kellie Bellrose, David Norman and Michelle Royters[*]

Photo: Marc Guitard – Getty Images

Abstract

Climate change affects banks because of the impact it has on the value of assets used as collateral for loans and the incomes borrowers use to repay their loans. There is significant uncertainty about the magnitude of risks to banks from climate change. This is because of the uncertainty about how climate change will alter future weather patterns, how policies will change globally and how economies adapt. This article uses one approach to provide preliminary estimates of the possible scale of risks climate change poses to banks' housing and business exposures. This approach suggests that a small share of housing in regions most exposed to extreme weather could experience price falls that might subsequently result in credit losses, but the overall losses for the financial system are likely manageable. Banks are also exposed to transition risks from their lending to emissions-intensive industries, but their portfolios appear to be less emissions-intensive than the economy as a whole. Further estimates of the impact of climate change on banks will be provided by the Climate Vulnerability Assessment currently being undertaken by the Australian Prudential Regulation Authority and the five largest banks.

Climate change creates risks for the Australian financial system that will rise over time to become substantial if they are not properly managed. The risks created by climate change can be both physical and transitional. The physical risks arise from outcomes that are likely to reduce the value of certain assets and income streams such as more frequent and intense extreme weather events and higher average temperatures. Transition risks are associated with changes in policy (both in Australia and overseas), technology and behaviours that relate to the process of moving to a less emissions-intensive economy. These risks could have a systemic impact on the financial system because they are global and occur across a range of financial sectors.

Assessing banks' exposure to climate-related risks is challenging. This is because there is uncertainty about exactly how climate change affects weather patterns and events, including the potential for non-linear tipping points. Further, historical experience may not be a good guide, and there may be impacts that are indirect and emerge over time. Mitigation actions can reduce physical risks, but could also increase transition risk if they cause rapid and unanticipated changes in the structure of the economy. In this article, we explore two risks that may pose a large threat to the Australian banking system: physical risks to mortgage portfolios and transition risks to business lending.

This analysis takes a complementary approach to the Australian Prudential Regulation Authority's (APRA's) Climate Vulnerability Assessment (CVA), which is currently underway. Working together with banks and the Council of Financial Regulators (CFR), the CVA will use more detailed data, design and methods with the banks each assessing the impact on their institution and reporting to APRA. In contrast, the approach in this article is to use common methodology and data for all banks. It is useful to view this topic from different angles because there is considerable uncertainty surrounding climate change and its current estimates. As a result, we will continue to learn from this process and refine, adapt and improve our analysis accordingly.

The physical risks associated with bank housing loans

Australian banks are exposed to potential credit losses from the physical risks of extreme climate events such as fires, floods, droughts and cyclones (acute physical risks). They are also exposed to the more persistent but gradually emerging effects from rising temperature, rainfall and sea level (chronic physical risks). One potentially large exposure from climate change is mortgages, which account for approximately two-thirds of Australian major banks' portfolios. Banks lend using the current value of housing as collateral. If current values do not fully reflect the longer-term risks of climate change, housing prices could decline, leaving banks with less protection than expected against borrower default. A number of international studies have indicated that there is little evidence of climate change being fully priced into 'at risk' properties, even in highly vulnerable areas like the US state of Florida (Keys and Mulder 2020; Bernstein, Gustafson and Lewis 2019). As a result, the price of properties considered to be at 'high risk' of being affected by climate events could decline sharply and banks could experience significant credit losses if borrowers default. This is particularly the case if properties are uninsured or underinsured.[1]

To estimate the extent to which Australian banks may have mortgage exposure to climate physical risks, we combine disaggregated climate risk forecasts with micro-level data on banks' mortgage exposures. The physical risk analysis discussed below is based on data by XDI-Climate Valuation – a widely used consultancy that generously supplied these data on request. These forecasts use the Network for Greening the Financial System (NGFS) Representative Concentration Pathway (RCP) 8.5 'Hot House World' scenario.[2] This is one of the scenarios recommended by the Task Force on Climate-related Financial Disclosures (TCFD 2020) for conducting scenario analysis on the impacts of climate-related risks, as well as by other international regulatory agencies. It is also one of the scenarios used in the CVA to examine banks' exposures to physical risks. The XDI-Climate Valuation data assess the climate risks to five hazards in Australia: riverine flooding, coastal inundation, forest wildfires, wind storms (other than cyclones), and ground subsidence in drought. These forecasts are generated at the address level, but the analysis that follows uses forecasts aggregated by suburb. These climate data were combined with banks' mortgage exposures from the Reserve Bank of Australia's loan-level securitisation database.

Material declines in housing prices are likely to be concentrated in specific regions

The main risk indicator used in this analysis is properties' Value at Risk (VaR). The VaR is measured by the technical insurance premium, which captures the annual expected cost of climate-related damage relative to the replacement cost of

dwellings.[3] Hence, the VaR captures the costs associated with servicing housing, including insurance, repairs, replacement and maintenance costs. It does not reflect a decline in the value of the property itself. For example, a VaR of 0.5 per cent is equivalent to an annual premium of $2,500 on a building that would cost $500,000 to replace. XDI-Climate Valuation forecasts a VaR for each dwelling in Australia, which they then aggregate by suburb, providing a standardised metric for consistency and comparison. From this, we can derive which regions are forecast to experience large increases in the level of climate risk over time and the resulting impact on property valuations. Consistent with international experience, a dwelling is classed as being a 'high risk' property if its VaR exceeds 1 per cent (based on the US Federal Emergency Management Agency's thresholds for government insurance schemes).

Around 3½ per cent of dwellings in Australia currently have a VaR greater than 1 per cent, according to XDI-Climate Valuation; this is projected to increase to 8 per cent over the next 80 years. However, when thinking about the risk to banks' collateral exposures in climate-sensitive regions, it is the *rise* in climate risk yet to be reflected in property prices that is relevant. One way of quantifying this is to calculate the increase in natural disaster costs from climate risk – measured by the *change* in VaR from 2021 – and then translate this to decreases in housing prices over time. This identifies properties that are not considered to be 'at risk' currently, but are predicted to become an emerging risk in the future. Using a user cost framework, we estimate that a VaR *change* of 0.4 percentage points is equivalent to roughly a 10 per cent decline in housing prices due to climate risk.[4] These increases in premium costs would be incurred every year, and therefore could result in sizeable declines in property values.

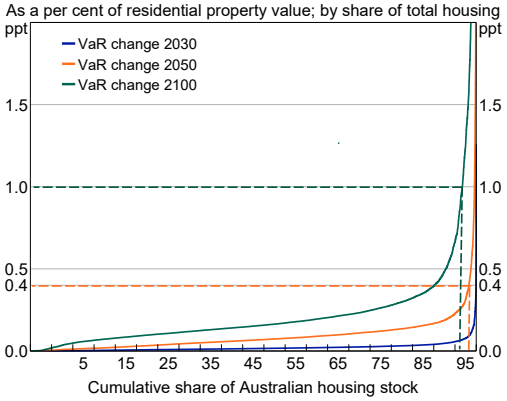
Graph 1 shows the distribution of projected VaR changes across all suburbs from this approach, ranked from lowest to highest. Based on the RCP 8.5 scenario and this specific method, the majority of properties are expected to experience very little impact from climate change. By 2050, only around 1½ per cent of properties are projected to experience a rise in annual insurance premiums that could reduce housing values by around 10 per cent or more (see orange dashed line in Graph 1).[5] This increases to 9 per cent of properties by 2100 (of which 3 per cent are projected to experience up to a 20 per cent reduction in housing prices; i.e., VaR change of 1 percentage point or more, see green dashed line in Graph 1). However, there are some properties that could see very large price falls. These risks could emerge more rapidly if buyers start to recognise the increasing risk of climate change and factor this in to current property prices (by discounting prices more heavily than the actuarial fair amount) ahead of climate change impacts being fully realised.

The risks also appear to be concentrated in small geographical areas, mostly in agricultural or coastal regions. This analysis suggests there are 254 climate-sensitive suburbs in 2050 with a VaR increase greater than 0.4 percentage points (and 1,438 suburbs by 2100) (Graph 2). Within the major capital cities, where the majority of properties are located, the highest risk regions are mostly located on the coastline, particularly in Brisbane (Graph 3). The risks in these regions could further increase if the affected communities find that access to, or affordability of, insurance becomes a challenge. That is, the technical insurance premium may understate the actual rise in premiums, particularly if insurers become more concerned about exposures to 'high risk' regions. This may arise because many of the addresses within these regions are impacted by the same hazard (e.g. an

Graph 1

Projected Increase in Natural Disaster Costs

As a per cent of residential property value; by share of total housing

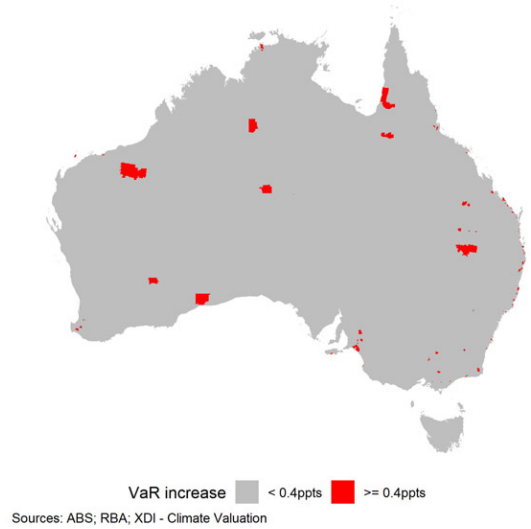


Sources: ABS; RBA; XDI - Climate Valuation

entire town is built in a flood zone or near fire hazards). In addition, if climate change causes incomes in these regions to also decline, it would result in even larger risks to banks.

Graph 2

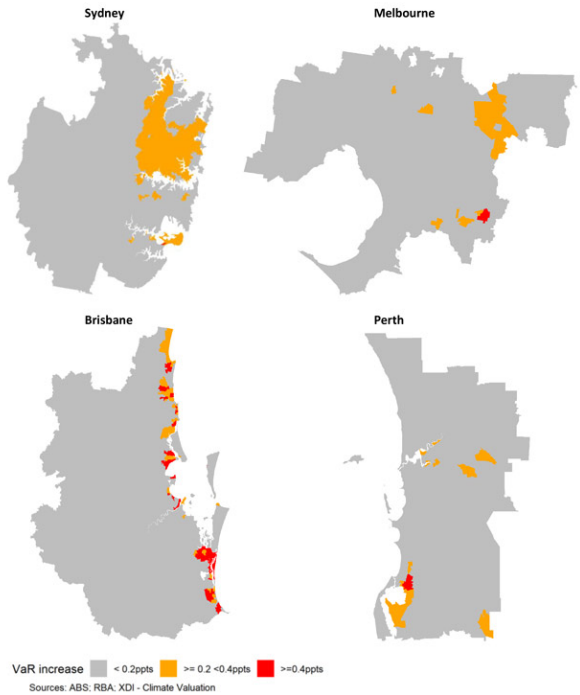
Suburbs Projected to Experience Large Increases in Value at Risk
Threshold change from 2021 to 2050



Sources: ABS; RBA; XDI - Climate Valuation

Graph 3

Projected Increase in Housing Value-at-Risk by 2050, Major Capital Cities
Threshold change from 2021 to 2050



Sources: ABS; RBA; XDI - Climate Valuation

The number of 'high risk properties' could grow

The above analysis could understate banks' actual exposure to the risks of climate change by aggregating high and low risk properties within a suburb. As a cross check, we looked at more granular property-level data provided by XDI-Climate Valuation. This alternative metric estimates the share of 'high risk' properties (HRP) (where the VaR is greater than 1 per cent) within each postcode. In principle, any HRP should be able to be insured, but if a large number of insurers increase annual premiums or withdraw their coverage of certain climate-sensitive regions, this may leave households without insurance cover and banks susceptible to borrower defaults. Evidence of this has already started to emerge in northern Australia, where high, unaffordable premiums are leading to a rise in uninsured homes (ACCC 2019).

Using only HRP in our calculations produces qualitatively similar results, suggesting that there is unlikely to be much aggregation bias in our earlier estimates. Nationally, only around 0.5 per cent of properties (or 74,000 properties) are projected to move into the 'high risk' category by 2050. This figure is less than the share of properties for which the rise in VaR implies a 10 per cent or larger decline in house prices. Graph 4 shows suburbs where the rise in the share of HRPs is greater than or equal to 2, 5 or 10 percentage points. The regions with the largest rise in the proportion of properties that are projected to be high risk continue to include some populous regions in south-eastern Queensland and northern New South Wales, which have a large number of houses at risk of coastal inundation (Graph 4).

Falling collateral values could increase borrower leverage

To estimate the potential impact of climate change on banks' mortgage books, we translated the potential falls in housing prices in climate-sensitive suburbs (by 2050) into an implied change in borrower leverage, as measured by loan-to-value ratios (LVR). To do this, we used the current balance of outstanding mortgages and property values in the Reserve Bank's securitisation database and adjusted for the projected housing price impact of

climate change from the earlier exercise.[6] These data were matched on a more aggregated, postcode-level basis (rather than suburb level). Using this approach, our results suggest that climate change results in around 40,000 more loans (2¼ per cent of all loans) having an LVR greater than 80 per cent (Graph 5). Within this, around half of these loans move to an LVR greater than 90 per cent. The majority of these risks appear to be concentrated in banks with greater exposure to particular NSW and QLD regions, rather than the major banks (who hold fewer mortgages in these regions).

Limitations

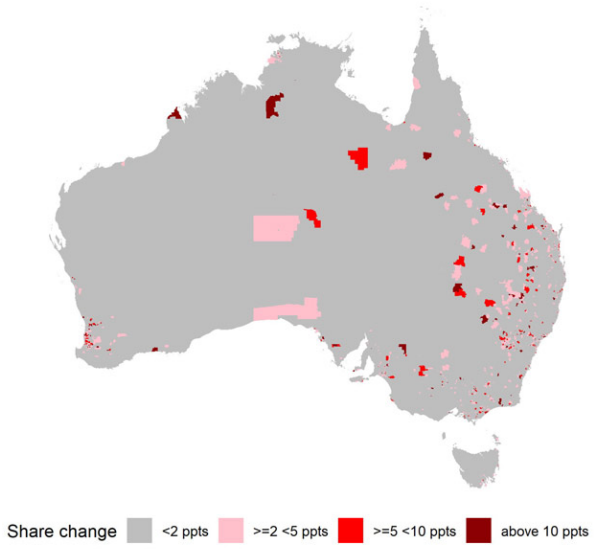
There are a number of limitations to this method that may affect our findings. The risks to banks' portfolios may be overstated in this exercise because we assume that banks' exposures will not change in the future. In reality, banks are expected to increasingly incorporate climate risks into their lending decisions (not just whether they will lend on a particular property, but how much). The VaR measure also excludes land values and so likely overstates the impact of higher technical insurance premiums on housing prices (because the denominator is understated when it only captures the value of the building). We are also unable to combine these estimates of impacts on the collateral backing bank loans with information on how climate change might impact the probability of default on mortgages. Banks will typically sustain losses only if *both* collateral values and borrower income decline. On the other hand, the risks to bank portfolios may be understated by other factors. For example, we implicitly assume rents are unaffected by climate change, but there may be less demand to rent houses that are at risk of damage. The need to aggregate some of our data may also result in some understatement of risks. More broadly, there is considerable uncertainty around predicting the future impacts of climate change, as a number of variables could cause the actual result to differ materially. This means caution should be taken when interpreting these results.

The transition risks for bank business lending

Australian banks also face credit risk through their lending to businesses that are exposed to transition risk. This risk is likely to be broadly proportionate to the emissions intensity of each industry they lend to – whether those emissions are from the industry itself or indirectly through the industry's supply chain. For example, firms that *directly* emit large quantities of greenhouse gases (relative to their income) are clearly exposed to transition risk.[7] But so too are firms that are heavy *users* of the output of

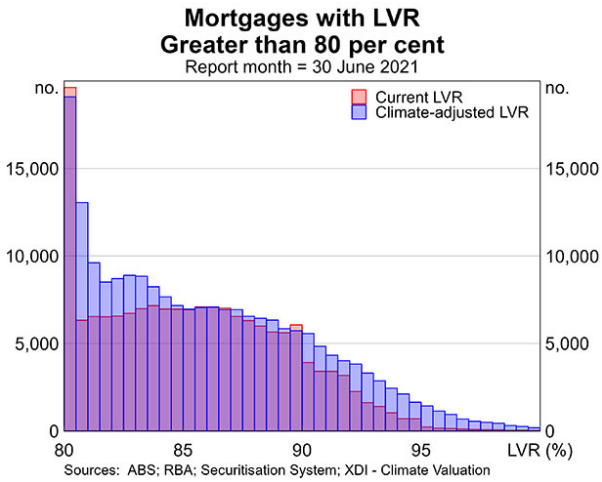
Graph 4

Suburbs Projected to Experience Large Increases in HRPs
Change in share from 2021 to 2050



Sources: ABS; RBA; XDI - Climate Valuation

Graph 5



Sources: ABS; RBA; Securitisation System; XDI - Climate Valuation

emissions-intensive industries because they could experience higher prices if the cost of carbon abatement is passed on. Food manufacturers are an example of this as their direct emissions are relatively small but they use products from the emissions-intensive agriculture industry.

Our analysis incorporates both the direct and indirect channels to provide a more accurate estimate of Australian banks' exposure to the transition risks of climate change. It is assumed the risk is proportionate to emissions intensity. We combined estimates of emissions by 114 sub-industries (using the Australian Bureau of Statistics input-output table industry groups) with disaggregated data on bank exposures by (SIC-3) industry, sourced via a special request from the major banks. Data on emissions by industry were primarily sourced from Australia's National Greenhouse Gas Inventory database, the National Greenhouse and Energy Reporting scheme and with some additional assumptions. By combining these data with disaggregated data on bank exposures by sub-industry, we calculated three measures of emissions intensity to investigate the extent of industry transition risks:

1. *Scope 1 emissions:* data for each sub-industry were used to calculate direct emissions intensity, defined as emissions per dollar of Australian production.
2. *Scope 2 emissions:* we added the input-weighted sum of emissions of industries that directly supply each industry to the direct emissions of that industry. For example, when calculating retail trade emissions, it also captures the emissions of the wholesale industries that directly supply the retail industry.
3. *Scope 3 upstream emissions:* this measure captures the emissions from the complete supply chain of each industry. For example, when calculating retail trade emissions it also captures the emissions of the transport industry that supplies goods to the wholesale industry that are then distributed via the retail industry.

We recognise that this method is just one way of estimating the size of exposures to emission-intensive industries. Notably, the *scope 3 (upstream)* measure does not consider the downstream emissions from customers. For example, the combustion of coal in coal-fired electricity generators is not captured as a relevant downstream *scope 3* emissions source for coal mines and coal logistics (although it is captured at an economy level through electricity emissions), nor are the emissions from Australian coal used in overseas generation.[8]

Electricity, agriculture and manufacturing appear to be the most emission-intense industries …

Graph 6 shows the emissions intensity of the most emissions-intensive industries. According to this approach, the most emissions-intensive industries (by *scope 1* emissions) are electricity and parts of agriculture (specifically sheep, grains and cattle), with a wide range of manufacturing industries and oil & gas extraction comprising the remainder of the top 20 industries.[9] These specific industries could all face considerable disruptions as Australia (and the world) transitions to a lower-emissions economy, with subsequent flow-on effects to banks' business books. Another set of industries could also be affected because of their *indirect* emissions through their supply chain. Several industries that are not incorporated in the top 20 by direct emissions are captured in the top 20 by *scope 3* emissions. The meat and dairy manufacturing industries and iron & steel manufacturing see a very large increase in their emissions intensity when the emissions embodied in their supply chains are taken into account. For the meat and dairy industries, the *scope 2* and *scope 3* emissions reflect the reliance of these industries on the sheep, grain and cattle industry, while the iron & steel industry's reliance on coal contributes to its *scope 3* emissions. These industries could therefore have a higher exposure to transition risk due to the industry composition of their supply chains.

… but banks' exposures to these emissions-intensive industries seem relatively small

As Australian industries look to transition towards cleaner production methods, the level of disruptions to the banking system will directly depend on the *size* of exposures banks have to these emissions-intensive industries. If this proves to

be material, it could have systemic consequences for the resilience of banks. To investigate this, we combine these emissions data with data on the scale of banks' business lending exposures.

The disaggregated industry exposure data we obtained from the major banks show that the majority of their lending exposures are to industries that look to be less emissions intensive. Specifically, Graph 7 indicates that banks' lending to industries with a high level of emissions (i.e. those to the right of the graph) are typically small, while their largest exposures (i.e. those to the top of the graph) are to industries with relatively low emissions intensity. (We exclude lending to finance from this graph because the risks associated with these exposures are of a different nature.) The largest risks to banks appear to come from industries like electricity, agriculture and oil & gas, reflecting that these industries have both relatively high emissions and that banks have reasonably sizeable exposures to them.[10]

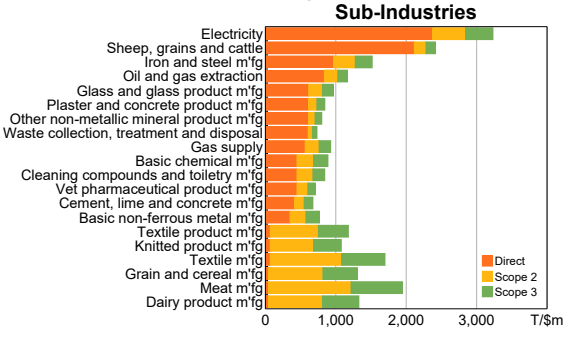
From this analysis, around 20 per cent of banks' business loans are found to be to industries with (*scope 1*) carbon emissions per dollar of output that are in in the top quartile of all industries by emissions (Graph 8). Based on this approach, banks' current portfolio of loans is estimated to be somewhat less emissions intensive than the economy as a whole. In saying that, the income of some borrowers in these industries is likely to decline quickly if government policies (domestic or international) around greenhouse gas emissions or consumer preferences for 'green' products shift rapidly. Should income decline more quickly than the borrower expected over the life of the loan, this could result in a sizeable impact on banks' business lending books. Nevertheless, the majority of banks' business lending is extended with a term of less than five years, in part due to the large capital costs associated with long-term lending (maturity is a component of business risk weight calculations).

Understanding how much risk these exposures pose to banks is complicated, and depends on:

1. the ability of exposed firms to absorb potential future emissions pricing in their profit margins or to pass it onto consumers
2. their opportunities and costs to reduce emissions
3. whether they might receive any compensation during the transition.

Graph 6

Top 20 Emissions Intense Sub-Industries

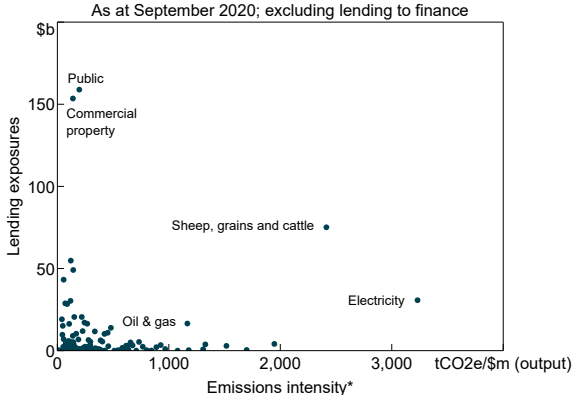


Sources: ABS; Australian Government; RBA

Graph 7

Bank Lending and Emissions Intensity

As at September 2020; excluding lending to finance

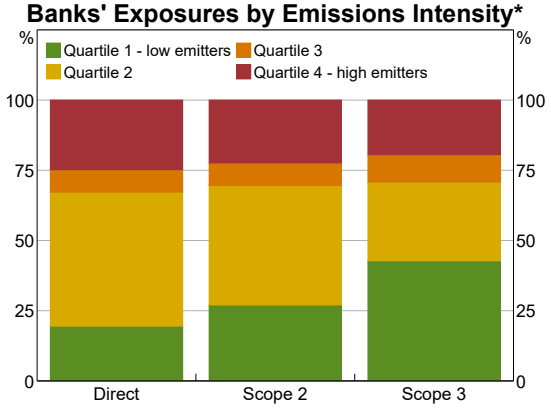


* Includes Scope 1, Scope 2 and Scope 3 (upstream) emissions

Sources: ABS; Australian Government; Major banks; RBA

Graph 8

Banks' Exposures by Emissions Intensity*



* Excluding finance and government lending

Sources: ABS; Australian Government; Major banks; RBA

Each of the major banks also have climate change policies that will further control their exposure to emissions-intensive industries over coming years (such as the thermal coal, oil & gas industries).

