

# Bulletin

MARCH 2020



RESERVE BANK OF AUSTRALIA



## Contents

1. Two Years of Fast Payments in Australia	1
2. Consumer Payment Behaviour in Australia	9
3. The Cost of Card Payments for Merchants	20
4. Developments in Banks' Funding Costs and Lending Rates	29
5. Renewable Energy Investment in Australia	36
6. The Road to Australian Dollar Funding	47
7. Regional Variation in Economic Conditions	60
8. Demographic Trends, Household Finances and Spending	69

The *Bulletin* is published under the direction of the Bulletin Editorial Committee: Luci Ellis (Chair), Andrea Brischetto, Ellis Connolly, Darren Flood, Judy Hitchen, Carl Schwartz and Paula Drew (Secretary).

The *Bulletin* is published quarterly in March, June, September and December and is available at [www.rba.gov.au](http://www.rba.gov.au). The next *Bulletin* is due for release on 18 June 2020.

The graphs in this publication were generated using Mathematica.

The contents of this publication shall not be reproduced, sold or distributed without the prior consent of the Reserve Bank and, where applicable, the prior consent of the external source concerned. Requests for consent should be sent to the Secretary of the Bank at:

Secretary's Department  
Tel: +61 2 9551 8111  
Email: [rbainfo@rba.gov.au](mailto:rbainfo@rba.gov.au)

ISSN 1837-7211 (Online)

# Two Years of Fast Payments in Australia

Emilie Fitzgerald and Alexandra Rush<sup>[\*]</sup>



Photo: Sarinya Pinngam – Getty Images

## Abstract

It has been two years since the public launch of the New Payments Platform (NPP) and the Fast Settlement Service (FSS). Together, the NPP and FSS now enable customers of more than 90 financial institutions to make fast payments 24 hours a day, every day of the week ('24/7'). Customers can send detailed information with a payment and nominate the payment recipient in a simple way. While the rollout of the NPP has been gradual, usage grew rapidly over the second half of 2019 and compares favourably with other successful fast payment systems introduced overseas. With a range of new functionality under development, the NPP and FSS are well placed to deliver innovative new payment services to support the Australian economy into the future.

## Introduction

The NPP is a new payment system infrastructure designed primarily for retail payments, which was developed and is owned by NPP Australia Limited (NPPA).<sup>[1]</sup> It allows consumers, businesses and Australian government agencies to make fast, data-rich payments 24 hours a day, every day of the year. NPP payments made between customers of different financial institutions are settled finally and irrevocably in real time in central bank funds through the FSS, a settlement system built by the Reserve Bank of Australia (RBA). This allows institutions to make funds available in recipients'

accounts immediately without settlement or credit risk, whereas funds for other types of retail payments such as cheques, cards and the direct entry (DE) system (which includes direct debits and some 'pay anyone' transactions) may take hours or days to be made available. Between its public launch on 13 February 2018 and the end of January 2020, the NPP processed around 384 million payments, totalling \$344 billion.

This article reviews the use of the NPP and FSS during the first two years of fast payments in Australia. It complements an earlier article explaining the payment process and infrastructure

behind the NPP and FSS (see Rush and Louw (2018)). The article examines the growth of the NPP, the types of payments being made and the payment patterns that have evolved. It also looks at the impact of the NPP and FSS on the operations of the payments industry, including how they have affected settlement liquidity and resiliency, and discusses the roadmap for future developments.

### How is the NPP being used?

The NPP is designed to allow different payment services to use and build upon the basic platform infrastructure. Osko, the first payment 'overlay' to come into service, allows customers of participating financial institutions to make immediate payments from their accounts to customers of other participating institutions.<sup>[2]</sup> The Osko service specifies that funds should be transferred from the payer to the receiver in under one minute on a 24/7 basis, along with a payment description of up to 280 characters. Participating financial institutions typically enable customers to make Osko payments through their online banking portal or mobile phone banking application – in a similar way to traditional 'pay anyone' payments. Many financial institutions are re-routing traditional 'pay anyone' payments addressed to a BSB and account number through the NPP, so that these payments are now also processed individually in real time.<sup>[3]</sup> Many customers may not be aware that many or all of the 'pay anyone' payments they are making are now being processed by the NPP through the Osko service.

While most NPP payments are Osko payments (Graph 1), some financial institutions are also sending 'single credit transfers' through the NPP Basic Infrastructure. Single credit transfers are NPP messages that utilise the NPP Basic Infrastructure's ability to make a payment with real-time settlement between financial institutions; however, unlike a payment made through an overlay service, they do not include rules around how long it should take to make funds available in customers' accounts, specifications around the content of accompanying information or other arrangements such as information flows between financial institutions.

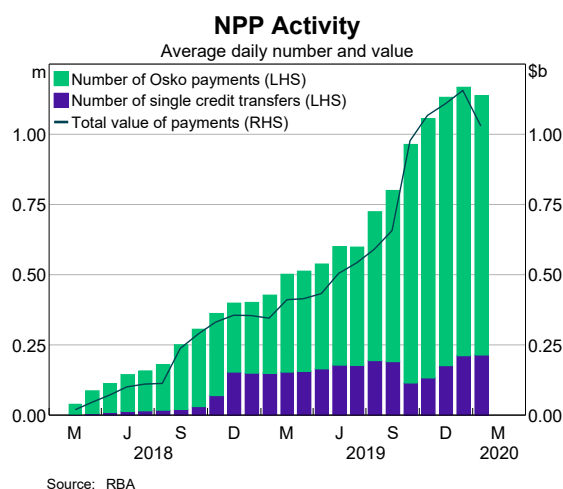
### How has use of the NPP grown?

Uptake of the NPP has been gradual as financial institutions have rolled out NPP payment functionality to different customer segments and channels. For example, some institutions prioritised the everyday transaction accounts of their retail customers before providing NPP services to business and corporate customer accounts. There were also delays by some financial institutions, including some major banks, in delivering core NPP functionality to customers. As the major banks completed their initial rollout activities, growth in NPP activity accelerated during the second half of 2019 and by the end of January 2020, the NPP was processing a daily average of more than 1.1 million payments worth \$1 billion.

### The NPP has performed well compared with overseas fast payment systems

Despite the slower-than-expected rollout to some customers, a comparison of per capita use of fast payment systems suggests that the adoption of the NPP in Australia is at least in line with other successful implementations (Graph 2). Two years after launch, monthly NPP volumes have grown to a rate that is equivalent to around 17 payments per capita per year, which is above that of the MobilePay (Denmark), Swish (Sweden) and FPS (UK) systems after a similar time frame.

