Bulletin

OCTOBER 2024

RESERVE BANK OF AUSTRALIA

In the spirit of reconciliation, the Reserve Bank of Australia acknowledges the Traditional Custodians of Country throughout Australia and their connections to land, sea and community.

We pay our respects to their Elders past and present and extend that respect to all Aboriginal and Torres Strait Islander peoples today.

Some graphs in this publication were generated using Mathematica.

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Contents

Do Housing Investors Pass-through Changes in Their Interest Costs to Rents?

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Photo: Isabel Pavia – Getty Images

Abstract

Interest rates and rents often move together. Some have argued that this positive relationship is evidence that higher interest rates have been a key driver of increases in rents over the past few years, due to leveraged housing investors passing through increases in their interest costs to their tenants. This article uses anonymised tax return data covering 2006/07–2018/19 to estimate the direct pass-through of interest cost changes to housing investors' rental income. It finds small pass-through on average, even when interest rates are rising. The largest estimate suggests that direct pass-through results in rents increasing by $25 per month when interest payments increase by $850 per month (the median monthly increase in interest payments for leveraged investors between April 2022 and January 2024). Overall, the results are consistent with the view that the level of housing demand relative to the housing stock is the key driver of rents.

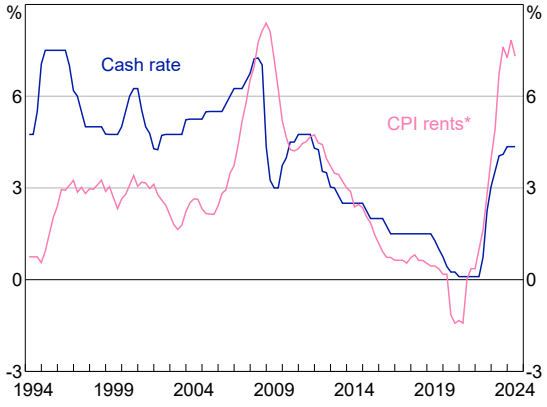
Introduction

Understanding the impact of interest rates on rents is important for the RBA. Rent is the second largest component of the Consumer Price Index (CPI), and so how rents respond when interest rates change will have a large mechanical bearing on the overall inflation response. Around one-third of Australian households rent their home. In 2022, the median renter spent 25 per cent of their disposable income on rent, with low-income households tending to have the highest rent-to-income ratios (Agarwal, Gao and Garner 2023). As such, changes in rents have significant implications for households' spending power and financial wellbeing.

A view that is often put forward is that higher interest rates push up rents in the short term by raising costs for indebted housing investors, which they, in turn, will pass on to tenants.[1] This is intuitive, and at first glance, appears consistent with the aggregate data – interest rates and growth in rents often move together (Graph 1).

Graph 1

Rent Growth and the Cash Rate



* Year-ended growth.
Sources: ABS; RBA.

By contrast, standard economic theory suggests that rents reflect the balance of demand for, and supply of, available housing. This standard view is embedded in models of the housing market that the RBA uses, such as the Saunders and Tulip (2018) model. In these models, the balance of demand and supply of housing is typically summarised by the vacancy rate, which also tracks movements in rent growth (Graph 2). In this framework, higher interest rates have little immediate *direct* effect on rents as the overall supply of housing in the economy is essentially fixed in the short run. But higher rates should reduce rents indirectly by lowering incomes and therefore housing demand.[2]

Pinning down the relationship between interest rates and rents is tricky because both will tend to move together with the economic cycle. For example, a strong economy, with a pick-up in income growth, will see increased demand for rental properties. This will put upward pressure on rents. At the same time, interest rates may be raised to reduce inflationary pressures. So the observation that rates and rents move together may be a case of correlation, rather than higher rates causing higher rents.

One way researchers have tried to better understand this relationship is to trace out the response of rents to higher interest rates but strip out the effect of the economic cycle on both. In principle, this approach should capture any direct pass-through of higher rates to rents, alongside indirect effects higher rates may have on rents by affecting incomes and, over the medium term, housing construction.[3] Overseas work taking this approach finds mixed results from changes in monetary policy on rent inflation (Liu and Pepper 2023; Albuquerque and Lenney 2023; Dias and Duarte 2019). Similar work in Australia finds higher rates have little effect on rents (Moore 2023).

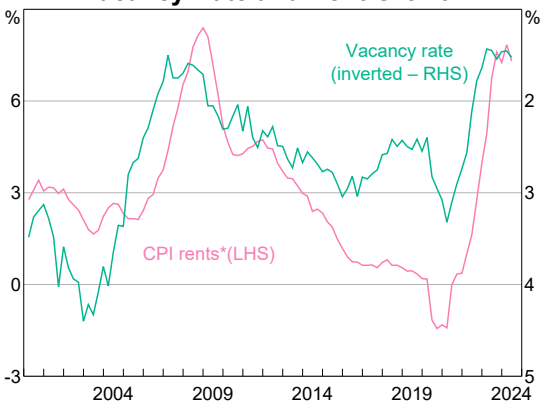
In this article, we take a different approach to specifically study the direct pass-through of interest costs to rents in the short term. To do so, we use detailed anonymised tax microdata. These data are well suited to study this question because we can compare rental outcomes for investors who have different levels of debt, while controlling for economic conditions that might influence rents and interest payments for all investors. The downside is that our approach implicitly assumes that there is limited spillover from highly indebted investors' rents to other less-indebted investors' rents. We think this is a reasonable assumption, as discussed later, but if such spillovers do exist, we may understate the pass-through of rates to rents.

Data

Our dataset covers every investor that filed a personal income tax return in Australia from 2006/07 to 2018/19. The data are annual. We observe an investor's rental income and their mortgage interest deductions, along with their location, total income, age and other demographic characteristics.

Graph 2

Vacancy Rate and Rent Growth



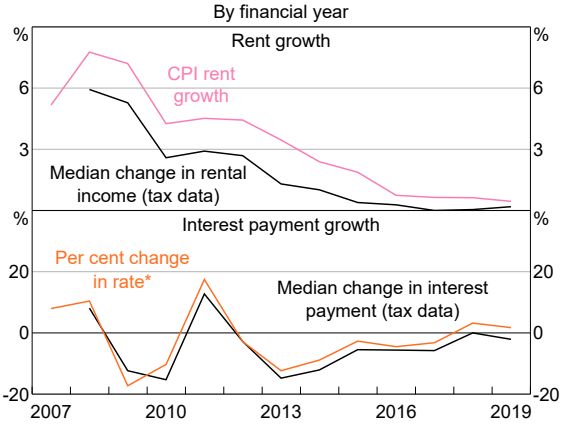
* Year-ended growth.
Sources: ABS; RBA; REIA.

The rental incomes and interest payments coming out of the dataset follow sensible patterns. Median growth in rental income in our dataset closely tracks the trend in CPI rent inflation (Graph 3). And median growth in interest payments closely tracks percentage changes in the indicator lending rate for investors.[4]

Graph 3

Growth in Rents and Interest Payments

By financial year



* Per cent change in indicator lending rate for investors.

Sources: ABS; RBA.

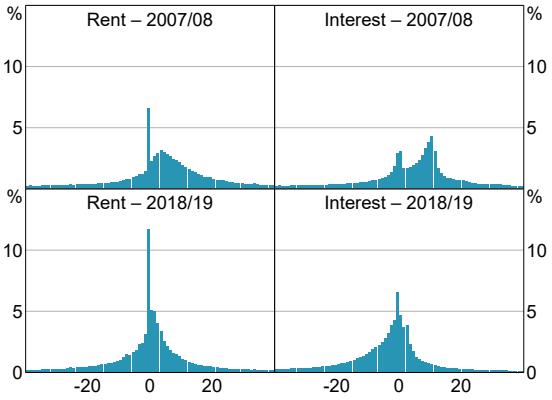
Nevertheless, there is a huge amount of variation in both annual rental income growth and changes in interest payments at the individual level (Graph 4). Much of this variation likely reflects investor-specific factors. For example, if an investor sells their property halfway through the year and pays off their mortgage, both rent and interest costs will halve, even though interest rates may not have changed. These kind of housing transactions introduce a spurious positive correlation between investors' interest costs and rental income: it looks like interest costs and rents move together, but this is not because of pass-through of interest costs to rents.

As such, we try to remove these observations when estimating the pass-through of interest costs to rents. Specifically, we remove observations with very large changes in rental income and, for levered investors, we remove observations where the change in interest payment does not broadly line up with the change in the indicator lending rate (Graph A.2; see Appendix A for details). The idea is that by removing these observations we are isolating cases where an investor retains their existing rental properties from one year to the next, and makes regular mortgage repayments that move in line with the interest rate they face.

Graph 4

Distribution of Annual Changes in Rental Income and Interest Payments*

Selected financial years



* Share of leveraged investors.

Sources: ABS; RBA.

Method

To test whether investors pass-through changes in their interest costs to their rents, we compare changes in rental incomes for investors with different levels of debt. Ideally, we would be able to observe rental growth for two identical properties with different levels of associated debt. Then when interest rates changed, we could compare rental growth for the more indebted property to the less indebted one and confidently learn something about pass-through. For example, suppose there are two fictional investors, A and B, that own identical investment properties next door to each other – the only difference being that A has a large mortgage on their investment property and B owns the property outright. If A increases their rent by more than B when interest rates increase, we would conclude that the difference reflects the pass-through of A's higher interest costs to the rent that they charge. However, if A and B's rental incomes grow similarly after a change in interest rates, then we would conclude that there is limited pass-through.

In reality, we do not observe identical properties with different levels of debt. Instead, we compare rental income growth for investors in the same local area, and investigate whether this varies across investors depending on the change in their interest costs. In doing so, we control for other factors that may drive both rates and rents for all investors, such as local economic conditions.

As mentioned above, we remove observations with very large changes in rental income and/or interest costs because they likely reflect property transactions that would bias our results if left in. We explore different thresholds for classifying movements as large enough to be removed. We show results for a 'narrow window', as well as a slightly wider 'medium window', which removes fewer observations. The extent of data trimming does not affect our conclusions. Appendix A provides more detail about our approach.

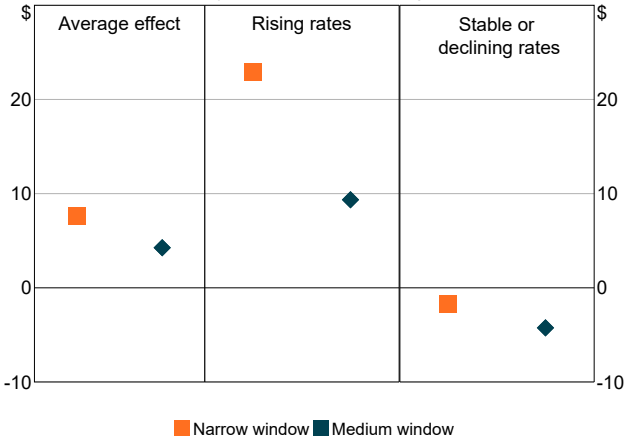
Results

We find little evidence of direct pass-through from interest costs to rents. On average, we find that for every dollar increase in their mortgage interest costs, investors increase their rents by one cent (see Appendix A for detailed results). To put this effect in context, the median monthly interest payment for leveraged investors increased by around $850 between April 2022 and January 2024.[5] Our estimate suggests that this $850 increase in interest costs would have raised rents by less than $10 per month, or just over $2 per week (Graph 5, left panel). This increase in rent equates to around 0.4 per cent of the median monthly rent in January 2024.

Graph 5

Effect of an $850 Increase in Monthly Interest Costs on Monthly Rent*

By extent of data trimming



* These figures multiply our point estimates in Table A.2 by 850. The 'narrow window' excludes observations if annual rental income growth is above 30 per cent or below 10 per cent, or if interest payment growth lies outside a +/- 5 percentage point range around the per cent change in the indicator lending rate over the corresponding financial year. The medium window uses a lower bottom threshold for interest payment growth. See Table A.1 for details. In our sample period, interest rates for investors were rising in 2008/09, 2011/12, 2017/18 and 2018/19. Interest rates were not rising in 2009/10 and 2012/13-2016/17.

Sources: ABS; RBA.

One natural question could be, do these results differ when interest rates are rising, compared with when they are falling? In our sample period, the indicator lending rate for investors increased in 2008/09 and 2011/12, in line with the cash rate. There were also small increases in 2017/18 and 2018/19, reflecting increases in lending spreads. We can use our regression approach to test whether pass-through is higher in these years compared with other years in our sample period.

We find some slight evidence of asymmetry, with pass-through tending to be more positive when interest rates are rising (Graph 5, middle and right panels), but the effects are small. Our biggest estimate suggests that investors increase their rent by 3 cents when their interest costs increase by one dollar. To put this in context, this estimate implies that in response to the $850 increase in their interest costs between April 2022 and January 2024, the median leveraged investor would have increased their rent by around $25 per month. This increase in rent equates to around 1 per cent of the median monthly rent as at January 2024. In most of our regressions, we cannot detect any statistically significant pass-through in years when interest rates are flat or falling, which is consistent with rents tending not to fall outside of sharp downturns.

Limitations and future work

There are a few limitations of our approach that are important to acknowledge. As described above, our regression tries to infer the extent of pass-through by looking at whether, following a change in interest rates, investors with higher debt change their rent by more than investors with less debt. In doing so, we are effectively ruling out the possibility of 'spillovers' between the rent-setting decisions of highly indebted investors and the rent-setting decisions of less-indebted investors. If investors with big mortgages increase their rents due to an increase in interest costs, and less-indebted investors observe this and follow suit, then our approach would incorrectly infer limited pass-through of interest costs to rents. Given the nature of Australian housing markets, with lots of individual landlords all competing for renters, this 'no spillovers' assumption may be reasonable. But others may believe it is a strong assumption, and we cannot verify it.

Our sample period, from 2006/07 to 2018/19, does not include a period where interest rates rose as much as they have in the current cycle. It is plausible that pass-through could be higher when interest costs rise sharply. This will be easier to test when data covering the last couple of years becomes available.

Another limitation is that to date we have not been able to incorporate information on how tight local rental markets are. It seems plausible that pass-through may be higher when the supply of vacant properties is especially low, as is currently the case. Future work will look to incorporate local vacancy rate data and to test whether the pass-through of rate rises is stronger when vacancy rates are low.

Conclusion

Overall, we find limited evidence that investors pass-through changes in their interest costs to their rents. This is consistent with the standard view that the level of housing demand relative to the stock of properties available is the key driver of rents (Hunter 2024). Indeed, the RBA's assessment is that high rent growth in recent years reflects this fundamental force. Housing demand has been strong, supported by high population growth and increased preference for more space, while supply has been hampered by ongoing capacity constraints and increases in construction costs.

Appendix A: Regression specifications and data trimming

Regression approach and specification

Our regression approach exploits variation in the indebtedness of investors within the same local area to estimate the pass-through of interest costs to rents. We start with a hypothetical rental pricing model and build up to our regression specification. Suppose a leveraged investor *i* sets their rent in year *t* according to:

$$Rent_{it} = p_{it} + \beta Interest_{it}$$

Here *p* is the (unobserved) 'competitive' annual rental price for *i* 's property, *Interest* is their annual mortgage interest payment, and β is the pass-through parameter that we want to estimate. The per cent change in *i* 's rent from year *t–1* to *t* is then:

$$\Delta\%Rent_{it} = \frac{\Delta p_{it}}{Rent_{it-1}} + \beta\frac{\Delta Interest_{it}}{Rent_{it-1}}$$

Two identical properties should have the same value for the first term on the right-hand side, which is (close to) the per cent change in the unobserved competitive rental price. Since we cannot observe identical properties, our approach is to soak up this term using location-by-time fixed effects, which should account for the effects of local housing market conditions. In other words, we assume all investors in the same local housing market (*SA4*) experience the same per cent change in the competitive rental price for their property each year. This assumption allows us to learn about β by comparing rental growth for investors in the same *SA4* but who experience different changes in their interest costs. More indebted investors should experience larger changes in their interest costs when interest rates change. Putting this all together, we arrive at our regression:

$$\Delta\%Rent_{it} = \alpha_{SA4,\,t} + \beta\frac{\Delta Interest_{it}}{Rent_{it-1}} + \Gamma' X_{it} + e_{it}$$

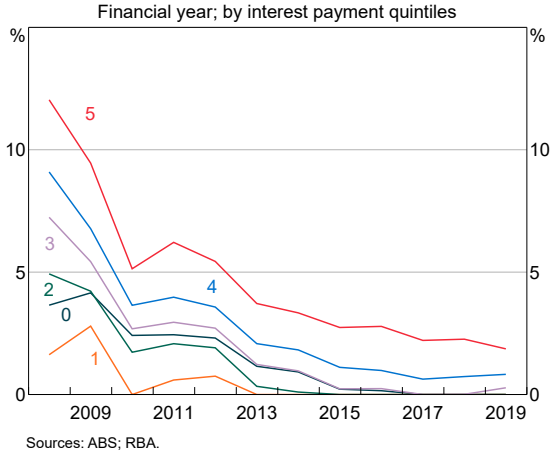
Rent is investor *i* 's annual rental income, Δ*Interest* is the dollar change in their interest payment from year *t–1* to *t*, and α is a *SA* 4-year fixed effect. β is the pass-through parameter of interest. A coefficient of one indicates that a one dollar increase in interest costs is passed on one-to-one to rental income.

To account for other differences in the properties and landlords, we include two types of additional controls in *X*. First, we include a control for lagged quintile of *Interest /Rent*. This is to account for the fact that investors with higher debt (as measured by their reported interest costs) tend to have systematically higher rental income growth over our sample period, potentially reflecting the different nature of the properties they hold (Graph A.1).[6] All regressions also include age-group and income quintile dummies. These auxiliary controls are not needed for identifying β, but may help with precision by absorbing residual variation in rental income growth.

Graph A.1

Median Growth in Rental Income

Financial year; by interest payment quintiles



Sources: ABS; RBA.

Table A.1: Data Trimming Levels Used when Estimating Pass-through

Window	Range for annual rental income growth (per cent)	Range for annual interest payment growth around the per cent change in the indicator lending rate[(a)] (ppt)
Narrow window (most restrictive)	[–10, 30]	[–5, 5]
Medium window	[–10, 30]	[–15, 5]
Wide window (least restrictive)	[–50, 50]	[–50, 50]

(a) We include non-mortgagors in our main regressions even if they fall outside these windows. But our results are robust to excluding non-mortgagors.

Source: RBA.

Data trimming

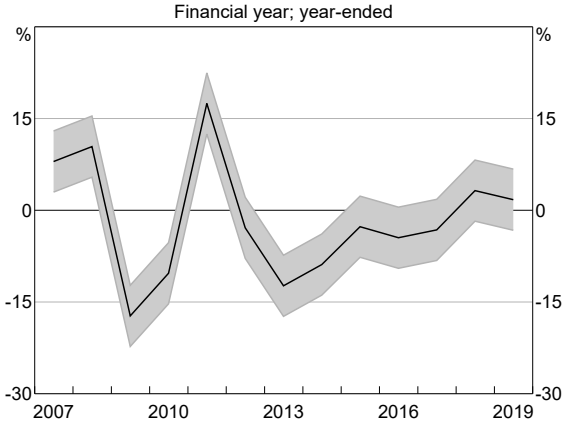
As noted earlier, housing transactions could create a significant positive bias in our estimate of β because they mechanically move rents and interest payments in the same direction. We try two approaches to dealing with them. First, we exclude observations with large changes in rental income and/or interest payments by trimming them. Second, we also try an instrumental variables (IV) approach.

We try three different levels of trimming: narrow, medium and wide (Table A.1). The 'narrow window' excludes observations if annual rental income growth is above 30 per cent or below –10 per cent, or if interest payment growth lies outside a ± 5 percentage point range around the per cent change in the indicator lending rate over the corresponding financial year. Graph A.2 gives a visual representation of how this range for interest payment growth works. This window should remove most observations where there is a transaction, but may exclude investors who are well into their mortgage term. These more seasoned mortgagors tend to have rapidly declining mortgage principals, meaning that interest payments will decline quickly. The 'medium window' tries to capture more of these seasoned mortgagors by lowering the bottom threshold for interest payment growth. Finally, the 'wide window', includes observations with rental income growth and interest payment growth below 50 per cent in absolute terms. The wide window undoubtedly includes many property purchases/sales, so we use it mostly for illustrative purposes when looking at the estimates.

Graph A.2

Narrow Window Around Changes in the Indicator Lending Rate

Financial year; year-ended



* Grey shaded area shows a +/-5 percentage point range.

Source: RBA.

Instrumental variables approach

We also try an IV approach, which tries to isolate changes in interest payments that are due solely to changes in aggregate lending rates, and not due to mortgage transactions or other factors. To construct the instrument, we first impute an investor's level of debt in year *t–1* by dividing their reported interest payment in that year by the indicator lending rate. Our instrument then multiplies this lagged imputed debt level by the observed change in the indicator lending rate over year *t–1* to *t*:

$$Z_{it} = \frac{\widetilde{D}_{it-1}}{Rent_{it-1}} \times \Delta r_t, \text{ where } \widetilde{D}_{it-1} = \frac{Interest_{it-1}}{r_{t-1}}$$

Here Z is our instrument, r is the indicator lending rate, and $\tilde{D}$ is the investor's imputed level of debt.
Table A.2 shows pass-through coefficient estimates for both OLS and IV specifications, and for different levels of data trimming shown in Table A.1. Table A.3 shows the first-stage and reduced-form estimates for the IV specification. Table A.4 shows pass-through estimates from OLS and IV specifications where the main regressor is interacted with a dummy variable equal to one in years where the indicator lending rates was rising.

Table A.2: Effect of Change in Interest Payment on Change in Rental Income

Effects	Narrow window (most restrictive)	Medium window	Wide window (least restrictive)
Panel A: OLS			
$\Delta Interest \,/\, Rent_{t-1}$	0.009^{+}	0.01**	0.316***
	(0.004)	(0.002)	(0.027)
Panel B: IV			
$\Delta Interest \,/\, Rent_{t-1}$	0.005	0.006	0.019^{+}
	(0.006)	(0.004)	(0.01)
Fixed effects	Yes	Yes	Yes
Controls	Yes	Yes	Yes
Observations	2,795,198	3,683,960	6,785,979

Notes: This table reports OLS and IV estimates of the effect on changes in interest payments on changes in rental income for different levels of data trimming as defined in Table A.1. All regressions include non-mortgagors. They also include control variables and year-SA 4 fixed effects as discussed earlier in the article. Year-clustered standard errors are in parentheses. ***, **, *, and + denote statistical significance at the 0.1, 1, 5 and 10 per cent levels, respectively.

Sources: ABS; Authors' calculations.

Table A.3: Reduced-form and First-stage Effects of Imputed Debt Times Change in Indicator Lending Rate

Effects	Narrow window	Medium window	Wide window
Panel A: Reduced-form		$\%\Delta Rent_t$	
$\tilde{D}_{it-1} \times \Delta r_t \,/\, Rent_{t-1}$	0.005	0.006	0.013^{+}
	(0.006)	(0.004)	(0.007)
Panel B: First-stage		$\Delta Interest_t \,/\, Rent_{t-1}$	
$\tilde{D}_{it-1} \times \Delta r_t \,/\, Rent_{t-1}$	1.009***	0.988***	0.720***
	(0.036)	(0.043)	(0.078)
First-stage F -Stat.	796.80	532.29	85.47
Fixed effects	Yes	Yes	Yes
Controls	Yes	Yes	Yes
Observations	2,795,198	3,683,960	6,785,979

Notes: This table reports the reduced-form and first-stage estimates of the effect of our instrument for interest cost changes $Z_{it} = \tilde{D}_{it-1} \times \Delta r_t \,/\, Rent_{it-1}$ where $\tilde{D}_{it-1} = Interest_{it-1} \,/\, r_{t-1}$, for different levels of data trimming as defined in Table A.1. All regressions include non-mortgagors. They also include control variables and year-SA 4 fixed effects as discussed earlier in the article. Year-clustered standard errors are in parentheses. ***, **, *, and + denote statistical significance at the 0.1, 1, 5 and 10 per cent levels, respectively.

Sources: ABS; Authors' calculations.

Table A.4: Asymmetric Effects of Change in Interest Payment on Change in Rental Income

Effects	Narrow window	Medium window
Panel A: OLS		
$\Delta Interest / Rent_{t-1}$	−0.002	0.005^{+}
	(0.003)	(0.003)
$\Delta Interest / Rent_{t-1} \times 1[\Delta r_t > 0]$	0.029*	0.016^{+}
	(0.011)	(0.008)
Panel B: IV		
$\Delta Interest / Rent_{t-1}$	−0.013*	−0.007
	(0.004)	(0.005)
$\Delta Interest / Rent_{t-1} \times 1[\Delta r_t > 0]$	0.046**	0.041*
	(0.012)	(0.014)
Fixed effects	Yes	Yes
Controls	Yes	Yes
Observations	2,795,198	3,683,960

Notes: This table reports OLS and IV estimates of the effect on changes in interest payments on changes in rental income for different levels of data trimming as defined in Table A.1. All regressions include non-mortgagors. They also include control variables and year-SA 4 fixed effects as discussed earlier in the article. Year-clustered standard errors are in parentheses. ***, **, *, and + denote statistical significance at the 0.1, 1, 5 and 10 per cent levels, respectively.

Sources: ABS; Authors' calculations.

Endnotes

* Declan Twohig is from Economic Analysis Department. Anirudh Yadav and Jonathan Hambur are from Economic Research Department.

1 Examples where this view has been expressed are Malo (2023) and Kelly (2023).

2 In the medium term, lower dwelling investment may offset some of this decline.

3 A drawback of this approach is that it can be sensitive to the exact approach used. It can also be hard to test for asymmetries, such as whether the effects differ when rates are rising or falling, due to short sample periods.

4 We use the standard variable rate for investors from Statistical Table F5, splice it backwards using the standard variable owner-occupier rate, and then compute the average rate for each financial year. The resulting series closely tracks movements in the cash rate.

5 This statistic is from the RBA's Securitisation Dataset. For detail on this dataset, see Hughes (2024) and Fernandes and Jones (2018).

6 Excluding this control does not substantially change the results.

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Developments in Wages Growth Across Pay-setting Methods

Martin McCarthy, Iain Ross, Madison Terrell and Lydia Wang*

Photo: courtneyk – Getty Images

Abstract

The dynamics of wages growth can differ across pay-setting methods. Understanding these differences is relevant for forecasting wages growth, and for assessing labour market conditions and inflationary pressures. Across each pay-setting method, wages growth picked up following the COVID-19 pandemic, but appears to have peaked. Wages growth is expected to continue to slow as the labour market eases, but the rate of easing is expected to vary across each method. This article explains recent developments in wages growth across pay-setting methods and the RBA's disaggregated approach to forecasting wages growth, which includes considering the Fair Work Commission's annual reviews of the minimum wages in modern awards.

Introduction

Over the past few years, the Wage Price Index (WPI) has grown at its fastest rate in more than a decade, although appears to have passed its peak for the current cycle. This strength has been driven by a combination of the tight labour market and high inflation outcomes such that, despite the strong growth, real WPI has declined. Assessing the outlook for wages growth is important for assessing the inflation outlook, as labour costs are a major factor in firms' pricing decisions. Further, wages are the largest source of household income, meaning wages growth has a significant impact on household consumption.

The wage system in Australia is made up of three distinct wage-setting methods: awards, enterprise bargaining agreements (EBAs) and individual arrangements. Wage dynamics can differ across these pay-setting methods and these differences can be important to consider when assessing the outlook for wages growth. For this reason, the Australian Bureau

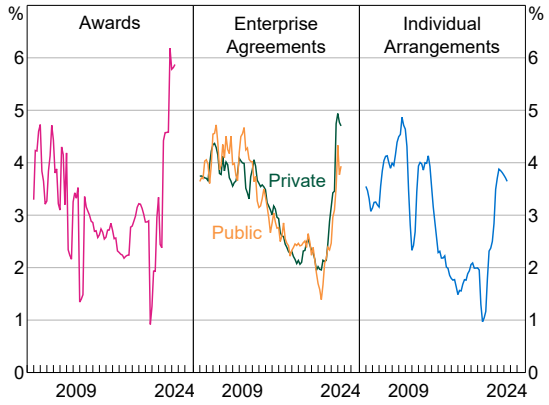
of Statistics (ABS) publishes estimates of contributions to wages growth by pay-setting method (ABS 2024a). One of the RBA's methods of forecasting WPI growth is to combine forecasts for wages growth in each pay-setting method into an aggregate forecast. Across each method, WPI growth has picked up over the past two years but appears to have peaked (Graph 1). Growth is expected to continue to slow as the labour market eases but the rate of easing is expected to differ across the methods.

This article outlines recent developments in wages growth and describes the RBA's approach to forecasting wages growth by pay-setting method. As part of its forecasting process, the RBA considers the decisions of the Fair Work Commission (the Commission), which sets minimum wages in modern awards. For this reason, this article also discusses the factors the Commission considers when making its annual wage review (AWR) determinations.

Graph 1

Wages Growth by Pay-setting Method*

Year-ended



* Excludes bonuses and commissions.

Sources: ABS; RBA.

Individual arrangements

Around 40 per cent of employees have wages and conditions set on an individual basis. Given just over 70 per cent of employees on individual arrangements work full-time, individual arrangements make up the largest share of the wage bill of the three pay-setting methods (nearly 50 per cent) (ABS 2024b).

Wages set by individual arrangements tend to be more responsive to the economic cycle than wages set by other pay-setting methods (Bishop and Cassidy 2019). Given this, the RBA's forecasts for wages growth in individual arrangements is informed by a 'wages Phillips curve' model. This model predicts wages growth based on its negative relationship with spare capacity in the labour market.[1] The cyclical sensitivity of individual arrangements, along with their large share of the wage bill, means they account for much of the high-frequency cyclical variation in WPI growth.