Limitations

Our estimates of the risk facing banks are affected by the aggregation at the sub-industry level and the range of assumptions used. Most importantly, modelling emissions intensity at the industry level implicitly assumes that all firms within an industry have the same emissions intensity. This limitation is greatest when there are multiple methods of producing the same output within an industry, some of which are more emissions intensive than others. A prominent example of this is that lending to renewables electricity generation is assumed to have the same emissions intensity (and hence risk) as lending to fossil fuel generators in this analysis because they are both categorised as part of the electricity generation industry. Another example is lending to the sheep, grain and cattle industry, since sheep and cattle raising are emissions-intensive activities while grain is not (but often occurs on the same farm). It is also possible that banks' credit assessment processes result in banks' exposures being focused on firms with more climate-friendly production processes than the industry average. Finally, our *scope 3* emissions estimates only include upstream emissions, and not downstream emissions. By definition, these estimates will then exclude the risks to firms that sell to 'at risk' industries.

Discussion

The focus of banks on climate risks faced by their customers has increased significantly in recent years. This reflects banks', and regulators', increased recognition of significant physical and transition risks from climate change, which, if left unmanaged, could become substantial. The methods and datasets used in this work suggest that the risks facing domestic banks appear manageable, but there are considerable uncertainties and limitations to this analysis. Projected costs from weather-related loan losses to banks over the next few decades could be mitigated if the majority of mortgaged properties are not in regions with elevated physical risks associated with climate change (such as coastal erosion or flooding). Similarly, this preliminary work suggests that Australian banks may have less exposure to emissions-intensive industries relative to the economy as a whole. The considerable uncertainty about the exact magnitude of the impacts from climate change makes it essential that banks further integrate climate risk into their mortgage and business lending processes and report on it to enable external assessment of the risks. In recognition of this, APRA has developed a Prudential Practice Guide ('CGP 229 Climate Change Financial Risks') designed to assist banks, insurers and superannuation trustees on managing the financial risks of climate change (APRA 2021).

Even abstracting from the uncertainties of projecting future weather events, there are also clear limitations to this work. We used simplified methods to gain some insight into the scale of banks' exposures to future physical and transition risks. We were also unable to consider the impact of climate change on household income. Finally, this work is based off a snapshot of banks' current housing and business lending portfolios, which will almost certainly be materially different in the future, particularly as more management actions are put in place. Accordingly, this work is just one way of examining the climate exposures facing Australian banks, and should be viewed as an initial assessment that will be improved upon by the more detailed and in-depth analysis of the upcoming CVA. Nevertheless, having multiple approaches to investigating the potential impacts of climate change is important in an environment of growing uncertainty and constant change.

Footnotes

[*] The authors undertook this work while in the Financial Stability Department. They would like to thank Natasha Cassidy, Guy Debelle, Michelle Lewis, Jonathan Kearns, Marcus Miller, Anna Park, Penny Smith and Callan Windsor for their valuable assistance and contributions. They would also like to thank XDI-Climate Valuation and the four major banks who supplied data for this work.

[1] See FSB 2020.

[2] RCP 8.5 is the concentration of greenhouse gas emissions that increases planetary warming by an average of 8.5 watts per square metre across the planet, resulting in a temperature increase of about 4.3˚C by 2100.

[3] The technical insurance premium (TIP) is defined here as the annual average loss per address (or group of addresses) for all hazard impacts; the actuarially fair premium – meaning the premium is equal to expected claims, not the *actual* premium. The TIP is based on the cost of damage to an asset, expressed in 2020 dollars with no discounting or adjustments for other transaction costs.

[4] The user cost framework proposes that the 'user cost' of owning a home should be equal to the rental yield if prices are at their 'fundamental' value (Fox and Tulip 2014). An increase in climate change risk and the associated increase in insurance premium should increase the rental yield and lead to a reduction in housing prices. In this scenario, we assume a starting rental yield of 4 per cent and the VAR increases by 0.4 percentage points. This increases the user cost or rental yield and leads to a fall of 10 per cent in house prices.

[5] This mapping from the technical insurance premium to housing prices is based on the user cost framework, which assumes that the rental yield on housing is equivalent to the cost of owning a house (interest, depreciation, insurance, etc), adjusted for capital gains. The mapping shown here assumes all costs other than insurance remain stable (including rents, which would arguably fall for climate-affected properties), and holds current rental yields constant into the future.

[6] 'Current balance' includes the outstanding amount of the loan, as at the collateral date. It is the sum of the outstanding amount on the loan, unpaid and due principal, interest, any penalty interest, and all other fees and costs charged to the loan balance.

[7] Greenhouse gases (such as carbon dioxide) contribute to the greenhouse effect by absorbing infrared radiation.

[8] Kemp, McCowage and Wang (2021) discuss the implications for Australia's fossil fuel exports from net zero emissions policies in the Asian region.

[9] The coal industry does not appear on this list because it does not emit much carbon when it is mined. However, coal releases significant emissions when it is burned (for electricity, domestically or overseas). Fugitive emissions have been excluded from this assessment.

[10] According to the publicly available figures for FY2020, the major banks' total coal mining exposures is approximately $2.3 billion; oil & gas extraction exposures are around $25 billion.

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Towards Net Zero: Implications for Australia of Energy Policies in East Asia

Jonathan Kemp, Madeleine McCowage and Faye Wang[*]

Photo: Chinaface – Getty Images

Abstract

China, Japan and South Korea have all set targets to achieve net-zero carbon emissions by around the middle of this century. These three countries account for around two-thirds of Australia's fossil fuel exports. Based on emission scenarios consistent with these commitments, we find that Australia's coal exports could decline significantly by 2050, with a more modest effect likely for liquefied natural gas exports; both may be offset to some degree by increases in green energy exports. The effect on overall Australian GDP is expected to be relatively small and gradual. Significant uncertainty surrounds the speed and manner in which countries will work to achieve net-zero emissions, as well as the technological developments that could change the efficiency and carbon intensity of fossil fuels.

International energy production and emissions

Global carbon emissions have risen sharply over the past 150 years. The major driver of this increase has been the rise in global energy use. Over the past 50 years, the world's energy supply has more than doubled, and in recent years the share generated by fossil fuels – the major source of carbon emissions – has accounted for around 80 per cent (Graph 1).

As parties to the Paris Agreement on climate change, the governments of China, Japan and South Korea have each announced targets to substantially reduce carbon emissions over the coming decades. These economies are Australia's top three goods export partners, and are destinations for around two-thirds of Australia's fossil fuel exports. As a result, their efforts to reduce carbon emissions will be a significant determining factor in the outlook for Australia's exports.

China, Japan and South Korea are jointly responsible for around a quarter of global fossil fuel consumption. Fossil fuels (including oil, coal and

natural gas) dominate these countries' energy mix, providing more than 85 per cent of energy supplied in these countries in 2018, far higher than in the remainder of the world (Graph 2). China is the most significant emitter of carbon of the three countries, due to its large population and energy mix. Coal accounted for around 60 per cent of China's energy use in 2018, far greater than in Japan and South Korea (where oil is the main fossil fuel) and the rest of the world (where the main fossil fuel is natural gas). China is a heavy user of coal given the country's abundant coal reserves, while Japan and Korea, with minimal domestic energy reserves, have relied more on oil. In general, coal use produces substantially more carbon emissions than either oil or natural gas for the energy it generates. This means that China's energy mix in particular is highly carbon intensive; the ratio of carbon dioxide emitted to energy supplied in China was around a quarter higher than the global average in 2018 (International Energy Agency 2021a).

China is also the world's largest energy-consuming country, responsible for around one-fifth of the world's total consumption (International Energy Agency 2021b). This is primarily a function of China's population, which is also the world's largest. Adjusted for population size, China's per capita energy use is broadly comparable to that of other east Asian economies, including South Korea, when they were at a similar level of GDP per capita (Graph 3).

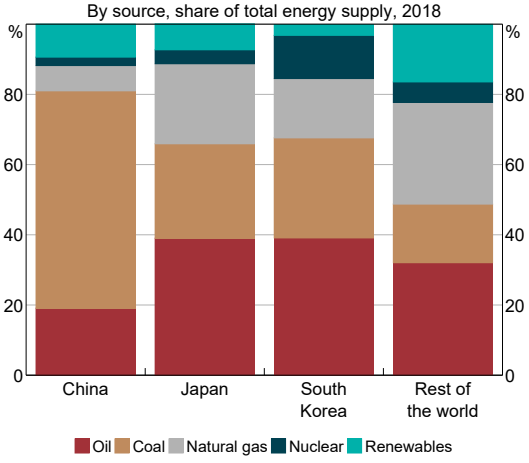
Emissions targets in China, Japan and South Korea and corresponding policies

Japan and South Korea have committed to achieving net-zero emissions of greenhouse gases by 2050, while China has committed to net-zero emissions of carbon dioxide by 2060. Carbon dioxide is by far the most significant greenhouse gas emitted by all three countries. In the interim, Japan and South Korea are targeting 46 per cent and 24 per cent reductions in greenhouse gas emissions from recent levels (2013 and 2017, respectively) by 2030 (Tsukimori 2022; Republic of Korea 2020).[1] China is similarly targeting a peak in carbon emissions by 2030 and a 65 per cent drop in the carbon intensity of output from 2005 levels at that time.[2] These targets are summarised in Graph 4. Emissions have been rising more quickly in

Graph 2

Energy Mix

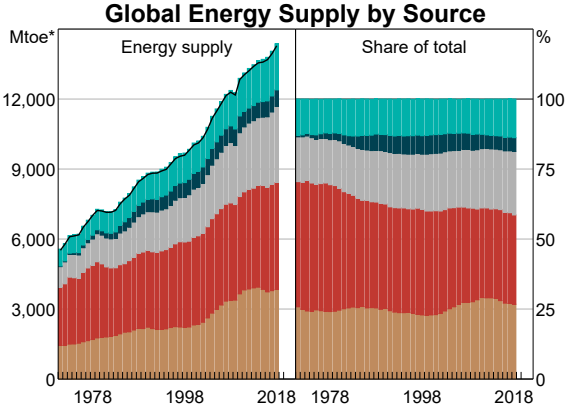
By source, share of total energy supply, 2018



Sources: International Energy Agency; RBA

Graph 1

Global Energy Supply by Source



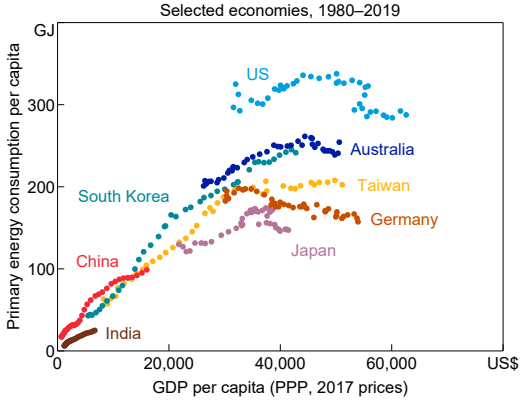
* Million tonnes of oil equivalent
** Crude oil, NGLs and feedstock

Sources: International Energy Agency; RBA

Graph 3

Energy Consumption per Capita

Selected economies, 1980–2019



Sources: BP; IMF; RBA

China than in Japan or South Korea in recent years, and the planned peak in emissions is much later. The absolute decline in emissions required to achieve net-zero emissions is highest for China, but on a per capita basis it is roughly similar across the three countries (Graph 5).

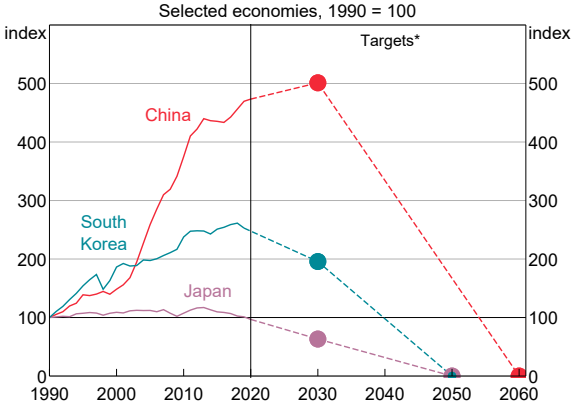
These emissions targets have been set with reference to broader global initiatives. Countries may put forward other or strengthened targets at the 26th UN Climate Change Conference of the Parties (COP26) in October and November 2021. Under the Paris Agreement, parties are required to submit updated plans ('nationally determined contributions' or NDCs) at least every five years (United Nations 2015).

A range of policies have been announced by China, Japan and South Korea to achieve these objectives, although full details are not yet available. In the near term, governments see reducing the use of fossil fuels in their energy mixes as key; reducing emissions from the rest of the economy will follow. Emerging technologies and innovations will also play an important role.

Graph 4

Carbon Dioxide Emissions

Selected economies, 1990 = 100



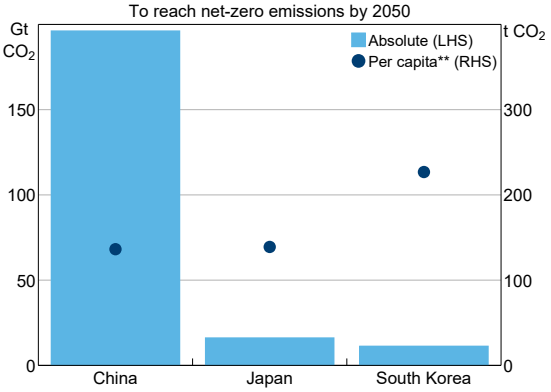
* Bubbles show targets; dashed lines show indicative paths to achieve them; Japan and South Korea's greenhouse gas targets are shown in terms of carbon dioxide; China's 2030 target is authors' estimate based on carbon intensity target for 2030 and authorities' desire for GDP growth to 2035

Sources: CEIC Data; International Energy Agency; RBA

Graph 5

Cumulative CO_2 Emissions Abatement*

To reach net-zero emissions by 2050



* The cumulative difference between 'current policies' and net-zero emissions scenarios by 2050

** Absolute emissions abatement per person to 2050, calculated using average population from 2020 to 2050 from UN population projections (constant fertility scenarios)

Sources: NGFS; RBA; UN

Moving away from carbon-intensive energy

China, Japan and South Korea have pledged to undertake a range of measures to assist in the shift from carbon-intensive energy use, including: investing in and further developing renewable sources; ensuring a pipeline of clean energy projects; and establishing a higher renewables share of energy supply. China is seeking to raise the non-fossil fuel share of primary energy consumption (including renewables and nuclear) to around 25 per cent by 2030 (Xinhua 2020b). Japan is looking to roughly double the renewables share of its electricity power generation to 36–38 per cent by 2030, while South Korea is seeking a six-fold increase to 42 per cent by 2034 (Kim 2020; Yamaguchi 2021). China and Japan's plans include a greater role for nuclear power, while South Korea is seeking to phase it out altogether (Kumagai and Yep 2021; MIT Energy Initiative 2018).

All three countries are seeking to reduce the use of coal through a combination of phasing out and decommissioning coal-fired power generation plants, improving plant efficiency and restricting capacity growth.[3] China and South Korea have also sought to put a price on carbon emissions through national emissions trading schemes (ETS), with China's now the largest in the world.[4]

The role of liquefied natural gas (LNG) in the transition to net-zero emissions is more mixed. LNG can be used as a cleaner near-term alternative to coal and a 'bridge fuel' until renewables are scaled up. However, while it produces lower carbon dioxide emissions than coal at the point of use, it still generates large methane emissions when it is produced – a greenhouse gas that is more potent

than carbon dioxide. China has increasingly used LNG as a cleaner alternative to coal power generation and has targets to increase domestic gas production. In contrast, Japan recently announced that it is seeking to almost halve LNG's share of its energy mix by 2030. South Korea is currently deciding between three potential policy roadmaps to achieve net zero, which see varying roles for LNG.

While these three countries appear committed to switching to other energy sources from fossil fuels, there may be challenging trade-offs to navigate. China is the world's largest renewable energy producer and has made significant domestic and foreign investments in renewable energy in the past decade (Global Commission on the Geopolitics of Energy Transformation 2019); however, in 2020 construction permits for new coal projects increased, and China's ETS does not impose an absolute limit on emissions. Japan and South Korea have also made significant progress expanding the renewables share of energy, but high population density, scarce land, the high costs of building and running renewable projects, and difficult terrain make it comparatively difficult to progress further (Graph 6). Accordingly, these two countries are seeking to build wind farms offshore.[5] Whether China and Japan will be able to scale-up nuclear energy to help offset declining fossil fuel use, as they are seeking to do, is unclear; for instance, much of Japan's nuclear fleet remains offline after the Fukushima disaster (Graph 6). Whether South Korea can sufficiently scale-up renewables to offset the role of nuclear in its energy system also remains to be seen.

Other policies

Green hydrogen, as well as carbon capture, use and storage (CCUS) and carbon dioxide removal (CDR) technologies, have the potential to play an important role in economy-wide decarbonisation.[6] Japan, China and South Korea are ambitious in their efforts to develop these technologies through combinations of regulatory and R&D support and subsidies. However, they still require large-scale investment and face numerous technical challenges before they can be deployed at scale and be commercially viable.

The three countries have also pointed to a range of other policies to work towards net-zero emissions, including electrification and efficiency-enhancing measures in transport, buildings and appliances.[7] Efforts to make industry less emissions intensive will also take place, although these are expected to be challenging in the near term.[8] Most notably, China, Japan and South Korea are all seeking to reduce emissions that arise from using coking coal in steelmaking. Chinese authorities are encouraging a shift in steel production towards low-carbon methods, and are targeting a 20 per cent reduction in steel sector emissions by 2025. Several Japanese and South Korean steelmakers have also pledged to substantially cut emissions by 2050, and are investigating ways to produce 'green steel' using hydrogen.

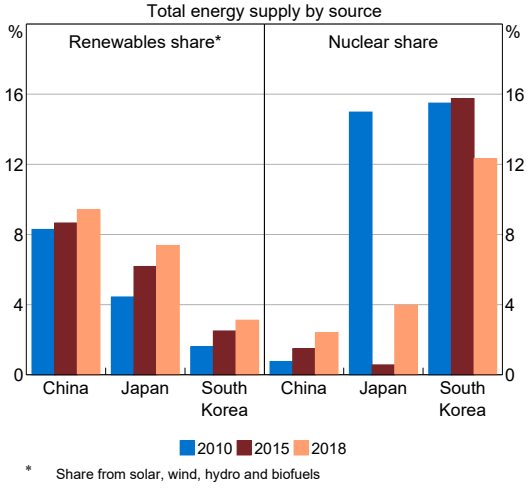
Australia's fossil fuel exports to East Asia

Fossil fuels account for around a quarter of Australia's total exports, of which around two-thirds is exported to Japan, China and South Korea (Graph 7). By value, Australia's fossil fuel exports mainly comprise thermal coal (4 per cent of total exports), coking coal (7 per cent) and LNG (10 per cent).[9] Oil accounts for a relatively small share of total exports, at just 2 per cent. Coking and thermal coal are estimated to account for around 80 per cent of carbon dioxide emissions made by Australia's fossil fuel exports, while LNG accounts for most of the remainder (Graph 8).

Graph 6

Energy Mix – Non-fossil Fuel Sources

Total energy supply by source



* Share from solar, wind, hydro and biofuels

Sources: International Energy Agency; RBA

Scenarios for energy demand and CO_2 emissions in Asia

The impact of net-zero emission targets in China, Japan and South Korea on Australia's fossil fuel exports is uncertain. The policies to achieve them are yet to be fully articulated, and technological advancements and carbon abatement costs are unclear. However, scenario analysis is one way of understanding how emission reduction policies might affect Australia's economy.

Several international bodies have explored how the global and regional energy mix might evolve under various policies aimed at achieving net-zero emissions by 2050. We focus here on climate scenarios designed by the Network for Greening the Financial System (NFGS), a consortium of central banks dedicated to improving climate risk management (NGFS 2021).[10] These scenarios were designed to provide a foundation and common reference point for analysis of climate change and its economic impacts, allowing for consistency and comparability of results across institutions around the globe.

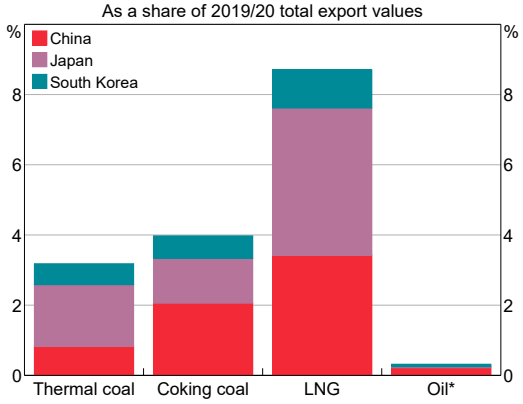
Importantly, the NGFS provides country-level energy demand profiles by fuel type, which outlines possible energy transition paths for China, Japan, South Korea and the rest of the world under different climate scenarios. Overall, the NGFS outlines the following transition paths required for countries to achieve net zero: an increasing role for renewable energy generation; a secular decline in the share of coal in energy production; and an eventual decline in the share of gas (Graph 9). These are in line with current plans signalled by China, Japan and South Korea. That said, there are many paths to net-zero emissions, and transition scenarios will depend crucially on the assumptions underpinning them.

Each NGFS scenario includes different assumptions about the availability of technologies and government policies. These can be summarised by the future paths for carbon emissions and carbon prices; carbon prices are used as a proxy for overall government policy intensity, but governments could use other tools. These assumptions are mapped to the consequences for the climate, such

Graph 7

Australian Fossil Fuel Exports

As a share of 2019/20 total export values



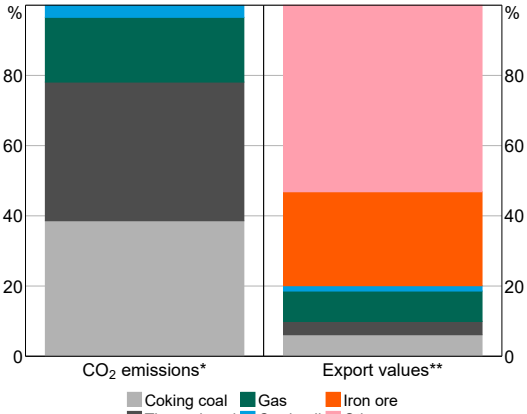
* Refined and unrefined petroleum

Sources: DFAT; DISER; RBA

Graph 8

Australian Exports

2020



* Estimated share of total exported emissions from coal, LNG, LPG and crude oil exports; emissions content of non-fossil fuels is negligible

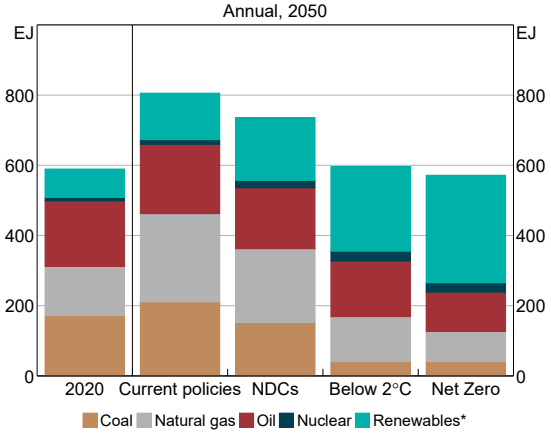
** Share of total export values (goods and services)

Sources: ABS; DISER; RBA

Graph 9

Global Primary Energy Consumption

Annual, 2050



* Includes solar, hydro, wind, geothermal and biomass

Sources: NGFS; RBA

as mean temperature changes, using scientific models. Key scenarios include:

- **Net Zero 2050 (Net Zero):** assumes ambitious policy responses, consistent with limiting global warming to 1.5°C. Global CO_2 emissions from energy use peak in 2020 and decline to around zero by 2050. Average carbon prices rise from around zero in 2020 to US$560 per tonne in 2050, with higher prices in developed economies. The scenario is based on existing and developing (but known) technologies, like CDR discussed above, but assumes they become cheaper to deploy and more widely accepted.
- **Below 2°C**: assumes policy and behavioural responses are more modest than in the Net Zero emissions scenario, such that global CO_2 emissions reach net zero by 2070. This is consistent with a 67 per cent chance of limiting global warming to below 2°C.
- **Nationally Determined Contributions (NDC):** assumes all NDCs pledged up to December 2020 are implemented fully, and that all countries reach their 2025 and 2030 targets on emissions and energy. While China, Japan and South Korea have not yet aligned their NDCs with a net-zero target, the scenario extrapolates their policy ambition levels implied by the NDCs beyond their 2030 targets.
- **Current policies (baseline):** incorporates only currently implemented government policies. In this scenario, limited progress in reducing emissions is achieved; global CO_2 emissions from energy use peak in the mid 2030s and are slightly higher than 2020 levels by 2050.

