# Bulletin

MARCH 2019

RESERVE BANK OF AUSTRALIA

# Bulletin

MARCH 2019

## Contents

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# New Payments Insights from the Updated Retail Payments Statistics Collection

Stephen Mitchell and Hao Wang[*]

Photo: zoranm – Getty Images


## Abstract

The Reserve Bank has significantly expanded the retail payments data that it publishes from 61 to around 300 series. This followed a project conducted in consultation with the industry to update the underlying statistical collection. The new data provide additional insights into Australians' payment behaviours, particularly in the context of the shift towards electronic methods of payment away from cash and cheques. This article discusses some of the new series being published by the Bank.


## Introduction

The Reserve Bank has published monthly statistics on Australian payment systems from its Retail Payments Statistics (RPS) collection since 2002, with some series dating back as far as 1985. These statistics cover credit and debit card systems, the direct entry system, the ATM system and cheque payments. The data are reported to the Bank every month by financial institutions and payment service providers.

The RPS collection helps the Bank to monitor payments activity in a timely and detailed manner. This information helps to inform the Bank's policy advice to its Payments System Board, which is responsible for promoting efficiency and competition in Australia's payments system and contributing to the overall stability of the financial system. The published RPS series – available on the Bank's website – are selected aggregates of the detailed data in the RPS collection.

The Bank recently completed a major project to update the RPS collection, which had been largely unchanged in terms of the type of data collected since 2002.[1] The primary motivation for this work was to ensure that the data collection remained a relevant and valuable source of information for

policymakers, the private sector and the wider community. The Bank consulted widely and worked closely with reporting institutions on the updated data collection, and also made the IT systems that support the collection more robust and secure. The Bank is now collecting data on payments made through the New Payments Platform (NPP) and a broader range of data on card payments, which are increasingly prominent payment methods for Australian households and businesses. Series that had become less relevant from a policy perspective – such as separate data on mail and telephone payments – have been discontinued to minimise reporting burden.

Another focus of the review was to ensure that a sufficiently comprehensive coverage of industry activity could be maintained, while reducing reporting burden where possible. As part of this, the Bank started collecting some data from centralised sources, such as from payment system operators directly, eliminating the need for system participants to report individually. In addition, institutions with very small market shares were removed from the survey, while a small number of new reporting institutions were added to make the survey more comprehensive within particular payment systems. Overall, the number of reporting institutions was reduced from 52 to 28.[2]

Changes to the RPS collection will support the Bank's work to understand the evolution of the payments mix in Australia and to promote reliable, secure and low-cost payments services. In addition, from March 2019, the Bank has significantly expanded the payments data it publishes on its website from 61 to around 300 series.[3] All existing series previously published in the statistical tables have been preserved in the new tables and will continue to be published. The Bank has also started publishing some seasonally adjusted payments data along with the original series (see Box A).

This article discusses some of the new series published by the Bank, including additional insights on how individuals and businesses make and receive payments.

## Payment Cards

Credit and debit cards combined are the most frequently used payment method in Australia.[7] Cards are becoming increasingly popular in Australia, reflecting users' preference for convenience and faster payments, and a reduction in card acceptance costs for merchants. The total number and value of card payments have increased by around 11 per cent and 7 per cent each year on average over the past decade, respectively, with growth in debit cards outpacing that in credit cards (Graph 1). Reflecting the growing importance of card payments, the Bank has started to publish new series on how and where card payments are made.

### Domestic and international transactions

The Bank is now publishing richer data on the domestic and international uses of credit and debit cards.

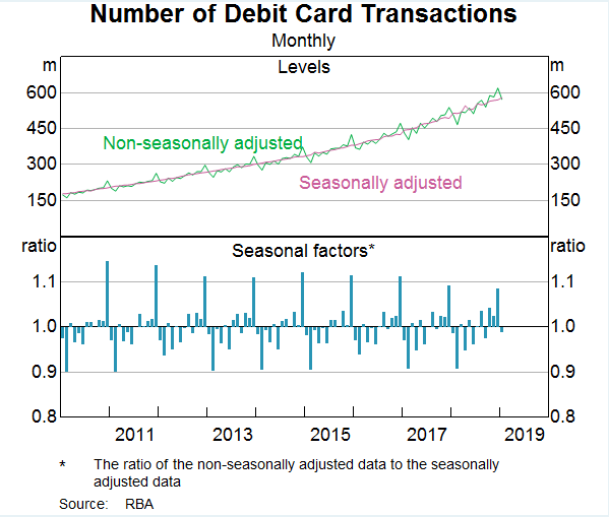
The vast majority of card payments by Australians are for domestic payments, although the use of cards for overseas transactions is growing. Domestic transactions currently account for around 95 per cent of the value of card payments on Australian-issued cards. Cards have become increasingly used for low-value purchases in Australia over the past decade, which has resulted in a decline in the average value of transactions for both credit and debit cards, despite general price inflation over this period (Graph 2). The decline in the average transaction size can be partly attributed to the introduction of contactless payments for credit and debit cards, which have made the use of cards for low-value purchases more convenient for both cardholders and merchants.

Card spending by Australians overseas has more than doubled over the past decade (Graph 2). This is consistent with both the increasing popularity of online shopping on international websites and an increase in short-term resident departures over the period. Australians spend on average around $250 on an overseas purchase. This is significantly higher than the average size of domestic transactions at around $65, partly because airfares, accommodation expenses and other relatively high-value goods and services tend to account for a

## Box A: Seasonal Adjustment of the Retail Payments Statistics

Some data exhibit a regular periodic pattern, which is also known as seasonality. Payments data can be highly seasonal, as some significant spending by households and businesses is associated with holidays and other events that tend to occur every year at a predictable time.[4] For example, a significant increase in the use of debit cards and other payment methods is typically observed in December due to Christmas spending, followed by a subsequent fall in January and February (Graph A1). Seasonality can also arise due to other factors, such as the number of trading days in a month.

**Graph A1**
**Number of Debit Card Transactions**




* The ratio of the non-seasonally adjusted data to the seasonally adjusted data

Source: RBA

As seasonality can cause significant changes to monthly and quarterly payments activity, it is important that policymakers and other analysts distinguish between seasonal effects and other drivers of payment activity (such as behavioural changes and policy interventions). Seasonal adjustment is a statistical technique that helps identify seasonality in time series data and is used globally by many statistical agencies and policy institutions.[5] Seasonally adjusted series are less volatile than the original series, providing a clearer interpretation of the data (Graph A1).

Although seasonal adjustment can help with data analysis, not all series can be seasonally adjusted, and seasonally adjusted series should be interpreted with care. A monthly series typically requires three to seven years of data to estimate a reliable seasonal pattern; some series introduced in the Bank's revised collection (e.g. data on NPP transactions) do not have a long enough history to meet this requirement.[6] Furthermore, seasonal adjustment can result in small data revisions over time, as the statistical method detects seasonality and changes in the seasonal pattern more accurately as more data are added to the series. Finally, not all payments data require seasonal adjustment; for example, stock measures like number of cheque accounts and credit card limits do not typically display significant seasonal variations.

When available, the Bank typically prefers to use seasonally adjusted data in analysing payments developments. In recent years, this has included showing seasonally adjusted series in publications, speeches and in policy advice to the Payments System Board. As part of the updated collection, the Bank is now publishing seasonally adjusted data in the statistical tables along with the original data. These new data should provide more meaningful insights into high frequency movements and short-term trends in the use of payment methods.

sizeable share of international card spending for individuals.

The Bank has also started publishing data on card spending in Australia conducted on international cards, which accounts for around 3 per cent of the value of all card payments in Australia. This includes spending by international tourists in Australia and, to a lesser extent, online shopping on Australian websites by foreigners. Over the past few years, there has been strong growth in international card spending in Australia. This is consistent with an increase in the number of international tourists visiting Australia, along with an increase in average tourist spending.[8] Greater acceptance of overseas-issued cards by Australian merchants has also likely contributed to the increase in international card spending in Australia.

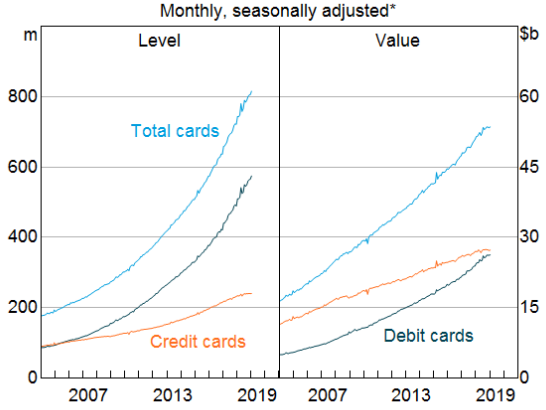
## In-person and remote transactions

The Bank is now publishing data on in-person and remote transactions with credit and debit cards to provide greater clarity on the way cards are used. In-person transactions refer to payments made at a point of sale, where the card, mobile phone or other device containing the card credentials (e.g. a payments-enabled smart watch) interacts with an acceptance technology to authenticate the transaction. In contrast, remote transactions include online payments, purchases made through a mobile app, and by mail and telephone. The growing popularity of online shopping and the increasing availability of mobile apps that allow users to make payments with pre-authorised card information (e.g. ride-sharing apps like Uber), have resulted in the share of remote payments rising from 12 per cent in 2008 to 16 per cent in 2018 (Graph 3).

## Personal and commercial use of credit cards

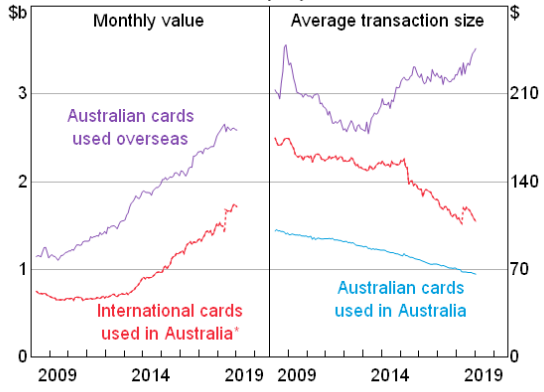
Recognising that credit cards are often used differently by households and businesses, the Bank has started publishing data on personal and commercial credit card transactions separately. The new data suggest that 19 per cent of the total value of credit card transactions are undertaken on commercial cards (Graph 4). As businesses typically repay credit cards in full within their interest-free period, commercial cards account for only 6 per cent of total balances accruing interest. These shares have remained largely constant over the past decade.

**Graph 1**
**Card Purchases**
Monthly, seasonally adjusted*



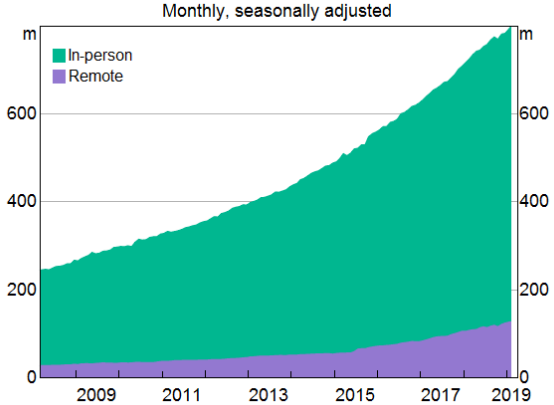

* Changes in reporting methodology in March 2008 and May 2018
Source: RBA

**Graph 2**
**Credit and Debit Card Spending**
Seasonally adjusted




* Series break due to changes in reporting methodology in May 2018
Source: RBA

**Graph 3**
**Card Transactions in Australia**
Monthly, seasonally adjusted




Source: RBA

The average transaction size on commercial credit cards has increased steadily over the past decade to around $360. By comparison, not only is the average transaction size on personal credit cards notably lower at around $100, it has also declined over the past decade. Commercial credit cards are typically used to manage business expenses, which can be significantly higher in value than typical personal transactions. There is no material difference in the proportion of international spending between personal and commercial cards.

### Prepaid scheme cards

Over the past few years, gift cards and reloadable travel cards have become increasingly popular among households and businesses. To provide clearer insights into the prepaid card market, the Bank is now publishing data on prepaid scheme card transactions, separate to debit card statistics (see Box B).[9] There are currently around 9.4 million prepaid scheme cards on issue in Australia with $1.8 billion of stored value held on them, or $190 per card on average.

Prepaid scheme cards are commonly used for international transactions, which account for around half of the total value of spending on these cards. By comparison, just 3 per cent of debit card spending is on overseas purchases.

## NPP Payments

The Bank started publishing data on NPP payments in August 2018, showing the number and value of transactions since the system became publicly available in February 2018.[10] There has been strong growth in NPP transactions as banks have progressively rolled out fast payments functionality to their customers. The total monthly number of NPP payments reached around 13 million in January, more than double the monthly number of cheque payments, and the value of NPP payments was around $11 billion (Graph 5). The average value of NPP transactions was just over $800. From March 2019, the Bank has also started to publish NPP payments by payment method. The NPP currently supports two payment methods – basic transfers (known as Basic Single Credit Transfers) and Osko payments, which offer richer functionality.[11] The Bank expects to publish data on additional NPP payment methods as they become available.

## Cash and Cheques

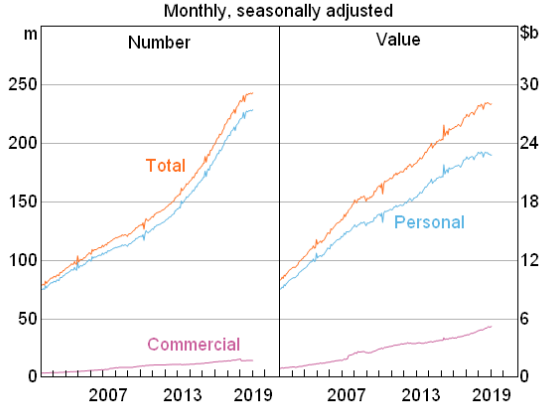
The use of cash and cheques has been declining for many years as consumers have increasingly adopted electronic methods of payment.[13] Reflecting the decreasing use of cash, use of ATMs has been falling for a number of years. The number of ATM withdrawals has fallen by an average of around 5 per cent per year since 2013 and is now about 35 per cent below its 2008 peak (Graph 6). The average value of an ATM withdrawal has increased over the past decade, in line with the rate of inflation, and is now around $225.

As use of ATMs continues to fall, it will be important to monitor how ATMs are being used. As part of the

**Graph 4**

**Credit and Charge Card Transactions**

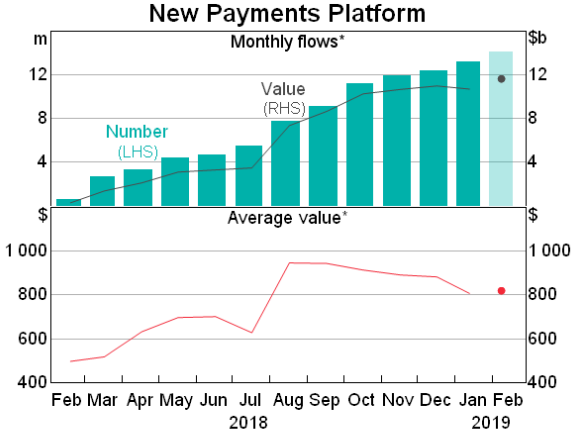
Monthly, seasonally adjusted




Source: RBA

**Graph 5**

**New Payments Platform**




* February observations are estimates based on Fast Settlement Service data from Statistical Table C7

Source: RBA

## Box B: Series Breaks in the Published Retail Payments Data

The recent changes to the RPS collection have resulted in breaks for a small number of series in the published data in May 2018, when the revised reporting methodology was introduced alongside changes in the sample of reporting institutions. After the break points, the series should also be more accurate as a result of an improved understanding of the reporting requirements by institutions. Most published series, however, were not affected by significant series breaks.[12]

There are some particularly notable breaks in the data on direct entry payments. From May 2018, published data for total direct entry payments were around 30 to 40 per cent lower than previously calculated, with debit transfers most heavily impacted. This break was mostly due to a number of institutions improving their reporting of these transactions by excluding various types of internal transfers that had previously been included as direct entry payments.

Another notable break in the data is the exclusion of prepaid scheme cards from the debit card statistics. Prior to May 2018, some institutions reported prepaid scheme cards as debit cards, as the earlier RPS survey did not include a separate category for prepaid cards. As discussed in this article, the Bank is now separately collecting and publishing data on prepaid card transactions. As a result of these changes, the published data for the number of debit card accounts declined by around 20 per cent in May 2018; other debit card data are also lower than previously calculated due to the exclusion of prepaid card transactions.

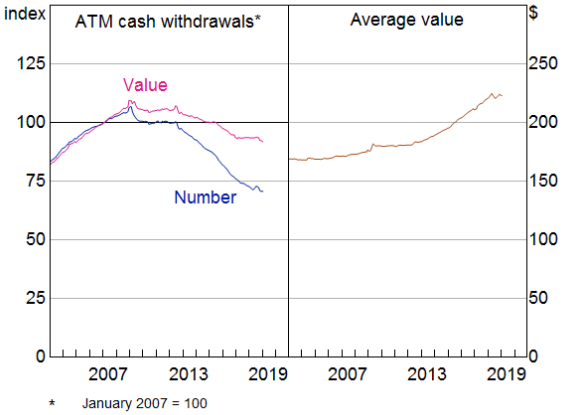
revised RPS collection, the Bank has started publishing a richer set of information on ATM transactions, including domestic and international use, the type of card used for ATM transactions and balance enquiries.

Most ATM withdrawals in Australia are undertaken with Australian-issued cards. Overseas cash withdrawals by Australians account for around 3 per cent of the value of all ATM withdrawals on Australian-issued cards. Similarly, around 3 per cent of all ATM withdrawals in Australia use international cards, although the average withdrawal amount on these cards tends to be relatively high at over $400.

Nearly all ATM withdrawals in Australia are made using debit cards, reflecting that most Australians hold a debit card and have access to a fee-free ATM at many locations. Around 3 per cent of the number of ATM withdrawals in Australia are made using credit cards, which likely reflects that many credit cards attract relatively high cash advance fees and interest rates for withdrawing money from an ATM. The average withdrawal on credit cards is higher than that for debit cards at around $285.

Since late 2017, cardholders have been more actively using ATMs owned by financial institutions that they do not bank with or independent deployers (Graph 7). Around half of all withdrawals are now undertaken at ATMs owned by other financial institutions and independent deployers, up from around 40 per cent in recent years. This notable shift in ATM preferences can be attributed to the decisions of a number of banks to remove their ATM direct charges for debit card withdrawals and balance enquiries in late 2017, greatly increasing the number of fee-free ATMs for Australian cardholders.[14] The removal of direct charges may also have contributed to a slowdown

**Graph 6**
**ATM Cash Withdrawals**
Three-month moving average, seasonally adjusted




* January 2007 = 100
Source: RBA

in the rate of decline in the number and value of ATM withdrawals since late 2017. The number of cash withdrawals fell by around 3 per cent in 2018, less than the average annual rate of decline of around 7 per cent observed in previous two years.

The Bank is also now publishing data on transactions conducted at ATMs owned by non-bank independent deployers. Independent deployer ATMs tend to be found in convenience locations like petrol stations and licensed venues, and typically levy direct charges for withdrawals and balance enquiries. Around 20 per cent of ATM withdrawals are made at ATMs owned by independent deployers; the average withdrawal at these ATMs is around $180, lower than the average value of withdrawals at financial institution ATMs of $240 (Graph 8). Only 7 per cent of balance enquiries are made at ATMs owned by independent deployers.

Cheque use has been declining for many years driven by changing preferences and payment innovations. As more businesses and other payees stop accepting cheques and the per-transaction cost of supporting the cheque system continues to rise, it will be increasingly important to identify which segments of the market continue to rely on cheques.[15] To this end, the Bank has expanded the data that it publishes on cheques to include splits by personal and commercial customers.

Around 60 per cent of all cheques are written by commercial customers. However, of the 12 million cheque accounts open at the end of January, around 80 per cent were held by personal customers. This may reflect the fact that many personal customers were provided with a free cheque book facility when they opened an account with a financial institution; these cheque accounts may not necessarily be actively used.

The total number of cheque payments fell by 22 per cent in 2018 (Graph 9). While this decline was driven largely by commercial cheques, the number of personal and financial institution (i.e. 'bank') cheques also declined. Overall, the number of cheque payments has fallen by around 80 per cent over the past decade. More recently, the value of cheque payments has also started to decline noticeably, led by a significant fall in the value of financial institution cheques. This has been driven primarily by the real estate industry moving towards electronic conveyancing systems such as Property Exchange Australia (PEXA), replacing the need to use cheques for property settlement (Graph 10).

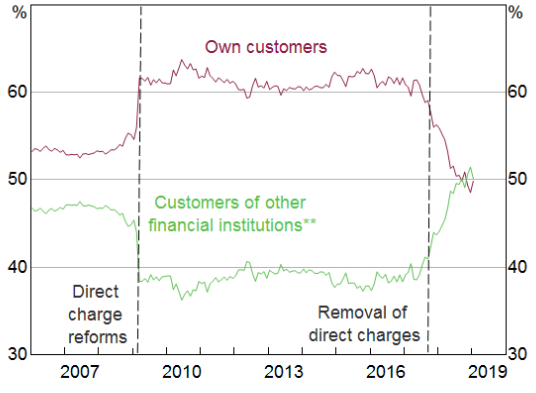
## Conclusion

The project to revamp the RPS collection will help maintain the relevance and accuracy of this important data set on Australians' payments behaviours. The expanded set of published data now includes seasonally adjusted estimates and more disaggregated series on payments activity. This information can provide greater insights into the changing payments mix and support research by policymakers, the private sector and the wider

**Graph 7**

**Composition of Number of ATM Withdrawals**

Seasonally adjusted*




* Excludes withdrawals by credit and charge cards, domestic transactions only

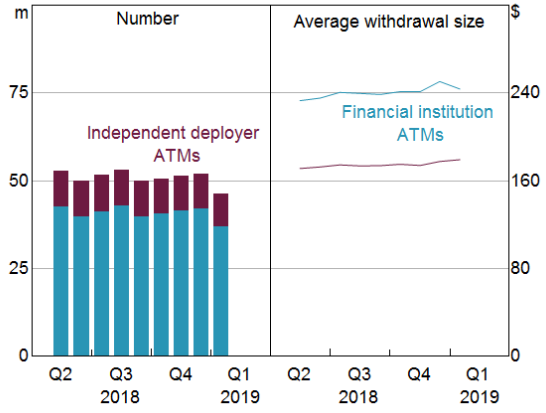
** Includes withdrawals at independent deployer ATMs

Source: RBA

**Graph 8**

**ATM Withdrawals**

Monthly



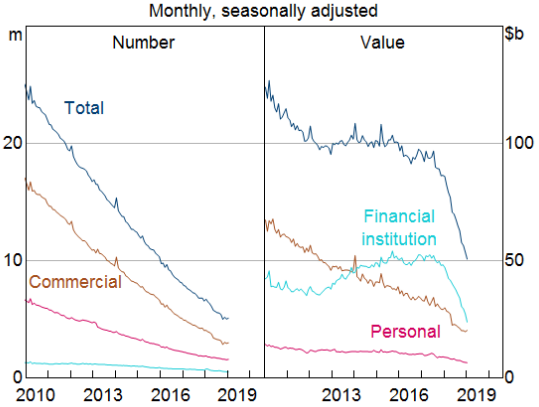

Source: RBA

community. The Bank is grateful for the cooperation of all those institutions that have been involved in the update of the RPS collection.

**Graph 9**

**Cheque Payments**

Monthly, seasonally adjusted

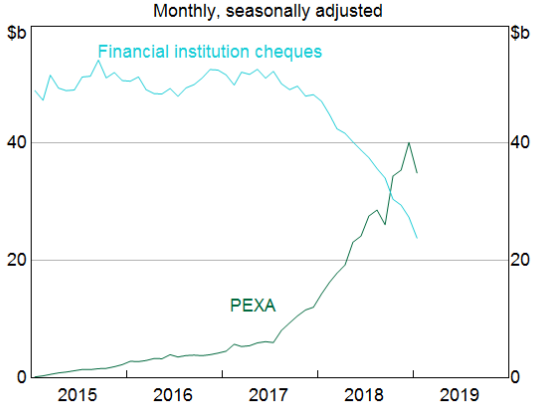



Source: RBA

**Graph 10**

**Cheque Payments and PEXA Settlement**

Monthly, seasonally adjusted




Source: RBA

## Footnotes

[*] The authors are from Payments Policy Department. The authors would like to thank Tim West and many other colleagues for their significant contributions to the Retail Payments Statistics review project.

[1] In 2008, the Bank made some small changes to the collection, mainly to separate the reporting of credit and debit card data for the international schemes.

[2] See Box B for discussion on statistical breaks for a small number of series.

[3] A link to the new statistical tables can be found at the end of this article. Further updates to the data can be found on the Bank's website <https://www.rba.gov.au/statistics/tables/>.

[4] Holidays that do not fall on the same day every year (such as Easter) can also induce seasonality.

[5] The Bank uses the X-13ARIMA-SEATS (X13) seasonal adjustment program to adjust payments data. X13 was developed by the US Census Bureau. For more information, see United States Census Bureau (2019).

[6] The Bank will look to publish additional seasonally adjusted data when the series have a long enough history.

[7] 'Credit card' in this article refers to both credit and charge cards. According to the Bank's triennial Consumer Payments Surveys, credit and debit cards overtook cash as the most common method of payment in 2016 (Doyle *et al* 2017).

[8] See Australian Bureau of Statistics (2019) and Tourism Research Australia (2019) for more information.

[9] Prepaid scheme cards include transactions that are routed over a card scheme network (e.g. eftpos, Mastercard, Visa). The data do not include transactions made on prepaid cards that are not processed over a scheme network, such as store cards or closed-loop gift cards (e.g. Westfield gift card).

[10] The Bank also publishes monthly data on the number and value of interbank NPP payments settled in the Fast Settlement Service, available at <https://www.rba.gov.au/statistics/tables/xls/c07hist.xls>.

[11] See Rush and Louw (2018) for more information on NPP and Fast Settlement Service functionalities.

[12] Reporting institutions were asked to report data under the previous and the new methodology concurrently for three months, which enabled the Bank to estimate the size of series breaks. For most series, the size of the breaks in the data are less than 2 per cent.

[13] For more information on developments in the use of cash see Davies *et al* (2016), and for changes in the payment mix see Doyle *et al* (2017).

[14] For more information on recent developments in the ATM industry, refer to Mitchell and Thompson (2017).

[15] For more information on ongoing cheque use, refer to Tellez (2017).

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## Related Information

- Updated retail payments data

# Developments in Banks' Funding Costs and Lending Rates

Susan Black and Dmitry Titkov[*]

Photo: Nikada and Aurelien Coulet / EyeEm – Getty Images


## Abstract

Banks' funding costs increased a little over 2018, driven by a rise in the cost of wholesale funding linked to money market rates, but with some offset from reductions in the cost of retail deposits. Most lenders passed the increase in funding costs through to their lending rates, including for mortgages. Nevertheless, funding costs and lending rates remain low by historical standards.


## Funding costs typically influence lending rates

The rates that banks offer on loans to households and businesses are partly driven by the cost of their funding. Banks also take into account the risks inherent in lending, such as the credit risk associated with loans and the liquidity risk involved in funding long-term assets with short-term liabilities. Competition in the financial sector, banks' growth strategies and the rate of return desired by equity holders also affect their lending rates.

The level of the cash rate is an important determinant of banks' funding costs (Graph 1). This is because the cash rate acts as an anchor for the broader interest rate structure of the domestic financial system. The pass-through from the cash rate to funding costs and lending rates is an important channel of monetary policy transmission (Brassil, Cheshire and Muscatello 2018). Nevertheless, there are other factors that influence funding costs, such as changes in the level of compensation required by investors for holding bank debt. The full effect of such changes can take some time to flow through to funding costs and lending rates. This article updates previous Reserve Bank research, focusing on developments in major banks' funding costs and lending rates over 2018 (McKinnon 2018).

The cost of banks' funding increased a little over 2018, driven by the higher cost of raising funds in wholesale debt markets as a result of increases in money market rates, in particular the rise in bank bill swap (BBSW) rates. The costs of around two-thirds of the major banks' debt and deposit funding are

ultimately linked to BBSW rates, either directly or as a result of their interest rate hedging practices. The major banks' overall funding costs have increased by less than money market rates because of the decline in interest rates on retail deposits, which account for around one-third of their non-equity funding.

Most lenders, including the major banks, have passed the increase in funding costs through to their lending rates. However, the average interest rate on outstanding housing loans increased only a little toward the end of 2018, and by less than the increases in banks' standard variable rates (SVRs) for housing loans. This owed in large part to strong competition for low-risk borrowers, as observed through the larger discounts that banks offered from their SVRs. Rates on loans to businesses also increased, particularly for large business loans, since many of these loans are linked to BBSW rates. Despite the increases, both funding costs and lending rates remain historically low, consistent with the low level of the cash rate.

## Banks' funding composition was little changed over 2018

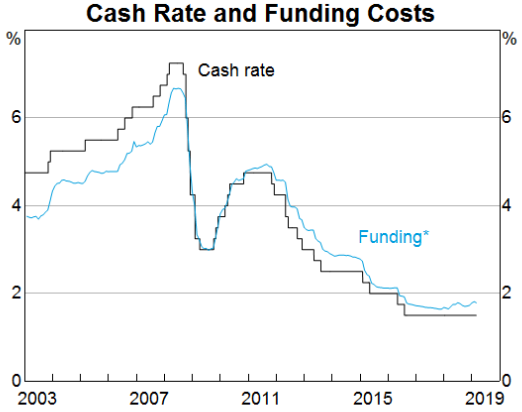
Banks obtain funding from four main sources: retail deposits, wholesale deposits, wholesale debt and equity. Excluding equity, around one-third of major banks' funding is from retail deposits. These are sourced from households and small- to medium-sized businesses. Another third of non-equity funding is from wholesale deposits, such as those from large corporations, pension funds and the government. Short- and long-term wholesale debt account for most of the remaining third of funding. The composition of major banks' funding was little changed over 2018 (Graph 2).

In aggregate, deposits account for around two-thirds of major banks' non-equity funding. This share has been relatively stable over recent years, following a large increase in the share of deposits in the aftermath of the global financial crisis. That increase was consistent with banks seeking more stable funding, particularly from term deposits (Graph 3). The introduction of new liquidity regulations – such as the Net Stable Funding Ratio requirement that came into force at the start of 2018 – has also supported the banks' demand for stable funding over recent years. Deposit growth slowed in 2018, in line with the generally subdued growth in banks' assets.

The share of funding sourced by the major banks from wholesale debt markets was little changed over 2018. Within this, the major banks shifted their funding slightly, moving away from short-term debt toward long-term debt (Graph 4). A large share of wholesale debt funding for the major banks is sourced from offshore markets, mainly in US dollars. Australian banks transform most of these foreign-currency denominated exposures into Australian-dollar denominated exposures using the cross-currency swap market. As a result, Australian banks are far less sensitive to changes in interest rates in

**Graph 1**

**Cash Rate and Funding Costs**



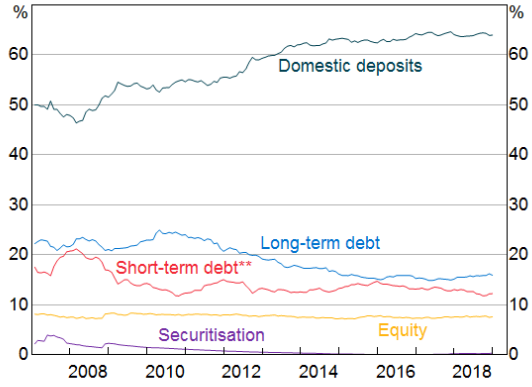

* RBA estimates for the major banks

Sources: APRA; Bloomberg; Canstar; major banks' websites; RBA; Refinitiv; Standard & Poor's

**Graph 2**

**Major Banks' Funding Composition***

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




* Adjusted for movements in foreign exchange rates

** Includes deposits and intragroup funding from non-residents

Sources: APRA; Bloomberg; RBA; Refinitiv

other jurisdictions than their share of offshore funding may suggest (Kent 2018).

## The share of funding from equity has been stable

In addition to deposits and debt, banks obtain a small portion of their funding from equity. The share of funding from equity has been stable over recent years. Since mid 2015, banks have increased their stock of equity funding by around $40 billion. This was largely in response to changes in prudential regulations that have increased the average mortgage risk weights, and therefore the amount of capital that banks are required to hold. The major banks continue to indicate that they are on track to meet the Australian Prudential Regulation Authority's (APRA) increased 'unquestionably strong' capital benchmarks by 2020 (as expected by APRA). Distinct from its 'unquestionably strong' benchmarks, APRA consulted on plans in late 2018 to implement a loss-absorbing capacity regime in Australia from 2023 (APRA 2018).