**Graph 1**



## There is good coverage of participating financial institutions

At the time of the NPP's launch, fast payments were made available to customers of around 50 participating financial institutions. As at the end of January 2020, that number had grown to 91, comprising 12 'NPP participants' that clear and settle their transactions and 79 'identified institutions' that use one of the directly connected NPP participants to clear and settle payments on their behalf (see NPPA 2019a). The current NPP participants include the RBA, large and mid-sized banks as well as three directly connected authorised deposit-taking institution (ADI) payment service providers. The identified institutions are largely composed of smaller ADIs (banks, credit unions and building societies) and a few financial technology firms ('fintechs').

The three payment service providers specialise in clearing and settling payments on behalf of other institutions. Five other NPP participants, including some major banks, clear and settle a small proportion of their total payments on behalf of their brands and subsidiaries, or other financial institutions. In January 2020, around 20 per cent of the number (and 14 per cent by value) of payments settled in the FSS were made on behalf of identified institutions.

## The NPP reaches a significant portion of Australian customer accounts

Over the past two years, financial institutions (including both NPP participants and identified institutions) have made over 66 million customer accounts reachable by the NPP. This represents a significant portion of Australian customer accounts – equivalent to around 78 per cent of the accounts reachable by the 'pay anyone' DE system. It is expected that further accounts will be made reachable by financial institutions currently offering the service and as additional institutions launch fast payments to their customers.

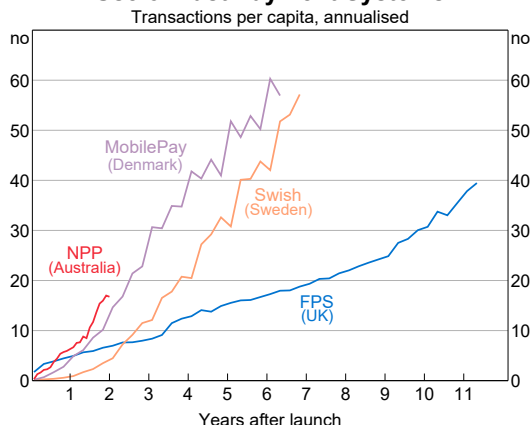
A key innovation provided by the NPP is the ability to address payments using a PayID, in addition to being able to use traditional bank account details (BSB and account number). Financial institutions allow their customers different choices of what can be used for a PayID, including their email address, phone number or ABN. At the end of January, consumers and businesses had registered more than 4.1 million PayIDs through their financial institutions (Graph 3).

## Where have NPP payments come from?

The growth of NPP reflects a shift in payment patterns as consumers, businesses and ADIs take advantage of the new technology. Since the introduction of the NPP in 2018, DE credit transfer payments have slowed noticeably from the long-term growth trend and have now begun to decline (Graph 4).<sup>[4]</sup> While factors such as changes in

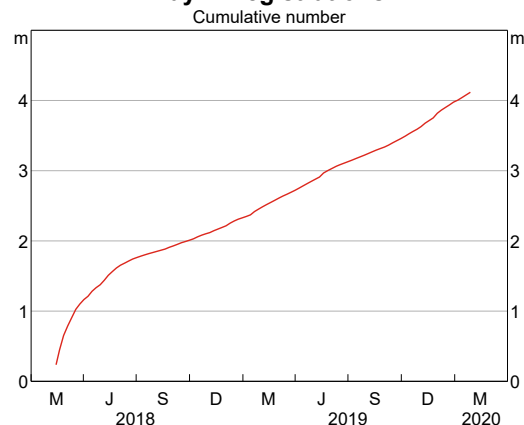
**Graph 2**

### Use of Fast Payment Systems



**Graph 3**

### PayID Registrations



economic activity and broader macroeconomic trends could potentially also be contributing to a decline in DE payments, card payments, which should be similarly affected by these economic factors, have not slowed. Accordingly, the slowdown in DE seems likely the result of financial institutions migrating some DE payments, such as ‘pay anyone’ transfers, to the NPP. We expect this migration from DE to continue as use of NPP continues to expand. However, DE is likely to continue to be used by businesses to make regular payments such as salaries and recurring bills until the equivalent functionality is available in the NPP.

It is likely that some NPP payments have also migrated from cash, cheques and the High Value Clearing System, although we are yet to see significant evidence of this and the effect of migration from the NPP may be difficult to isolate or measure in some of these payment methods.

### What can the FSS data tell us?

The FSS was developed and is operated by the RBA as a new service of the Reserve Bank Information and Transfer System (RITS). This is the system used by banks and other approved institutions to settle payment obligations between each other. Settlement in FSS occurs across the exchange settlement accounts (ESAs) held at the RBA by NPP participants, and is final and irrevocable. Currently around 74 per cent of payments made through the NPP are interbank payments that need to be settled between the NPP participants via the FSS. The

remaining 26 per cent are transactions between customers serviced by the same NPP participant (including customers of identified institutions using the same NPP participant to access the NPP) – sometimes referred to as ‘on-us’ transactions.

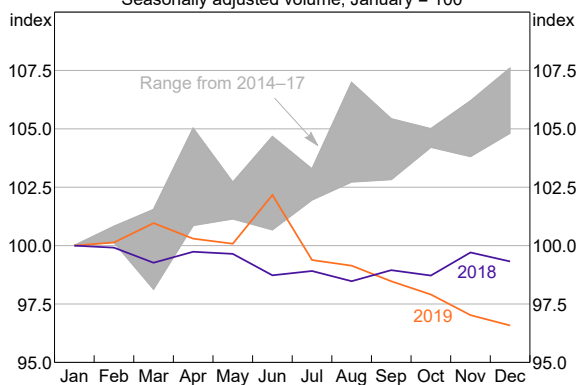
### NPP payments are typically low-value retail payments

In 2019, the median value of payments settled in the FSS was \$170, and 87 per cent of settlements were less than \$1,000 (Graph 5). This is consistent with one of the initial objectives of the Payments Systems Board: for the NPP to fill a gap in the provision of ‘retail payments’, which tend to be relatively low-value payments between consumers, businesses and government agencies (RBA 2012). This includes some uses of the NPP, such as for emergency government payments to individuals, including flood and bushfire emergency payments, with the benefit that these payments can be made and received immediately at any time.

While the median payment value has remained steady over the past two years, the average payment value has increased from around \$880 in 2018 to around \$940 in 2019. This likely reflects the gradual rollout of NPP to business and corporate customers, which tend to make higher-value payments. The largest payment to date of \$920 million (a government-related transaction) was settled in the FSS on 10 March 2020, accounting for nearly half of total FSS payment value settled on that day.