We use the NGFS country-level energy demand profiles under the various scenarios to estimate the effect of these developments on Australia's exports and provide some information on the contributions of China, Japan and South Korea. To do this, we assume that Australia's share of fossil fuel energy consumption in each country is unchanged.[11] This may overstate the impact because Australian fuel tends to be higher quality (and therefore produces fewer emissions per unit of energy) and is produced at lower cost than many competing producers.[12]

Coal

Under the baseline, coal exports increase gradually to be 17 per cent higher in 2050. By contrast, the volume of Australian coal exports falls under all other scenarios, with the sharpest falls seen under the Net Zero and Below 2°C scenarios (Graph 10). Coal exports under these scenarios fall by 80 per cent by mid-century, with declining demand from China, Japan and South Korea accounting for around two-thirds of the fall. Coal exports under NDC remain little changed over the current decade, before falling rapidly over the 2030s to reach 65 per cent of 2020 levels in 2050; falling demand from China, Japan and South Korea (while less sharp than implied by the Net Zero scenario) contribute over 90 per cent of the decline.

The NDC scenario suggests countries are unlikely to materially alter their energy mix in the near term, and that demand for coal will likely remain robust this decade. However, as global appetite for coal tapers off from 2030 onwards under all scenarios except for the baseline, Australian coal-related investments are at risk of becoming 'stranded assets' as lower export volumes and prices weigh on firm profitability. The risk is somewhat lower for Australian coking coal producers because of their lower cost of supply relative to other producers and strong global demand for high-quality coking coal in steelmaking until greener alternatives become more widespread. Nevertheless, current coal reserves at operating Australian mines notably exceed projected export demand to 2050 under the Net Zero and Below 2°C scenarios; this suggests there is potential for 'stranding' even if there is no investment into new mines.[13]

LNG

The outlook for LNG exports is more resilient to a range of scenarios, as developing countries in particular substitute from coal to gas to reduce emissions, cushioning the fall in demand from advanced economies switching to renewable energy. Under the baseline and NDC scenarios, LNG exports increase by around 80 per cent and 60 per cent from 2020 levels (Graph 11).[14] By contrast, LNG exports are projected to fall to around half of their current levels by mid-century under Net

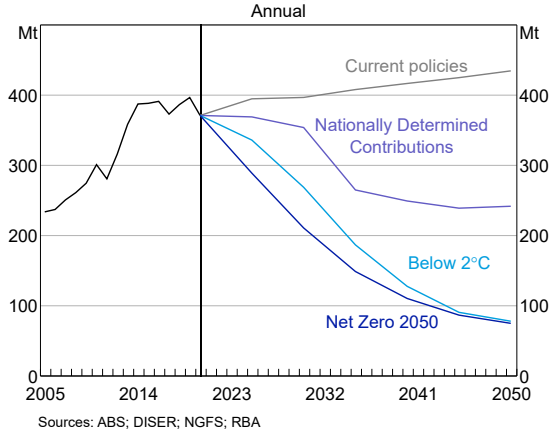
Zero, led by sharp declines in Japanese and South Korean demand (which account for almost 40 percentage points of the fall). LNG exports under Below 2°C also increase in the near to medium term, reflecting the interim global transition from coal to gas, but decline from 2040 onwards to be around 2020 levels by 2050.

Renewable and other energy sources

With the global momentum towards reducing carbon emissions, Australia is well-placed to participate in the nascent renewable energy export market. NGFS expects global demand for renewables to become the largest source of energy by 2050 under the Net Zero and Below 2°C, and reach around one-seventh of energy consumption under the baseline (Graph 9).

Graph 10

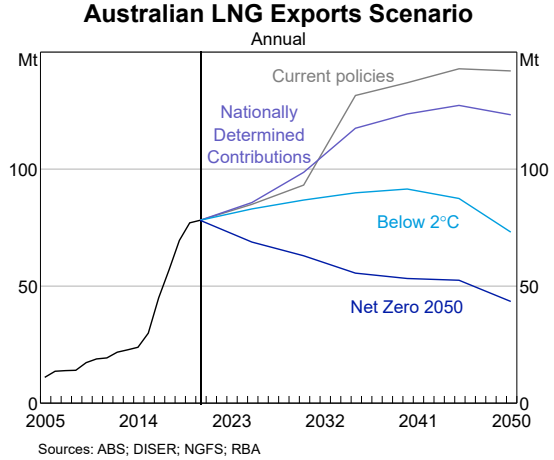
Australian Coal Exports Scenario



Sources: ABS; DISER; NGFS; RBA

Graph 11

Australian LNG Exports Scenario



Sources: ABS; DISER; NGFS; RBA

A number of export projects of green hydrogen have been proposed by industry – including the Western Green Energy Hub, a $100 billion project for the world's largest renewable energy hub in Western Australia. Japan has signalled plans to boost hydrogen and ammonia use under its decarbonisation plans, with a joint Australia–Japan partnership under way to establish the world's first international hydrogen trade route.[15] Several Japanese corporations have also increased investment into foreign green hydrogen projects, including in Australia. Green hydrogen also has the potential to be used in the domestic production of 'green steel', which can then be exported.[16]

Growing global demand for electric vehicles and batteries also provides opportunities for Australia to increase its exports of lithium, nickel, cobalt and other rare earth minerals. Australia also has the world's largest deposits of uranium; nuclear energy generation is projected to increase in some markets in the coming decades.

GDP impact

The overall impact of reduced fossil fuel exports on GDP is expected to be relatively small and gradual. The direct contribution of fossil fuel exports to annual GDP growth would be on average 0.1 percentage points lower in the Net Zero scenario relative to the baseline.[17] There would also be flow-on impacts to associated activity; however, these impacts are likely to be partly offset, over time, by opportunities in other sectors. One example is the renewable energy market, where investment has begun to support activity and employment, particularly in regional areas where large-scale renewable generators tend to be located (de Atholia, Flannigan and Lai 2020). However, the renewables export market is still at an early stage and the outlook is uncertain. More broadly, it is difficult to estimate the extent to which activity in other sectors could eventually offset a decline in activity related to fossil fuel production. Whatever happens, the impact of a decline in fossil fuel exports would be significant for certain communities and regions, especially those in which mining accounts for a large share of employment.

Uncertainties

The NGFS scenarios illustrate one of many possible paths for global emissions and fossil fuel consumption, but there is a large degree of uncertainty around how the global economy can transition to a lower-emissions world. Alternative plausible scenarios would result in a more (or less) favourable outlook for Australia's fossil fuel exports.

- A key uncertainty is the speed and manner in which countries make progress towards net-zero emissions. Achieving this will require far-reaching changes in government policy globally and rapid shifts in the behaviours of households and businesses. The appetite for such changes is uncertain. A slower transition than required to meet net-zero emissions targets – for example, because new renewable technologies are not widely accepted, the cost of renewable energy is high, energy security concerns are heightened or popular opinion opposes certain policies – would suggest a more moderate decline in Australia's fossil fuel exports than embodied in the net-zero emissions scenario above. Likewise, faster shifts in policy and behaviour would indicate additional downside risk to Australia's exports.
- Technology also remains an important uncertainty. Advances in renewable technology beyond those considered in the NGFS scenarios could lower the cost of alternative energy sources and speed up the transition away from fossil fuels. On the other hand, negative emissions technology or advances that lower the carbon intensity of fossil fuel energy could enable countries to continue to use fossil fuels, even while producing net-zero emissions.

Conclusion

The commitments by China, Japan and South Korea to achieve net-zero emissions by mid-century and the broader global shift towards carbon emission reduction puts downward pressure on the outlook for Australia's fossil fuel exports. Coal exports are projected to decline significantly, while the expected impact on LNG exports is more modest. Overall, the effect of net-zero emissions policies in these three economies on Australia's GDP is expected to be small and gradual, although it could be significant for directly affected sectors. However, significant uncertainty remains, including the speed and manner in which countries attempt to achieve net-zero emissions and technological developments that could change the efficiency and carbon intensity of fossil fuels.

Footnotes

[*] The authors are from Economic Analysis Department. They thank Zan Fairweather for work that laid the foundation for the international analysis in this article.

[1] South Korea's 24.4 per cent reduction by 2030 entails a 37 per cent reduction from a 'business as usual' path.

[2] 'Carbon intensity of output' is the ratio of carbon emissions to real GDP. The Chinese Government does not have a 2030 target for real GDP that would allow for calculating an implied carbon emissions target. However, Chinese President Xi Jinping has suggested that authorities are aiming to double 2020 GDP by 2035 (Xinhua 2020a). Assuming underlying GDP growth moderates only gradually, that suggests that real GDP will be around two-thirds larger in 2030 than 2020. The carbon-intensity target would then suggest a 2030 target for carbon emissions around 6 per cent higher than the 2020 level. This estimate is used in Graph 4.

[3] Korea has pledged to permanently close 30 aging coal-fired power plants by 2034 (or convert to LNG), half of its current capacity, which will reduce coal-fired power generation capacity to 29 GW from 38.3 GW in 2022 (Kumagai and Yep 2021). Japan's largest power generator will seek to shut down all inefficient older coal-fired power plants by 2030, or around 13 per cent of existing capacity. In China's latest Five Year Plan, authorities have noted they will control the development of coal-fired capacity, continuing the trend of seeking to restrict new coal plant capacity from 2016 (Boulter 2018).

[4] South Korea's scheme covers heavy polluters in the industrial and power sectors and has been in operation since 2015, while China's launched in mid 2021 after a number of years in development and various regional pilot programs. China's scheme has low initial coverage, low opening prices and a lack of an absolute cap on emissions, but coverage and prices are expected to increase in the coming years. Already the scheme covers around 40 per cent of China's emissions.

[5] Japan is seeking to ramp up its offshore wind capacity to 10 GW by 2030 and 30–45 GW offshore wind capacity by 2040, from around 65 MW currently (Ministry of Economic, Trade and Industry (Japan) 2020). This would make it the third-largest offshore wind generator in the world. South Korea recently announced plans to construct the world's largest offshore floating wind farm by 2030 (to generate up to 8.2 GW), a flagship project in South Korea's Green New Deal (Moon 2021).

[6] Green hydrogen is a source of clean fuel produced using renewable energy, and 'blue hydrogen' produced from natural gas or coal, with the resulting carbon emissions captured and stored. Conventional methods of creating hydrogen are emissions intensive.

[7] In China, the government has mandated that electric vehicles make up 40 per cent of all sales by 2030. The industry has significant momentum after years of government subsidies, tax waivers and support for charging infrastructure. Japan is pioneering hydrogen fuel cell vehicles and buses, and has pledged to stop the sale of new gasoline-only cars by 2035.

[8] The International Energy Association suggests this is due to: the need for high-temperature heat; emissions that naturally result from conventional industrial processes; narrow profit margins that leave little room for firms to absorb the costs associated with adopting more expensive production options; and the fact that heavy industries use capital-intensive equipment with long lives (30–40 years), slowing the uptake of innovative low-emission technologies (International Energy Association 2021).

[9] See Cunningham, Van Uffelen and Chambers (2019) for more information on Australia's coal exports.

[10] The NGFS is a group of over 90 central banks and supervisors including the RBA whose purpose is to share best practices, contribute to the development of climate and environment-related risk management in the financial sector and mobilise mainstream finance to support the transition towards a sustainable economy. The NGFS published its first set of climate scenarios in June 2020, which delivered a consistent set of transition pathways based on global policy responses, the energy network and the climate. The second vintage of the NGFS Climate Scenarios was published in June 2021, and included updated commitments by countries to reach net-zero emissions and greater region-level granularity. Three different 'integrated assessment models' were used for each scenario to provide an estimated range. We rely on the Global Change Assessment Model (GCAM) model as it provides the greatest country-level granularity for primary energy consumption.

[11] Fossil fuel exports to China, Japan and South Korea are individually calibrated based on their domestic fossil fuel demand profiles. Exports to the rest of the world are calibrated to change at the same rate as global aggregate fossil fuel demand (excluding China, Japan and South Korea) in the NGFS scenarios.

[12] For example, demand for Australian coal may decline by less in response to lower global coal consumption, particularly if tightening environmental standards support demand for higher-grade coal.

[13] Geoscience Australia estimates there to be 19,458 Mt of black coal Ore Reserves as of December 2019, 60 per cent of which are associated with operating mines. Ore Reserves are defined as an economically mineable part of a mineral resource, taking into consideration a range of factors including governmental and environmental regulations; this does not include a significant amount of mineral resources that can be converted into reserves (Geoscience Australia 2021).

[14] This would require investment into large expansions of Australia's current LNG export capacity.

[15] Under the Hydrogen Energy Supply Chain pilot, hydrogen produced from brown coal in Victoria's Latrobe Valley will be exported to Japan via a special vessel, with first shipments of liquefied hydrogen expected in October and March 2022 following COVID-19-related delays (Department of Industry, Science, Energy and Resources 2021).

[16] For example, Fortescue Metals Group is aiming to build Australia's first green steel project in the Pilbara, powered entirely by green hydrogen from local wind and solar in the next few years (Forrest 2021).

[17] The cumulative fall in fossil fuel exports subtracts around 3 per cent off the level of GDP in 2050 relative to the baseline. Assumes real GDP to grow in line with RBA forecasts to 2023 (RBA 2021), then at the OECD's growth forecast to 2050 (OECD 2018).

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The Financial Cost of Job Loss in Australia

David Lancaster[*]

Photo: RUNSTUDIO – Getty Images

Abstract

Workers who lose a job tend to experience large and persistent earnings losses. On average, real earnings are around one-third lower in the year of job loss, and it takes at least four years for an individual's annual earnings to recover. Earnings losses are particularly persistent following the loss of a long-term job. Workers who find new employment tend to work fewer hours at lower hourly rates of pay.

Introduction

Many workers will face periods of unemployment over the course of their working lives. For those workers who lose their jobs, some will soon find work elsewhere; for others, job loss will be costly and entail significant financial hardship. Government income support typically provides only a partial replacement for lost wages. Some people who find new employment will accept work with reduced wages or hours. Beyond these financial costs, it is well documented that unemployment – particularly long-term unemployment – can have adverse effects on mental and physical health (Mathers and Schofield 1998).

Information about the experience of those who lose a job can enhance our understanding about how household incomes, and therefore spending patterns, are affected by outcomes in the labour market (Penrose and La Cava 2021). This is relevant for policymakers tasked with managing aggregate demand, such as the Reserve Bank of Australia. It also informs policymakers who are tasked with designing policies to support workers who lose a job, including because of technological disruption, an economic downturn or a global pandemic.

This article explores the effect of job loss on workers' earnings by examining people's experience in the 18 years prior to the outbreak of COVID-19.

Measuring the financial cost of job loss

We can estimate the financial cost of job loss by following people's earnings around a transition from employment to unemployment and comparing their earnings with those of workers who did not lose a job. Statistical models can be used to control for other factors that may influence the comparison

of outcomes. This enables us to estimate the average loss of earnings as a direct result of job loss, as well as any forgone growth in earnings.

For this study, I used a model similar to that made popular by Jacobson, LaLonde and Sullivan (1993) (for details, see Appendix A). The key feature of this model is that the annual real earnings (i.e. after adjusting for inflation) of individuals are partly explained by whether they recently lost a job or will in the near future. The model includes controls for characteristics of individuals that vary over time and that we can observe (such as age and education) and fixed characteristics that are unique to each individual and that we cannot observe (such as ability). The model also controls for changes in general labour market conditions over time.

I used data from the Household, Income and Labour Dynamics in Australia (HILDA) survey – a dataset that enabled me to follow the characteristics, earnings and work history of 5,600–8,600 individuals each year from 2000/01 to 2018/19 (DSS and Melbourne Institute 2020). I defined job loss as a transition from employment to unemployment.[1] The rate of job loss in the HILDA data lines up well with movements in the official unemployment rate from the Australian Bureau of Statistics (ABS) (Graph 1). Periods of falling unemployment coincide with declining rates of job loss in the HILDA data, while periods of increasing unemployment are associated with rising rates of job loss. A comparison of the characteristics of those who lose a job with the broader workforce can be found in Table B1.

Job loss tends to result in significant and persistent earnings losses

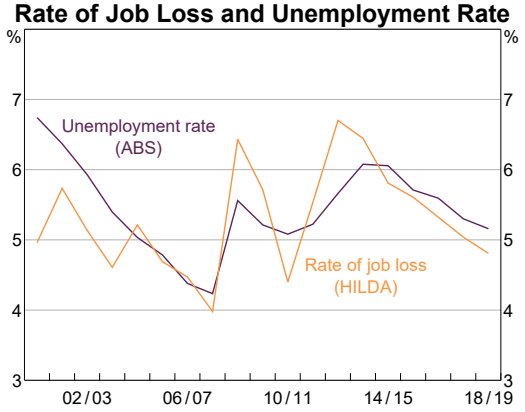
Graph 2 shows estimates of the effect of job loss on real earnings, relative to what would have been expected in the absence of job loss (see also Table A1). The results indicate that Australian workers who lose a job tend to experience large and persistent losses of real earnings. Real earnings are around one-third lower in the year of job loss, on average.[2] Earnings recovery slowly; it takes at least four years for those who lost a job to be earning as much as if they had not lost a job. Overall, cumulative losses of real earnings are equivalent to around 50 per cent of a workers' real earnings in one year, or a little under $40,000 for the average income earner in 2018/19. These estimates can be interpreted as the average effect of job loss on earnings; in practice, workers' experiences differ significantly and include better and worse outcomes.

Earnings for Australian workers typically begin to decline in the year prior to job loss, consistent with findings in the United States (Jacobson, LaLonde and Sullivan 1993). As shown below, this partly reflects that workers tend to work fewer hours in the year prior to job loss.

The loss of a long-term job appears to be more costly than the loss of a shorter-term job. Graph 3 shows estimates of earnings losses based on the length of time with their employer. The experience of those who lose their jobs with at least two years of tenure is similar to the short-term

Graph 1

Rate of Job Loss and Unemployment Rate

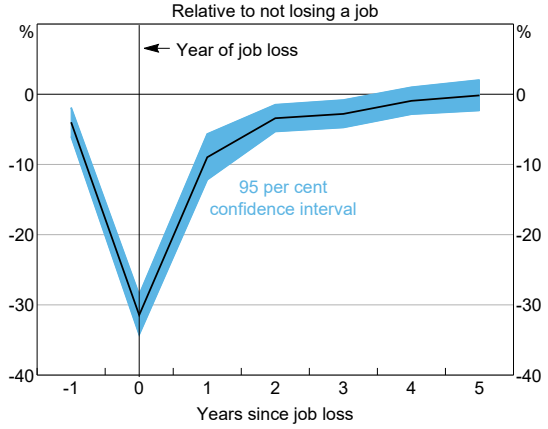


Sources: ABS; Author's calculations; HILDA 19.0

Graph 2

Effect of Job Loss on Real Earnings

Relative to not losing a job



Sources: Author's estimates; HILDA 19.0

estimates reported by the OECD (2016). When we define job loss as the ending of an employment relationship of at least 10 years, real earnings are around 40 per cent lower in the year of job loss, compared with around 30 per cent for a sample of all workers who lost a job. Of note, the recovery in annual earnings is slow and incomplete even after five years; earnings remain around 20 per cent below the level that would be expected if the worker had not lost a job. That said, the sample of workers who lost a long-term job is relatively small (around 420 cases), so some caution in interpreting these results is warranted.

The finding that the loss of a long-term job is particularly costly is consistent with workers accumulating skills and networks that are not transferable to other workplaces. Long tenure is also suggestive of a good match between workers and their employers that could result in higher worker productivity and wages (Jovanovic 1979). When a worker loses such a job, they may find it difficult to find a new job with comparable wages and/or hours. The result could also be a symptom that those who lose a long-term job tend to have specialised skills for which there is less demand generally – for example, due to structural change in the economy. Studies in the United States have found particularly poor outcomes for workers who lose a job as part of mass layoff because of the closure of a large manufacturing plant (Jacobson, LaLonde and Sullivan 1993).

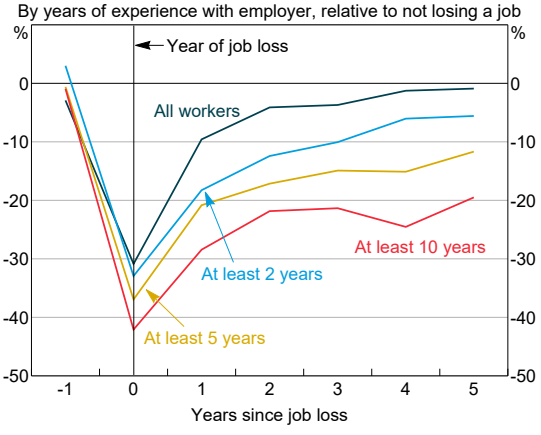
Workers who report quitting their job voluntarily appear to experience similar costs of job loss to workers who lose a job because they were retrenched or fired (Graph 4). Earnings tend to be 20–30 per cent lower in the year of job loss and recover over a few years. The similar outcomes across these workers could be partly the result of stigma for unemployed people. For example, a prospective employer may assume that an unemployed worker has lower ability because the employer cannot confirm whether the employee left voluntarily (Lawrence and Gibbons 1991). In addition, leaving a job because of dissatisfaction with pay or hours could indicate a poor match between the skills of the employee and the business, which results in reduced pay or hours and eventually leads to the employer or employee ending the job (Jovanovic 1979). This complicates the interpretation of survey information on the reason for job loss.