## Banks' funding costs are a little higher than in recent years but remain low

We estimate that overall debt and deposit funding costs for the major banks increased by around 10 basis points over 2018 (Graph 5). This was driven by increases in the costs of wholesale debt and wholesale deposits. Nevertheless, funding costs remain low by historical standards.

## The cost of wholesale funding increased …

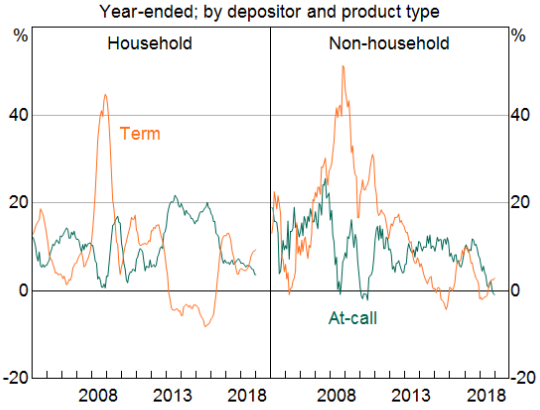
Wholesale funding – which includes both wholesale debt and wholesale deposits – accounts for around two-thirds of major banks' non-equity funding. Wholesale funding costs tend to be roughly linked to BBSW rates, which increased in 2018 (Graph 6).

BBSW rates measure the cost for highly rated banks in Australia to issue short-term bank paper with tenors of up to six months. These rates are some of the key interest rate benchmarks for the Australian dollar and are widely used as reference rates in

**Graph 3**

**Deposit Growth***

Year-ended; by depositor and product type



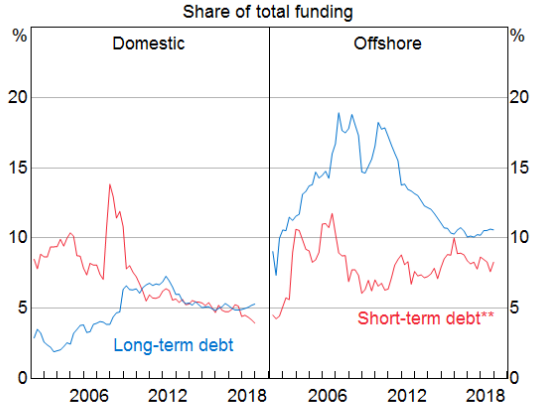

* Break-adjusted; not seasonally adjusted; excludes certificates of deposit, and foreign currency and intragroup deposits

Sources: APRA; RBA

**Graph 4**

**Major Banks' Wholesale Debt***

Share of total funding




* Adjusted for movements in foreign exchange rates; debt is on an original maturity basis

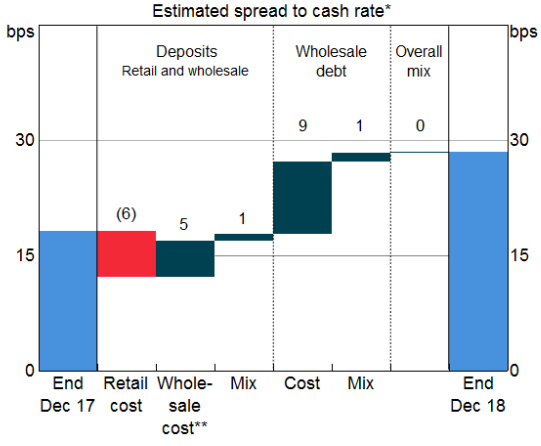
** Includes deposits and intragroup funding from non-residents in the offshore share

Sources: APRA; Bloomberg; RBA; Refinitiv; Standard & Poor's

**Graph 5**

**Major Banks' Funding Costs**

Estimated spread to cash rate*




* RBA estimates; numbers represent contributions to the overall change in the spread and may not add to the total due to rounding; bracketed numbers represent negative contributions; costs include the cost or benefit of interest rate hedges

** Reflects the impact of increases in BBSW rates on overall deposit costs

Sources: APRA; Bloomberg; Canstar; major banks' websites; RBA; Refinitiv

contracts including derivatives, loans and securities (Alim and Connolly 2018). BBSW rates are heavily influenced by expectations for the cash rate, although they are also affected by other factors, including developments in offshore money markets and changes in the demand for short-term bank paper from investors.[1]

The cost of wholesale debt for Australian banks is ultimately linked to BBSW rates either directly or as a result of their interest rate hedging practices. In addition to issuing floating-rate Australian-dollar denominated debt (at a spread to BBSW rates), banks swap much of their foreign-currency denominated or fixed-rate debt into Australian-dollar floating-rate exposures by using derivatives that typically use a BBSW rate as the reference rate (for more, see Cole and Ji 2018). These hedging practices better align movements in the rates on Australian banks' funding with those that they receive on their assets, which consist largely of loans that are variable rate and denominated in Australian dollars. Rates on wholesale deposits also tend to be closely linked to BBSW rates. In particular, wholesale term deposits are close substitutes for bank paper of the same tenor, so the rates offered on these deposits tend to move with BBSW rates.

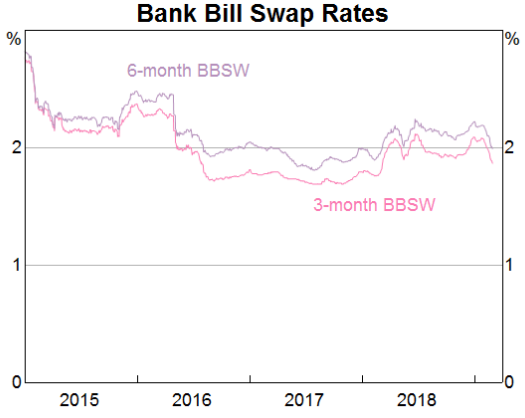
Wholesale funding costs moved broadly in line with BBSW rates over 2018, with BBSW rates around 20 basis points higher than their average in 2017 (Graph 6). In particular, BBSW rates rose noticeably toward the end of the March, June and December quarters, as did other short-term money market rates in Australia and offshore. Most of the impact of a change in BBSW rates flows through to wholesale funding costs in three to six months, with the time frame varying between banks based on the maturity profiles of their short-term debt, wholesale deposits and interest rate hedging instruments. The increases in BBSW rates were reflected in higher costs for outstanding short-term and, to a lesser extent, long-term wholesale debt. Nevertheless, wholesale funding costs remain low relative to recent history (Graph 7).

A few factors other than BBSW rates also put upward pressure on the cost of wholesale debt in 2018, although their contributions were relatively small. The major banks' wholesale debt that is issued offshore was affected by increases in cross-currency basis swap spreads, which measure the cost of swapping foreign-currency exposures into Australian-dollar exposures. In particular, the major banks' cost of sourcing short-term debt funding in US dollars and swapping it into Australian dollars increased by a little more than the increases in BBSW rates (Graph 8). Nevertheless, Australian banks may still prefer to issue offshore – even when it appears to be relatively more expensive – to diversify their funding base (Kent 2018). The slight shift in the composition of wholesale debt from short term to long term added a little to funding costs, along with an increase in the average original tenor of the major banks' long-term debt.

Banks continued to issue wholesale debt at relatively low yields in 2018. Australian banks issued bonds at a similar pace to previous years, with around $115 billion of bonds issued in the year. Net

**Graph 6**

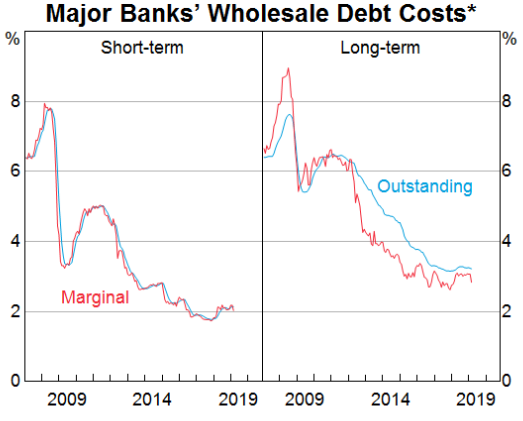
**Bank Bill Swap Rates**




Source: ASX

**Graph 7**

**Major Banks' Wholesale Debt Costs***




* RBA estimates; rates do not include interest rate hedges

Sources: APRA; Bloomberg; RBA; Refinitiv

issuance, which takes into account bond maturities, was high in 2018, with issuance outpacing scheduled maturities by around $25 billion. Although spreads to benchmark rates for the major banks' bonds widened over 2018, yields remained little changed around the low levels of recent years (Graph 9).

## … but this was partly offset by a decrease in the cost of retail deposits

Major banks' funding costs increased by less than money market rates because the cost of retail deposits declined. Major banks' overall deposit costs therefore fell over 2018, even though wholesale deposit rates increased (Graph 5). The decline in the cost of retail deposits was in large part due to substantial reductions in all of the major banks' base rates on online savings accounts (excluding any 'honeymoon' or introductory bonus rates) (Graph 10). Honeymoon rates on online savings accounts were little changed. Partly offsetting this, there was a small increase in the major banks' average rate on bonus savings accounts. Major banks' advertised rates on retail at-call deposits remain low relative both to historical rates and to rates currently offered by non-major banks.

Although rates on new retail term deposits were little changed over 2018, the cost of outstanding term deposits fell slightly because some term deposits that were contracted at higher rates in earlier years have since been replaced by term deposits at lower rates. However, the impact of this on overall funding costs was somewhat offset by a change in the mix of deposits toward term deposits, which typically have higher interest rates than at-call deposits.

## Banks increased their lending rates a little, but they remain low

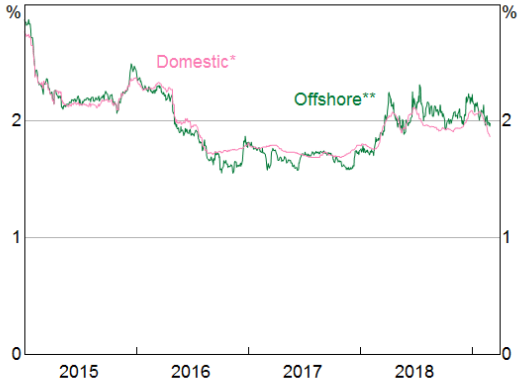
Most lenders passed the increase in funding costs through to their lending rates for households and businesses. But lending rates remain low, consistent with funding costs and the cash rate.

Interest rates on housing loans rose a little for many borrowers over 2018. Most banks increased their SVRs on housing loans in the second half of 2018 by around 10–15 basis points. The banks generally attributed the increases to higher funding costs.

**Graph 8**

**Major Banks' Marginal Cost of Short-term Debt**

3-month tenor; denominated in or swapped to Australian dollars

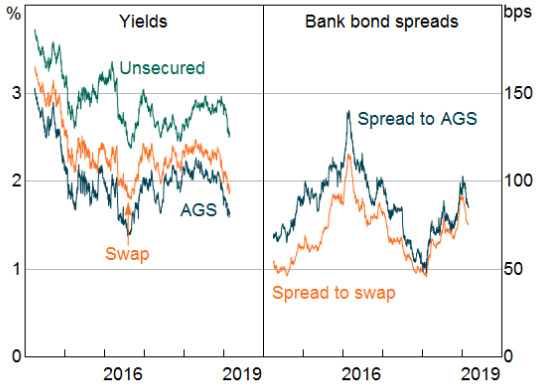



* 3-month BBSW
** AA-rated financial US commercial paper
Sources: ASX; Bloomberg; RBA; US Federal Reserve

**Graph 9**

**Major Banks' Bond Pricing**

3-year target tenor; domestic and offshore

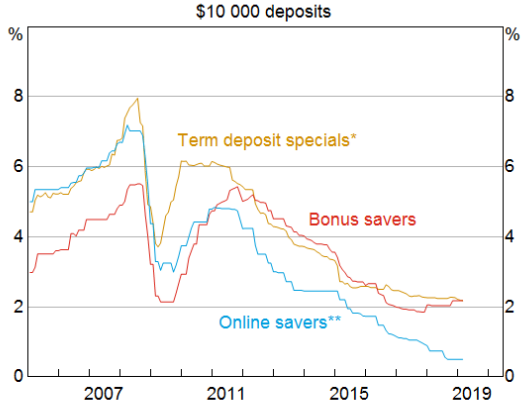



Sources: Bloomberg; RBA

**Graph 10**

**Major Banks' Retail Deposit Rates**

$10 000 deposits




* Average of 1–12, 24-, 36- and 60-month terms
** Excludes temporary bonus rates
Sources: Canstar; major banks' websites; RBA

However, the average interest rate on outstanding variable rate housing loans increased by only a few basis points over the second half of the year (Graph 11). This was partly because not all lenders raised their SVRs in that period; one of the major banks increased its housing SVRs in early 2019. In addition, interest rates on new housing loans continued to be significantly lower than interest rates on outstanding loans, which provides an indication of the strength of competition for low-risk borrowers. Some existing borrowers refinanced at a lower rate with a different lender or renegotiated the rate of their loan with their existing lender. Moreover, advertised interest rates on fixed-rate housing loans, which account for around one-fifth of outstanding housing credit, declined throughout 2018.

Interest rates on outstanding loans to large businesses are estimated to have increased by around 35 basis points over 2018, reflecting in part the increases in BBSW rates (Graph 12). Most loans to large businesses are linked to BBSW rates. Rates on loans to small businesses were little changed over the year, though they remain noticeably higher than those for large businesses. Some banks increased their advertised rates for small businesses toward the end of 2018, citing higher funding costs.

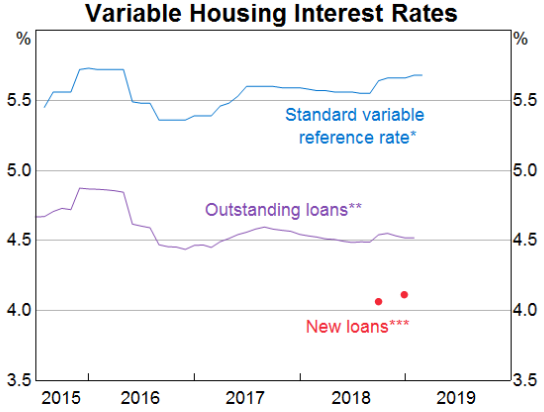
## Banks' implied lending spread narrowed a little

A bank's implied spread on its outstanding lending is the difference between its average lending rates and overall funding costs. We estimate that this spread narrowed slightly for the major banks over 2018 (Graph 13). The implied lending spread did not narrow by as much as the increase in funding costs because much of this increase was passed through to an increase in lending rates, including for mortgages and large business loans.

The implied lending spread differs from some commonly reported measures of bank profitability (for example, the net interest margin), because it excludes the returns on banks' other interest-earning assets, such as high-quality liquid asset holdings. Yields on some of the banks' liquid assets rose over 2018, consistent with increases in BBSW rates. The effect of this was to dampen the impact of higher funding costs on banks' net interest margins.

**Graph 11**

**Variable Housing Interest Rates**

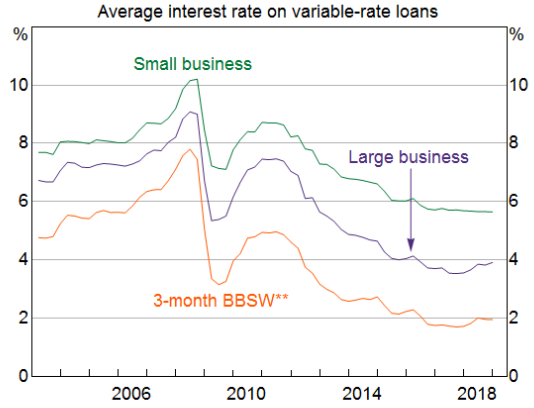



* Average across major banks' rates; data to February
** Data to January; data from the Securitisation Dataset
*** Average new variable lending rate based on APRA quarterly data
Sources: APRA; RBA; Securitisation System

**Graph 12**

**Variable Business Lending Rates***

Average interest rate on variable-rate loans

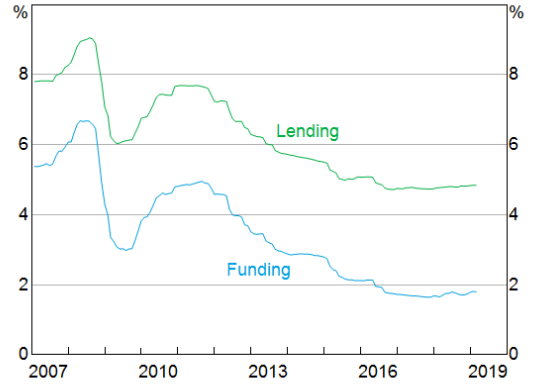



* RBA estimates
** 3-month trailing average
Sources: APRA; ASX; RBA

**Graph 13**

**Major Banks' Funding Costs and Lending Rates***

Outstanding




* RBA estimates
Sources: APRA; Bloomberg; Canstar; major banks' websites; RBA; Refinitiv

## Footnotes

[*] The authors are from Domestic Markets Department.

[1] For information on factors that influenced BBSW rates in 2018, please see RBA (2018).

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# Updates to Australia's Financial Aggregates

Joel Bank, Kassim Durrani and Eden Hatzvi[*]

Photo: Caiaimage / Robert Daly – Getty Images


## Abstract

The financial aggregates for Australia are important data compiled by the Reserve Bank that are used by policymakers to assess financial and economic activity of households and companies. From August 2019, the Reserve Bank will publish the financial aggregates using an improved framework based on a better data collection. This will enhance the quality of information available to policymakers and the wider community. This article gives an overview of the main changes.


## What Are the Financial Aggregates?

The Reserve Bank publishes and monitors data on the stock of money and credit in Australia based on international statistical standards, much like central banks and statistical agencies in other countries. These data are called the financial aggregates. They can be used to help understand developments in financing and the economy.

The **credit aggregates** measure the funds borrowed by Australian households and businesses from financial intermediaries. Total credit can be broken down into housing credit, personal credit (such as credit cards) and business credit. The credit aggregates measure households' borrowing for purposes such as housing (whether owner-occupier or investment) and consumption (such as cars and holidays). They also measure how much businesses are borrowing for purposes such as investing in projects, buying assets or managing their cash flows.

Table 1 shows some of the data series currently published on the Reserve Bank's website. These are available both expressed as growth rates and as the value of credit outstanding at the end of each month. The entire data series can be found in Statistical Tables D1 and D2 on the Reserve Bank's website.

The **monetary aggregates** measure the money and 'money-like' instruments – such as deposits – that the banking system owes to households and

**Table 1: Australia's Credit Aggregates**

December 2018

| | Share of total credit<br>Per cent | Share of GDP<br>Per cent |
|---|---|---|
| Household | 67 | 103 |
| – Housing | 62 | 95 |
| – Owner-occupier | 42 | 64 |
| – Investor | 21 | 31 |
| – Personal | 5 | 8 |
| Business | 33 | 50 |
| Total credit | 100 | 154 |

Sources: ABS; APRA; RBA

**Table 2: Australia's Monetary Aggregates**

December 2018

| Measure | Description[(a)] | Share of nominal GDP<br>Per cent |
|---|---|---|
| Currency | Holdings of notes and coins by the private non-bank sector | 4 |
| Money base | Currency + banks' holdings of notes and coins + deposits of banks with the RBA + other RBA liabilities to the private non-bank sector | 6 |
| M1 | Currency + current (cheque) deposits of the private non-bank sector at banks | 19 |
| M3 | M1 + all other deposits of the private non-authorised deposit-taking institution sector at banks (including certificates of deposit) + all deposits at credit unions and building societies | 111 |
| Broad money | M3 + other deposit-like borrowings (such as short-term debt securities) of banks and non-bank lenders in Australia from private sector entities outside the banking system | 112 |

(a) These descriptions abstract from some detail. See the financial aggregates release for more information.

Sources: Doherty, Jackman and Perry (2018); ABS; APRA; RBA

businesses.[1] Money can be held in different forms, for example, as banknotes in a wallet or as deposits in a bank account.

The Reserve Bank publishes five different monetary aggregates: currency, the money base, M1, M3 and broad money. These measures differ in the types of instruments that are included. For example, M1 contains only the most liquid forms of money such as banknotes and current deposits (i.e. funds that can be easily used to make payments), whereas broad money also includes term deposits and short-term debt securities issued by financial institutions in Australia. Table 2 shows how the monetary aggregates are currently defined. The data can be found in Statistical Tables D1 and D3 on the Reserve Bank's website.

## Why are the financial aggregates important?

The financial aggregates are used extensively by policymakers and the wider community. Monitoring changes in the stock of money and credit is important because it can help us understand more about what is happening in the economy. Monitoring changes in credit can also be helpful for identifying risks to financial stability. For example, rapid credit growth could signal stronger economic growth, but also increasing risks to financial stability, particularly if debt levels are already high.

Some examples of how the Reserve Bank uses the aggregates include the following:

- Data on borrowing for owner-occupier housing, investor housing and personal lending can assist in monitoring households' access to credit

and lenders' willingness to lend. Housing credit data can depend on conditions in the housing market and can also influence conditions in the housing market.

- Data on business borrowings from banks and non-bank lenders form part of an assessment on financial conditions for businesses in Australia.
- The aggregates provide information on the composition of lenders' assets and liabilities. These exposures are relevant to assessments on financial stability in Australia.
- The Reserve Bank also combines data on the composition of banks' assets and liabilities with other information to assess developments in banks' profitability.

Graphs 1–4 show some of the financial aggregates data that can feature in the Reserve Bank's assessments of economic and financial conditions.

## The Framework for Compiling the Financial Aggregates

This section briefly discusses the conceptual framework that underlies the financial aggregates. More comprehensive information on the framework can be found in the International Monetary Fund's (IMF) Monetary and Financial Statistics Manual and Compilation Guide (which has informed Australia's aggregates).

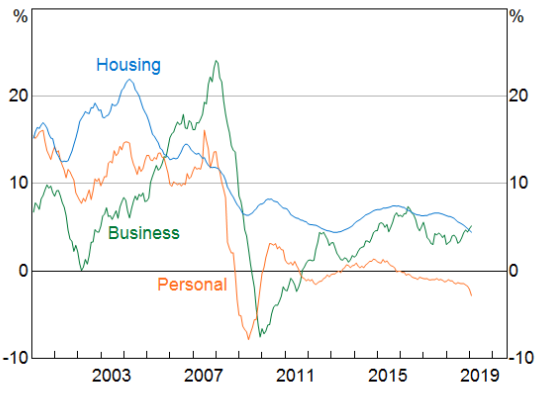
Every financial aggregate has **three components**:

1. a set of financial instruments

**Graph 1**

**Credit Growth by Sector***

Year-ended

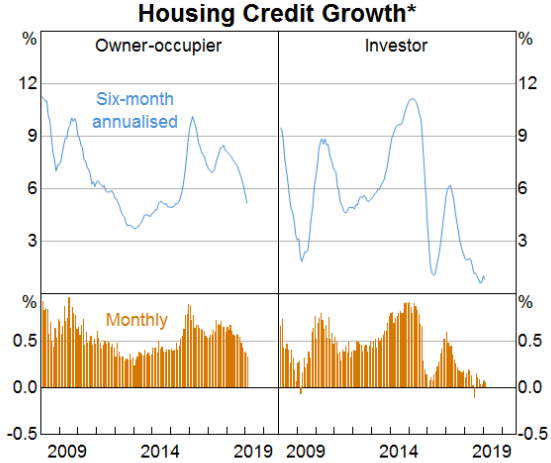



* Seasonally adjusted and break-adjusted

Sources: ABS; APRA; RBA

**Graph 2**

**Housing Credit Growth***



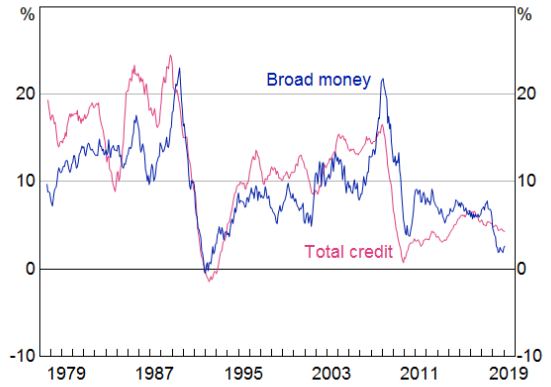

* Seasonally adjusted and break-adjusted

Sources: APRA; RBA

**Graph 3**

**Credit and Broad Money Growth***

Year-ended



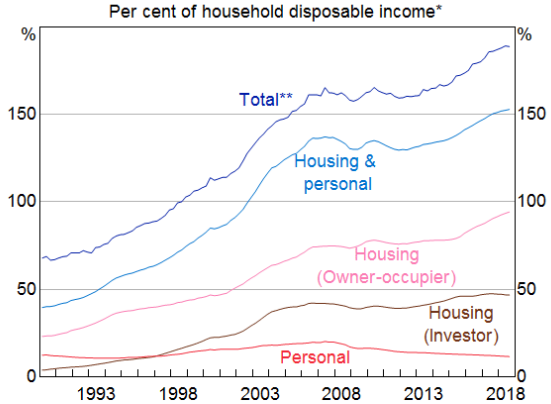

* Seasonally adjusted and break-adjusted

Sources: APRA; RBA

**Graph 4**

**Household Liabilities**

Per cent of household disposable income*




* Household disposable income is after tax, before the deduction of interest payments, and includes income of unincorporated enterprises

** Includes debt of unincorporated enterprises and debt owed to non-financial organisations e.g. HECS-HELP

Sources: ABS; APRA; RBA

2. a set of financial intermediaries
3. a set of counterparties to the financial intermediaries.

For the **credit aggregates**: the financial instruments are loans made by financial intermediaries to households and businesses, which are the counterparties to the financial intermediaries. The loans are assets of the intermediaries, and liabilities of the households or businesses. Using this framework, we can narrow down the scope of the aggregates to focus on particular areas of interest. For example, the Reserve Bank produces a credit aggregate called 'investor housing credit' by restricting the set of counterparties to households and the financial instruments to loans used to purchase housing for investment purposes.

For the **monetary aggregates**: the money and 'money-like' financial instruments are liabilities of the financial intermediaries and are assets held by households and businesses. Again, the scope of the aggregate can vary to focus on areas of interest.

A key challenge in compiling the aggregates is **avoiding double counting**. This requires keeping the sets of financial intermediaries mutually exclusive from the sets of counterparties. For example, if a financial intermediary borrows from another financial intermediary to extend a mortgage to a household, only the final loan to the household should be included in the credit aggregates.

**In principle**, the financial aggregates should be:

- **produced using timely, reliable and accurate inputs**, and be free from double counting;
- **easily understood** by and **explained** to users;
- available in various breakdowns to **meet the analytical needs of data users** without creating undue burden for compilation and publication;
- **consistent with the general international principles** for the compilation of financial aggregates while taking account of Australia's particular circumstances; and
- **as robust as possible through time** to changes in how particular financial instruments or the counterparties that issue and hold them are classified.

The Australian Prudential Regulation Authority (APRA) **is the statistical agency for the Australian financial sector**. APRA collects a large amount of data from banks and other financial institutions using various 'forms', which can be found on APRA's website. As part of this role, APRA collects data on behalf of the Australian Bureau of Statistics (ABS) and the Reserve Bank. The current version of this set of forms was introduced in 2002 and has not been comprehensively updated since then. The data from each reporting institution's forms are aggregated, and feed into ABS publications such as the National Accounts: Income, Expenditure and Product, the National Accounts: Finance and Wealth, and Lending to Households and Businesses, Australia.[2]

This collection is also what the Reserve Bank currently uses to compile the financial aggregates. Conceptually, the entities that report on this collection represent the financial intermediaries in the credit and money aggregates. Individual items are taken from the assets and liabilities of each reporting institution and then aggregated to a total using the principles outlined above.

## The New Economic and Financial Statistics Collection

Over the past few years, APRA, the ABS and the RBA have worked to modernise the existing set of forms, and banks and other reporting institutions have adapted their infrastructure to be able to report on the new versions of these forms. This has been a large scale and complex project, involving considerable collaboration between the three agencies and the industry. The new set of forms are called the **Economic and Financial Statistics (EFS) collection** and will better meet the data needs of policymakers.

The EFS collection will be **implemented in three phases**.

1. The first phase will focus on data used for the financial aggregates and national accounts finance and wealth estimates – discussed in more detail below.

2. The second phase will update current forms on housing and business loan approvals. It will also provide much more granular information on banks' and other reporting institutions' lending, their liabilities and interest rates.
3. The third phase will provide information on other aspects of reporting institutions' activity and performance, including profits, fees charged and activity in specific financial products and markets. The first phase national accounts aggregates will be used in addition to this performance data in the compilation of Australia's Gross Domestic Product (GDP).

The EFS collection will increase the reliability and accuracy of the inputs used to calculate the aggregates. One of the most important changes in the EFS is **more detailed and precise definitions of the data to be reported**. These definitions are **accompanied by comprehensive guidance** to assist institutions in reporting consistent data.

The guidance includes a Reporting Practice Guide and published responses to questions from reporting entities about the new forms. The guide explains the common principles underlying the EFS collection and elaborates on specific terms and concepts within the forms such that reported data should be more consistent across institutions. This, in turn, will increase the accuracy and reliability of the financial aggregates. The guidance is comprehensive, but it is worth pointing out a few items.

### Clarifying definitions

A number of definitions have been clarified or updated to align with international standards for compiling economic statistics. These include the definitions of different types of deposits and industry sectors.

More broadly, an underlying principle of the EFS collection is that loans should be **classified by their purpose**, such as to purchase a house or to finance a business**.** The definitions of loan purpose types have been specified to seek to avoid ambiguity, an improvement on existing reporting in which institutions have sometimes used a variety of interpretations when reporting data.

This could have a significant effect on the reporting of **owner-occupier housing loans**, which EFS defines as being for the principal place of residence. This means a borrower can generally only have one owner-occupier housing loan, with all other housing loans by the same borrower classified as being for investment purposes (investor loans). This is not how banks and other reporting institutions have necessarily recorded housing loans in their own systems in the past.

The EFS collection includes updated definitions of **residency status** for households and businesses, which are consistent with the compilation of Australia's national accounts. Detailed guidance on how to classify counterparties and financial instruments by residency is now also provided, including for cases when households' or businesses' activities are spread across multiple countries.

### Improving data quality

There is also separate guidance on how existing data quality standards apply to EFS reporting. This sets out the level of accuracy expected for specific EFS data and gives reporting entities a sense of where to focus their data quality management efforts.

The **set of institutions** that will form part of the financial aggregates will also change, which will further improve the accuracy of the aggregates. The aggregates will transition towards **no longer including estimates of lending by non-bank entities that are not registered with APRA**, which is mostly relevant for housing lenders that securitise their loans. Only a small number of these institutions currently report data to APRA, which are used to construct estimates of lending by all non-registered lenders. As a result of the small number of reporting institutions, these estimates are imprecise. Recent legislative changes mean that many of these entities will register with APRA and begin reporting data.[3] This will allow the Reserve Bank to transition away from including estimates for non-registered lenders in the credit aggregates.

### Simplifying the conceptual framework

**The conceptual framework has also been simplified and modernised**, which will make the

aggregates more accurate, easier to understand and more robust through time. A prominent example is the definition of M1 in the monetary aggregates. Conceptually, M1 should measure physical currency plus transferable deposits. However, M1 as currently published only includes chequing accounts at banks, and excludes all deposits at credit unions and building societies (CUBS). The new M1 will include all transaction deposits at both banks and CUBS.

Further technical changes to the framework can be found in the Appendix.

## Changes to Existing Financial Aggregates Data

The EFS collection will significantly improve the quality of Australia's financial aggregates. The updated financial aggregates will be better aligned with the principles outlined above. As a result, the new data will be more accurate and provide policymakers with a better understanding of developments in financial conditions in Australia.

The more detailed guidance accompanying EFS, along with some definitional changes, are likely to result in **changes to the financial aggregates**, some of which may be significant. The RBA and ABS will receive parallel run data for the new financial aggregates in April, which will give us an indication of the scale and direction of revisions.

The new guidance on principal place of residence is expected to be reflected in **lower owner-occupier housing lending and higher investor housing lending** in the new aggregates**,** all other things being equal; and **M1 will be higher** with the inclusion of all transaction deposits. However, given the holistic nature of the changes, it is too early to say what the broader impact of the introduction of the EFS on these aggregates is likely to be.