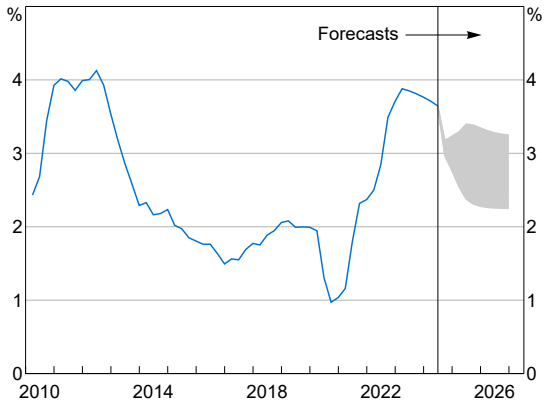
Given that wages growth in individual arrangements is most responsive to changes in demand, the tightness in the labour market following the COVID-19 pandemic led to wages growth in individual arrangements picking up earlier than other pay-setting methods (Graph 1). With the labour market becoming less tight since late 2022, it appears that wages growth in individual arrangements has peaked. The Phillips curve suggests that wages growth in individual arrangements will continue to decline, consistent with conditions in the labour market expected to ease further over the forecast period.

The standard Phillips curve specification uses the unemployment gap as the measure of labour market spare capacity. The unemployment gap is the difference between the unemployment rate and an estimate of the non-accelerating inflation rate of unemployment (NAIRU).[2] The RBA is currently expanding its suite of labour market indicators. At times, these measures can tell varying stories about the state of the labour market, and therefore may be useful in providing different insights on the outlook of wages growth. These include the hours-based underutilisation gap, and the quits rate and employer-to-employer transition rate measures developed using Longitudinal Labour Force Survey data from the ABS. The range of estimates produced from the Phillips curve using these alternative measures of slack is very wide, highlighting the difficulty in forecasting wages growth (Graph 2).

Graph 2

Individual Arrangement WPI Growth*

Year-ended



* Excludes bonuses and commissions. Grey area shows model output range.

Sources: ABS; RBA.

Enterprise bargaining agreements

EBAs are collective agreements negotiated at the enterprise level between an employer and a group of employees. Around 35 per cent of Australian employees are covered by an EBA (ABS 2024b). Changes to wages are pre-determined for the life of the agreement, which is an average length of three years. During the life of an agreement, employees cannot lawfully engage in industrial action in pursuit of further claims. EBAs therefore tend to be affected by labour market conditions with a lag.

Private sector enterprise bargaining agreements

Information on wage outcomes in private sector EBAs is available in the Workplace Agreement Database (WAD) maintained by the Australian Government Department of Employment and Workplace Relations (DEWR). The WAD provides information on the average annualised wage increase (AAWI) of federally registered EBAs, which includes all private sector EBAs that are in effect. The RBA has a model that uses the AAWIs to predict private EBA wages growth, which involves three steps:

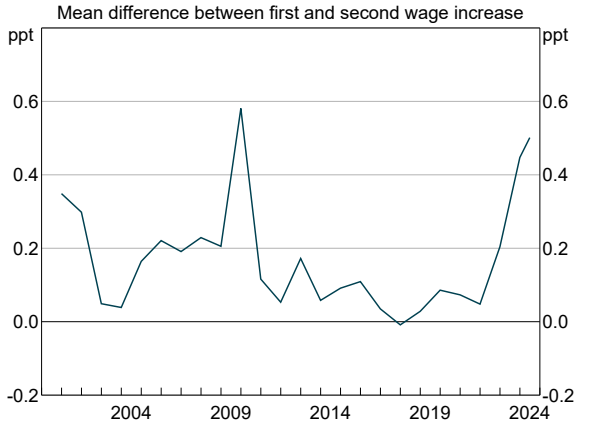
1. Forecast AAWIs in new agreements – This is done with a Phillips curve model whose explanatory variables are a lag of AAWIs in new private sector EBAs, the unemployment gap and inflation expectations.
2. Forecast AAWIs in the stock of all agreements – This is done using the forecast from step 1 as an input.
3. Forecast private EBA WPI growth – This is done using the forecast from step 2 as an input.

There are some limitations to the existing model. First, the AAWI measures the average increase over the life of an agreement, and therefore does not account for the precise size and timing of wage increases. The underlying microdata of WAD contains detailed information on all agreements in effect including wage increases, the length and expiry of agreements, and number of employees covered. The microdata suggest that wage increases are not always uniform over the duration of an EBA, and agreements often have 'front-loaded' wage increases – that is, the first pay rise tends to be larger than subsequent increases over the agreement. There are several reasons for this, including a perception that inflation will decline over the life of an agreement or compensation for delays in negotiations.

Over the past two years, there has been a higher degree of front-loading in agreements, consistent with other periods of high inflation (Graph 3). As the AAWI measures the average wage increase over the agreement, front-loaded agreements may lead to AAWIs that underestimate wages growth in the near term and overestimate growth in later years. These factors are included in the private sector EBA forecast using judgement, although the RBA is continuing to evolve its forecasting framework for private sector EBAs.

Graph 3

Wages Growth Trajectory in Private Sector EBAs*



* By year of certification. Latest observation includes agreements up to June quarter 2024.

Sources: DEWR; RBA.

A second limitation of the RBA model is that the AAWI series only includes agreements that provide for quantifiable wage increases over the life of the agreement. This means a large proportion of agreements are not being captured in the current forecasting framework. Agreements may be determined as 'non-quantifiable' for a number of reasons, including that the agreement contains wage changes that are:

- not consistent between groups of employees
- linked to performance
- linked to the Commission's AWR or the Consumer Price Index (CPI).

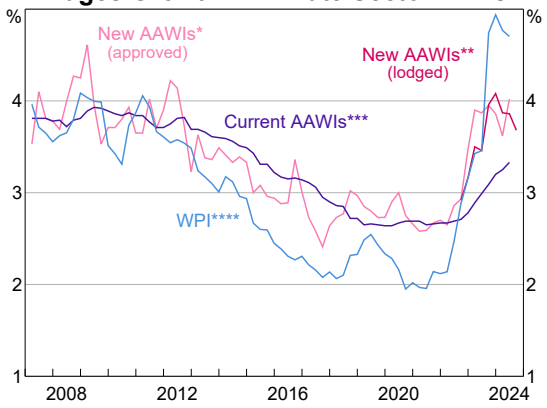
Around 20 per cent of private sector agreements are non-quantifiable, and these agreements cover 40 per cent of private sector employees on an EBA. Given the proportion of agreements linked to the CPI or the AWR is known, the RBA can make assumptions about wage increases in these agreements based on CPI and award wage forecasts. For agreements with increases that are not consistent between groups or linked to performance, the RBA is currently looking

into the usefulness of machine learning techniques in extracting the wage increase from these non-quantifiable agreements.

Wages growth in private sector EBAs appears to have peaked, broadly consistent with other EBA wages growth indicators (Graph 4). However, given the stickiness of EBA wages growth, growth in private sector EBAs is forecast to ease more gradually across the forecast horizon compared with individual arrangements.

Graph 4

Wages Growth in Private Sector EBAs



* Average AAWI in new private sector agreements.
** Average AAWI in newly lodged agreements; latest observation is current quarter to date.
*** Average AAWI in the total stock of nominally current private sector agreements.
**** Year-ended growth in private sector agreements.
Sources: ABS; DEWR; FWC; RBA.

Public sector enterprise bargaining agreements

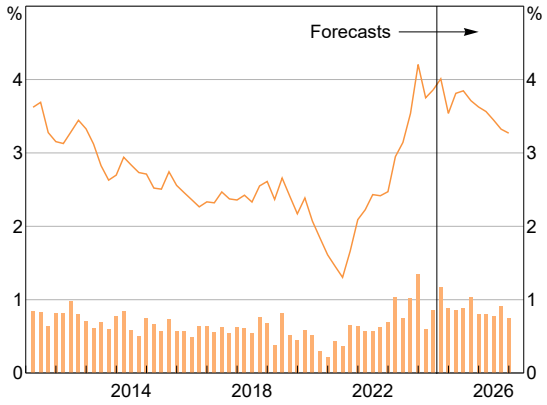
Wages in the public sector tend to behave differently to those in the private sector, and tend to be driven by other factors such as government wage policy settings and budget balances. Public sector wages are predominantly made up of EBAs, with around 80 per cent of public sector employees being covered by an EBA.

To model wages growth in the public sector, the RBA monitors a representative sample of public sector EBAs based on published information.[3] Public sector wages growth is forecast for each state or territory by aggregating scheduled wage increases in each major EBA relevant to that state or territory, with each EBA weighted by the number of employees. Public sector wages growth for Australia is given by aggregating the wages growth forecasts from all states and territories.

Prior to and during the pandemic, many state governments imposed annual caps on the maximum allowable wage increases for public sector workers. These caps were introduced to reduce state and territory budget deficits and ensure public sector employees were receiving wage increases consistent with those in the private sector. Since 2022, state and territory governments have raised or abolished the wage caps put in place before and during the pandemic. State and territory essential workers have also received large pay increases under recently negotiated EBAs. This has led to an increase in public sector wages growth over the past year (Graph 5). Although public sector WPI growth appears to be past its peak, it is expected to remain robust over the period ahead.

Graph 5

Public Sector WPI Growth*



* Excludes bonuses and commissions.
Sources: ABS; RBA.

Awards

Awards are legally enforceable determinations that set out minimum terms and conditions of employment in addition to any legislated minimum terms. In its AWR, an Expert Panel of the Commission reviews the modern award minimum wages and the National Minimum Wage Order (NMW Order), and determines if they should be adjusted.

There are currently 121 modern awards that set minimum wages and conditions for a wide range of industries and occupations (FWC 2023). Around 20 per cent of all employees are paid at the applicable minimum wage rate in awards and are directly affected by the AWR (ABS 2024b). The characteristics of this cohort of employees are significantly different from those of the workforce as a whole:

- they predominately work part-time hours and are female
- almost half are casual employees
- compared with the general workforce, they are disproportionately low paid and employed by small businesses.

The NMW Order applies only to employees who are not covered by a modern award or enterprise agreement. An award- or agreement-free employee cannot be paid less than the applicable rate specified in the NMW Order.[4] The practical application and effect of the NMW Order is very limited, with less than one per cent of all employees estimated to be paid the NMW.

The AWR process is set out in the *Fair Work Act 2009* (Cth) (Fair Work Act). The Commission must conduct and complete the AWR in each financial year. Any orders and determinations made that change award minimum wages must come into operation on 1 July in the new financial year, unless there are exceptional circumstances.[5] For example, over the pandemic period, the Commission adopted a staggered approach to implementing the increases to modern award minimum wages.

The Commission has also said that its decision-making process in an AWR should be as transparent as possible and disclose the factors most relevant in a particular year.[6] Although the Expert Panels may be differently constituted year-to-year, they tend to adopt a consistent interpretation of the legislative framework. As the Commission has said, '[j]ustice requires consistent decision-making unless a difference can be articulated and applied'.[7]

A reasonable opportunity must also be provided to all persons and bodies to make written submissions. Submissions are typically provided by governments, unions and employer associations, and academics.

The statutory framework and approach

In the AWR, the Commission must ensure the maintenance of a safety net of fair and relevant minimum wages.[8] The relevant statutory objectives are broadly expressed and do not necessarily exhaust the matters that the Commission may consider to be relevant.

Economic, labour market and business considerations

The Commission must consider the likely impact of its determinations on employment growth, inflation and the sustainability, performance and competitiveness of the national economy.[9] It has interpreted this as meaning that it must take into account 'the effect of its decision on national economic prosperity' and in doing so give 'particular emphasis' to employment growth and inflation.[10]

The Commission considers both actual and forecasts of economic indicators, with actual indicators the primary consideration as they are viewed by the Commission as more reliable. The Commission considers the Living Cost Index for employee households alongside the CPI for changes in living standards and purchasing power, noting that price increases in non-discretionary items are more likely to adversely affect the household budgets of the low paid.

The Commission pays particular attention to trend data and routinely looks to developments over the medium and longer term, as well as to changes over the past year. Consistent with this, the Commission has also noted that short-term changes in productivity should be interpreted with caution and productivity growth is best measured over the business cycle.[11] The main measure of productivity examined by the Commission is Gross Domestic Product (GDP) per hour worked.

Relative living standards and the needs of the low paid

The Commission must consider the relative living standards and the needs of the low paid.[12] 'Relative living standards' is a comparative concept and requires a comparison of the living standards of award-reliant workers with other groups. The comparison of living standards is at the household level using equivalised household disposable income.

The 'low paid' have been defined as those employees whose ordinary-time earnings are below two-thirds of median adult ordinary-time earnings of all full-time employees. There are two measures of this benchmark:

- $1,066.67 per week (as at August 2023) from the ABS Characteristics of Employment data.
- $1,131.33 per week (as at May 2023) from the ABS Employee Earnings and Hours (EEH) survey data.

The 'needs of the low paid' requires an examination of the extent to which low-paid workers can purchase the essentials for a decent standard of living and to engage in community life. The Commission has accepted that if low-paid workers live in poverty then their needs are not being met. In measuring poverty, the Commission relies on 'poverty lines based on a threshold of 60 per cent of median equivalised

household disposable income' and has stated that 'those in full-time employment can reasonably expect to earn wages above a harsher measure of poverty'.[13]

The Commission also considers legislated superannuation guarantee increases and changes in the tax/transfer system, noting that the latter can provide a more targeted approach than increases in minimum wages.

Gender equality

In 2022, amendments were made to the Fair Work Act requiring the Commission to consider the promotion of gender equality when performing its functions and exercising its powers.[14] This applies to the modern award and minimum wage objectives, which now require the Commission to consider the need to achieve gender equality in the workplace by:

- ensuring equal remuneration for work of equal or comparable value
- eliminating gender-based undervaluation of work
- providing workplace conditions that facilitate women's full economic participation.

In the *AWR 2022–23*, the Commission noted that there were significant issues concerning the potential undervaluation of work in modern award minimum wage rates applying to female-dominated industries and occupations. However, the scope of the AWR prevented these gender equality issues from being sufficiently addressed.[15] Since then, the Commission commenced proceedings to consider variations to five identified priority awards on work value grounds to remedy potential gender undervaluation (see Box A for details).

Job security

The job security consideration primarily refers to whether the AWR outcome might affect the capacity of employers to continue to offer, or maintain permanent employment, in the future.[16]

Collective bargaining

The Commission must consider 'the need to encourage collective bargaining', which requires attention to be given to whether the exercise of modern award powers may affect the extent to which enterprise bargaining is occurring.[17] The Commission has consistently observed that a complex mix of factors may contribute to employee and employer decision-making on whether to bargain, and has expressed the view that increases in award reliance do not support the contention that minimum wage increases act as a disincentive to bargaining.[18]

The outlook for annual wage reviews

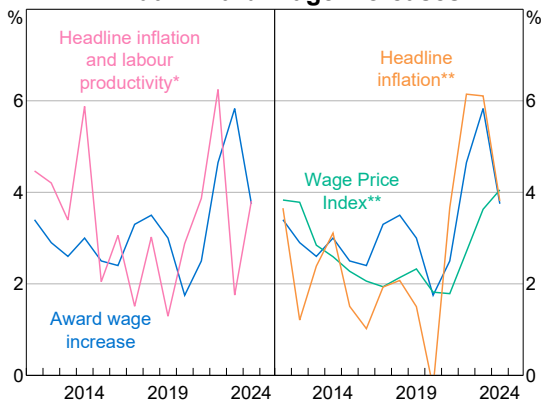
The Commission has repeatedly noted that it will not adopt a mechanistic approach to award determinations, such as, for example, real wage maintenance as a 'decision rule'. However, over the years it has outlined a range of principles that are used to guide its decision. Rather than using a model to forecast wages growth in awards, the RBA uses the principles outlined by the Commission and other information to forecast future AWR decisions across the forecast horizon.

The Commission has said that the AWR is not an 'adjudication between competing proposals', but a 'statutory task' that requires it to make its own 'assessment of what constitutes a safety net of fair minimum wages having regard to the prescribed considerations'.[19]

The Commission has noted that awarding an increase that is less than increases in prices and living costs would amount to a cut in real wages, and such an outcome would mean that many award-reliant employees, particularly low-paid employees, would be less able to meet their needs.[20] On average, the increases in award wages since 2010 have been higher than year-ended headline inflation (Graph 6). However, in recent years the annual award wage increases have been closer to headline inflation.

Graph 6

Annual Award Wage Increases



* Year-ended growth in headline inflation plus year-ended growth in labour productivity as at June quarters.

** Year-ended growth as at June quarters.

Sources: ABS; FWC; RBA.

In the two most recent AWR decisions, the Commission concluded that the immediate economic circumstances mitigated against awarding an increase above headline inflation. This included inflation being above the target range, insufficient evidence of productivity growth having returned to its pre-pandemic average rate, Stage 3 tax cuts and other Federal Budget cost-of-living measures, and the legislated superannuation guarantee increases.[21]

Further, recently the Expert Panel has accepted that '[i]n the medium to long term, it is desirable that modern award minimum wages maintain their real value and increase in line with the trend rate of national productivity growth'.[22] The simplest measure of labour productivity, GDP per hour, grows in part because of changes in the composition of the workforce. For example, the decline in the number of labourers and increases in the number of software engineers over time contributes to GDP per hour growth. The quality-adjusted labour productivity measure currently being developed by the RBA may be relevant in future AWR proceedings (Bruno, Hambur and Wang 2024).

The effects of annual wage review decisions on wages growth

Direct effects

The direct effect of the AWR on wages growth is limited to the award-reliant workforce. Given these employees tend to work part-time hours and are disproportionately low paid, award-reliant employees account for around 10 per cent of the wage bill (ABS 2024b).

Direct effects of the AWR also occur through EBAs directly linked to the AWR. Over 300,000 employees are on federally registered EBAs linked to the AWR (DEWR 2024). Nearly all EBAs in the hospitality and retail industries are linked to the AWR, as are many EBAs in the health care and social assistance industry. Further, the base pay rate in an enterprise agreement must be at least equivalent to the pay set out in the relevant award. As a result, employees on EBAs paid a rate close to the award may need to receive a pay increase, even if the EBA is not explicitly linked to the AWR, to ensure their wage remains at least in line with the award rate.

Indirect effects

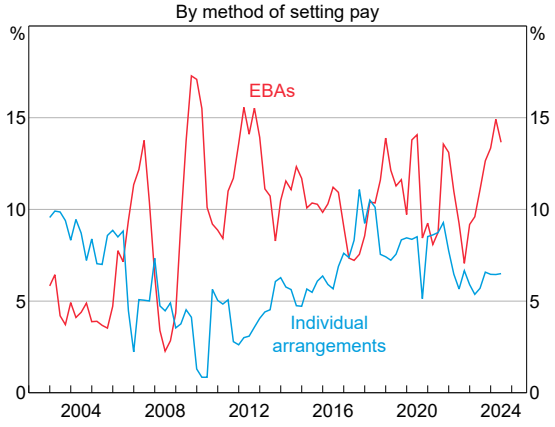
Outside of direct effects, the AWR decision can also influence the wages for non-award reliant employees. This is because the decision can influence wage expectations, which can lead to different wage outcomes than would have occurred under a weaker or stronger AWR decision. For example, if an AWR decision is higher than expected, non-award employees may receive a higher wage change to maintain the same differential as award and non-award jobs.

Measuring the indirect effects of the AWR decision – also referred to as 'spillovers' – is difficult as the prevalence and size of spillovers is not directly observable. The RBA has several methods for capturing the proportion of jobs indirectly affected by the award decision using underlying WPI microdata. For example, the RBA looks at the share of 'award-influenced' jobs by using information provided by firms in the WPI survey about why a particular job's wage changed in the quarter (Graph 7). The RBA also receives qualitative information from firms through its liaison program that is useful for estimating spillovers. For such purposes, the RBA assumes the award decision will spillover to around 10 per cent of individual arrangements and 15 per cent of EBAs (including those directly linked). However, these estimates are sensitive to assumptions.

Graph 7

Share of Wage Changes Influenced by Award Decisions

By method of setting pay



Sources: ABS; RBA.

Forecasting wages growth and broader labour costs

The forecast for each pay-setting method is aggregated together based on the WPI weights to provide a profile for total WPI. For technical reasons, the weights in the WPI for awards is a little less than its share of the wage bill, and the reverse is true for individual arrangements.[23]

This forecasting framework complements the Reserve Bank's suite of other wages models, including the Phillips curve model for the private sector in aggregate. Given the framework is only a few years old, the RBA has not been able to thoroughly evaluate the accuracy of forecasts derived from this disaggregated method. However, it has the benefit of providing a framework that accounts for the different dynamics across pay-setting methods. The framework is also useful for scenario analysis, including modelling the impact of award wage increases and proposed changes in government wage policies.

When compiling the wages growth profile, the RBA considers all models and makes further judgements to account for elements of wages growth the models do not sufficiently capture. This includes, for example, the legislated superannuation guarantee increases, which analysis suggests should detract from growth in base wages,[24] and the extent to which real wages are expected to 'catch up' to their pre-pandemic level across the forecast horizon. Information from timely wages indicators, liaison and business and household surveys are also incorporated into the near-term forecast (one to four quarters ahead).

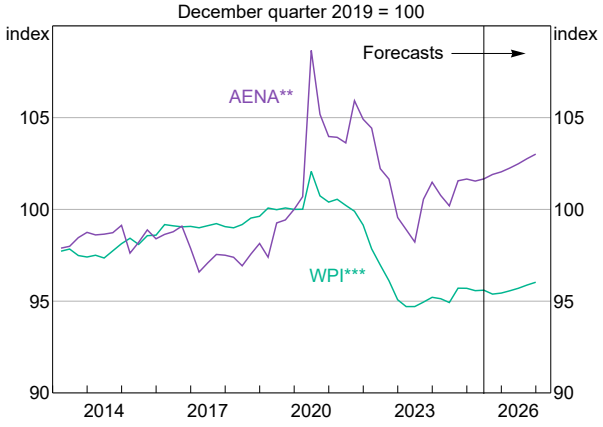
As the WPI measures the changes in wage rates for a given quantity and quality of labour, it is a narrow measure of labour costs. The RBA also forecasts measures of labour costs that are wider in scope than the WPI and are more relevant for assessing living standards and inflationary pressures. This includes average earnings from the National Accounts (AENA), which is designed to measure the average earnings per hour and incorporates non-wage costs, such as superannuation and redundancy payments, along with pay increases resulting from changes in the composition of the workforce. Forecasts for AENA and labour productivity are then used to create a profile for unit labour costs (ULCs), which measures the labour costs per unit of output produced. This is the most relevant concept for assessing inflationary pressures from labour costs and feeds into the RBA's mark-up model used to forecast trimmed mean inflation (see Cassidy *et al* 2019).

A key judgement in the RBA's forecasts is the degree to which wages 'catch up' to the substantial increase in consumer prices since 2021. Real wages, as measured by the WPI, have declined by around 5 per cent since 2021 and remain around their 2023 trough. In the August 2024 *Statement on Monetary Policy*, it was assessed that the level of real WPI will only modestly pick up over the forecast horizon, with the pace of nominal wages growth declining more slowly than inflation (Graph 8). However, real AENA is above its pre-pandemic level and is expected to increase at a faster rate than real WPI over the forecast horizon. This forecast for stronger growth is mostly due to the legislated superannuation guarantee increases. The August *Statement on Monetary Policy* includes RBA's latest forecast for wages growth and broader labour costs (RBA 2024).[25]

Graph 8

Measures of Real Wages*

December quarter 2019 = 100



* Deflated by headline CPI. Forecasts are from August 2024 *Statement on Monetary Policy*.
** Non-farm.
*** Excludes bonuses and commissions.
Sources: ABS; RBA.

Conclusion

This disaggregated framework for forecasting wages growth is useful in informing the RBA's outlook for wages growth and assessing the effects of the Fair Work Commission's award wage decisions. The RBA will continue to use and improve this framework alongside its other methods for forecasting wages growth.

Box A: Gender pay equity review

In the *Annual Wage Review 2023 –24*, the Commission considered its own recent research on segregation and gender undervaluation. The research identified priority occupations and industries affected by gender pay equity issues. The Commission commenced proceedings under section 157(3)(a) of the Fair Work Act to consider variations to five identified priority awards on work value grounds to remedy potential gender undervaluation. The proportion of workers covered by these awards are overwhelmingly female and cover around 250,000 employees (with the largest being childcare workers). The relevant occupations and awards include:

- pharmacists on the Pharmacy Industry Award 2020
- medical technicians, dental assistants and psychologists on the Health Professionals and Support Services Award 2010 and the Aboriginal and Torres Strait Islander Health Workers and Practitioners and Aboriginal Community Controlled Health Services Award 2020
- disability carers (and other relevant classifications) on the Social, Community, Home Care and Disability Services Industry Award 2010
- childcare workers on the Children's Services Award 2010.

In a Statement issued on 24 June 2024, the Commission outlined its plan to complete these proceedings by the time of the *AWR 2024–25*, with the lodgement of submissions and evidence processing starting from September 2024 and hearings taking place in December 2024.

It is likely that the outcome of these cases will influence wages growth in 2025/26. As with the AWR, pay increases arising from the gender pay equity reviews are likely to have direct and indirect effects on aggregate wages growth. The direct effect comprises both that the pay of workers on these awards will be increased, and that the base pay rate in an enterprise agreement must also be at least equivalent to the pay set out in the relevant award. The indirect effect is the influence on other non-award workers. For example, if the pay of disability carers rises substantially, then employers of workers with similar skills may need to increase wages more than otherwise to retain staff.

Case study: Aged care industry work value case

Over 2020 and 2021, applications were made by relevant unions to vary the minimum wages and classifications in certain awards covering aged care employees. The applications sought a 25 per cent increase in minimum wage rates for all aged care employees covered by the relevant awards, which is estimated to be around 350,000 employees across Australia.

In November 2022, the Commission awarded an interim pay increase of 15 per cent in minimum wages for 'direct care' workers, which was implemented in July 2023. In April 2024 in Stage 3 of its decision, the Commission made a further determination that created a new classification structure for direct care employees, with pay increases varying across classifications. Inclusive of the interim 15 per cent, the increases awarded were between 18 and 28.5 per cent. 'Indirect care' workers (i.e. administrative workers) will receive a pay rise of between 3 and 7 per cent. The further wage increase will be awarded over two stages in 2025.

The interim increase was estimated to contribute around 0.2 percentage points to September quarter 2023 WPI growth. Given most aged care workers are covered by an EBA, this increase contributed to a significant increase in private EBA WPI growth (Graph 1).

Endnotes

* Martin McCarthy and Lydia Wang contributed while working in Economic Analysis Department, Iain Ross is a member of the Reserve Bank Board and Madison Terrell is from Economic Analysis Department.

1 Bishop and Greenland (2021) estimate the strength of this negative relationship using labour markets data on 291 regions.

2 Ballantyne, Sharma and Taylor (2024) describe how the RBA assesses full employment, including the role of the NAIRU.

3 This includes the WAD database, which covers almost 40 per cent of all public sector employees in the Victorian, Commonwealth, Australian Capital Territory, Northern Territory and Tasmanian governments. Information on agreements for other state governments is retrieved from state industrial relations commissions (or equivalent).

4 See *Fair Work Act 2009* (Cth) s 294(2) (Fair Work Act).

5 Fair Work Act s 287.

6 *Annual Wage Review 2019–20* [2020] FWCFB 3500 at [7].

7 *AWR 2019–20*, n 6 at [9].

8 The Commission is also required to take into account considerations specified in the Fair Work Act, including the 'minimum wages objective' (s 284(1)), the 'modern awards objective' (s 134(1)), and the Act's object (s 3).

9 Fair Work Act ss 134(1)(h), 284(1)(a).

10 *Annual Wage Review 2018 –19* [2019] FWCFB 3500 at [12].

11 *Annual Wage Review 2012 –13* [2013] FWCFB 4000 at [167]–[169]; *Annual Wage Review 2022 –23* [2023] FWCFB 3500 at [87].

12 Fair Work Act ss 134(1)(a), 284(1)(c).

13 *Annual Wage Review 2021 –22* [2022] FWCFB 3500 at [71].

14 Fair Work Act ss 134(1)(ab), 284(1)(aa).

15 *AWR 2022 –23*, n 11 at [11].

16 See Fair Work Act s 134(1)(aa).

17 Fair Work Act s 134(1)(b); *AWR 2022 –23*, n 11 at [148].

18 *Annual Wage Review 2014-15* [2015] FWCFC 2500 at [461].

19 *AWR 2022 –23*, n 11 at [7].

20 *Annual Wage Review 2010–21* [2021] FWCFB 3500 at [170].

21 *AWR 2022 –23*, n 11 at [179]; *Annual Wage Review 2023 –24* [2024] FWCFB 3500 at [156]–[157].

22 *AWR 2022 –23*, n 11 at [179]; *AWR 2023 –24*, n 21 at [154].

23 In the WPI release, the ABS uses the jobs in its sample to estimate wages growth for each 'elementary aggregate', which is a combination of state/territory, industry and sector (public/private). The ABS then weights each elementary aggregate using the shares of the wages bill in the EEH survey. This method does not explicitly weight each pay-setting method. However, the implicit weight of each pay-setting method in the aggregate WPI can be deduced. These implicit weights are about right for EBAs, a bit low for awards, and a bit high for individual arrangements. To complement the WPI release, the ABS publishes an analytical series that shows contributions to aggregate wages growth by pay-setting method, where each method is weighted according to EEH data (see ABS 2024b). This analytical series typically shows similar wages growth to the published WPI, except in September quarter 2023 where the AWR decision caused much higher wages growth for workers on awards.

24 See the comments from Treasury in Senate Economics Legislation Committee (2023).

25 This excludes the June quarter 2024 WPI and National Accounts releases, which were published after the August *Statement on Monetary Policy*.

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Small Business Economic and Financial Conditions

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Photo: Vladimir Vladimirov – Getty Images

Abstract

The economic environment has been challenging for many small businesses over the past year. Growth in demand has slowed while input costs remain elevated, putting pressure on profitability – particularly for businesses reliant on discretionary consumer spending. Even so, profit margins remain around pre-pandemic averages for most small businesses. While access to credit remains a challenge for small businesses, many accumulated sizeable cash buffers during the pandemic, contributing to their resilience over the past few years. The unevenness in small business conditions has been reflected in some continuing to perform well, while others have had to draw down on cash buffers and an increasing share have entered insolvency. However, the number of insolvencies remains below its pre-pandemic trend on a cumulative basis. This article discusses small business conditions in Australia by drawing on information from the Reserve Bank's 32nd Small Business Finance Advisory Panel, firm-level administrative data and other economic surveys.