The experience that job loss is costly has been fairly consistent across various groups of workers. Earnings losses are similar for males and females, and across levels of education and income; differences are statistically insignificant (Graph 5). Age is one exception, with older workers tending to experience a greater cost of job loss, on average, than younger and middle-aged individuals. This is consistent with previous studies, which have shown that the average duration of unemployment for

Graph 3

Effect of Job Loss on Real Earnings

By years of experience with employer, relative to not losing a job

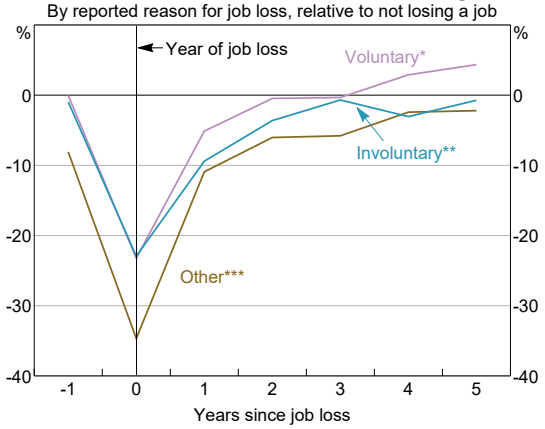


Sources: Author's estimates; HILDA 19.0

Graph 4

Effect of Job Loss on Real Earnings

By reported reason for job loss, relative to not losing a job



* Dissatisfaction with job (e.g. hours, pay, colleagues), desire for a change, obtain a better job, start a new business

** Laid off, made redundant, dismissed, employer went out of business, own business closed for economic reasons

*** Includes individuals who did not report a reason for job loss

Sources: Author's estimates; HILDA 19.0

older workers tends to be significantly longer (Cassidy *et al* 2020). Older workers are also more likely to have longer tenure in the job that they lost.

While the cost of job loss is similar across workers, the *incidence* of job loss is not. Male workers have tended to experience higher rates of job loss than female workers, particularly since the late 2000s (Graph 6). Females are more likely to work in industries that have lower rates of job loss, such as healthcare & social assistance (see Table B2). By contrast, male workers are more likely to be employed in occupations requiring routine manual operations, including in construction and manufacturing; these occupations have been declining as a share of employment over recent decades (Heath 2016). Younger workers, those with lower levels of education and those from lower-income groups have also tended to experience higher rates of job loss in this sample. The rate of job loss of those in the bottom one-third of income earners is around twice as high as those in the top one-third of income earners.

Overall, the earnings losses of those who lose a job in Australia are similar to those reported in US studies. The US Panel Study of Income Dynamics (PSID) is comparable to HILDA and has also been used to estimate earnings losses from job loss in the United States. Estimates of earnings losses using the PSID range from 15 per cent to 30 per cent in the year of job loss, similar to the results reported for Australia (Krolikowski 2017; Ruhm 1991; Stevens 1997). Studies in the United States using administrative data have also found persistent losses for workers who lose a long-term job. For example, Jacobson, LaLonde and Sullivan (1993) reported earnings that were 25 per cent lower even after six years, using a sample of workers who had at least six years of experience with their employer.

Many who find new employment work fewer hours at lower hourly rates of pay

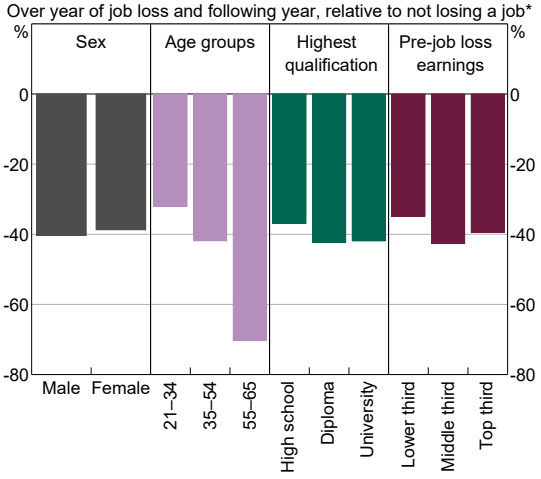
When workers lose a job, they experience financial losses because they do not earn a wage during the stint of unemployment. They might also be offered fewer hours of work or lower hourly rates of pay in a new job (Lachowska, Mas and Woodbury 2020). I decomposed the cost of job loss into these components by focusing on workers who lose a job but subsequently find new employment.

Workers who find new employment tend to have weekly earnings that are around 8 per cent lower than if they had not lost a job (Graph 7). This is a smaller decline than earlier estimates based on financial year data, suggesting that time spent in unemployment is the main source of financial loss. However, even workers who find new employment tend to work fewer hours. In the first HILDA survey after experiencing job loss, workers who had found new employment tended to be working 6 per cent fewer hours than similar workers who did not lose a job. Accordingly, those who lost a job were also more likely to report wanting to work more hours than they currently work. It generally takes two

Graph 5

Real Earnings Losses by Worker Characteristics

Over year of job loss and following year, relative to not losing a job*

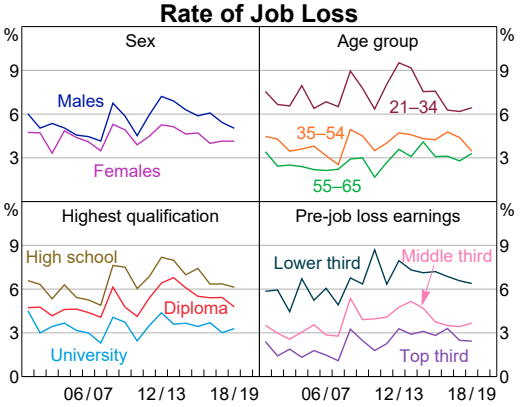


* Expressed as a percentage of one year's earnings

Sources: Author's calculations; HILDA 19.0

Graph 6

Rate of Job Loss



Sources: Author's calculations; HILDA 19.0

years for the number of hours worked to recover to pre-job loss levels.

There is also evidence that workers who find new employment tend to earn lower hourly rates of pay in their new job. In addition, hourly wages barely recover from the initial fall and remain 2 per cent lower even after four years, on average. This suggests that lower hourly earnings are the more persistent consequence of job loss for workers. Workers might receive lower hourly rates of pay because they were paid a premium in their previous job for firm-specific skills and networks. New employers might also offer lower wages or hours because they have imperfect information about the true reason for job loss so cannot determine whether the worker will be a good fit (Lawrence and Gibbons 1991). Lachowska, Mas and Woodbury (2020) found that persistently lower hourly wages after job loss in the United States could largely be attributed to workers moving from employers that pay wage premiums to employers that do not – for example, moving from unionised to non-unionised workplaces.

Government income support and the tax system reduce the cost of unemployment

A range of policies are in place that support workers who lose their job. Many become eligible for government income support, such as JobSeeker (previously Newstart Allowance), while they search for a new job. Their lower level of income may also qualify them for other government support, such as family tax benefits. Further, in Australia's progressive tax system, after-tax income will usually decline by less than gross income following job loss; the average rate of income tax declines with income.

Graph 8 presents results where the measure of income includes government taxes and benefits. Comparing this graph to the above version using gross earnings (Graph 2) shows that the effect of government benefits and taxes is to reduce the cost of job loss to around 20 per cent in the year of job loss. The effect of job loss on real income (including taxes and benefits) after about three years is similar to the effect on real gross earnings.

Graph 9 decomposes the decline and recovery in income into the contributions from gross earnings, taxes and government benefits. Government benefits provide most of the offset to the decline in real gross earnings in the year of job loss and the following year. This highlights that income support for those who lose a job tends to focus on the period of unemployment. Lower taxes provide a relatively modest offset to the decline in earnings.

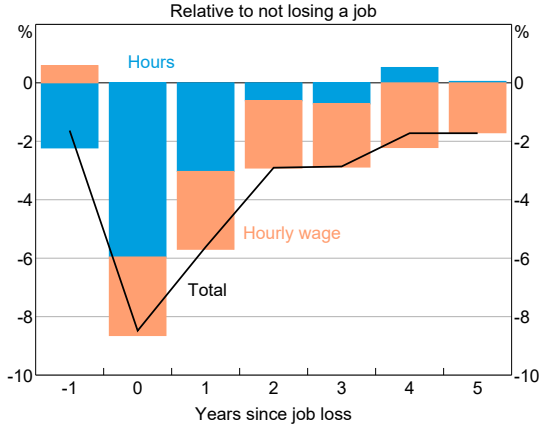
The COVID-19 pandemic

The outbreak of COVID-19 has had significant effects on Australia's labour market. Activity restrictions to contain the virus and precautionary behaviour by households and businesses have caused many businesses to close or operate at reduced capacity at times. As a result, demand for labour has fallen in certain industries.

Graph 7

Weekly Real Earnings of Re-employed Workers

Relative to not losing a job

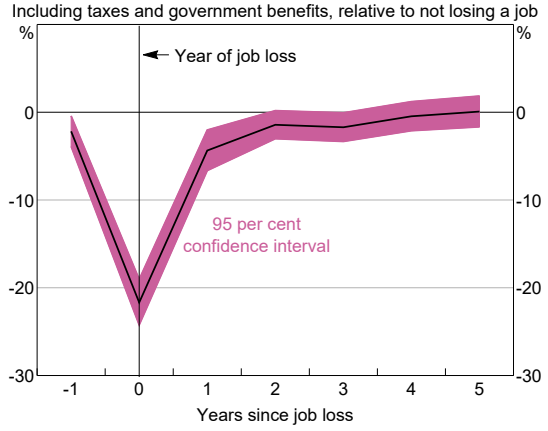


Sources: Author's estimates; HILDA 19.0

Graph 8

Effect of Job Loss on Real Earnings

Including taxes and government benefits, relative to not losing a job



Sources: Author's estimates; HILDA 19.0

The sample of the HILDA survey does not yet cover the period since the outbreak of COVID-19. Distinct features of this downturn suggest that the experience of workers might differ from the experience of job loss estimated in this study. Such features include:

- The economic contraction during the pandemic was much larger than downturns in the HILDA survey's sample, including the global financial crisis.
- The incidence of job loss was reduced by the policy response to the pandemic, including the JobKeeper wage subsidy. JobKeeper was targeted towards keeping Australians in jobs, even at zero hours, to maintain the relationships between employers and their employees. Bishop and Day (2020) estimated that JobKeeper reduced total employment losses by at least 700,000 between April and July 2020.
- For many workers who did lose a job, expanded unemployment (JobSeeker) benefits during the pandemic would have resulted in a smaller decline in real income, compared with individuals who lost a job in this study's sample.
- Underpinned by significant policy support, labour market conditions rebounded strongly once activity restrictions were eased. Employment and total hours worked had recovered to pre-pandemic levels in early 2021 (Graph 10). This suggests that workers who lost a job were able to find new employment relatively quickly, which was not true for many workers who lost a job in this study's sample. That said, recent outbreaks of the virus have introduced a high degree of uncertainty about labour market conditions in the second half of this year.

Despite the distinct features of the current episode, the results based on pre-pandemic data still offer insights. By underpinning the retention of employees, it is clear that policy support, particularly the JobKeeper wage subsidy, avoided significant financial costs and hardship for many workers. In many cases, job losses would have likely caused persistent earnings losses, especially taken with international evidence that job loss in downturns is particularly costly for workers (Davis and von Wachter 2011). By avoiding this, policy measures also contributed to the relatively quick recovery in household spending that occurred after previous lockdowns.

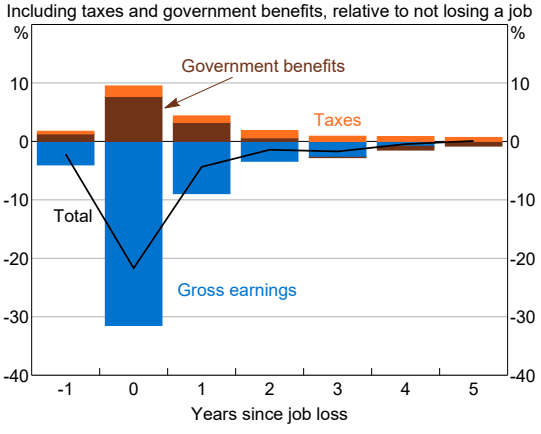
Conclusion

Job loss can be financially costly for workers, particularly when a long-term job is lost. Real earnings begin to decline in the year prior to job loss and fall sharply in the year of job loss. Earnings recover slowly. Most of the cost of job loss stems from time spent in unemployment, but even re-employed workers tend to work fewer hours at lower hourly rates of pay. Government benefits have tended to reduce the cost of job loss by around one-third.

Graph 9

Effect of Job Loss on Real Earnings

Including taxes and government benefits, relative to not losing a job

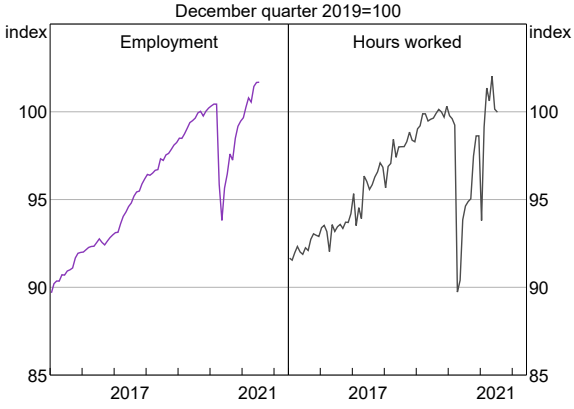


Sources: Author's estimates; HILDA 19.0

Graph 10

Employment and Hours Worked

December quarter 2019=100



Sources: ABS; RBA

Distinct features of the pandemic period and policy response make it difficult to generalise the results presented in this article to describe the experience of workers who lost a job during the pandemic. That said, the results underscore that policies designed to support the retention of employees would have averted significant financial hardship for many workers and quickened the recovery. The experience of workers over the sample examined in this article highlights that job loss can have persistent effects on household incomes, often well beyond the initial stint of unemployment.

Appendix A

I estimated real earnings losses using the approach of Jacobson, LaLonde and Sullivan (1993). The model is as follows:

$$y_{it} = x_{it}\beta + \alpha_i + \gamma_t + \sum_{k=-1}^{5} D_{it}^{k}\delta_k + \varepsilon_{it}$$

where *y* is real income, *x* is a vector of observed, time-varying worker characteristics – in this case, interactions of education with age and age squared. These interactions capture the positive relationship between education and earnings, and the positive and concave relationship between experience (age) and earnings (Mincer 1974). The coefficient α is an individual fixed effect, which captures fixed, unobservable differences between workers, such as ability. The coefficient γ is a financial year fixed effect, which captures labour market conditions that are common to all workers in each year. Finally, ε is the error term, *i* and *t* the subscripts and index individuals and financial years, respectively.

The main variables of interest are the dummy variables for job loss, D_{it}^{k}, which are equal to one if the individual moved from employment to unemployment *k* years since the current year. The estimated coefficients δ represent the difference between the earnings of workers who lost a job and those of workers who did not. Because I use annual data (financial years), the timing of job loss within the year will influence estimated losses. For example, a worker who lost a job near the end of the financial year will exhibit small earnings losses in the year of job loss but larger earnings losses in the subsequent year. Therefore, I augmented my model to include quarter dummies in the year of job loss and year after job loss; beyond this, the quarter dummies are not statistically different.

I transformed income variables using the inverse hyperbolic sine (IHS) function (Burbidge, Magee and Robb 1988). Like log transformations, estimated coefficients with an IHS transformation can be interpreted as elasticities, but the transformation did not require me to drop observations that report zero taxes paid or government benefits received.

Table A1: Estimation Results[(a)]

2001/02–2018/19

Years since job loss	Real gross earnings Per cent	Real income (including taxes and benefits) Per cent
One before	−4.0***	−2.2***
Year of job loss		
– First quarter	−31.5***	−21.7***
– Second quarter	−29.3***	−20.8***
– Third quarter	−25.5***	−16.1***
– Fourth quarter	−12.9***	−8.7***
One after		
– First quarter	−9.0***	−4.4***
– Second quarter	−13.2***	−8.2***
– Third quarter	−12.6***	−9.4***
– Fourth quarter	−20.5***	−13.4***
Two after	−3.4***	−1.4**
Three after	−2.8***	−1.7**
Four after	−0.9	−0.5
Five after	−0.2	0.1
Observations	135,225	135,186
R^2	0.11	0.05

(a) Coefficients are presented in per cent differences using the approach of Bellemare and Wichman (2020). ***, ** and * denote statistical significance at the 1, 5 and 10 per cent levels using robust standard errors. The models are estimated via ordinary least squares with unrestricted individual and time fixed effects, and controls for time-varying characteristics of individuals (interactions of education with age and age squared)

Sources: Author's estimates; HILDA 19.0

Appendix B

The sample in this study includes individuals aged 21–65 years. In each year, workers who report zero or negative earnings, or report a period out of the labour force are excluded. Individuals who report that a job loss was caused by sickness or injury, retirement or pregnancy/having children are also excluded.

Table B1: Descriptive Statistics of Workers and Workers Who Lost a Job

2002–2019 pooled sample

	All workers	Workers who lost a job
Male (%)	52	58
Age groups (%)		
– 21–34	36	52
– 35–54	49	40
– 55–64	15	8
Education – highest qualification (%)		
– High school or lower	33	42
– Diploma	35	36
– University	32	22
Selected industries (%)		
– Manufacturing	9	11
– Construction	7	11
– Healthcare & social assistance	15	10
– Retail trade	8	10
– Accommodation & food services	4	8
Occupation[(a)] (%)		
– Non-routine cognitive	40	23
– Routine cognitive	22	24
– Non-routine manual	11	12
– Routine manual	27	41
Real gross earnings[(b)] ($'000)		
– Mean	70	55
– Median	60	46

(a) See Heath (2016) for discussion of the classification of occupations

(b) For those who lose a job, this is real earnings in the year prior to job loss

Sources: Author's estimates; HILDA 19.0

Footnotes

[*] The author is from Economic Analysis Department and would like to thank Ivailo Arsov, Mark Chambers, Darren Flood, Brad Jones and Tom Rosewall for their thoughtful advice and suggestions in preparing this article. This document uses unit record data from the Household, Income and Labour Dynamics in Australia (HILDA) Survey. The unit record data from the HILDA Survey was obtained from the Australian Data Archive, which is hosted by the Australian National University. The HILDA Survey was initiated and is funded by the Australian Government Department of Social Services (DSS) and is managed by the Melbourne Institute of Applied Economic and Social Research (Melbourne Institute). The findings and views based on the data, however, are those of the author and should not be attributed to the Australian Government, DSS, the Melbourne Institute, the Australian Data Archive or the Australian National University and none of those entities bear any responsibility for the analysis or interpretation of the unit record data from the HILDA Survey provided by the author.

[1] Because job loss is defined as a transition from employment to unemployment, it excludes cases in which workers lose one of multiple jobs. To meet this study's definition, workers must have moved from having at least one job to having zero jobs and actively looking for work.

[2] Earnings in the year of job loss are not zero because most workers were employed for part of the financial year – either they were employed for a period before losing their job or they found new employment within the financial year.

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Government Bond Markets in Advanced Economies During the Pandemic

Nick Baker, Marcus Miller and Ewan Rankin[*]

Photo: Chuanchai Pundej – Getty Images

Abstract

Governments in advanced economies have funded their large fiscal policy responses to the COVID-19 crisis by issuing government debt securities. Except for a period of dysfunction in the early months of the pandemic, government bond markets have functioned well. Despite the substantial increase in debt issuance, the interest rate paid on new government debt has declined to historically low levels. A rise in private sector saving relative to investment has contributed to demand for low-risk assets like government bonds. At the same time, advanced economy central banks have lowered their policy rates and made large-scale purchases of government bonds in secondary markets in pursuit of their inflation and employment goals.

In response to the dramatic economic contraction caused by the COVID-19 pandemic, governments in advanced economies implemented the largest fiscal policy response since the Second World War.[1] These fiscal policies have been funded through a substantial increase in the issuance of government debt securities. Such securities are issued by government debt management agencies into 'primary' debt markets. With the notable exception of March and April 2020, conditions in primary markets have been favourable throughout most of the pandemic and so supported governments' fiscal responses.

Conditions in primary markets are highly dependent on conditions in 'secondary' markets, where securities that have already been issued are traded. Conditions in the secondary market were dysfunctional early in the pandemic but have since been stable. Good functioning of the secondary government bond market is important for central banks because government bond yields in secondary markets serve as a benchmark for yields on other assets and play a key role in monetary

policy transmission. Historically low government bond yields during the pandemic have put downward pressure on funding costs throughout advanced economies and supported the economic recovery.

This article outlines the evolution of government bond markets in advanced economies since the onset of the pandemic, beginning with descriptions of demand and supply developments in the primary and secondary markets and finishing with a discussion of how these have influenced bond yields.[2]

Despite increased government debt issuance, funding conditions in primary markets remain favourable …

The supply of government debt securities in advanced economies increased substantially in 2020 and 2021 as governments issued debt to fund their fiscal response to the pandemic. The stock of government debt securities outstanding increased by over 50 per cent in Australia, Canada and New Zealand and increased by around one-third in the United States and the United Kingdom (Graph 1). The International Monetary Fund projects that fiscal deficits will moderate but remain high in 2022 as governments continue to provide fiscal support to the economic recovery (Graph 2). Accordingly, while the bulk of the financing task of the COVID-19 fiscal response was addressed in 2020 and 2021, the supply of advanced economy government debt is expected to remain at historically high levels for some time.

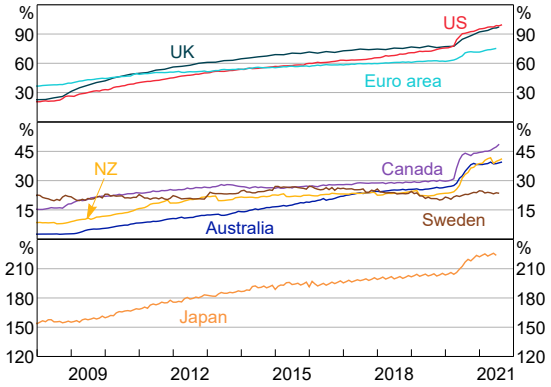
In the United States and some other advanced economies, short-term debt securities (of up to one year maturity, called 'bills' in some countries) made up a large share of new issuance early on in the pandemic (Graph 3). This was because short-term debt provided flexibility to borrowing authorities as uncertainty around fiscal policy and the economic outlook made future government funding requirements difficult to forecast. At the same time, investors were willing to increase their holdings of bills because bills carry less interest rate risk than longer-term government debt and typically attract a wider pool of investors. Over time, issuance of longer-maturity fixed-rate government debt (generally referred to as 'bonds') has increased. Governments generally pay higher interest rates on their longer-term debt, but in return reduce the frequency with which they need to roll over their debt. When rolling over debt, there is a risk of paying a higher-than-expected interest rate.

The average maturity of government debt outstanding has evolved differently across advanced economies during the COVID-19 pandemic. The average maturity of US and Canadian government debt has declined reflecting their larger issuance of bills (Graph 4). In other countries, including Australia, the average maturity of debt outstanding has been little changed over the pandemic period.[3] Differences in market structures across countries, such as the depth of short-term debt markets in the United States, have

Graph 1

Government Debt Outstanding

Per cent of March 2021 GDP



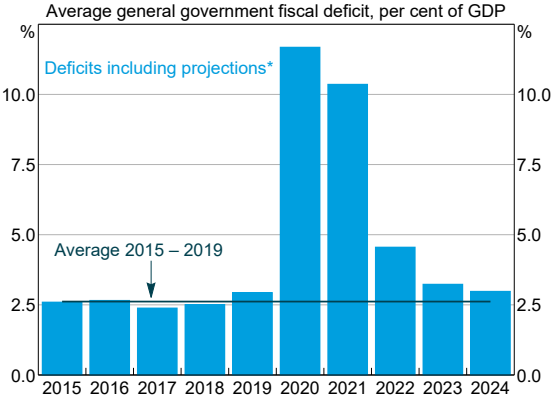
* Marketable debt securities only

Sources: Debt managment offices; Refinitiv

Graph 2

Fiscal Deficits in Advanced Economies

Average general government fiscal deficit, per cent of GDP



* Data and projections as at the IMF's April 2021 Fiscal Monitor, and do not incorporate developments since that time

Source: IMF

also contributed to the differences in funding strategies.