**It may also take time for reporting entities to get used to the new forms**. APRA, the ABS and the RBA have been engaging with the industry about EFS on a regular basis, with the aim of answering as many questions from industry as possible. Nevertheless, the scale and complexity of EFS means that there may be some large revisions to data (over and above normal) for some time after the new financial aggregates are first released in August 2019.

## What's Next?

The EFS collection will provide more information relating to the aggregates, which creates the opportunity for the Reserve Bank to publish more detailed breakdowns as part of its financial aggregates publication. The Reserve Bank will make some of this new information publicly available if it is assessed to be of sufficient quality and judged to be of wider interest to users of the financial aggregates statistics.

The financial aggregates are also just the first phase of EFS. The second phase will provide policymakers with much more detailed data on: loan approvals; housing, personal and business lending, including interest rates on different types of lending; and financial intermediaries' liabilities. These data will be of interest to the wider community and further information will be published by the Reserve Bank over the years ahead.

## Appendix

The appendix has further details about the upcoming changes to the financial aggregates.

## Footnotes

[*] The authors are from Domestic Markets Department. From the April 2023 release, changes have been made to the financial aggregates to add series that exclude lending to warehouse trusts in business credit. More information is available in the Change Notice published 21 April 2023.

[1] See Doherty, Jackman & Perry (2018) and Kent (2018) for a comprehensive primer on the concept of money and how it is created.

[2] In the ABS release, lending refers to loan approvals.

[3] The legislation is the *Financial Sector (Collection of Data) Act 2001*.

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# Updates to Australia's Financial Aggregates – Appendix

Joel Bank, Kassim Durrani and Eden Hatzvi

## Updates to Australia's Financial Aggregates

A number of changes are being made to the financial aggregates framework. Updates to Australia's Financial Aggregates provides a high level overview of the main changes and this appendix provides further details. In all of the tables in this appendix: ticks denote items that are included in the corresponding part of the aggregates; crosses show those that are not included; and entries in blue typeface indicate where changes have been made to any of the financial aggregates.

### Credit lenders and money issuers

This section compares the financial institutions that are included as lenders and money issuers (the financial intermediaries in the monetary aggregates). Both sets are being simplified, which will improve the accuracy of the aggregates and make them easier to interpret and compile.

Tables A1 and A2 show all of the changes that are being made to the sets of lenders and money issuers. To summarise:

- Authorised deposit-taking institutions (ADI) that are not registered as banks, credit unions or building societies will now be included as lenders (previously they were excluded). This means that all ADIs will be treated consistently as lenders in the credit aggregates.
- The aggregates will transition towards no longer including lending by non-registered wholesale funders (NRWF).[1] Except for the smallest NRWFs, these institutions should register with APRA (and hence be included in the credit aggregates) due to recent legislative changes.
- Cash management trusts (CMTs) will now be excluded as both lenders and money issuers.[2] There are several problems with using CMT lending data, including potential double counting. The lending assets and money liabilities of CMTs are quite small (CMTs mostly provide finance by purchasing debt securities that are not included in credit).
- All non-bank ADIs will now be treated consistently as money issuers in all measures of money, which will affect the definitions of M1 and M3. This makes the money aggregates easier to understand and interpret. The set of financial intermediaries in M1 and M3 can now be thought of simply as all ADIs, while the set in broad money will be all ADIs and registered financial corporations.

### Credit borrowers and money holders

This section compares the entities that are included as counterparties, either as borrowers or money holders. The changes made to these sets are designed to produce a consistent and complete set of financial aggregates. Tables A3 and A4 show all of the changes that are being made to the sets of borrowers and money holders. To summarise:

- NRWFs will no longer be included as lenders so they will be included as borrowers in the credit aggregates.
- CMTs will no longer be included as money issuers so they will now be included as money holders (in broad money). CMTs will continue to be included as a borrower type in the credit aggregates for the same reason.

### Credit assets and money liabilities

This section details the assets and liabilities that will be included under the new methodology for the financial aggregates, and how these differ from the old methodology. Most of the changes made to these sets will improve the conceptual framework of the financial aggregates. However, they are

## Table A1: Lenders Included in the Credit Aggregates

January 2019

| Lender types | Old method | New method |
|---|---|---|
| Banks | ✔ | ✔ |
| Credit unions and building societies (CUBS) | ✔ | ✔ |
| Other ADIs | ✘ | ✔ |
| Registered financial corporations | ✔ | ✔ |
| NRWFs | ✔ | ✘* |
| CMTs | ✔ | ✘ |
| Offshore lenders | ✘ | ✘ |

* This change may be made later than the implementation of the new data collection in August 2019.

## Table A2: Issuers Included in the Money Aggregates

January 2019

| Lender types | M1 | | M3 | | Broad Money | |
|---|---|---|---|---|---|---|
| | Old | New | Old | New | Old | New |
| Banks | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Credit unions and building societies | ✘ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Other ADIs | ✘ | ✔ | ✘ | ✔ | ✘ | ✔ |
| Registered financial corporations | ✘ | ✘ | ✘ | ✘ | ✔ | ✔ |
| NRWFs | ✘ | ✘ | ✘ | ✘ | ✘ | ✘ |
| CMTs | ✘ | ✘ | ✘ | ✘ | ✔ | ✘ |

## Table A3: Borrowers Included in the Credit Aggregates

January 2019

| Borrower types | Old method | New method |
|---|---|---|
| Households | ✔ | ✔ |
| Non-financial businesses | ✔ | ✔ |
| All ADIs | ✘ | ✘ |
| Registered financial corporations | ✘ | ✘ |
| NRWFs | ✘ | ✔* |
| CMTs | ✔ | ✔ |
| Other financial businesses | ✔ | ✔ |

* This change may be made later than the implementation of the new data collection in August 2019.

unlikely to have a noticeable impact on the aggregates, as the affected credit assets and money liabilities are small relative to financial intermediaries' other credit assets and money liabilities.[3]

Tables A5 and A6 show all of the changes that are being made to the sets of credit assets and money liabilities. To summarise:

- Bill endorsements will be excluded as assets in the updated credit aggregates. Bill endorsements are contingent assets of financial intermediaries, which means that no funds have actually been lent to a borrower by the financial intermediary (the actual funding associated with assets like this is contingent on a specific event happening at some point in the future; no funds get borrowed if this event does not

**Table A4: Holders Included in the Money Aggregates**

January 2019

| Holder types | M1 | | M3 | | Broad Money | |
|---|---|---|---|---|---|---|
| | Old | New | Old | New | Old | New |
| Households | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Non-financial businesses | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| All ADIs | ✘ | ✘ | ✘ | ✘ | ✘ | ✘ |
| Registered financial corporations | ✔ | ✔ | ✔ | ✔ | ✘ | ✘ |
| NRWFs | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| CMTs | ✘ | ✘ | ✘ | ✘ | ✘ | ✔ |
| Other financial businesses | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |

**Table A5: Asset Classes Included in the Credit Aggregates**

January 2019

| Asset types | Old aggregates | New aggregates |
|---|---|---|
| Loans and finance leases | ✔ | ✔ |
| Securitised loans (off-balance sheet) | ✔ | ✔ |
| Bill acceptances | ✔ | ✔ |
| Bill endorsements | ✔ | ✘ |
| Short-term debt securities | ✔ | ✘ |
| Long-term debt securities | ✘ | ✘ |
| Other security types | ✘ | ✘ |

occur). The generally accepted international practice is to exclude all contingent assets from financial aggregates.[4] Bill acceptances reflect actual lending (i.e. they are not contingent assets) and will therefore remain in the credit aggregates.

- Short-term debt securities will be excluded as assets in the updated credit aggregates. The aggregates are meant to capture intermediated lending, but debt securities are a form of non-intermediated lending, since any entity (not just financial institutions) can purchase debt securities.
- All types of transaction deposits will be included in the new M1 measure. M1 is meant to be a relatively liquid measure of money that includes all deposits that are directly accessible and available on demand without penalty or restriction. For example, deposits held by households in online bank accounts where direct payments can be made to third parties are highly liquid. However, the current measure of M1 only includes cheque account deposits.
- Long-term certificates of deposit will be excluded from M3 and broad money. The values of these certificates tend to fluctuate in response to interest rate movements, which means they are considered to be a less reliable store of value, and hence not very 'money-like'. Only short-term certificates of deposit will remain in M3 and broad money, as interest rates are less likely to have an impact on their value over the short term. This is consistent with the monetary aggregates framework provided by the IMF.

## Table A6: Liability Classes Included in the Money Aggregates

January 2019

| Holder types | M1 | | M3 | | Broad Money | |
|---|---|---|---|---|---|---|
| | Old | New | Old | New | Old | New |
| Banknotes and coins (issued) | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Cheque deposits | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Non-cheque transaction deposits | ✘ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Non-transaction deposits | ✘ | ✘ | ✔ | ✔ | ✔ | ✔ |
| Short-term negotiable certificates of deposit | ✘ | ✘ | ✔ | ✔ | ✔ | ✔ |
| Bill acceptances | ✘ | ✘ | ✘ | ✘ | ✔ | ✔ |
| Other short-term debt securities | ✘ | ✘ | ✘ | ✘ | ✔ | ✔ |
| Long-term negotiable certificates of deposit | ✘ | ✘ | ✔ | ✘ | ✔ | ✘ |
| Other long-term debt securities | ✘ | ✘ | ✘ | ✘ | ✘ | ✘ |

## Footnotes

[1] See RBA (2009) for further details on how wholesale funders not registered with APRA were included in the old methodology for the credit aggregates.

[2] Cash management trusts are managed investment vehicles that invest a collective pool of capital provided by investors in short-term money markets.

[3] One particularly extreme example of this is that bill endorsements by registered financial institutions are currently zero.

[4] The Reserve Bank's updated methodology for the financial aggregates draws from the International Monetary Fund's (IMF) Monetary and Financial Statistics Manual and Compilation Guide. The IMF does not recommend including bill endorsements in the credit aggregates, and these assets are also excluded by a number of other central banks.

# Recent Trends in Banknote Counterfeiting

Meika Ball[*]


Photo: Reserve Bank of Australia

## Abstract

Law enforcement intervention has shut down several large counterfeiting operations and led to a decline in counterfeiting rates over the past couple of years. At the same time, the increased availability of low-cost, high-quality printing technology has meant that the quality of counterfeits has improved. This article discusses trends in banknote counterfeiting in Australia and the impact of counterfeiting on different stakeholders.

## Introduction

As Australia's banknote issuing authority, the Reserve Bank of Australia (the Bank) aims to prevent counterfeiting and maintain public confidence in the security of Australian banknotes. Counterfeiting is a crime and amounts to theft; since counterfeits are worthless, if an individual or business unknowingly accepts a counterfeit in exchange for something of value, they have been stolen from. More broadly, counterfeiting can erode public confidence in physical currency, which carries social and economic costs.

Counterfeiting is prosecuted under the *Crimes (Currency) Act 1981*, which prescribes a number of offences. These include:

- making, buying or selling counterfeit money
- passing counterfeit money
- possessing, importing or exporting counterfeit money
- possessing, importing or exporting materials used to counterfeit money
- sharing information about how to counterfeit money
- wilfully damaging genuine money.

Penalties for counterfeiting can be severe, including fines of up to $75,000 and/or up to 14 years imprisonment for responsible individuals. The Bank assists in preventing counterfeiting by ensuring that Australia's circulating banknotes are secure and of high quality, and by raising public awareness of banknote security features. The Bank also examines

and monitors counterfeits seized and detected in Australia, makes referrals to the Australian Federal Police (AFP), and assists police and prosecutors with information and expert evidence.

This article discusses recent trends in counterfeiting in Australia, and the costs and impact of counterfeiting on different stakeholders, including the public, retail businesses, the Bank and law enforcement. The article also contains information on how to detect counterfeits, and what to do with them.

## Trends in Counterfeiting

The Bank typically receives around 30,000 counterfeits per year. This is small relative to the total amount of banknotes in circulation (around 1.6 billion pieces). Therefore, when we measure the incidence of counterfeiting we use the number of counterfeits per million genuine banknotes in circulation (parts per million, or ppm). Counterfeiting in Australia rose steadily from the early 2000s, when the counterfeiting rate was around 5–10 ppm, until 2015, when the counterfeiting rate reached 26 ppm (Graph 1). Since then, counterfeiting has declined to an estimated 15 ppm in 2018. Much of this decline can be attributed to a number of successful police operations, which disrupted several large counterfeiting sources. The declining cost and growing sophistication of technology will likely enable counterfeiters to more easily produce counterfeits on a larger scale than was the case previously, and the Bank does not necessarily expect the counterfeiting rate to return to the low levels of the early 2000s (Brown, Collard and Spearritt 2017).

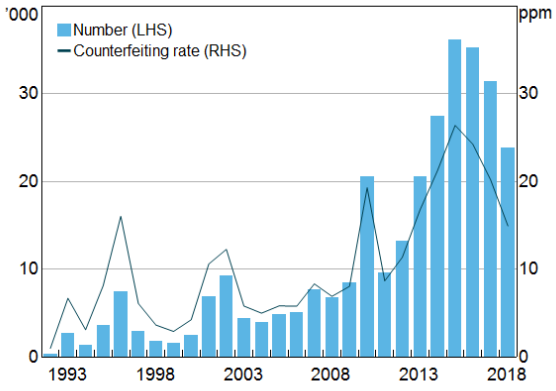
### Denominations

As the $50 banknote is the most commonly withdrawn from ATMs and used in everyday transactions, and is of relatively high value, it is perhaps unsurprising that $50 counterfeits account for the majority of all counterfeits (Graph 2). The lower denominations, while also used regularly in transactions, suffer comparatively few counterfeit attacks. This is likely because the cost of counterfeiting – both the direct production cost and the cost of being caught and going to jail – is judged too high by potential counterfeiters, relative to the expected payoff.

Counterfeits of the $100 banknote have increased over recent years from relatively low levels, with their overall volume now around half that of $50 counterfeits. Since there are fewer $100 banknotes in circulation, the rate of $100 counterfeiting is now similar to that of $50 counterfeiting. This may in part reflect advances in technology, which have enabled the production of counterfeits that will usually pass a cursory inspection (although fail a more thorough inspection that checks security features). Given that $100 banknotes are likely to be more closely inspected than other denominations when spent, counterfeiters are unlikely to produce and try to pass them unless they believe that the counterfeits

**Graph 1**

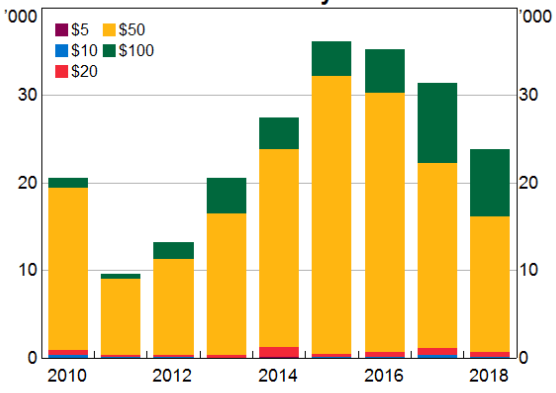
**Counterfeits Detected***




* Estimates shown for 2018
Source: RBA

**Graph 2**

**Counterfeits Detected by Denomination***




* Estimates shown for 2018
Source: RBA

have a good chance of fooling an unsuspecting retailer or member of the public.

## Substrate

The substrate is the material on which a banknote is printed; genuine Australian banknotes have been printed on a polymer substrate since 1992. Over the past decade, we have seen the emergence of sizeable volumes of counterfeits made using polymer. Although the first polymer counterfeit banknote was detected in 1997, it was not until 2010 that we began seeing significant volumes of polymer counterfeit attempts. The increase in both domestic and international polymer counterfeiting was a major factor in the decision by the Bank to begin upgrading Australia's banknotes. Polymer-based counterfeits now represent more than half of all counterfeits detected, with the remainder being mostly poorer-quality paper counterfeits (Graph 3).

Polymer counterfeits are usually higher quality than paper ones, and so the rise in the share of polymer substrate counterfeits has occurred alongside an increase in the average quality of counterfeits. Over the past two years, around 40 per cent of counterfeits detected in Australia have been considered high quality (Graph 4). This has been driven by a small number of counterfeit manufacturers.

It is worth noting that counterfeits that successfully replicate security features such as the microprint, shadow image, see-through register or intaglio (raised ink) print are rare, and members of the public can check these security features if they suspect a counterfeit (see Box A).[1]

## International comparison

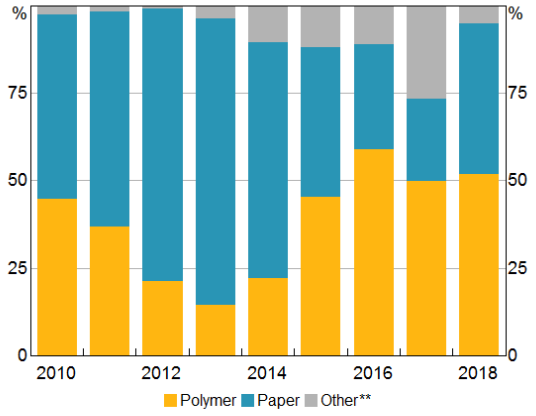
Despite the increase seen through to 2015, Australia's counterfeiting rate has remained low relative to other major currencies, peaking at 26 ppm (Graph 5). This compares with the counterfeiting rate reaching around 50 ppm in the euro area and 140 ppm in the United Kingdom over the past five years. The release of upgraded banknotes saw Canada's counterfeiting rate decline to quite low levels following high rates in the early 2000s, although it has increased slightly in recent years. Relative to a larger sample of currencies for which data are available, however, Australia's counterfeiting rate is around average, with some countries – New Zealand, for example – having very low counterfeiting rates of less than 1 ppm (RBNZ 2018).

Counterfeiting rates across countries are affected by a number of factors including the broader crime rate, the security of a currency's banknotes, how cash is used, and the cost of equipment used to counterfeit banknotes (Quercioli and Smith (2015); van der Horst *et al* (2016)). The 'internationalness' of currencies also appears to be a contributing factor: on average, more widely used currencies (such as the US dollar, euro and British pound) have higher counterfeiting rates than other, less international,

**Graph 3**

**Counterfeits by Substrate***

Share of counterfeits detected




* Estimates shown for 2018

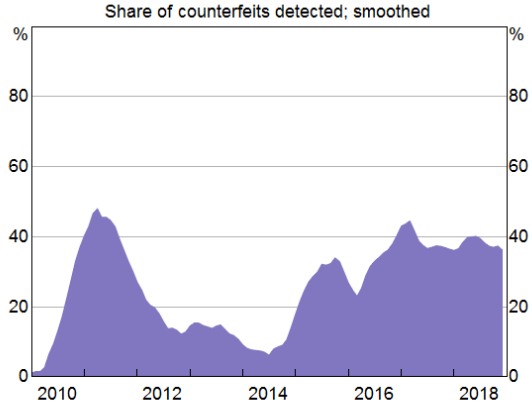
** 'Other' includes hybrid, composite substrates and wilfully damaged genuine banknotes

Source: RBA

**Graph 4**

**High-Quality Counterfeits***

Share of counterfeits detected; smoothed




* Counterfeits characterised as being 'good', 'very good', or 'excellent' quality; estimates shown for 2018

Source: RBA

## Box A: Banknote Security Features

There are a number of security features that can be used to confirm whether a banknote is genuine. All Australian banknotes are produced on polymer, which contributes to their distinct texture and makes them difficult to tear. They should spring back when crumpled. The ink is raised, and you should be able to feel it with your finger. The print should also be sharp, not blurry or fuzzy. This means that when looking closely or with a magnifying glass, the microprint should be clearly legible. The window should be clear and look like it is integrated into the design, and when examined under UV light, certain elements on the banknote will glow.

On the first series of polymer banknotes, you can also look for the shadow image produced when the banknote is held to the light, or the see-through register that is formed (Figure A1).

### Figure A1: First Polymer Banknote Series Security Features


On the new series of polymer banknotes, the clear top-to-bottom window is an additional security feature (Figure A2). Within the window are multiple elements, including holographic sections, a flying bird, and the value of the banknote switching directions when the banknote is held at different angles. In the top corner of the banknote you can also see a rolling-bar colour effect.

currencies. This may be because counterfeiters in neighbouring countries choose to counterfeit a more widely used foreign currency rather than the domestic one.

## Impact of Counterfeiting

The Bank does not reimburse individuals or businesses for counterfeit banknotes, as doing so would act as an incentive to counterfeit. This choice is consistent with other central banks. Consequently, a successfully passed counterfeit results in a direct loss to the individual or business who unknowingly accepts it.

The value of counterfeits received by the Bank each year is typically around $1–2 million. Not all counterfeits are submitted to police, however, as should be the case; a survey conducted by the Bank indicates that around 20 per cent of people would either keep or throw out a counterfeit that came into their possession. This suggests that total losses from counterfeiting are moderately higher than the recorded $1–2 million per year.

Figure A2: Second Polymer Banknote Series Security Features


See the Reserve Bank's Banknotes microsite to learn more about security features you can use to verify a banknote.

Although losses associated with counterfeiting are relatively minor compared with other kinds of payment fraud, receiving a counterfeit can have severe consequences for people with low incomes and businesses with small profit margins.[2] The average retail business would need to sell around $2,200 worth of goods or services to recoup the loss sustained through a single $100 counterfeit banknote.[3] Businesses that face narrower profit margins would need to raise prices or sell even more goods or services to make back any losses due to counterfeiting.

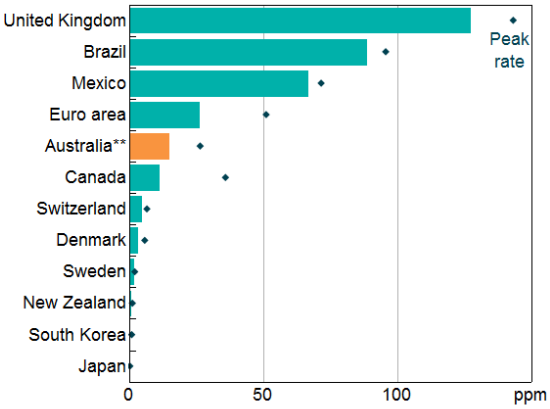
Broadly speaking, commercial banks and cash depots are where counterfeits are most commonly detected. This is unsurprising given their bulk cash processing role. However, when cash processing organisations and banks detect counterfeits and know who the depositor of the counterfeit was, they typically pass the loss back to the originating customer.

On a per capita basis, Victoria and New South Wales have the highest counterfeiting rates, while Tasmania and the Northern Territory have low rates (Graph 6). This is largely related to where large counterfeiting operations choose to distribute the counterfeits. For example, a large counterfeiting source was recently operating out of Western Australia, but this was shut down by police at the end of 2017; this helps to explain the large spike and fall in Western Australian counterfeits per capita. The difference in counterfeiting rates could also be affected by other factors such as differences in crime reporting rates.[4]

**Graph 5**

**Counterfeiting Rate***

Latest rate and 2014–2018 peak rate




* Calendar year counterfeiting rates; New Zealand data are for years to June
** Bar is 2018 estimate
Sources: Central banks; law enforcement agencies; RBA

Beyond the direct losses to the general public and businesses, there are a number of other indirect costs of counterfeiting. The Bank aims to maintain public confidence in the supply, security and quality of Australia's banknotes as a secure means of payment and store of wealth. To that end, the Bank operates a Counterfeit Examination Laboratory to examine and monitor counterfeit currency in Australia. Almost all counterfeits seized and detected in Australia are sent to this laboratory for examination, and significantly higher numbers of counterfeits contribute to increased monitoring and examination costs. The Bank also runs education programs and liaises with businesses that deal heavily in cash to promote an adequate knowledge of banknote security features. Most visibly, Australia's banknotes have been upgraded with improved security features to prevent counterfeiting.[5]

Businesses also incur indirect costs associated with counterfeiting. Cash depots, banks and retail businesses all deal heavily with cash, which leads to expenses such as staff training, equipment investment and administrative costs (such as processing banknotes to identify counterfeits, and invoicing customers for the value of counterfeits submitted). In addition, significant law enforcement resources are devoted to reducing counterfeiting.

## Role of Law Enforcement

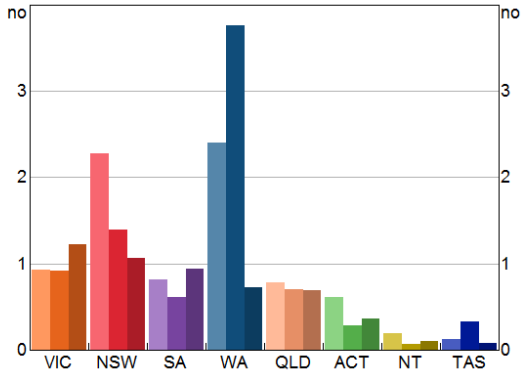
Law enforcement efforts to investigate and prosecute counterfeiting operations play a large role in managing the threat of counterfeiting. When counterfeit banknotes are sent to the Bank's Counterfeit Examination Laboratory, they are assessed by specialised document examiners. Counterfeits that are considered to be made by the same production source are grouped, monitored and referred to the AFP for investigation if deemed to be a high risk (high volume and/or high quality) to the Australian public or businesses. The AFP, state police forces, and the Commonwealth Director of Public Prosecutions all work to investigate and prosecute counterfeiting operations, with information and expert witness statements often provided by the Bank.

Police seizures of stocks of counterfeits that have not yet been passed prevents these counterfeits from entering circulation, ensuring no one loses money as a result of accepting the counterfeits. Over the past decade, police seizures have averaged 16 per cent of all counterfeit detections in Australia (Graph 7). In addition, there have been several large seizures of counterfeits made for promotional or 'hell money' purposes (that is, counterfeits that are not intended to be passed into circulation).[6] Although these may not be manufactured with the aim of being passed into circulation, there are examples of this nonetheless happening and so seizures of these are important in protecting the public from loss.

**Graph 6**

**Counterfeits Detected***

Per 1,000 people, three years to 2018




* Estimates shown for 2018

Sources: ABS; RBA

## The Life of a Counterfeit

Counterfeits from high-volume counterfeiting operations are mostly detected within the first few months after the first counterfeit is detected, and almost all are detected within two years of this point (Graph 8). This suggests that most of these operations' production is released into circulation within a fairly short period, and then progressively removed as they are detected. A major reason why this period is short, leading to an early peak and rapid decline in detections, is the efforts of law enforcement in shutting down a number of counterfeiting operations soon after their initial detection.

## Box B: What to do with a Counterfeit

If you have received a banknote that you suspect may not be genuine, first check the security features (see Box A). If any security features are missing, take the following steps:

### 1. Put aside

Handle the suspected counterfeit banknote as little as possible, and store it in an envelope.

### 2. Provide details

Try to remember as many details as possible about when, where and how you came into possession of the banknote. This information can help police and the Bank gain a better understanding of counterfeiting in Australia, and assist police in any investigations.

### 3. Submit

Report the incident to your local police or the AFP. When submitting a counterfeit, you will also be asked to complete a Suspect counterfeit banknote form. Your form and the suspect banknote will be sent to the AFP. From there it will brought to the Bank and examined. If the banknote turns out to be genuine, it will be sent back to you.

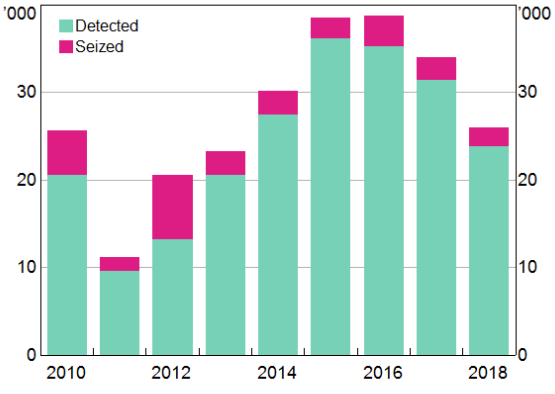
More details about what to do if you come into possession of a counterfeit can be found on the Reserve Bank's Banknotes microsite or the Australian Federal Police website. You are within your rights to refuse to accept a banknote you suspect is counterfeit. Knowingly passing a counterfeit banknote is a crime.

## Conclusion

The rate of counterfeiting in Australia steadily increased up until its peak in 2015, and has since declined to a rate of around 15 counterfeits per million genuine banknotes. The majority of counterfeits are $50 banknotes, while the share of counterfeits that are of high quality or made of polymer has increased over time. The rise in counterfeiting before 2015 was largely due to several high-volume counterfeit manufacturers. Since then, AFP and state and territory police intervention has led to a number of counterfeiting operations being shut down, preventing tens of millions of dollars' worth of losses by the Australian public. If you receive a suspicious banknote, check for the security features and submit it to police if you believe that it may be a counterfeit.

**Graph 7**

**Counterfeits Seized and Detected***



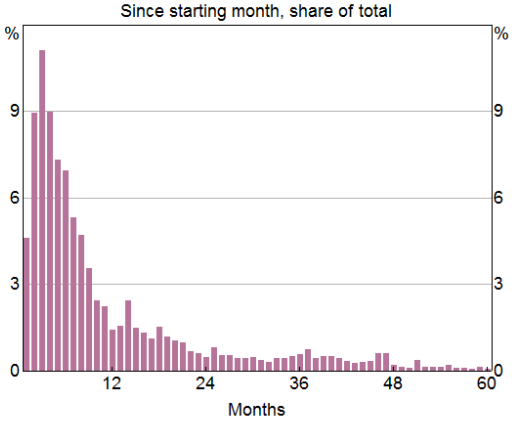

* Estimate shown for counterfeits detected in 2018; large promotional material seizure in 2015 and 'hell money' seizure in 2018 excluded

Source: RBA

**Graph 8**

**Average Counterfeits Detected***

Since starting month, share of total




* Average monthly shares of total detections of inactive counterfeit sources since 1997

Source: RBA

## Footnotes

[*] The author is from Note Issue Department.

[1] See Fox, Liu and Martz (2016) for more information on the security features on the new banknote series.

[2] Losses related to fraudulent card and cheque transactions were around $650 million in 2017/18 (Australian Payments Network 2018). The value of counterfeits detected in the same year was less than $2 million. However, people are not reimbursed for counterfeits regardless of how a counterfeit came into their possession.

[3] The retail sector had a net profit margin of 4½ per cent in 2016/17 (ABS 2018).

[4] Reporting rates based on the Australian Bureau of Statistics (ABS) Crime Victimisation survey vary significantly between states and territories (ABS 2019).

[5] See Kim and Turton (2014) for a discussion on the impact of counterfeits on the development of the new polymer banknote series. RBA (2018) estimates that the banknote upgrading program will cost approximately $37 million for all denominations to be upgraded.

[6] 'Hell money', 'ghost money' or 'spirit money' are counterfeit banknotes that are intended to be burned during religious ceremonies.

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# The Labour and Capital Shares of Income in Australia

Gianni La Cava[*]

Photo: xavierarnau, mihailomilovanovic, Westend61 and tap10 – Getty Images


## Abstract

In Australia, the share of total income paid to workers in wages and salaries (the 'labour share') rose over the 1960s and 1970s but has gradually declined since then. The corollary is that the share of income going to capital owners in profits (the 'capital share') has risen. The long-run increase in the capital share largely reflects higher returns accruing to owners of housing (primarily rents imputed to home owners, particularly before the 1990s) and financial institutions (since financial deregulation in the 1980s). Estimates of the capital share of the financial sector are affected by measurement issues, though structural factors, such as a high rate of investment in information technology, have reduced employment and increased capital in the sector.


In the 20th century, economists typically assumed that the division of aggregate income between labour and capital (the 'factor shares') was stable over a long period of time (Kaldor 1957). This presumption was typically built into models of long-run growth. But since the 1970s, trends in the labour and capital shares of income in many countries have challenged this view and reignited interest in studying the causes of changes in the factor shares (Ellis and Smith 2010, Piketty and Zucman 2014, Elsby, Hobijn and Sahin 2013, Neiman and Karabarbounis 2014).

In Australia, the labour share of income – the share of total domestic income paid to workers in wages, salaries and other benefits ('compensation of employees') – rose over the 1960s and early 1970s but has gradually declined since then (Graph 1). Since the 1970s there has been a gradual increase in the capital share of income – the share of domestic income going to capital owners in profits (or 'gross operating surplus'). The income accruing to unincorporated business owners (or 'gross mixed income') declined as a share of the economy over the 1960s and 1970s. Gross mixed income reflects a mix of labour and capital income and it is hard to

say how much of the profits to business owners is the return to labour and how much is the return to capital. Regardless, it has not been an important driver of the trends in the factor shares since the 1980s (Trott and Vance 2018).[1]

The long-run trend increase in the capital share of income is partly due to an increase in returns accruing to the owners of housing (including both rents paid to landlords and rents imputed to home owners, particularly before the 1990s) (Graph 2). Other advanced economies have seen similar trends towards housing rents accounting for a larger share of the economy (Rognlie 2015, Rognlie 2014, La Cava 2016). The share of income going to capital in the finance sector has also risen strongly since deregulation in the 1980s. However, the long-run trend in the finance sector capital share is affected, at least in part, by issues with measuring financial sector output (to be discussed later). The share of aggregate income going to non-financial companies increased in the 2000s because the resources boom caused mining company profits to rise significantly. Some of the increase in the capital share of income to mining firms has contributed to the overall upward trend over recent decades, given that the terms of trade have remained elevated; however, there was also a temporary boost to mining profits during the boom.