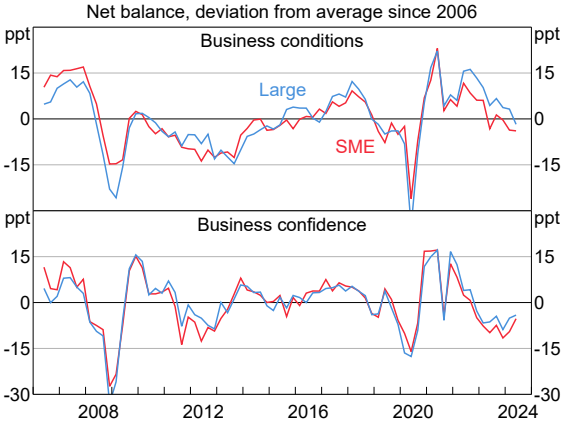
Introduction

The economic environment has been challenging for many businesses over the past year. Demand growth has continued to slow, growth in input costs has remained elevated, and higher interest rates have continued to flow through to indebted businesses' expenses (RBA 2024b). These pressures have been particularly challenging for small businesses but they have been felt unevenly between and within industries. Survey measures of operating conditions have continued to decline for small businesses and remain a little weaker than for large businesses (Graph 1, top panel).[1] Expectations of future business conditions among small businesses also remain below historical averages (Graph 1, bottom panel). Understanding these developments is important because small businesses make up a substantial share of output, employment and income in the Australian economy (Chan, Chinnery and Wallis 2023). They also support innovation and play an important role in communities, particularly in regional areas (Jones 2024).

Graph 1

Business Sentiment*

Net balance, deviation from average since 2006



* Quarterly survey. SMEs have turnover less than $5 million; large businesses have turnover between $5 and $10 million. Latest observation June 2024.

Sources: NAB; RBA.

In July 2024, the RBA convened its 32nd annual Small Business Finance Advisory Panel to discuss the provision of finance and the economic environment for small businesses. This article provides an update on economic and financial conditions for small businesses, drawing on information from this year's panellists as well as new analysis using firm-level administrative data, information from the RBA's regular liaison program and other economic surveys.

Economic conditions have been challenging for many small businesses

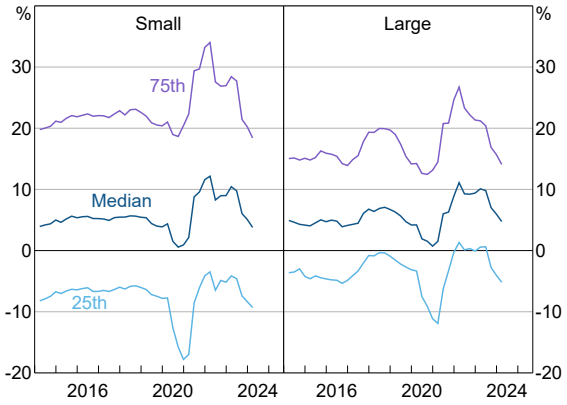
Demand growth has slowed from high levels, though the impact has been uneven across industries and between firms

Growth in demand – and, correspondingly, revenues – has slowed for most small businesses over the past year (Graph 2). Growth in household consumption remains well below pre-pandemic averages, as high inflation and higher interest rates have weighed on disposable incomes and consumer spending. Business investment growth has also started to moderate (RBA 2024b). However, as usual, small business performance has varied widely – more so than for large businesses (see dispersion in Graph 2 and discussion below).

Graph 2

Annual Revenue Growth Distribution

By business size*



* Year-ended revenue, seasonally adjusted. Small businesses have 5–19 employees; large 200+. Latest observation March 2024.

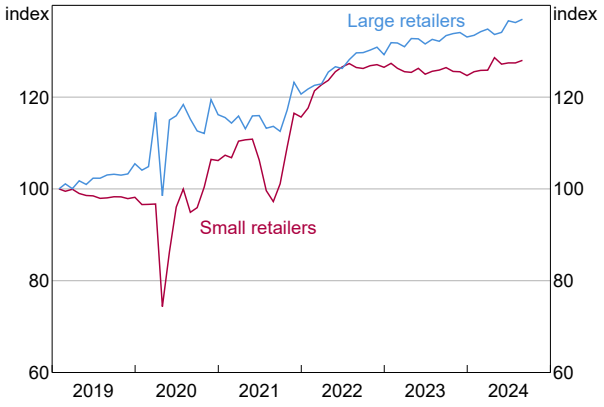
Sources: ABS (BLADE); RBA.

Conditions have varied by industry, with small businesses reliant on discretionary consumer spending, such as those in hospitality and retail trade, particularly impacted by softer demand. Growth in aggregate retail sales for smaller businesses has been subdued over the past year due to households reducing non-essential spending and trading down to cheaper items. This is especially true when compared with larger businesses (Graph 3). Survey measures of current operating conditions are softest for small businesses operating in accommodation and food (NAB 2024). This is consistent with revenue growth for many small businesses in these sectors close to or below zero over the past year (Graph 4, left panel). By contrast, revenue growth for many small construction companies and professional services firms has slowed to a lesser extent and remained solid, with the median growth around 6 per cent (Graph 4, right panel). Nonetheless, some construction firms are facing cash flow pressures from higher costs and payment delays (discussed later).

Graph 3

Retail Sales Values

January 2019 = 100, by size



* The survey uses annualised turnover, based on the ATO's Business Activity Statement item Total Sales, as the measure of business size. Around 700 'large' businesses are included in the survey every month, while a sample of around 2,700 'smaller' businesses is selected. This series has been seasonally adjusted by the RBA. Latest observation August 2024.

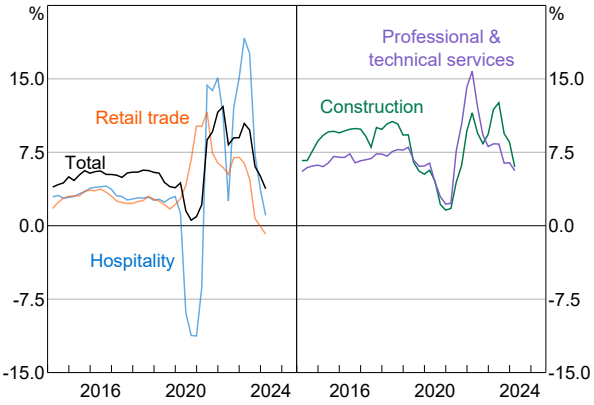
Sources: ABS; RBA.

As demand growth has slowed from very high levels, the share of small businesses experiencing very high or very low growth are back near historical averages in most industries. The share of high growth small businesses – those with three-year annualised revenue growth greater than 20 per cent – increased to a record high of 18 per cent in the period immediately after the pandemic, owing to the strong economic recovery (Graph 5, left panel). This share has now returned to pre-pandemic levels of around 12 per cent, and remains higher than for large businesses – as has been the case over the past

Graph 4

Small Business Annual Revenue Growth

Median, by industry*



* Year-ended revenue, seasonally adjusted. Selected industries shown. Small businesses have 5–19 employees. Latest observation March 2024.

Sources: ABS (BLADE); RBA.

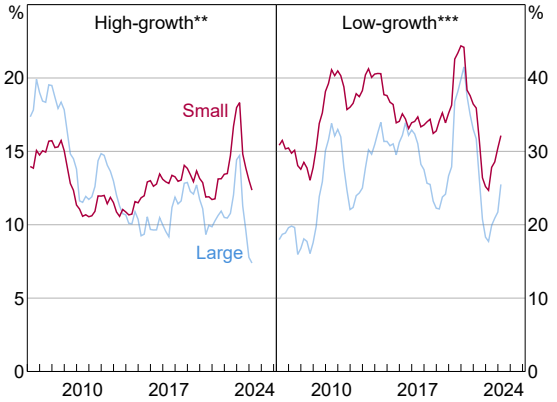
decade. High-growth firms contribute significantly to innovation, as well as growth in sales, employment and exports (Majeed *et al* 2021).[2] The concentration of high growth small businesses within most industries remains around historical averages. One notable exception, however, is hospitality, where the share of high-growth firms (14 per cent) is above its historical average (9 per cent). This highlights the fact that some small cafes and restaurants continue to perform well, despite challenging conditions in the sector.

While the share of high-growth businesses has fallen, the share of low-growth businesses – those with three-year annualised revenue growth less than or equal to zero percent – has increased from low levels, to around one-third (Graph 5, right panel). This share remains a little below pre-pandemic averages but higher than larger businesses – again, as is generally the case. The distribution of low growth small businesses within most industries remains around historical averages. Some exceptions are rental, hiring and real estate services, agriculture, and retail trade, which have slightly higher concentrations of low growth businesses than their historical average.

Graph 5

High and Low Growth Firms

Share of businesses, by size*



* Small businesses 5–19 employees; large businesses 200+. Latest observation March 2024.

** Three-year annualised revenue growth > 20 per cent.

*** Three-year annualised revenue growth <= 0 per cent.

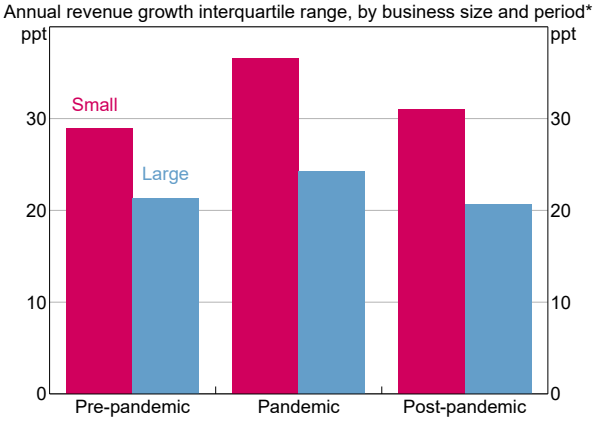
Sources: ABS (BLADE); RBA.

Many small businesses experience large fluctuations in revenue growth year to year, contributing to cash flow challenges. Small businesses typically experience a wider range of annual revenue changes than larger businesses (Graph 6; Graph 2). This indicates that small businesses have more variable trading conditions year to year relative to larger businesses, including those operating in the same industry. Higher revenue variability is one factor that can make accessing financing more difficult, as lenders find it challenging to forecast future cash flows (see 'Access to finance remains difficult for small businesses' below). Variable cash flows can also be a source of financial stress for businesses, particularly those with smaller cash buffers and limited access to finance.

Graph 6

Revenue Variability

Annual revenue growth interquartile range, by business size and period*



* Pre-pandemic variability is the average from September 2004 to March 2020; pandemic is June 2020 to March 2022; post pandemic is after June 2022. Small companies have 5–19 employees; large companies have 200+ employees.

Sources: ABS (BLADE); RBA.

Operating cost growth has remained elevated and hiring intentions have eased …

Domestic input cost growth remains elevated. Business liaison, which cover firms of all sizes, report that while growth in non-labour costs is slower than a year ago, it remains above its long run average.[3] Both liaison participants and panellists from the Small Business Finance Advisory Panel point to higher logistics, energy and insurance costs as contributing factors. They also report that compliance costs remain elevated.

Labour costs remain above their long-run average and are expected to remain so over the coming year. While finding suitable labour continues to be difficult for many firms, labour availability has risen compared with a year ago. Voluntary staff turnover rates have fallen and panellists report that competition for higher income workers has eased a bit.

In response to elevated cost pressures (and weaker demand), many small businesses are looking to cut costs, including by decreasing employment (Banjo Loans 2024). Employment intentions are below historical averages and a slightly larger share of liaison participants (again, covering firms of all sizes) have reported their intention to decrease headcount. Other survey indicators suggest that fewer small businesses have increased headcount recently compared with larger businesses (NAB 2024). Small business finance panellists also referred to other cost-cutting measures, including increasing automation, cutting IT expenditure, and investing in new manufacturing centres to reduce transport costs.

Survey measures suggest many small businesses will focus on cost cutting over the year ahead (Banjo Loans 2024).

… but profitability has been maintained, as businesses have passed on higher costs

Profit margins are around their pre-pandemic averages for most small businesses (Graph 7). Strong demand following the pandemic enabled many businesses to pass on higher input costs. However, more recently, some small businesses have had less scope to pass cost increases on to customers compared with last year, especially those exposed to producing, distributing, and selling discretionary products and services. This is consistent with small declines in margins in hospitality and transport.

A sizeable share of small businesses are not very profitable or make losses, so they are quite vulnerable to a deterioration in economic conditions.

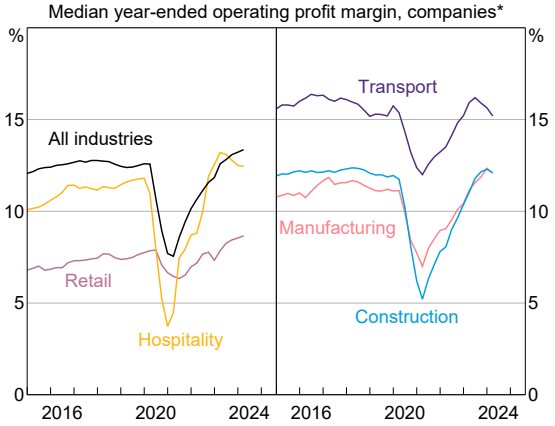
The median small and large business generally reports comparable levels of profitability, incorporating both the margin and volume of goods and services sold (Graph 8, middle panel). However, top and bottom performers (i.e. the top and bottom quartiles) have quite different profitability across business size.

While small businesses report a higher level of profitability for top performers (Graph 8, right panel), the bottom 25 per cent tend to make no (or negative) profits (Graph 8, left panel). This is especially true among the very smallest (micro) firms.[4] Small businesses with weak profitability are particularly vulnerable to deterioration in economic conditions.

Graph 7

Small Business Profit Margins

Median year-ended operating profit margin, companies*



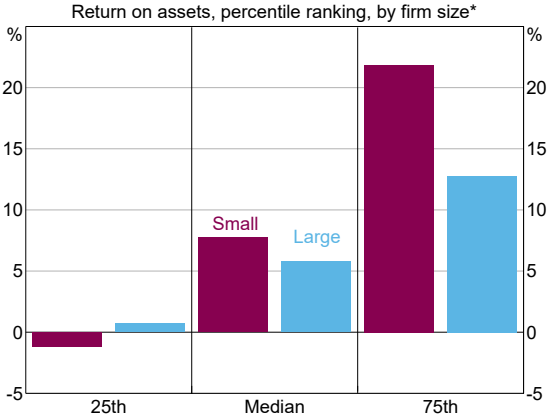
* Selected industries; net profits as year-ended operating revenue less operating costs and wages; not including government payments (e.g. JobKeeper); includes ~250,000 GST-remitting companies; seasonally adjusted. Latest observation March 2024.

Sources: ABS (BLADE); RBA.

Graph 8

Profitability Distribution

Return on assets, percentile ranking, by firm size*



* Return on assets is profits over total assets. Results based on historical averages from 2004–2022. Small companies have 5–19 employees; large companies have 200+ employees.

Sources: ABS (BLADE); RBA.

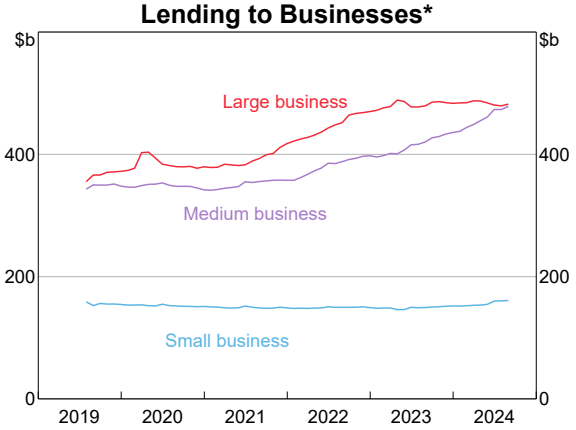
Increases in the cash rate have led to tighter financial conditions for small businesses

Access to finance remains difficult for many small businesses

For many years, small businesses have found it difficult to access finance with terms that suit their needs.[5] Common challenges include strict lending criteria, high interest rates, and the requirement to provide personal assets or property as collateral (Jones 2024; Banjo Loans 2024). In part reflecting these challenges, the value of outstanding small business loans – defined as smaller loans to small and medium enterprises (SMEs) – has been relatively stable for several years (Graph 9); in real terms, this implies a decline in the stock of small business loans. Over the past year, overall lending to SMEs has picked up, growing by 12 per cent and around 25 per cent since the start of 2022. Growth in lending to SMEs over the past year has been driven by medium-sized business loans in the property services, retail and wholesale trade, and agriculture industries.

Graph 9

Lending to Businesses*



* Data cover financial institutions with $2 billion or more of business credit; not seasonally adjusted. Excludes loans to financial businesses. Small and medium business loans are those to businesses with $75 million or less in consolidated annual revenues; within this category, small business loans are those where the lender has $1.5 million or less in loan exposures to the borrower. Business size definitions have changed over sample period.

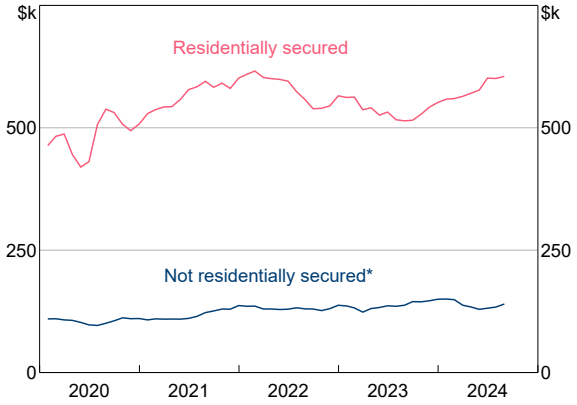
Sources: APRA; RBA.

Small business finance panellists reported that financial conditions had tightened over the past year. Panellists described lenders applying stricter criteria across a range of products, even though lenders have generally reported little change in lending standards. Several panellists had chosen to fund their business largely with equity because they were unwilling to pledge their family home as collateral (and had no other suitable assets) or because loans were too inflexible or risky in an uncertain economic environment. Just under half of all small business credit is secured with residential property,

Graph 10

Average Small Business Loan Size

New loans; 3-month moving average



* Excluding credit cards.

Sources: APRA; RBA.

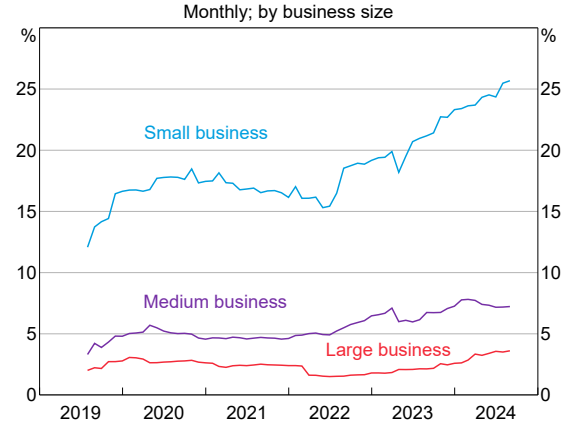
and businesses can obtain larger loans on average if they are willing and able to pledge residential property as collateral (Graph 10).

Banks provide most small business finance but non-banks have increased their market share over recent years (Graph 11). Information from liaison with banks and market reporting has suggested some non-banks have competed more aggressively for small and medium-sized business loans, in part due to a decline in market share in the residential mortgage market reflecting heightened competition from banks. The increase in non-bank SME business credit since 2022 has been broadly based across most industries, with the exception of lending to the property services industry. Most non-bank lending to small businesses is for purchases of plant and equipment (including vehicle financing), while new lending from banks is more concentrated in loans for the purchase of property.

Graph 11

Non-bank Share of Business Lending*

Monthly; by business size



* Not seasonally adjusted or break-adjusted. Business size definitions changed in April 2023 and July 2024.

Sources: APRA; RBA.

Trade credit, which involves businesses extending credit to each other by delaying payments, has become a more important source of finance recently. Some panellists preferred trade credit to bank credit facilities because it was more flexible, despite being similarly costly. For some panellists, the increased use of trade credit was a response to increased cash flow pressures, including because of late payments from their own customers. Aggregate trade credit across private non-financial businesses has grown strongly over the past few quarters. The average time for small businesses to be paid and total late payments remain well below their pre-pandemic averages (Xero 2024).

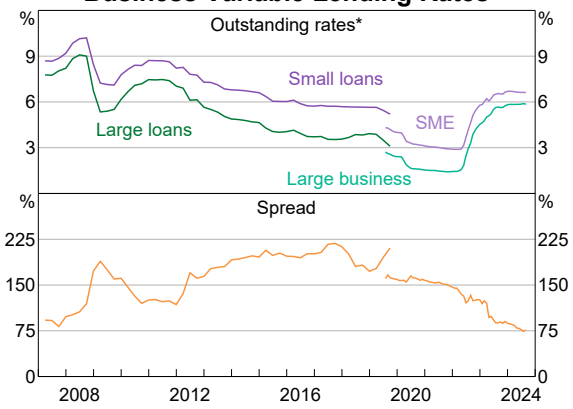
Another source of credit for small businesses is debt owed to the Australian Taxation Office (ATO). Debts to the ATO increased through the pandemic period as the ATO paused debt recovery actions. The level of unpaid debts remains high, the majority of which is owed by small businesses.

Smaller businesses continue to face higher borrowing costs than larger businesses

Smaller businesses typically face higher borrowing costs than larger businesses, although this spread has narrowed over recent years. Higher costs largely reflect banks' responding to their assessment of the greater risk of lending to SMEs. In particular, their risk modelling suggests that small and medium businesses are more likely to default than large corporations. Even so, the difference between rates on outstanding large and SME business loans has narrowed by around 120 basis points over the past two years, as rates on large businesses loans have risen by more than those on SME loans in the recent hiking phase (Graph 12). This trend partly reflects changes to business size definitions in April 2023 and June 2024 that resulted in some large business loans (which pay lower interest rates on average) being reclassified as SME loans. However, it could also reflect higher competition for SME lending (relative to large business lending) over this period, facilitated by improved funding conditions for non-bank lenders. Reductions to the Australian Prudential Regulation Authority's capital requirements for banks' SME loans, which became effective from January 2023, may also have contributed to this trend.[6] Rates on new SME loans have been little changed over the past year but have increased by around 365 basis points since April 2022, compared with around 415 basis points for new large business loans.

Graph 12

Business Variable Lending Rates



* Changes to business size definitions in April 2023 and July 2024 resulted in some large business loans being reclassified as SME loans.

Sources: APRA; RBA.

Strong financial positions have supported resilience but some small businesses have faced severe financial pressures and entered insolvency

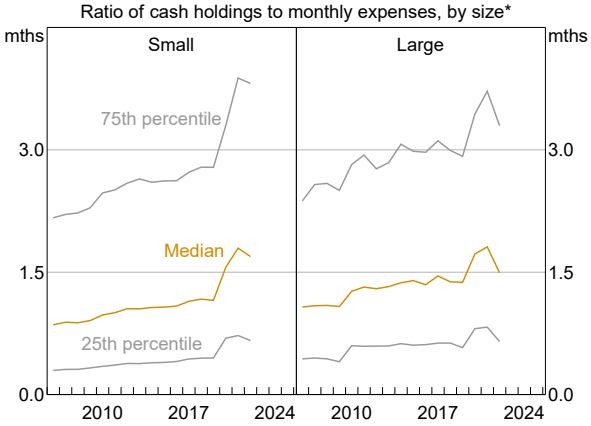
Cash holdings of small businesses have supported resilience

The sizable cash buffers accumulated during the pandemic have played a key role in small businesses' resilience through recent challenging conditions. While lagged, data available up to June 2022 on small businesses' cash holdings show the substantial buffers accumulated through the pandemic period, facilitated by significant pandemic support measures and precautionary saving (Graph 13). These buffers – measured as the ratio of liquid assets to monthly expenses – reached a similar level to those of larger businesses by the end of the pandemic period. By contrast, prior to the pandemic, the median small businesses had a cash buffer around 25 per cent lower than larger businesses. Many small businesses were able to pass on the increase in expenses observed in recent years, allowing them to maintain their cash buffers at near historical highs through to mid-2022. Cash buffers can be used to fund expansion. They can also be drawn on in periods of financial stress or to alleviate cash flow pressures arising from late payments.

Graph 13

Business Cash Buffers

Ratio of cash holdings to monthly expenses, by size*



* Small businesses are those with 5–19 employees; large 200+. Cash holdings estimated by subtracting inventories and accounts receivable from current assets. Latest observation June 2022.

Sources: ABS (BLADE); RBA.

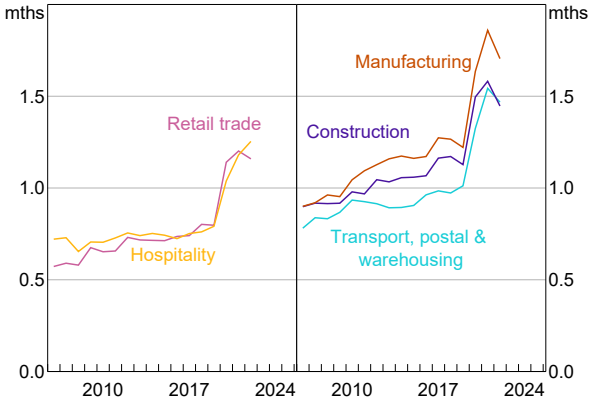
Cash buffers are likely to have declined over the past year. Recent bank liaison suggests cash buffers for small and medium businesses have declined further over the past year and returned to pre-pandemic levels, as challenging economic conditions have persisted. This implies that small businesses have less capacity to withstand future shocks.

Cash buffers tend to be lower for industries whose cost structure is more flexible (Graph 14). Industry differences possibly reflect different operating structures, with businesses in some industries like hospitality and retail trade typically having more ability to adjust their operating expenses, especially via employment.

Graph 14

Small Business Cash Buffers by Industry

Median ratio of cash holdings to monthly expenses*



* Small companies are those with 5–19 full-time employees. Measure of cash holdings constructed by subtracting inventories and accounts receivable from current assets as reported in annual company tax returns. Latest observation June 2022.

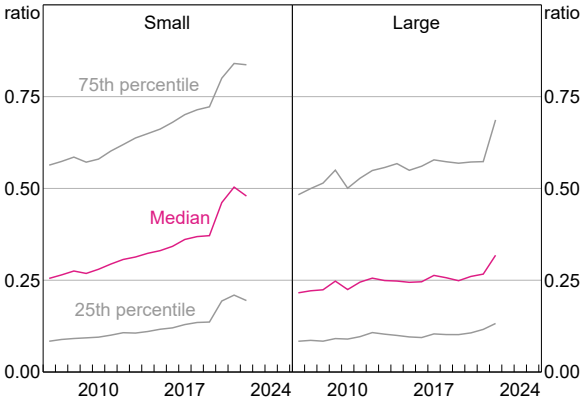
Sources: ABS (BLADE); RBA.

Small businesses tend to keep a higher share of their total assets as cash compared with large businesses (Graph 15) (La Cava and Windsor 2016). This cash ratio has been increasing for small businesses since the early 2010s, while remaining stable for most large businesses. These high and increasing cash ratios are likely to reflect the importance of internal funding for small businesses, given that they typically experience greater difficulty in accessing external sources of funding (as discussed above). During the pandemic, small businesses experienced the largest increase in cash ratios across the distribution, with the median cash ratio peaking at around half in 2021.

Graph 15

Business Cash Holdings to Total Assets

By business size*



* Small companies are those with 5–19 full-time employees; large 200+. Cash holdings estimated by subtracting inventories and accounts receivable from current assets. Latest observation June 2022.

Sources: ABS (BLADE); RBA.

There is little information available on leverage among small businesses. Aggregate business leverage, however, has declined over the past decade and liaison suggests that many small businesses entered the recent tightening cycle with low gearing.

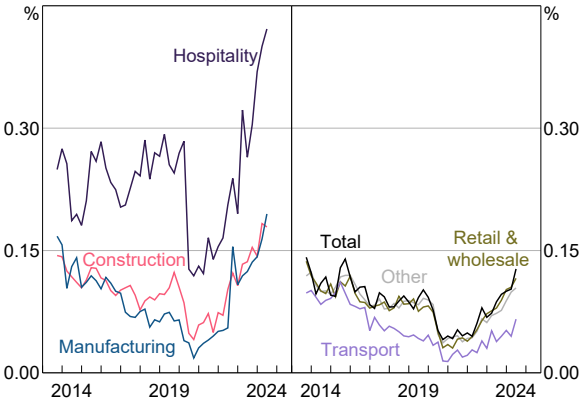
Some small businesses have faced severe financial pressures and entered insolvency

The number of companies entering insolvency has increased sharply over the past couple of years, and at least three-quarters have been small businesses. However, insolvencies remain less than 0.15 per cent of all operating businesses each quarter, similar to pre-pandemic levels (Graph 16, right panel). Insolvencies in the construction and hospitality sectors have driven much of the increase in insolvencies and are above pre-pandemic levels as a share of businesses in these industries (Graph 16, left panel). For the hospitality sector, this is consistent with the acute pressure on revenues and profitability described above. In the past few months, the total number of construction companies entering insolvency has begun to ease but they remain elevated – particularly among sub-contractors, who have been affected by builder insolvencies, rising costs, weather delays and labour shortages (RBA 2024a).

Graph 16

Company Insolvencies by Industry

Share of operating businesses within each industry*



* Quarterly company insolvencies divided by the number of businesses operating in that industry at the end of the financial year. Company insolvencies is seasonally adjusted. Latest observation June 2024.

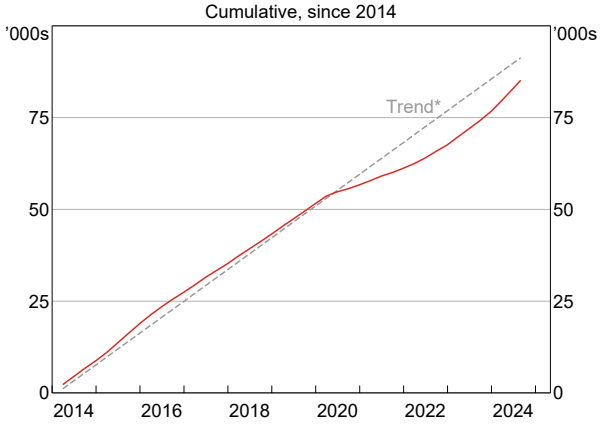
Sources: ABS; ASIC; RBA.