Despite the significant increase in government debt issuance, conditions have been generally favourable in primary markets for government debt apart from the period of bond market dysfunction in March and April 2020 (see below). Demand for new issuance, as measured by the ratio of total bids to the amount of debt being sold at auction, has remained broadly within historical ranges (Graph 5).[4] In some countries, government debt management agencies have also made greater than usual use of syndications to issue government debt. In a syndication, the price of the bond issuance is negotiated with prospective investors rather than being determined at auction. This approach provides debt management offices with greater certainty when issuing larger-than-normal quantities.[5]

… supported by stable conditions in secondary government bond markets

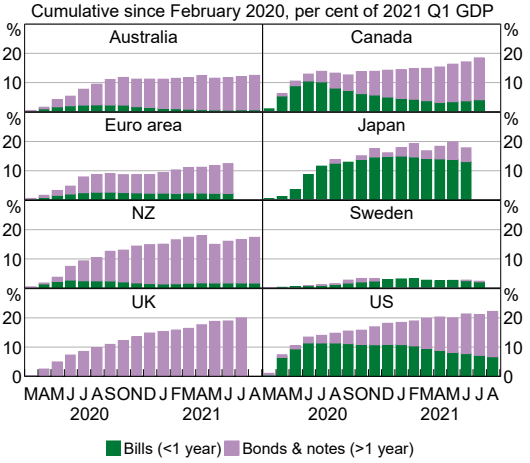
The cost and ease with which governments obtain funding in primary markets can be affected by conditions in secondary markets for government debt. Dealers serve as intermediaries within secondary markets and between the primary and secondary markets, providing liquidity to maintain smooth trading conditions. Dysfunction in the secondary markets can make it difficult or costly for market participants to buy and sell securities, which can in turn limit the ability or willingness of participants in primary markets, particularly dealers, to buy newly issued securities. In addition, bond yields in secondary markets influence the cost of issuing government debt in primary markets.

In early 2020, the extreme economic and financial uncertainty caused by the global spread of COVID-19 caused secondary markets for government bonds to become severely dislocated.[6] Market participants sold large quantities of government bonds to meet their increased demand for liquidity. Bond dealers then struggled to intermediate the significant volume of flows from clients, reflecting balance sheet constraints and a reluctance to assume significant positions at a time of increased uncertainty and associated financial

Graph 3

Net Debt Issuance

Cumulative since February 2020, per cent of 2021 Q1 GDP

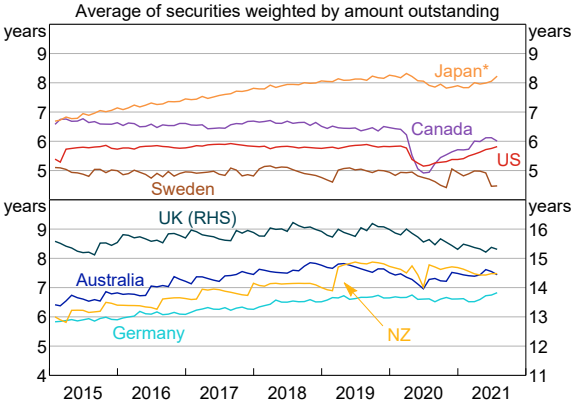


Sources: Debt management offices; Refinitiv

Graph 4

Tenor of National Government Debt

Average of securities weighted by amount outstanding



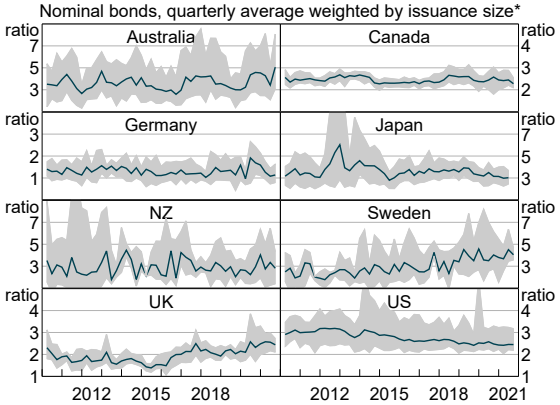
* Does not include securities issued in Liquidity Enhancement Auctions or inflation adjustment for indexed bonds

Sources: Debt management offices; RBA

Graph 5

Government Bond Bid-to-cover Ratios

Nominal bonds, quarterly average weighted by issuance size*



* Shaded area represents the range of bid-to-cover ratios of individual auctions over the quarter. Ratio is lower in Germany than in other countries as a greater share of issuance is typically retained by the debt management office to be sold at a later date.

Source: National debt management entities

market risk. This resulted in a sharp rise in the cost of transacting in these markets, as illustrated by the sharp rise in bid-ask spreads in March 2020 (Graph 6). Central banks responded to this market dislocation by announcing a range of policy measures. Subsequent to these announcements, conditions quickly improved in secondary bond markets.

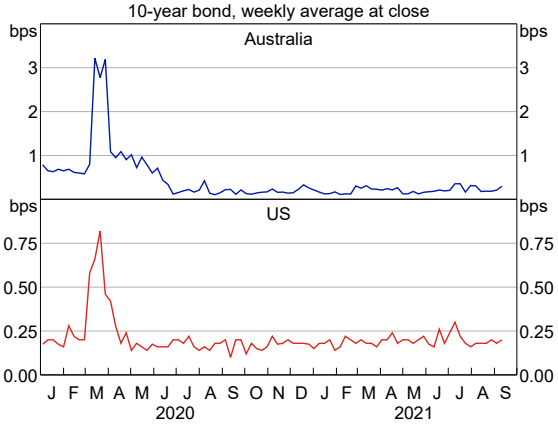
The return to more normal trading conditions in secondary government bond markets by April 2020 facilitated the increased issuance of advanced economy government debt. Most categories of market participants have subsequently increased their holdings to above pre-pandemic levels (Graph 7; Graph 8). In many advanced economies in mid 2020, banks and money market funds (MMFs) substantially increased their holdings of government debt. Financial institutions act as intermediaries between savers and borrowers, and government spending on households and businesses during the pandemic has led to funds flowing to financial institutions that have then invested those funds in financial assets, including government bonds. Foreign investor holdings of government bonds also increased in some advanced economies.

Central bank purchases of government bonds in secondary markets have added to demand for government bonds. These were motivated at first by the need to address market dysfunction in March 2020. Thereafter, bond purchases formed part of the packages of measures adopted to ease financial conditons in pursuit of central bank mandates.[7] Most advanced economy central banks have purchased the equivalent of at least half of the net increase in government debt since March 2020 (Graph 9). Market participants expect central bank purchases to continue in most jurisdictions until the end of 2021 or beyond, although the pace of purchases has slowed since the start of the pandemic in many economies (and is expected to slow soon in others).[8]

Graph 6

Government Bond Bid-ask Spread

10-year bond, weekly average at close

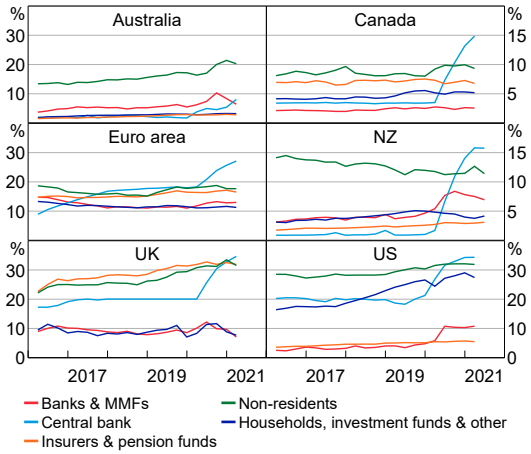


Sources: RBA; Refinitiv; Tradeweb; Yieldbroker

Graph 7

Government Bond Ownership

Per cent of March 2021 GDP

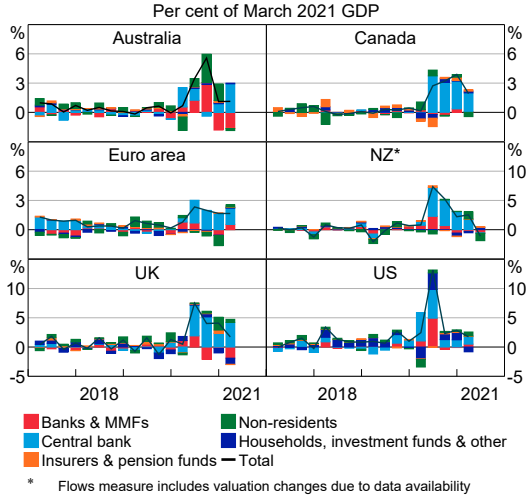


Sources: ABS; authors' estimates; ECB; Federal Reserve; ONS; RBNZ; Refinitiv; Statistics Canada

Graph 8

Net Flows into Government Bonds

Per cent of March 2021 GDP



* Flows measure includes valuation changes due to data availability

Sources: ABS; authors' estimates; ECB; Federal Reserve; ONS; RBNZ; Refinitiv; Statistics Canada

Government bond yields declined to historically low levels

Government bond yields in advanced economies have declined during the pandemic, from levels that were already historically low. This decline in yields has reflected investors' expectations for growth and inflation, and by extension expectations of an extended period of stimulatory monetary policy and hence low short-term interest rates. Indeed, low government bond yields have been an important aspect of the transmission of monetary policy, given that they reflect expected central bank policy rates and are influenced by asset purchase programs. A range of borrowers have benefited as a result – governments have been able to fund their pandemic responses at low interest rates, while lower yields have also contributed to lower interest rates faced by other borrowers.[9]

Longer-term forces had led to a decline in bond yields over many decades

Government bond yields in advanced economies have declined since the 1980s, reflecting persistent structural changes in the global economy and financial markets (Graph 10). These structural changes led to a decline in each of three components of bond yields: market expectations of central bank policy rates (in real terms); market expectations for inflation; and the 'term premium', which is the compensation bond holders receive for risks associated with holding a longer-term fixed-rate bond rather than investing in a series of short-term securities (RBA 2019).

Financial market expectations for future central bank policy rates have declined over recent decades in both real and nominal terms. This reflects a decline in the so-called 'neutral' rate, which is the level of the policy rate that financial markets judge to be neither stimulatory nor contractionary for an economy over the medium term. The neutral rate cannot be observed directly but is likely to have declined due to several factors, including a decline in potential growth rates of advanced economies, a rise in household income inequality, a decline in the risk appetite of firms and changes in the age structure of the population.[10]

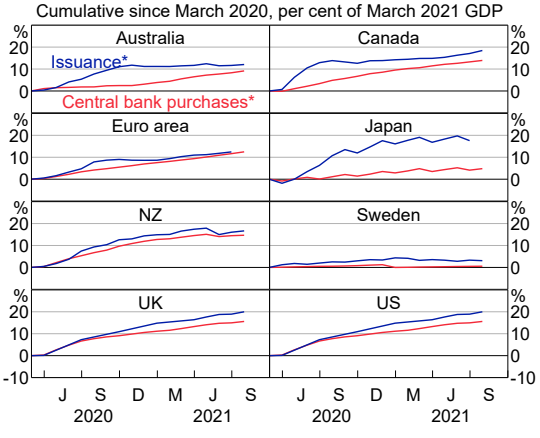
Financial market expectations of inflation declined with the adoption of inflation targeting by many central banks in the early 1990s. As a result, investors have demanded less compensation for the erosion of the purchasing power of their savings, and the expected return on nominal assets has declined.

Another factor that has lowered yields, particularly for longer-term bonds, has been a decline in the term premium. The term premium compensates for the risks that the bond will be difficult to sell at some point (liquidity risk) or that nominal short-term interest rates do not turn out as expected (which is in turn a combination of inflation risk and real interest rate risk).[11] Substantial uncertainty surrounds estimates of term premiums, but most estimates suggest that they had trended lower and even turned negative prior to the pandemic

Graph 9

Sovereign Debt
Issuance and Central Bank Purchases

Cumulative since March 2020, per cent of March 2021 GDP

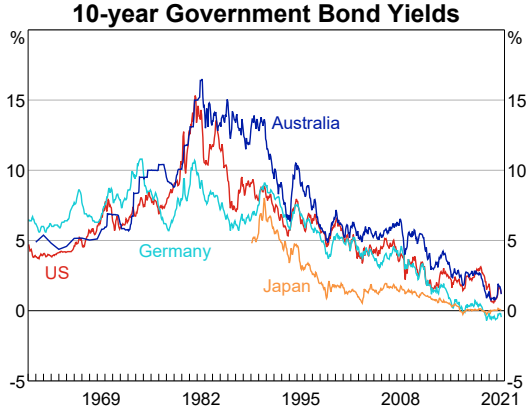


* Net of maturities

Sources: Central banks; Debt management offices; Refinitiv

Graph 10

10-year Government Bond Yields



Sources: Bloomberg; FRED; RBA

(Graph 11).[12] That has been attributed to low uncertainty about macroeconomic outcomes and an increased presence of price-insensitive buyers for longer-term government securities (RBA 2019).[13]

There has also been a cyclical decline in bond yields during the pandemic

Yield curves for government bonds in advanced economies have changed substantially over the course of the pandemic. These movements can be characterised as having three phases.[14] In the first phase, during March and April 2020, yields rose substantially. As noted above, bond market liquidity deteriorated sharply as many market participants sought to convert bond holdings into cash. This contributed to a higher liquidity premium for a short period, after which interventions by central banks saw bond market functioning improve and liquidity premiums decline.

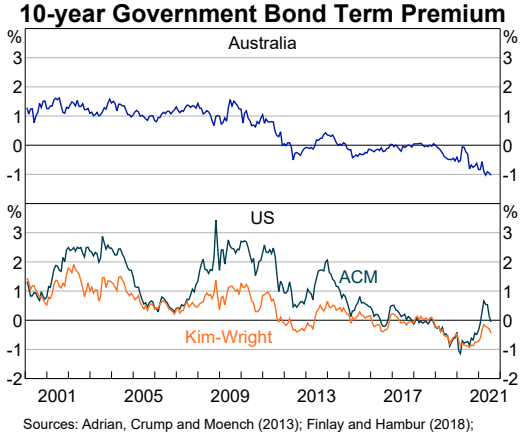
In the second period, from April 2020 to later that year, yields declined at all maturities to below their pre-pandemic levels (Graph 12). Shorter-term bond yields declined to around zero in many advanced economies driven by reductions in central bank policy rates, while in the euro area and Japan they remained at already low levels. Longer-term yields also declined substantially, reflecting expectations among market participants that weakness in economic activity and inflation would require a sustained period of very stimulatory monetary policy. The government bond purchase programs instituted by central banks in response to the deterioration in the economic outlook put additional downward pressure on bond yields, including by signalling central bank commitment to low policy rates.

There has been a notable increase in household saving during the pandemic, due to constraints on household expenditure and fiscal stimulus. Business investment has also been lower than it would have been otherwise. Together, this has led to greater demand for assets such as government bonds and placed further downward pressure on yields. Operating in the other direction, the sharp increase in government borrowing tended to put upward pressure on yields. In other words, the private sector has increased saving at the same time that the government has borrowed.

In the third phase since late 2020, longer-run government bond yields have risen alongside progress in the economic recovery and an improving economic outlook supported by the successful development of COVID-19 vaccines. There was a sharp increase in longer-term yields in the first three months of 2021. Since that time, there has been some decline in longer-term yields, in part because of concerns about the impact of new

Graph 11

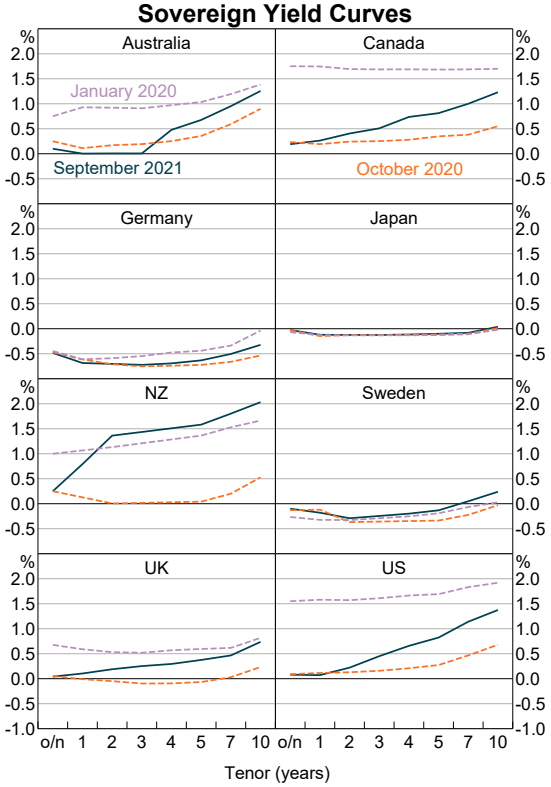
10-year Government Bond Term Premium



Sources: Adrian, Crump and Moench (2013); Finlay and Hambur (2018); Kim and Wright (2005)

Graph 12

Sovereign Yield Curves



Sources: Bloomberg; Yieldbroker

variants of COVID-19 on economic growth. Meanwhile, shorter-term bond yields have remained low, as central banks have emphasised the need for very stimulatory policy for some time.

During this third phase, there has been a rise in the expected path of central bank policy rates and inflation, with the latter returning to levels consistent with, or only a little below, central bank inflation targets. This has been accompanied by an increase in uncertainty about the outlook for inflation and interest rates. Greater uncertainty increases the compensation required by bond investors for the risk that things do not turn out as they expect, and so leads to higher term premiums. An increase in uncertainty in the United States in particular has drawn attention. However, on some measures, such as the dispersion of longer-run forecasts or option-implied uncertainty, it is not clear that uncertainty about inflation or nominal interest rates is that high relative to history (Graph 13).

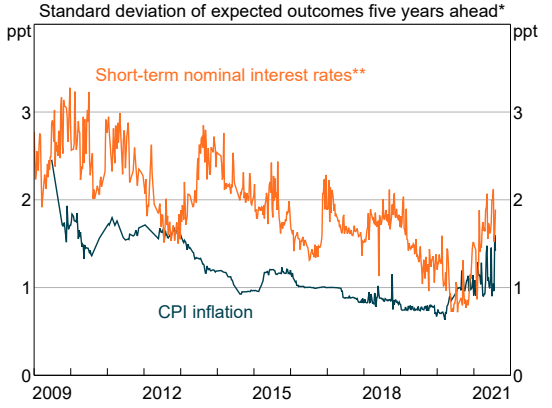
Conclusion

After a period of dysfunction early in the pandemic, government bond markets in advanced economies have generally functioned well. Fiscal deficits and government debt issuance were especially high in 2020 and 2021, and debt issuance is projected to remain at higher levels in 2022. Interest rates on government debt were already around historic lows prior to the pandemic and have since declined further. This reflects an increase in the level of private sector savings and a decline in business investment during the pandemic, as well as the support that central banks have provided to the COVID-19 recovery, which has lowered financing costs for both the private and public sectors. The longer-run forces that have led government bond yields to decline over many decades are likely to remain for some time. However, if the economic recovery continues as expected in advanced economies and employment and inflation move towards central bank targets, central banks will shift to a less accommodative stance of monetary policy and bond yields will rise. Developments in government bond markets will continue to depend on private sector demand for government debt securities. This in turn will depend on private sector saving and investment levels, growth and inflation outcomes, and uncertainty about future economic outcomes.

Graph 13

Uncertainty about US Inflation and Interest Rates

Standard deviation of expected outcomes five years ahead*



* As implied by the pricing of put and call options in financial markets
** Three-month LIBOR
Source: Federal Reserve Bank of Minneapolis

Footnotes

[*] The authors are from International Department, and would like to thank Stephen Knop for his early contribution to this work.

[1] For a summary of the global fiscal policy response, see Hudson *et al* (2021).

[2] The analysis focuses on a subset of advanced economies most relevant to Australia, specifically a mixture of the largest economies and other relatively small open economies. Not all measures are shown for every country, but the intention is to provide a representative picture of advanced economy government bond market developments.

[3] For detail on the issuance of government debt during the pandemic by the Australian Office of Financial Management, see Nicholl (2020) and Nicholl (2021).

[4] At times, periods of weaker demand for debt issuance have attracted attention and contributed to a rise in bond yields. A prominent example was a period of weaker-than-expected demand for seven-year US Treasury bonds in March 2021. However, these experiences are not representative of any issues with primary market conditions during the period as a whole.

[5] For a discussion of the relevant benefits of government bond issuance by tender versus syndication, see AOFM (2019).

[6] For further details on the dysfunction in financial markets over this period, see Financial Stability Board (2020), Finlay, Xiang and Seibold (2020) and Vallence and Wallis (2020).

[7] For more detail on central bank purchases of government bonds during the COVID-19 pandemic, including the channels through which they support economic activity, see RBA (2021).

[8] In many advanced economies, central banks have reduced the pace of their government bond purchases as progress has been achieved in the economic recovery and towards central bank goals for employment and inflation. The pace of government bond issuance has also slowed over the course of the pandemic because of a faster-than-expected economic recovery that has reduced the need for issuance, and because government debt management agencies in some countries acted relatively quickly to provide pre-emptive financing last year.

[9] The significant rise in public debt on issue over the course of the pandemic has not called into question the sustainability of government finances in advanced economies, partly because of low interest rates on government debt (Blanchard 2019; Hudson *et al* 2021).

[10] For a broad discussion of the causes of a decline in global neutral rates, see Rachel and Smith (2015). Mian, Straub and Sufi (2021) is a more recent paper on the decline in the US neutral rate, which argues that a rise in income inequality has been a more important cause than the changing age structure of the population. For a discussion on Australia's neutral rate, see McCririck and Rees (2017).

[11] Government bond yields for some economies may also include premiums for default risk, and for euro area countries a redenomination risk (Corradin, Grimm and Schwaab 2021).

[12] The term premium for a given bond is typically calculated as the difference between observed longer-term bond yields and the average expected short-term rate over the life of the bond. Relatively complex models are required to estimate government bond term premiums because the average expected short-term rate cannot be directly observed beyond near-term horizons. The term premium estimates shown are based on the models described in Adrian, Crump and Moench (2013), Kim and Wright (2005) and Hambur and Finlay (2018). For a discussion of how different models for the term premium give different results, but suggest similar trends over time, see Cohen, Hördahl and Xia (2018).

[13] Price-insensitive buyers include firms with significant long-term liabilities such as insurers and defined benefit pension funds, for which longer-term assets such as government bonds provide a hedge against interest rate risk. Financial institutions required to hold higher levels of high-quality liquid assets since the Global Financial Crisis are another source of demand that may be less price sensitive. Central bank holdings of government bonds had also increased in size substantially as some central banks implemented quantitative easing programs.

[14] Government bond yields tend to fluctuate in similar ways across advanced economies; this is because they are affected by many of the same cyclical and structural economic forces, and their financial markets are highly integrated. For a recent discussion of the common movement of government bond yield curves in advanced economies, see Clarida (2021). For a discussion of how global factors impact monetary policy and term premiums in small open economies, see Rey (2013) and Obstfeld (2015). For a discussion of the impact of global financial conditions on Australia specifically, see Jacobs (2019).

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China's Labour Market: COVID-19 and Beyond

Jonathan Kemp and Morgan Spearritt[*]

Photo: d3sign – Getty Images

Abstract

The Chinese labour market has recovered quickly following the sharp economic downturn caused by the COVID-19 pandemic. While widespread lockdown measures in early 2020 pushed large numbers of Chinese workers out of the labour market, successful containment of the virus allowed most of these workers to return relatively quickly. Structural factors – notably a shrinking labour force – are now likely to be the dominant drivers of developments in the Chinese labour market. In the short term, policymakers are considering changes to the retirement age to boost labour supply. In the longer term, the focus of reforms is increasing labour productivity and reducing labour market frictions.

Background

As Australia's largest trading partner, China's economic trajectory affects demand for Australian goods and services. Understanding conditions in China's labour market strengthens our understanding of the Chinese economy. It also informs our expectations of economic policy in China, as employment outcomes are a key focus of Chinese policymakers.

China's labour markets have changed dramatically since the founding of the People's Republic of China in 1949. In the 1950s, the system for registering households – *hukou* – was expanded into one that divided the population into a rural and an urban workforce, and tied those workforces to particular regions. Urban workers were allocated what was essentially a job for life in a state-owned enterprise (SOE), an arrangement colloquially known as the 'iron rice bowl'. Rural workers were assigned land to farm, first in collectives and then individually through the household responsibility system.