Australia's experience of a falling labour share (and rising capital share) over recent decades appears to be very similar to that of other advanced economies (Graph 3). About 30 advanced economies (accounting for around two-thirds of world GDP) have experienced a decline in the labour share since 1990 (Dao *et al* 2017).

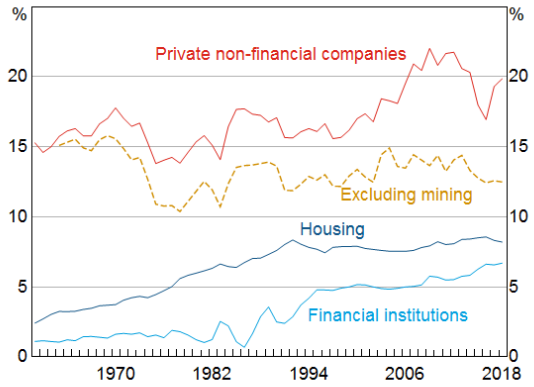
From the perspective of monetary policy, there are several reasons why understanding the drivers of changes in the labour share might be important.

First, in theory, factor shares can be useful indicators of the state of the business cycle. Profits are more procyclical than labour costs, so a rising capital share is typically indicative of an expansionary phase of the business cycle. If the labour share is declining, this is because real wages growth is not keeping up with labour productivity growth, which implies that businesses face lower cost pressures stemming from the labour market. However, in practice, the RBA's forecasting models find a limited

**Graph 2**

**Capital Income***

Share of total factor income



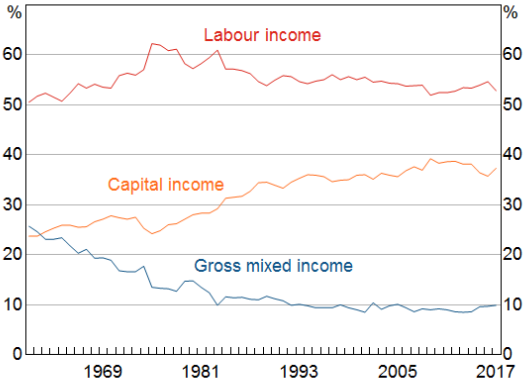

* Capital income measured by gross operating surplus; government sector excluded

Source: ABS

**Graph 1**

**Labour and Capital Income***

Share of total factor income

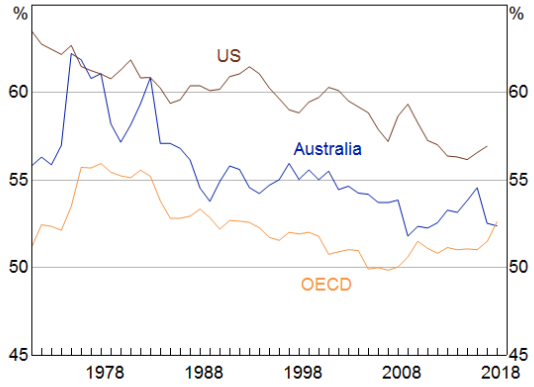



* Labour income is measured by compensation of employees. Capital income is measured by gross operating surplus

Source: ABS

**Graph 3**

**Labour Share of Income***




* Compensation of employees divided by total factor income

Sources: OECD; RBA

role for the labour share in predicting inflation independent from the business cycle.

Second, longer-term shifts in the labour share can provide insights into changes in the structure of the economy that might be relevant for monetary policy. For example, a change in the composition of capital income towards housing and the financial sector suggests that the economy has become more interest sensitive. Shifts in the labour share could also indicate changes in competitive conditions in markets for labour and goods and services.

This article analyses the changes in the factor shares of income in Australia. It starts by looking at the effects of the mining boom on factor shares, particularly since the peak in the terms of trade in 2012. It then highlights the important role of capital income in the housing and financial sectors for understanding the longer-run trends in factor shares and discusses some leading explanations for these changes, including advances in technology, the globalisation of trade and the rising market power of some large companies.

## The Labour Share, Wages Growth and the Resources Boom

The labour share is typically thought of as the ratio of total wages and salaries to total income in the economy. But an alternative way of thinking about it is as the ratio of real wages to labour productivity. Both ratios capture earnings accrued by labour, divided by the value of the output produced by that labour. If the labour share is declining, this is because real wages growth is not keeping up with labour productivity growth.

It may be surprising, therefore, that the labour share has shown little net change since the global financial crisis given weak real wages growth and relatively strong productivity growth. The resolution of this puzzle comes from the fact that real wages can be measured in different ways. Real wages are typically measured as the ratio of nominal wages to consumer prices (or 'consumer wages'). This measures the purchasing power of workers. But real wages can also be measured as the ratio of nominal wages to producer prices ('producer wages'). This measures the cost of hiring labour from the firm's perspective, and is the measure that underpins the national accounts estimates of the labour share.

Since 2012, consumer wages have grown relatively slowly despite solid growth in labour productivity, which can be partly attributed to the lagged effects of the resources boom on productivity in the mining sector (Graph 4). Much of this productivity dividend has gone to mining companies in profits (and therefore to foreign shareholders to some extent). At the same time, producer wages – which are nominal wages deflated by output prices rather than consumer prices – have increased since 2012 because the decline in the terms of trade has meant that the prices that firms receive have fallen relative to the prices that consumers pay.

Although workers have seen little of the productivity dividend recently, they did benefit from the earlier 'terms of trade dividend' (Parham 2013). Strong external demand during the resources boom pushed up producer prices by a lot more than consumer prices. This, in turn, implied that consumer wages grew faster than either productivity or producer wages during this period. Seen over a longer timeframe, the divergence between consumer wages and labour productivity appears to have been a temporary phenomenon and some of the stagnation in consumer wages over recent years is part of the adjustment process to the unwinding of the mining boom. Since 1995, the growth in real consumer wages has basically matched the growth in labour productivity.

Developments in the mining sector and the terms of trade are important for explaining movements in labour and capital shares since 2012, but the housing and financial sectors are more important for explaining the longer-run trends in factor shares to be discussed in the next section.

## What Explains the Long-term Trends in the Factor Shares?

### The housing sector

The long-run increase in capital income earned in the housing sector is an important part of the story behind the rise in the aggregate capital share. Housing capital income is measured as total rental

income less intermediate consumption of housing. Total rental income includes both the rent earned by landlords from tenant-occupied properties and the imputed rent that is 'earned' by homeowners from owner-occupied properties. Intermediate consumption of housing includes maintenance, building insurance, real estate agent commissions and the imputed service charge component of interest paid on mortgages. It is assumed that there is no labour income earned in the housing sector.

As recommended by international guidelines, the Australian national accounts adds an estimate of 'imputed rent' for owner-occupiers to both the household consumption and income estimates. This imputed rent measures the value of housing services that owner-occupiers receive from living in an owner-occupied dwelling. The imputed rent component is the largest component of rental income given that most homes are owner-occupied. Conceptually, the inclusion of imputed rent as part of income treats owner-occupiers as if they were renting the home from themselves, so they are both 'paying' rent and 'earning' rental income. The adjustment makes estimates of consumption and income for renters comparable to owner-occupiers. In imputing rents to home owners, the Australian Bureau of Statistics (ABS) national accounts assumes that rental prices for owner-occupied dwellings move in line with those for tenant-occupied dwellings.

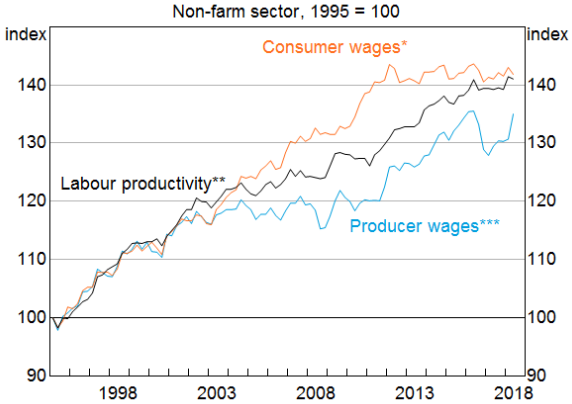
The increase in the housing capital income share since the 1960s is due to a higher share of domestic income being paid in rents, including both higher cash rents paid to landlords and, even more noticeably, higher rents imputed to homeowners (Graph 5).

To understand the drivers of the trends in the housing capital share, it can be decomposed into two components: (1) the ratio of housing capital income to the value of land and dwellings (the 'rate of return on housing') and (2) the value of land and dwellings to total factor income (the 'housing wealth to income ratio'). Since at least 1990, the increase in the housing capital share is fully explained by an increase in the housing wealth to income ratio (Graph 6). In contrast, the rate of return on housing has declined over time in line with long-term interest rates.

## Graph 4

**Real Wages and Productivity**

Non-farm sector, 1995 = 100

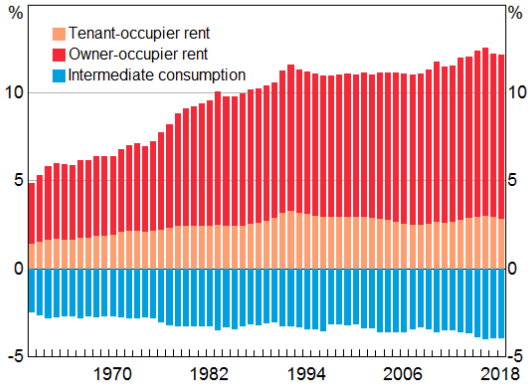



* Ratio of average hourly earnings to the household consumption deflator
** GDP per hour worked
*** Ratio of average hourly earnings to the GDP deflator
Sources: ABS; RBA

## Graph 5

**Housing Capital Income**

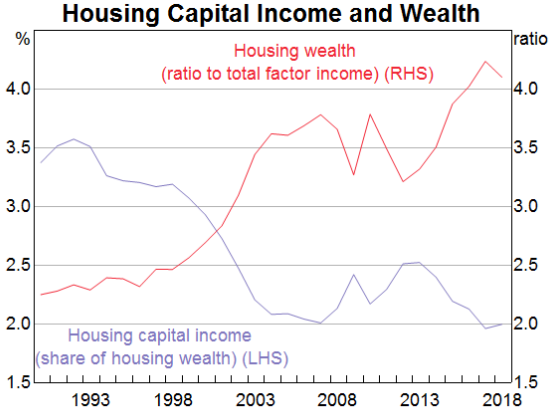
Share of total factor income




Source: ABS

## Graph 6

**Housing Capital Income and Wealth**




Sources: ABS; RBA

It is also possible to decompose the housing capital share into the relative 'price' and 'quantity' of housing consumed. About half of the long-run increase in the housing capital share is due to an increase in the relative price of housing. This has been especially important over recent decades (Graph 7). The remainder of the increase in the housing capital share is due to 'real' factors, such as an increase in the average size and quality of owned homes. These real factors were particularly important in the period between 1960 and 1990.

The trends in housing rents, prices and incomes across Australian states can also shed light on the causes of the increase in the housing capital share. Since 1990, the states that have seen the largest increases in housing prices (relative to average household income) have also seen the biggest increases in the housing capital share (Graph 8). This pattern is consistent with factors, such as financial deregulation and disinflation, acting to relax credit constraints and boost demand for owner-occupier housing over recent decades.[2]

## The financial sector

The rise in the share of financial sector capital income, and conversely the decline in the share of labour income, reflects a range of factors. Profits in the financial sector have been boosted by total factor productivity that is estimated to have grown consistently faster than in the rest of the economy (Graph 9, top panel).[3] The fast pace of productivity growth reflects, at least in part, structural changes, such as the relatively high rate of investment in information technology in the sector (Graph 9, bottom panel). Over the late 1990s, there were significant increases in bank efficiency and technological innovation, such as the widespread adoption of ATMs, which resulted in a sharp reduction in the number of bank branches.

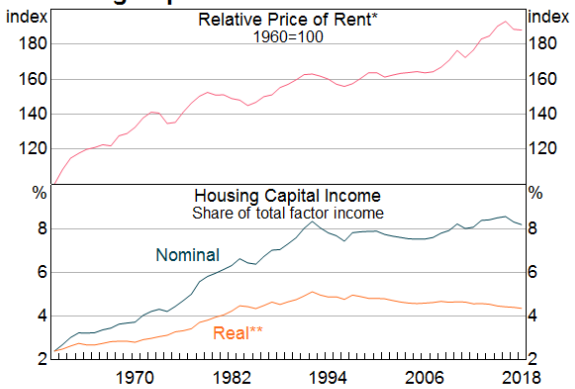
Over this period, there has also been a significant reduction in the number of branch staff, such as bank tellers. There were more people employed in finance in 1990 than there are today (Graph 10), and the share of total industry income going to finance workers has nearly halved since 1990 (ABS 2018) (Graph 11).

The post-global financial crisis decline in the financial sector labour share may also reflect the adjustments made by Australian banks to adapt their business models following the financial crisis. Part of this adjustment has involved a high rate of technology adoption. Over the past decade, job losses in finance has been concentrated in occupations that are exposed to automation, including bank tellers, office support and keyboard operators. At the same time, IT-related occupations, including programmers and IT managers, contributed about one-fifth of total employment growth in the financial sector.

While structural factors matter, the relatively large increase in financial sector output and profits is also due to the way in which financial sector output is measured. It is difficult to measure the output that financial institutions 'sell' to households and

**Graph 7**

**Housing Capital Income and Relative Prices**




* The ratio of CPI rents to the GDP deflator
** Measured in 1960 prices
Source: ABS

**Graph 8**

**Housing Capital Income and Prices by State**
1990–2018


* Each data point represents a state or territory and year
Source: ABS

businesses. The approach in the national accounts (both in Australia and overseas) is to measure financial sector output indirectly through imputed service charges known as financial intermediation services indirectly measured (FISIM).

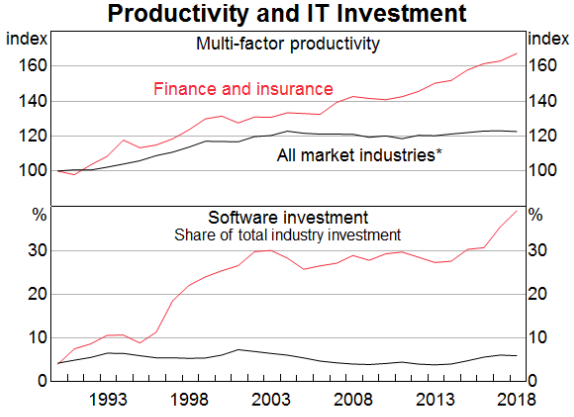
FISIM is estimated as the spread of the average loan rate (over some reference rate) multiplied by the total stock of loans less the spread of the average deposit rate (over the same reference rate) multiplied by the total stock of deposits. The reference rate is the midpoint between the average interest rate on loans and deposits. For the banks, FISIM is essentially the spread between the interest rate on loans and deposits multiplied by the size of the banks' balance sheets as measured by the stock of loans and deposits.

Because of the way it is measured, a range of factors can affect the output of the financial sector that may not be widely seen to be 'genuine' changes in the services provided to households and businesses (Zieschang 2016).[4] A key issue is the way in which the bearing of risk is measured as a service provided by banks (Haldane 2010). For example, an increase in housing prices will be associated with higher demand for mortgage debt and increase the size of bank balance sheets which, in turn, will increase the measured value of financial services. An increase in the spread between the interest rate on loans and deposits can also lead to an increase in the measured value of financial sector output on this basis. Because of this link between interest rate spreads and measured output, the official statistics indicate that financial sector profits grew very strongly through 2008/09 precisely when the global economy was entering a financial crisis (Haldane 2010).

Putting aside some of the challenges associated with measuring financial sector output, an alternative source of information is the publicly listed banks' reported profits. Published annual reports indicate that the banks' profits have risen strongly (relative to GDP) over recent decades and, in fact, by more than that recorded in the national accounts. This suggests that structural factors such as financial sector deregulation and disinflation may have contributed to the rise in the share of financial sector profits, despite also raising competition in the sector (Gizycki and Lowe 2000).[5] Furthermore, statistical analysis indicates that the trend rise in the financial sector's share of corporate profits is

**Graph 9**

**Productivity and IT Investment**



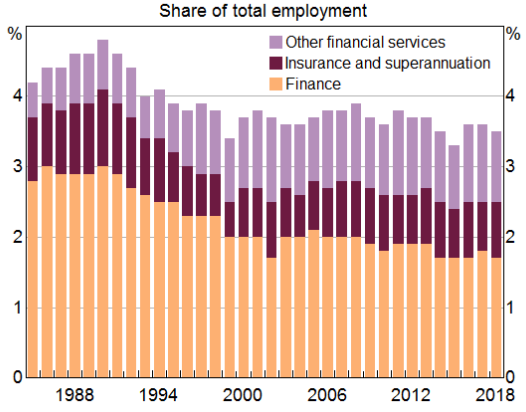

* Excludes education, health and public administration sectors

Source: ABS

**Graph 10**

**Financial Sector Employment**

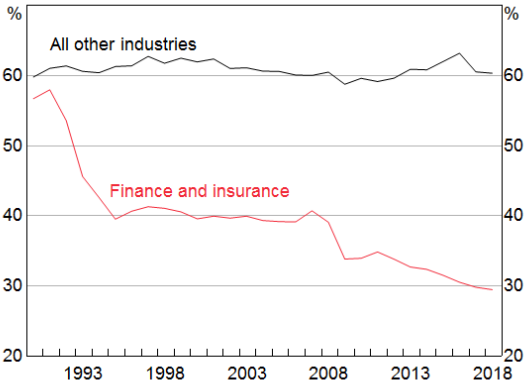
Share of total employment




Source: ABS

**Graph 11**

**Labour Share of Income***




* Compensation of employees divided by total factor income.

Source: ABS

strongly correlated with the decline in interest rates over the 1980s and 1990s.

## Other sectors

An analysis of the trends in the aggregate labour share may mask important trends occurring at a more granular level *within* industries. Excluding the financial sector, the aggregate labour share has been unchanged since 1990.[6] Stepping away from the financial sector, the labour share of income has risen in some industries and fallen in others (Graph 12). Industries that have seen the largest increases in the labour share are typically in the services sector and include rental, hiring & real estate services as well as administrative services. Apart from finance, the industries that have experienced the biggest falls in the labour share include utilities, mining and transport. Perhaps surprisingly, the long-run shift in economic activity away from manufacturing and towards services has had little effect on the aggregate labour share. This is because manufacturing and services had very similar labour shares in the early 1990s, so a shift in resources between the two sectors has had little discernible effect.

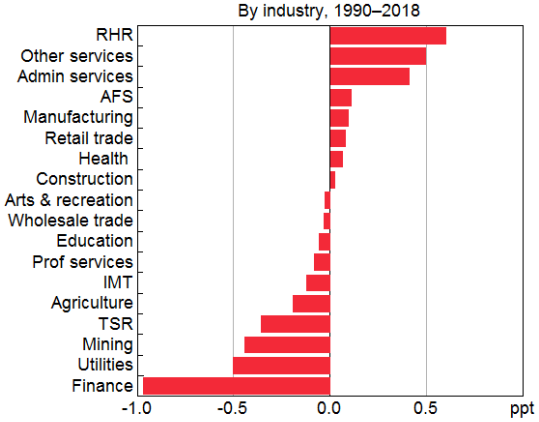
Guided by economic theory and overseas research, three leading explanations for trends in factor shares across industries include:[7]

1. **Technology:** A decrease in the cost of capital (e.g. lower relative price of investment goods or interest rates) or higher capital-augmenting technological change (e.g. automation) will lower the labour share of income.
2. **Globalisation:** A decrease in the cost of foreign labour relative to domestic labour (for example, due to the rise of Chinese manufacturing, offshoring and/or global value chains) will lower the domestic labour share.
3. **Market power:** A decrease in labour bargaining power (as firms extract greater monopoly rents in product or labour markets) will lower the labour share.

**Graph 12**

**Annual Change in Labour Share**

By industry, 1990–2018




* AFS is the accommodation and food services division. IMT is the information, media and telecommunications division, RHR is the rental, hiring and real estate division. TSR is the transport, storage and warehousing division.

Sources: ABS; RBA

### The effect of technology

Overseas research has indicated that technological advancement can affect aggregate factor shares. Greater technological progress will be associated with a lower aggregate labour share if that technical change is 'capital augmenting' in that it increases worker productivity without a corresponding increase in real wages. Examples of such technical progress could include the development of computer software that makes hardware work more efficiently.

Technological progress may have also affected the aggregate labour share by lowering the relative price of investment goods. This lowers the cost of capital for firms and provides an incentive to replace labour with capital. So the rapid advance in information and communications technology, which underpins much of the decline in the relative price of investment goods over recent decades, may have reduced the labour share.

There is strong statistical evidence of a relationship between the labour share and both total factor productivity growth and the relative price of IT goods across Australian industries (Graph 13). Regression analysis indicates that the labour share has declined by more in industries experiencing faster productivity growth and larger falls in the relative price of IT goods. These relationships hold even when controlling for a wide range of other factors, such as demand conditions in the industry.

### The effect of globalisation and the rise of Chinese imports

There is a large body of international research looking at the effect of trade, and the rise of

Chinese imports in particular, on the labour share of income. But the existing research indicates that the effect of higher import penetration on the labour share is ambiguous.

A key reason for this ambiguity is that higher import competition not only reduces employment and earnings, but also profits, which may imply a higher and not lower labour share. Over the past decade or so, there has been a decline in employment and labour costs in manufacturing industries that were most exposed to Chinese import competition, such as electronics, clothing and toys. But business profits have fallen by even more in these highly exposed industries. The net effect is that the labour share has actually risen in the most affected industries.

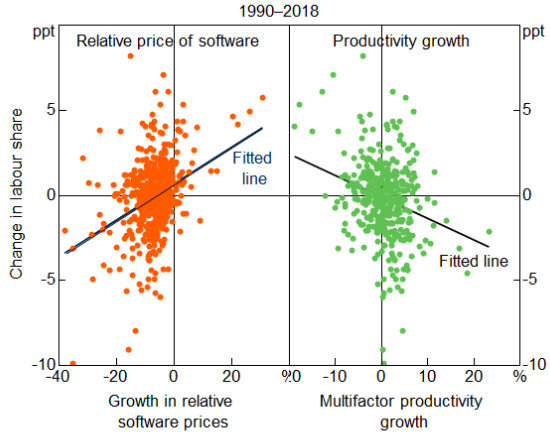
If anything, the fall in the labour share in Australian manufacturing appears to pre-date the strong increase in Chinese imports by a few decades (this is also true for many other industrialised countries where the labour share declined even more). In this earlier period, increasing globalisation was still part of the explanation, for example, by motivating the reduction in government protection, which coincided with a lower labour share in manufacturing through the 1980s and 1990s.

The rise of China has also affected the aggregate labour share indirectly through its effect on the demand for Australian resources and hence labour and capital used in the mining sector. Following the emergence of China as a global exporter in the early 2000s, the labour share in the mining sector declined because mining company profits rose more strongly than wages; but since then, the labour share has risen in the mining sector as both the terms of trade and company profits have declined.

**Graph 13**

**Determinants of Labour Share by Industry***

1990–2018




* Each data point represents a year and a 1-digit ANZSIC division

Sources: ABS; RBA

### The effect of changes in market power

An alternative explanation for the decline in the labour share in some industries is that Australian workers have lost bargaining power. This loss of bargaining power could reflect a range of factors, such as lower job protection regulation, a decline in union protection or an increase in the concentration of economic activity among a few large 'superstar' firms.

The implications of labour market deregulation for the labour share are unclear. Recent overseas research suggests that job protection deregulation reduces the labour share (Ciminelli, Duval and Furceri 2018). But other studies suggest that the labour share declined by more in *more* regulated labour and product markets (Ellis and Smith 2010).[8] While some studies find that the Australian labour market has become more flexible over time, there is no Australian evidence that directly links changes in the labour share to changes in job protection legislation.

There is some international evidence to suggest a positive but weak link between a decline in unionisation and the labour share. In Australia, there has been a broad-based decline in union membership across industries over recent decades, but recent research suggests that there is little evidence of a link to wage outcomes (Bishop and Chan 2019). This may be because actual union coverage of Australian workers has been little changed since the early 1990s; union involvement in enterprising bargaining agreement (EBA) negotiations ultimately affects all employees on an EBA, and not just union members.

An alternative explanation for the decline in the labour share is the 'superstar hypothesis' (Autor *et al* 2017). This hypothesis states that lower labour shares within industries reflect the increasing dominance of a few large firms that produce a lot of output with relatively little labour. Any shift in

economic activity towards these very productive firms could explain the observed decline in the share of income going to labour within industries.

Research using detailed firm-level data finds some evidence for higher business concentration in Australia (La Cava and Hambur 2018). Since the early 2000s, there has been a shift in economic activity towards large firms. This is true across a range of industries, but is most notable in the retail trade sector. The four largest retailers in Australia now account for around one-third of total industry sales. Statistical analysis suggests that higher business concentration across industries has lowered the aggregate labour share since the early 2000s.

## Conclusion

The aggregate labour share in Australia rose over the 1960s and early 1970s but has been on a gradual decline since then. In an accounting sense, the decline in the aggregate labour share over recent decades is largely because of a larger share of imputed income accruing to home owners, along with a lower labour share in the financial sector. The decline in the financial sector labour share, in turn, appears to be partly due to structural changes in the financial sector, such as financial deregulation, labour-saving technology adoption and high productivity growth. But it also may be affected by issues with measuring the output of the financial sector.

At the same time, the aggregate capital share has risen. This is largely explained by rising profits accruing to financial institutions and rising rents paid to land owners. In turn, higher housing rents over recent decades appear to reflect a combination of higher-quality owner-occupied housing, lower interest rates and rising housing prices. Across the rest of the economy, there have been varying trends in factor shares that are largely offsetting.

## Appendix A: How Are the Labour and Capital Shares of Income Measured?

The labour and capital shares of income measure the fractions of domestic income going to labour and capital respectively. While these concepts may be intuitive, it can be hard to measure both labour and capital income.

Labour income typically measures the compensation of employees, which includes wages and salaries (in cash and in kind) and employers' social contributions (such as payments to pension and superannuation funds). It does not include any voluntary unpaid work or payroll taxes. Capital income usually refers to both gross operating surplus (GOS) and gross mixed income (GMI). This income is derived as the excess of gross output over production costs before allowing for depreciation. GOS is the income from production by companies, while mixed income is the income from production by unincorporated businesses.[9]

The sum of compensation of employees, GOS and GMI is known as 'total factor income'. In the national accounts, total factor income is equal to GDP less net taxes on production and imports. Given that these net taxes are relatively small as a share of GDP, total factor income and GDP are typically very similar, both in levels and trends.

There are two key challenges in separating total aggregate income into capital and labour income. First is the question of how to treat the income of the self-employed. Second is the issue of whether to measure total income on a net basis after deducting depreciation.

In standard national accounts, the profits of unincorporated business owners (the self-employed) are fully included in capital income. But at least some of this income is a return to labour effort, and hence should be included in labour income.

There are a number of ways to adjust the split between labour and capital income to account for this, but none of them are fully satisfactory. The labour and capital shares can be estimated without making any adjustment, which we refer to as the 'unadjusted' factor shares. But we also consider 'adjusted' estimates that apportion some of the GMI to labour income. This is done by assuming that, in a given industry, employees and self-employed workers both earn the same average wage.[10]

The national accounts estimates also do not deduct depreciation from capital income. The amount of

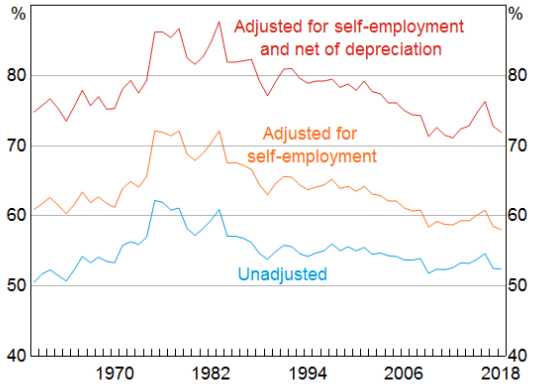
income spent on depreciation is essentially 'eaten up' in the production process and is not distributed to either labour or capital. The distinction between gross and net income could be important because measured depreciation has been rising as a share of the aggregate capital stock due to a long-term shift towards fast-depreciating capital, such as computers and software. Some overseas studies suggest that measured depreciation is important to the long-run trends in the aggregate labour share.

The adjustments for the labour income of the self-employed and the depreciation of the capital stock raises the level of the labour share and leads to a slightly larger decline over recent decades (Graph 14). This is apparent from a comparison of the published estimates (the 'unadjusted' measure) and the estimate of the labour share that adjusts for self-employment income and is net of depreciation (the 'adjusted' net measure). The steeper decline in the adjusted labour share is due to the gradual fall in the share of workers that are self-employed, particularly in the farm sector.[11] The adjustment for depreciation affects the level, but makes little difference to the long-run trend.

The adjustments for the self-employed and depreciation also do not affect the story regarding the role of finance. There is still a clear decline in the labour share for the financial sector and, outside of finance, the labour share has been trending sideways since 1990.

**Graph 14**

**Labour Share of Income***




* Compensation of employees divided by total factor income

Sources: ABS; RBA

## Footnotes

[*] The author works in Economic Research Department.

[1] This is discussed in more detail in Appendix A. Gross mixed income has been on a trend decline since the 1960s because of a decline in the farm sector's share of the economy and a declining share of self-employed workers.

[2] The increase in the share of total household income spent on housing may also be due to a shift in preferences to housing. But, if this were the case, we should observe an increase in the share of income spent on both owned and rented housing. Instead, we observe a strong increase in housing prices over recent decades alongside an even larger increase in the demand for owner-occupier housing services. This is more consistent with the rise in the housing share being due to a long-run decline in credit constraints and an increase in demand for better housing in Australia.

[3] The growth in financial sector output has been partly driven by the growth in output of insurance companies and superannuation funds. But detailed ABS data indicate that banking is the main source of output growth within the sector.

[4] Problems in measuring output are a feature of other services industries too, such as education and health. As a result, statistical authorities often do not even attempt to measure productivity in these industries.

[5] Reserve Bank staff research indicates that there were competing factors affecting banking profits during the 1980s and 1990s that were potentially offsetting. Lower interest rates and higher productivity were lifting bank profits, while higher competition in the mortgage market was lowering bank profits through lower loan spreads. This research suggests that the interest rate and productivity effects outweighed the competition effects, so profits increased.

[6] This is true regardless of whether the labour share is adjusted for depreciation and self-employment.

[7] These explanations for the changes in factor shares are not independent of each other. For instance, a decrease in the cost of investment goods may have boosted profit margins for large companies and given them more power to bargain with workers. Labour bargaining power may also decline because of technological change, for example, because faster rates of innovation make current skills obsolete more quickly.

[8] This is because faster rates of technological innovation can lead to higher rates of labour churn; when hiring and firing costs are high (and hence the labour market is more

rigid), this can reduce labour's bargaining power and thus income share.

[9] Both GOS and GMI are measured before deducting any explicit or implicit interest charges, rent or other property incomes payable on the financial assets, land or other natural resources required to carry on production.

[10] A common alternative approach is to assume that two-thirds of GMI is attributable to labour income. This rule of thumb is reasonable in some contexts, but is likely to be flawed for certain industries.

[11] The decline in self-employment is at least partly due to the increasing tax incentive to incorporation.

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# Wealth and Consumption

Diego May, Gabriela Nodari and Daniel Rees[*]

Photo: Witthaya Prasongsin – Getty Images


## Abstract

Do households consume more when their wealth increases? Our research identifies a positive and stable relationship between household wealth and consumption, largely reflecting changes in spending on motor vehicles, durable goods and other discretionary spending. Increases in household wealth supported household spending between 2013 and 2017, when growth in disposable income was weak. Similarly, declines in household wealth typically weigh on consumption. However, a decline in household wealth is less likely to coincide with weaker consumption growth if it occurs at a time when the labour market is strong and household income growth is firm.