The increase in total insolvencies has been driven by more challenging trading conditions and a catch-up effect following the removal of pandemic-period government support. During the pandemic, the boost to cash buffers from the significant government support and ATO pausing tax collections eased immediate cash flow challenges for many small businesses. As these measures have been unwound over the past two years (including the ATO resuming enforcement actions on unpaid taxes) and economic conditions have become more challenging for small businesses, a cohort of unprofitable businesses have depleted buffers and entered insolvency. On a cumulative basis, however, insolvencies remain below their pre-pandemic trend (Graph 17). Additionally, around 20 per cent of recent insolvencies have been small businesses that are in the process of restructuring. Analysis by ASIC on the first cohort of businesses to enter small business restructuring plans in 2021/22 show that most businesses that undergo restructuring eventually resume operating (ASIC 2023).

Graph 17

Company Insolvencies

Cumulative, since 2014



* Trend for cumulative insolvencies calculated using observations from 1999–2019. Latest observation August 2024.

Sources: ASIC; RBA.

Conclusion

The economic environment has been more challenging for small businesses over the past year. Demand has slowed, especially for discretionary goods and services, while costs have continued to grow at an elevated rate. This has put pressure on more small businesses' profitability. Relative to larger businesses, small businesses generally have more variation in their revenues year-to-year and are more likely to experience losses. However, most small businesses have maintained their profit margins and sizable cash buffers built up during the pandemic have been a key source of resilience through more recent challenging conditions. These buffers are declining and an increasing share of businesses have entered insolvency, though the number of insolvencies remains below its pre-pandemic trend on a cumulative basis.

Small businesses' access to finance is highly variable, and many small businesses continue to report difficulty accessing financing on terms that suit their needs. While the 32nd Small Business Finance Advisory panellists described financing conditions as having tightened over the past year, lenders have generally reported little change in lending standards and the cost of small business finance has been little changed.

Looking ahead, pressures on businesses are expected to ease as real household disposable incomes are projected to grow and inflation to ease. However, given the depletion of buffers and higher sensitivity of small business revenues to the economic cycle, small businesses would be particularly vulnerable to a further deterioration in economic conditions.

Endnotes

* The authors are from Domestic Markets and Financial Stability departments. They would like to thank the members of the Small Business Finance Advisory Panel for their participation in this year's discussion.

1 The Australian Small Business and Family Enterprise Ombudsman's (ASBFEO) index of small business operating conditions also remains below the long-term average.

2 The split of total high-growth firms and low-growth firms by industry generally follow the industry's share of total businesses in Australia. Firms in construction and professional, scientific and technical services make up around 40 per cent of high-growth small firms in Australia, slightly above historical proportions.

3 Timely firm-level data on small business expenses is not available.

4 By number of businesses, micro firms – those with less than five employees – account for around 70 per cent of employing businesses. However, as they are very small, they make up a more limited share of employment and output and are typically excluded from our analysis of small businesses.

5 Data on business lending by business size are compiled based on monthly returns collected by the Australian Prudential Regulation Authority (APRA) from banks and registered financial corporations that have $2 billion of business credit or more. This threshold captures over 95 per cent of total business credit. Small and medium business loans are those defined as 'SME retail' or 'SME corporate' respectively in APRA's Prudential Standards APS 112 and APS 113, corresponding to businesses with less than $75 million in consolidated annual revenues. Loans are 'SME retail' if they are in the form of a small business lending facility and the total exposure from the lender to the borrower is less than $1.5 million.

6 These changes lowered the risk weights on loans to SMEs, reducing the amount of capital banks are required to hold against these loans. They also revised the definition of retail SMEs, which attract lower capital requirements than loans to non-retail SMEs, to include loan exposures of up to $1.5 million. Lower capital requirements reduce the cost to banks of funding SME loans (all else equal).

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The Reliability of Retail Payment Services

Jared Griffiths and Matthew Joyce*

Photo: gremlin – Getty Images

Abstract

Australians are increasingly dependent on the continuous availability of electronic payment systems. As such, every incident or outage can potentially cause inconvenience or economic harm for end-users of those systems. This article presents insights into the reliability of payment systems using information from the RBA's retail payment incidents dataset. The article notes that retail payment services have an average availability of at least 99.8 per cent each quarter. Online banking and fast payments services are most likely to be affected from outages, with root causes relating to issues with third parties, software and change management. Given the wide-reaching impact of outages, the effective management of operational risk in the payments system has never been more important.

Introduction

The safe and reliable operation of payment systems is critical to the operation of the Australian economy. Most salary, pension and welfare payments are made via account-to-account payments (electronic transfers between bank accounts) and over 75 per cent of consumer transactions are made through electronic payment rails such as debit and credit cards (Nguyen and Watson 2023). This reliance on electronic payment methods means that any disruption to the provision of these services (i.e. an outage) can have serious impacts on customers, businesses and the broader economy.

Recognising the growing importance of payment service availability, in 2012 the RBA started collecting incident reports from payment service providers on unplanned retail payment service outages. Following an increase in payment systems outages over

2018 and 2019, the RBA collaborated with industry to improve the quality of the RBA's data collection by establishing a standardised set of statistics to measure operational outages in retail payments.

To support the transparency of retail payment service reliability, the RBA also expects individual providers of payment services to publish a standardised set of statistics about the availability of their services on their websites (RBA 2021). These disclosures commenced in November 2021. Public disclosure has enabled retail payment service providers to benchmark their performance against competitors, while also providing an incentive for service providers to improve the reliability of their own offerings. Disclosure has also provided the general public with more visibility on the reliability of their current retail payment service providers and an ability to compare their performance to other providers.

This article presents insights from the RBA's collection of retail payment incident statistics. It provides an overview of the dataset, including which service providers report and what they report to the RBA each quarter. The article then presents information about the availability of the different types of retail payment services. It also provides information on the root causes of outages and discusses the importance of managing operational risk.

The retail payment incidents dataset

The RBA expects certain financial institutions to report and publicly disclose data on the reliability of their retail payment services. These retail payment services include ATM, branch and online banking services, services provided to merchants to accept card payments, services provided to customers to make card payments, fast payments[1] and next-day payments.[2]

The institutions expected to report and disclose reliability data are those that provide payment and banking services to individual and business customers, and that are either ranked within the top 25 largest authorised deposit-taking institutions[3] or acquire card transactions for merchants (RBA 2022).

The information that the institutions disclose each quarter to the RBA is summarised in Figure 1 and includes:

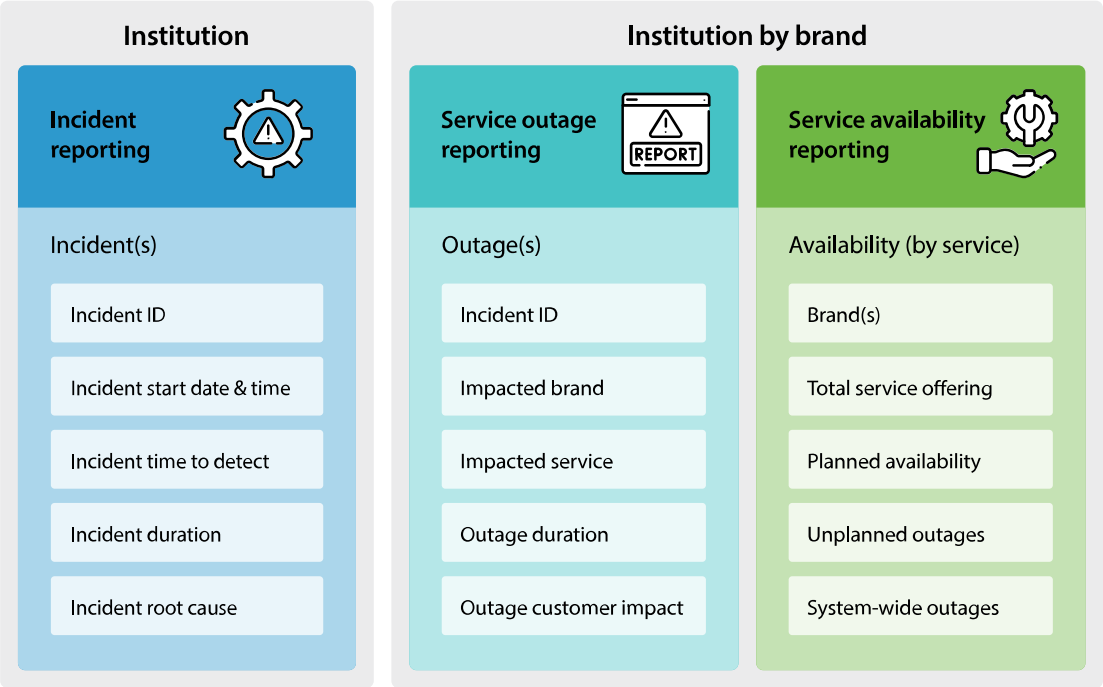
- the time and date of any incident that affected the institution's ability to provide retail payment services, the root cause of the incident, the time taken for the incident to be detected and the time taken for the incident to be resolved[4]
- the length of any outage to a retail payment service caused by an incident and the proportion of customers affected by an outage
- the total number of hours that the institution planned to provide retail payment services to customers, the total length of any planned or unplanned outage that affected any retail payment service and the overall percentage availability of the retail payment service.

An institution should report any 'significant outage' that lasts for more than 30 minutes or, for next-day payments, if a next-day account transfer cannot be processed by the end of the day. A significant outage also includes an outage that impacts either 10 per cent of customers for that service or impacts a major geographical area for ATM, branch or card payment services.[5] One downside of this definition is that it does not capture some localised outages, such as those caused by natural disasters affecting regional communities, which can be very disruptive for the consumers and businesses impacted.

Under the agreement with industry, disclosing institutions publish a subset of the information reported to the RBA on their websites.[6] For each retail brand, data is publicly disclosed on the percentage availability of their retail payment services,[7] the length of any significant outage caused by incidents arising from within the institution and the length of any significant outage caused by issues arising from system-wide infrastructure issues or natural disasters. If the institutions operate multiple brands, disclosures should be made at the retail brand level, given that households and businesses interact with these brands for their payment and banking services.

The RBA uses the full set of information reported by the institutions to update the Payments System Board on progress towards one of its key strategic priorities – to strengthen the resilience of payments and market infrastructure. Through this dataset, the RBA is able to monitor the reliability of payments services and work with industry to minimise the occurrence of incidents that might impact the day-to-day activity of households and businesses. The RBA is currently drawing on the data to understand the system-wide

Figure 1
Retail Payment Incidents Reporting Structure



Source: RBA.

reliability of the payments system and to identify if there is a need for additional resilience and redundancy within certain parts of the system.

Availability of retail payment services

Fast transfers and online banking have the highest number of significant outages relative to other retail payment services (Table 1). Online banking and fast transfers have also recorded the most hours of significant outages since the dataset's inception. Access to online banking is increasingly essential for end-users making fast and next-day transfers. As a result of this dependency, online banking outages can have a greater impact on end-users by also disrupting the ability of consumers to use other payment rails. While the median length of significant outages for next-day transfers is higher than other retail payment services, this is a product of the different reporting criteria for next-day transfers. Indeed, the average quarterly duration of planned outages to next-day payments is approximately 1⅓ hours, which is lower than other payment rails.

Overall, payment services have high aggregate levels of reliability. All retail payment offerings have an average availability of 99.80 per cent or higher per quarter. Making and accepting card payments have the highest service availability, while fast transfers, next-day transfers and online banking are more likely to experience service disruptions. Despite the overall high average service availability, a singular significant outage can cause economic harm for affected end-users and has the potential to transmit systemic issues across the payments system and economy. For this reason, the RBA engages with industry to understand the causes of outages and to encourage work to reduce their further occurrence.

Table 1: Availability of Retail Payment Services

September quarter 2021 to March quarter 2024

Service	Total number of significant outages	Total length of significant outages (hrs)	Median length of significant outages (hh:mm)	Average quarterly planned outages (hh:mm)	Average service availability (%)
ATMs	39	379	2:06	4:58	99.91
Branches	42	101	1:39	6:34	99.90
Make card payments	79	249	1:47	2:24	99.97
Accept card payments	23	72	1:55	1:45	99.98
Fast transfers	415	1316	2:10	5:02	99.81
Online banking	532	1478	1:26	8:42	99.82
Next-day transfers	36	477	7:52	1.22	99.85

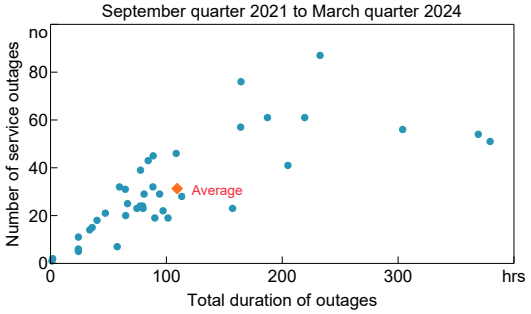
Source: RBA.

Across all retail payment services, brands have incurred approximately 30 outages on average since the dataset's inception (Graph 1). The average aggregate duration of these outages has been 110 hours. As shown in Graph 1, the majority of brands have performed better than the average. Indeed, a significant portion of retail payment incidents are attributable instead to a select number of institutions that have reported outages that are significantly higher than the average brand.

Graph 1

Service Outages by Institution Brand

September quarter 2021 to March quarter 2024



Source: RBA.

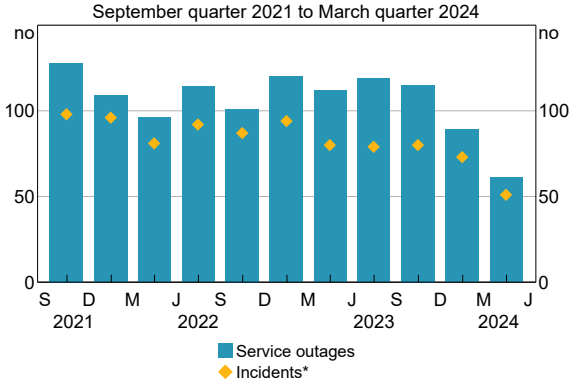
Frequency of retail payment incidents and outages

The total number of incidents and outages has trended downwards over the time that the RBA has collected the data (Graph 2). The overall reduction in outages has been driven by falls in the number of fast transfers and online banking outages. As stated above, it is possible for multiple outages to arise from a single incident. While the number of incidents causing one service outage has fallen in recent quarters, the number of incidents causing multiple service outages has not fallen to the same extent. The RBA will be analysing future data to see if there is persistency in the number of incidents causing multiple outages and whether this is indicative of increased interdependency between services within the modern payment system.

Graph 2

Total Service Outages per Quarter

September quarter 2021 to March quarter 2024



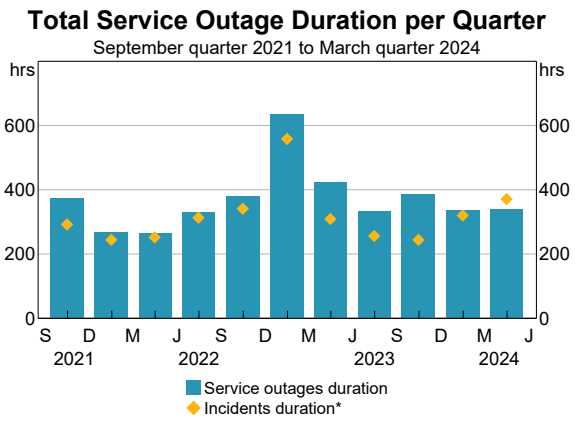
* A reported incident may result in one or more service outages, and may impact one or more reporting institution brands.

Source: RBA.

The total duration of outages has not decreased alongside the fall in the overall volume of outages. For example, the number of outages reported in the March quarter of 2024 was the lowest to date, but there has not been any notable fall in total outage duration relative to previous quarters. This insight suggests that the overall impact of service outages

has not decreased, despite institutions taking action to reduce the number of incidents. The largest total duration of outages since the dataset's inception occurred in the December quarter of 2022 (Graph 3). This spike was partly due to an incident affecting RBA-operated payments infrastructure on which some account-to-account transfers rely.[8]

Graph 3



* The duration of an incident will equal, or exceed, the duration of any individual corresponding service outage.

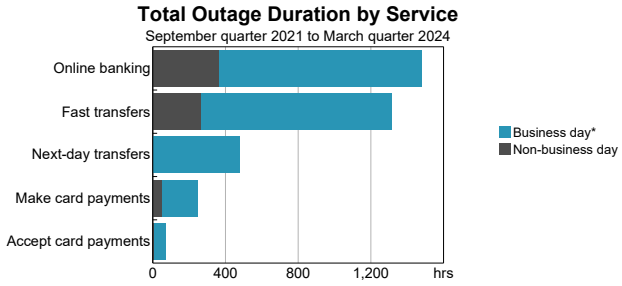
Source: RBA.

Retail payment outages across business days

Certain payment rails such as fast transfers or card payments are time critical. Consumers and businesses have an expectation that these services will be continuously available – that is, 24/7 – and so any outage preventing transactions can have a significant impact on them. For example, a non-cash carrying customer's ability to pay for physical goods will be limited when there is a card outage. Furthermore, a consumer wishing to make an online card payment to secure a discounted price for a product would be affected if an outage occurred and the card payment service was not available; it could mean the consumer has to pay a higher price for the same item when the outage is rectified. For online banking, fast transfers and card payments, outages are reported for all days, including non-business days, since the 24/7 nature of these services means that outages at any time potentially having an impact on end-users (Graph 4).

By contrast, next-day transfers are used for transactions that need to arrive on a particular future date and time and where scheduling is understood in advance. For example, recurring transactions such as salary, direct debits and planned welfare payments need to be available in recipient accounts at a date that can be planned for and set up in advance. As a result, there is a greater ability for an incident affecting next-day transfers to be resolved throughout the day without any immediate impact on end-users; consumers will only be affected if an incident has not been concluded by the end of the day. Outages to next-day transfers are only reported as occurring on business days, given that end-users expect next-day transfer services to be available on business days.

Graph 4



* Where the incident corresponding to a service outage is detected on a business day.

Source: RBA.

Operational risk

Regulators monitor the management of operational risk by payments and market infrastructures to ensure that the infrastructure is robust and supports financial stability. For payment systems, operational risk can arise from deficiencies in internal processes, human error or external events (CPSS and IOSCO 2012). The effective management of operational risk by payment system operators and payment service providers is increasingly important, as the interconnectedness of the ecosystem means that a singular incident has the potential to cascade and create systemic issues across the ecosystem (RBA 2023).

The retail payment incidents dataset captures information on the root causes of incidents and so provides insights into common issues relating to operational risk management. The leading cause of outages are issues with third parties (Table 2). Payment rails rely on various service providers, ranging from information technology and utility service providers to parties that clear or settle retail payments. As a result, regulators such as the RBA and the Australian Prudential Regulatory Authority (APRA) have taken steps to encourage institutions to uplift their management of potential sources of risk from service providers, while also encouraging service providers to consider potential risks they could pose to these institutions (Lonsdale 2024; RBA 2023).

Table 2: Number of Outages to Fast and Next-day Payments by Root Cause

September quarter 2021 to March quarter 2024

Root cause	Accepting card payments	Making card payments	Online banking	Fast transfers	Next-day transfers	Total
Change management[(a)]	8	11	123	64	5	211
Operational[(b)]	2	3	28	19	1	53
Technology[(c)]	4	22	246	97	11	380
Third party[(d)]	9	43	135	235	19	441
Total	23	79	532	415	36	1,085

(a) An outage will have a change management root cause if the outage arose from changes carried out without following proper change management procedures, incorrectly carried out installations or other change activities, inadequate pre- and post-implementation verification or outages caused by a requirement to back out a planned change.

(b) An incident will have an operational root cause if there is an operational failure (e.g. not following procedures, insufficient controls, inadequate monitoring, failure to detect or appropriately respond to alerts or a failure to apply incident prevention where it may have been possible).

(c) An incident will have a technological root cause if there is a software or application failure, an infrastructure or hardware issue or a malicious attack on target systems.

(d) An incident will have a third party root cause if there is a network or communications failure, a service provider failure, a system-wide infrastructure error or a natural disaster.

Source: RBA.

Outages are also often caused by technology issues and change management processes. Technological issues typically arise from software, hardware and infrastructure failures, while outages deriving from change management issues arise from incorrectly carried out installations or failures to follow adequate procedures and verification processes.

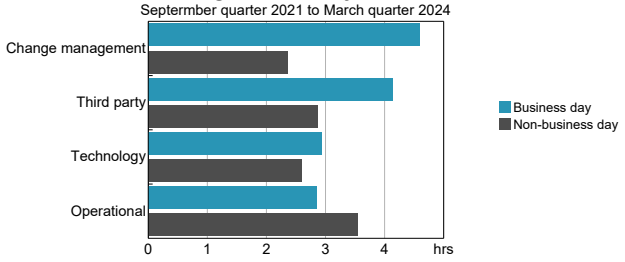
The duration of incidents resulting in service outages vary by root cause and business day (Graph 5). Incidents have generally taken longer to resolve when they have been detected on a business day and where the cause can be traced to change management or third party issues. This may seem counterintuitive, but further investigation shows that incidents occurring on a Monday have the longest time to resolve on average, as it is common for system changes and upgrades to be scheduled over the weekend.

This insight highlights the challenges of managing incidents caused by process or technological changes that are introduced outside of business hours and the importance of effective testing when system changes are implemented. As consumers increasingly expect retail payment services such as card payments, fast transfers and online banking to be available 24/7, it is important that service providers have the ability to swiftly address outages, irrespective of whether they arise within or outside of business hours.

Graph 5

Mean Outage Duration by Root Cause*

Septermber quarter 2021 to March quarter 2024



* The root cause of the incident corresponding to a service outage.

Source: RBA.

Conclusion

This article provides insights into the Australian retail payments ecosystem from the RBA's collection of retail payments incidents data reported and publicly disclosed by certain institutions. Standardised reporting and publication of data has provided greater transparency for the public and industry. The public is now able to analyse the reliability of their service provider, while industry can compare the reliability of their services with those of other providers.

Payment services overall have high aggregate levels of reliability. However, incidents affecting the reliability and availability of retail payments can have a serious impact on customers, businesses and the broader economy. Significant outages are most likely to occur for online banking and fast transfer services. The importance of industry in effectively managing operational risks relating to payment systems will continue to be emphasised by the RBA in its efforts to promote financial stability. The retail payment incidents database will continue to be an important source of information in this regard.

Endnotes

* The authors are from Payments Policy Department. They are grateful to Stephanie Bolt, Ellis Connolly, Declan Hunt, Sushmitha Kasturi, Elizabeth Kandelas, Kristin Langwasser, Konrad Szylar, Grant Turner and colleagues in Payment Settlements Department for comments on this article. They also wish to acknowledge the work of Grant Turner and Elizabeth Kandelas in establishing these data collection, and Sally Wong for helping to collect data used in this article.

1 Fast transfers refer to account-to-account transfers to a PayID and other one-off or scheduled payments made through NPP/Osko. NPP is the New Payments Platform.

2 Next-day transfers refer to account-to-account transfers and scheduled payments not made as fast payments through NPP/Osko and BPAY payments.

3 Authorised deposit-taking institutions are financial institutions such as banks, building societies and credit unions that are licensed by APRA to carry on banking business, including accepting deposits from the public.

4 Active members of the Reserve Bank Information and Transfer System (RITS) that are direct clearing or settlement participants in the NPP, Bulk Electronic Clearing System (BECS) or BPAY payment systems are also required to provide this information to the RBA. However, they are not obliged to publicly disclose this information.

5 A major geographical area is defined as an entire capital city metropolitan area or 50 per cent of ATMs, branches, card payment transactions or point-of-sale terminals in the rest of a state or territory. For a more detailed explanation of the RBA's data collection, see RBA (2022).

6 For a compilation of links to published statistics, see RBA (undated).

7 The service availability is the actual amount of time that the service is not experiencing an unplanned significant outage, as a proportion of the amount of time the service was planned to be available in the quarter.

8 For further detail about this outage, see Deloitte (2023).

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Inflation-linked Financial Markets

Nick Baker, Dominique D'Netto, Mac McKenna and Dmitry Titkov*

Photo: Andriy Onufriyenk – Getty Images

Abstract

Financial instruments with returns that are indexed to inflation allow market participants to hedge against or take positions on future inflation. Inflation-linked bond and swap markets in Australia are small and not very liquid relative to some other advanced economies. Nevertheless, pricing in these markets can provide valuable information about participants' inflation expectations. Market measures of long-term inflation expectations have increased in many advanced economies since the COVID-19 pandemic. In Australia, this has brought expectations into closer alignment with the RBA's inflation target.

Introduction

Inflation-linked financial instruments involve cash flows between market participants (for an inflation-linked bond, from the issuer to the holder) that depend on the rate of inflation. Inflation-linked markets serve two important purposes. First, they can be used for hedging. Market participants with inflation-linked assets, such as governments or infrastructure providers, can issue or enter into inflation-linked financial instruments with participants with inflation-linked liabilities, such as super funds or insurance companies, to reduce risks from future inflation. Second, inflation-linked markets reveal information about participants' inflation expectations. This is because participants can profit by trading in these markets if their forecasts for inflation turn out to be more accurate than those of others.

The two key types of inflation-linked financial instruments are capital indexed bonds ('indexed bonds') and inflation swaps.[1] Pricing in inflation-linked markets provides measures of the compensation that market participants demand for holding an instrument that exposes them to future inflation. This is called 'inflation compensation' and can differ

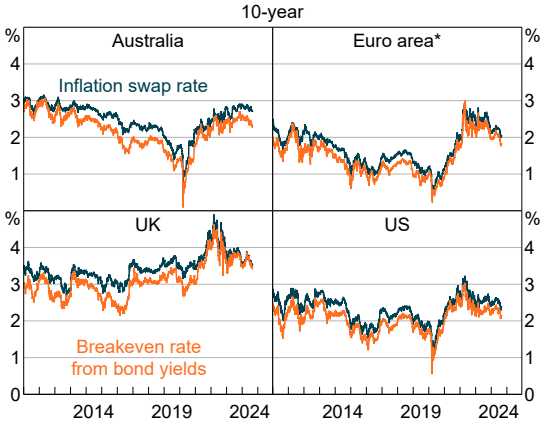
from market participants' expectations for future inflation, as discussed below. For swaps, inflation compensation can be inferred directly from swap pricing. For bonds, inflation compensation is inferred by comparing the pricing of indexed bonds with nominal bonds that have similar terms to maturity. Most advanced economies, including Australia, have markets for both inflation-linked bonds and swaps. Relative to some other advanced economies, Australia's markets for indexed bonds and inflation swaps are modest in size and somewhat less liquid, particularly for swaps.

Measures of inflation compensation are influenced by risk premia and technical factors, which can cloud their interpretations. This article explains these influences, before presenting estimates that attempt to decompose inflation compensation into components for inflation expectations and risk premia. Understanding how inflation-linked markets function, and decomposing inflation compensation, supports clearer interpretations of how consistent market participants' inflation expectations are with central bank inflation targets. This article investigates market participants' inflation expectations across advanced economies during the most recent inflationary shock – the COVID-19 pandemic. Inflation compensation fell at the onset of the pandemic across advanced economies before rising alongside the surge in inflation (Graph 1). Once estimates of risk premia are removed, pricing in inflation-linked markets suggests that participants' long-term inflation expectations have settled around central bank inflation targets in most advanced economies as inflation has declined. In Australia, participants' long-term inflation expectations are now anchored around the midpoint of the RBA's inflation target (RBA 2024).

Graph 1

Measures of Inflation Compensation

10-year



* Breakeven rate uses German inflation-linked bonds, which reference euro area HICP inflation.

Sources: Bloomberg; RBA.

Inflation-linked financial instruments

What are they?

Indexed bonds are a debt security in which the issuer promises to adjust principal and interest (or coupon) payments in line with a reference inflation index on a pre-determined frequency. The coupon is paid on the inflation-adjusted principal value to maintain the real value of the coupon, so the value of the payments to the holder of the security is constant in real terms because it varies directly with inflation outcomes over the life of the bond. This means the yield on an indexed bond is a real yield. Nominal bonds, in contrast, have fixed face values and coupon payments and therefore they provide a constant nominal cash flow and the yield on these bonds is in nominal terms. The inflation rate that equalises the expected return on equivalent maturity indexed and nominal bonds is known as the 'breakeven' inflation rate and is a measure of the inflation compensation demanded by participants in the bond market. As discussed in 'Risk premia' below, measures of inflation compensation can differ from market participants' inflation expectations, including because participants can demand additional compensation for the risk that inflation turns out to be different from what they had expected.

Inflation swaps are a type of derivative in which two counterparties agree to exchange cash flows for a given notional amount and specified period, where the cash flows in one direction are linked to inflation. One counterparty pays a fixed interest rate, which is agreed at the initiation of the contract, in exchange for a floating interest rate that is based on the change in a reference inflation index. The fixed payment leg of the contract is a measure of the inflation compensation demanded over the term of the swap by participants in the swap market, as that is the rate at which market participants can agree to exchange future fixed and floating cash flows.

Where did they come from?

Indexed bonds

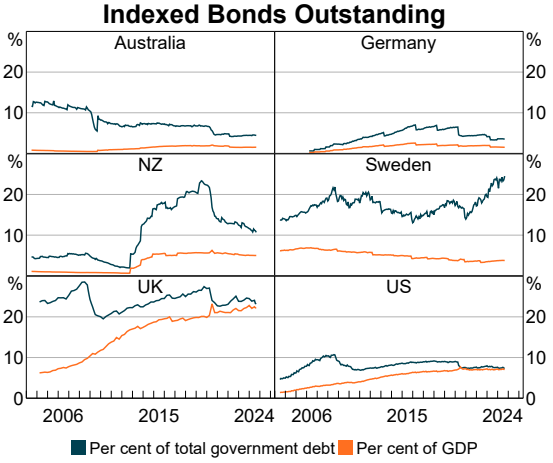
There are several reasons why governments have issued indexed bonds (see, generally, Cole and Schaper 2024). These bonds can reduce the expected cost of debt servicing in so far as investors are willing to pay a premium to reduce their inflation risk (for more detail, see 'Risk premia' below). Indexed bonds may also allow governments to better hedge their net cash flows – at least in the short run – because when inflation is high, nominal tax receipts tend to increase immediately while spending tends to increase with a lag (Bankowski *et al* 2023). Issuing indexed bonds can help to reinforce anchored inflation expectations and monetary policy credibility by reducing the incentive for governments to inflate away the real value of their liabilities. A liquid indexed bond market creates a real risk-free benchmark rate for the economy (i.e. a rate free from both credit and inflation risk). Also, indexed bonds can improve the resilience of sovereign funding by increasing the diversity of the investor base.