Reforms throughout the 1970s, 1980s and 1990s eased these arrangements. New policies enabled rural workers to allocate some of their labour to

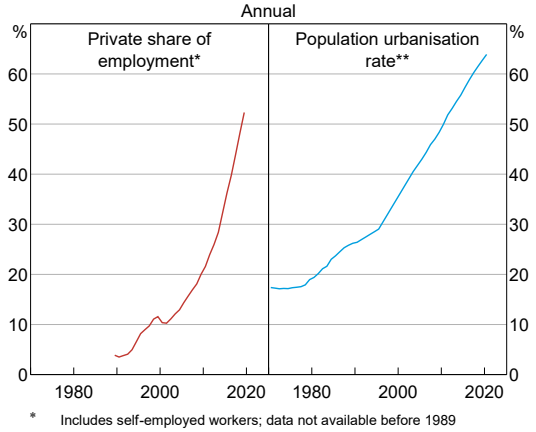
non-agricultural work and eventually allowed them to move into urban areas for work (Meng 2014). China's opening up to foreign investment, reforms to SOEs and the passing of new labour laws in the 1990s led to the marketisation of labour in China, breaking the 'iron rice bowl' of urban workers and allowing them to migrate between cities for work. These reforms reduced labour market frictions and promoted a more efficient allocation of labour, paving the way for the private sector to become the dominant employer in China and driving urbanisation (Graph 1).

While many aspects of China's labour market today are similar to labour markets in other economies, this history has left institutional legacies that have resulted in some unique features that affect both China's labour market itself and its measurement. One such feature is the existence of a large workforce of domestic migrants. These workers – who work and live in one region but hold *hukou* in another – now make up around one-third of China's total labour force and around half of China's urban labour force. The term 'migrant workers' includes both people who hold rural *hukou* but who live and work in urban areas (rural-urban migrants) and people who hold urban *hukou* in one city but live and work in another (urban-urban migrants).[1]

Another point of difference is that some official labour market statistics, most notably the surveyed unemployment rate, only capture people living in urban areas (including migrant workers). When China's rural population was purely an agricultural workforce allocated land to farm, they could be assumed to have guaranteed employment, making the measurement of rural labour market outcomes redundant. Rural residents can now engage in non-agricultural work, and can seek and lose employment – meaning they cannot be assumed to have guaranteed employment. Yet residents of rural areas are not captured by the monthly labour force survey, leaving this part of China's labour market largely unmeasured.

Graph 1

China – Employment and Population Trends



The interaction of these factors can distort statistics generated by the monthly labour market survey. If a rural-urban migrant loses their job and remains in an urban area, they will be captured by the monthly labour force survey and recorded as unemployed. However, if they return to a rural area on losing their job, they would no longer be captured in the survey and this would manifest as a reduction in the urban labour force. While the impact of this distortion will diminish as China becomes more urbanised, it is a significant consideration for understanding labour market data today. While not explored in this article, the reclassification of rural areas as urban areas can also affect labour market and urbanisation statistics (Berkelmans and Wang 2012).

COVID-19 greatly affected the labour market, but the recovery was swift

China's GDP fell by 9 per cent in the March quarter of 2020 – the largest quarterly decline in decades – as authorities shut down large parts of the economy in an effort to contain the spread of COVID-19. By February, urban employment (which includes migrant workers) had declined by around 16 per cent (70 million) from its pre-COVID-19 level.[2] In addition, average hours worked among those still employed fell sharply. Together, this suggests that total urban hours worked declined by more than 30 per cent between December 2019 and February 2020 – a larger fall than implied by indicators of economic activity (Graph 2).

Urban employment and average hours rebounded strongly in March as authorities began to lift restrictions. The recovery then continued more gradually and reached pre-COVID-19 levels around June 2020. By December 2020, employment had

recovered to be consistent with its pre-pandemic trajectory.

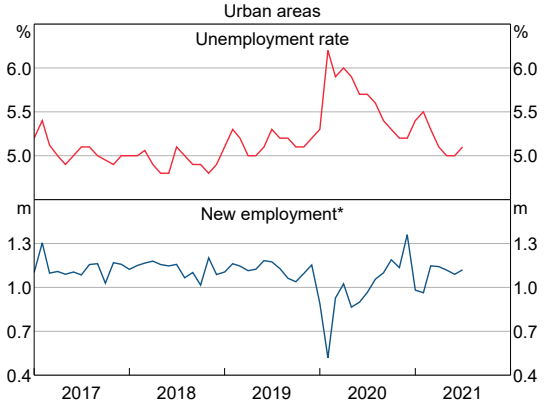
Despite the large fall in urban employment, the surveyed urban unemployment rate increased only moderately, as the vast majority of urban workers who lost jobs during the COVID-19 downturn left the urban labour force. The limited response in the unemployment rate could be because workers left the urban labour force entirely (because they were not looking for work or were unable to begin work if offered a job) or they were no longer captured by the monthly labour market survey due to a change in their residential area or both. China's urban surveyed unemployment rate rose from 5.2 per cent in December 2019 to a high of 6.2 per cent in February 2020, and has fallen since to be around its pre-COVID-19 level (Graph 3). This relatively small rise in the unemployment rate, combined with the large fall in employment, suggests a sharp fall in the urban participation rate. New urban employment – the number of gross new jobs created in urban areas and one of two key metrics used by the Chinese Government to assess the health of the urban labour market – fell by more than half in early 2020.

Migrant workers accounted for most of the fall in the urban labour force (Graph 4). This is because migrant workers are concentrated in industries that were hit most heavily by the lockdowns, particularly in services such as retail and hospitality (Wang 2020). In addition, many migrants who returned to their hometowns for Chinese New Year were stranded there when movement restrictions were imposed; this may have hampered their ability to search for work if laid off and almost certainly would have limited their ability to begin work if offered employment in the city where they usually live. In this case, only after these migrants began to return to cities were they able to re-enter the urban labour force and their joblessness could be recognised as unemployment. While the vast majority of migrant workers who stopped working out-of-province early in 2020 had returned by June 2020, a small proportion still have not.

Given the data limitations, it is harder to assess how the pandemic affected labour markets in rural areas than in urban areas. As in cities and towns, rural neighbourhoods were locked down at the height of

Graph 3

China – Labour Market

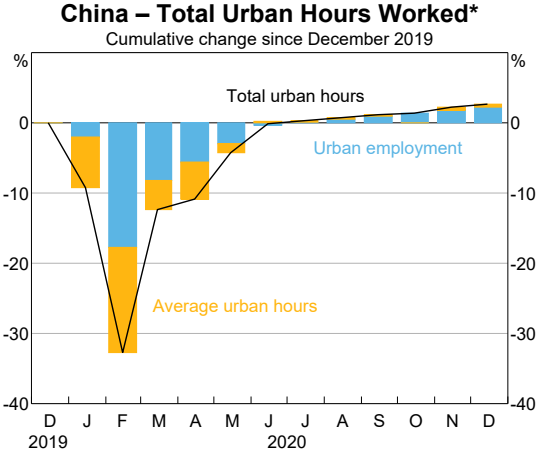


* Seasonally adjusted

Sources: CEIC Data; RBA

Graph 2

China – Total Urban Hours Worked*



* Authors' estimates based on statements by NBS officials and published unemployment rate; the level of employment is generally linearly interpolated in months when no data is available

Sources: CEIC Data; RBA

Graph 4

China – Migrant Workers*

* Seasonally adjusted by the RBA; quarterly after September quarter 2010; earlier estimates are sporadic and marked with dots

Sources: CEIC Data; NBS; RBA

the initial wave of infections, with very limited movement permitted. A survey of rural residents in mid February 2020 found that non-farm economic activity had virtually ceased, either because employers had closed or because of challenges with transport to work.[3] A follow-up survey in April, when many restrictions had been lifted, suggested only a slow resumption of activity and employment in rural areas (Wang *et al* 2021). Per capita household income from wages fell more sharply in the first quarter of 2020 for rural residents than for urban residents; in part, this may reflect falls in income for temporary migrant workers (those who have been in cities for less than six months) who are classified as rural residents (Graph 5). It is also possible that the return of those migrants from cities greatly increased the pool of available workers in rural areas, leading to more competition for scarce jobs and putting downward pressure on wages. As many migrants returned to cities over the remainder of 2020, rural wages income recovered strongly.

COVID-19 impacted China's economy in a unique way

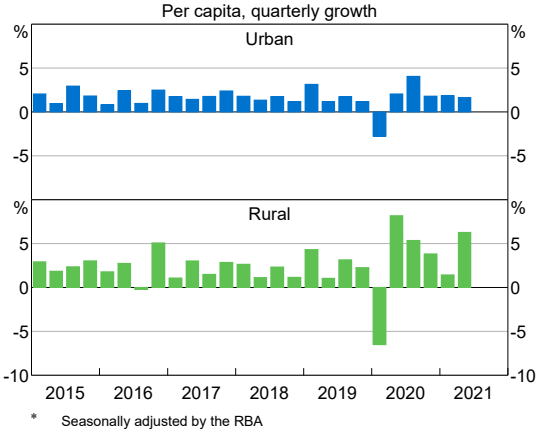
The fall in Chinese employment was sharper than in major advanced economies in 2020 and the recovery was swifter (Graph 6). The sharper fall reflects that China's lockdowns were more quickly and strictly imposed than in other economies and that the government's economic response did not include the kind of wage subsidies designed to preserve firm–employee relationships that some other governments pursued. The more rapid recovery largely reflects that virus containment measures were ultimately successful in containing COVID-19 more quickly than in other economies. Mass testing and restrictions based largely on individual health-risk status (a system administered by mobile applications) has meant that subsequent outbreaks have been contained relatively quickly and with minimal economic disruption (IMF 2021). The fact that widespread lockdowns were relatively short-lived may have resulted in their lasting effects being less pervasive in China than elsewhere. Another factor assisting this could be the high informal (non-contractual) share in Chinese employment (particularly among migrant workers), which increases the labour market's flexibility, making it relatively simple for employers both to lay off workers and to hire again.

The effective containment effort led to the industrial sector rebounding quickly once lockdowns were lifted. Firms were able to implement distancing strategies to protect workers while resuming business. Manufacturing also benefited from booming global demand for consumer goods, particularly because manufacturers in China were able to resume production at the same time manufacturers in other economies were entering lockdowns (Graph 7). This supported employment in manufacturing to the

Graph 5

China – Income from Wages*

Per capita, quarterly growth



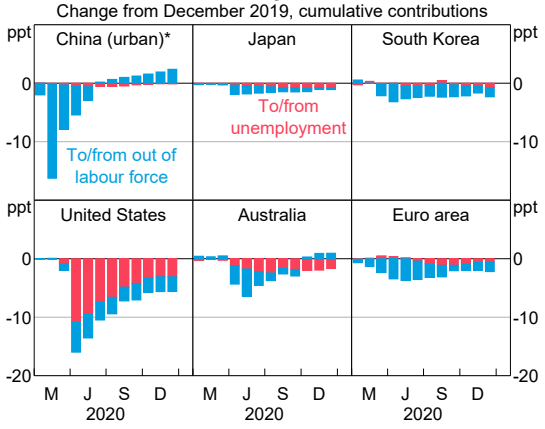
* Seasonally adjusted by the RBA

Sources: CEIC Data; RBA

Graph 6

Employment

Change from December 2019, cumulative contributions



* Authors' estimates based on statements by NBS officials and published unemployment rate; for China, the level of employment is generally linearly interpolated in months when no data is available

Sources: CEIC Data; RBA

point that employers in coastal provinces have reported difficulty recruiting workers (Liu 2021).

More closely mirroring outcomes in other economies, China's services activity, which depends much more on human contact than manufacturing, was slower to recover. The number of migrant workers, who make up a large share of employment in services sectors, remains below its pre-pandemic level (Liu 2021). Eastern provinces, where demand for labour in factories was particularly strong, saw the biggest fall in in the number of migrant workers leaving to work elsewhere (National Bureau of Statistics 2021a). So, while industrial employment expanded in 2020 for the first time since 2012, annual growth of services employment slowed sharply.

With COVID-19 contained and businesses able to resume operation, authorities made labour market stability a key policy priority. Unlike in advanced economies, where many governments provided income support directly to households to support them through lockdowns, containment of COVID-19 allowed Chinese authorities to support household incomes indirectly, mainly by trying to keep firms in business. Key measures to support firms included easing cost pressures (including taxes and fees) and providing access to concessional loans (IMF 2021). The focus has particularly been on micro and small businesses, which are large employers of service sector workers. The government has also provided job-seeking assistance for specific groups affected by the pandemic, including new university graduates and migrant workers (State Council of the People's Republic of China 2021).

Despite the strong rebound, total employment in China remained below its pre-pandemic level by the end of 2020. Rather than being driven by cyclical factors, this largely reflects a key long-run trend: China's working-age population has now been falling for several years, limiting the size of the labour force available for employment. Other long-run trends were again present in 2020 – for example, rural employment has been falling for around two decades (and as a share of total employment since the 1960s) (Graph 8). The promise of higher wages in the cities has driven migration to urban areas and into the higher-productivity industrial and services sectors.

Looking forward, demographic changes are presenting challenges for policymakers

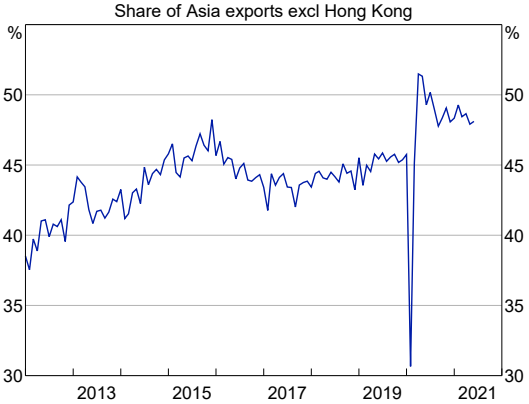
With China's economy now largely recovered from COVID-19, policymakers have increasingly turned their attention to long-run, structural considerations. Core among these is that China's ageing population and shrinking labour force present significant labour market challenges. The release of the 2020 national census results in May this year renewed the focus on demographics.

Once a key driver of the Chinese economy, population growth has slowed in recent decades (Graph 9). The main reason is a declining birth rate;

Graph 7

China – Merchandise Exports*

Share of Asia exports excl Hong Kong



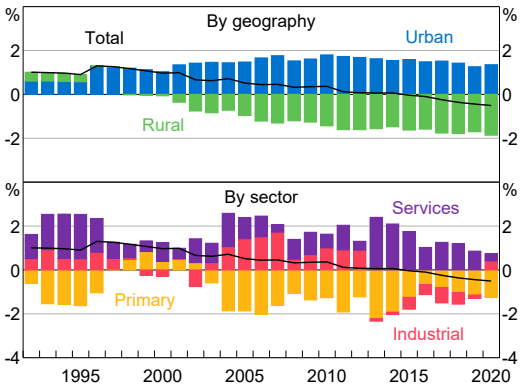
* Seasonally adjusted by the RBA; includes China, Japan, Taiwan, Singapore, South Korea, Thailand, Indonesia, Malaysia, Philippines and India

Sources: CEIC Data; RBA; Refinitiv

Graph 8

China – Employment Growth

Annual with contributions



Sources: CEIC Data; RBA

between a baby boom in the mid 1960s and the start of the 1980s the birth rate halved, and has since halved again. While policy constraints have played a role, notably the 'one-child' policy initiated in the 1980s, the falling birth rate is also the result of changing preferences for smaller families as living standards improved and the cost of raising children increased (Cai 2018; Lim and Cowling 2016). This shift in preferences – which has also been seen in other economies, albeit usually at a higher level of GDP per capita – means that China's population is considered likely to peak within the next decade irrespective of the recent relaxation of restrictions on births (discussed in more detail below).[4]

Combined with very limited immigration, the falling birth rate has gradually reduced the pool of potential workers for China's labour force. The working-age population peaked in 2013 at just over one billion. This headline number masks some underlying disparities – for example, the working-age population in urban areas has continued to rise due to ongoing internal migration and urbanisation, but peaked in rural areas in the mid 1990s. A declining pool of workers and a gradual rise in the share of the population that depend on them will increasingly weigh on development in rural areas and the capacity of governments to raise enough revenue to fund increasing social security obligations.

Policymakers are exploring options to boost labour supply …

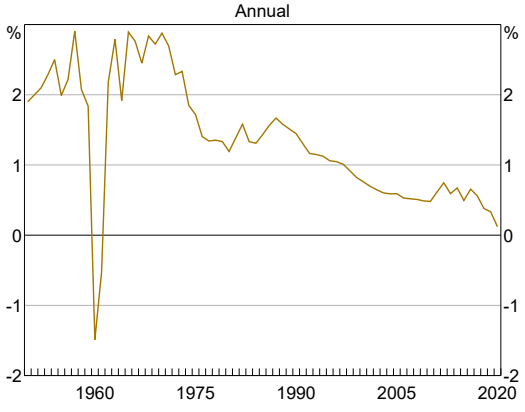
In responding to these demographic pressures, authorities have begun discussing a range of options to boost labour supply. In the short term, authorities have announced changes to the retirement age that are expected to offset some of the decline in labour supply. Policymakers have also announced a phased rise in the statutory retirement ages, which have remained at 60 years for men and 50–55 years for women for more than seven decades. These are low retirement ages by international standards (Wang 2021). As noted by Roberts and Russell (2019), a scenario in which the retirement age were to equalise across the sexes and gradually increase from 60 to 65 between 2021 and 2035 would result in a boost to the working-age population (Graph 10). However, without a change to the trajectory of fertility rates, the working-age population would begin to decline again in the mid 2030s and by 2045 would be back at 2021 levels. An upside scenario that incorporates both increases in the retirement age and a birth rate that rises to 2.1 births per woman (considered necessary for replacement) would see China's working-age population stabilise, oscillating between 93 per cent and 105 per cent of its 2020 level over the remainder of the century.

Policymakers are also considering measures designed to increase birth rates, remove frictions to internal migration and keep people in the workforce for longer. While authorities recently announced a three-child policy, consensus among

Graph 9

China – Population Growth

Annual

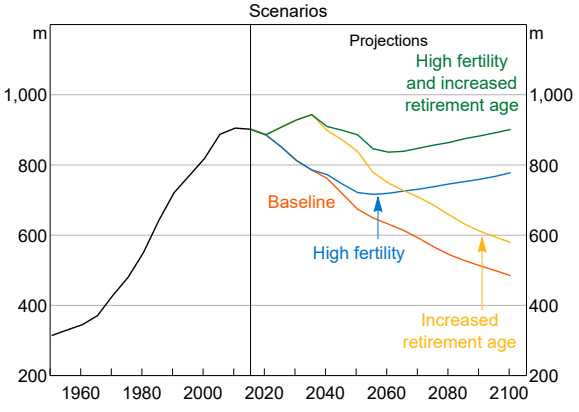


Sources: CEIC Data; RBA

Graph 10

China – Working-age Population

Scenarios



Sources: RBA; United Nations

policymakers is that this policy alone is unlikely to materially raise China's birth rate (Chen *et al* 2021; Xinhua 2021a). When China relaxed its one-child policy to a two-child policy between 2013 and 2015, the impact on birth rates was muted. In a 2019 survey, more than half of Chinese parents cited increased economic burden and lack of childcare as barriers to having a second child (Xinhua 2021a). Policymakers have announced plans to focus on reducing the economic burden of raising children by increasing the supply of affordable childcare, improving prenatal and infant healthcare and providing direct government payments to parents of second and third children in some provinces (Xinhua 2021b). As demonstrated by Roberts and Russel (2019), in a scenario where such policies were successful in raising the birth rate to the 2.1 replacement level, working-age population would still decline until around 2050 (Graph 10).

Currently, policymakers appear unlikely to embrace immigration as a means of materially boosting the size of the labour force. The 2020 census showed that just 0.1 per cent of people residing in Mainland China were from other parts of the world and almost 40 per cent of those came from Macao, Hong Kong and Taiwan (National Bureau of Statistics 2021b). Naturalisation is rare. While data on naturalised citizens from the 2020 census has not yet been released, data from the 2010 census showed just 1,448 of China's over 1.3 billion citizens were naturalised (National Bureau of Statistics 2010). This seems unlikely to change significantly. Draft regulations circulated in early 2020 that would have opened more pathways to permanent residency for foreigners were met with concern from the general public, and authorities committed to absorb public opinions and amend the regulations before issuing them (Xinhua 2020).

… and other reforms may boost labour productivity

A range of other policy reforms already underway could help increase labour productivity, mitigating some of the impact of a shrinking labour force. Increased rural-urban migration, facilitated by relaxation of China's *hukou* system, has been a significant driver of increases in productivity in China for a number of decades by reallocating labour from agriculture to higher-productivity sectors (Cai 2018). While China has already reaped large productivity gains from this reallocation, official statistics show a quarter of its workforce remains employed in the primary sector (Graph 11). While some estimates suggest the true figure is perhaps as much as 10 percentage points lower, this would still be higher than the average for high-income economies (under 3 per cent) and other economies in the region including South Korea (5 per cent) and Malaysia (10 per cent) (Cai, Guo and Wang 2016; World Bank 2021). This suggests there is still some scope for China to further increase productivity through rural-urban migration.

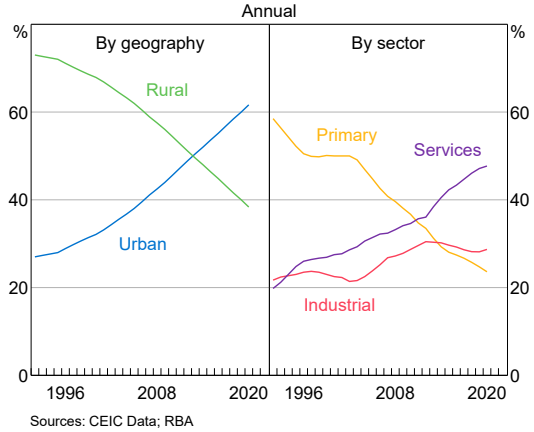
In addition, productivity differs between provinces and within different parts of the non-agricultural economy (Cai 2018; World Bank 2020). This suggests that increased urban-urban migration that allows labour reallocation within sectors could also boost overall labour productivity. Frictions to urban-urban migration in China remain and policymakers have flagged reforms that could address these (National Development and Reform Commission 2021).

While *hukou* reforms have been underway for many years and restrictions have slowly relaxed, the *hukou* system still links Chinese people to a particular region. Those without *hukou* in their city of residence (be it rural-urban migrants or urban-urban migrants) are often prohibited from purchasing property there and can struggle to access social services that are funded by provincial

Graph 11

China – Employment Shares

Annual



Sources: CEIC Data; RBA

governments for themselves and their dependents. This can inhibit a worker's ability to move to other regions for work or force them to leave their children and parents behind if they do. While there is a process for Chinese people to convert their *hukou* from rural to urban and to move it from one region to another, this can be difficult – particularly if they wish to move to already large cities like Beijing and Shanghai. Central authorities have instructed provinces to remove or relax restrictions on *hukou* eligibility in smaller cities and a number of provinces are rolling out new systems designed to facilitate these transfers more efficiently (Xinhua 2019; Xinhua 2021c).

Links between the *hukou* registration location and provision of health care also weigh on the length of time rural-urban and urban-urban migrant workers choose to remain in the workforce. Workers face increased health care costs as they age and there is evidence that despite attempts to make health care more accessible for migrant workers, they still struggle to access health insurance cover where they work (Chen *et al* 2020). As such, the incentive to return to the region in which they hold *hukou* increases as they age. Improving their ability to access insurance cover where they work (but do not hold *hukou*) may make it feasible for them to work in other regions for longer. To support such changes, policymakers would also need to address how funding for these services can be reallocated as people move around the country, as many of these services are funded by provincial governments or provincial insurance schemes. While efforts have been made to improve migrant workers' access to services over a number of years, authorities are continuing to work on improving nationwide coverage of social services and ensuring the fiscal expenditure system can support this (National Development and Reform Commission 2021).