**Graph 4**

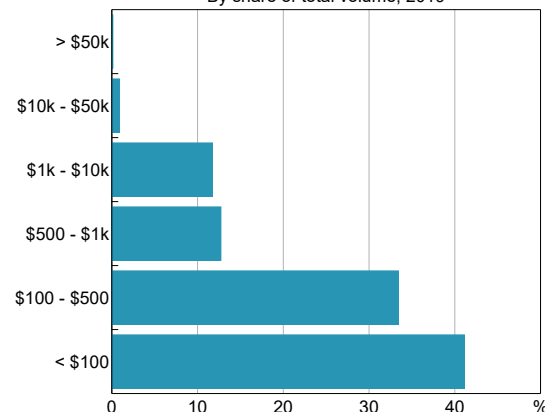
**Direct Entry Credit Transfers\***  
Seasonally adjusted volume, January = 100



\* DE credit transfers of tier 1 participants settled in RITS only.  
Source: RBA

**Graph 5**

**Value of FSS Transactions**  
By share of total volume, 2019



Source: RBA



### Larger payments are made during business hours but smaller payments continue through the evening

The value of FSS settlements is elevated on business days between 9.00 am and 5.00 pm, likely reflecting the higher values involved in business-related transactions (Graph 6). However, the number of payments stays elevated until around 9.00 pm, consistent with lower-value customer payments being made throughout the day and into the evening. An observed early morning uptick in activity may be from payments that have been instructed by customers to occur on a particular day and are scheduled by ADIs to occur at off-peak times. These patterns have remained broadly unchanged since the NPP’s public launch in February 2018.

This pattern of business-related versus consumer-related payments is particularly evident when looking at payment value bands. Payments over \$10,000 – more likely to be business-related – decline sharply just after 5.00 pm, while payments less than \$10,000 – more likely to be consumer-related payments – show a more gradual decrease later in the day (Graph 7).

### Payments peak on Wednesdays or Thursdays and drop on weekends and public holidays

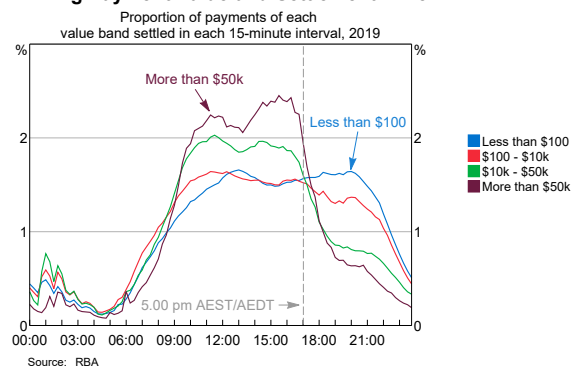
The volume of FSS settlements peaks mid week on Wednesdays and Thursdays, while the value of FSS settlements is more stable across the weekdays (Graph 8). Again, this likely reflects, at least in part,

the difference in business versus consumer payment patterns. Higher-value business payments are more stable through the week, whereas lower-value consumer payments are more concentrated mid week, including around salary days. Weekends tend to have around half of the level of weekday settlement activity, with values dropping off more than volumes, consistent with higher-value business payments being less prevalent on the weekend.

Public holidays show payment patterns that are very similar to weekends (Graph 9). Interestingly, there is no subsequent increase in settlement activity on the following business day, beyond what is considered ‘normal’ activity for those days of the week.

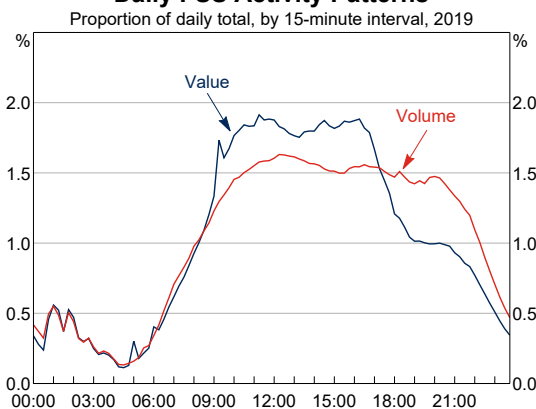
**Graph 7**

**Linking Payment Value and Settlement Time**



**Graph 6**

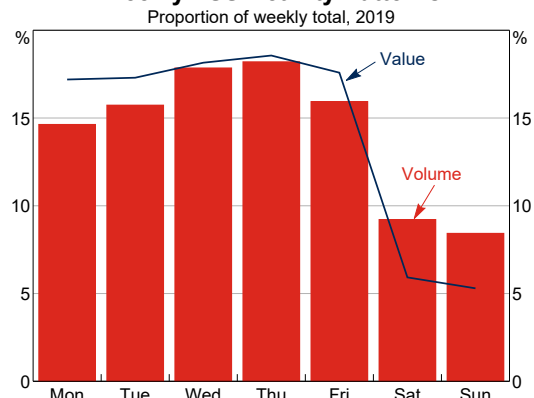
**Daily FSS Activity Patterns**



Source: RBA

**Graph 8**

**Weekly FSS Activity Patterns**



Source: RBA

## How have the NPP and FSS affected the operation of the payments system?

The NPP and FSS are complex new systems, involving real-time 24/7 operations with a very high number of transactions, which have required the RBA and financial institutions to make significant IT system enhancements and operational changes.

The NPP and FSS have been designed to high standards of resiliency, capacity and security. The RBA's availability target for the FSS is 99.995 per cent, equivalent to having a maximum of approximately 26 minutes per year when the system is unavailable to settle payments. This presents a number of challenges and has resulted in some operational changes in order to meet this target for the FSS: planned maintenance and upgrades to the FSS are carried out while the system remains in operation; the FSS is continuously monitored by the RBA's RITS Help Desk staff; and the FSS can be operated from two geographically diverse sites. Separately, in the design of the NPP Basic Infrastructure and the FSS, it was decided that in the case of a contingency event, the NPP will be able to continue processing payments for up to 12 hours without settlement, storing settlement requests until the FSS is available again, which allows customers to continue initiating payments even during contingency events.

FSS availability over 2018 was 99.961 per cent – slightly below target. This was largely due to a major operational incident that involved the loss of power to most of the RBA's Head Office IT systems on 30 August 2018. Following a full review of the

incident, a number of improvements have been made to critical infrastructure maintenance, system restoration and communications. In 2019, the FSS did not experience any downtime, meeting the target with an availability of 100 per cent.

Over the past two years, financial institutions participating in the NPP have also experienced incidents that have affected the availability of fast payments for their customers. These incidents have included software and hardware issues that have impacted connectivity to the NPP, as well as incidents involving mobile or internet banking services that customers use to make NPP payments. It is hoped that as participants learn lessons from these incidents and improve their technologies or processes, the number and duration of incidents will moderate over time.