## Introduction

Over the past decade, Australian households' wealth has changed significantly. An important consideration in assessing the macroeconomic outlook is how these changes in wealth affect household consumption. Because consumption accounts for a large share of aggregate demand, the consumption response to changes in wealth can also affect economic activity more broadly.

In this article we revisit the relationship between household wealth and consumption. We first document recent trends in the two variables. We then provide updated estimates of the empirical relationship between consumption and wealth, and compare these estimates to other studies in Australia and overseas. Finally, we use the RBA's macroeconomic model, MARTIN, to explore the broader macroeconomic consequences of changes in household wealth.

## Recent Trends in Household Wealth and Consumption

Household wealth is measured as the household sector's assets minus its liabilities. Household assets comprise financial assets, which include bank deposits, direct equity holdings and superannuation balances, and non-financial assets, which include housing and durable items such as motor vehicles. The household sector's liabilities are

largely made up of residential mortgages, but also include items such as credit card debt and personal loans.

Household wealth has grown much faster than household income over recent decades (Graph 1). This is largely because of increases in the value of household assets, which have grown from around six times household disposable income in the early 1990s to around eleven times currently. Household liabilities have also grown faster than household income, although by less than household assets. The rate of growth of household wealth varies greatly from year to year and on several occasions, such as during the Global Financial Crisis, the value of household wealth has declined. After increasing by around 60 per cent between 2013 and 2017, growth in household wealth has slowed recently because of falling housing prices.

Household consumption growth is much more stable than wealth from year to year. After averaging around 5 per cent in year-ended terms between the early 1990s and mid 2000s, the pace of household consumption growth has eased to a bit above 2½ per cent in recent years (Graph 2). Modest growth in consumption alongside fast growth in wealth could be taken to mean that changes in wealth have little effect on consumption. In making that judgement, however, it is important to account for other factors that influence consumption growth, such as household income. As the top panel of Graph 2 shows, consumption and income tend to grow at similar rates over time, although income growth is more volatile. Between 2013 and 2017, when household wealth was increasing rapidly, household income growth was low.

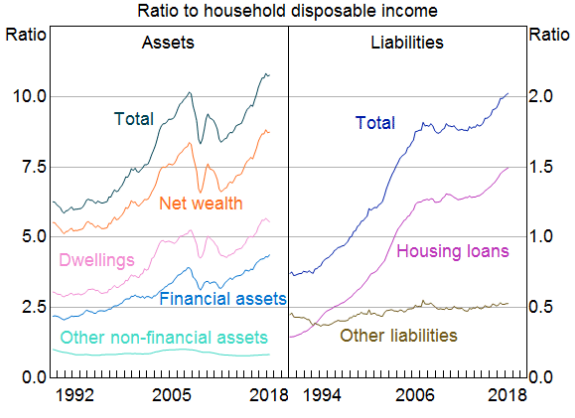
The difference between household consumption and income is reflected in the household saving ratio.[1] Changes in the saving ratio point to a positive relationship between household wealth and consumption. When household wealth grows strongly, consumption typically grows faster than household income and the saving ratio tends to decline. For example, between the 1990s and early 2000s, and again between 2013 and 2017, when household wealth was increasing rapidly, the household saving ratio fell. The opposite typically occurs when household wealth falls. For instance, during the Global Financial Crisis, when household wealth declined, the saving ratio increased (although this had already started some years earlier for other reasons).

The patterns highlighted in Graph 2 are consistent with the idea that strong growth in household wealth supported consumption growth in recent years, while, at the same time, weak growth in household income meant that consumption grew more slowly than it did in the 1990s and early 2000s. These relationships may not be causal, however, as other factors influencing both wealth and consumption may drive the correlation between the two variables. In addition, aggregate trends do not tell us how large the effects of changes in household wealth on consumption are. We address these issues in the analysis below by studying the

**Graph 1**

**Household Assets and Liabilities**

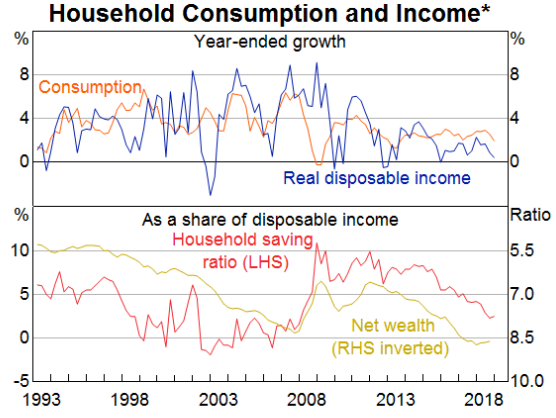
Ratio to household disposable income




Sources: ABS; RBA

**Graph 2**

**Household Consumption and Income***




* Disposable income is after tax and interest payments; saving ratio is net of depreciation

Sources: ABS; RBA

## Box: What Are Wealth Effects?

The response of consumption to unexpected changes in wealth is referred to as the 'wealth effect'. Wealth effects can occur for a number of reasons. 'Traditional' wealth effects occur because, when wealth unexpectedly increases, households have more resources to support consumption over their lifetime. In simple models, where households face no transaction costs or collateral constraints on borrowing, the consumption response to a change in wealth will depend only on how much households want to smooth consumption over time and how persistent they expect the change in wealth to be (Friedman (1957), Ando and Modigliani (1963)).

In reality, the size of traditional wealth effects is likely to vary between different sources of wealth. One reason for this is because of differences in the cost of buying and selling different types of assets (Kaplan and Violante 2014). For example, it is easier to consume gains in the value of directly held equities than it is to consume gains in the value of housing or superannuation accounts. Traditional wealth effects from housing wealth could also be smaller than from other sources of wealth because housing wealth often increases at the same time as it becomes more expensive to rent or buy a home (Sinai and Souleles (2005), Buiter (2008)). However, aggregate wealth effects from housing may still exist if home owners, who see an immediate increase in their wealth, adjust their consumption by more than future home buyers and renters, for whom the increased costs of living lie in the distant future (Berger *et al* 2018).

Changes in wealth may also be associated with changes in consumption for other reasons. For example, an increase in household wealth may make it easier for households to borrow in order to smooth cyclical variations in their income (Campbell and Cocco (2007), Iacoviello and Neri (2010)). Expectations of improved economic conditions could lead to a rise in the value of shares and other financial assets, while at the same time encouraging households to consume more in anticipation of higher income in the future. Financial liberalisation in Australia increased the borrowing capacity of consumers, which may have also led to an increase in consumption and asset prices. In addition, rising housing prices are often associated with a larger number of housing transactions. Because households typically purchase housing-related goods and services in the months before and after a home purchase, an increase in housing transactions is likely to be associated with increased consumption (Benmelech, Guren and Melzer 2017).

Although it is difficult to isolate the precise mechanisms through which wealth affects consumption, the observed relationship between consumption and wealth is reliable and consistent. We can therefore use it to help form a view about the state of the economy.

relationship between household wealth and consumption in each Australian state.

## How Much Does Consumption Respond to Changes in Wealth?

In this section, we first estimate the response of consumption to changes in financial and non-financial wealth. We then discuss which components of consumption respond most to changes in household wealth and compare our estimates to others in the literature.

### Updated estimates for Australia

At an aggregate level, components of wealth often move together, which makes it hard to disentangle their individual effects on consumption. We follow the approach described in Case, Quigley and Shiller (2013) and Dvornak and Kohler (2007), and estimate the relationship between consumption, stock market wealth and housing wealth at a state level.[2] Each state's housing market is geographically distinct and is affected by region-specific shocks as well as national macroeconomic fluctuations (Graph 3). In contrast, movements in stock market wealth are more synchronised across the states

because the value of a household's financial assets is typically unaffected by its state of residence. This geographical variability helps us to distinguish between the effects of changes in stock market and housing wealth on consumption.

Our baseline model estimates the relationship between consumption, stock market wealth, housing wealth and household income in each state in a given quarter (see Appendix A for details). We control for income because factors that increase income growth are also likely to raise household wealth and consumption. We estimate the model using data in log levels. This provides us with estimates of the long-run elasticities – the percentage change in consumption following a permanent one per cent change in wealth or income.

Graph 4 shows our main results. The left panel shows the estimated elasticity of consumption with respect to housing wealth, while the right panel shows the estimated elasticity with respect to stock market wealth. In each panel, the first dot shows the point estimate – or most likely value – of the elasticity over our full sample, which spans 1988Q3 to 2018Q3. The vertical lines shows 95 per cent confidence intervals, which convey a sense of the uncertainty around the point estimates. In each panel, the second and third dots show results when we split the sample in two and separately analyse each sub-sample.[3] This gives us a sense of whether wealth effects have changed over time.

The results from the full sample estimation suggest that a one per cent increase in the value of housing wealth will lead to a 0.16 per cent increase in the long-run level of consumption, while a one per cent increase in stock market wealth will raise consumption by 0.12 per cent.[4] The estimated coefficients do not differ substantially between the two sub-samples, which suggests that wealth effects are as large today as they were in the past.

Our baseline results show the relationship between the *levels* of consumption, income and wealth. However, estimates of relationships in levels can be biased if the model specification does not control for other long-run trends that may affect both wealth and consumption. To address this issue, we also estimate the relationship between the *growth* rate of consumption and those of income and wealth. As well as being more robust to omitted long-run trends, this exercise gives us a sense of how quickly consumption responds to changes in wealth. However, it may underestimate the total response if consumption adjusts slowly to changes in wealth or income.

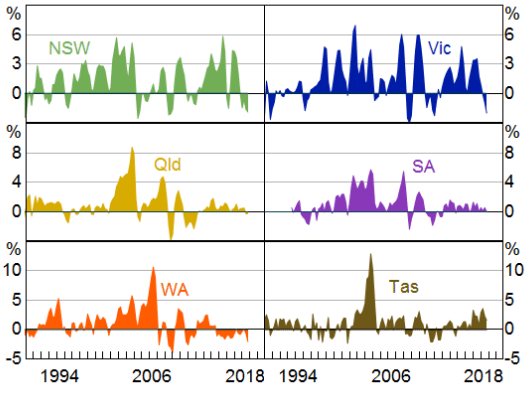
Graph 5 shows the results of this approach. The graph summarises the response of consumption to each component of wealth after two quarters. As before, in each graph the dots represent the point estimates for each regression, while the vertical lines show 95 per cent confidence intervals.

The results indicate that consumption responds quickly to changes in housing wealth. A one per

**Graph 3**

**Housing Price Growth by State**

Quarterly percentage change

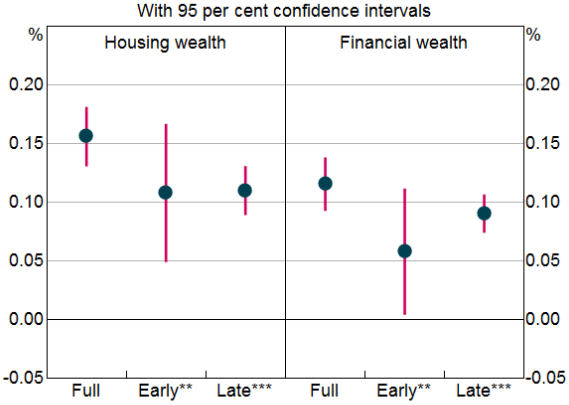



Sources: CoreLogic; RBA

**Graph 4**

**Long Run Wealth Effects***

With 95 per cent confidence intervals




* Eventual effect of a 1 per cent increase in per capita wealth

** Covers September 1988 through to June 2001

*** Covers September 2001 through to June 2018

Source: Authors' calculations

cent increase in housing wealth raises consumption by 0.08 per cent over two quarters, representing around half of the long-run response shown in Graph 4. As before, the estimates are consistent across early and late sub-samples. In contrast, the response to changes in stock market wealth is small and statistically insignificant. Although our baseline results in Graph 4 suggest that changes in stock market wealth will ultimately affect consumption, those effects do not tend to occur in the first six months after the change.[5]

## Which components of consumption respond most?

We re-estimate the model used in Graph 5 using more disaggregated consumption data to determine which *components* of consumption respond most to changes in housing wealth.[6] Graph 6 shows the results of this exercise. Once again, the dots show the estimated elasticity of each component of consumption with respect to housing wealth, while the vertical lines show 95 per cent confidence intervals around these estimates. To give an indication of how important each component of consumption is to the aggregate effect, the bars show the share of each component in aggregate consumption.

The components of consumption that respond most to changes in wealth are typically durable goods, such as motor vehicles and household furnishings. The responsiveness of motor vehicles is particularly large – a one per cent increase in housing wealth raises expenditure on motor vehicles by 0.6 per cent.[7] Many of the other expenditure categories that show a large response are discretionary items, such as recreation. In contrast, expenditure on less discretionary items – such as food, rent and education – appears to be insensitive to changes in housing wealth. Several of these components account for a large share of aggregate consumption expenditure. This helps to reconcile the large elasticities for categories like vehicle sales and home furnishings with the smaller aggregate elasticities reported in Graphs 4 and 5.

## Elasticities or marginal propensities to consume?

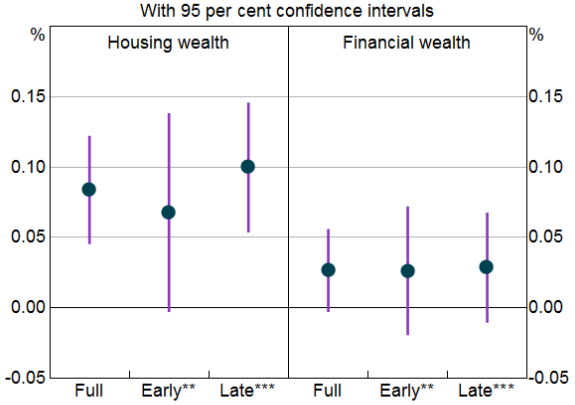
So far, we have described wealth effects in terms of elasticities – the *percentage* change in consumption following a one *per cent* change in each component of wealth. An alternative way of expressing wealth effects is in terms of marginal propensities to consume, or MPCs. An MPC describes the *dollar* change in consumption to a *one dollar* change in wealth. We can convert our results into MPCs by multiplying the estimated elasticities in Graph 4 by the average ratio of consumption to housing wealth or stock market wealth over each sample, using the formula:

$$MPC = \frac{\%\text{ change in consumption}}{\%\text{ change in wealth}} \times \left(\frac{\text{Average level of consumption in sample}}{\text{Average level of wealth in sample}}\right)$$

**Graph 5**

**Short Run Wealth Effects***

With 95 per cent confidence intervals

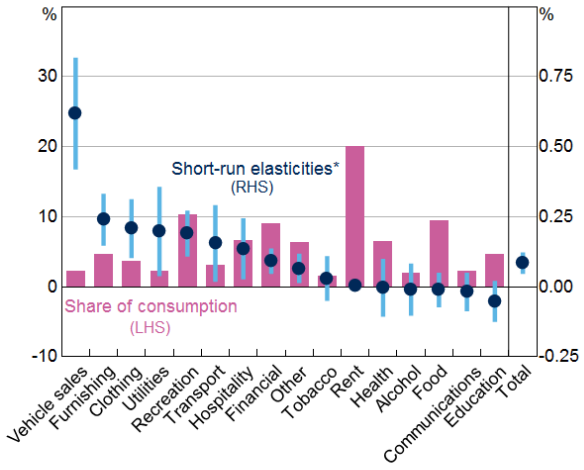



* Effect of a 1 per cent increase in per capita wealth over two quarters
** Covers September 1988 through to June 2001
*** Covers September 2001 through to June 2018
Source: Authors' calculations

**Graph 6**

**Wealth Effects by Consumption Category**

With 95% confidence intervals




* Effects of a 1 per cent increase in per capita housing wealth over two quarters
Source: Authors' Calculations

Although the estimated elasticities for changes in stock market wealth and housing wealth are similar, the estimated MPC for stock market wealth is much larger: a one dollar increase in stock market wealth raises annual consumption by about 15 cents, whereas a one dollar increase in housing wealth raises annual consumption by about 3 cents. When we repeat this exercise for our two sub-periods, we find that the MPC out of housing wealth is lower in the late sample than it was in the early sample.

We can reconcile stable elasticities with declining MPCs by the fact that the value of housing wealth has increased much faster than consumption over recent decades. The estimates in Graph 4 show that the *percentage* change in consumption following a given *percentage* change in housing wealth has been stable over time. However, because the value of housing wealth is much larger today than it was in the past, a one dollar increase in housing wealth represents a much smaller percentage change in wealth today. Aggregate consumption has also grown over this time, but not by as much. Hence, the estimated MPC out of housing wealth has declined. The fact that the value of housing wealth exceeds the value of stock market wealth also explains why the estimated MPC out of stock market wealth is larger than the MPC out of housing wealth, even though the two elasticities are similar.

Whether an elasticity or an MPC is the most appropriate measure of how wealth affects consumption depends on the question one is asking. When assessing the macroeconomic consequences of changes in wealth, one is generally interested in the percentage change in aggregate consumption following a percentage change in a component of wealth. For that purpose, elasticity estimates are most appropriate.

## How do these results compare to other estimates?

Other researchers, both in Australia and overseas, have studied how much consumption responds to changes in wealth. Comparing our results to others in the literature, many of which were constructed using different data sources and methodologies to our estimates, provides another indication of the uncertainty surrounding the size of wealth effects. Because more recent studies have access to more data than earlier studies, this exercise can also give a sense of whether the estimates have changed over time.

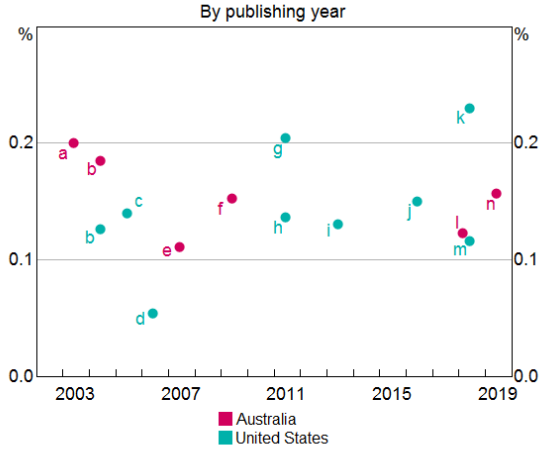
Graph 7 compares estimated elasticities of consumption with respect to housing wealth for Australia and the US.[8] Each dot represents a study and is placed in order of its publication date. Most studies point to an elasticity between 0.1 and 0.2, which is consistent with our results in Graphs 4 and 5. Differences in housing market institutions and housing price developments between the US and Australia do not seem to cause systematic differences in the estimated elasticities between the two countries. Moreover, the similarity between earlier and more recent estimates suggests that the elasticities have been stable over time.

If we reproduce Graph 7 using estimated MPCs rather than elasticities, we observe much greater variation between results, as well as persistent differences across countries and time. In general, studies that work with US data report larger MPCs out of housing wealth than Australian studies. This reflects the fact that the value of housing wealth is larger relative to consumption expenditure in Australia than it is in the US. MPC estimates also appear to have been declining over time. We view the consistency in elasticity estimates across studies and wide variation in MPC estimates as a further reason why one should rely on elasticity estimates to analyse the macroeconomic consequences of changes in household wealth.[9]

**Graph 7**

**Estimated Housing Wealth Effects***

By publishing year




* Eventual effect of a 1 per cent increase in housing wealth

Sources: Authors' calculations; Various Authors

## Macroeconomic Consequences of Recent Changes in Household Wealth

We use MARTIN, the RBA's macroeconometric model, to assess the macroeconomic implications of changes in household wealth.[10] We first examine the extent to which increases in household wealth between 2013 and 2017 supported consumption growth. We then estimate the potential consequences of a prolonged fall in housing prices.

In MARTIN, the long-run level of consumption is determined by household disposable income, net wealth and the level of real interest rates. In the short run, changes in income, wealth and the unemployment rate as well as the economy's long-run trend growth rate also influence consumption. The model's estimate of the long-run elasticity of consumption with respect to net wealth is 0.17, which is consistent with the estimates in Graph 4.

To explore how much household wealth supported consumption in recent years, we simulate the model so that it exactly replicates the driving forces, or 'shocks', that influenced the Australian economy over the past 20 years for all variables except for net wealth, which we constrain to grow at the same rate as household disposable income from 2013 to 2017. Year-ended growth in net wealth is about 5 percentage points lower on average in the scenario than it was in the data (Graph 8). By comparing the values of macroeconomic variables in the scenario to their values in the data, we can infer how much the growth in net wealth contributed to macroeconomic outcomes.

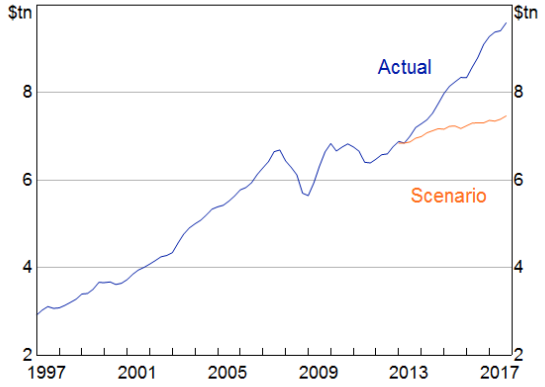
We identify the implications of lower wealth for household consumption in two steps. In the first, we hold all variables, except for consumption and wealth, at their actual values. This reveals the *direct effects* of lower wealth on consumption. Average year-ended consumption growth is about ¾ of a percentage point lower in the scenario (Graph 9). With income unchanged, this implies a household saving ratio of about 6.5 per cent at the end of 2017 as opposed to its actual value of 4.1 per cent.

In the second step, we allow the rest of the model to respond. This accounts for *feedback effects* from other variables and reveals the full effect of lower wealth on consumption according to the MARTIN model. As Graph 9 shows, the direct effects initially dominate, but over time the indirect effects become important. By the end of 2017 they account for around a quarter of the 1.2 percentage point decrease in year-ended consumption growth. The household saving ratio is also lower than in the case with only direct effects, because household income falls by more than consumption.

Our second exercise examines the effects of a prolonged fall in housing prices. Specifically, we consider a 10 per cent fall in national housing prices that persists for five years. It should be noted that such a prolonged downturn is outside the usual range of experience in Australia, and therefore the estimated relationships in MARTIN, which capture the average of past experience, might be less

**Graph 8**

**Real Household Net Wealth***

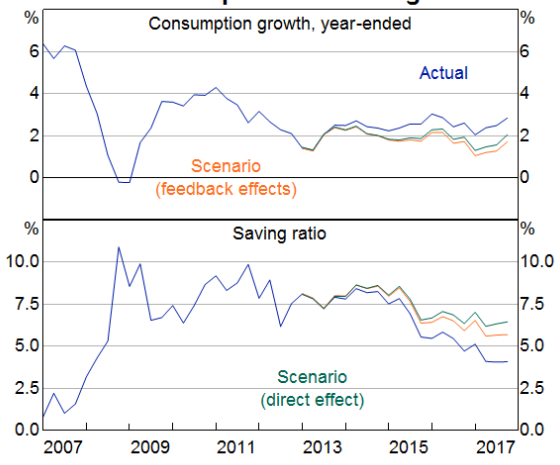



* Deflated by the consumption deflator

Source: ABS; Authors' calculations

**Graph 9**

**Consumption and Savings**




Source: ABS; Authors' calculations

reliable. We first discuss results assuming that the cash rate remains fixed at its initial level, which allows us to isolate the effects of lower housing prices independently of other economic developments. This turns out to have a modest contractionary effect on economic activity. We then show how the results change when we allow the cash rate to respond, the arguments for which would be stronger if the decline in housing prices were to coincide with a broader deterioration in economic conditions. Graphs 10 and 11 show the results of the scenarios, with all variables expressed as deviations from a baseline where housing prices are stable.

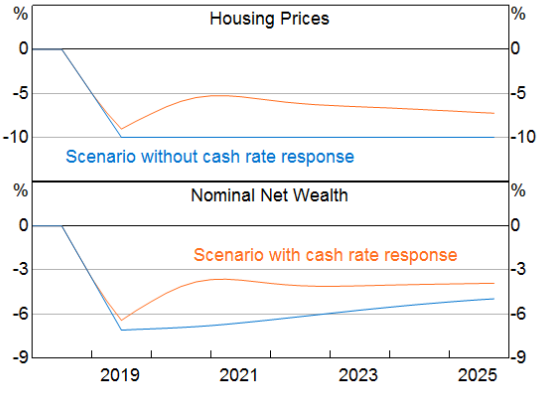
A fall in housing prices affects the economy in several ways. As well as lowering net wealth and household consumption, lower housing prices also reduce incentives to build new housing. The decline in household consumption and residential construction activity reduce aggregate demand, which leads to lower business investment. The net effect of these developments is that economic activity expands more slowly than would have been the case if housing prices did not fall; the *level* of GDP is 1.2 per cent below its baseline level after three years and remains low for some time. The decline in economic activity lowers the demand for labour and causes an increase in the unemployment rate, which rises by 0.4 percentage points, assuming that the estimated relationships in the model are correct (Graph 11). To put the results in context, this increase in the unemployment rate is around one quarter of the rise in the trend unemployment rate that occurred in 2008–09 during the Global Financial Crisis.

Changes in housing prices rarely occur in isolation. The net effect of a fall in housing prices that occurs when broader macroeconomic conditions are positive – for example, if the unemployment rate is falling and the global economy is expanding at a solid pace – might be only a small slowdown in the pace of economic activity. However, if the same fall in housing prices occurred alongside a broader slowdown in economic conditions, this could add to any case for an easing of monetary policy coming from the broader slowdown. As an example of a monetary policy response that could largely offset the effect of lower housing prices, we consider a hypothetical cash rate profile illustrated with the orange line in Graph 11.

The macroeconomic consequences of falling housing prices are smaller and less sustained when monetary policy responds. In this case, the decline in the level of GDP is about half as large as when the cash rate is constant, and GDP returns to its baseline level after two years. The increase in the unemployment rate is also much smaller and less persistent.

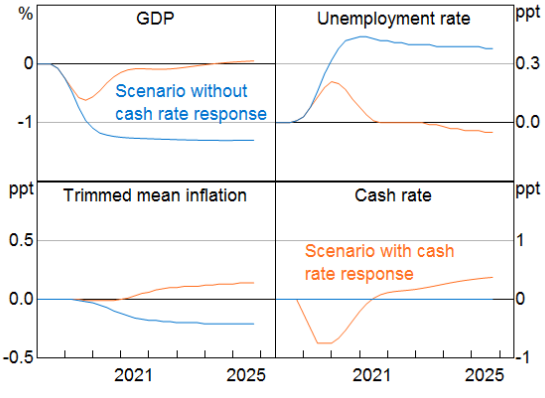
With lower interest rates, housing prices do not fall by as much as they do when the cash rate is held constant. Nonetheless, housing prices remain below their baseline level. This is because monetary policy targets inflation and full employment, not asset prices. Lower interest rates stimulate the economy in part through the housing market. But other mechanisms, such as easier cash flow

**Graph 10**
**Scenario**
Deviation from baseline




Source: Authors' calculations

**Graph 11**
**Macroeconomic Responses**
Deviation from baseline




Source: Authors' calculations

constraints on households and a depreciation of the exchange rate, are also important. As a result, monetary policy can stabilise economic activity and inflation without necessarily returning housing prices to their initial level.

More generally, the exact size and timing of any change in interest rates in response to a fall in housing prices would depend on a range of factors, including the other forces affecting the economy. As mentioned previously, a fall in housing prices would have fewer negative consequences if it was offset by other developments which meant that the overall economic outlook was positive and the unemployment rate was falling. Also relevant are the expectations of households and businesses: if they continue to expect strong growth and inflation in line with the target in the longer term, despite the fall in housing prices, interest rates may not need to be reduced as much to offset the effect of that price fall. Although MARTIN cannot capture these features, they may be relevant in the Australian context.

## Conclusion

When wealth increases, Australian households consume more. Spending on durable goods, like motor vehicles, and discretionary goods, such as recreation, appears to be most responsive to changes in household wealth, although many categories of consumption expenditure appear to grow more quickly when wealth increases. The positive relationship between consumption and wealth is particularly robust for housing wealth and has been stable over time.

Our simulation results suggest that strong growth in household wealth played a meaningful role in supporting consumption growth between 2013 and 2017. However, wealth is only one of the factors determining aggregate consumption growth. In recent years, rapid increases in household wealth have coincided with comparatively modest growth in household consumption, because income growth was weak. Similarly, declines in household wealth may not correspond to lower consumption growth if other factors, such as strong employment and income growth and accommodative monetary policy, are providing support.

## Appendix A: Estimating the Relationship between Consumption and Wealth

Our baseline regression to assess the relationship between consumption and wealth is:

$$\log C_{it} = \alpha_i + \beta \log S_{i,\,t} + \gamma \log H_{i,\,t} + \phi \log Y_{i,\,t} + \varepsilon_{i,\,t} \quad \text{A1}$$

Where $C_{i,\,t}$ is household consumption in state $i$ at time $t$, $S_{i,\,t}$ is stock market wealth, $H_{i,\,t}$ is housing wealth and $Y_{i,\,t}$ is compensation of employees, which accounts for the bulk of household income. All variables are in real per capita terms. We include state-level fixed effects to control for factors like the age structure of the population, which might cause some states to consume more than others relative to their income and wealth. Fixed effects will also control for systematic error in the measurement of the dependent variables. We assume, however, that the proportional response of consumption to *changes* in income or wealth is the same in each state.[11]

Table A1 shows our main results. The first three columns show the estimated elasticities of consumption with respect to stock market wealth, housing wealth and income over different sample periods. The first column shows estimates over the full sample, which spans 1988Q3 to 2018Q2. The second and third columns show results when we split the sample in two and separately analyse each sub-sample.

The results from the full sample estimation suggest that a one per cent increase in the value of equity or housing wealth will lead to a 0.12–0.16 per cent increase in the long-run level of consumption. The estimated coefficients on wealth over the two sub-samples are similar, suggesting that wealth effects are as large today as they were in the past.

The last column in Table A1 shows the implied estimates of the marginal propensity to consume out of income and wealth from our full sample estimates. We derive these by multiplying our full sample elasticities by the average ratio of annual consumption to stock market wealth, housing wealth or labour income over our full sample.

## Table A1: Effects of Wealth on Consumption

| Variable | Elasticity | | | Marginal Propensity to Consume |
|---|---|---|---|---|
| | Full sample 1988Q3–2018Q2 | Early sample 1988Q3–2001Q2 | Late sample 2001Q3–2018Q2 | Full sample 1988Q3–2018Q2 |
| Stock market wealth | 0.12** (0.01) | 0.06 (0.03) | 0.09** (0.02) | 15 |
| Housing wealth | 0.16** (0.01) | 0.11** (0.03) | 0.11** (0.01) | 3 |
| Disposable income | 0.45** (0.01) | 0.84** (0.06) | 0.50** (0.02) | 54 |
| No. Observations | 672 | 264 | 408 | |
| No. Groups | 6 | 6 | 6 | |

* and ** denote significance at the 10 and 5 per cent level. Standard errors are in parentheses.
Sources: Authors' calculations.

## Table A2: Short-run Effects of Income and Wealth on Consumption

| | **Full Sample**[(a)] 1988Q3–2018Q2 |
|---|---|
| Stock market wealth ($\beta_0 + \beta_1$) | 0.03 |
| Housing wealth ($\gamma_0 + \gamma_1$) | 0.08** |
| Income ($\phi_0 + \phi_1$) | 0.10** |
| Lagged consumption ($\delta_1$) | 0.06 |
| State fixed effects | Y |

(a) Estimate of the sum of the coefficients. ** denotes significance at the 5 per cent level using a Wald test for joint significance.

Sources: Authors' calculations

As an alternative to our levels specification, we also estimate the relationship between the *growth rates* of consumption, income and wealth:

$$\Delta \log C_{it} = \alpha_i + \sum_{j=0}^{J} \left( \beta_j \Delta \log S_{i,t-j} + \gamma_j \Delta \log H_{i,t-j} + \phi_j \Delta \log Y_{i,t-j} \right) + \sum_{k=1}^{K} \left( \delta_j \Delta \log C_{i,t-k} \right) + \varepsilon_{i,t} \quad \text{A2}$$

Where $\Delta \log C_{i,t}$ is the log change in consumption (approximately equal to its growth rate), which is regressed against the current and previous growth rates of income and wealth, in addition to state fixed effects.[12] As well as being more robust to omitted long-run trends, this exercise gives us a sense of how quickly consumption responds to changes in wealth. However, it may underestimate the total response if consumption adjusts slowly to changes in wealth or income.