Authorities are also targeting an increase in average education levels as a means to lift productivity and counter the effects of a falling working-age population. Education levels have gradually risen in recent years. By 2025, China's most recent Five-Year Plan aims to raise average years of schooling of its working-age population to 11.3, from 10.8 in 2020 (National Development and Reform Commission 2021).

While an aggregate rise in education levels would help to lift productivity, there are also gains to be made from addressing disparities within China. For example, the share of rural residents with an education at senior-middle school or higher is less than half that of urban residents, and rural residents are more than twice as likely to be unschooled (Graph 12). As well as reflecting a generally lower-quality education system in rural areas, lower rates of education among the rural population may be due to greater demand for highly skilled workers in urban areas. Both factors depress productivity in rural areas and authorities are responding with a range of policies designed to improve the education services in rural areas and encourage the flow of urban professionals to rural areas (Ministry of Education, National Development and Reform Commission, and Ministry of Finance 2021; Ministry of Agriculture 2021) .

Summary

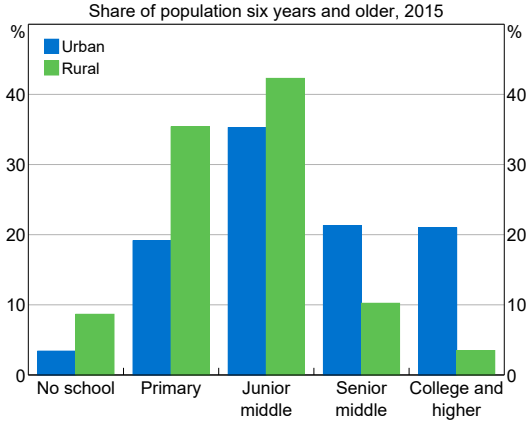
China's labour market has undergone profound changes over the past 70 years and it will continue to evolve in the decades to come as demographic pressures weigh and the government institutes new reforms.

The rapid recovery of China's economy from COVID-19 lockdowns early in 2020 provided support to global growth in a year when most economies contracted. China's large manufacturing

Graph 12

China – Highest Level of Education

Share of population six years and older, 2015



Sources: CEIC Data; RBA

and construction sectors resumed production quickly once restrictions were lifted, as firms rehired migrant workers who had exited the workforce. Services sectors have been slower to recover, but are likely to resume their role as important drivers of employment growth in China once sporadic outbreaks of COVID-19 cease.

With China's population widely expected to decline in the period ahead, policymakers are developing a series of policies to address this transition. The labour market and other economic reforms that Chinese policymakers are now considering will also have significant implications for China's economy and, given its size, the global economy. How policy-makers navigate these transitions will influence economic outcomes in China and its trading partners for decades to come.

Footnotes

[*] The authors are from Economic Group. They would like to thank Lynne Cockerell, David Norman, Ivan Roberts, Tom Rosewall, Carl Schwartz and Kate Hickie for their advice and comments on earlier drafts.

[1] Urban *hukou* holders rarely migrate to rural areas.

[2] The National Bureau of Statistics (NBS) does not release a time series of the monthly net change in employment; the estimate here was calculated based on statements made by NBS officials throughout 2020, with months in which data was not included in media statements linearly interpolated.

[3] The decline in national primary sector output in the first quarter of 2020 was shallower than for other parts of the economy and output swiftly regained its pre-pandemic trend once restrictions were lifted.

[4] A 2019 report by the Chinese Academy of Social Sciences, a state-sponsored think-tank, projected China's population will peak in 2027 (Shi 2019).

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China's Evolving Financial System and Its Global Importance

Nicole Adams, David Jacobs, Stephen Kenny, Serena Russell and Maxwell Sutton[*]

Photo: Filippo Maria Bianchi – Getty Images

Abstract

China's economic policy response to the COVID-19 pandemic has been less stimulatory than the response after the global financial crisis because Chinese authorities have sought to avoid fuelling risks in the financial system. Indeed, the authorities have continued with reforms to make the financial system more market-based so that it can better support China's economy, although the state continues to play a central role in the financial system. At the same time, China has become increasingly important for international financial markets, mainly due to its weight in international trade but also because certain cross-border capital flows are rising.

Introduction

In the years following the global financial crisis (GFC), Chinese policymakers supported a period of rapid economic growth despite the weak global environment. This stimulus resulted in strong credit growth and was accompanied by a rise in financial vulnerabilities.[1] The stock of debt rose substantially, concentrated in state-owned enterprises (SOEs) that were burdened by over-capacity (Graph 1). An opaque and largely unregulated 'shadow' financial system emerged. This was accompanied by a widespread belief that a range of financial assets would be guaranteed by the state. In addition, an easing in the economy's trend rate of growth has meant that it has become harder to 'outgrow' any problems in the financial system (Roberts and Russell 2019).

Some years ago, the Chinese authorities began to focus more attention on reducing financial risks, along with a number of other long-term goals (such as environmental sustainability), accepting slower growth in the process. These efforts were successful in a number of ways. Economy-wide leverage stabilised, albeit at a high level relative to other economies at a similar stage of development. The stock of shadow financing declined from

60 per cent to 45 per cent of GDP as regulatory scrutiny was tightened and the bond and equity markets were developed as more transparent alternatives (Sutton and Taylor 2020). In addition, the authorities demonstrated a willingness to allow some investors to incur losses on a range of assets previously assumed to be guaranteed by the government.

The rise in vulnerabilities over the past decade or so has shaped the policy responses to the pandemic, as is discussed in the first part of this article. The article then turns to the long-running efforts to reconfigure the way that the Chinese financial system supports the economy, which has gained renewed focus since the onset of the pandemic. Finally, the article puts these developments into an international context, by examining how the global importance of the Chinese financial system is changing.

How has the pandemic response been affected by risks in China's financial system?

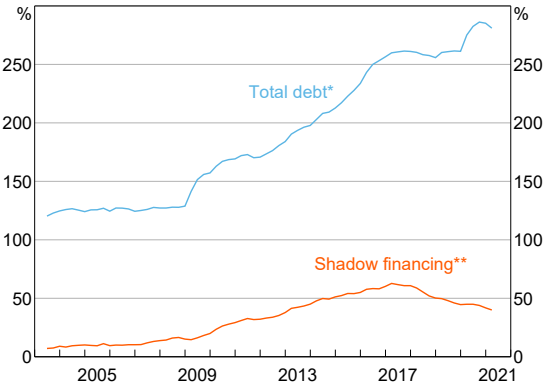
With work still to be done to address these financial system vulnerabilities at the outset of the COVID-19 pandemic, the authorities have been alert to avoiding a further rise in systemic risks where possible. In particular, the *scale* of monetary stimulus in response to the pandemic has been modest, particularly compared with the large-scale easing during the GFC. Credit growth rose but by far less than in earlier episodes (Graph 2). Interest rates on bank loans declined by around 50 basis points compared with around 200 basis points during the GFC.

Monetary stimulus has also been quite *targeted*, favouring specific borrowers to avoid fuelling a further rise in systemic risks. There has been renewed emphasis on banks orienting credit towards small and medium-sized businesses rather than SOEs. These firms tend to have more sustainable debt loads and have faced more difficulties obtaining finance (particularly during the earlier campaign to reduce financial risks) (Graph 3). At the same time, various steps have been taken to avoid unnecessary stimulus of the property market, including limits on lending for mortgages and to higher-risk property developers.

Graph 1

China – Non-financial Sector Debt

Per cent of nominal GDP



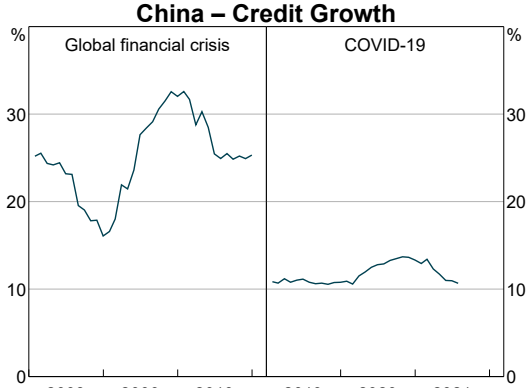
* Total debt is the sum of bank credit, shadow financing and bond financing (both corporate and public)

** RBA estimate

Sources: CEIC Data; RBA; WIND Information

Graph 2

China – Credit Growth

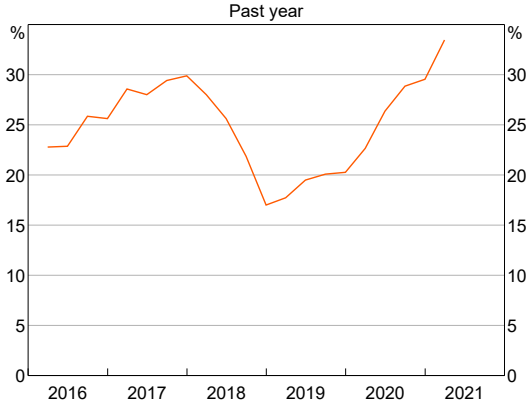


Sources: CEIC Data; RBA

Graph 3

Medium and Small Enterprises' Share of New Business Financing

Past year



Sources: CEIC Data; RBA

This approach has been aided by the successful containment of the virus and the strong recovery in demand for China's exports, which has seen the economy quickly return to its pre-pandemic trajectory.

The more modest expansion of credit in this episode also reflected a smaller degree of fiscal stimulus (Graph 4). Unlike most economies, a degree of fiscal stimulus in China is often funded by borrowing from the banking system or from shadow finance via local government financing vehicles (LGFVs). That is because fiscal stimulus is delivered largely by local governments and SOEs, in contrast to other economies where fiscal stimulus is reflected mainly in the central government budget balance. To reduce the use of shadow finance and impose a degree of market discipline, in recent years local governments have been encouraged to access the bond market by issuing 'special' bonds linked to specific projects (Holmes and Lancaster 2019).

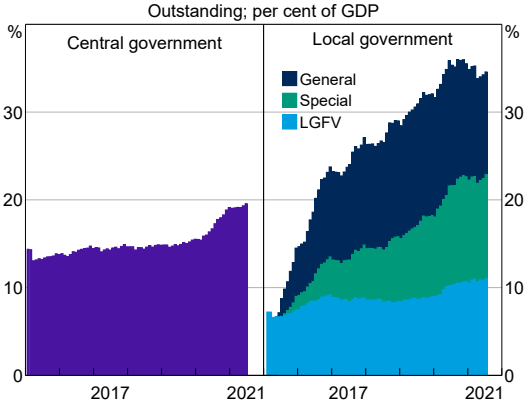
Despite the modest and targeted policy responses to the pandemic, the authorities tolerated an increase in debt relative to GDP (Yi 2020). Further reforms to address the still-large stock of shadow financing were also delayed.

Accordingly, as economic activity continued to recover this year, the authorities proceeded with a tapering of stimulus. At the meeting of the National People's Congress early in 2021, authorities approved a plan to ensure that the growth of credit slows this year, such that it stabilises relative to nominal GDP, and announced a modest tightening of fiscal policy (National Development and Reform Commission 2021). Authorities also chose a GDP growth target for 2021 that could be met provided the economy did not subsequently contract, limiting the potential for conflict between that target and measures to reduce financial risk. As intended, credit growth has slowed to a rate that has been in line with the growth of nominal GDP.

Graph 4

Chinese Government Bonds

Outstanding; per cent of GDP



Sources: CEIC Data; RBA; WIND Information

How is China's financial system being reformed?

The pandemic has also underscored the authorities' long-running efforts to pursue deeper reforms that improve the stability and efficiency of the financial system so that it can better support economic growth. Historically, the state intervened heavily to ensure that the financial sector supported an investment- and export-led model of economic growth. This included:

1. a heavy bias in the allocation of credit to SOEs over private and/or small enterprises, especially by the dominant state-owned banking sector – even as banks became more commercial, implicit state guarantees meant that SOEs continued to enjoy preferential access to credit
2. controls on interest rates, which were set at artificially low and stable levels – low borrowing rates for SOEs assisted in channelling high rates of private savings into state-led investment at subsidised cost
3. a managed exchange rate and restrictions on capital flows, which prevented domestic savers from moving into higher-yielding assets abroad and insulated the economy from volatility in foreign capital flows (an exception was direct investment in China by foreign corporations, which was typically longer-term and involved the transfer of foreign technologies).

That model was acknowledged as having several drawbacks. First, it contributed to the build-up of financial vulnerabilities. Inefficient investment in the state sector was encouraged, and many investors and borrowers sought better deals in the shadow financial system. As investors progressively sought new ways to earn higher returns, excessive risk-

taking arose in different parts of the financial system. Second, the system lacked key macroeconomic shock absorbers, in the form of a more flexible exchange rate and countercyclical interest rate tools. Third, it tended to deprive fast-growing private-sector industries of finance.

As a result, the authorities have pursued several reforms over the past decade, including: reducing implicit guarantees of SOEs; increasingly using changes in interest rates to influence financial conditions; and gradually opening the capital account and allowing for a more flexible exchange rate. The past year or so has seen some important developments in these areas and posed questions about the future direction of the reform process.[2]

Reducing implicit guarantees

In recent years, the authorities have allowed a series of defaults by entities that were previously assumed to have been guaranteed. That has included SOEs and some large private firms (mainly property developers) (Graph 5). Several small banks have experienced capital shortfalls, resulting in the first bank failures in China in 20 years (RBA 2019). While such defaults remain much less common than in other economies, they are a marked shift from China's past.

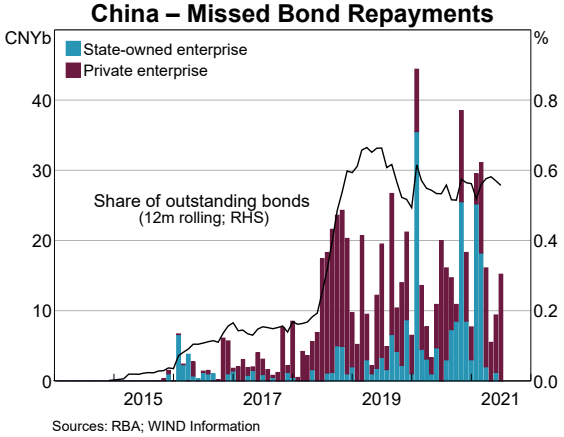
These events mean that investors now face more credit risk than before, and as a result some higher-risk borrowers now find it more expensive and more difficult to obtain credit.[3] In particular, financing conditions have diverged for borrowers in different provinces, because of the important role that has been played by local government backing (Graph 6). Indeed, the central authorities have emphasised that local (rather than central) authorities are responsible for resolving the risks of certain borrowers, notably troubled banks in their provinces. However, the consequences of defaults for local governments can be significant, and some have temporarily extended additional support to local SOEs while they restructure their finances (He 2021).

As a result of the weakening of guarantees, and transfer of credit risk to investors, credit is now starting to be allocated more towards regions that can deploy it more efficiently and sustainably. Regions with industries burdened by over-capacity and shrinking populations tend to have local governments with higher debt burdens, which reduces their capacity to support local firms, both state-owned and private (Feng and Wright 2020; Wright and Feng 2021). That has been the case especially for the provinces in north-eastern China (notably Liaoning) that have been struggling economically. For such provinces, funding costs in the bond market for local SOEs have risen over the past year or so, and credit growth has been slower than in other provinces (Graph 7).

While some state-backed borrowers now face greater scrutiny, improvements in the availability of finance for small and private enterprises have lagged (Bowman 2019; Bunny 2020). The bond market remains heavily dominated by SOEs, while

Graph 5

China – Missed Bond Repayments

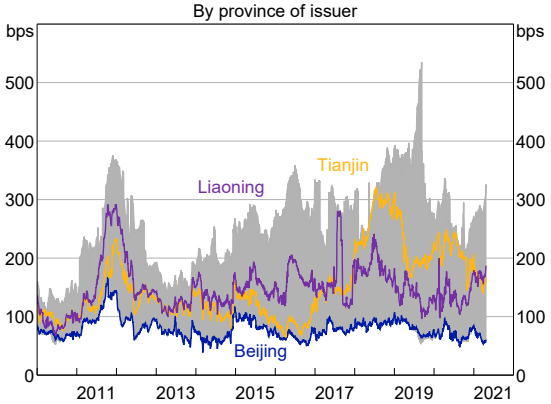


Sources: RBA; WIND Information

Graph 6

China – Corporate Bond Spreads*

By province of issuer



* Average spread to central government bonds across all maturities longer than six months; shaded area shows minimum and maximum spread on each date

Sources: RBA; WIND Information

private firms still face elevated funding costs. To address this, a range of other policies have been used to encourage banks to provide more credit to small businesses and improve private firms' access to equity capital (IMF 2021b).

While helpful for ensuring investments are made efficiently, allowing investors to incur losses has posed a risk of triggering wider financial stress. Each credit event has prompted a reassessment of assets that were previously considered safe. For example, the first small bank failure in 2019 saw interbank funding markets freeze up. Also, the default of a major SOE in late 2020 saw a widening of spreads and corporations found that it was very difficult to raise funds in the bond market for a time. In each case, the People's Bank of China (PBC) has injected substantial liquidity into interbank markets, which has been effective in avoiding wider spillovers to other parts of the system.

Looking ahead, while GDP has recovered quickly and this has alleviated some risks, banks also remain exposed to a rise in non-performing loans. That is especially true of smaller banks, and PBC stress tests at the end of 2020 also indicated that some medium and large banks could fall short of minimum capital requirements even under 'mild' scenarios (PBC 2020) (Graph 8). In some cases, those exposures have risen because of loans extended to smaller firms (which lack a state backstop) or to SOEs whose government backing has weakened. Capital shortfalls among small banks are likely to be resolved slowly with a mix of recapitalisation and acquisitions, but there may also be further bankruptcies (Wu, Zhu and Shen 2020).

Interest rate reform

The authorities have gradually deregulated interest rates over the past couple of decades. Artificially low interest rates encouraged investors to seek higher returns, including in the (less regulated) shadow financial system and by speculating in property. Interest rate controls also made lending to the private sector unattractive because banks could not charge higher rates to compensate for the risks involved.[4]

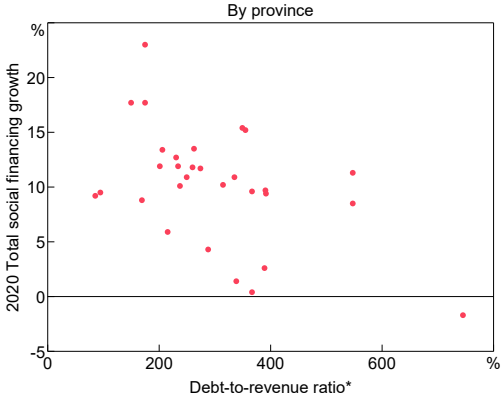
Interest rate controls also meant that short-term interest rates in money markets had little bearing on the rates faced by end borrowers (though those rates were adjusted directly at times). So instead of adjusting short-term interest rates, monetary policy was adjusted by directly guiding banks to expand credit and facilitating this by lowering reserve requirements and extending central bank funding ('quantity-based' tools) (Jones and Bowman 2019).

As interest rates were liberalised, it became more effective to use short-term interest rates as a countercyclical ('price-based') tool. Several other steps were taken that have helped to bolster the effectiveness of this tool further. A deep interbank money market was developed and the PBC improved its control over interbank interest rates (Jones and Bowman 2019). A more liquid yield curve for government bonds was developed, which

Graph 7

Growth in Total Social Financing versus Debt-to-Revenue Ratio

By province



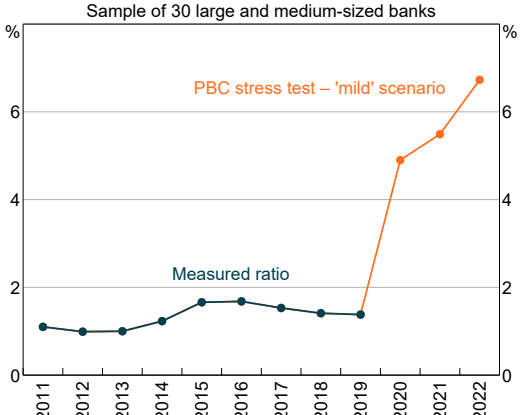
* 2019 debt-to-revenue ratio only includes bond debt

Sources: RBA; Rhodium Group; WIND Information

Graph 8

China – Non-Performing Loans

Sample of 30 large and medium-sized banks



Sources: CEIC Data; People's Bank of China; RBA

embodies expected future short-term interest rates and provides a benchmark for other issuers in the bond market. Finally, interest rates on bank loans were linked to a new benchmark (the Loan Prime Rate, LPR), which tracks rates on the PBC's facilities for lending to banks (specifically, the Medium-term Lending Facility, MLF).

During the pandemic, these new price-based tools were employed as part of the PBC's modest and targeted easing. Money market interest rates were lowered, which transmitted to lower borrowing costs for governments and corporations in the bond market (Graph 9). A small decline in the MLF rate was passed through to the LPR and business lending rates.[5]

Nevertheless, monetary policy still relies on an array of quantitative tools and direct guidance, including as part of the pandemic response (IMF 2021b). Moreover, the incomplete nature of interest rate reform has constrained the use of price-based tools. For example, more of the easing passed through to bank lending rates than to deposit rates (which remain subject to more controls), thereby putting pressure on bank profits (Zhang 2021).

Capital account reform

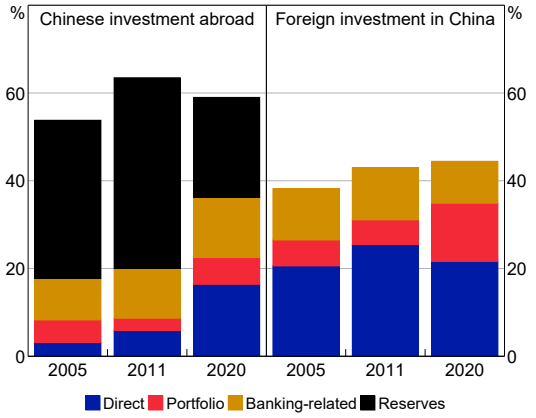
Following the GFC, the authorities opened up further to cross-border capital flows. The overall strategy was to liberalise inflows before outflows, given the potential for sizeable outflows of domestic savings into foreign assets. As well as permitting inflows of 'direct investment' by foreign corporations, cross-border banking inflows were favoured because they were expected to support use of the renminbi internationally and expose the domestic banks to helpful competition (Graph 10). 'Portfolio flows' into bond and equity markets were not liberalised initially, because they tend to be relatively volatile.

With greater openness to capital flows, it was necessary for the renminbi to become more flexible and market-based (Lien and Sunner 2019). But in 2015, a slowing of the economy and an easing in monetary policy prompted more capital outflows and pressure for depreciation, and the authorities intervened to support the currency and halted the process of opening up (McCowage 2018) (Graph 11).