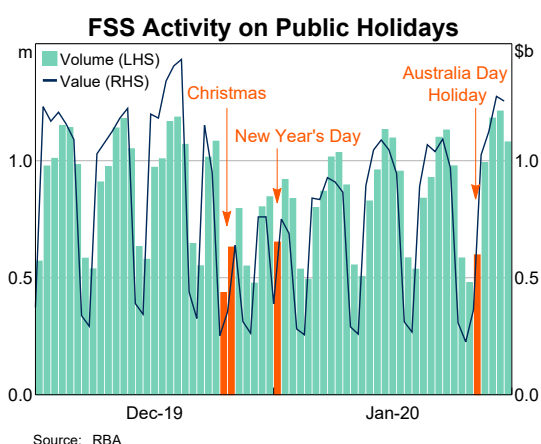
### Participants are managing their FSS liquidity well

Another important consideration for participants in the NPP is the management of their liquidity for settlement of transactions in the FSS. Participants that settle directly in the FSS designate a portion of their ESA funds to settle their FSS transactions, which is known as their FSS allocation. FSS settlements are credited or debited against this allocation.

Although individual institutions have different approaches to their liquidity management, all are holding ample liquidity to ensure smooth settlement of NPP transactions. In late 2019, in aggregate, institutions' FSS balances during RITS hours (07:30 – 22:00 on weekdays) were around double the average daily value of FSS settlements (Graph 10). The incoming payments of NPP participants also provide additional liquidity to fund outgoing payments throughout the day.

Outside of RITS hours, both overnight during the week and on weekends and public holidays, all of an institution's ESA funds are transferred to their FSS allocation. In aggregate, this increases the amount of funds available for FSS transactions to around \$24 billion. When RITS opens again, excess funds being held in the institution's FSS allocation are transferred back to its RITS allocation, based on pre-set parameters.

**Graph 9**



## Where to from here?

NPPA, the operator of the NPP, has developed a 'roadmap' for a wide range of new functionality that will enable innovative capabilities (see NPPA 2019b):

- NPPA has recently published an update of its Application Programming Interface (API) framework.<sup>[5]</sup> This follows the launch of an API sandbox by NPPA and SWIFT to allow fintechs and other third parties to test NPP capabilities.
- International Funds Transfer Instructions Service – NPPA recently introduced an optional service that will allow the domestic leg of an inbound cross-border payment to be made quickly and efficiently over the NPP.
- NPP message standards – NPPA has developed NPP message usage guidelines for payroll, tax, superannuation and e-invoicing payments that define the use of category purpose codes and specific data elements to be included in the payment message. NPP participants will be obliged to receive these NPP messages with additional defined data elements by December 2020.
- Mandated Payments Service – NPPA is also developing functionality to enable third-party initiation of payments on behalf of customers. The service will enable a third party to 'pull' payments from a customer to a business, including to pay recurring bills or subscriptions, which is comparable to existing direct debit

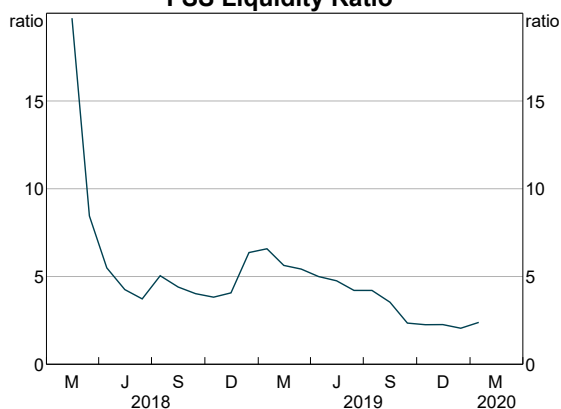
arrangements. Key principles are that the account holder's authorisation (consent) is required for payments to be made from their account, with the creation of a digital payment arrangement (mandate) in advance of payments being processed. The mandates will be held centrally, making it easier for customers to manage their third-party payments and to change banks. All participating financial institutions will be required to implement elements of this capability by December 2021, for rollout of services in early 2022.

- Basic Payment Initiation Service – In advance of the Mandated Payments Service, NPPA plans to implement a Basic Payment Initiation Service. The service will enable a third party to easily initiate a set of payments, potentially for distribution to multiple customer accounts. One possible use case for the service is for a payroll software provider to initiate payroll payments from a business to its employees. NPP participants will be able to opt in to this service, which will be available in October 2020.

Individual participants have also been developing capability in the areas of bulk payments, APIs and transaction value limits. A number of non-bank entities, such as payment service providers and technology companies, have started to develop and use NPP functionality. Examples include a service that enables employees to access their income in real time as they earn it, a service that allows businesses to efficiently process and validate customer payments in real time, and a rental management platform for owners to manage their property rentals without an agent. Over time, it is expected that fintechs and other payment service providers will be able to offer their customers new services that use the capabilities of the NPP infrastructure and a wider range of ways to make fast payments.

**Graph 10**

### FSS Liquidity Ratio\*



\* The liquidity ratio is the ratio of average daily aggregate FSS balances during RITS hours to average daily aggregate FSS settlement value during RITS hours.

Source: RBA

## Conclusions

The launch of the NPP was a significant advancement in the Australian payment system, providing fast, flexible and data-rich payments to support the needs of Australia's modern economy. In the two years since launch, the NPP and FSS have

delivered the capacity for customers of 91 institutions to make fast payments 24/7. Usage of NPP payments has grown significantly, with over 4.1 million PayIDs registered and an average of

1.1 million payments worth \$1 billion made per day in January 2020. With a range of functionality under development, the NPP is expected to continue to deliver new payment services and innovations. ✖

## Footnotes

- [\*] Emilie Fitzgerald is from Payments Settlements Department and Alexandra Rush contributed to this work while in Payments Settlements Department. The authors would like to thank Gabrielle De Freitas, Kasia Kopec, John Bagnall and Kylie Stewart for their help and suggestions.
- [1] NPPA is the company that was established by the RBA and 12 other participants to develop and operate the NPP as an industry utility.
- [2] 'Overlay services' are commercial payment services that use the NPP Basic Infrastructure's capabilities and can range from simple arrangements that involve setting industry standards to more complex payment solutions that implement new message flows or payment types between participants. Osko is a service developed by the payments platform BPAY.
- [3] In the past, these payments have usually been processed in batches via the DE system.
- [4] In the context of this article, DE credit transfers refer only to the interbank DE credit transfers of tier 1 participants settled in RITS.
- [5] In this context, an API sets out software protocols that can be used by third parties to communicate in a standardised and secure way with a financial institution's systems to access NPP functionality.