Table A2 shows the results of this approach. To ease interpretation, we have summed the response of consumption to each of the variables after two quarters.

In addition to the specifications described above, we have also conducted a number of additional robustness checks on our baseline estimation results. For the first two checks, we included additional explanatory variables – housing turnover and household credit – in addition to wealth and income. For the third robustness check, we included time fixed effects. This controls for omitted variables, like the stance of monetary policy, that are common to all states in a given time period.

The specific models that we estimated were:

$$\Delta \log C_{it} = \alpha_i + \sum_{j=0}^{J} \left( \beta_j \Delta \log S_{i,t-j} + \gamma_j \Delta \log H_{i,t-j} + \phi_j \Delta \log Y_{i,t-j} + \tau_j TR_{i,t-j} \right) + \sum_{k=1}^{K} \left( \delta_j \Delta \log C_{i,t-k} \right) + \varepsilon_{i,t} \quad \text{A3}$$

$$\Delta \log C_{it} = \alpha_i + \sum_{j=0}^{J} \left( \beta_j \Delta \log S_{i,t-j} + \gamma_j \Delta \log H_{i,t-j} + \phi_j \Delta \log Y_{i,t-j} + \kappa_j HC_{i,t-j} \right) + \sum_{k=1}^{K} \left( \delta_j \Delta \log C_{i,t-k} \right) + \varepsilon_{i,t} \quad \text{A4}$$

$$\Delta \log C_{it} = \alpha_i + \xi_t + \sum_{j=0}^{J} \left( + \gamma_j \Delta \log H_{i,t-j} + \phi_j \Delta \log Y_{i,t-j} \right) + \sum_{k=1}^{K} \left( \delta_j \Delta \log C_{i,t-k} \right) + \varepsilon_{i,t} \quad \text{A5}$$

Where in addition to the variables described above, $TR_{i,t}$ is the housing turnover rate, $HC_{i,t}$ is housing credit and $\xi_t$ is a time fixed effect. Because state-level dwelling turnover and housing credit data is not available before 2004, we estimate Equations

**Table A3: Tests for Omitted Variables**

| | (1) Dwelling turnover 2004Q1–2017Q4 | (2) Housing Credit 2004Q1–2017Q4 | (3) Time Fixed Effects 1988Q3–2018Q2 |
|---|---|---|---|
| Stock market wealth ($\beta_0 + \beta_1$) | 0.02 | 0.01 | na |
| Housing wealth ($\gamma_0 + \gamma_1$) | 0.07** | 0.09** | 0.07** |
| Income ($\phi_0 + \phi_1$) | 0.17** | 0.15** | 0.02 |
| Lagged consumption ($\delta_1$) | −0.03 | −0.05 | 0.03 |
| Dwelling turnover rate[(b)] ($\tau_0 + \tau_1$) | 0.60* | | |
| Housing credit ($\kappa_0 + \kappa_1$) | | 0.16** | |
| State fixed effects | Y | Y | Y |
| Time fixed effects | | | Y |

(a) Estimate of the sum of the coefficients. ** and * denote significance at the 5 per cent and 10 per cent level respectively using a Wald test for joint significance.

(b) Calculated as the number of dwellings sold, in levels, as a share of state dwelling stock. The average value is 0.013, or 1.3 per cent. All other variables are used in log differences and real per capita terms.

Sources: Authors' calculations

A3 and A4 on a restricted sample. We omitted stock market wealth from Equation A5 because of the lack of variation in changes in stock market wealth across states. Table A3 shows the results of these exercises.

The results in Table A3 indicate that both turnover and credit tend to have a positive effect on consumption, which suggests that they can account for part of the transmission of changes in household wealth to consumption. However, in both cases, the coefficient on housing wealth remains largely unchanged from our baseline results, after one accounts for the restricted sample. When we include time fixed effects, the estimated response of consumption to changes in housing wealth is marginally smaller than in our baseline specification, although it remains statistically significant. Overall, our results are robust to these alternative specifications.

## Footnotes

[*] The authors work in the Economic Analysis Department and would like to thank Penelope Smith, Tom Rosewall and Peter Tulip for their comments and suggestions.

[1] As well as consumption and income, the household saving ratio also takes into account consumption of fixed capital, which is a measure of depreciation on households' assets. However, because this latter component tends to be fairly stable from year to year, changes in the household saving ratio are driven almost entirely by growth in consumption and income.

[2] We focus on stock market wealth and housing wealth because data are readily available and these components account for most short-run changes in household wealth.

[3] Our two samples span 1988–2001 and 2001–18. The early sample allows us to compare our results to those published in Dvornak and Kohler (2007), which is the standard reference for wealth effects in Australia. Splitting the sample in 2004, which makes the early and late samples of equal length, generates similar results.

[4] These elasticities show the effect of a one per cent change in gross housing or stock market wealth. Elasticities with respect to a change in net housing or stock market wealth are around 20 per cent smaller.

[5] It could be that because stock prices exhibit a large amount of short-run volatility, households wait to see how persistent changes are before adjusting their consumption to changes in the value of their stock market wealth. However, in light of the results in Graph 5, we can be less confident about the consumption responses to changes in financial wealth, particularly in the short run, than we are about the consumption responses to non-financial wealth.

[6] We focus on housing wealth because it is the largest component of household wealth.

[7] This elasticity is consistent with the evidence presented in Gillitzer and Wang (2016), who report an elasticity of motor vehicle *registrations* with respect to housing prices

of 0.5 per cent, although their estimate for total consumption is smaller than ours.

[8] Sources: (a) Tan and Voss (2003), (b) Ludvig and Slok (2004), (c) Case, Quigley and Shiller (2005), (d) Juster *et al* (2006), (e) Slacalek (2009), (f) Kohler and Dvornak (2007), (g) Carroll, Otsuka and Slacalek (2011),(h) Iacoviello (2011), (i) Case, Quigley and Shiller (2013), (j) Kaplan, Mitman and Violante (2016), (k) Berger *et al* (2018), (l) Cusbert and Kendall (2018), (m) Guren *et al* (2018), and (n) May, Nodari and Rees (2019).

[9] In particular, it may be better to convert an elasticity estimate into an MPC using the current value of housing wealth and consumption, rather than rely on an MPC estimate calculated in the past.

[10] An advantage of using MARTIN is that it accounts for feedback between consumption and other macroeconomic variables. For example, an increase in consumption will boost aggregate demand, leading to increased employment and faster wages growth. This, in turn, will raise household income, causing further increases in consumption. See Cusbert and Kendall (2018) for a description of MARTIN.

[11] Our model implicitly assigns an equal weight to each state. However, the results are almost identical if we were instead to weight each state by its population share.

[12] We are unable to include time fixed effects in the baseline specification because there is insufficient cross-state variation in stock market wealth.

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# Firm-level Insights into Skills Shortages and Wages Growth

Hannah Leal[*]

Photo: Jessie Casson – Getty Images


## Abstract

Despite increased reports of skills shortages from contacts in the RBA's regional and industry liaison program since 2016, national wages growth has picked up only a little and remains subdued. Information collected through the liaison program since the early 2000s suggests Australian firms use a range of practices in addition to, and sometimes before, increasing wages to address skills shortages. In the short run, this may constrain the effect of skills shortages on wages growth.


## Introduction

The emergence of skills shortages has been a central theme in the Bank's meetings with firms as part of the regional and industry liaison program over the past couple of years. Australian firms have increasingly reported pockets of skills shortages, especially in information technology (IT), construction and engineering occupations since 2016. A key question is whether and when these reports of skills shortages will translate to higher wages growth, which economic theory suggests should happen when demand for labour exceeds supply. To investigate the relationship between skills shortages and wages growth, this article summarises historical liaison information about the evolution of skills shortages, how firms reported responding to shortages, and the effect of shortages on wages. The recent period is compared with the period of increasing wages growth between 2002 and 2007. Further insights are drawn from Australian research on skills shortages and firm decision-making, as well as published information about liaison programs and skills shortages in the United States and the United Kingdom.

There are a number of definitions of skills shortages. Where practical, this work defines skills shortages as occurring when demand exceeds supply of appropriately skilled workers available at a prevailing market wage (Healy, Mavromaras and Sloane 2015). It is not a skills shortage when an

employer is not willing or able to pay the market wage. For example, some not-for-profit organisations have discussed labour availability concerns during liaison meetings, but also commonly acknowledge that they typically pay below the usual market wage, so have been excluded from this analysis. Unfortunately, we cannot know if shortages reported by other liaison contacts follow this definition, and this may also affect any survey data of skills shortages.

## Insights from Liaison with Firms

Since the regional and industry liaison program began in 2001, there has only been one prolonged period of broad labour market tightness, which occurred in the years leading up to the 2008 financial crisis. This section draws insights from the Bank's liaison information through this time to identify the various experiences of firms and the strategies firms used to address skills shortages.[1]

### Labour market tightness during 2002–07

Starting in 2002–03, shortages were commonly reported in the residential part of the construction industry. While there were some mentions of skills shortages in the non-residential part of the construction industry, as well as in manufacturing, mining, health and some business services industries, they were less pronounced and/or not as widespread across Australia.[2] Wages growth, as measured by the wage price index (WPI), started to pick up in late 2002 (Graph 1). The WPI measures the changes in wage and salary rates (total hourly rates of pay) for a given quantity and quality of labour for a fixed basket of jobs and is published both excluding and including bonuses.[3] The index excludes changes in wages caused by changes in the nature of work performed and changes to labour force composition; the WPI excluding bonuses also excludes the effect of changes in the quality of the work performed. The national accounts measure of average earnings per hour (AENA) is a broader labour cost measure which includes non-wage costs (for example, superannuation, travel allowances and redundancy payments) and is affected by compositional changes in employment. This can make it difficult to determine the drivers of AENA fluctuations.

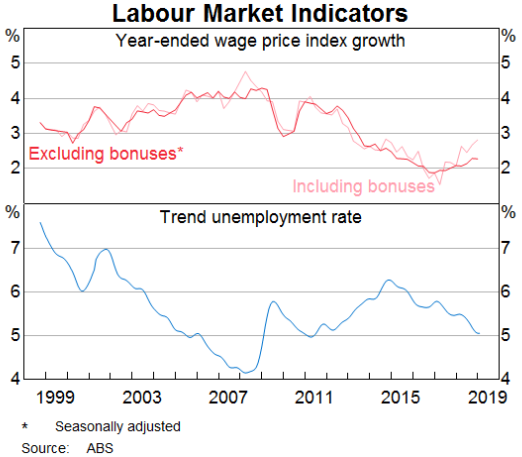
Reports of skills shortages were increasing and more widespread in 2004. These reports broadened to include service sector firms (such as tourism-related and equipment-hire firms) and teachers, and intensified in construction and some business services industries. Wage pressures were building in response to the tightening labour market. The use of non-wage remuneration to attract and retain labour was increasingly reported in the second half of 2004, such as the use of training to upskill workers. Increased bonus payments, which increase temporary payments to employees but avoid permanently increasing wage levels, were also more frequently reported.

In 2005, reports of skills shortages were widespread and persistent across a broad range of industries and skill sets. These reports were accompanied by accounts of increasing wage pressures and the WPI measure of wages growth increased to a little over 4 per cent during the year. Wages growth including bonuses was also strong in 2005, reflecting firms' more frequent use of bonuses to attract and retain labour.

The use of non-wage remuneration also broadened over the year and included executive-style packages, increased leave provisions, earlier promotion opportunities, increased use of overtime payments, the provision of more attractive workplaces, and more frequent salary reviews.

**Graph 1**

**Labour Market Indicators**




* Seasonally adjusted

Source: ABS

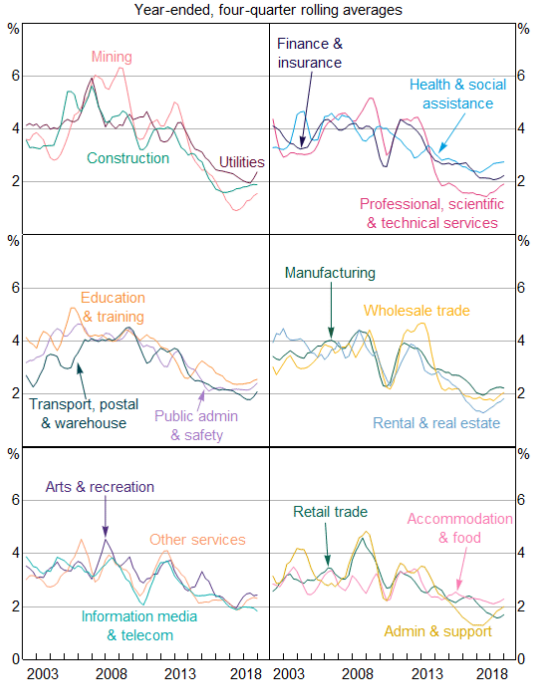
Firms continued to report acute and pervasive skills shortages in 2006. These shortages affected highly skilled, semi-skilled and low-skilled positions (as more low-skilled workers were attracted to mining), and were severe in mining, non-residential construction and business services, although shortages eased in residential construction. Skills shortages were reported to be constraining employment growth and output, and some firms were leaving positions unfilled or increasing their use of short-term contractors, overseas workers and recruitment agencies to fill roles. The use of non-wage remuneration to address skills shortages continued to be reported by many firms.

Growth in the WPI was broadly stable during 2006, despite increased labour turnover and reports of poaching (that is, higher wage levels being used to entice workers to switch jobs). Liaison information indicated that growth varied significantly between industries, and those with the most acute shortages like construction, mining, utilities and business services saw higher wages growth (Graph 2). Industries such as retail trade and manufacturing did not report much wage pressure; more subdued wages growth in these industries helped to stabilise overall wages growth.

**Graph 2**

**Wage Price Index Growth by Industry***

Year-ended, four-quarter rolling averages




* Excluding bonuses

Sources ABS; RBA

Reports of broad-based skills shortages intensified in 2007. Mining, non-residential construction and business services remained the most affected, though reports of shortages in other industries also increased. Shortages were reported in all states, but resource-rich states were the most affected, especially by shortages of low-skilled labour. There were continued reports during 2007 that shortages were constraining output growth, and higher staff turnover had led to increased absenteeism, reduced motivation and more overtime work for others.

WPI growth excluding bonuses remained firm but stable despite liaison reports of wage pressures. Wages growth continued to vary by industry, skills and states, and was strongest where the most severe shortages were found. However, there was still little evidence of wage pressures in industries such as retail trade and manufacturing, and in hospitality-related roles.

Firms responded to skills shortages in 2007 in a broad range of ways, many of which avoided additional payments directly to staff or included higher temporary payments. By the end of 2007, wages growth including bonuses was noticeably higher than wages growth excluding bonuses. This is likely to have partly reflected firms' efforts to constrain labour costs in the longer term; AENA growth also increased in 2007. Strategies firms reported taking to address skills shortages fall broadly into three categories (albeit, with some overlap): strategies aimed at increasing a firm's labour supply; strategies which constrained a firm's labour growth or increased productivity; and strategies which increased labour costs to retain staff (Table 1). In terms of wage strategies, some firms offered targeted wage increases to high-performing staff, and a few shortened salary review periods. A small number were paying higher wages to all staff, but with the caveat that this was not sustainable.

In summary, during the only period of acute labour market tightness for which we have liaison information, increasing wages was only one method of trying to attract and retain staff, and was commonly not the first or favoured response. Firms actively tried to constrain wages growth by using a raft of non-wage measures to address skills

**Table 1: Strategies to Address Skills Shortages**

| Increasing labour supply | Constraining labour growth, or increasing productivity | Increasing labour costs to retain staff |
|---|---|---|
| • hiring from interstate or offshore<br>• hiring from outside the labour force<br>• hiring contract labour<br>• hiring less-qualified staff<br>• taking on more trainees<br>• boosting training efforts<br>• lengthening the normal term of employment contracts<br>• engaging in poaching<br>• shortening the recruitment process<br>• offering flexible and temporary work arrangements<br>• offering more holidays<br>• reducing overtime where it was weighing on morale<br>• hoarding labour in between projects<br>• improving workplace culture and branding | • leaving positions vacant<br>• increasing hours for existing staff<br>• reducing labour requirements by increasing the level of automation of operations<br>• relocating work offshore | • increasing temporary and performance-based forms of remuneration (e.g. bonuses, equity sharing schemes and spotter's fees)<br>• paying retention bonuses<br>• offering targeted wage increases to high-performing staff<br>• shortening salary review periods<br>• paying higher wages to all staff |

Source: RBA

shortages. Because only some of these measures involved payments directly to staff, this lowered the direct effect of skills shortages on wages growth.

## The recent experience

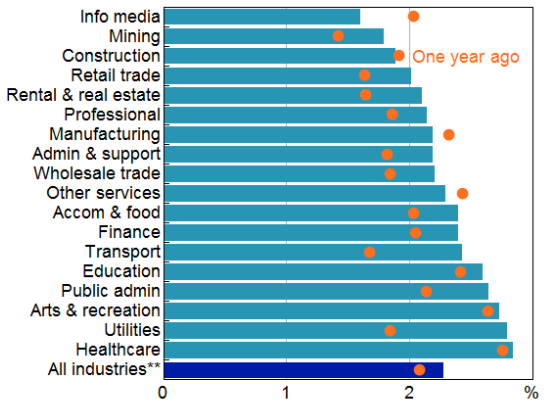
By comparison, reports of skills shortages from liaison between 2016 and 2018 have occurred in the context of a labour market which still has some spare capacity. Shortages have been reported mostly in IT, and in construction and engineering; this is consistent with the high volume of residential and non-residential construction activity and public infrastructure work being undertaken on the east coast during this time. Liaison has reported pockets of higher wages growth for construction, engineering and IT roles but, at the industry level, the overall pattern of constrained wages growth has been quite uniform. Recorded wages growth does not appear to have differed by much across industries over the past year (Graph 3).[4]

Consistent with the liaison evidence from the pre-2008 period, firms facing skills shortages over the past two years have reported responding by means other than increasing wages such as hiring less-skilled workers and increasing training for existing staff. The use of targeted bonuses has also increasingly been reported by liaison contacts, which is consistent with the increase in wages growth seen in the WPI measure that includes bonuses.

**Graph 3**

**Wage Price Index Growth by Industry***

Year-ended, December 2018




* Excluding bonuses; not seasonally adjusted

** Excluding agriculture, forestry and fishing

Source: ABS

## Box A: Insights from Job-level Data

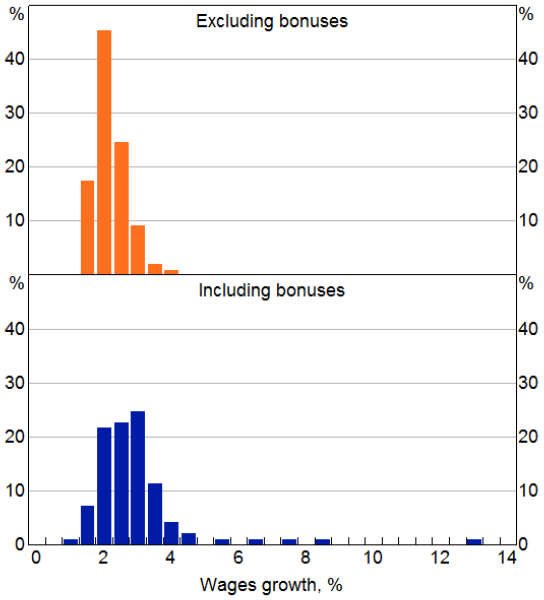
Job-level WPI data can provide further insights on the link between skills shortages and wages growth. Together, the Reserve Bank and the Australian Bureau of Statistics (ABS) have looked at the wage increases for all the 18,000 individual jobs that the ABS uses to construct the WPI. These data are useful for examining whether there are pockets of higher wages growth in the labour market.

This job-level analysis provides little evidence that skills shortages have translated into pockets of higher base wages growth in recent years. However, there is some evidence of pockets of higher wages growth if we consider a broader measure of hourly compensation that includes bonuses, in addition to base wages.[5] To see this, we aggregate the job-level WPI data to the 3-digit occupation level. There are around 90 such occupation classifications, which include roles like 'systems analysts & programmers', 'database administrators and IT security specialists' and 'engineering professionals'. If there are pockets of higher wages growth in the labour market, we would expect to see at least a few of these occupations having large wage rises. For base wages, this does not appear to be the case. The top panel of Graph A1 shows the distribution of annual base wages growth across occupations; the height of each bar represents the share of occupations with an annual wage increase of a given amount, averaged over the 2016 to 2018 period. This shows that the distribution in wages growth across occupations has been highly compressed, with no occupation having wages rises in excess of 4½ per cent over the period considered. However, after including bonuses, there are a handful of occupations with relatively strong growth in hourly compensation (bottom panel of Graph A1).

**Graph A1**

**Distribution of Wages Growth by Occupation**

Histogram of annual average growth, 2016Q3 to 2018Q3



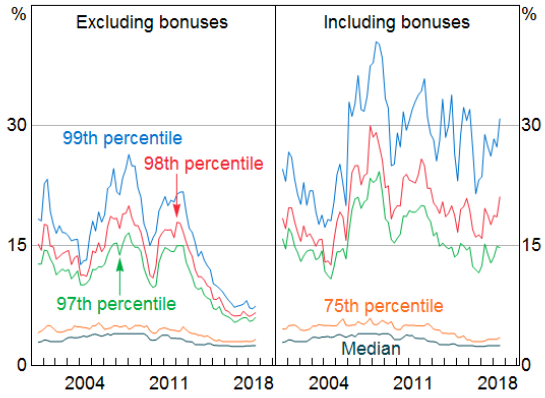

* Occupations are 3-digit ANZSCO codes

Sources: ABS; RBA

We can also look for evidence of pockets of higher wages growth in the distribution of wage increases across the 18,000 individual jobs in the WPI sample (rather than the 90 occupation categories considered above). To do this, we simply take the year-ended wage change for every job in the WPI sample, and then calculate the percentiles of that distribution at each point in time. Again, if we exclude bonuses, we

observe little evidence of pockets of higher wages growth (LHS panel of Graph A2). Even the 99th percentile of the wages growth distribution is at low levels compared to historical standards, and currently at its lowest level in the history of the WPI. This contrasts with the earlier period of reported skills shortages in 2007, where a much larger share of jobs was experiencing large pay rises. If we include bonuses, there is a bit more evidence of higher wages growth outcomes at the top of the distribution; however, this strength is only evident above the 97th percentile (RHS panel of Graph A2), which means that, if there are pockets of strength in the economy, they are confined to a very small fraction of jobs.

**Graph A2**
**Wages Growth**
Year-ended




Sources: ABS; RBA

## Do Liaison Conclusions Differ from Other Australian Research and Data?

We can conclude from liaison information that increasing wages is one of many methods used by firms to address skills shortages. Firms actively try to constrain wages growth by using a variety of non-wage financial and non-financial measures when faced with skills shortages, which is likely to weaken the direct effect of shortages on wages growth.

There is not much in the literature to suggest why and when Australian firms should take certain actions to respond to labour market tightness, and very little on the actions they do take. Healy, Mavromaras and Sloane (2015) used the ABS's Business Longitudinal Database (BLD, now supplanted by the Business Longitudinal Analysis Data Environment, or BLADE) to examine: the determinants of different types of skills shortages faced by Australian small- and medium-sized enterprises; the response strategies firms use to address skills shortages; and the short-term consequences of skills shortages for firm performance from 2004 to 2007. The authors found that firms facing more complex skills shortages (where two, or three or more options were selected as the cause of the shortage) were more likely to increase the hours of their existing workforces and/or increase wages or conditions than firms facing simple shortages (with only one cause selected). However, in a weighted sample of firms that faced skills shortages in 2004–05, only 16 per cent responded by increasing wages or conditions. More common responses were to increase the hours of the firm's existing workforce, subcontract or outsource work, provide on-the-job or internal training and reduce outputs or production.

The NAB Quarterly Business Survey asks around 900 firms how different factors constrain output, including the availability of suitable labour. Respondents can answer that labour supply is a significant constraint, a minor constraint or no constraint (or not applicable). The survey has suggested that suitable labour has become significantly harder to find over the past two years or so, and has been around 2006 levels since late 2017. Results for NAB's 'labour is a constraint'

question have also diverged from the historical relationship with WPI (Graph 4). It is likely part of the explanation that while the share of those saying labour is a major constraint on output has increased noticeably over the last few surveys, this group is still smaller than it was from mid-2005 to 2008 (Graph 5).

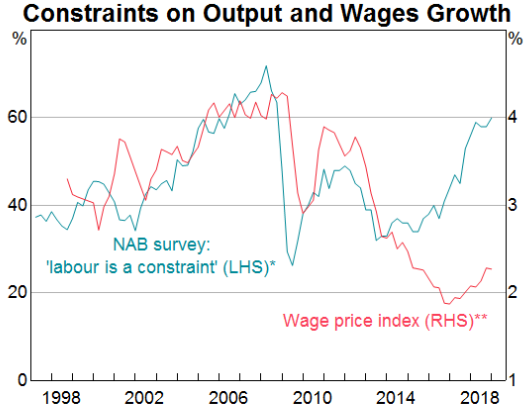
The Australian Government Department of Jobs and Small Business conducts research each year to determine state and national skills shortages (including shortages particular to specialisations within occupations). This can provide an insight into how widespread skills shortages are over time.[6] The number of occupations experiencing national shortages rose rapidly in the years before the financial crisis and fell rapidly after (Graph 6). Similar to the NAB survey, it has increased a bit in the last few years, suggesting that skills shortages have broadened, but it remains well below pre-financial crisis levels.

## Does the Australian Experience Differ from Other Countries' Experiences?

A comprehensive review of overseas liaison evidence is beyond the scope of this article but some insights can be drawn from other markets. It is commonly observed that wages growth was subdued in the United States (US) and United Kingdom (UK) in recent years, despite falling unemployment and increasing reports of skills shortages, although wages growth did pick up in both countries in 2018 (Graph 7).[7]

### Graph 4

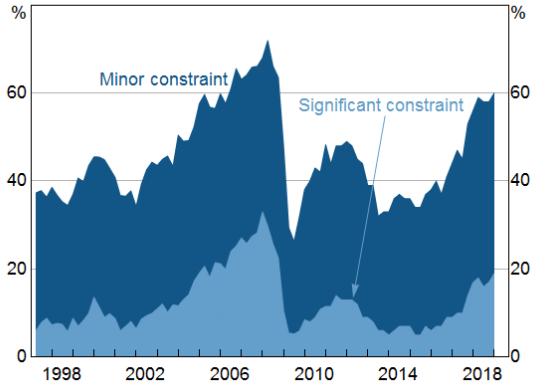
**Constraints on Output and Wages Growth**




* Share of firms reporting availability of suitable labour as a minor or significant constraint on output
** Year-ended growth, seasonally adjusted; excluding bonuses
Sources: ABS; NAB

### Graph 5

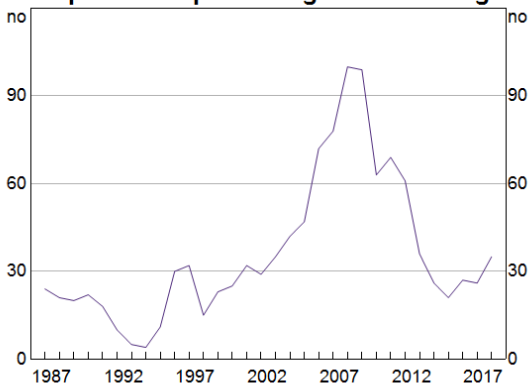
**Labour Availability as a Constraint**
Percentage of respondents




Source: NAB

### Graph 6

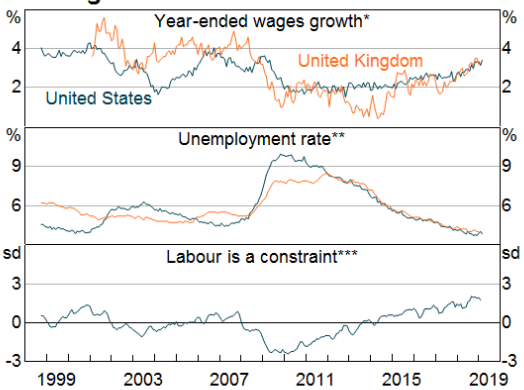
**Occupations Experiencing Skills Shortages***




* Includes only shortages considered national
Source: Department of Jobs and Small Business

### Graph 7

**United States and United Kingdom – Labour Market Indicators**




* Seasonally adjusted; excluding bonuses; United States is average hourly earnings for total private non-farm employees spliced with non-farm and non-supervisory employees pre-2006; United Kingdom is average weekly earnings
** Seasonally adjusted; United Kingdom is a three-month moving average
*** Businesses reporting few or no qualified applicants for job openings; standard deviation; three-month moving average
Sources: RBA; Refinitiv

The Federal Reserve's Beige Book has continued to report that labour markets in the United States are 'tight', and skills shortages were increasingly mentioned from 2016 (and there were reports of pockets of skills shortages and tightening labour markets before then):

*Labor markets across the country remained tight, restraining job gains in some regions. Contacts continued to note difficulty finding qualified candidates across a broad array of industries and skill levels. Reports of labor shortages over the reporting period were most often cited in high-skill positions, including engineering, information technology, and health care, as well as in construction and transportation*. (Federal Reserve District 2018).

As in Australia, firms were also reported to have used non-wage strategies, such as increasing training and automation, as well as increasing wages to address skills shortages (Federal Reserve District 2018). While wages growth did pick up in 2018, it had been weak over the previous few years despite increased reports of skills shortages. Periods of labour market tightness and stable wages growth have been reported in the Federal Reserve's Beige Book numerous times and at least as far back as 1995.

To explain why wages growth remained low despite widespread reports of skills shortages, some have suggested that American firms are more cautious and unwilling to offer permanent wage increases to address skills shortages because of their experiences during the financial crisis. It may also have been that workers are less willing and able to bargain for higher wages after the financial crisis, partly due to declining union membership and collective bargaining, and increased market power of firms to employ workers such as through non-compete clauses and no-poaching agreements (Krueger 2018). Krugman (2018) also hypothesised that US reports of skills shortages were so widespread because human resource managers had forgotten what full employment looks like, and reported shortages when fewer highly qualified workers applied for each job than in previous years.

The United Kingdom has also experienced skills shortages, partly due to the fall in net migration from the European Union following the Brexit vote. The Bank of England's liaison program has found that recruitment difficulties have increased over the past couple of years. Further, skills shortages were said to be constraining headcount growth, particularly in industries with the most acute skills shortages such as construction, haulage and IT (Bank of England 2018).

Wages growth had been subdued for a number of years before increasing a bit in 2018. Recent increases in wages growth were attributed to a number of factors, including staff retention:

*Average pay settlements were a little higher than a year ago, in a range of 2½%–3½%. Growth in total labour costs picked up due to the increase in employers' pension auto-enrolment contributions; the rise in the National Living Wage – and pressure to maintain pay differentials in line with it; the Apprenticeship Levy, and ad hoc payments to retain staff with key skills*. (Bank of England 2018).

Firms also reported using numerous strategies to address skills shortages, as in Australia and the United States, such as improved working conditions, employing more lower-skilled workers and increasing automation (Bank of England 2018).

The long periods of subdued wages growth, despite increasing reports of skills shortages, is similar to the current Australian experience. High levels of spare capacity in the preceding years may have skewed views on skills shortages in each economy and may explain some of the gap between reported shortages and wages growth. However, there are differences between each country's labour markets. Non-compete restrictions and other anti-competitive practices are unlikely to

have affected wages growth in Australia as much as in the United States. Both the US and UK labour markets began tightening a few years before Australia's, and unemployment in both countries are below OECD estimates of their natural rates of unemployment. Reports of skills shortages also appear more frequent, and shortages more widespread, than in Australia.

## Conclusion

Overall liaison information supports the conclusions of the RBA's forecasts that, while wages growth is likely to continue picking up over the next few years, increases are expected to be gradual. Increasing wages is one of many strategies firms use to address skills shortages and is, at times, only chosen after a range of other responses. This may dampen the short-run effect of skills shortages on wages growth. However, because this pattern of choices was also common prior to the 2008 financial crisis, it does not fully explain the recent weakness in wages growth.

## Footnotes

[*] The author is from Economic Analysis Department and would like to thank James Bishop (from Economic Research Department) for his contribution on job-level data in Box A.

[1] Labour availability may not be discussed in all liaisons. See RBA (2014) for more information about the liaison program.

[2] There is not one definition of 'business services' and the industries it covers (Manalo and Orsmond 2013). However, the RBA tends to classify firms in the following industries as 'business services': professional, scientific & technical services; administrative & support services; rental, hiring & real estate services; information media & telecommunications; and financial & insurance services.