The earliest recorded use of indexed bonds was by the Commonwealth of Massachusetts in 1780 (Fisher 1913; Shiller 2003). In 1945, Finland became the first sovereign issuer of indexed bonds. Further sovereign issuance was initially limited to small economies with high inflation that struggled to issue nominal bonds in their own currencies (Garcia and van Rixtel 2007). In 1981, the United Kingdom became the first major advanced economy to issue an indexed bond. Other advanced economies followed later: Australia in 1985; Canada, Sweden, New Zealand and the United States in the 1990s; and Japan and Germany in the 2000s. However, issuance of indexed bonds has often been sporadic. For example, Australia stopped issuing indexed bonds in 1989–1992 and 2004–2008 (McCray 1997). Over the past few years, Canada and Germany have ceased issuance completely.

Indexed bonds account for a small share of total government debt in most economies (Graph 2). In Australia, Canada and Germany, indexed bonds comprise less than 5 per cent of total debt. These shares have fallen in most advanced economies since the pandemic, in part because governments relied on the more liquid nominal bond market to fund pandemic responses. While less than 10 per cent of US federal debt is in indexed bonds, the market is still large in absolute terms, with around US$2 trillion outstanding. Indexed bonds make up around a quarter of total government debt in the United Kingdom and Sweden.

Graph 2

Indexed Bonds Outstanding



Sources: LSEG; RBA; respective debt management offices.

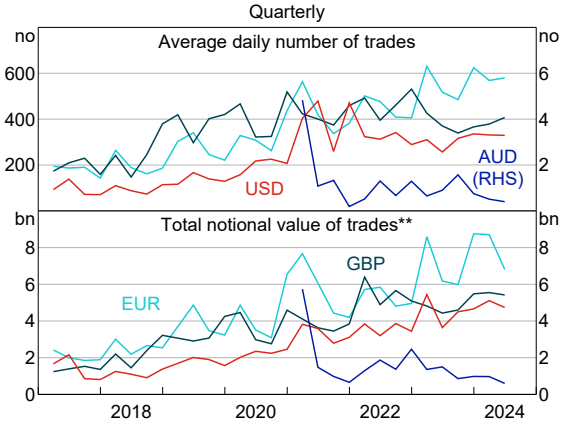
Inflation swaps

Inflation swap markets emerged in the 1980s and 1990s alongside the issuance of indexed bonds, although they were initially small and non-standardised. The market for inflation swaps in Australia developed during the mid-2000s, as they provided an alternative to indexed bonds, the issuance of which was suspended temporarily by the Australian Government due to budget surpluses. Data on the size of inflation swap markets was, until recently, very limited as inflation swaps are an over-the-counter product. However, central clearing of inflation swaps in a number of overseas markets has increased considerably since 2016 and has been associated with an increase in trade volumes (Graph 3).[2] By contrast, Australian dollar inflation swaps are not centrally cleared. Activity in the Australian inflation swap market is generally low and sporadic, and the size of the market has declined over recent years in terms of notional value outstanding. It is possible that activity could increase if clearing was offered – for example, if clearing drew in institutions that were either unable or reluctant to participate in an uncleared market.

Graph 3

Inflation Swap Market Activity*

Quarterly



* Data cut-off is Q2 2024. For USD, EUR and GBP, trades are those cleared by LCH. For AUD, trades are an upper bound based on reporting to ASIC and exclude swaps between related parties and trade terminations.

** Values are reported in the local currency corresponding to each series.

Sources: ASIC; LCH; RBA.

Who trades them?

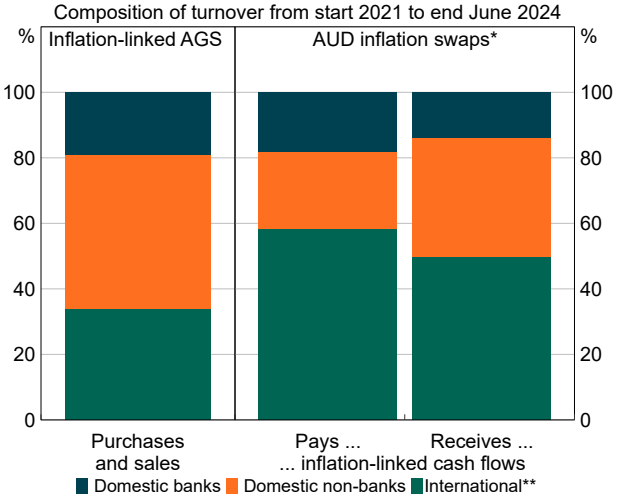
The supply of indexed bonds is determined largely by government debt management decisions. Entities with revenues tied to inflation and low variable costs, such as infrastructure providers or utility companies, may also issue indexed bonds to hedge their inflation-linked assets or revenues. Super funds and insurance companies are the key sources of demand for indexed bonds (and for receiving inflation-linked cash flows in inflation swaps), which they use to hedge their inflation-linked liabilities. Because investors in indexed bonds typically 'buy and hold' the asset for hedging purposes, liquidity in indexed bond markets can be significantly lower than in nominal bond markets, which tend to be more actively traded by a diverse range of participants. In Australia, domestic non-bank financial institutions – including super funds, insurance companies and fund managers – make up around half of the turnover in inflation-linked Australian Government securities (AGS; Graph 4).

By contrast, Australian dollar inflation swap activity is dominated by international banks on both sides of the swap, though domestic non-banks are relatively more active on the side that receives inflation-linked cash flows. There are financial market participants, such as hedge funds, that may choose to pay or receive cash flows linked to inflation for speculative or diversification purposes, though this is primarily at shorter horizons. As a result of the interaction of supply and demand dynamics for these instruments, indexed bonds are typically only issued at longer maturities whereas inflation swaps tend to trade at maturities of between one and 30 years.

Graph 4

Inflation-linked Markets in Australia

Composition of turnover from start 2021 to end June 2024



* Excludes swaps between related parties and trade terminations.

** Excludes domestically incorporated entities of international banks for inflation-linked AGS, but includes them for AUD inflation swaps.

Sources: AOFM; ASIC; RBA.

How do their design features differ across advanced economies?

Indexed bonds and inflation swaps typically reference the same inflation index within an economy, although the index used varies across economies. In most cases, including Australia, the reference index is identical to the central bank inflation target. Where the index is different, measures of inflation compensation can differ from the inflation target (Graph 5). However, index spreads are typically material only in the United States and United Kingdom.[3]

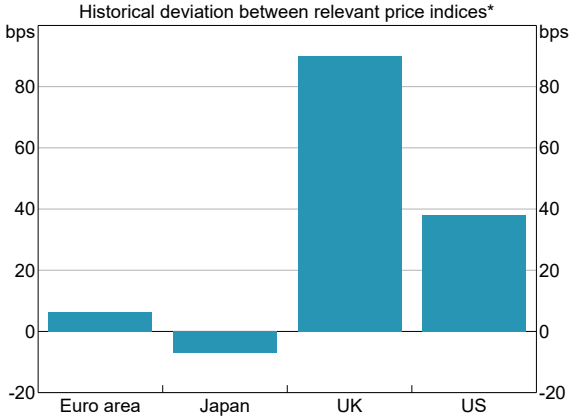
One difference between Australia and other advanced economies (except New Zealand) is that Australia's reference index, the Consumer Price Index (CPI), is published at a quarterly rather than monthly frequency. The Australian Bureau of Statistics (ABS) plans to transition to a complete monthly CPI in late 2025, though it will continue to publish a quarterly CPI series.[4] The monthly CPI will not automatically become the new reference index for inflation-linked financial instruments in Australia, given that the pricing formulae for them currently refer to the quarterly CPI.[5]

There are other characteristics that can, at the margin, affect the pricing of inflation-linked financial instruments. First, the frequency of coupon payments can matter.[6] Second, indexation lags can affect interpretations of inflation compensation, particularly at shorter horizons.[7] Third, some indexed bond issuers (including the United States, Australia, Germany and Japan) offer deflation floors at maturity, so that if deflation drives the principal amount below par, an investor would still receive the full par amount at maturity.[8] See Appendix A for a comparison of design features of indexed bonds and inflation swaps across selected advanced economies.

Graph 5

Inflation Index Spreads

Historical deviation between relevant price indices*



* Over the past 20 years. For the euro area, the spread between CPIH excluding tobacco and CPIH. For Japan, the spread between CPI excluding fresh food and CPI. For the UK, the spread between RPI and CPI. For the US, the spread between CPI-U and PCE deflator.

Sources: Bloomberg; RBA.

Risk premia

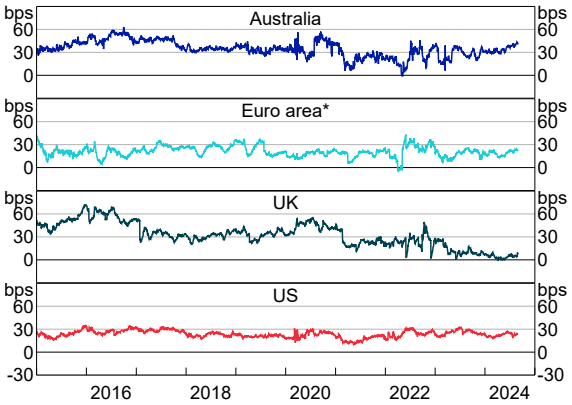
Ideally, measures of inflation compensation would provide a direct view of market participants' expectations for inflation. This would be the case if inflation-linked markets were efficient and frictionless and participants were risk-neutral. However, in practice, risk premia and the design features of indexed bonds and inflation swaps can influence measures of inflation compensation such that they do not reflect participants' inflation expectations alone.

Market participants may demand premia for inflation, liquidity and credit risk. These premia are difficult to measure, but models that decompose inflation compensation into inflation expectations and risk premia suggest that they can vary substantially over time. Inflation compensation and risk premia can differ across indexed bond and inflation swap markets due to differences between the two markets. While the spread between inflation swap rates and breakeven inflation rates implied by bond yields varies over time and across advanced economies, swap rates generally tend to be higher than breakeven rates (Graph 6). This spread has averaged around 20–30 basis points in recent years in Australia and some other advanced economies.

Graph 6

Inflation Compensation Spreads

10-year; swap rates less bond breakeven rates



* Using German inflation-linked bonds, which reference euro area HICP inflation.

Sources: Bloomberg; RBA.

Inflation risk

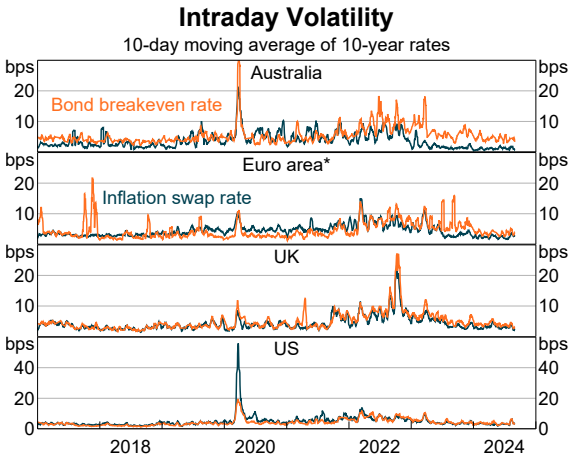
Future inflation is uncertain, so investors may demand compensation for the risk that inflation turns out to be higher or lower than their expectations. In theory, inflation risk premia could be positive or negative depending on the composition of participants in inflation-linked markets and their risk preferences, although estimates tend to be positive on average over time. This is consistent with greater demand for hedging inflation-linked liabilities than inflation-linked assets and may also reflect that unexpected inflation tends to hurt most market participants, so they are willing to pay a premium to insure against it. However, models decomposing inflation compensation into risk premia and inflation expectations should be treated with caution. Term structure models are commonly used, which assume nominal yields, real yields and inflation expectations are linear functions of 'pricing' factors, such as in Hambur and Finlay (2018). There are modelling limitations in decomposing market measures, particularly when the policy rate is at its effective lower bound, as it was in many advanced economies during the global financial crisis and the pandemic (Chung, Hui and Li 2017).

Liquidity risk

Measures of inflation compensation can incorporate liquidity premia, which compensates investors for market frictions in transacting in bonds or swaps. Indexed bonds are generally less liquid than nominal bonds, so liquidity premia are generally larger in indexed bond yields, which has the effect of reducing breakeven rates (Moore 2016). For inflation swaps, liquidity premia can be positive or negative depending on which side of the swap is more liquidity constrained. Dealer balance sheet constraints can also push up measures of inflation compensation from inflation swaps (Finlay and Olivan 2012). In the private sector, there is generally greater demand to receive inflation-linked cash flows than pay them, so market participants may require a premium to enter into swaps where they pay inflation-linked cash flows. Dealers may require a smaller premium to enter into swaps where there is a deeper and more liquid indexed bond market, because they can more easily hedge the swaps using the indexed bond market.

Liquidity premia on inflation swaps and indexed bonds cannot be observed directly, but changes in liquidity premia can be inferred from movements in measures of market liquidity. Intraday yield movements – a measure of volatility that can be exacerbated by poor liquidity – tend to be similar in both indexed bond and swap markets, suggesting liquidity premia have tended to move similarly in the two markets (Graph 7).

Graph 7



* Uses German inflation-linked bonds, which reference euro area HICP inflation.

Sources: Bloomberg; RBA.

Credit risk

Indexed bonds and inflation swaps can incorporate some degree of credit risk. For bonds, this is the risk that the issuer will default on coupon payments or the repayment of principal, while for swaps it is the risk that the counterparties to the swap are unable to meet their obligation to pay the fixed or the floating leg. As indexed bond breakeven rates are derived from the difference between the yield on nominal and indexed bonds, any credit risk is netted out, so credit risk premia are zero in breakeven rates. By contrast, inflation swap rates may incorporate some credit risk premia, with the magnitude varying depending on the credit risk of the counterparties involved. While collateralisation and central clearing can reduce credit risk, it may introduce other costs that affect pricing. Overall, credit risk may be contributing to the spread between inflation swap rates and indexed bond breakeven rates.

Inflation compensation since the pandemic

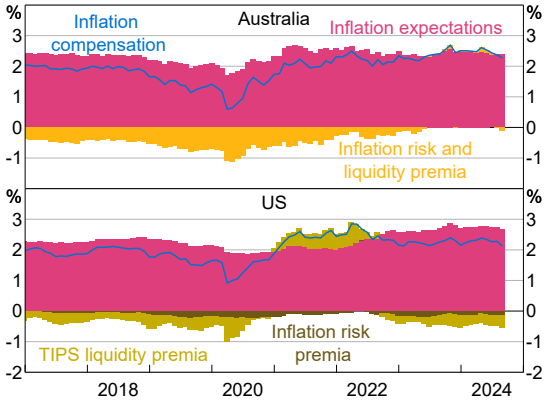
At the onset of the pandemic, inflation compensation declined considerably below central bank inflation targets, reaching record lows in Australia and the euro area, and the lowest levels since the global financial crisis in the United States (Graph 1). According to model estimates, inflation expectations declined a bit but generally remained closer to targets than inflation compensation, with the latter's large declines driven mostly by risk premia (Graph 8; Burban *et al* 2021). In March 2020, pandemic-related uncertainty caused a sudden increase in liquidity demand (the so-called 'dash for cash') that saw liquidity premia become larger as bond holdings were widely sold off, with larger increases in less liquid markets.[9] Because inflation-linked bond markets are less liquid than nominal bond markets, the liquidity premia demanded to hold them increased further, contributing to the decline in measures of inflation compensation. In Australia, poor liquidity continued to affect pricing in inflation-linked financial markets through to late 2020, though by 2021 these markets were once again functioning fairly well, as bid-offer spreads for inflation-linked bonds returned to around their pre-pandemic levels. Leaving aside risk premia, the decline in inflation expectations at the onset of the pandemic was consistent with the view that the pandemic would weaken the global economy, which helped prompt expansionary monetary policy (RBA 2020; FOMC 2020; Lagarde 2020).

From mid-2020, short-term inflation compensation increased notably above central bank inflation targets, amid an increase in headline consumer price inflation.

Graph 8

Inflation Compensation Decomposition

10-year, monthly, model estimates based on bond yields*



* Estimates in periods when the policy rate is at its effective lower bound, such as during the pandemic, should be interpreted with caution. The term structure models used do not enforce the effective lower bound, which can create biases.

Sources: D'Amico, Kim and Wei (2018); Federal Reserve; Hambur and Finlay (2018); Kim, Walsh and Wei (2019); RBA.

Inflation compensation returned to pre-pandemic levels around early 2021, before surpassing them in late 2021. This was several months before central banks started tightening monetary policy, suggesting market participants were quick to recognise building inflationary pressures. Short-term inflation swap rates reached record highs in many advanced economies in 2022. In Australia, the one-year inflation swap rate peaked at over 6 per cent in mid-2022, which was comparable to the RBA's one-year-ahead forecasts for headline inflation around that time. Longer term rates experienced a smaller increase, indicating market participants did not expect high inflation to persist in the long term, partly because they expected central banks to respond to higher inflation in the near term by increasing their policy rates.

According to model estimates, inflation expectations increased a bit in this period but again remained closer to central bank inflation targets than suggested by some measures of inflation compensation, as rising risk premia influenced these measures. Estimates of inflation risk premia moved higher, consistent with market participants perceiving an increase in uncertainty and upside risks to inflation, likely linked to supply chain pressures and high energy prices at the time (Lowe 2022; Lagarde 2022; Powell 2022). Additionally, in the United States, changes in liquidity premia pushed up inflation compensation as market functioning for indexed bonds improved.

As central banks increased their policy rates quickly in 2022 to return high inflation to target and reduce the risk of above-target inflation becoming embedded in inflation expectations, long-term inflation expectations remained around targets. This suggests market participants expected central banks to set policy rates such that inflation would stay on target over the long term. Short-term measures of inflation expectations moderated from their peak, some of which reflected the unwinding of negative supply shocks in addition to tighter monetary policy settings.

Over the past year, inflation compensation has settled above its pre-pandemic levels and is either consistent with or slightly above central bank inflation targets in the United States, euro area and Australia. Model estimates suggest long-term inflation expectations are generally anchored at targets.[10] Risk premia have moved higher than their pre-pandemic levels in Australia and the euro area, and are little changed in the United States (Burban *et al* 2021; Lane 2024). In Australia, long-term inflation compensation drifted upward by around ½ percentage point

starting from early 2023, reflecting a rise in inflation expectations and inflation risk premia, though more so the latter. This upward drift brought long-term inflation expectations closer in line with the midpoint of the RBA's inflation target, following a long period prior to and during the pandemic where they were below target (RBA 2024).

Overall, the period since the pandemic highlights that inflation compensation in indexed bonds and inflation swaps contains factors beyond market participants' inflation expectations, so caution is needed when interpreting these measures.[11]

Nevertheless, because indexed bonds and inflation swaps price inflation compensation in real time, they are useful for policymakers as a timely indicator of market participants' inflation expectations, to complement other, less timely, measures of inflation expectations such as surveys.
After abstracting from risk premia, inflation expectations derived from pricing in inflation-linked markets generally support the view that long-term inflation expectations are well-anchored in advanced economies, including Australia.

Appendix A: Design features of inflation-linked instruments in advanced economies

Table A.1: Indexed Bonds

An overview of key features across selected advanced economies

Key features	Australia	Canada	Germany	Japan	New Zealand	Sweden	United Kingdom	United States
Introduction	1985	1991	2006	2004	1995	1994	1981	1997
Reference index	CPI	CPI	HICP[a]	CPI[b]	CPI	CPI	RPI[c]	CPI-U
Indexation lag	~5m	3m	3m	3m	~5m	3m	3m[d]	3m
Coupon frequency	Quarterly	Semi-annual	Annual	Semi-annual	Quarterly	Annual[e]	Semi-annual	Semi-annual
Share of total debt	4%	2%	4%	N/A	11%	25%	23%	7%
Maturities issued	5–20y	–	–	10y	7, 10, 20y	2–15y	10–30y	5, 10, 30y
Deflation floor	Yes	No	Yes	Yes[f]	No	Yes	No	Yes

(a) For the euro area, excluding tobacco.

(b) Excluding fresh food.

(c) Until 2030, after which the CPIH (CPI including housing) will be used for all outstanding and new issuance.

(d) For indexed bonds issued from 2005 only. Prior to 2005, indexed bonds had an eight-month lag. There are still three indexed bonds outstanding that were issued prior to 2005 (the last of which matures in 2035).

(e) Sweden has also issued zero-coupon indexed bonds.

(f) For bonds issued after 2013.

Sources: Bloomberg; debt management offices.

Table A.2: Inflation Swaps

An overview of key features across selected advanced economies

Key features	Australia	Canada	Euro	New Zealand	Sweden	United Kingdom	United States
Introduction	2007	2007	2004	2014	2007	2004	2004
Reference index	CPI	CPI	CPIH[a]	CPI	CPI	RPI[b]	CPI-U
Indexation lag	3m	3m	3m	3m	3m	2m	3m
Interpolation method	Monthly	Monthly	Monthly	Monthly	Monthly	Monthly	Daily
Coupon frequency[d]	Zero	Zero	Zero	Zero	Zero	Zero	Zero
Maturities	1–30y	1–30y	1–30y	1–30y	1–30y	1–50y	1–30y

(a) For the euro area, excluding tobacco.

(b) Until 2030, and then the CPIH (CPI including housing) will be used for all outstanding and new issuance. There are some CPI swaps in the market but they are currently much less liquid.

(c) Most common/liquid swap. Coupon swaps are available in some economies, such as the United States.

Source: Bloomberg.

Table A.3: Indexed Bonds

Maturity mismatches across selected advanced economies

Maturity mismatches	Australia	Germany	United Kingdom	United States
Nominal bond lines[(a)]	38	84	103	395
Indexed bond lines[(a)]	7	4	32	53
Average maturity mismatch (days)[(b)]	139	61	96	9
10-year benchmark mismatch (days)	61	59	50	31

(a) Current outstanding bills or bonds, not including non-standard bonds on issue (e.g. green bonds and Treasury STRIPS).
(b) Average difference between current indexed bonds outstanding and the closest maturity nominal bond.

Sources: Bloomberg; debt management offices.

Endnotes

* The authors are from International Department and Domestic Markets Department. The authors would like to thank: the Derivatives Surveillance team at the Australian Securities and Investments Commission (ASIC) for processing and providing data on AUD inflation swaps; Andrew Barrelle from Barrenjoey for his insights on Australian inflation-linked financial markets; Matthew Wheadon from the Australian Office of Financial Management (AOFM) for clarifications regarding indexed bonds; and Susan Black, Jon Cheshire, Sean Dowling, Rachael Fitzpatrick, Matt Gibson, Jonathan Hambur, Callum Hudson, Christopher Kent, Jeremy Lawson, Gordana Peresin, Benn Robertson, Claudia Seibold and Penny Smith from the RBA for comments that improved the article. The cut-off for data used in this article is end August 2024 unless stated otherwise.

1 This article focuses on capital indexed bonds, though there are other, less common types of inflation-indexed bonds, such as indexed annuity bonds. Indexed annuity bonds provide a fixed real stream of regular cash flows over the life of the bond, with no lump-sum principal repayment at the end of the loan period.

2 Before the 2016 non-cleared margin rules came into effect, banks were hesitant to clear inflation swaps because this would have created a funding mismatch. The dealer would not have received initial margin from the client (on the non-cleared leg of the trade) but would have been required to post initial margin to the central counterparty. For a discussion of the costs and benefits of central clearing (in the context of bonds), see Cheshire and Embry (2023).

3 From 2030, all new and outstanding indexed UK government bonds will be linked to the Consumer Price Index including housing costs (CPIH). The change in reference index is already influencing the pricing of indexed gilts maturing beyond 2030.

4 Since September 2022, the ABS has published a monthly CPI indicator, which reflects updated prices for part of the CPI basket, whereas the complete monthly CPI will reflect updated prices for the whole CPI basket.

5 For more detail, see AOFM (2023) for indexed bonds and Australian Financial Markets Association (2017) for inflation swaps.

6 Inflation swaps are typically zero-coupon so there is only one payment made at maturity. Indexed bonds generally involve coupon payments and the frequency varies across markets. When there is a discrepancy in coupon frequency between the nominal and indexed bond (as in Australia and New Zealand), calculating an undistorted breakeven rate requires an adjustment to account for the compounding effect on yields.

7 In most advanced economies, indexed bonds have an indexation lag of up to three months so that bonds traded between coupon dates can include accrued coupon payments from the previous coupon date. However, Australia and New Zealand have lags of up to six months (and sometimes longer) due to the quarterly publication of the CPI. Inflation swaps typically have a two- or three-month lag, so the floating leg payment is based on inflation over the period starting two to three months before the start date of the contract and ending two to three months before the termination date of the swap. There are also differences in how the lag is handled: daily interpolated lag or monthly interpolated lag.

8 Without a deflation floor, the price of the indexed bond would decline below par value (and the yield would rise) if deflation occurred over the life of the bond, resulting in a lower implied breakeven rate. As a result, where the outlook is for low or no inflation, indexed bonds with a deflation floor can imply artificially breakeven rates (even if deflation is not the central expectation, as removing the risk of deflation can still imply artificially high breakeven rates). This is most relevant for Japan, where there is evidence the deflation floor has increased breakeven rates over time (Hiraki and Hirata 2020).

9 For more detail on dysfunction in the Australian government bond market at the onset of the pandemic, see Finlay, Seibold and Xiang (2020).

10 In the United States, this takes into account the average difference between the US Federal Reserve's (Fed) inflation target and the reference rate used in inflation swaps and indexed bonds. US Treasury Inflation-protected Securities (TIPS) and most US dollar inflation swaps reference the Consumer Price Index for All Urban Consumers (CPI-U), whereas the Fed targets the Personal Consumption Expenditures (PCE) index. The CPI-U has averaged 0.4 percentage points more than the PCE deflator over the past two decades.

11 This lesson is applicable outside of the post-pandemic period. In some economies, including Australia, the United States and euro area, there is evidence that changes in risk premia are a significant driver of changes in inflation compensation over time, and may be the dominant driver at times (D'Amico, Kim and Wei 2018; Finlay and Wende 2011; Böninghausen, Kidd and de Vincent-Humphreys 2018).

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Growth in Global Private Credit

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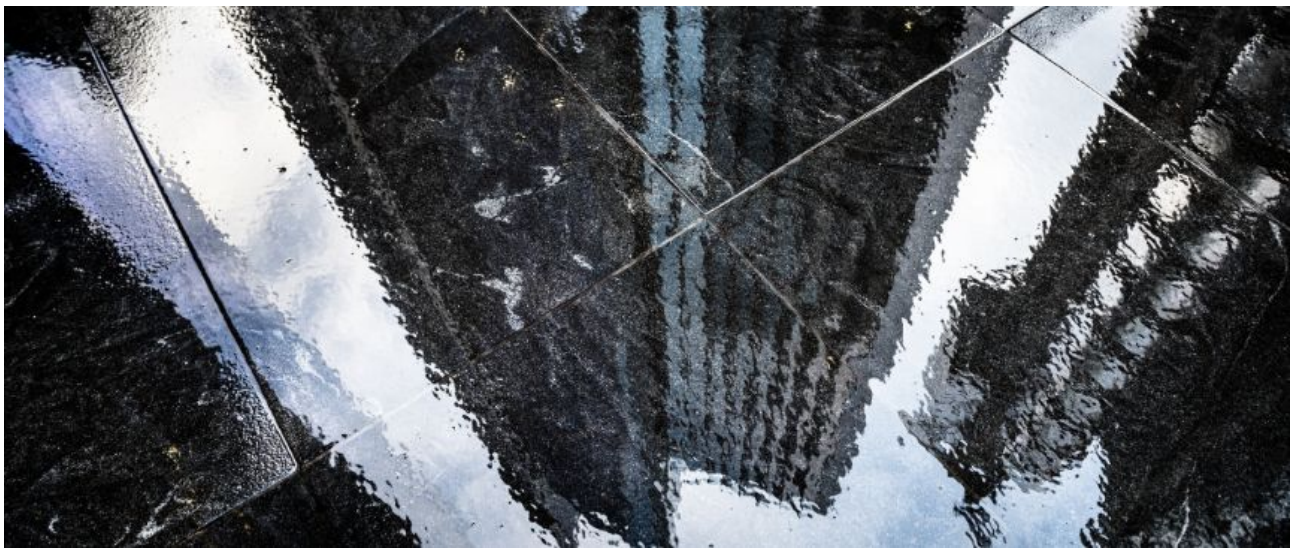


Photo: Tim Grist Photography – Getty Images

Abstract

Global private credit has grown rapidly over the past two decades, providing an alternative source of financing for businesses. This article introduces a new estimate of the size of private credit outstanding in Australia, based on data collected by the Australian Prudential Regulation Authority and London Stock Exchange Group. It is estimated that there is around $40 billion in private credit outstanding in Australia, which is around 2½ per cent of total business debt. Globally, the growth in private credit has raised concerns related to a lack of visibility over leverage and interlinkages, with regulators taking steps to strengthen oversight of the market. For Australia, the risks to financial stability appear contained for now, though regulators continue to monitor the sector closely.

Introduction

Private credit is bilaterally negotiated lending to businesses arranged by non-banks. The lenders in the private credit market are typically asset managers that intermediate between end investors and borrowers.[1] End investors – like pension funds and insurance firms – provide funds to these intermediaries or, in some cases, lend directly to borrowers. Private credit provides an alternative source of finance for businesses to borrowing from banks or issuing bonds, particularly for firms with unique financing needs or irregular cash flows that are too risky for banks or too small for public markets.