## References

- RBA (Reserve Bank of Australia) (2012), 'Strategic Review of Innovation in the Payments System: Conclusions', June. Available at <<http://www.rba.gov.au/payments-and-infrastructure/payments-system-regulation/past-regulatory-reviews/strategic-review-of-innovation-in-the-payments-system/conclusions/>>.
- Rush A and R Louw (2018), 'The New Payments Platform and Fast Settlement Service', RBA *Bulletin*, September, viewed 9 December 2019. Available at <<https://www.rba.gov.au/publications/bulletin/2018/sep/the-new-payments-platform-and-fast-settlement-service.html>>.
- NPPA (2019a), 'Accessing the New Payments Platform'. Available at <<https://nppa.com.au/wp-content/uploads/2019/11/Accessing-the-New-Payments-Platform-October-2019.pdf>>.
- NPPA (2019b), 'New Payments Platform Roadmap 2019', October. Available at <[https://nppa.com.au/wp-content/uploads/2019/10/NPP-Roadmap-2019\\_28-Oct-2019-final.pdf](https://nppa.com.au/wp-content/uploads/2019/10/NPP-Roadmap-2019_28-Oct-2019-final.pdf)>.

# Consumer Payment Behaviour in Australia

James Caddy, Luc Delaney, Chay Fisher and Clare Noone<sup>[\*]</sup>



Photo: Carolyn Hebbard – Getty Images

## Abstract

The Reserve Bank's 2019 Consumer Payments Survey has provided further evidence that Australian consumers are increasingly preferring to use electronic payment methods. Many people now tap their cards, or sometimes phones, for small purchases rather than paying in cash. Consumers also have an increasing range of options available for making everyday payments. Despite this, cash still accounts for a significant share of lower-value payments and a material proportion of the population continues to make many of their payments in cash.

## Introduction

The Bank undertook its fifth comprehensive survey of consumer payments in October and November 2019.<sup>[1]</sup> Participants in the Consumer Payments Survey (CPS) recorded details about every transaction they made in a week and provided extra information on their payment preferences and attitudes in a post-survey questionnaire.<sup>[2]</sup> The way in which Australians are making payments is changing and new payment methods are emerging, often enabled by mobile technology. Accordingly, the 2019 CPS asked participants to report more information than previously on their

use of newer electronic payment methods and channels, as well as in-depth information on their use of and attitudes towards cash. Around 1,100 people participated in the survey, recording around 13,500 consumer payments (see Box A: Details of the CPS).

The CPS showed that Australians are continuing to switch to electronic payment methods in preference to cash and confirmed that personal cheques are seldom used for consumer payments (see Box B: The Decline of Cheques). In 2019, debit cards were the most commonly used means of payment, overtaking cash as the single most

**Table 1: Consumer Payment Methods<sup>(a)</sup>**

Share of number of payments, per cent

	2007	2010	2013	2016	2019
Cash	69	62	47	37	27
Cards	26	31	43	52	63
– Debit	15	22	24	30	44
– Credit and charge cards	11	9	19	22	19
BPAY	2	3	3	2	2
Internet/phone banking	n/a	2	2	1	3
PayPal	n/a	1	3	3	2
Cheque	1	1	0.4	0.2	0.2
Other <sup>(b)</sup>	1	1	2	4	2

(a) Excluding payments over \$9,999

(b) ‘Other’ methods include prepaid, gift and welfare cards, bank cheques, money orders, ‘buy now, pay later’ and Cabcharge

Sources: RBA calculations, based on data from Colmar Brunton, Ipsos and Roy Morgan Research

frequently used payment method (Table 1).<sup>[3]</sup> Although the share of payments made in cash continued to fall, cash was still used for over one quarter of consumer payments and some people continue to rely heavily on cash in their daily lives.

This article sets out the main findings of the 2019 CPS, focussing on consumers’ use of cash, cards and other electronic payment methods and channels.<sup>[4]</sup>

### Cash

The 2019 CPS provided further evidence of the decline in the transactional use of cash – 27 per cent of all consumer payments were made with cash in 2019, compared with 37 per cent in 2016 and 69 per cent in 2007 (Graph 1, left panel).<sup>[5]</sup>

When measured by the value of consumer payments (rather than the number), the share of cash payments fell to around 10 per cent, from just under 40 per cent in 2007 (Graph 1, right panel).

While consumers in all broad demographic groups are using cash less frequently than they did in the past, the shift to electronic payment methods has been most pronounced among younger Australians (Graph 2, left panel). Survey respondents aged under 40 used cash for less than 15 per cent of their payments in 2019, roughly half the share reported by participants in this age group in 2016.

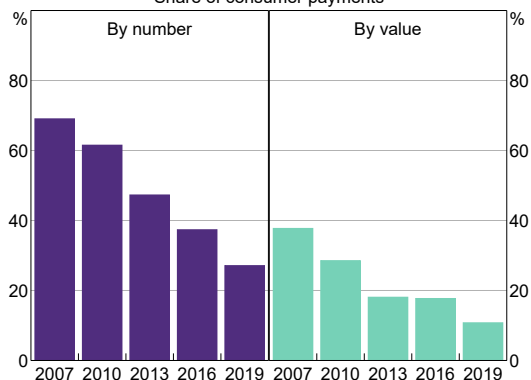
Despite these changing payment preferences, some members of the community continue to make a material share of their payments in cash. While participants aged 65 and over use cash less frequently than they used to, consumers in this demographic still made over half of their payments in cash in 2019. Lower-income households also tend to pay in cash more often than households in higher income groups (Graph 2, right panel).

Among all survey participants, around 15 per cent of respondents used cash for over 80 per cent of their in-person payments in 2019 and about 10 per cent used cash for *all* of their in-person transactions over the week (compared with

**Graph 1**

**Cash Payments**

Share of consumer payments



Source: RBA calculations, based on data from Colmar Brunton, Ipsos and Roy Morgan Research

12½ per cent of all respondents in 2013 and 2016) (Graph 3). At the other end of the scale, the CPS indicates that an increasing share of Australian consumers do not use cash at all in a typical week; around a third of consumers did not record *any* cash payments in the 2019 survey, compared with 18 per cent in 2016.

The shift away from cash has occurred for transactions of all sizes, including for lower-value payments as consumers increasingly prefer to use contactless cards to ‘tap and go’ for these purchases (see below). This trend continued in the latest survey, with the share of transactions of \$10 or less made in cash falling by 18 percentage points since 2016. Cards are now used more often than cash for all payments over \$5. Nonetheless, cash still accounts for a significant share of small transactions:

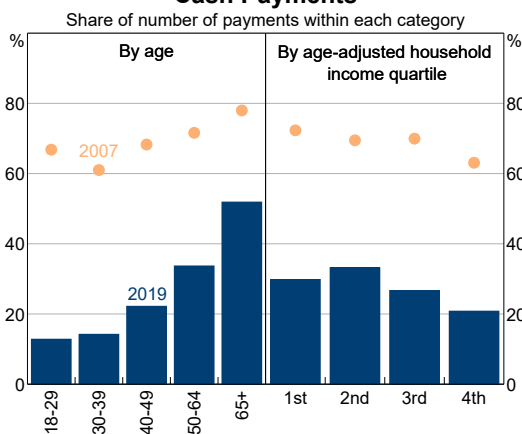
about 45 per cent of payments of \$10 or less (Graph 4).