[3] All wage measures considered in this article capture changes in both ordinary time hourly wage and salary rates, and overtime hourly rates. The WPI excludes changes in penalty payments (such as for overtime, weekends and public holidays) because these payments vary based on hours worked at penalty rates. The WPI is also not affected by changes in allowances which fluctuate (for example, allowances paid according to how much work is performed in heat or at height).

[4] For more information on low wages growth in Australia, please see Bishop and Cassidy (2017).

[5] The data on wage measures that include bonuses can reflect changes in the quality of the work performed and should be interpreted with caution, particularly at the level of granularity shown in Graph A1 and Graph A2.

[6] There are caveats to historical comparisons of these data. Only selected skilled occupations are included, and the occupation coverage has changed over time. Lack of a rating in any year doesn't necessarily mean there was no shortage for that occupation; it may mean the occupation was not assessed. Occupations are grouped by ANZSCO code.

[7] Arsov and Evans (2018) find that lower productivity growth, the difficulty cutting wages after the financial crisis and decreased labour bargaining power have contributed to (but do not fully explain) low wages growth in advanced economies, including the United States and the United Kingdom.

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# The International Trade in Services

Peter Rickards[*]

Photo: Lane Oatey – Getty Images


## Abstract

Services are becoming increasingly traded globally and technological advances have led to the rise of more modern services such as communications, financial and intellectual property services. While advanced economies continue to account for the bulk of the demand and supply of services traded around the world, the emerging economies' share has been increasing. This article examines the changing global trends and compares them to Australia's experience with services trade, which has been shaped by China's growing demand.

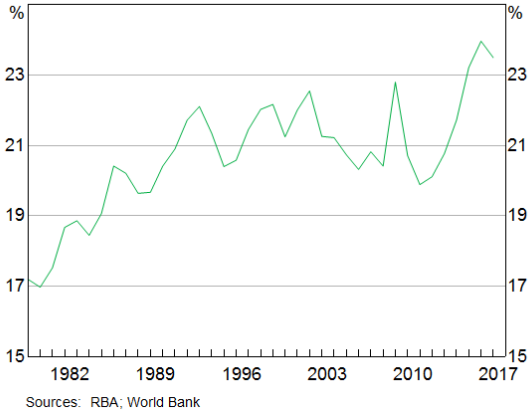

## Introduction

Services account for around two-thirds of global output and 75 per cent of total employment, yet they account for less than one-quarter of global trade (Graph 1). Historically, international trade in services has been less prevalent than the trade in goods, because buyers and sellers have needed to be face to face. However, advances in communications technology have allowed for more services to be traded.

Declines in the cost of transportation (freight and passenger) – which is itself a traded service – and falling communication costs have encouraged trade in services, as well as goods (Graph 2). Innovations in transport services have also enabled goods to be produced in longer value chains around the world, further contributing to trade in goods.[1] Business support functions have been increasingly outsourced in response to cost and technology developments. The rise of multinational

**Graph 1**

**Services Share of Global Trade**




Sources: RBA; World Bank

corporations has also increased services trade because they create within-firm cross-border transactions in intellectual property, human resources and information technology. There have also been concerted efforts to liberalise trade in services over the past couple of decades, although barriers to trade in services remain higher than for goods (IMF 2018).

This article outlines developments in the main exporters and importers of services, and the main types of services traded. The unique role that services have played in global value chains is also discussed. Finally, the article places Australia's experience with services trade in the global context.

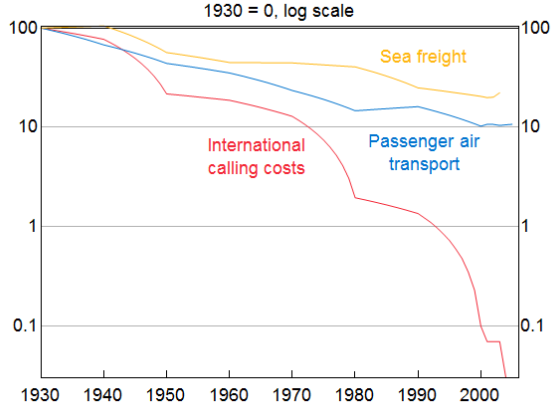
## Who Trades Services?

Services trade is dominated by the large advanced economies (the United States, United Kingdom, Japan and the euro area) (Graph 3). These four economies account for 50 per cent of exports and 40 per cent of imports of services, which is larger than their share of global output and goods trade (around one-third). In contrast to goods trade – where large advanced economies are net consumers, often importing manufactured goods from emerging economies – large advanced economies are net providers of services. These are often high-value professional and intellectual property services exported to emerging economies. The advanced economies also trade large volumes of services with each other.

While emerging economies trade less services in total than advanced economies, they are increasingly important for services trade. Emerging economy service exports have grown at twice the rate of exports from advanced economies over the past few decades. This growth has been driven by the Asian region, in particular China, which is now the world's fourth largest services exporter. Growth has been assisted by government support as part of a broader effort to rebalance the economy towards domestic consumption and the export of higher-value goods and services (The State Council of The People's Republic of China 2018). Much of the growth in global demand for services, particularly from emerging economies, has come from the increasing popularity of outbound travel from China. China is now the world's third largest services importer, marginally behind the United States, and is the largest net consumer of services.

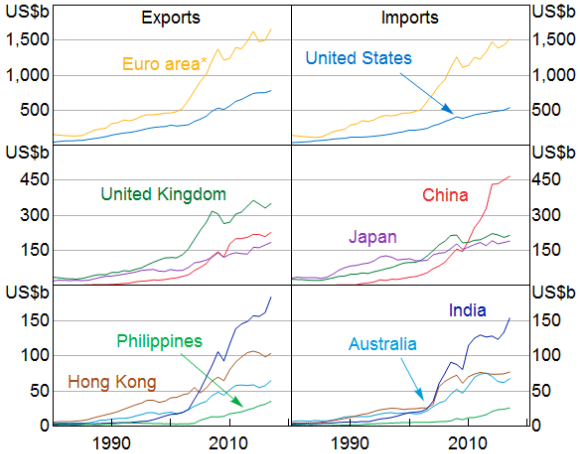
Hong Kong, India and the Philippines have also contributed to the rapid growth of exports and are net providers of traded services. China has been a direct source of demand for many of Hong Kong's 'merchanting' services.[2] Hong Kong also acts as a financial entry point to China. As a result, Hong Kong generates sizeable financial service exports (Leung *et al* 2008). In India and the Philippines, service exports have risen rapidly due to the outsourcing of support services to these countries and the growth in telecommunications services.

**Graph 2**
**World Trade Costs**
1930 = 0, log scale




Sources: OECD; RBA

**Graph 3**
**World Trade in Services**
By country, annual




* Includes intra-regional trade

Sources: RBA; UN

## What Services Are Traded?

Travel and transport accounted for the majority of global services trade until the late 1990s (Graph 4). These services are 'traditional' in the sense that they involve face-to-face transactions.

In recent decades, technological progress and changes in the regulatory environment have facilitated trade in a broader range of services, including financial and insurance services, intellectual property charges, communication & computing services, professional & management consulting and technical services. These more 'modern' services have increased from around one-quarter of service exports in the early 1970s to half in 2017, and continue to grow rapidly (Graph 5).

### Travel

Travel is the single largest service export, accounting for around US$1¼ trillion in global exports annually. Travel includes services provided by a country to foreign tourists, students and business travellers, and covers services like accommodation, meals, tourist attractions and education expenses. It does not include the transport to and from the country, which is captured in transport services.

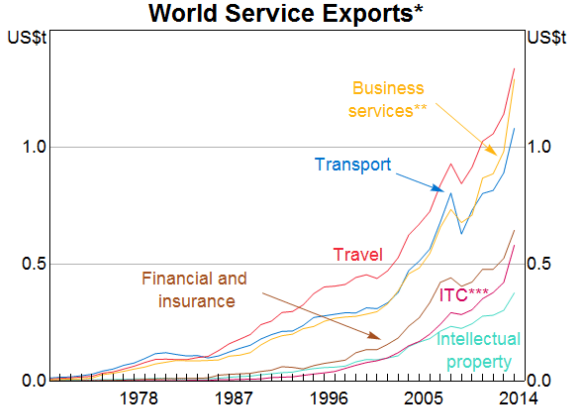
Since 2000, global travel exports have increased rapidly. The most important driver of this growth has been demand from China. Chinese nationals are travelling abroad much more than they used to, which has been the result of rising Chinese disposable incomes, the relaxation of foreign travel restrictions and the growth of low-cost airlines. The total number of visits to foreign economies from China has increased from 10.5 million in 2000 to around 150 million in 2017, and China is now the largest outbound travel market in the world. Chinese tourists also spend more than twice the amount of an American tourist on average (World Tourism Organisation 2018). Another driver of outbound travel has been demand for foreign education. The number of Chinese students studying abroad has increased from just over 100,000 in 2005 to more than 600,000 in 2017. The most popular destinations to study have been the United States, the United Kingdom and Australia. As a result of these trends, China now accounts for around 20 per cent of global travel demand and this is expected to increase further.

### Transport

Transport services capture the movement of people, animals and goods across borders by air, sea, road and rail. Sea transport is predominantly used for the movement of goods, so this trade largely involves economies that are large trading hubs, such as China, Denmark, Hong Kong, Japan, Korea, the Netherlands and Singapore. Air transport services typically originate from economies that are

**Graph 4**

**World Service Exports***




* Does not include construction, government services, maintenance or cultural and recreational services. These services in aggregate account for 6 per cent of the total. Includes intra-regional trade in the euro area

** Includes professional and management consulting, technical and trade-related and research and development services

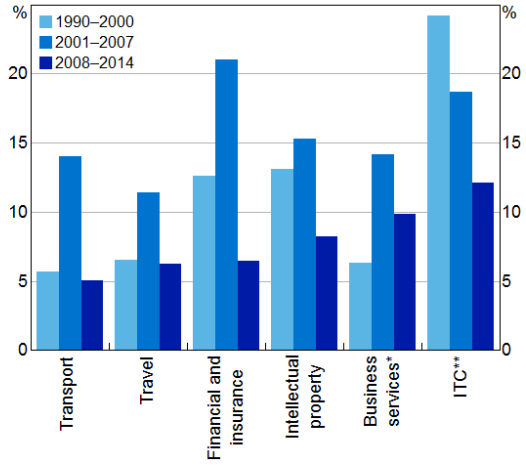
*** Information, telecommunications and computing

Sources: IMF; RBA

**Graph 5**

**World Service Exports Growth**

Average annual growth




* Includes professional and management consulting, technical and trade-related and research and development services

** Information, telecommunications and computing

Sources: IMF; RBA

airline hubs, such as Germany, the United States, the United Arab Emirates and the United Kingdom. Goods trade and transport services trade are closely linked and during the Global Financial Crisis (GFC), slowing trade in goods saw a contraction in world transport exports. Most of the growth in transport exports over recent decades has been driven by increasing goods trade and growth in international air passenger traffic.

During the 1970s, transport accounted for around one-third of all services traded globally. Over the past few decades, transportation costs have declined and there has been strong growth in other services trade. As a result, the share of transport in global services trade has declined to be below 20 per cent. However, despite the share declining, transport services have been vital for the development of global value chains, and are a key input in goods trade (Loungani *et al* 2017).

## Business services

The rise of multinational firms and outsourcing has led to a considerable increase in business service exports over the past few decades. International trade in business services covers a wide array of commercial activities, including technical and trade-related services (such as engineering, leasing and merchanting services); professional and management consulting services (such as legal, accounting, advertising and management consulting services); and research and development (R&D) services (which includes the initial purchase or development of intellectual property).[3] R&D does not include charges for using intellectual property, which are a separate category of service exports discussed below.

Globally, technical and trade-related services are the most traded business services, but this varies across economies (Graph 6). Trade in professional and management consulting services is significant for the United States, in part because the world's largest consulting and accounting firms are domiciled there. By contrast, in Japan, the majority of business service exports are technical and trade-related services, reflecting the prevalence of merchanting services in Japan (WTO 2015).[4] China's business service exports have been almost exclusively technical and trade-related, which is likely to reflect merchanting. In the euro area, technical and trade-related services are dominated by architectural, engineering and other technical services. Across advanced economies, R&D service exports are consistently smaller than the other two subcategories.

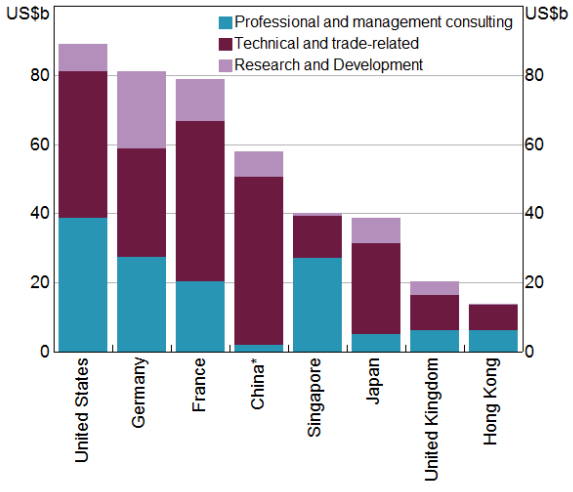
## Financial and insurance services

Financial and insurance (F&I) services represent the third most traded service around the world, with financial services accounting for the vast bulk of these. Financial services are measured by transaction charges and margins, asset management fees and other intermediation charges. Insurance services are measured by the value of premiums paid to insurers net of any claims.[5] F&I services are exported by a relatively small group of economies that are large international financial and insurance centres: Singapore, Switzerland, the United Kingdom, the United States and the euro area (Graph 7). Imports of financial services are concentrated in the same group of economies because financial services are typically traded across large financial centres. Cross-border trade in F&I services began to grow rapidly from the 1990s and has increased from 4 per cent of all services trade in 1990 to around 12 per cent in 2017. This rapid growth is in large part due to financial deregulation, the opening of financial

**Graph 6**

**Business Service Exports**

2016




* Split is based on 2016 total business services and component breakdown at 2002

Sources: IMF; RBA; UN

sectors to international competition, outsourcing of some financial services and growth in internationally active banks (WTO 2019). In the euro area, financial services trade has also benefited from much closer financial integration, such as the shared currency (Liebscher 2005). The onset of the GFC saw a considerable contraction in the trade of F&I services, as banks withdrew from foreign operations, and growth in this trade has not subsequently returned to the pre-GFC rates.

The United Kingdom is currently one of the largest exporters of financial services due to the role of London as a global financial services centre. The United Kingdom is the world's largest foreign exchange market and provides more cross-border bank lending than anywhere else. The size of the financial services sector is in part due to its access to continental European markets – around one-half of the United Kingdom's financial service exports are to the European Union. The size and nature of this trade in future may be influenced by how Brexit is resolved.

China's financial service exports are relatively small compared with the size of its economy. In part, this is because, over the past few decades, Hong Kong has acted as an entry point to financial markets and firms in China, and has also provided financial services to China (Leung *et al* 2008). However, China's financial services sector has grown strongly over the past decade due to the rising importance of the financial intermediation industry in the domestic economy and efforts to open financial markets to foreigners.

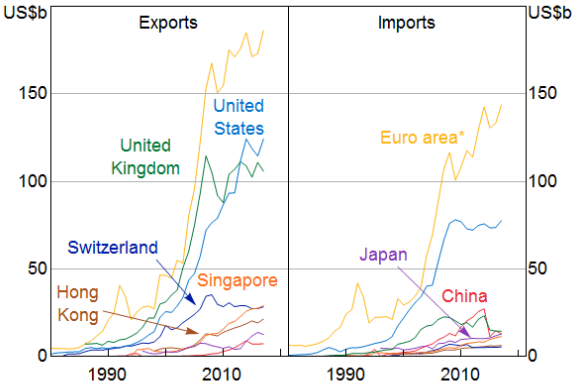
## Information, telecommunications & computing

The fastest growing component of the global trade in services has been information, telecommunications & computing (ITC) services. These services have grown strongly because they are increasingly being used in the production of many other goods and services, in part driven by lower ITC costs. While the classifications of some of these services vary across economies, information technology, communication and contact centre services have all been key candidates for outsourcing. India and the Philippines are major service outsourcing destinations and have seen considerable increases in their service exports as a result.

In India, the ITC sector is the largest and fastest growing sector in the economy, and is predominantly export oriented, accounting for almost one-third of total service exports (Hyvonen and Wang 2012). India's ITC exports also accounted for around 10 per cent of the world's ITC exports in 2017, exporting more than the United States and United Kingdom combined.[6] India has become a significant provider of Business Process Outsourcing (BPO) – which can include back-office functions like finance and accounting, and front-office functions like call centres. Together with software engineering, ITC and BPO services form the broader Indian IT industry, which accounts for the majority of service exports (Graph 8).

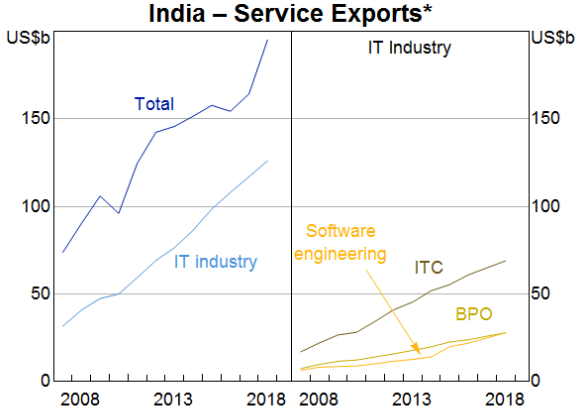
Since the early 2000s, the Philippines has also become a key destination for BPO. The Philippines

**Graph 7**
**Insurance and Financial Services Trade**




* Includes intra-regional trade
Sources: RBA; World Bank

**Graph 8**
**India – Service Exports***




* Reported for Indian fiscal year: April 1 to March 31.
Sources: CEIC Data; RBA

BPO industry is export focussed; around 90 per cent of revenues are derived from exports. The outsourcing of these services to the Philippines has been driven by a lower cost of labour and a young workforce with relatively good English language skills (Mitra 2013). BPO exports grew by 36 per cent annually between 2004 and 2013, rapidly increasing service exports from the Philippines. As a result, the share of BPO exports in GDP rose from around 1 per cent in 2005 to more than 5 per cent in 2013 (Graph 9).

### Intellectual property

Trade in intellectual property (IP) occurs when businesses use IP that is owned in another country and includes charges for the use of patents, trademarks, copyrights, franchises and trade secrets. The majority of global IP trade consists of intra-firm transactions – such as payments between a subsidiary and a firm's headquarters. In the United States, two-thirds of IP exports are intra-firm (Neubig and Wunsch-Vincent 2017). IP is often imported by economies where manufacturing has been outsourced from another country and exports of IP typically originate from the world's more advanced economies: the euro area, Japan, the United States and the United Kingdom.[7] These economies are much larger exporters than importers of IP, because technology and 'know-how' on a net basis is transferred to lower and middle-income economies (Graph 10). The euro area is an exception, although a large part of their IP imports reflects businesses relocating to Ireland for tax and legal reasons.

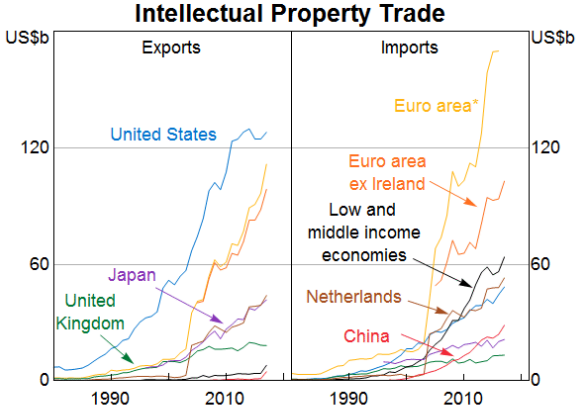
## Services and Value Chains

The services sector is an important link in global value chains and the role of services in global trade is larger than that suggested by gross trade values. While some services are exported directly, others are used as inputs to the production of goods exports – such as engineering services embodied in manufacturing exports. On a 'value-added' basis, the share of services in global trade is far higher (Graph 11).

On average, services comprise one-quarter of gross exports but in value-added terms services account for almost half of all exports. There is large variation across economies, but invariably the services value-

**Graph 10**

**Intellectual Property Trade**



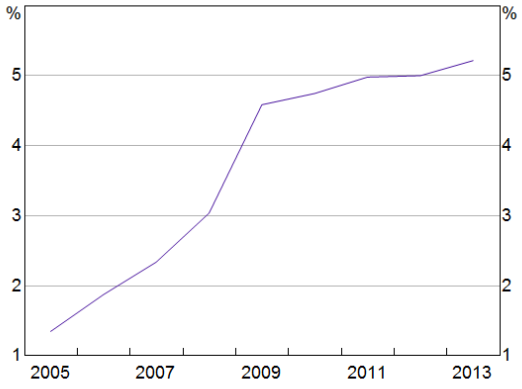

* Includes intra-regional trade

Sources: RBA; World Bank

**Graph 9**

**Philippines – BPO Exports***

Share of nominal GDP



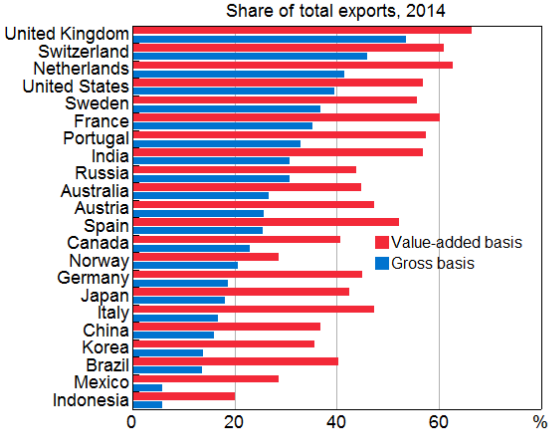

* Data unavailable past 2013

Sources: Banko Sentral ng Pilipinas; RBA; World Bank

**Graph 11**

**Services Share of Exports**

Share of total exports, 2014




Sources: RBA; World Input Output Database

added share in exports is significantly larger than on a gross basis. Globally, the higher services share of trade when measured on a value-added basis is broadly matched by a correspondingly lower manufacturing share because these services are embodied in manufactured goods exports (Graph 12). Manufactured goods are also over-represented in gross trade because of their prevalence in global value chains.

All industries use services to some extent as inputs into production. The value of services used as inputs in the manufacturing sector have not changed much over the 1990s and 2000s, but the origin of those services has. The use of domestic inputs has declined across most industries while the use of imported services has increased (Graph 13).

As with the manufacturing industry, the services industry itself has increased the use of imported services as inputs, displacing the use of domestic service inputs (Graph 14). This is particularly the case for economies that specialise in financial services, as they are produced in hubs connected to other financial centres that provide some of the service inputs, and computer services (Venzin 2009).

## Australia's Experience

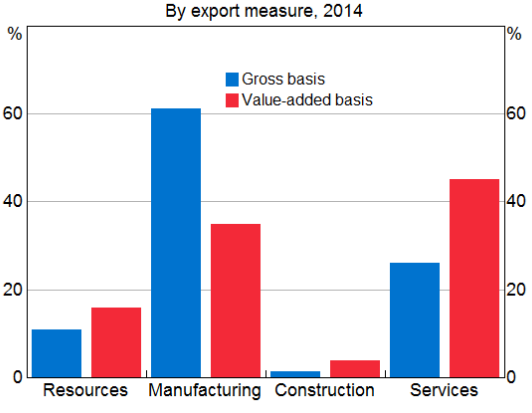
Australia's trade in services has changed considerably over the past couple of decades (Graph 15). Service exports from Australia have increased from around 15 per cent of total exports in the 1970s to more than 20 per cent in 2018. Education-related exports and tourism are now Australia's third (behind iron ore and coal) and fifth (behind natural gas) largest exports respectively. In line with global trends, the transport share of services trade has declined steadily since the 1970s and now makes up around one-quarter of services trade.

In contrast to other advanced economies, travel has increased as a share of services trade for Australia. On the export side, this has been driven by growth in education and on the import side, by outbound

**Graph 12**

**Sector Share of Exports**

By export measure, 2014

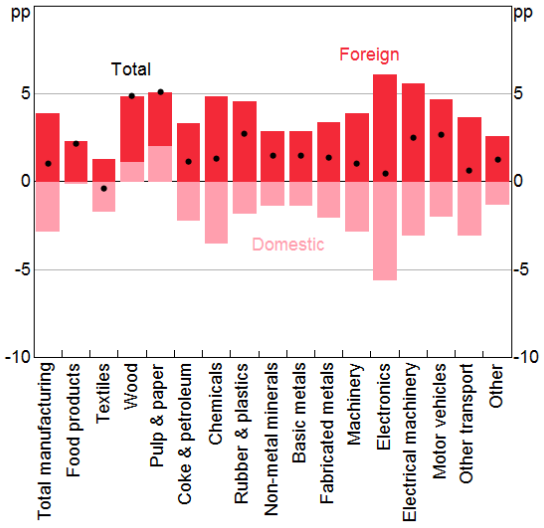



Sources: RBA; World Input-Output Database

**Graph 13**

**Change in Service Inputs in Manufacturing**

1995–2011

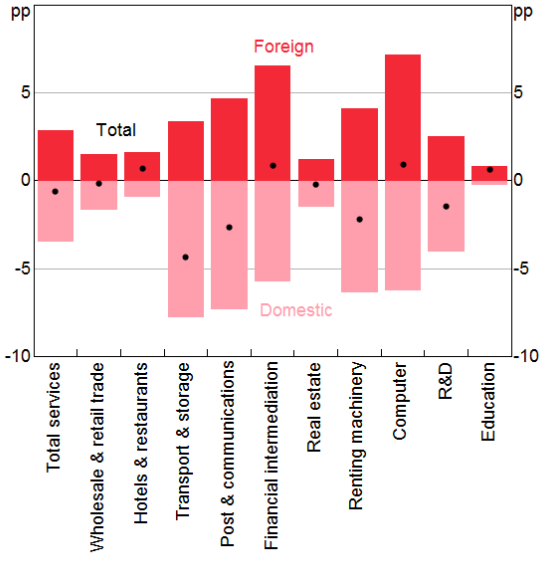



Sources: OECD; RBA

**Graph 14**

**Change in Service Inputs in Services**

1995–2011




Sources: OECD; RBA

tourism. The rapid increase in education travel exports can be attributed to changes in Australia's migration policy, student visa access and rising demand for education from China and India (Hooper and Dobson 2015). Rapidly rising income in China has increased Chinese demand for education; one-third of Australia's education exports are to China, compared with 7 per cent in 2000. Education exports to emerging South-East Asian economies have also increased rapidly; education exports to these economies are greater than those to India and around half those to China (Alston *et al* 2018). Most spending in Australia of those who have travelled here for education purposes is on accommodation, retail and restaurants, and has also increased over recent decades.

Outbound travel continues to grow quickly and is a large and growing share of total service imports — much higher than in most advanced economies. Previous studies have found that rising incomes and increasing migration have had a positive impact on outbound travel.

Australia has not seen the same rising share of modern service exports, such as ITC and financial services, as most other advanced economies, and does not have a substantial share of trade in professional services, financial services or IP.

China became the largest single export destination for Australian services in 2010 and the share of services provided to China has continued to increase since, driven by education exports (Graph 16). With this shift to China, the share of services provided to the major advanced economies has declined, although exports to other parts of Asia (excluding China and Japan) remain sizeable. By contrast, the source of Australia's service imports have been stable and are dominated by the major advanced economies and the economies in Asia that are often tourism destinations.

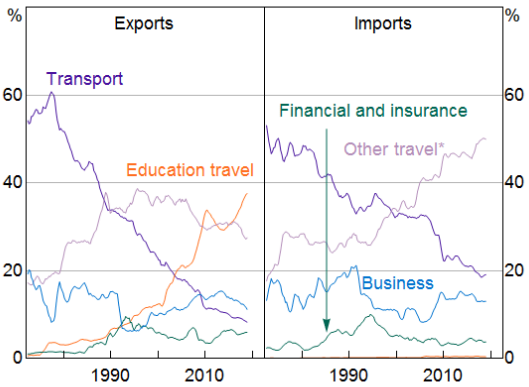
## Conclusion

Services are becoming increasingly traded. Advanced economies account for the majority of service exports, and are typically net providers of services to emerging economies. However, exports from emerging economies have been growing quickly, driven by China and India. Trade in traditional services has continued to grow strongly, supported by goods trade – facilitated by falling costs and advancements in transportation – and demand for overseas travel and education. Technological improvements have led to the increased tradability of more modern services, such as intellectual property, professional and financial services, which have grown quickly over the past few decades. In Australia, the bulk of service exports are traditional services, such as tourism and education, and they mostly go to the Asian region. Rising incomes in emerging economies should continue to provide opportunities for Australia's services sector.

**Graph 15**

**Australia – Trade in Services**

Smoothed share of total



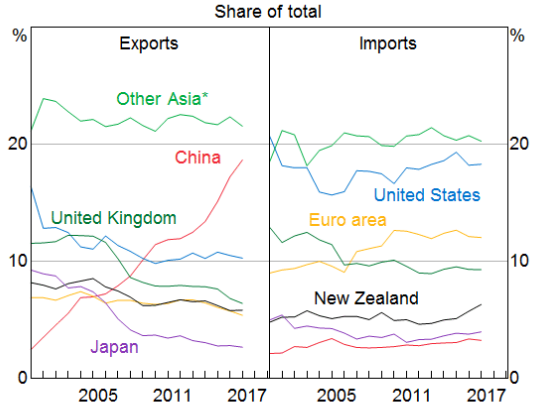

* Total travel excluding education-related

Sources: ABS; RBA

**Graph 16**

**Australia – Trade in Services**

Share of total




* Includes Hong Kong, Korea, Singapore, Taiwan, Malaysia, Indonesia, Thailand and the Philippines

Sources: ABS; RBA

## Footnotes

[*] The author is from the Economic Analysis Department

[1] Global value chains refer to production processes in which different stages of production occur in different countries, with trade occurring each time the partially finished goods are shipped to the next production location.

[2] Merchanting occurs when a resident (merchant) buys a good from a non-resident and then re-sells the good to another non-resident. Merchanting services are measured as the gains from this trade.

[3] Tax differentials create incentives for multinationals to shift activities such as balance sheets and intellectual property across borders. This activity 'creates' trade in services that is not contributing to economic activity. The experience in Ireland since 2015 is an example of this. See Conefrey (2018) for more detail.

[4] For example, it is common for Japanese merchants to purchase oil from the Middle East and subsequently re-sell this to non-residents without the oil ever entering Japan. Japan also has considerable transactions in non-monetary gold. In 2003, gross transactions of non-monetary gold that did not cross borders amounted to about 7 trillion Japanese yen.

[5] The value of insurance exports from a particular economy may fluctuate considerably due to large claim events, such as those following large natural disasters, because the insurance premium collected in that year is less than the claims made on the insurer.

[6] India's share of ITC exports is likely to be larger than 10 per cent because the euro area's measured ITC exports include considerable ITC service exports from Ireland, which reflect technology firms moving their balance sheets across borders rather than genuine economic activity (see footnote 2).

[7] These exports are typically factory techniques or industrial processes due to companies shifting manufacturing facilities overseas. See Neubig and Wunsch-Vincent (2017) and Yamaguchi (2004) for more detail.

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# Housing Policy and Economic Growth in China

Martin Eftimoski and Kate McLoughlin[*]

Photo: A-Digit – Getty Images and Reserve Bank of Australia


## Abstract

Housing investment has contributed significantly to Chinese GDP growth in recent decades and, due to the steel-intensive nature of that investment, has also been an important driver of Australian exports of iron ore and metallurgical coal. Trends in Chinese residential investment have been strongly influenced by government policies. Since 2016, the Chinese Government has tightened policies, particularly towards 'speculative' housing purchases, to moderate property price inflation. It has simultaneously implemented targeted, incremental measures to improve longer-term housing supply. Even so, construction activity has weakened and prices have continued to rise rapidly. Maintaining this policy mix towards the sector is likely to prove challenging as downside risks to broader economic conditions mount.


## Background: Property Cycles and Growth

China's residential property sector has been transformed in recent decades but the government continues to play a role in guiding markets. Starting in the 1990s, residential housing, which had formerly been allocated by the state in urban areas, was privatised. This led to the creation of an active property market, an emerging market for mortgage credit and rapid housing price inflation. The expansion of the private market, however, also fuelled concerns about wealth inequality and affordability, which has prompted the government to boost the construction of social housing to supplement the role of the private market in housing allocation (Yang and Chen 2014). Private property markets continue to be strongly affected by government policies, many of which are periodically changed to affect the demand for (and supply of) housing to help smooth economic growth and temper large swings in housing prices (Graph 1).