Understanding the use of private credit is important for assessing the nature and availability of business funding and potential risks to financial stability. As private credit is sourced from non-banks, it can be difficult to measure. This article introduces a new

estimate of the size of private credit outstanding in Australia based on data collected by the Australian Prudential Regulation Authority (APRA) and London Stock Exchange Group (LSEG) on lending to Australian businesses facilitated by asset management firms. This measure indicates that the Australian private credit sector has grown strongly over recent years, though it accounts for a small share of total business debt.

The global private credit market

Global private credit assets under management have quadrupled over the past decade to US$2.1 trillion in 2023 (IMF 2024). In the United States, the stock of private credit is now around the same size as either of the high-yield bond and leveraged loan markets (IMF 2024). North America accounts for around 70 per cent of global private credit raised since 2008, while Europe represents about one-quarter (PitchBook 2024).

Private credit has an attractive risk-return trade-off for some investors. It pays a relatively high interest rate – generating higher returns than other similar assets such as leveraged loans – and to date has exhibited low volatility relative to publicly traded assets, like corporate bonds (Cai and Haque 2024).[2] Non-bank lenders have played an increasingly large role in lending to risky companies, in part because some business lending has become more expensive for banks; regulatory reforms after the global financial crisis raised banks' capital requirements and made them more sensitive to risk (IMF 2024).

The structure of private credit lending

Private credit loans are in many ways similar to syndicated loans by banks. That is, they are generally senior secured, variable rate, larger than standard bank loans, and may comprise multiple credit facilities.[3] Unlike syndicated lending, however, most private credit lending involves a private credit fund that intermediates between the ultimate lender and borrower. Private credit loans are typically not traded in secondary markets or publicly rated, and lenders tend to hold private credit deals to maturity. The key roles in the private credit market are:

- **End investors, which provide funds to intermediaries.** These include pension funds, insurance companies, family offices, sovereign wealth funds and high net worth individuals. Some investors also lend directly to borrowers without a fund intermediating. In Australia, superannuation funds primarily invest in private credit via funds, though they also lend directly.
- **Intermediaries, which take funds from end investors and lend to borrowers.** The most common lenders in the global market are unlisted private credit funds, but lenders also include business development companies (BDCs) and off-balance sheet securitised loan pools, known as collateralised loan obligations.[4] The most common private credit investment vehicle outside Australia is a closed-end fund, with a limited life cycle that prevents redemptions during its life span. Notably, in Australia, open-ended funds are more common (Preqin and AIC 2024).
- **Borrowers, which are typically highly leveraged medium-sized businesses.** Globally, most of these businesses have been acquired by private equity firms, which tend to increase debt levels to enhance investor returns (Haque 2023). Borrowers' earnings are typically between US$10 million and $100 million, and they often have irregular cashflows or limited collateral, thus necessitating bilateral loan negotiations. Some borrowers access both private credit and other markets, with recent instances of banks and private credit funds jointly providing finance to borrowers (ACC undated; Tan and Seligson 2023).

The Australian private credit market

The scope of lending varies across estimates of Australian private credit:

- **RBA (A$40 billion)** (Graph 1): This estimate captures lending to Australian businesses facilitated by asset management firms from investor money pooled into managed funds. It also includes direct lending from superannuation funds as part of a syndicated loan. The estimate does not capture non-syndicated direct lending by superannuation funds. The data are sourced from data reported by registered financial corporations (RFCs) to APRA and from LSEG syndicated lending data. APRA and LSEG data are timely and consistent with other aggregates, but coverage is not universal (see Appendix A).
- **EY (A$188 billion)**: This estimate captures privately disclosed or publicly reported assets under management of private debt funds and other non-bank investors (Paphitis and Lowe 2022; Paphitis and Gaede 2024). Assets under management may differ from lending reported to APRA; for example, RFCs only report the portion of their business lending that is to Australian residents, and some types of fund structures may not be in scope to report to APRA.
- **Preqin and Australian Investment Council (AIC) (A$1.8 billion)**: This estimate captures assets under management of closed-ended private credit funds using Preqin data.

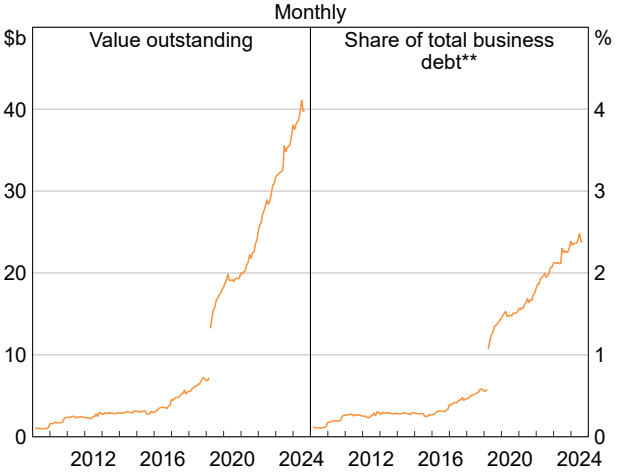
The RBA estimate focuses on business lenders with a managed fund structure to distinguish from other types of non-bank lenders in Australia (see Hudson, Kurian and Lewis 2023). Private credit is typically funded with equity, whereas many Australian non-banks operate similarly to banks, raising funds from debt and securitisation markets but without access to deposit funding. These non-banks tend to provide standardised loans for specialised purposes like finance for vehicles or other equipment.

The Australian private credit market is small relative to other lending to businesses but it is growing rapidly (Graph 2). Private credit accounts for around 2½ per cent of total business debt (which includes both intermediated lending and corporate bond issuance outstanding). Private credit grew faster than business debt over the past few years; growth has slowed in 2024 but is still around 2 percentage points higher than growth of business debt (Graph 3).

Graph 1

Private Credit*

Monthly

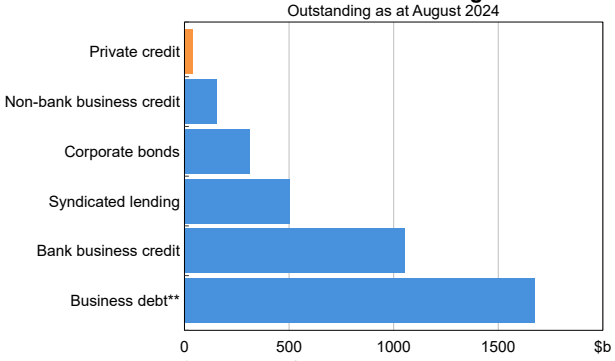


* Not seasonally adjusted; break in 2019 for the introduction of the EFS collection.
** Business debt includes business credit, corporate bonds and other lending.
Sources: APRA; LSEG; RBA.

Graph 2

Business Lending*

Outstanding as at August 2024

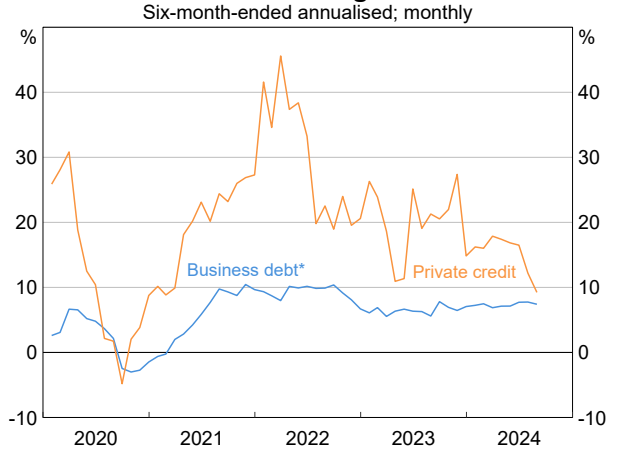


* Lending to non-financial businesses; categories are not mutually exclusive due to data overlaps.
** Business debt includes business credit, corporate bonds and other lending.
Sources: APRA; LSEG; RBA.

Graph 3

Business Lending Growth*

Six-month-ended annualised; monthly



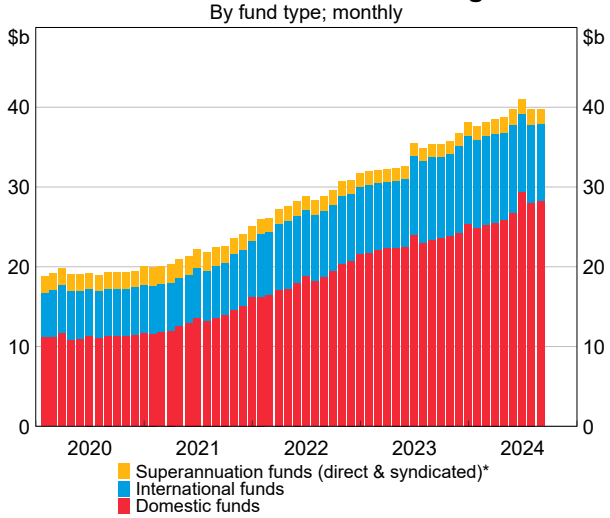
* Business credit data is seasonally adjusted and break-adjusted; private credit is not seasonally adjusted or break-adjusted. Business debt includes business credit, corporate bonds and other lending.
Sources: APRA; LSEG; RBA.

Domestic private credit funds account for around 70 per cent of private credit outstanding and have contributed the most to growth in lending (Graph 4). Superannuation funds' direct holdings of private credit via syndicated deals are relatively small, though our estimate does not capture their non-syndicated direct lending. Australian superannuation funds primarily invest indirectly in the private credit sector via investment in private credit funds; this investment is captured in our estimate.[5]

Graph 4

Private Credit Outstanding

By fund type; monthly



* Does not include direct lending assets that are not syndicated. Superannuation funds also have indirect holdings of private credit through other funds.

Sources: APRA; LSEG; RBA.

Risks to financial stability from private credit markets

Leverage

Private credit can involve leverage at three different levels: investors, intermediaries and end borrowers. Each of these parties can use leverage to achieve a higher return on equity. Information on leverage in the Australian private credit market is limited. However, on average, North American private credit funds' debt-to-asset ratios are around 35 per cent, lower than those of issuers of leveraged loans and high-yield corporate bonds that are closer to 50 per cent (IMF 2024). Although private credit funds' leverage appears low compared with other lenders, end borrowers tend to be more highly leveraged than those in public markets, increasing the risks to financial stability (IOSCO 2023).[6]

Liquidity risks

Private credit funds invest in illiquid assets like corporate loans, but typically manage cash flow risks by adopting a closed-end structure. This structure allows funds to restrict end investors' withdrawals in a given period, mitigating liquidity risks.

However, liquidity pressures could arise for end investors and spill over to financial markets. For example, in the event of a large economic shock, intermediaries may request large amounts of capital from existing investors' committed but uninvested capital via capital calls.[7] End investors have little control over the timing of these calls and may be required to provide capital within days (IMF 2024). There is a significant and growing amount of committed but uninvested capital, suggesting potentially large cash flow pressures if capital calls were widespread and synchronised. In such an event, end investors – such as pension funds or insurance companies – may struggle to meet the required payments and may therefore need to quickly sell other assets, potentially causing tension in financial markets.

Interconnectedness

While bank lending to private credit funds appears moderate and well-collateralised globally, there are some links that could pose risks to financial stability. Banks are among the primary providers of leverage to private credit funds, and in the United States, invest in private credit via collateralised loan obligations and are reportedly selling complex debt instruments to private fund managers in synthetic risk transfers (Carpenter 2024).[8] These instruments can make links between financial institutions more complex and less transparent. It is challenging to determine the size of these vulnerabilities due to data limitations.

There are strong links between private credit and private equity markets. Most private credit borrowers are partly controlled by a private equity firm following the acquisition of a major equity stake. Furthermore, around three-quarters of private credit assets are managed by funds whose umbrella firm is also active in private equity (IMF 2024). Private equity firms are often involved in strategic decisions about the borrowing firm's management, operations and capital structure. This can help reduce the frequency of defaults, but can also introduce conflicts of interest, given that managers may have multiple connections through portfolio firms and investors (IMF 2024).

Transparency of asset quality

The value of private credit assets appears more stable than for some comparable asset classes, partly because valuations are typically less frequent and subjective. While private credit funds must generally adhere to accepted accounting principles, these principles do not mandate specific techniques for asset valuation. Stale valuations may pose a risk to financial stability whereby a macroeconomic shock leads to a broad reassessment of asset valuations across the sector. In Australia, APRA has recently revised prudential standards in an effort to strengthen the investment governance of superannuation trustees, including in the valuation of unlisted assets (APRA 2023).

Default rates in private credit have been relatively low and less frequent in recent times relative to comparatively risky investments, such as in the syndicated loan or high-yield bond markets (Cai and Haque 2024). The sector has greater capacity than other forms of lending to postpone losses and defaults due to the bilateral nature of lending agreements. This has made it more resilient thus far in the cycle, but could increase the sector's vulnerability to large shocks.

The sector has also not endured a recession so there is little precedent to understand its resilience to a large downturn (IMF 2024). Where there have been defaults, private credit typically has a higher loss given default. This may reflect a higher incidence of lower or poorer quality collateral or subordinated lending (IMF 2024; Cai and Haque 2024). Lending in the sector is typically medium term, and refinancing risk appears to be evenly distributed across the next five years (Cai and Haque 2024).

Regulatory response

The International Monetary Fund (IMF) has highlighted vulnerabilities in private credit that could become systemic if left unchecked (IMF 2024). Since private credit lacks the oversight of banks (which are subject to strong prudential regulation) and the disclosure requirements of leveraged loans, the IMF recommends that authorities consider a more proactive regulatory approach.

International regulators have taken steps to strengthen oversight of the sector. The US Securities and Exchange Commission (2023) has implemented measures to enhance transparency and competition within the sector, including stronger reporting requirements. The European Union (2024) has enhanced disclosure requirements, implemented limits on funds' use of leverage and placed restrictions on fund structure. Regulators in other countries, including the United Kingdom, India and China, have also increased oversight of private credit funds (IMF 2024).

In Australia, the Australian Securities and Investments Commission (ASIC) is examining the growth of private markets as part of its drive for consistency and transparency across markets and products (ASIC 2024a). ASIC is undertaking a number of surveillances and industry engagement to identify conduct issues and consider the implications for the integrity and efficiency of markets (ASIC 2024b). APRA is heightening supervision of superannuation funds' investments in unlisted assets and stress-testing potential sources of contagion (APRA 2024; Wootton 2024). The Australian Treasury is also reviewing the regulatory framework for managed investment schemes, which are one form that private credit funds can take, with an aim to reduce risk to investors (Jones 2023).

Conclusion

The Australian private credit market is growing rapidly. Due to its small size, direct risks to financial stability from the private credit market in Australia appear low. Risks stemming from overseas private credit markets also appear contained. Although the migration of credit from regulated banks and public markets raises some vulnerabilities for the financial system, liquidity risks are low, and so far in the most recent tightening phase, default rates have been lower than leveraged loan or high-yield bond markets. However, private credit markets remain opaque and are expected to continue to grow rapidly. Work by regulators to improve transparency will assist in monitoring growth in private credit and the potential risks to financial stability.

Appendix A: Data used to estimate the size of the Australian private credit market

The RBA's estimate of private credit outstanding in Australia captures lending to Australian businesses from lenders with a fund structure. It combines data from the Economic and Financial Statistics (EFS) Collection and the LSEG syndicated lending data. The EFS Collection includes balance sheet data from RFCs with total assets of A$50 million or more. The syndicated lending database collects loan-level data of syndicated loans to Australian borrowers, including firms that do not report in the EFS Collection (see Liu 2023). We identify more than 200 lenders with a managed fund structure across the two sources. Two-thirds of private credit outstanding comes from lenders in the EFS Collection.

The estimate captures much of the private credit lending in Australia, but there are some gaps. The estimate of direct lending from superannuation funds only includes superannuation funds' participation in syndicated loans. Direct lending from a superannuation fund to a borrower with no syndication is not captured. Non-syndicated lending from overseas institutions that do not report to APRA is also not captured. The estimate also does not include lending by RFCs with assets of less than A$50 million. Smaller lenders below the reporting threshold – such as some family offices – are therefore excluded unless they participate in a syndicated loan captured by the LSEG database. Certain trust structures used by some managed investment schemes are not covered by the definition of an RFC, so do not report in the EFS Collection. It is also likely that some syndicated loans are not captured by the LSEG database, if they are arranged by financial institutions that are not surveyed by LSEG.

Endnotes

* The authors are from Financial Stability and Domestic Markets departments. They would like to thank Jenny Hancock, Michael Thornley, Duke Cole, Peter Wallis, Jon Cheshire, Claude Lopez, Gideon Holland and Andrea Brischetto for their valuable comments. They would also like to thank APRA, ASIC and others for participating in helpful discussions.

1 Intermediaries in the sector are often referred to as 'general partners' or GPs, while the end investors who provide funds to these intermediaries are referred to as 'limited partners' or LPs.

2 The most common form of private credit is 'direct lending'. Like bank lending, direct lending is typically senior secured (claiming priority over a company's assets in the event of insolvency).

3 Syndicated lending is extended by a group of lenders to a single borrower. The borrower typically organises this by agreeing to terms with a small group of banks, called 'mandated lead arrangers'. In most cases, the mandated lead arrangers seek other lenders to join the syndicated loan as participating lenders. See Liu (2023) for further details of syndicated lending in the Australian market.

4 BDCs are closed-end managed funds that invest in small and medium-sized businesses. They are often listed and open to retail investors. Collateralised loan obligations are structured finance vehicles that pool a portfolio of privately originated loans and securitise them into debt securities (IMF 2024).

5 Indirect investment is captured to the extent that those funds lend to Australian businesses; however, Australian superannuation funds' indirect investment in private credit funds that lend overseas is not captured.

6 Leverage can be provided directly, by making cash loans, or synthetically using swaps (Aramonte and Avalos 2019). Intermediaries like private credit funds can gain leverage via subscription credit lines (bank loans collateralised with committed but uninvested capital) and net asset valuation credit facilities (lending facilities secured against assets placed in special purpose vehicles). Listed BDCs also issue secured and unsecured corporate bonds. End investors borrow to achieve higher returns on their assets (IMF 2024). While most pension funds typically employ low leverage, entities like hedge funds, insurance companies, family offices and high net worth individuals often have more variable and opaque leverage structures.

7 The portion of end investors' capital that is committed but uninvested is often referred to as 'dry powder'.

8 Synthetic risk transfers are securities that allow banks to buy insurance against credit risk, reducing their risk weights and capital charges. They have reportedly been used to reduce regulatory capital charges and become popular in recent years (Wirz and Rudegeair 2023). They are structured much like credit default swaps, except that they are used to insure a broader loan portfolio rather than a specific counterparty exposure. A typical synthetic risk transfer pays a floating coupon in exchange for the buyer bearing the first 10 to 15 per cent of losses on the specified pool of assets (often consumer loans, trade finance and commercial real estate loans), while retaining the remainder of the risk.

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Interpreting Chinese Statistics: Extracting Expenditure-side Quarter-on-quarter Growth Contributions

Adam Baird, John Boulter, Vincent Carse, Vanessa Li, Josh Spiller and Jenny Wang*

Photo: IanZ – Getty Images

Abstract

Components for GDP on the expenditure side of the national accounts – expenditure on consumption, investment (including inventories) and exports less imports – can provide an important read on the composition of demand. For China, these components are available in contributions to year-ended GDP growth, which provides insight into trends but makes it difficult to interpret how the economy is operating quarter to quarter. This article discusses a method for deriving contributions to quarter-on-quarter GDP growth using official data that allows for a better understanding of expenditure side drivers of quarter to quarter. The decomposition shows that strong growth in the March quarter of 2024 was driven by a large increase in net exports, but growth in the June quarter was mainly supported by investment, which likely reflected a large contribution from the change in inventories. This suggests that Chinese domestic demand remained sluggish in the first half of the year, despite the strong outcome for GDP growth in the March quarter.

Introduction

The National Bureau of Statistics (NBS) – China's national statistics agency – publishes more detail on the production side of the national accounts in their estimate of quarterly GDP growth than the expenditure side, and does not publish expenditure contributions to quarter-on-quarter (qoq) GDP growth or qoq growth of the expenditure components of GDP.[1] Information on the composition of demand within each quarter – the split between expenditure on consumption, investment and exports less imports – provides a useful read on how the Chinese economy is operating, and has implications for our view of the outlook. For example, the qoq growth rates of these expenditure components can help us understand, in a timely manner, whether GDP growth is being driven by domestic or external demand.

Growth in different components can also have different implications for Australia. For example, strong investment growth could imply strong steel and thus iron ore demand, while higher consumption growth could imply more demand for tourism or luxury goods. Although the NBS provides expenditure components in annual national accounts data, and as contributions to year-ended growth (published every quarter), these do not provide a direct read on qoq growth.

In this article, we provide a method for deriving contributions to qoq GDP growth using official NBS data. This decomposition allows us to better understand expenditure side drivers of quarter to quarter, and also to better detect turning points in Chinese domestic demand and risks to growth.

Overview

To attribute GDP growth from quarter to quarter to the underlying contributions from consumption, investment (including inventories) and (net) exports, we use a simple method to calculate contributions to seasonally adjusted (SA) qoq GDP growth from non-seasonally adjusted (NSA) contributions to year-ended GDP growth.[2] This method can be thought of as a direct conversion from underlying NBS data, with minimal error introduced.
Our calculated expenditure side contributions to SA qoq GDP growth will not completely match the headline NBS series of SA qoq GDP growth, due to our contributions being derived using our own seasonal adjustment process rather than NBS seasonal adjustments, but the differences are generally small.

After we have obtained the contributions from total consumption and total investment to quarterly GDP growth, we use other data to estimate a further breakdown of these components into household and government consumption, and investment and inventories. We also derive monthly trade indices from year-ended data as a cross-check of our net exports contribution to GDP.

Constructing expenditure side contributions to quarter-on-quarter growth

To construct expenditure contributions from consumption, investment and net exports to SA qoq growth series, we use contributions to year-ended growth data (Graph 1; as published by the NBS every quarter) and annual nominal shares of expenditure components (Graph 2).[3] Consumption here is a broad measure that includes household and government consumption, and investment is 'gross capital formation' that includes changes in inventories. This construction occurs in four steps:

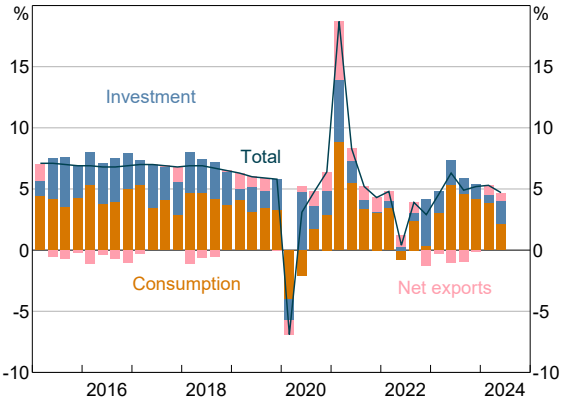
1. Calculate year-ended growth rates for consumption and investment for every quarter from published *contributions* to year-ended growth data and nominal shares of expenditure components.
2. Use a seasonal adjustment 'trick' to convert year-ended growth of consumption and investment to SA qoq growth rates of these components.
3. Use SA qoq growth rates together with the nominal shares of consumption and investment to calculate contributions to quarterly GDP growth for these two components.
4. Calculate, as a residual, net exports.

Code for the process described is available on request.[4]

Graph 1

China – GDP Growth

Year-ended with contributions

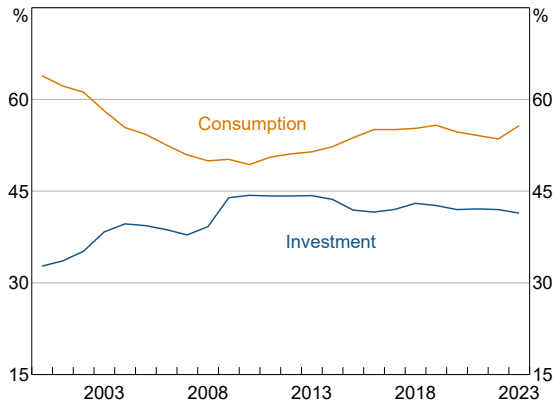


Sources: CEIC Data; RBA.

Graph 2

China – Expenditure Shares of GDP

Annual



Sources: CEIC Data; RBA.

Step 1: Calculate year-ended growth rates

To calculate year-ended growth rates for each expenditure component for each quarter from their quarterly contributions to year-ended growth, we use the formula for contributions to real GDP growth for consumption and investment (component *i*) and solve for real year-ended growth (Equation 1):

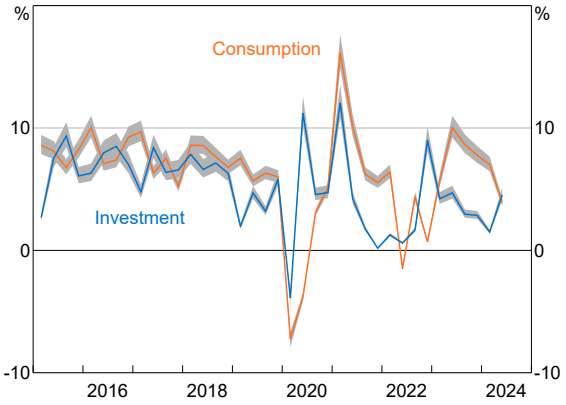
$$Contribution\ to\ ye\ growth_t^i = Nominal\ share\ of\ expenditure_{t-4}^i \times Real\ ye\ growth_t^i$$

Ideally, we would use the nominal share of each component from the base quarter of the year-ended growth calculation (i.e. the share four quarters ago), but quarterly shares are not published by the NBS. However, the shares change very slowly from year to year (Graph 2), so we simply use the annual nominal share from the year prior. To provide a guide to the size of error this could introduce, we identify the largest change in consumption and investment shares from year to year since 2000 – a change in the investment share of 4.7 percentage points from 2008 to 2009. We then assess how sensitive our calculated year-ended growth series for investment and consumption are to varying the weights by that amount, and find that the resulting change in annual shares, shown by the bands in Graph 3, is reasonably small.

Graph 3

China – Expenditure Components

Year-ended growth; with sensitivity test*

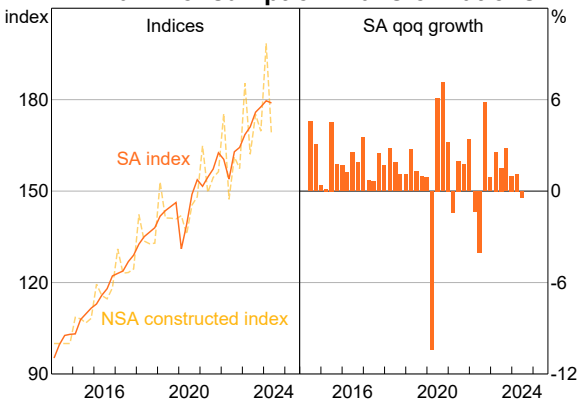


* Shaded area calculated using the largest annual move in GDP shares since 2000.

Sources: CEIC Data; RBA.

Graph 4

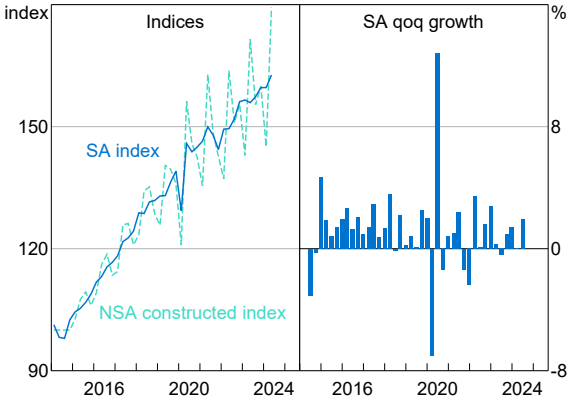
China – Consumption Transformations



Sources: CEIC Data; RBA.

Graph 5

China – Investment Transformations



Sources: CEIC Data; RBA.

We cannot directly calculate the contribution from net exports using Equation 1 because we do not have individual contributions from imports and exports (see Appendix A for why this matters). Therefore, we assume the net exports contribution is the residual once the contributions of consumption and investment to growth have been accounted for.

Step 2: Convert year-ended growth rates to SA quarter-on-quarter growth rates

Once we have year-ended growth rates for consumption and investment, we make use of a simple property of seasonal adjustment:

> ***After seasonal adjustment*** *using X-13ARIMA-SEATS, a qoq or month-on-month (mom) growth profile constructed from year-ended growth data* ***is invariant to the choice of base year values*** *used to construct the profile (to a close approximation).*

The method only requires us to choose arbitrary values for a base year, grow them forward using year-ended growth, and then seasonally adjust that series. For more discussion on this 'trick', see Appendix B.

We choose 2014 as our base year with each quarter in 2014 set to 100 and seasonally adjust using X-13ARIMA-SEATS. Using the resulting index, we then calculate qoq growth rates (Graph 4; Graph 5).

Steps 3 and 4: Construct quarterly contributions and calculate net exports

Finally, we use the annual nominal expenditure shares of GDP to calculate contributions to quarterly growth for consumption and investment, which is Equation 1 in reverse (but using shares in the current year).[5] Then, net exports is calculated as a residual (Graph 6):

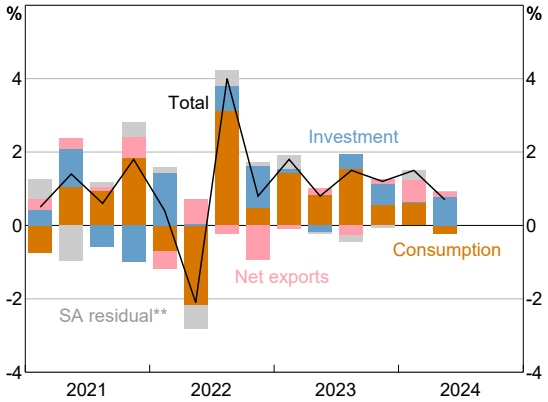
$$Net\ exports_t^{growth\ ctr} = GDP_t^{growth(RBA\ SA)} - Investment_t^{growth\ ctr} - Consumption_t^{growth\ ctr}$$

Because the net exports contribution is calculated as a residual, it captures any error in the conversion of investment and consumption to year-ended growth and any misalignment in seasonal adjustment between investment, consumption and our SA GDP series (aggregating SA subcomponents of a series does not in general give the same result as seasonally adjusting the aggregate series). We minimise this misalignment by using the same seasonal adjustment settings for investment and consumption and using our own headline SA qoq GDP growth series, $GDP_t^{growth(RBA\ SA)}$, rather than using NBS SA qoq growth (see Appendix C for more detail). The difference in seasonal adjustment of qoq GDP growth between the NBS and the RBA is shown in grey in Graph 6.