People continue to use cash for two broad reasons: personal preference and merchant acceptance. When asked about the most important reason for paying in cash, around a third of respondents in 2019 cited factors relating to merchant acceptance, fees and pricing (Graph 5). Some respondents also indicated a preference for using cash for small transactions (around 20 per cent), as well as to assist in budgeting or as a means to spend using their own (rather than borrowed) funds (around 15 per cent). Not surprisingly, respondents who used cash relatively frequently (for more than 80 per cent of their in-person payments) tended to cite factors relating to a preference for using cash over other payment methods. For example, nearly half of frequent cash users reported that budgeting and a preference for using their own funds were their most important reasons for using cash. In contrast, people who used cash less often commonly cited merchant acceptance as the most important reason they used cash, which could suggest that they paid in cash only when other payment options were unavailable.

As the transactional use of cash has continued to decline, so too has the value of cash that respondents held in their wallets or purses. The median value of such holdings was \$45 in 2019, which was \$10 less than in 2013. In the 2019 survey, around a quarter of people held no cash at all in their wallet; the equivalent figure was 8 per cent in

**Graph 2**

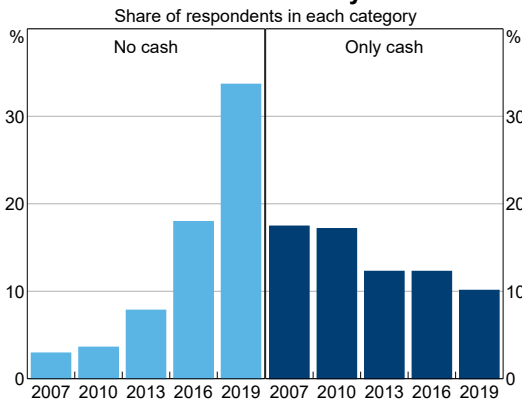
**Cash Payments**



Source: RBA calculations, based on data from Roy Morgan Research

**Graph 3**

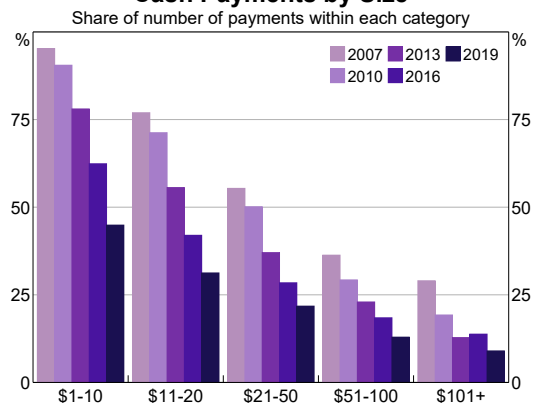
**Point-of-sale Cash Payments**



Source: RBA calculations, based on data from Colmar Brunton, Ipsos and Roy Morgan Research

**Graph 4**

**Cash Payments by Size**



Source: RBA calculations, based on data from Colmar Brunton, Ipsos and Roy Morgan Research

2013. Respondents were also asked if they held cash outside their wallet, with nearly 40 per cent reporting that they did so. Aside from making everyday payments, the most common reason cited for holding cash was for precautionary purposes (Graph 6). People also cited budgeting and issues relating to the convenience and accessibility of cash as important reasons for holding it.

### Payment Cards

As Australian consumers pay in cash less frequently, they are often instead using cards for their purchases. This trend continued in the latest CPS, with the share of payments made using credit and debit cards combined increasing by around

10 percentage points between 2016 and 2019, to 63 per cent of consumer payments (Table 1).

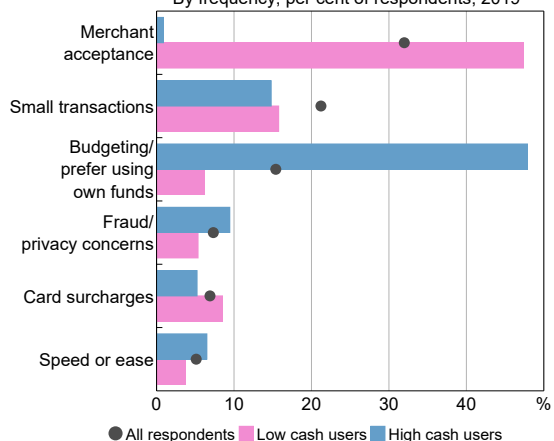
The recent increase in the frequency of card payments relative to other payment methods has been largely because cards are being used more often to make payments in-person at the point-of-sale.<sup>[6]</sup> While consumers are using cards more frequently for payments of all sizes, growth in the use of cards – particularly debit cards – was strongest for lower-value transactions (Graph 7). This ongoing shift to cards for relatively small purchases has been facilitated by the adoption of contactless functionality by consumers and merchants; around half of all in-person payments were made by ‘tapping’ a debit or credit card on a card terminal in 2019 (Graph 8, left panel). A further 5 per cent of in-person payments were made by tapping or waving a smartphone or other payment-enabled mobile device (e.g. watch) in front of a card terminal rather than using a physical (plastic) card. Overall, 83 per cent of point-of-sale card transactions were contactless, initiated by tapping a card or mobile device (Graph 8, right panel).

While mobile device ‘tap and go’ payments still account for a relatively small share of consumer payments, the use of mobile payments has grown over the past three years. In 2019, around 10 per cent of respondents made at least one mobile payment during the week of the survey, which is over twice the share of respondents that made at least one such payment in 2016.<sup>[7]</sup> The

**Graph 5**

**Most Important Reason for Using Cash**

By frequency, per cent of respondents, 2019\*

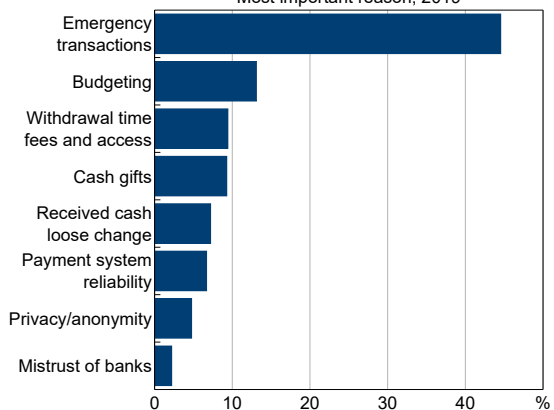


\* Frequency based on share of point-of-sale payments in cash (low: <20 per cent, high ≥80 per cent)  
Source: RBA calculations, based on data from Roy Morgan Research