In recent years, there have been several distinct episodes of policy intervention. In 2007, 2009, 2013 and 2016, the government tightened policies

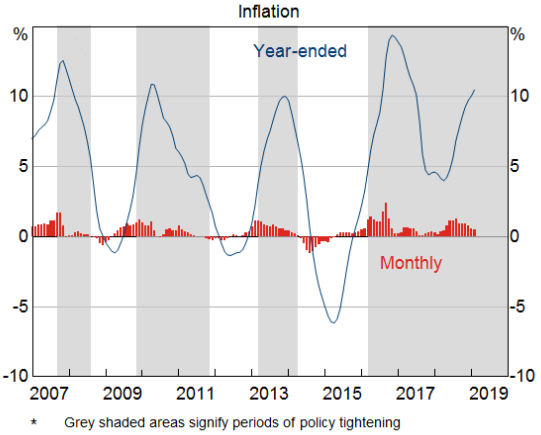
on housing purchases and related borrowing to control rapid increases in prices. In each episode, restrictions were placed on the number of apartments households could purchase. These restrictions were often linked to households' residency status (or *hukou*) in the locations where they intended to purchase property. For example, the number of home purchases would be determined by a household's possession of local residency or other evidence of long-term residence, such as documentation of local tax payments. Authorities also introduced higher mortgage rates and lower loan-to-value ratio (LVRs) (higher down payment) requirements for investment or second home purchases to dampen speculative demand, which was broadly defined as purchases for investment rather than use.[1] The government also attached minimum ownership periods of two to five years before the property could be resold, to disincentivise speculative purchases (Wang 2017, Deng and Zheng 2018).

Typically, when it became clear that tighter policies were weighing too heavily on prices and construction activity, the authorities responded by raising LVRs, introducing mortgage rate discounts and increasing tax exemptions to stimulate construction activity. This approach is illustrated by the 2014–16 episode, which initially recorded a sharp fall in property prices followed by a strong recovery. In response to lower prices, persistent falls in sales and a large stock of unsold housing that had accumulated following earlier construction booms, a large number of smaller ('second-tier' and 'third-tier') cities eased mortgage requirements and housing purchase restrictions in 2014.[2] In March 2015, the People's Bank of China announced a national easing in lending policies for housing purchases (PBC 2015). As a result, sales recovered strongly (Graph 2). The rebound was augmented by the introduction of more direct policies to support purchases, such as subsidies for home buyers in some smaller cities. In many small cities, the rebound was also supported by strong demand from investors, due to the lack of *hukou*-based restrictions on purchasing property in these locations. Sales in second- and third-tier cities strengthened further after the stock market crash in mid 2015 and into late 2015 when capital controls were tightened; down payment requirements were eased further at this time. This easing over 2015 also successfully reduced the stock of unsold housing.

Periodic tightening and loosening episodes have had a pronounced effect on Chinese residential fixed asset investment. These policy cycles have also had non-trivial effects on GDP growth in China due to the wide range of upstream and downstream industries that facilitate construction and sales (including steel, cement, glass, household fittings and financial services related to housing). Extending earlier research by Xu *et al* (2015), which exploits input-output tables provided by China's National Bureau of Statistics, we estimate the upstream and downstream contribution to GDP growth of real estate (including both residential and commercial)

**Graph 1**

**China – New Residential Property Prices**



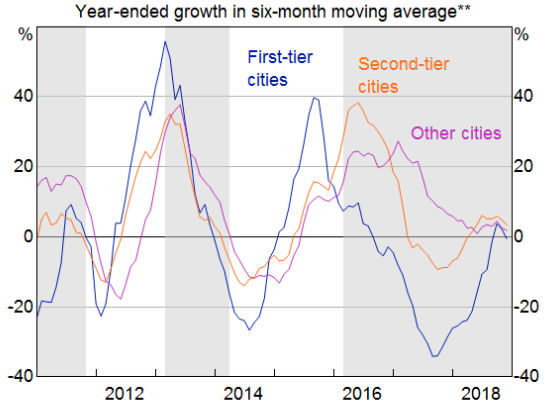

* Grey shaded areas signify periods of policy tightening

Sources: CEIC Data; RBA

**Graph 2**

**China – Residential Floor Space Sold***

Year-ended growth in six-month moving average**




* Grey shaded areas signify periods of policy tightening

** Seasonally adjusted

Sources: CEIC Data; RBA

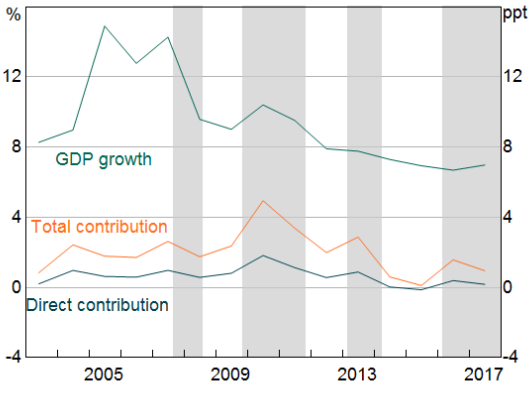
investment.[3] Combining the direct and indirect effects of real estate investment on activity, our estimates suggest that, on average, from 2003 to 2017 real estate investment contributed 2 percentage points to GDP growth – that is, just over one-fifth of the average increase in real GDP (Graph 3).[4] This contribution peaked following the government's policy stimulus in response to the global financial crisis; real estate investment accounted for almost half of GDP growth in 2010. In other periods, fluctuations in the contribution of real estate investment to GDP growth have also been broadly aligned with major changes in government policies affecting the residential property market, albeit to a lesser extent.

These sizeable real effects of policies towards the housing market underscore the importance of understanding these policies when considering the outlook for Chinese growth, steel production and demand for Australia's bulk commodities. In light of this, in the next two sections we explore recent changes in Chinese Government policies with respect to the housing market. First, we consider how the policy approach adopted by authorities since 2016 to control residential property demand and prices has affected market outcomes and how these trends have differed across different-sized cities. Second, we discuss progress made on longer-term supply-side policies and their implications for Chinese investment and growth.

**Graph 3**

**China – Real GDP Growth**

Real estate investment contribution




* Grey shaded areas signify periods of policy tightening

Sources: CEIC Data; NBS; RBA

## The 2016 Policy Tightening and Its Effects

The most recent episode in housing market conditions can be distinguished from previous ones because property price inflation has persisted, especially in medium-sized and smaller cities, despite these cities also having introduced a large number of house purchase restrictions and tightened LVR requirements. By 2016, housing price inflation had risen sharply, and authorities had grown concerned about property price 'bubbles', a sharp increase in leveraged purchases of property, and related risks to financial stability. In response, in early 2016, local authorities began tightening policies again, progressively announcing more measures as housing price inflation persisted. Required down payments reached 80 per cent of the purchase price in certain locations. Many cities also introduced policies that restricted purchasers of new properties from reselling within two or three years (depending on the city) to limit 'speculative' purchases (Zhang 2017). The Reserve Bank of Australia's (RBA's) liaison contacts in China reported that real estate agents and developers in some cities were instructed to impose price ceilings (or 'price caps') on sales, and that authorities could shut down the business of developers or real estate agents in breach of these requirements.

Policymakers' resolve to tame property price inflation did not waver even when the largest ('first-tier') cities experienced much weaker sales growth and prices began to decline in late 2017 and early 2018 (Graph 4). Tightening policies have now been implemented in more than 100 cities that collectively account for the majority of the urban population; some commentators have claimed that the current tightening episode is the most stringent in history (Xinhua 2018)

It is likely that the continued steady rise of property prices, despite the restrictions, partly reflects the fact that tightening measures in the current episode have been highly tailored to local conditions and have been implemented in several waves. This has arguably given local governments more flexibility to avoid the sharp falls in prices observed in some earlier tightening episodes because they could tighten measures incrementally. In fact, in first-tier cities, inflation in property prices is likely to have

been stronger than suggested by the data due to innovations such as the use of 'yin yang contracts' – secondary supplementary contracts between vendors and buyers that effectively evade price caps imposed by local governments.[5] More generally, persistent inflation in housing prices has been supported by a combination of strong investor and owner-occupier demand and relatively tight housing supply.

Part of the explanation for continued strong demand in medium-sized and smaller cities is that many are close to clusters of industrial activity, are relatively affordable (compared to the first-tier cities) and are seen as having significant potential for future inflation in property prices. Recent liaison in China by the Bank has highlighted that cities earmarked as being within major planned 'city clusters' (e.g. in the Pearl River Delta, the Yangtze River Delta, and the Beijing-Tianjin-Hebei area) have attracted particularly strong investor and owner-occupier interest and are widely expected to see further rapid property price inflation over the coming decade. Owner-occupier housing purchases have also been supported by continued population inflows from rural (and other urban) areas, cash subsidies provided under social housing programs to eligible households, and low mortgage interest rates (Wang and Zhao 2018).

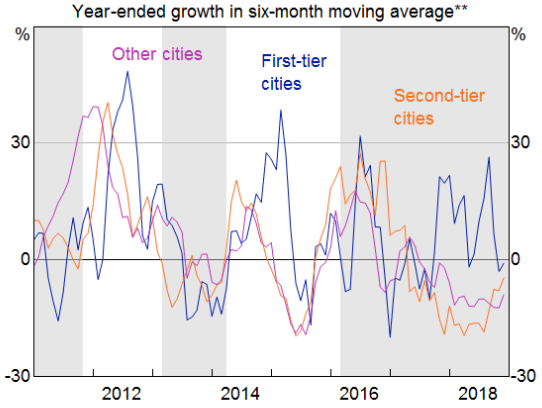
New housing supply has also been slow to come on line in these second- and lower-tier cities. The relatively slow increase in supply compared to past episodes is consistent with a fall in construction activity in some areas (Graph 5).[6] Liaison contacts have reported that developers have pushed out construction time frames in the hope that completions will ultimately occur in future periods when price caps may be removed. Indeed, growth in developers' expenditure on construction has fallen noticeably in the most recent housing market episode, despite ongoing growth in land sales for new residential plots (Graph 6).[7]The slowdown in developers' activity is partly due to financing pressure faced by real estate developers (due to slower growth in sales receipts) and reduced access to 'shadow' financing channels due to the nationwide crackdown on non-bank financial intermediation.

The government's reluctance to initiate a blanket easing of property market policies over the past

**Graph 5**

**China – Residential Floor Space Completed***

Year-ended growth in six-month moving average**

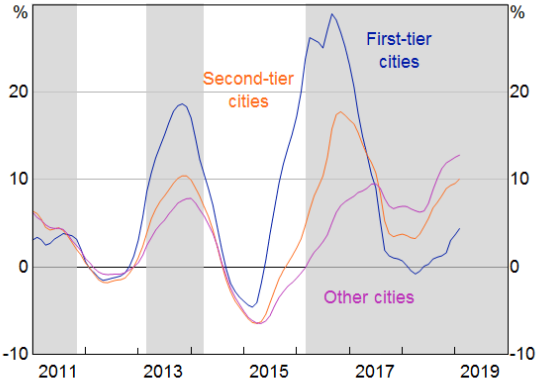



* Grey shaded areas signify periods of policy tightening
** Seasonally adjusted
Sources: CEIC Data; RBA

**Graph 4**

**China – New Residential Property Prices***

Index growth

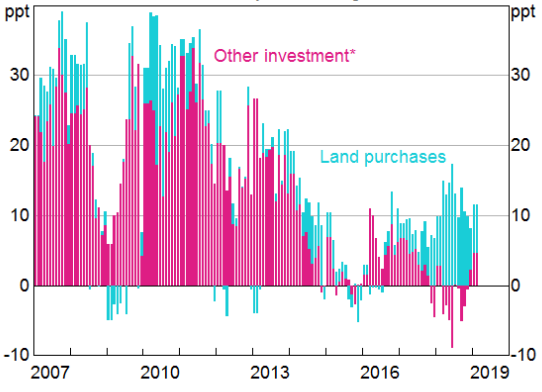



* Grey shaded areas signify periods of policy tightening
Sources: CEIC Data; RBA

**Graph 6**

**China – Real Estate Investment**

Contribution to year-ended growth




* Construction, installation, equipment purchases and other
Sources: CEIC Data; RBA

year, despite softer economic growth, demonstrates increased willingness to reduce China's dependence on the real estate industry as an engine of growth. This aligns with the government's longer-term goals of preventing the build-up of financial risks in the property market (for example, due to leveraged housing purchases) and fostering a rebalancing of GDP growth away from investment. A related aim is to reduce local government dependence on revenues from sales of land use rights, partly through broader taxation reforms such as the planned introduction of a national annual tax based on the value of a property (Wan and Xie 2017).[8] The tight policy stance towards the property market is underscored by President Xi Jinping's repeated emphasis that 'housing is for living in and not for speculation' (Xi 2014). A shift in impetus away from using property sector policies to achieve macroeconomic objectives is also illustrated by the regulatory tightening of financing to developers. This crackdown, combined with slower sales receipts due to house purchase restrictions, has led to a noticeable consolidation in the industry; in 2018, the top 30 developers accounted for more than 30 per cent of sales volumes, up from 8 per cent in 2010.

Nonetheless, pressure on the authorities to relax some of the constraints on the property sector is increasing as downside risks to broader economic conditions mount. To date, there have been isolated reports of smaller cities and specific districts within larger cities offering interest rates below benchmark rates and some house purchase restrictions being eased slightly (Liu 2018 and Wang and Jia 2018). However, in recent months the central government has continued to emphasise its commitment to limiting market speculation and reducing the economy's reliance on the real estate sector (MOHURD 2018, Wang 2019). So far, most policies announced to support economic activity have focused on consumption and infrastructure investment rather than stimulating the property sector.

## Longer-term Efforts to Build a Sustainable Housing Market

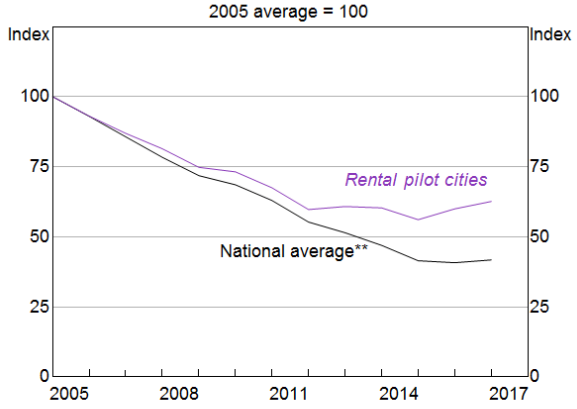
Taken at face value, the case for further significant policy-driven increases in housing supply in China is not obvious. Home ownership rates in China are relatively high by international standards. Academic estimates suggest that 80–90 per cent of the population in China already own a residential property (Yang and Chen 2014, Deng *et al* 2014).[9] In other countries, home ownership rates vary significantly, although many lie in the 60–80 per cent range (RBA 2015).[10] Moreover, simple metrics such as price-to-income ratios suggest that housing affordability in China has improved over the past decade, as rapid property price inflation has been outpaced by even stronger growth in household incomes (Graph 7). Nonetheless, Chinese policy-makers have been deeply concerned about the affordability of, and access to, housing that is of a reasonable quality. This reflects concerns that a lot of housing is dilapidated or does not meet basic safety standards. It also reflects concerns about the income distribution, particularly in some of China's largest cities, where affordability has plateaued; these issues are especially acute in some of the cities that have been designated as 'rental pilot cities' (discussed in detail below).

A number of issues have driven these concerns. First, a large number of households own or reside in lower-quality housing (or 'shantytowns'). Second, significant income disparities within China mean

**Graph 7**

**China – Price to Income Ratio***

2005 average = 100




* Urban Income
** National average excluding rental pilot cities
Sources: CEIC Data; CRIC; RBA

that measured aggregate affordability ratios are unlikely to reflect the constraints or distributional issues faced by millions of households. In particular, housing is likely to be less affordable for rural-to-urban migrant workers because available data suggest that migrant workers' annual wages are only two-thirds of the national average. Housing purchase restrictions also typically impose more onerous restrictions on migrant workers, and these workers lack equal access to public rental housing. The fact that home ownership is high reflects the fact that many people own properties where they were born (often former public housing that was sold at a heavy discount to tenants during the 1990s housing reforms), but not necessarily in the cities where they live and work. Another issue is that the lack of affordable and accessible housing is especially acute for younger households (Yang and Chen 2014). Meanwhile, in an environment where housing prices have consistently risen faster than the value of other financial assets, higher income earners have had an incentive to undertake speculative investments in properties in smaller cities (many of which have not had strict *hukou*-based purchasing restrictions in place until recently), which has put upward pressure on prices in those cities.

To address these affordability and inequality concerns, Chinese authorities have spearheaded several initiatives in the past five years to foster a targeted increase in housing supply and improve its composition. These initiatives have significantly boosted real estate investment. One key initiative is the 'shantytown redevelopment program', which aims to reduce the number of people living in poorer-quality housing in less-developed areas and 'rustbelt' cities. Another initiative is the 'rental pilot cities' program, under which the government has announced a number of policies to boost the supply of public and private rental housing.[11] Rental programs seek to provide good quality, stable and safe rental accommodation in some of China's largest cities, where affordability has not improved in recent years, especially for new migrant workers (both from rural areas and other cities) and college graduates.

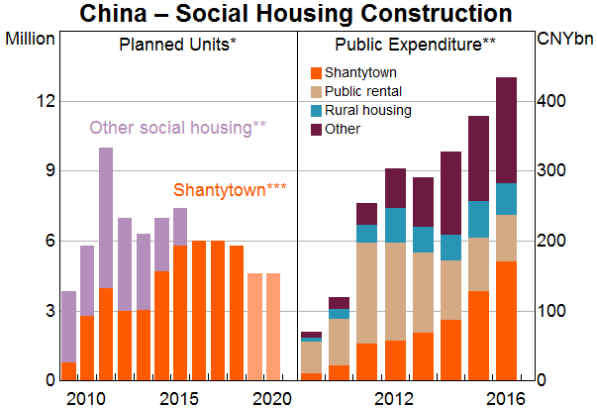
## The shantytown redevelopment program

Redeveloping shantytowns has been the primary contributor to overall growth in social housing construction in recent years (Graph 8). Chinese authorities define 'shantytowns' as areas with high density simple structures, with poor functionality, limited access to infrastructure, and safety risks; these areas were mainly populated by older and lower-income groups (MOHURD 2013). Initially China's shantytowns were located near heavy industrial areas (such as coal mines) because they were constructed in the early stages of China's development to house workers from other regions. But, over time, they became more widely distributed (MOHURD 2010). Estimates by the Chinese Government suggest that investment in shantytown redevelopment alone added 0.2 percentage points per annum to GDP growth between 2015 and 2017 (State Council 2015). Using investment data from the National Audit Office, and applying the same input-output table-based method used above, we arrive at a similar estimate.

The shantytown program has also contributed directly to strong housing demand growth in recent years. Eligible existing residents are either offered a better quality, reconstructed home in place of their old home, or given cash-based compensation that can be used to purchase new housing from the market. From 2014, the government increased the use of cash-based compensation, which rose from 9 per cent of total (cash and in-kind) compensation in 2014 to 48.5 per cent in 2016 (State Council

**Graph 8**

**China – Social Housing Construction**




* Planned units includes household units and individual apartments
** Data not available from 2016
*** Completions and planned quantities have historically alligned
Sources: RBA; WIND information

2018a). However, analysis of survey data by the China Household Finance Survey and Research Center suggests that only 20 per cent of households receiving monetary compensation over 2013–17 used it to repurchase a primary residence for occupation. Instead, more than half of households surveyed were reported to have used it to buy secondary (or additional investment) properties.[12] In other cases payments were reportedly used to support consumption, purchase financial assets, or pay down household debts.

The shantytown redevelopment program is due to be completed in 2020, which, all else being equal, will reduce future growth in real estate investment. Announcements in late 2018 indicated that remaining investment under the program would become more targeted, partly reflecting concerns that public funding intended to help resettle impoverished families has been poorly directed in some cases (State Council 2018c).[13] To better target investment under the program, the central government has directed local governments in parts of the country with low developer inventories to replace compensation payments with in-kind compensation (in the form of a replacement dwelling) (State Council 2018b).[14] While the government has foreshadowed a slight further acceleration in shantytown reconstruction in the very near term, there are currently no plans to significantly broaden or extend the program. Authorities have emphasised that they are seeking to deliver a 'multifunctional' housing market that also encompasses alternatives to owning property.

## Boosting the supply of rental housing

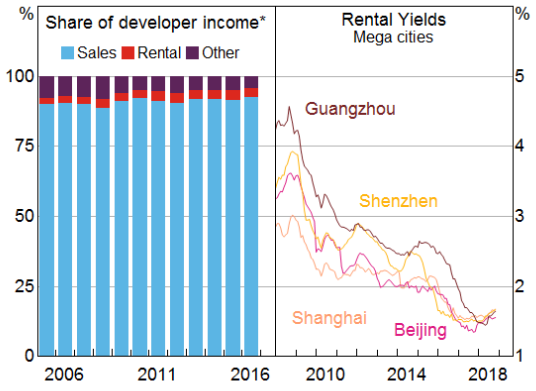
Another key agenda item for the Chinese Government is to improve the volume and quality of rental housing. Only around 5–10 per cent of China's housing stock is estimated to be rented (Deng *et al* 2014, Peppercorn and Taffin 2014). This is low compared to many other developing and advanced economies. The small private share of the rental housing stock in part reflects the fact that until recently there have been limited market incentives for real estate developers to construct and manage rental housing themselves. Low rental yields in large cities have made cost recovery difficult and the boom in property prices has further incentivised developers to focus on sales, which have accounted for the bulk of developers' income in the past decade (Graph 9).

In January 2017, 13 cities – mainly first-tier cities and provincial capitals located around the coastal fringe and clustered around first-tier cities – were designated as 'rental pilot cities' by the central government. This designation means that these cities now have obligations to the central government to accelerate development of their rental markets by 2020. Most of the official pilot cities announced are among China's most populous cities and all of these cities have tightened access to housing purchases over the past three years. Specific policies to deliver on these obligations are being determined and implemented at the city level. As such, policies vary by city, allowing them to be calibrated to local needs (Table A1 compares key policies by pilot city). Designated cities submitted pilot plans to the Ministry of Land and Resources and the Ministry of Housing and Urban Construction in 2017 and the implementation of these pilots will be reviewed at the end of 2020. More recently, an additional five second-tier cities have also been slated to develop rental programs (Du 2019).

The rental pilot program will support investment in coming years, but by how much is uncertain. A couple of the rental pilot cities included targets for the number of unit completions in their pilot plans, but these ranged from 20,000 to close to 200,000, and most cities did not include specific numbers.

**Graph 9**

**China – Rental Market Indicators**




* Real estate industry income, 35 city

Sources: CEIC Data; RBA; WIND Information

Some local governments are using their control over land supply to achieve these targets. For example, in Guangzhou, Fuzhou, Xiamen and Hangzhou, around 25–30 per cent of land releases for new housing are to be demarcated for rental purposes only. Some other cities, such as Hefei, are dedicating around one-sixth of new housing to rental accommodation. In some instances, conditional price ceilings at land auctions have been imposed to foster growth in the supply of rental housing. Liaison by the Bank suggests that when bidding reaches 1.7 times the starting bid, the auction is terminated and the purchaser is forced to hold the land and prohibited from reselling apartments built on the land for up to 70 years. In response to these 'bid caps', developers have an incentive to increase the share of their developments devoted to rental properties in an attempt to make their bid more attractive to local authorities.

Authorities are also facilitating rezoning of underutilised land to contribute to the supply of rental properties. In their pilot plans, the majority of local governments announced that developers and state-owned enterprises would be permitted to convert idle or underutilised factories and commercial spaces into rental housing.[15] While these conversions will contribute to investment and construction activity, they are unlikely to be as steel-intensive as newly built apartments. In addition, developers that have large stocks of unsold residential property designated for private sale in second-tier cities are being encouraged to repurpose these properties as rental housing, which seems unlikely to make much, if any, contribution to construction activity.

Authorities are also trying to take advantage of China's well-developed e-commerce infrastructure and related 'big data' sets to reduce information asymmetries. One of the obstacles new measures are seeking to overcome is that much of the rental market to date has been informal and fractured. As a result, large companies are now being enlisted to create more centralised online rental markets. Large online portals for rental listings (including listing property features and prices) are being launched, which also include information on landlord and tenant ratings histories. Property managers are working with large e-commerce providers to use digital wallet credit scores (based on shopping data) to identify creditworthy renters; in some cases those with good credit scores will also have the typical deposit requirement of three months' rent waived. Several of China's largest banks have also launched products that will see renters granted loans to help them make the upfront payments necessary to secure longer-term leases (some reports suggest previous leases may have had to be renewed every three to six months).[16]

A separate group of initiatives seeks to encourage growth in the private rental stock by incentivising individual landlords to put their second or third properties (i.e. investment properties) on the rental market. Reforms include proposals to reduce taxes on rental income and to remove restrictions on homeowners' use of unoccupied properties.[17] However, the time frame for implementation of these measures remains uncertain and it is not clear they will be sufficient to incentivise owners to start renting out their properties. Most city-level plans identify, as a priority, development of additional large-scale leasing enterprises to professionally manage affordable properties to help accelerate development of rental markets and formalise rental arrangements.[18]

## Conclusion: The Outlook for China's Property Markets

As in the recent past, future trends in China's property markets are likely to be strongly conditioned by the evolution of policies towards the housing sector. If the authorities succeed in simultaneously maintaining relatively tight demand-side policies, while delivering on the government's social housing objectives, this would fulfil President Xi's aspiration that housing should be 'for living in and not for speculation'. Indeed, the current mix of tight demand-side policies and accommodative medium-to-longer-term supply-side measures should, in principle, help moderate price growth and deliver better access to housing for people who are constrained from buying their own home.

However, the authorities face a challenging policy dilemma. The strong influence of property market

conditions on overall GDP growth implies that, if the current policy mix continues to deliver weak construction activity, policymakers will face incentives to ease restrictions on housing markets. This is especially the case when GDP growth is already slowing because of tighter financial regulation, as well as longer-term structural factors such as a declining working age population. At the same time, the fact that property prices have continued to rise relatively quickly in mid-sized and smaller cities, despite an unprecedented tightening of demand-side controls on purchases, means that any policy easing would increase the risk of prices picking up further, and reducing affordability.

The forthcoming phasing out of the shantytown redevelopment program, the uncertain scale of construction of new rental housing, tight financing conditions for developers, and the central government's strong resolve to maintain restrictions on home purchases despite softer economic growth over the past year, all add uncertainty to the outlook for real estate investment. If housing purchase restrictions remain in place for a protracted period, or if construction of rental dwellings falls short of expectations, the risk of a marked slowdown in real estate investment will increase. This would have wider implications for the Chinese economy and for Australian exports, particularly iron ore and metallurgical coal exports.

## Appendix A

**Table A1: Key Features of Rental Pilot City Plans**

As submitted by November 2017

| | Beijing | Chengdu | Foshan | Guangzhou | Hangzhou | Hefei | Nanjing |
|---|---|---|---|---|---|---|---|
| Minimum land release requirements | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Permitting conversion of retail, office and industrial properties | | | ✔ | ✔ | | ✔ | ✔ |
| Encourages residential inventory reduction through conversions | | ✔ | ✔ | | | | ✔ |
| Marketisation of public rental units[(a)] | | ✔ | ✔ | ✔ | ✔ | ✔ | |
| Preferential access for young graduates to rental accommodation | | | ✔ | ✔ | ✔ | ✔ | |
| Enhancing renters legal rights | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Formalising collective land leasing arrangements | ✔ | | | | ✔ | ✔ | ✔ |

| | Shanghai | Shenyang | Wuhan | Xiamen | Zhaoqing | Zhengzhou |
|---|---|---|---|---|---|---|
| Minimum land release requirements | ✔ | ✔ | | ✔ | ✔ | |
| Permitting conversion of retail, office and industrial properties | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Encourages residential inventory reduction through conversions | | ✔ | | ✔ | ✔ | ✔ |
| Marketisation of public rental units | | ✔ | ✔ | | | ✔ |
| Preferential access for young graduates to rental accommodation | ✔ | ✔ | ✔ | | | ✔ |
| Enhancing renters legal rights | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Formalising collective land leasing arrangements | ✔ | | | | | ✔ |

(a) Policies include introducing more market-based rates for rental properties and converting some public rental housing

Sources: Local government policy documents

## Footnotes

[*] The authors are from Economic Group.

[1] While not new, over recent years the Chinese Communist Party has frequently emphasised that the availability of adequate basic housing is a high priority, through repetition of the slogan that 'housing is for living and not for speculation'. President Xi's view on residential housing topic was outlined in a speech in October 2013 (Xi 2014).

[2] China's cites are commonly (although not officially) referred to by hierarchical groupings of 'first-tier' cities (Beijing, Guangzhou, Shanghai and Shenzhen, or 'mega' cities), 'second-tier' cities (the capital cities of China's provinces, 'medium sized' cities), and 'third-tier' and below cities ('smaller cities', which typically are less developed and have smaller populations).

[3] The approach involves applying the 'Leontief inverse' method (Miller and Blair 1985) to individual official input-output tables for 2002, 2005, 2007, 2010, 2012 combined with annual estimates of real residential gross capital formation derived using the approach of Ma, Roberts and Kelly (2016). Estimates for unobserved years are produced using linear interpolation. Investment in commercial property has, on average, accounted for around one-third of real estate investment over the past decade.

[4] The indirect effects on services activity have been substantial at times. For example, growth in financial

services arising from housing investment contributed almost half as much value added as industrial and consumer goods manufacturing in 2016.

[5] Liaison conducted by the Bank suggests that these supplementary contracts could be worth around 40 per cent of the 'real price' (which is not captured by price data). While 'yin yang contracts' are thought to have been most pervasive in first-tier cities, liaison conducted by the Bank suggests that their use has spread to some of the capital cities of provinces throughout China in the most recent episode.

[6] The fairly sharp recovery in inventories in first-tier cities from mid 2017 follows some urging from local authorities for progress to be made on projects (Beijing Municipal Commission of Housing and Urban-Rural Development 2017b).

[7] While this measure also includes developers' investment expenditure on commercial property, more than two-thirds is related to residential property.

[8] Following the 19th National Congress of the Chinese Communist Party in 2017, Finance Minister Xiao Jie published an op-ed article suggesting that China's long-awaited national property tax (which has been under development for several years) could be implemented by 2020. However, uncertainty remains as to the date of introduction and the design of the tax (e.g. the rate at which properties will be taxed).

[9] In recent years the Chinese government has been building a land title registry to record actual ownership holdings for both primary residences and investment properties, which will generate more precise ownership rates and support introduction of a national property tax.

[10] Land 'ownership' is complicated in China with the use rights attached to titles varying between rural and urban residents, meaning that cross-country comparisons are, however, not strictly equivalent.

[11] Previous policies have primarily focused on public (i.e. government subsidised) rental housing (Yang and Chen 2014 and Deng *et al* 2014).

[12] Many others are thought to have used these compensation payments to supplement income and fund consumption over this period (Gan 2018).

[13] Since 2007, local governments have also financed public housing with proceeds from land sales (Yang and Chen 2014).

[14] Central authorities also emphasised the need for more careful fiscal planning at the local level to support the program, and authorised the use of local government 'special bond' issuance to help fund the rest of the program.

[15] In Guangzhou, it was foreshadowed that converted properties would be subject to restrictions on their resale (General Office of Guangzhou Municipal People's Government 2017).

[16] For example, in November 2017, China Construction Bank began granting loans of up to CNY1 million so that renters could make one-off down payments of several years' worth of rent to secure multi-year leases (China Construction Bank 2018).

[17] Previous liaison conducted by the Bank in China suggests that, generally, rental income taxes vary by city but in some cases the rate is close to 20 per cent, including income, business and value added taxes (VAT). The taxation bureaus in some cities have lowered the VAT on rental income from 5 per cent to 1.5 per cent for individual landlords with rental income less than CNY30,000 per month. Professionally managed rental intermediary services will also be able to apply lower VAT rates on rental income. Introduction of national annual tax based on the value of a property may further encourage owners to rent out empty properties.

[18] Some of these leasing companies are to be state-owned enterprises and in other cases subsidiaries of property developers, although several cities also explicitly note that small and medium-sized professional property managers would also be beneficial. A few cities have included minimum targets for the number of leasing companies.

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