Graph 6

China – GDP Growth*

Quarterly with estimated contributions



* Components seasonally adjusted by the RBA and their contributions calculated by the RBA.

** Difference between RBA and NBS seasonal adjustment of total GDP growth.

Sources: CEIC Data; RBA.

Breaking down consumption and investment further

The quarterly contributions from consumption and investment estimated using the approach described above are for total consumption and total investment (i.e. gross capital formation, GCF). Total consumption includes both household and government consumption, and GCF includes both gross fixed capital formation (GFCF) and change in inventories. We further decompose growth in total consumption and GCF into these components. However, to obtain these decompositions, we have to draw signal from partial data that introduces much greater uncertainty into this decomposition compared with the one discussed above.

Consumption

We can estimate the contribution from household consumption to total consumption growth using survey data on household consumption from China's quarterly Household Income, Expenditure and Living Conditions Survey (Household Survey) as a proxy for consumption in the national accounts. Government consumption can then be estimated as a residual from total consumption. Household consumption from the Household Survey is released in nominal, per capita, NSA adjusted terms, so we first need to convert it into real, total, SA terms using the following steps:

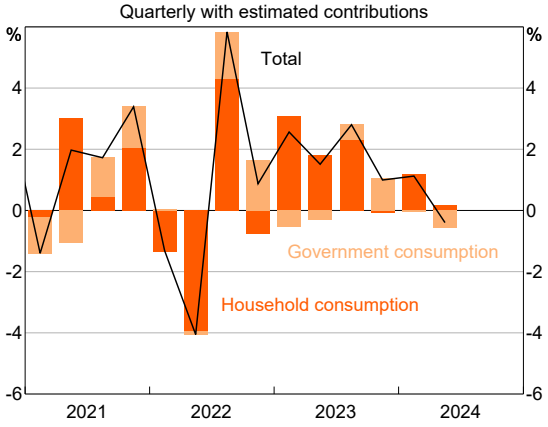
1. multiply by population, interpolated from the NBS annual series of total population
2. deflate using the NBS Consumer Price Index (CPI)[6]
3. seasonally adjust, in this case using the same seasonal adjustment parameters used in the broad expenditure side components discussed above.

Using annual, nominal GDP shares of household consumption and total consumption, we calculate the share of household consumption in total consumption using Equation 1 (but using the household share of total consumption in the current year), with government consumption as the residual (Graph 7). This breakdown is an estimate with more significant sources of error than the estimate of total consumption growth.[7] Real household consumption growth calculated from the Household Survey is subject to considerable error, and is different from the national accounts measure due to sampling and methodological differences. For example, household consumption in the national accounts not only includes goods and services bought by households directly, but also includes goods and services obtained in other ways, such as goods and services produced and consumed by households themselves.

Graph 7

China – Consumption Growth*

Quarterly with estimated contributions



* Components seasonally adjusted and contributions estimated by the RBA.

Sources: CEIC Data; RBA.

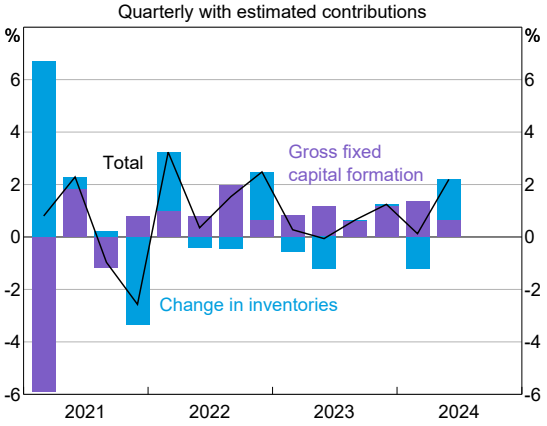
Investment (gross capital formation)

We can estimate the components of gross capital formation (GCF) – gross *fixed* capital formation (GFCF) and change in inventories – by using nominal monthly fixed asset investment (FAI) data as a proxy for growth GFCF, and then estimating the contribution from the change in inventories as a residual from the total investment qoq growth series derived above. Nominal FAI data are scaled to account for conceptual differences between nominal FAI and nominal GFCF, and converted into real terms using a weighted average of producer price indices (PPIs) as a deflator.[8] Then, using Equation 1 (but using GFCF's share of total investment in the current year), we calculate the contribution to GCF from GFCF, with the contribution from the change in inventories as the residual of total investment (Graph 8). This decomposition shows that the large positive contribution to growth from gross capital formation in the June quarter of 2024 was mostly from change in inventories. Due to differences between FAI and GFCF, these estimates are subject to considerable uncertainty.[9] However, these estimates are still useful as a summary of our best estimate of the contributions of GFCF and the change in inventories to quarterly growth in China. Further details on these estimates are given in Appendix D.

Graph 8

China – Gross Capital Formation Growth*

Quarterly with estimated contributions



* Components seasonally adjusted and contributions estimated by the RBA.

Sources: CEIC Data; RBA.

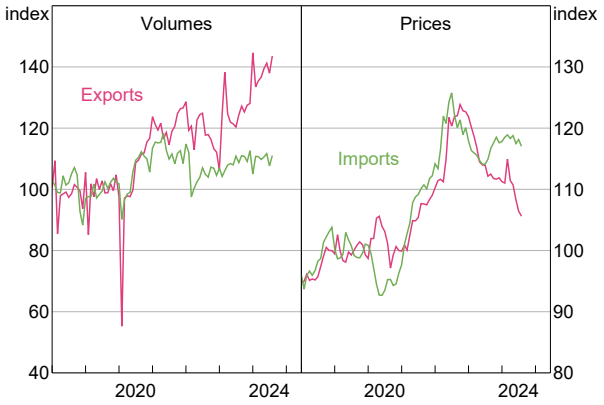
Diving deeper into net exports

We compare our net exports estimates against China's General Administration of Customs' (China Customs) data on merchandise trade volumes and prices (CNY basis) by converting their year-ended growth data to a level index using seasonal adjustment as described in Appendix B (Graph 9).[10] This allows us to better understand month-to-month movements and offers a useful qualitative cross-check on our above estimate of the contribution of net exports to qoq growth (as merchandise trade data from China Customs do not include services trade). The resulting indices suggest that merchandise export volumes increased significantly in the first quarter of 2024, and increased by more than the merchandise values series suggest, as export prices declined at the same time. A large increase in export volumes aligns with the strong contribution from net exports in our GDP growth decomposition over the same timeframe.

Graph 9

China – Merchandise Trade*

CNY basis, 2019 average = 100



* Seasonally adjusted by the RBA.

Sources: CEIC Data; RBA.

Conclusion

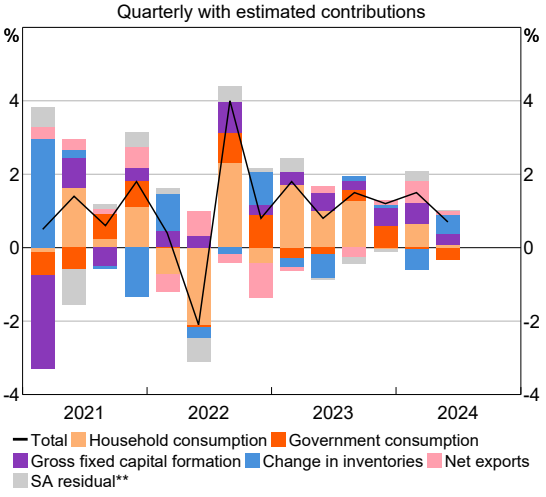
We have shown in this article that we can derive expenditure side contributions to qoq growth from the data provided by the NBS. This decomposition highlights recent key drivers of growth. Net exports and household consumption were the key drivers of the strong outcome in the first quarter of this year as external demand ramped up quickly and there was strong spending by households on domestic tourism during the Lunar New Year holiday (Graph 10). In the second quarter, these drivers waned and qoq growth declined. It was largely investment that kept GDP growth positive – but this was likely supported by a large contribution from change in inventories that does not necessarily imply higher steel demand.

Finally, we note that these estimates are subject to changing seasonal factors, so could change over time as more data arrives. These revisions could be larger than usual for some time as seasonal patterns reassert themselves or change in the post-pandemic period.

Graph 10

China – GDP Growth*

Quarterly with estimated contributions



* Components seasonally adjusted by the RBA and their contributions calculated by the RBA.

** Difference between RBA and NBS seasonal adjustment.

Sources: CEIC Data; RBA.

Appendix A: Contribution from net exports

The contribution from net exports would be calculated as follows:

$$Contribution\ to\ ye\ growth_t^{net\ exports} =$$
$$(Nominal\ share_{t-4}^{exports} \times Real\ ye\ growth_t^{exports}) -$$
$$(Nominal\ share_{t-4}^{imports} \times Real\ ye\ growth_t^{imports})$$

Having the contribution to net exports only makes it impossible to separately identify real year-ended growth in exports and imports.

Appendix B: Seasonal adjustment 'trick'

Extracting quarter-on-quarter growth from year-ended growth data

Consider China's headline year-ended GDP growth for quarter *t* applied to different arbitrary profiles in the base year:

$$GDP_t^{level,\ nsa} = GDP_{t-4}^{level,\ nsa} \times$$
$$(1 + GDP_t^{ye\ growth})$$

where $GDP_{t\ =\ 0,1,\ 2,3}^{level,\ nsa}$ (the first four quarters) is set to some sensible arbitrary value.

The quarterly index profiles grown forward from different arbitrary base years are completely different (Graph B.1, second panel). However, after seasonal adjustment, qoq growth is indistinguishable (fourth panel). In other words, when growing forward arbitrary values in a base year using year-ended growth rates, the resulting NSA profile in levels is meaningless, but the SA qoq growth rate series is not (this can also be presented as a re-based levels index).

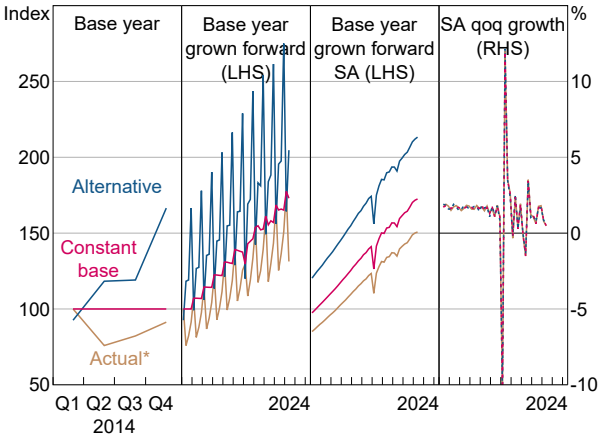
Harris and Yilmaz (2008) show that the SA qoq growth rates from the derived series are exactly the same as the SA qoq growth rates from the true series when using seasonal adjustment techniques that have linearly separable seasonal factors (e.g. those with constant seasonal factors).

Using more complicated algorithms where seasonal factors can change over time and are therefore not linearly separable, such as those implemented in X-13ARIMA-SEATS, could introduce some error, but Harris and Yilmaz (2008) show that this is minimal using UK retail sales data where the actual series is known.

Below we provide two examples where the underlying series is known (i.e. using Australian and Chinese data) and we perform simulations involving a synthetic seasonal break on Chinese GDP data. These examples and simulations show that the seasonal adjustment property holds up well when using X-13ARIMA-SEATS.

Graph B.1

China – Year-ended GDP Growth Applied to Different Base Years



* 2014Q1 =100.

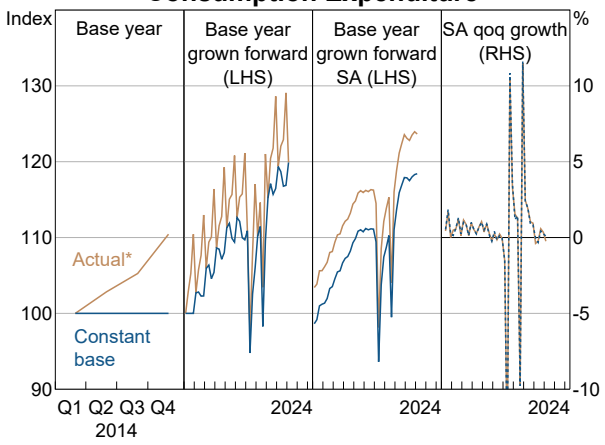
Sources: CEIC Data; RBA.

Examples of two known series

To demonstrate that our method uncovers reasonably accurate qoq or mom growth rates, we apply it to two data series for which we know the base year (Graph B.2; Graph B.3). In each case, we replace the actual data in the first year with 100 for each quarter or month and follow our method to recover qoq or mom growth rates by growing forward with year-ended growth rates and then seasonally adjusting. The Australian Bureau of Statistics (ABS) series that we seasonally adjust will not be the same as the official ABS SA series, as the seasonal adjustment method is not the same.

Graph B.2

Australia – Real Household Final Consumption Expenditure

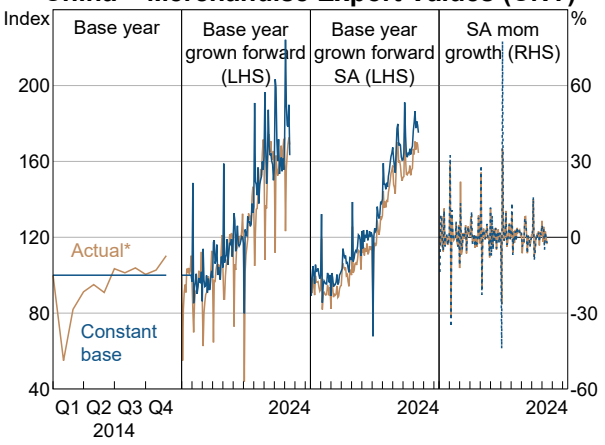


* 2014Q1 =100.

Sources: ABS; RBA.

Graph B.3

China – Merchandise Export Values (CNY)



* 2014Jan =100.

Sources: CEIC Data; RBA.

Generalising further

Is it possible to generalise, particularly in a situation where the seasonal factors change? We run some basic simulations to indicate where the method might fail when using X-13ARIMA-SEATS.

The NBS publish real GDP as an NSA levels index so we can use the true base year and a very different arbitrary base year to see what happens when using X-13ARIMA-SEATS when there is a large seasonal break. We perform simulations where, in each iteration, we change the base year and add a synthetic seasonal break. This is not an exhaustive test of this method, but indicates when care is needed in applying the method.

Base year

In each iteration, we scale all quarters in the original base year by a random number k_i drawn from a uniform distribution where $k_i = U(-a,a)$ (Table B.1). We choose a=0.2 and a=0.4 in separate simulations. These produce a range of large changes in the base year.

Table B.1: Base Year Adjustments by Quarter

Quarter	Adjusted base year
Q1	$\widehat{GDP\ Index}^{Q1}_{1992} = GDP\ Index^{Q1}_{1992} * (1 + k_1)$
Q2	$\widehat{GDP\ Index}^{Q2}_{1992} = GDP\ Index^{Q2}_{1992} * (1 + k_2)$
Q3	$\widehat{GDP\ Index}^{Q3}_{1992} = GDP\ Index^{Q3}_{1992} * (1 + k_3)$
Q4	$\widehat{GDP\ Index}^{Q4}_{1992} = GDP\ Index^{Q4}_{1992} * (1 + k_4)$

Synthetic seasonal break

We insert the same synthetic seasonal break in each iteration in both series by multiplying the index in quarters 1, 2 and 3 from March 2020 onwards by a factor $(1 + s_i)$ and quarter 4 by $(1 - s_1 - s_2 - s_3)$ (Table B.2). For each iteration, s_i is chosen from a uniform distribution of $U(-b,b)$. This creates a synthetic seasonal break in just one quarter. We choose b=0 (no synthetic break), b=0.1 and b=0.2 in separate simulations. These distributions create a range of large seasonal breaks.

Table B.2: Seasonal Break Adjustments by Quarter

Original with seasonal break	Adjusted with seasonal break
$GDP\ Index^{Q1}_{2020\rightarrow} * (1 + s_1)$	$\widehat{GDP\ Index}^{Q1}_{2020\rightarrow} * (1 + s_1)$
$GDP\ Index^{Q2}_{2020\rightarrow} * (1 + s_2)$	$\widehat{GDP\ Index}^{Q2}_{2020\rightarrow} * (1 + s_2)$
$GDP\ Index^{Q3}_{2020\rightarrow} * (1 + s_3)$	$\widehat{GDP\ Index}^{Q3}_{2020\rightarrow} * (1 + s_3)$
$GDP\ Index^{Q4}_{2020\rightarrow} * (1 - s_1 - s_2 - s_3)$	$\widehat{GDP\ Index}^{Q4}_{2020\rightarrow} * (1 - s_1 - s_2 - s_3)$

Simulations

We run six different simulations, each with n =100 (Table B.3).

Table B.3: Base Year and Seasonal Break Simulations

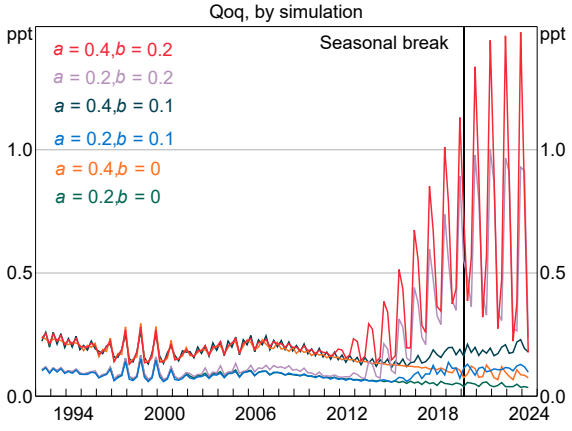
Simulation	*a* (base year)	*b* (seasonal break)
1	0.2	0
2	0.2	0.1
3	0.2	0.2
4	0.4	0
5	0.4	0.1
6	0.4	0.2

We find errors to be reasonably small, except around the seasonal break when b =0.2 (Graph B.4).

Graph B.4

China GDP Growth Simulations – Mean Absolute Error

Qoq, by simulation



Sources: CEIC Data; RBA.

Picking out just one draw from *a*=0.4, *b*=0.2, we can see that despite a very different base year and the large seasonal break that causes significant changes in qoq growth, the adjusted base year series and original growth series remain reasonably close (Table B.4; Graph B.5).

Table B.4: Seasonal Break Simulations

Original base year	Adjusted base year	Seasonal break
100	84	0.90
115	97	1.08
129	118	0.83
143	166	1.20

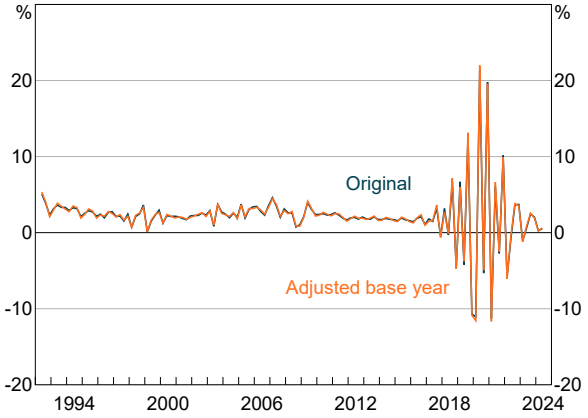
When using this method, we do not observe the true underlying base year, so we never know how much of an impact the error in our assumed base year might have. However, we can detect large seasonal breaks by looking at a time series of seasonal factors (in a seasonal/irregular plot) over time. We do not observe changes in seasonal factors in the series used in this article that are large enough to cause concern.

In some iterations, the automatic outlier detection in X-13ARIMA-SEATS selects different outliers for series with different base years, which can cause material differences. Manually imposing outliers when there are strong priors around what they should be would minimise this source of error, but without knowing the underlying series it may be hard to say what the outliers 'should be'. Ultimately, an outlier should be discarded if there is no reasonable explanation for the outlier.

Graph B.5

China GDP Growth – Simulation Draw

Quarterly, *a* = 0.4, *b* = 0.2



Sources: CEIC Data; RBA.

Appendix C: Comparing RBA and NBS seasonal adjustment settings

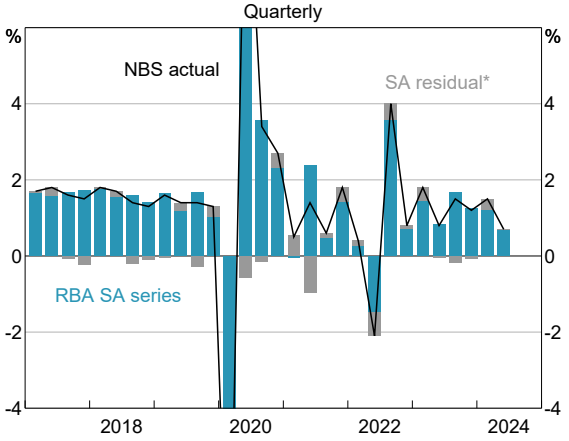
We choose to seasonally adjust headline GDP ourselves to align the method of seasonal adjustment between total GDP growth with its components. The difference between our constructed SA qoq GDP growth series and that published by the NBS is not large, which is unsurprising, as X-13ARIMA-SEATS also forms the basis for NBS seasonal adjustment (Graph C.1; NBS 2023). There are some bigger differences in quarter 2 of 2021 and quarter 2 of 2023, but statistical agencies commonly made interventions through the COVID-19 pandemic period,[11] whereas we do not make such interventions here.

The settings used in the R *seasonal* package for each of our NSA indices of GDP, consumption and investment is given below (Sax and Eddelbuettel 2018). Since net exports is calculated as a residual from these three variables, we align the outliers and arima model for the three series to preserve addivity as best as possible when using direct seasonal adjustment, as described by the ONS (2007). We align outliers by taking the union of outliers between investment and consumption models when outliers are auto selected, and align ARIMA models by taking the highest order model from investment and consumption:

Graph C.1

China – GDP Growth

Quarterly



* Difference between NBS published seasonally adjusted qoq GDP series and RBA's seasonally adjusted qoq GDP series.

Sources: CEIC Data; RBA.

```
library(seasonal)
# GDP.level.constructed.nsa, C.level.constructed.nsa and
# GCF.level.constructed.nsa are r time series objects.
sa_model.GDP <- seas( x = GDP.level.constructed.nsa,
        x11 = "",
        regression.variables = c("const", "ao2020.1", "ao2020.2", "ao2022.2"),
        arima.model = "(1 0 1)(0 1 0)",
        regression.aictest = NULL,
        outlier = NULL,
        transform.function = "log"
)
sa_model.C <- seas( x = C.level.constructed.nsa,
        x11 = "",
        regression.variables = c("const", "ao2020.1", "ao2020.2", "ao2022.2"),
        arima.model = "(1 0 1)(0 1 0)",
        regression.aictest = NULL,
        outlier = NULL,
        transform.function = "log"
        )
sa_model.GCF <- seas( x = GCF.level.constructed.nsa,
        x11 = "",
        regression.variables = c("const", "ao2020.1", "ao2020.2", "ao2022.2"),
        arima.model = "(1 0 1)(0 1 0)",
        regression.aictest = NULL,
        outlier = NULL,
        transform.function = "log"
)
```

Appendix D: Investment (GCF) estimates

We decompose GCF growth in four steps:

1. Estimate a growth scaling factor that we use to estimate quarterly growth in nominal GFCF from quarterly growth in nominal fixed asset investment (FAI), which is an alternative measure of investment published monthly by the NBS.
2. Apply the scaling factor to nominal quarterly FAI growth.
3. Convert from nominal estimate to real estimate.
4. Calculate contributions to GCF.

Step 1: Estimate a growth scaling factor

FAI and GFCF are two nominal measures of investment published by the NBS. FAI is published monthly, while GFCF is published only annually. The NBS state that they use FAI to estimate GFCF in the national accounts, so it is reasonable to assume they are closely related. But unadjusted, the two measures diverge significantly from one another. There are several reasons for this gap. Conceptual differences between FAI and GFCF – mainly the inclusion of land sales and purchases of existing assets in FAI – mean that FAI should be larger than GFCF. However, these differences do not appear large enough to fully explain the gap between the two measures. The NBS has noted in the past that local authorities sometimes inflate FAI data, which could explain some of the residual error.

We estimate the scaling factor between annual growth in the two measures to be 0.72, which is the geometric average of the ratio between annual GFCF and annual FAI prior to 2017. Prior to 2017, the ratio between the two measures was quite stable, but since 2017 the ratio has been more volatile, as annual growth in nominal GFCF in some years has been much higher than growth in nominal FAI. We assume the ratio will return to be around this long-term average in the future.

Step 2: Apply the scaling factor

We estimate nominal quarterly growth in GCF by multiplying quarterly nominal FAI by the scaling factor calculated above.

Step 3: Convert from nominal to real

We deflate the nominal estimate using a weighted composite of producer price indices. We estimate a weighted average of PPIs that provides a close approximation of the published deflator up to 2019, and then use the same weights to extend the series forward.

Step 4: Calculate contributions to gross capital formation

We multiply our estimate of GFCF growth by GFCF's nominal share of GCF in the current year to estimate its contribution to quarterly growth in GCF. Subtracting this estimated contribution from quarterly growth in GCF yields a residual that we take to be the contribution from the inventories plus any error. Given the scaling factor does not fully adjust for differences between FAI and GFCF, and GFCF's quarterly share of GCF is not equal to its annual share (though the size of the error from this assumption does not look large in other countries), these estimates are subject to considerable uncertainty. However, these estimates are still preferable to the next best alternative, which is to take signal from FAI data directly.

Endnotes

* The authors are from Economic Analysis Department. They would like to thank their colleagues Michelle Wright, Benjamin Beckers and Jarkko Jaaskela for their comments on this work. Thanks also to Peter Radisich from the ABS for his helpful input.

1 There are three ways of measuring GDP. The expenditure method (GDP(E)) measures the sum of all expenditures on consumption (household and public), investment, changes in inventories and exports, less expenditure on imports. The production method (GDP(P)) measures the value added by all goods and services produced in the economy during a given period. Finally, the income method is the total income received by employees and businesses plus taxes less subsidies.

2 The RBA uses 'year-ended growth' to describe the percentage change in a variable from its value 12 months prior and 'year-average growth' or 'year-on-year growth' to describe the percentage change in a whole year compared with the whole year prior.

3 Directly using year-ended growth data for each of the components would be preferable, but these series are not published by the NBS.

4 Full data and coding is available on request via General Enquiries form.

5 Nominal share in the current year will generally be the closest approximation to share in the previous quarter. For contributions in the current year, we use shares in the past year.

6 We use the CPI as the consumption deflator is not published by the NBS. Using CPI (a Laspeyres index) is not perfect as it tends to be a little higher on average than the national accounts consumption deflator (a Paasche index).

7 The root mean squared deviation between annual growth in the survey measure of household consumption and the national accounts measure was 1.2 per cent between 2012 and 2023. Average growth in the national accounts measure of household consumption was 9.1 per cent over the same period.

8 The NBS stopped publishing a deflator for its FAI series in 2019. We estimate a weighted average of PPIs that provides a close approximation of the published deflator up to 2019, and then use the same weights to extend the series forward. This work was completed by Diego May while in Economic Analysis Department.

9 The root mean squared deviation between annual growth in FAI and GFCF is large – between 1996 and 2023 it was 3.9 per cent. The mean average growth in GFCF over the same period was 12.6 per cent.

10 Because China Customs switched from producing these series on a USD to CNY basis in 2014, we have only applied the seasonal adjustment trick to the post-2014 data. Further, China Customs did not release separate data on volumes and prices for January and February 2020. For prices, we have assumed a growth rate in each month equal to the combined January–February 2020 growth rate. For volumes, we have assumed a growth rate equal to the growth rate in merchandise trade values for that month, adjusted for the assumed change in prices.

11 For example, see ABS (2020) for changes made in the methods used to produce and disseminate economic statistics during the pandemic.

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The ABCs of LGFVs: China's Local Government Financing Vehicles

Patrick Hendy, Elena Ryan and Grace Taylor*

Photo: zhen li – Getty Images

Abstract

China's local government financing vehicles (LGFVs) are a key feature – and risk – of China's infrastructure investment and financing environment. The scale of their debt has consequences for local governments' fiscal sustainability and for capacity to continue financing infrastructure development. This article reviews progress and challenges in the transformation of LGFVs from local government off-balance sheet financing vehicles into market-driven entities, and estimates the scale and sustainability of their debt burdens at a regional level. Developments in the debt sustainability and investment outlook at China's LGFVs potentially has implications outside of China due to the importance of LGFVs to financial stability and long-run growth in China.

Introduction

Local government financing vehicles (LGFVs) are state-owned investment companies established by China's local governments. LGFVs have played a significant role in driving China's economic growth and investment by financing urban infrastructure development, but these entities have accumulated substantial debts in the process. The original role of LGFVs was to raise debt for local governments, which were liquidity constrained and unable to borrow on their own balance sheets before reforms in the 2010s. Authorities in China have long acknowledged the risks of this opaque off-balance sheet debt and have attempted to reduce the links between LGFVs and local government balance sheets, while transitioning LGFVs to become market-oriented state-owned enterprises. Modern LGFVs have a range

of business models, but are most commonly involved in public interest projects such as urban infrastructure construction and renewal, operating utilities or toll-roads, and affordable housing construction. LGFVs continue to struggle with the legacy of off-balance sheet debt, and have had difficulties finding new, profitable business models, that would allow them to stand financially independent of their local governments. This article reviews progress and challenges in the transformation of LGFVs from local government off-balance sheet financing vehicles into market-driven entities and estimates the scale and sustainability of their debt burdens at a regional level.