**Graph 6**

**Why Hold Cash Outside of Wallet?**

Most important reason, 2019

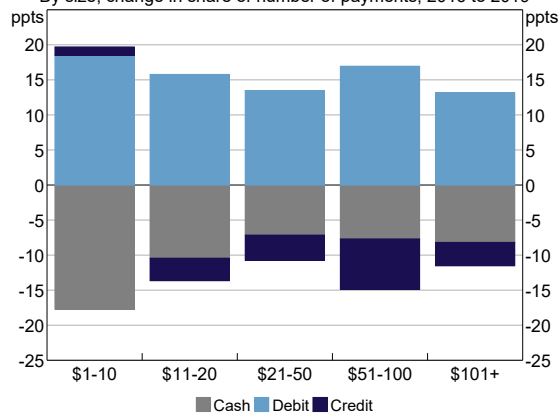


Source: RBA calculations, based on data from Roy Morgan Research

**Graph 7**

**Change in Point-of-sale Payments**

By size, change in share of number of payments, 2016 to 2019



Source: RBA calculations, based on data from Ipsos and Roy Morgan Research



adoption of mobile payments is consistent with the increased availability of this payment option and with consumers' greater awareness of the ability to make mobile payments. At the time of the 2016 survey, the ability to make mobile payments was still a relatively new feature of the retail payment system whereas it is now a more common product offering across card issuers. The growth in contactless mobile device payments has been driven by increased use among consumers aged under 40; almost one in five people in this age group recorded at least one contactless mobile payment during the week of the 2019 survey (Graph 9).

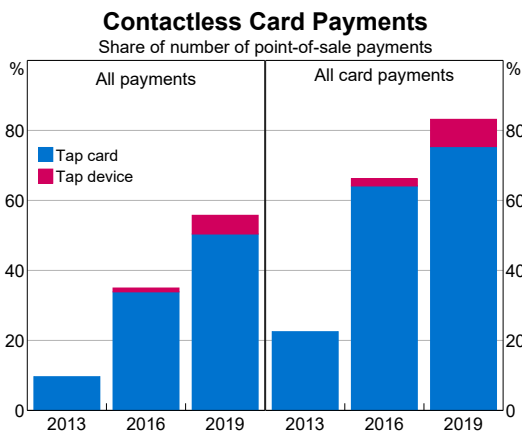
Cards are being used more frequently at all broad types of businesses, including in sectors where cash has traditionally been used for a high share of

transactions. For example, participants in the 2019 CPS used cards for around 60 per cent of purchases at (non-supermarket) food retailers – which includes small food stores, cafes, restaurants and pubs/bars – displacing cash as the most common means of payment at these businesses for the first time.<sup>[8]</sup>

When choosing to pay with a card, Australian consumers are increasingly using debit cards – which allow people to make payments from funds in their deposit account – rather than credit cards. Debit cards were used for nearly 45 per cent of consumer payments (by number) in 2019, an increase of around 15 percentage points from three years earlier. Credit cards accounted for 19 per cent of consumer payments in 2019, which was a slightly lower share than in the 2016 survey (Table 1).<sup>[9]</sup>

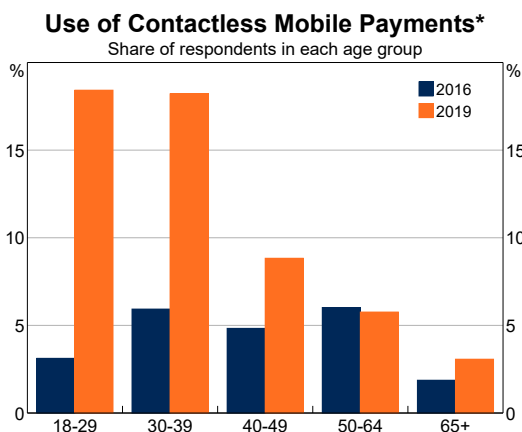
The use of debit cards grew among survey participants of all ages between 2016 and 2019, although younger people tend to use debit cards the most intensively; respondents aged under 40 made around two thirds of their in-person payments with a debit card, compared with 36 per cent for consumers in older age groups (Graph 10). Debit cards are also becoming an increasingly popular way of making online purchases, accounting for around 30 per cent of these payments in 2019, compared with 23 per cent in 2016 (see below).

**Graph 8**



Source: RBA calculations, based on data from Colmar Brunton, Ipsos and Roy Morgan Research

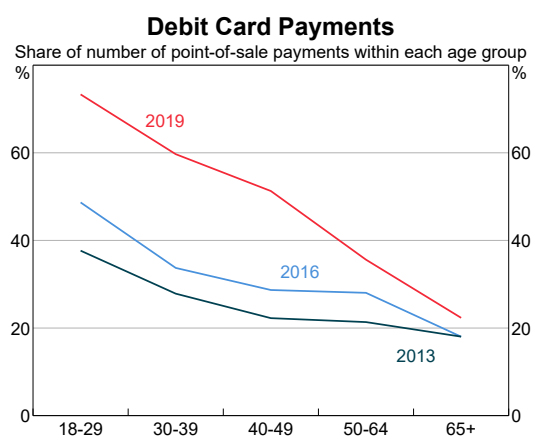
**Graph 9**



\* Used at least once in the diary week

Source: RBA calculations, based on data from Ipsos and Roy Morgan Research

**Graph 10**



Source: RBA calculations, based on data from Colmar Brunton, Ipsos and Roy Morgan Research

**Table 2: Online Payments**  
Share of number of consumer payments, per cent

	2007	2010	2013	2016	2019
Debit card	0.3	1	2	3	4
Credit card	1	1	3	3	2
BPAY/Internet banking	2	4	5	4	4
Other <sup>(a)</sup>	0.4	1	3	4	2
Total	3	7	13	13	13
<i>Mobile/app share of online</i>	n/a	n/a	6	20	40

(a) 'Other' methods include Paypal, prepaid, gift and welfare cards and 'buy now, pay later' services

Sources: RBA calculations based on data from Colmar Brunton, Ipsos and Roy Morgan Research

## Online Payments

A long-run trend in retail payments is an increase in the share of transactions that occur online rather than in-person, consistent with growth in e-commerce. As in previous surveys, participants in the 2019 CPS were asked to record the details of every consumer payment that they initiated online during the week of the survey.

Around 55 per cent of respondents made at least one online payment in 2019, which was about the same as in 2016 but double the share of people surveyed in 2007. When measured by the number of transactions, the share of payments made online was 13 per cent, which was a similar share as in the previous two surveys but roughly four times the online share recorded in 2007 (Table 2). It has become increasingly common for these payments to be made using mobile apps, with 40 per cent of online payments initiated through apps rather than 'traditional' web browsers (e.g. Chrome or Safari) in 2019.