Graph 10

China – External Position

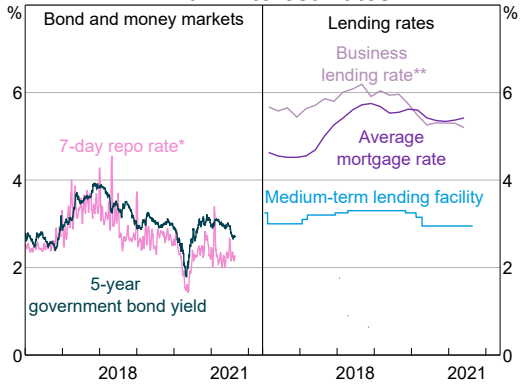
Per cent of GDP



Source: IMF

Graph 9

China – Interest Rates



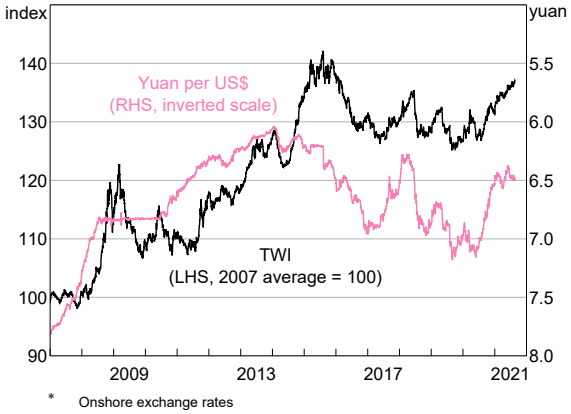
* 14-day rolling average

** Proxy based on the average general bank lending rate

Sources: Bloomberg; CEIC data; RBA

Graph 11

Chinese Renminbi*



* Onshore exchange rates

Source: BIS

Since then, there have been several steps towards liberalising capital flows. Most importantly, foreign portfolio investors have been given much greater access to Chinese bond and equity markets. That is seen as helpful for developing these markets, as well as supporting the use of the renminbi in international finance and trade. Specific steps include: the opening of 'connect' schemes between exchanges in China, Hong Kong and London (with more under development); the inclusion of Chinese onshore bonds and equities in international indices that form a benchmark for around US$8 trillion of investments; and giving foreign investors more access to derivatives markets to manage the risks of their investments.[6]

As a result, portfolio inflows have, for the first time, been among the largest sources of foreign capital inflows to China, even exceeding direct investment in recent quarters (Graph 12). Moreover, recent inflows have been mainly from private investors, rather than reserve managers and sovereign wealth funds as seen in the past. These private inflows reflect a 'latent' demand by investors to hold Chinese assets, motivated by the diversification benefits and the relatively high returns of Chinese assets. To date, investments in the bond market have been almost exclusively in sovereign (or quasi-sovereign) bonds because investors have been reluctant to take credit exposure to Chinese local governments or SOEs (Graph 13). These inflows could have much further to run if investors eventually match new benchmark weights (Lien and Sunner 2019).

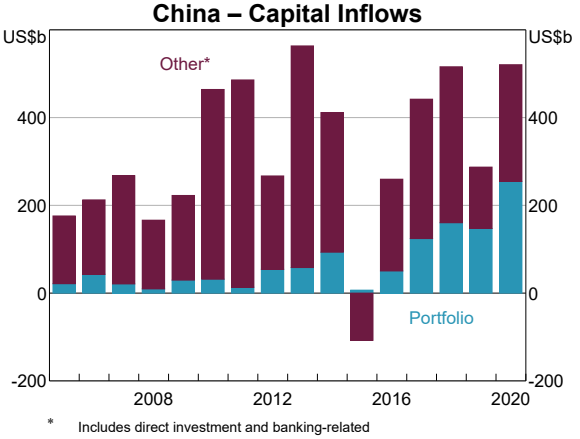
More freedom in the movement of private capital has been associated with more exchange rate flexibility. That has most recently been reflected in an appreciation, given the stronger recovery of the Chinese economy and the fact that controls on capital inflows have been eased more than those on outflows.

A key issue remains how far China will ultimately pursue an opening of its capital account. The size of foreign holdings of Chinese securities remains small compared with other economies. Indeed, the fact that debt in China continues to be owned mainly 'internally' (and in domestic currency) rather than by foreign investors gives the authorities considerable scope to control the pace of any deleveraging (Graph 14).

As well as gradually allowing more capital flows, the authorities have promoted the use of renminbi more widely outside China in both trade and finance. Greater international use of the renminbi would allow Chinese entities to conduct international trade and access foreign capital with less exchange rate risk and less exposure to potential stresses in the US dollar funding system (Windsor and Halperin 2018).[7] Those efforts have included setting up offshore centres for settling renminbi transactions, developing a pool of offshore renminbi deposits and providing liquidity backstops abroad with bilateral currency swap agreements.

Graph 12

China – Capital Inflows



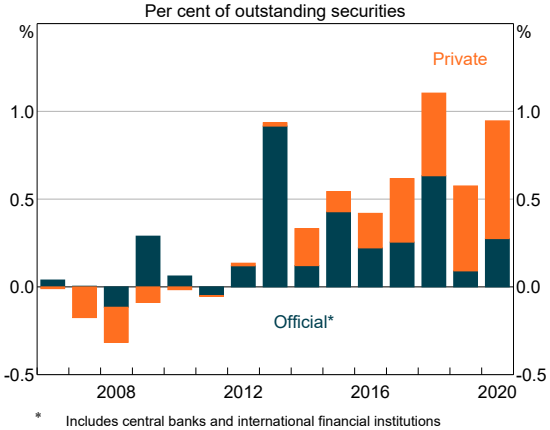
* Includes direct investment and banking-related

Source: CEIC Data

Graph 13

Foreign Purchases of Chinese Government Debt Securities

Per cent of outstanding securities



* Includes central banks and international financial institutions

Source: Sovereign investor base estimates by Arslanalp and Tsuda (2014)

How is China's influence on the global financial system changing?

China has become increasingly important for the global financial system. There are three key aspects of this: China's excess of savings over investment (or relatedly, trade surpluses); China's increased integration with global trade; and China's increased integration with global capital markets and, relatedly, the international use of the renminbi. All three aspects have the potential to influence risk-free interest rates, exchange rates and risk premiums globally.

Historically, China's influence on the global financial system was via sizeable capital outflows

China has long had domestic savings in excess of its domestic investment (Graph 15). China's remarkably high rate of savings is partly a result of its under-developed social safety net (IMF 2021a). This was exacerbated by financial restrictions, especially through the 2000s, which promoted export-led growth. To manage the exchange rate, savings were channelled abroad via the accumulation of foreign exchange reserves, which are invested in the debt of foreign governments. Some observers saw this 'savings glut' as contributing to a persistent decline in long-term, risk-free interest rates globally prior to the GFC (Bernanke 2005).

Since the mid 2000s, the difference between China's savings and investment has declined from 10 per cent of its GDP to about 1 per cent. The rate of saving has declined from very high levels as the economy has begun a transition towards higher levels of consumption. After the GFC there was also an increase in investment, which was associated with rapid growth in credit and related financial vulnerabilities.[8] In that regard, the decline in the extent of the 'external imbalance' has been associated with a rise in 'internal imbalance'.

How far China exports net savings to the rest of the world in the coming years (if at all) will depend partly on how these internal imbalances are resolved. A return to reducing financial system risks could weigh on investment, which by itself would see external surpluses rise. But the authorities are also looking to continue to encourage other sources of domestic demand (i.e. consumption), which would lower the rate of savings, reducing the external surplus. Over a longer period, the ageing of the population and building out of the social safety net could also see the savings rate decline, which might even see China import savings from the rest of the world.

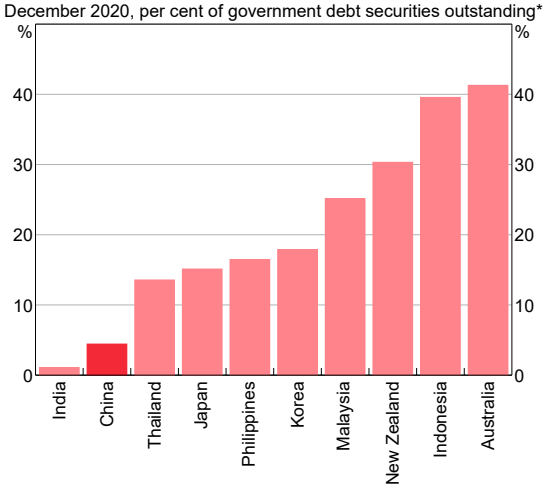
China's large trade flows have given rise to indirect effects on global markets

China now plays a critical role in global trade, as both its imports and exports have grown as a share of the world economy (i.e. in *gross* rather than *net* terms). As a result, China's business cycle has become more important for other economies, affecting interest rates, profits and asset returns globally. In turn, it has had a growing *indirect* effect

Graph 14

Asian Sovereign Debt – Foreign Ownership

December 2020, per cent of government debt securities outstanding*



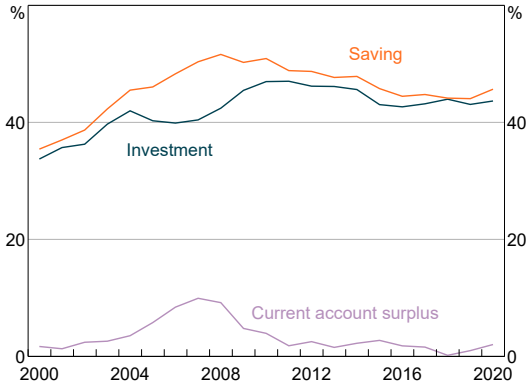
* Includes central, state and local government debt

Source: Sovereign investor base estimates by Arslanalp and Tsuda (2014)

Graph 15

China – Saving and Investment

Per cent of GDP



Source: IMF

on global markets, even while it has remained relatively closed financially.

That growing influence helps to explain the rising co-movements between Chinese and international markets. That is especially marked for equity prices, while co-movements with government bond yields remain lower (Graph 16). For example, the more positive outlook for China's economy over the past year has not only helped to lift equity prices in China but also abroad.

The renminbi now also moves more closely with a range of other currencies (not only the US dollar). This reflects the greater flexibility of the exchange rate to respond to developments in the Chinese and global economies. An improved outlook in China tends to place upward pressure not only on the renminbi, but also on the currencies of commodity exporters (e.g. Australia) and some other economies in Asia that are closely integrated with Chinese supply chains or seek to maintain their export competitiveness with China (Graph 17).[9]

China's direct links to the global financial system have begun to deepen

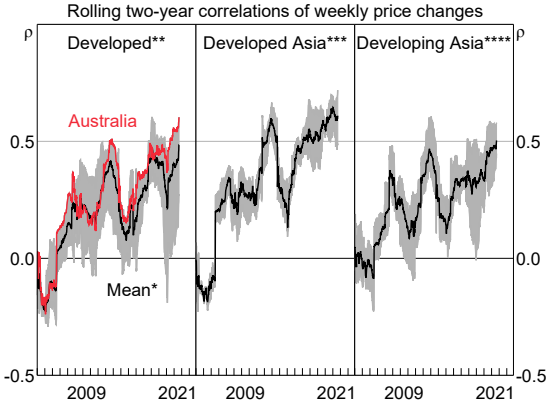
As capital flows have been gradually liberalised, *direct* exposures to Chinese assets in the international financial system have risen. China's share of international portfolios has doubled over the past decade, while international banks' lending into China has also risen. However, the size of these links remains modest, at around 2 per cent of international portfolios and 4 per cent of international banks' cross-border loans (Graph 18).

Meanwhile, China's investment abroad has widened in scope. In the past, this mainly took the form of investments by the state via its foreign exchange reserves. In recent years, direct investments abroad by private Chinese companies expanded significantly. However, from 2016 these slowed substantially, after authorities curtailed a wave of debt-funded acquisitions by Chinese corporations expanding outside of their core areas of business (McCowage 2018). There has also been some easing of restrictions on portfolio outflows, while bank-related outflows continue to play a significant role.

Graph 17

Exchange Rate Correlations with Renminbi

Rolling two-year correlations of weekly price changes

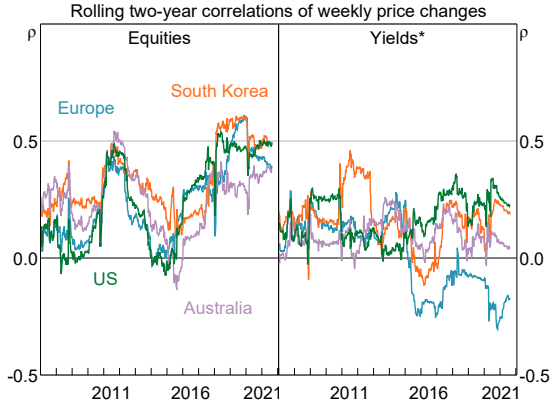


* Shaded area around mean indicates minimum and maximum; all exchange rates against US dollar
** Canada, Japan, UK, Australia, euro area
*** South Korea, Taiwan, Singapore
**** Philippines, Malaysia, Indonesia, Thailand
Sources: Bloomberg; RBA

Graph 16

Correlations with Chinese Financial Markets

Rolling two-year correlations of weekly price changes

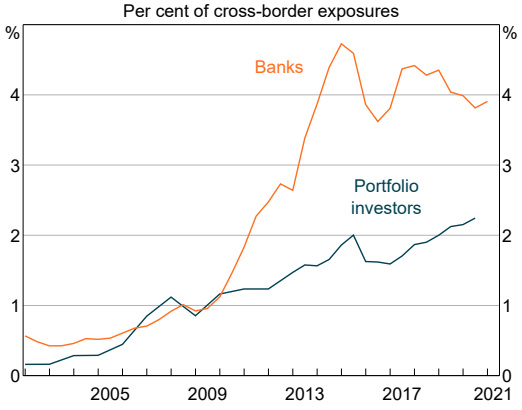


* Five-year government bond yields
Sources: Bloomberg; ECB; RBA

Graph 18

Non-Chinese Entities' Exposures to China

Per cent of cross-border exposures



Sources: BIS; IMF

China affects Australian financial conditions mainly because of its importance for trade

China's effect on Australian financial markets has risen, as it has for many other economies. That reflects deep trade linkages, particularly in relation to Australia's resource exports. The Australian dollar moves more closely with the renminbi than do the currencies of many other advanced economies. That said, many Australian asset prices continue to move much more closely with those in the United States than those in China (Graph 19).

With capital flowing more freely across its borders, China has at times been a source of investment flows into Australia. China is a substantial investor in Australian government debt through its foreign exchange reserves. Chinese corporations have also made direct investments in Australia over the past decade or so, initially in the mining sector but more recently in a broader range of industries (Graph 20). Chinese direct investment in Australia declined in 2020, amid similar declines across other economies; however, it continues to account for a steady share of the stock of total foreign investment in Australia.

Australian investments in China were mainly banking-related in the past, while direct investment has been relatively small. However, Australian portfolio investments in China have become much more important in recent years as market access has improved.

Overall, the size of these investments remains modest. China accounts for only 2 per cent of both foreign investment in Australia and of Australian investment abroad (compared with around one-third of Australia's exports), and Australian investment in China has declined recently. More generally, advanced economies continue to account for over 80 per cent of foreign investment in Australia (Graph 21).

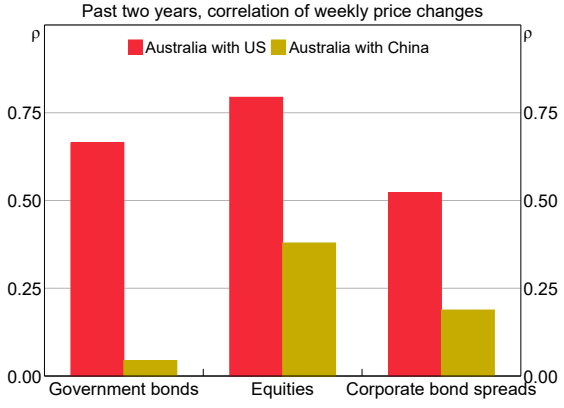
The renminbi's role in the international financial system remains modest

China's efforts to promote the wider international use of the renminbi have seen some limited progress. Most notably, a rising share of payments involving Chinese entities are in renminbi, recently as much as 40 per cent (Graph 22). That reflects increased foreign activity in Chinese securities markets (which are transacted in renminbi) and also

Graph 19

Financial Market Correlations

Past two years, correlation of weekly price changes

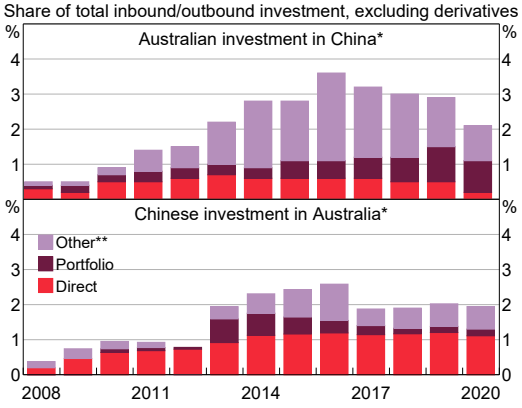


Sources: Bloomberg; ICE; RBA

Graph 20

Stock of Investment

Share of total inbound/outbound investment, excluding derivatives



* Includes mainland China only

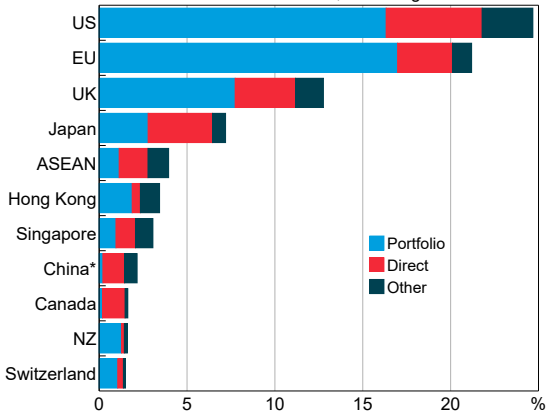
** Loans, currency and deposits, trade finance and other assets

Sources: ABS; RBA

Graph 21

Stock of Foreign Investment in Australia

Share of total stock in 2020; excluding derivatives



* Includes mainland China only

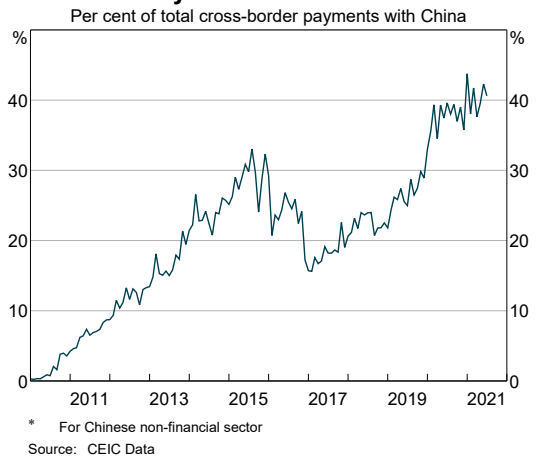
Sources: ABS; RBA

more of China's trade being invoiced in yuan (Windsor and Halperin 2018). But the wider international use of the renminbi (including between non-Chinese entities) remains small for both trade and investment, and well below use of the US dollar, euro and even the Japanese yen and UK pound sterling (Graph 23).

It remains to be seen how widely the renminbi will be adopted internationally. Some observers have suggested that a Chinese central bank digital currency ('an eCNY') might gain greater use internationally (BIS 2021; Feng 2021; Prasad 2020). This is currently a domestically focused project, with objectives similar to those highlighted by some other emerging market economy central banks (such as improving domestic payments and widening financial inclusion). The Chinese authorities have played down the extent to which they expect the existence of an eCNY to drive international use of the renminbi. More generally, to the extent that the renminbi gains increased international use, this is most likely to occur within Asia given the region's integration into Chinese trade and production.

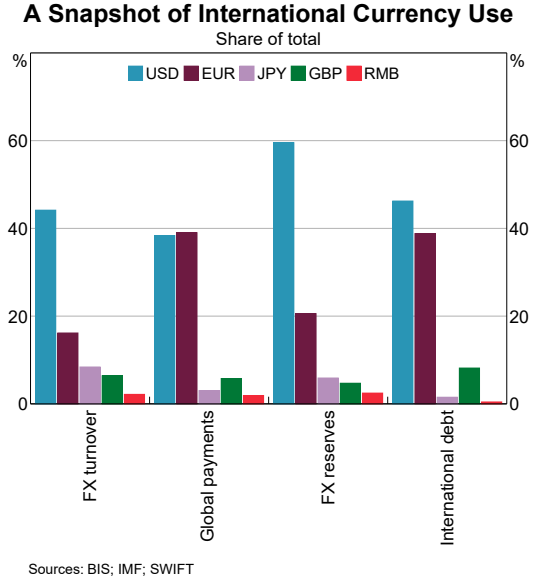
Graph 22

International Payments with China in Renminbi*



Graph 23

A Snapshot of International Currency Use



Conclusion and outlook

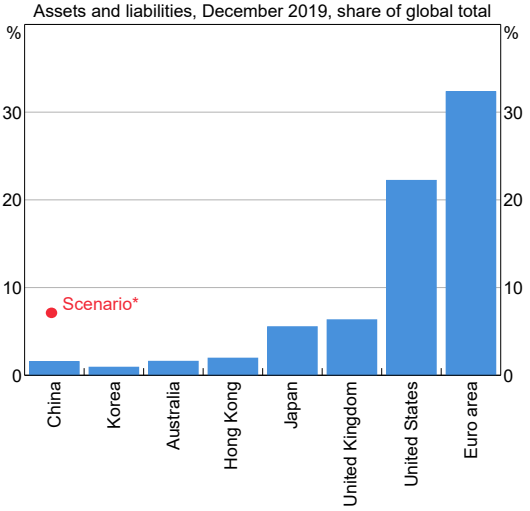
Risks in China's financial system remain elevated despite its economy's strong recovery from the COVID-19 pandemic and the modest and targeted use of monetary stimulus. These risks will continue to shape its economic management in the years ahead, with implications for growth and, in turn, financial conditions in the global economy.

While China has become heavily integrated with the global trading system, its integration with global capital markets is still at a formative stage. It is unclear just how far and how quickly China will open further to international capital flows. The history of other economies suggests that there is merit in proceeding carefully. But China's large size means that any progress will make it much more important for the global financial system. While the scale and nature of this shift is difficult to predict, its importance can be illustrated by looking at what would happen if China's stock of portfolio positions (both inward and outward investments) were to reach 70 per cent of GDP – half that of the United States or Australia, but similar to South Korea. In that case, China would account for around 8 per cent of global portfolio investment, third behind the euro area and the United States (and compared with 1 per cent currently) (Graph 24).[10]

Graph 24

Gross Portfolio Position

Assets and liabilities, December 2019, share of global total



* Chinese portfolio positions if 70 per cent of GDP

Sources: IMF; RBA

More generally, further opening would mean increased holdings of foreign assets by Chinese residents and increased holdings of Chinese assets by the rest of the world. That large rebalancing could affect asset prices and financial conditions differently across regions and markets. If this is a gradual process, it may prove relatively manageable. The renminbi could become a more widely used international currency, especially within Asia. Over time, financial conditions in Australia are likely to be increasingly influenced by the news in Shanghai and Shenzhen alongside New York and London.

Footnotes

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[1] See, for example, Bowman, Hack and Waring (2018).

[2] In its recent 'Article IV Report for China', the International Monetary Fund (IMF) considers the challenges to China's reform process, as well as opportunities for further development. See IMF (2021a) for more details.

[3] This has been reinforced by a range of other policies that restrict the availability of credit for riskier borrowers.

[4] One earlier reason for interest rate controls also diminished over time – namely, to help recapitalise the banking system (by artificially lifting net interest margins) after a severe rise in non-performing loans in the late 1990s.

[5] Policy interest rates have remained well above zero, and so the PBC has not purchased government securities to lower long-term interest rates further.

[6] The 'connect' schemes enable cross-border portfolio investment, between exchanges in Hong Kong and China as well as London and China. While no launch dates have been specified, additional schemes enabling mainland investment in the Hong Kong bond market and two-way investment in wealth management products are expected in the near future.

[7] For a recent analysis of the international role of the US dollar, see Prasad (2019).

[8] From a trade perspective, the decline in the current account surplus reflected a substantial appreciation of the exchange rate, a natural slowing in China's penetration of export markets and a rise in tourism imports.

[9] Statistical methods that identify co-movement with the renminbi more precisely (by abstracting from the common effect of US dollar movements on all exchange rates) also show a rising relationship with exchange rates of other Asian economies (Windsor and Halperin 2018).

[10] See Cunningham, Hatzvi and Mo (2018) for an alternative counterfactual analysis of the removal of restrictions on China's portfolio outflows.

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