The role of LGFVs in the Chinese economy

Since the implementation of tax-sharing reforms in 1994, which expanded the tax base and reallocated a large share of revenue to the central government budget, local governments' share of revenues have been smaller than their spending needs (Graph 1). This led to a short fall in revenue for many local governments (the 'funding gap'), which at the time of the tax reforms, local governments were not authorised to fill by issuing bonds or directly taking loans from banks. To fill this gap, a popular model was for local governments to set up state-owned enterprises – known as LGFVs – that were permitted to take out loans and issue bonds. These LGFVs were primarily established to finance infrastructure development.[1] As part of banking reforms around the same time as the tax-sharing reforms, local governments were also permitted to establish local banks, and these rapidly increased in number over the next decade (Graph 2). The proliferation of local banks further compounded the rise – and the risks – of LGFVs, as these banks became a major funding source for LGFVs (Liu, Oi and Zhang 2022; Gao, Ru and Tang 2021). Local banks are primarily funded by domestic deposits.

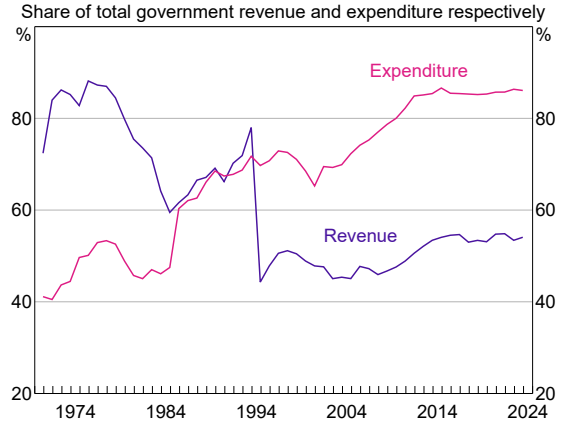
LGFVs were most heavily used as a source of (off-balance sheet) financing following the global financial crisis (GFC). Central authorities actively encouraged local governments to use LGFVs to fund fiscal stimulus, resulting in a dramatic increase in the scale of LGFVs (Shih 2010). However, the expansion of this opaque form of off-budget financing created risks as detailed by central authorities in a 2013 national audit of local government debt (Keohane 2013), largely because LGFVs tended to invest in unprofitable infrastructure projects. Central authorities responded with a two-pronged approach to regulating local government debt. First, they attempted to 'open the front door', legalising the direct issuance of bonds by local governments, as well as later granting quotas to local governments to swap LGFV debt into local government bonds. Second, they sought to 'close the back door', cracking down on the use of LGFVs as a way of raising off-balance sheet debt. Under new rules issued in 2014, LGFVs were no longer permitted to 'add government debt', and local governments were barred from explicitly guaranteeing LGFV debt (State Council 2014).

As a result of these reforms, modern LGFVs have had to seek more varied business models than simply filling local governments' funding gaps. For example, some LGFVs have transitioned to a legal footing analogous to general state-owned enterprises by eliminating debt that is legally attributable to the local government (known as 'hidden debt') and expanding operations in new, more profitable activities.

Graph 1

Local Government Revenue and Expenditure*

Share of total government revenue and expenditure respectively

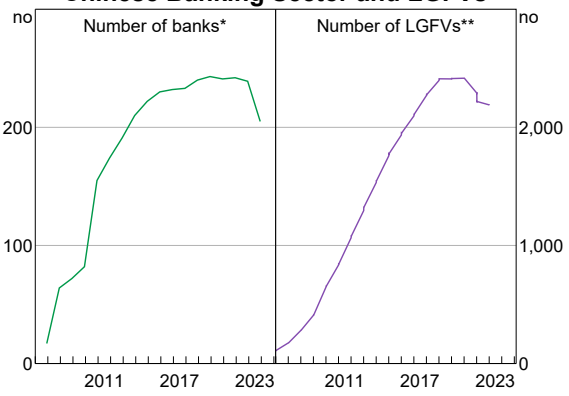


* General public budget revenue and expenditure.

Sources: CEIC; RBA.

Graph 2

Chinese Banking Sector and LGFVs



* Consolidated basis; excludes banks that do not report balance sheet data.

** Estimate based on a sample of bond-issuing LGFVs (Chinabond classification).

Sources: RBA; SNL; WIND.

In wealthier provinces like Guangdong, this has been done through shifting hidden debt onto local government balance sheets or paying down debt from LGFVs' own profits, although for less wealthy provinces, eliminating hidden debt has proven more difficult.[2] Since 2014, LGFVs have become more diversified, investing in sectors ranging from manufacturing, technology and retail, including through venture capital and private equity investments, but have been generally slow to transition to market-oriented companies. As a result, a large stock of existing debt remains on the balance sheets of many LGFVs that have been less successful in finding profitable new business models (Ministry of Finance 2015; Yang 2019). The limited success that LGFVs have had in transitioning to more profitable business models is evident in ongoing declines in their return on assets.

Why does LGFV debt matter?

LGFV debt has increased significantly since 2009, which has increased financial pressure on LGFVs, the local governments that support them, and the local banks that lend to them. Markets perceive that local governments stand behind LGFV debt, regardless of whether the legal responsibility for debt repayment ultimately lies with the local government (as is the case for 'hidden debt') or with the LGFV itself. Although the majority of LGFV bonds are owned by local banks, these institutions are unlikely to trade them regularly, meaning the 'marginal investor' is more likely to be institutions like insurance funds that are highly sensitive to the perceived safety of these bonds. The perception of local government support means that interest rates on LGFV debt do not adequately reflect the risks of this debt, and therefore more capital is directed to these companies than might be the case in a market system. If capital is misallocated because risk is mis-priced, it will weigh on productivity growth in the economy. Although international investors do not tend to hold LGFV debt, and therefore are not exposed to direct financial spillovers from LGFV debt risks, the global economy is exposed to the impact of capital misallocation on long-run economic growth.

Additionally, from a financial stability perspective, this perception of support generates risks to creditors such as local banks that extend credit to LGFVs at below market interest rates. These creditors would suffer losses if the LGFVs default on loans and perceived government support is unexpectedly withdrawn. The solvency of LGFVs, and the closely related role of local government support for LGFVs, therefore has consequences for the financial stability of local banks, which also tend to be more vulnerable than the large state-owned and joint stock banks (RBA 2023).

The overall debt burden of LGFVs is consequential because LGFVs are a major issuer of debt in Chinese markets (accounting for around 40 per cent of outstanding corporate bonds and the majority of enterprise bonds in 2022). There have been no major LGFV defaults on a public bond (i.e. a bond listed on an exchange or traded in the interbank market, rather than a private placement) to date, but if a LGFV were to default on a public bond, the market may reassess the strength of the local government implicit guarantee not only for that LGFV's debt, but also the debt of other state-owned enterprises that are perceived to benefit from implicit guarantees. This could lead to a significant repricing of LGFV debt, with potential implications for financial stability.

A significant repricing on public markets could lead to a deterioration in bank asset quality and profitability through either a revaluation of bank assets, or by reducing the refinancing capabilities and therefore LGFVs' ability to repay their debt. This would be likely to have a larger effect on smaller banks in more indebted and economically weaker regions of China and could inhibit the ability of those banks to supply credit to borrowers or could require bank recapitalisations. Additionally, an LGFV default could also cascade to falling land prices, as LGFVs have historically been a significant buyer of local government land, which, in conjunction with government-led bank recapitalisations could directly affect the revenue- and debt-raising ability, and potentially the solvency, of local governments.

Given bond markets are now pricing a higher degree of government support for LGFVs than in early 2023, the more pressing concern may be the consequences of high LGFV debt burdens in the absence of a default. Debt burdens may weigh on growth by constraining the ability of local government and LGFVs' to support growth through public spending since local government funds are increasingly allocated to debt repayment. LGFVs may also need to dedicate a greater proportion of capital raised to service existing debt, rather than raising finance to support public interest projects such as infrastructure construction. There may already be signs of this trend: infrastructure FAI growth slowed in 2024 after weak LGFV bond issuance in the first half of the year.

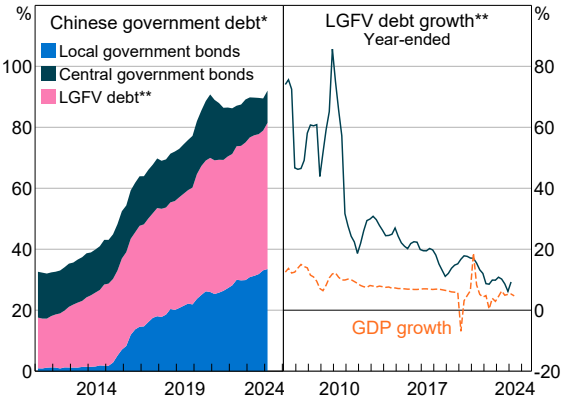
Size of the LGFV debt burden

LGFV debt is significantly larger than official Chinese local government debt at around 50 per cent of GDP, compared with 30 per cent of GDP for official local government debt (Graph 3). We estimate LGFV debt using data on issuance of interest-bearing debt by companies believed to be LGFVs. We focus on interest-bearing debt since this is the type of LGFV debt most comparable to government debt. However, this estimate should be treated as a lower bound of LGFV debt given that our approach does not capture LGFVs that have not issued public bonds and does not include the non-interest-bearing debt of LGFVs. Additionally, prior estimates of the total number of LGFVs significantly exceed the 2,300 LGFVs captured in our analysis (Appendix A).

After the initial burst of post-GFC stimulus delivered through LGFVs, LGFV debt has continued to grow, driven by the continued local government funding gap, soft budget constraints, the need to repay interest on existing debt, and incentives for local officials to boost local growth at the expense of long-run debt accumulation. Accounting for LGFV debt, gross government debt is estimated to be around 90 per cent of GDP. This is larger than the debt of other emerging markets that grew to become developed economies, compared at the same historical point in their development process. For example, in the years that Japan and Korea first exceeded US$12,000 GDP per capita in constant 2015 US dollars (which China first exceeded in 2023), their debt to GDP ratios were 12 and 10 per cent respectively.

Graph 3

LGFV Debt and Growth



* Per cent of GDP.

** Based on the interest-bearing liabilities of 2,100+ bond-issuing LGFVs (Chinabond classification); growth for March quarter 2024 is an estimate based on growth of around 1,200 LGFVs.

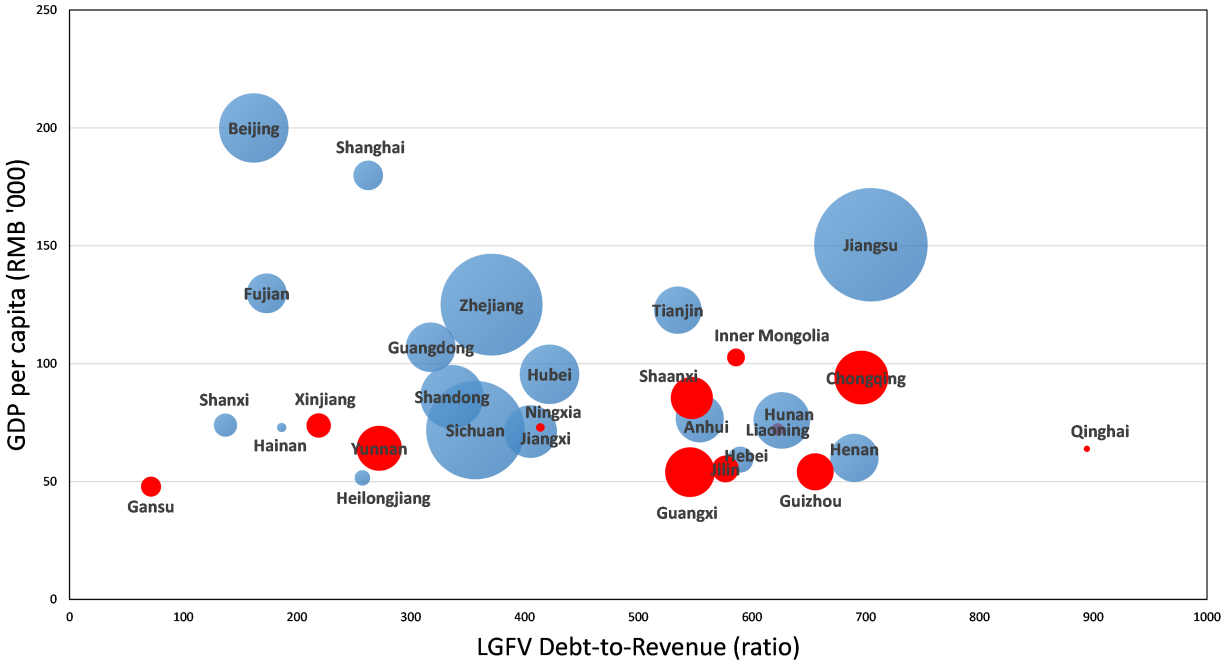
Sources: CEIC; RBA; Wind.

LGFV debt is also problematic in how it is distributed due to the uneven distribution of LGFV revenue raising capabilities, combined with the reduced ability of LGFVs in more indebted regions to raise new debt. The proliferation of LGFVs also means that default risks are difficult to monitor, and there may be periods where individual LGFVs may be lacking cash to meet debt servicing needs, even while total local government fiscal resources are sufficient to cover debt servicing. While LGFVs have rarely defaulted on public bonds,[3] they have regularly defaulted on other types of debt such as commercial notes and bank loans, indicating the stress LGFVs face in their day-to-day debt management (Wang 2024).

LGFV debt levels are also not evenly distributed among local governments: lower income provinces tend to have greater LGFV debt burdens than higher income provinces (Graph 4). Local governments in economically weaker and more indebted provinces face a higher level of financial stress. These provinces mainly consist of inland regions in the west and north-eastern 'rust belt' that have benefited less from the expansion and upgrading of China's manufacturing and exports, and face greater demographic challenges due to ageing populations. In recognition of the over-indebtedness of certain provinces, authorities have placed restrictions on the ability of 12 provinces to invest in certain new infrastructure projects.

Graph 4

LGFV Debt Burden by Province*
2023



* Dot size represents total LGFV stock and red shading indicates the 12 provinces subject to borrowing and spending restrictions.
Source: CEIC Data; RBA; WIND.

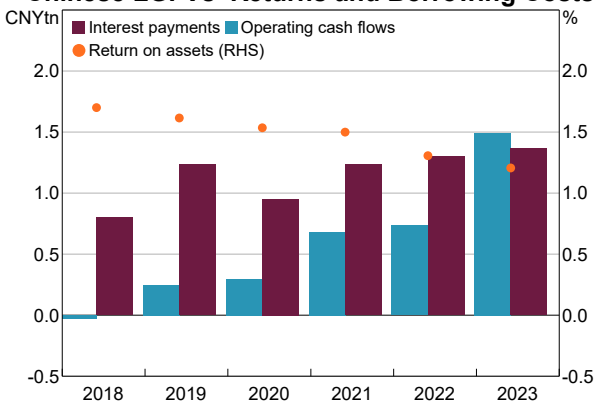
Sustainability of LGFV debt

Many LGFVs do not generate enough cash flow to service debt as they tend to be involved in projects for public welfare, such as financing utilities and infrastructure. LGFVs' return on assets has been weak and declining for several years (Graph 5). Additionally, LGFV debt financing costs are higher and at shorter tenors than official local government debt. Market economists estimate LGFV financing costs to have been around 5 per cent in 2023, higher than the 3 per cent on official debt, and much higher than the 1.2 per cent LGFV return on assets. The combination of low returns and high financing costs means that LGFVs use a significant share of bond revenue to service existing debt.

These concerns were exacerbated in 2022 as assets operated by LGFVs were adversely affected during COVID-19 lockdowns (such as toll roads and rail). Around half of LGFVs had interest expenses exceeding operational income in 2022. The distribution of this shortfall was geographically uneven: interest payments exceeded operating revenue in 21 of 31 provinces. At the end of February 2023, total government spending on interest payments had grown the fastest of all fiscal spending components (27 per cent in year-ended terms). Interest payments were equivalent to more than 10 per cent of gross fiscal revenue in a third of Chinese cities, and as high as 75 per cent in Lanzhou (in Gansu province). There is also substantial variation in debt service coverage ratios throughout the year, meaning that some local governments may have debt servicing liabilities more than revenues in certain months during the year (Shih and Elkobi 2023).

Graph 5

Chinese LGFVs' Returns and Borrowing Costs



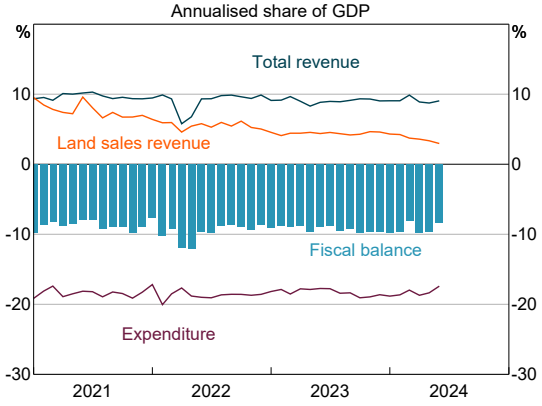
* Based on sample of around 2300 bond-issuing LGFVs.
Sources: RBA; Wind.

While local governments have continued to support their LGFVs, avoiding any defaults on public bonds in 2023, fiscal sustainability pressures on local governments themselves have also increased. China's stringent COVID-19 containment policy and widespread lockdowns, as well as economic weakness in the aftermath of the pandemic, led to an increase in local government spending and a decline in revenue. Land sales revenue – historically the most important source of local government revenue – had contracted by 35 per cent (CNY3 trillion) in 2023 from 2021 levels amid intensifying property sector stress (Graph 6). Local governments increasingly relied on LGFVs to replace developer demand in land auctions and offset falling land sales revenue, as land sales to property developers fell by 53 per cent in 2022. However, increasing pressure from regulators to prevent local governments 'inflating' land sales using LGFVs has led to a reduction in this activity, further adding to the decline in land sales revenue. LGFVs themselves have been significantly affected by the decline in the property sector: local government land is often a significant asset for LGFVs, and 25 per cent of LGFVs list property development as their main registered business.

Graph 6

Local Government Budget

Annualised share of GDP



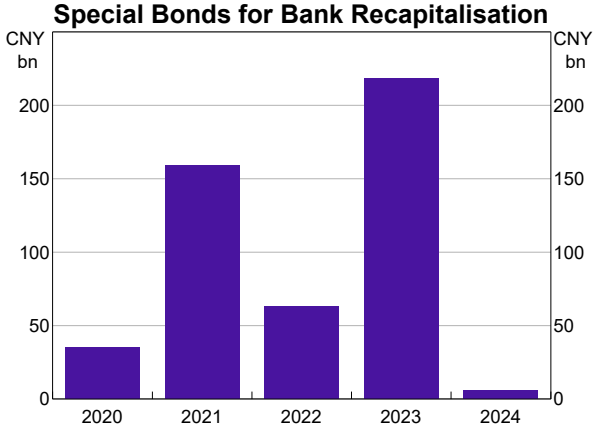
Sources: CEIC; RBA.

Despite the challenges local governments face in managing their debt burdens, they have continued to service their (and their LGFVs') debt. Most importantly, transfers from the central government have also supported local government fiscal balances, increasing by 25 per cent between 2021 and 2023. The size of these transfers is significant, equivalent in 2023 to around 45 per cent of local government general public budget revenue and around 95 per cent of central government general budget income (excluding bonds). Second, LGFVs have delayed payments to maintain cash levels, such as by delaying payments to suppliers, defaulting on short-term notes, and missing interest payments on bank loans (Bloomberg News 2023). Media reports have accused some local governments of delaying payments to civil servants (Yuan 2023). Indeed, the Premier's 2024 Report on the Work of the Government specifically mentioned the need to ensure local governments have the fiscal resources to ensure salaries are paid (Li 2024).

The banking sector has had an important role in helping LGFVs to manage their debt burden. Smaller city and rural commercial banks tend to hold more LGFV debt than the major state-owned banks and joint stock banks due to their regional focus and closer ties with local governments. These banks face a trade-off between profitability and asset quality when considering how to manage losses on lending to LGFVs. Many LGFVs have had loan terms extended by banks or have renegotiated more favourable interest rates on their loans, which weighs on bank profitability. If banks chose not to roll over LGFV debt, they would have to categorise the loans as non-performing and provision the loans accordingly, which could result in many small banks being undercapitalised. The issuance of special bonds for bank recapitalisation increased considerably in 2023 and is indicative of the pressure banks face to continue absorbing losses from LGFVs (Graph 7).

Graph 7

Special Bonds for Bank Recapitalisation



Sources: RBA; WIND.

Resolving local government debt issues

Authorities face two fundamental challenges in resolving local government and LGFV debt. First, China's local governments continue to face a funding gap, exacerbated by the significant loss of land sales revenue in recent years. Fiscal reform to better match local governments' revenue-raising and expenditure

responsibilities is needed to improve fiscal sustainability, local government fiscal discipline and the social safety net (Wingender 2018; Bloomberg News 2024). Authorities are aware of this issue, and in the Third Plenum meeting held in July promised to expand the sources of tax revenue for LGs, raise the central government share of expenditures and increase central transfers to local governments (20th Central Committee 2024). This is a positive development for addressing the root problem in centre-local fiscal relations and progress here will be important to watch.

The second challenge is that although authorities aim to transform LGFVs into market-oriented state-owned enterprises, not all of these companies have an obvious development path to finding a profitable business model. Some LGFVs have found success in businesses related to their core competencies, such as operating existing infrastructure like toll roads, wastewater treatment or urban renewal projects. Other LGFVs have attempted to diversify into businesses unrelated to infrastructure, such as manufacturing, healthcare and software development (Fan, Liu and Zhou 2021).

LGFVs may also act like investment platforms on behalf of local governments: recapitalising local banks, acquiring listed companies and investing in high-tech industries (Xiao, Zhao and Cade 2020). However, this kind of transition is likely easier for LGFVs in developed cities. Additionally, transitioning to a market-oriented investment platform is easier said than done. For example, an LGFV belonging to Weifang City in Shandong Province, which was previously praised for its acquisition activity as an example to follow for other LGFVs, had suffered significant losses on its acquisitions by 2023 (He and Xu 2023). The Third Plenum has promised faster transformation of LGFVs into general state-owned enterprises but did not specify how it would do this (20th Central Committee 2024).

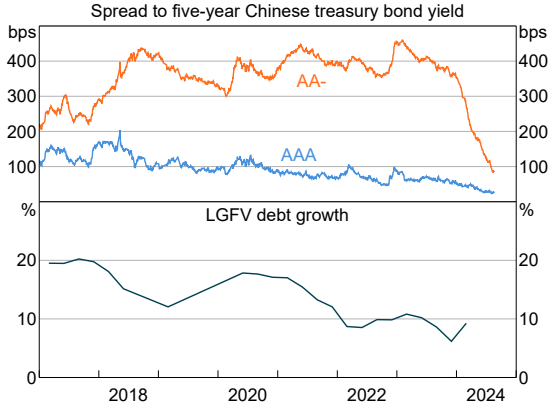
Authorities are balancing addressing local government debt issues with maintaining a reasonable economic growth rate. The challenge is how to reduce the size of local government debt without triggering a repricing of local government debt that threatens financial stability or affects economic activity. Authorities have attempted to diverge from their historical approach to LGFVs in the recent cycle. Typically, tighter LGFV regulation is met with wider spreads and lower bond issuance, as investors react to reduced government support.

In this cycle, authorities have simultaneously backstopped LGFVs and reduced the risk of default, while attempting to limit new borrowing by LGFVs. This action has led to narrower spreads and reduced issuance. In this way, authorities are attempting to reduce risks to the broader financial market in renewing the implicit guarantee on LGFVs, while also requiring LGFVs to be more disciplined in issuing new debt. In other words, authorities are attempting to replace market discipline (i.e. higher interest rates in the absence of implicit guarantees) with administrative discipline (i.e. restrictions on LGFV debt issuance). However, while LGFV net bond issuance has declined even as spreads tighten, total debt growth among LGFVs has increased at the start of 2024 (Graph 8) – this may reflect LGFVs substituting bond financing for bank loan financing as restrictions tighten (Graph 9).

Graph 8

LGFV Spreads

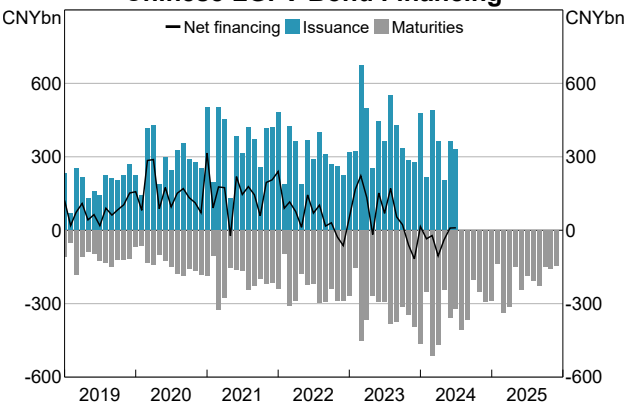
Spread to five-year Chinese treasury bond yield



Sources: Bloomberg; CEIC; RBA; Wind.

Graph 9

Chinese LGFV Bond Financing



Source: Wind.

While authorities appear to be comfortable with the approach in the recent cycle, there are risks. First, administrative discipline could be ineffective and LGFVs may increase their debt burden. Second, the crackdown on issuance could put too much stress on LGFVs, causing defaults or the need for a significant bailout. Third, the administrative discipline could be *too* effective, causing a significant decline in infrastructure investment, thereby posing a threat to the economic growth target. To mitigate this risk, authorities have increased central government expenditure on infrastructure investment, such as the CNY1 trillion special bond issuance announced in 2023 for local government infrastructure spending. The ability of local governments to withstand the decrease in LGFV financing while maintaining economic growth will be tested in 2024, as they continue to face substantial bond maturities (Graph 9).

Conclusion

LGFV debt is a major vulnerability in the Chinese financial system because it is large, difficult to measure, backed by assets with low returns and priced on the basis of government support unrelated to LGFVs' fundamentals. Defaults by individual LGFVs could have systemic implications if they lead investors to reassess the strength of implicit government guarantees in the Chinese financial system more broadly. However, a broader repricing of risk in the Chinese financial system is unlikely to spillover to financial systems beyond China since direct links between China and the global financial system are relatively small (Adams *et al* 2021).

LGFV debt vulnerabilities and deleveraging are most likely to affect other economies, including Australia, via economic channels. First, infrastructure investment is likely to slow, particularly in heavily indebted provinces where LGFVs are now prohibited from financing new investment of certain kinds. This could weigh on economic growth in the near term. Additionally, authorities have signalled for some time that they prefer economic activity to increasingly be driven by 'new industries' related to science, technology and high-tech manufacturing. This means that infrastructure investment is likely to slow in the future. Some LGFVs have indicated that they are diversifying their business models to expand beyond traditional infrastructure investment to focus more on the industrial sector and infrastructure operation (rather than construction).

The authorities' approach to managing local government and LGFV debt vulnerabilities will also affect long-run growth. The current approach to managing LGFV debt vulnerabilities means that many LGFVs continue to operate despite not having a sustainable business model. Additionally, as the banking sector continues to provide loan forbearance to LGFVs, credit is not being allocated to the most productive uses. As the pressure on the banking sector grows, additional fiscal resources are likely to be allocated to recapitalising local banks, rather than new government investment or consumption. Although this approach to managing LGFV debt vulnerabilities may avoid a disruptive financial shock, it comes at the cost of slower economic growth in the long run.

Appendix A: Estimate of LGFV debt

We estimate LGFV debt using data from the WIND database. Specifically, we use the interest-bearing liabilities of WIND's list of bond-issuing chengtou (urban investment) companies. We focus on the interest-bearing debt of LGFVs since this is the type of LGFV debt most comparable to government debt. We use a vintage of the WIND LGFV list from 2022, therefore including some LGFVs that have since been recategorised by WIND.

WIND's list of chengtou companies is intended to approximate a list that Chinese regulators have historically maintained of LGFVs. Presence on regulators' lists is tied to certain restrictions around financing such as tighter bond issuance restrictions. The regulatory lists are not public and it is likely that the WIND list is not entirely accurate, especially as it only covers bond-issuing LGFVs. For example, in 2013 regulators indicated that China had over 10,000 LGFVs at the time, while our dataset only covers 1,700 for that period (Keohane 2013). At least one LGFV interviewed by the RBA China Office had no outstanding bonds, relying largely on bank financing, and so may not be listed in our dataset. As such, the estimate of LGFV debt is very likely to be an underestimate. However, there may be some inaccuracies with the WIND list that could lead to an overestimate. For example, some companies in the list may no longer exist or have been merged with other companies on the list. There may also be some companies that should not be considered as proper LGFVs (Xu and Mao 2021). On the whole, our estimates are likely to underestimate the scale of LGFV debt, and should be treated as a lower bound.

Endnotes

* The authors are from International Department and the RBA China Office. This article was prepared using analysis undertaken in International Department with reference to interviews undertaken by RBA China Office with six LGFVs across four cities. The authors would like to acknowledge Diego May and Serena Russell for their earlier work developing the approach to estimating LGFV debt used in this article, and are grateful for feedback provided by Jarkko Jaaskela, Penny Smith, Chris Kent and Jeremy Lawson.

1 A popular version of early LGFVs was known as the Wuhu model, named after a city in Anhui province. The model entailed establishing an LGFV by injecting LG-owned land-use rights. The LGFV then borrowed from China Development Bank using the land as collateral and used the proceeds to develop infrastructure on the land.

2 Hidden debt is specifically debt (usually LGFV debt) that an LG takes on in contravention of the regulations – that is, any debt for which the LG is responsible, raised by means other than through the LG bond quota system. Most forms of hidden debt involve LGs illegally providing a guarantee on LGFV debt, either explicitly or through indirect means like fully backstopping project returns with fiscal funds (China News 2017; National Audit Office 2017). Hidden debt, in the way that authorities use the term, does not refer to all LGFV debt.

3 Although commentators commonly state that an LGFV has never defaulted on a public bond, this is debatable. A unit of XPCC, a Xinjiang LGFV, defaulted on a bond in 2018 (Zhang and Jia 2018). This did not shake the market's broader expectation of an implicit guarantee, perhaps because XPCC is considered unique compared with other LGFVs. LGFVs in other provinces have also missed payments on public bonds (Liang and Jia 2019; Duan 2020).

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