Many respondents also reported that they had used debit or credit card details that had previously been stored on a computer, device or within an app to make an online payment (as opposed to filling in their card details at the checkout stage of the transaction). This includes, among other things, choosing to auto fill stored payment credentials when shopping online, and payments made via apps in which the payment is embedded and occurs in the background at the time of a transaction (e.g. transport ride-sharing apps).

Around 45 per cent of survey participants had used

stored payment details for an online payment in the past year. This is consistent with a trend towards payments becoming more seamless from the perspective of consumers.

While the online share of payments shown in Table 2 has been fairly stable in recent years, these figures do not include participants' automatic payment arrangements, such as household bills (e.g. electricity or subscription services) paid by direct debit, and recurring 'pay anyone' transactions via online banking. These arrangements are set up ahead of the payment occurring and are recorded separately in a post-diary questionnaire. This allows participants to review their bank statements when recording information on these payments. The share of total weekly spending made automatically – rather than initiated during the week of the CPS – has been steadily increasing over recent years, to 9 per cent of the number of total transactions (Graph 11, left panel). When measured by the value of weekly spending, around one fifth of all payments were made automatically in 2019 (Graph 11, right panel). The growth in automatic payments largely reflects the changing way people pay their bills and, to a lesser extent, make debt repayments. Around half of all household bill payments in 2019 were made automatically, which is more than double the share in 2013. This shift towards automatic payments for certain transactions is another way in which payments are becoming more seamless.

## New Payment Methods

The way in which Australian consumers make payments is being shaped by a number of related influences. Among other things, these include the emergence of different payment channels, the use of mobile technology and the introduction of innovative products and services.<sup>[10]</sup>

Over the past few years, a number of alternative means of payment have emerged or attracted greater attention. These include (among others): buy now, pay later (BNPL) services that enable consumers to obtain goods and services immediately and make subsequent payments in a series of interest-free instalments; the ability to make in-app payments using stored card details; 'cryptocurrencies'; and the ability to make real-time account-to-account bank transfers using PayIDs via the New Payments Platform. To gauge awareness and use of these methods, the CPS asked respondents whether they had heard of a number of 'alternative' ways of making payments and also whether they had used them at least once in the past 12 months (Graph 12).

In terms of awareness, a majority of respondents had heard of several of the newer means of payment, with awareness highest for BNPL services and the ability to make tap and go payments using devices such as mobile phones and various types of 'wearables'. Although many respondents had heard of 'cryptocurrencies', very few had used a cryptocurrency such as Bitcoin to actually make a consumer payment over the past year (indeed, less

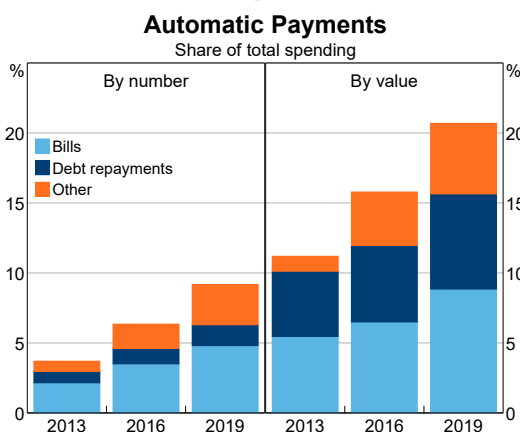
than one per cent had done so). In contrast, around one third of consumers reported that they had made an in-app mobile payment, with tap-and-go mobile device payments and BNPL the next most frequently used 'alternative' payment methods. While consumers have a broader range of options with which to make their payments, it is worth noting that many of these newer services ultimately use existing card networks to facilitate the payment (e.g. via stored card details).

## Conclusion

The way in which Australian consumers make their everyday payments is continuing to change. The Bank's 2019 CPS showed a continuation of the trend decline in the use of cash for consumer payments as many people now prefer to use electronic payment methods, such as cards, for even small purchases. The majority of in-person payments are now initiated by tapping a card with contactless functionality on a terminal, and consumers are also using mobile phones and other devices to make 'tap and go' payments more often than they were three years ago. People are also making more of their online payments using mobile devices and using stored payment credentials.

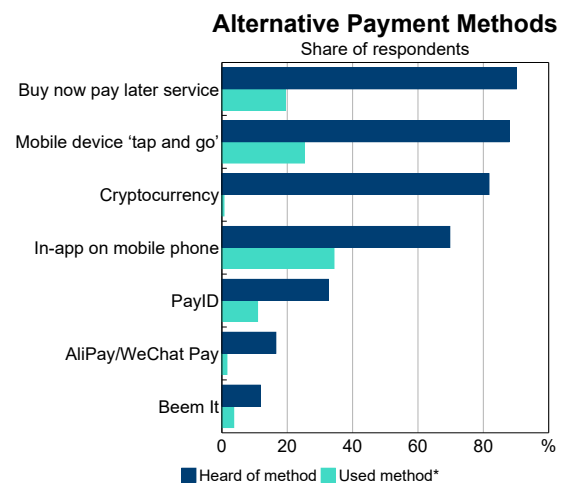
The growing importance of electronic payments highlights the need to make sure that electronic payments are low-cost, secure and resilient to operational disruptions. In this regard, the Bank is conducting a review of retail payments regulation

**Graph 11**



Source: RBA calculations, based on data from Colmar Brunton, Ipsos and Roy Morgan Research

**Graph 12**



\* In the last 12 months

Source: RBA calculations, based on data from Roy Morgan Research

in 2020 which will consider a range of issues relating to competition, efficiency and the safety of retail payments.<sup>[11]</sup> The CPS is an important source of information on a number of aspects of this review.

The CPS is also one of the main sources of information on the use of cash and cheques in the economy. While cash is used less frequently than in the past, it is still widely held for precautionary purposes and some members of the community

continue to rely very heavily on it in their daily lives. Older Australians, for example, continue to make a significant share of their payments in cash, although survey participants in this demographic are also making increasing use of electronic payment methods over time. It will be important to consider the needs of people who prefer to pay in cash or continue to write cheques, and/or who do not have access to electronic payment options in the broader transition to electronic payments. ✎

## Box A: Details of the Survey

The fieldwork for the 2019 Consumer Payments Survey was conducted by the research firm Roy Morgan Research on behalf of the Bank in October and November 2019. The survey consisted of three parts: a pre-diary questionnaire about the demographic characteristics of respondents; a seven-day payments diary; and a post-survey questionnaire focussing on respondents' payment preferences and attitudes. To encourage participation and engagement with the survey, respondents received a gift card on completion of the three components.

The survey was delivered online for most respondents but to ensure the sample was broadly representative of the Australian population, participants without internet access were recruited by telephone to complete a paper-based survey. The overall response rate was good, resulting in a final sample of just over 1,100 respondents. These participants made a total of around 13,500 consumer payments and around 1,500 automatic payments in their seven-day diary periods.

In addition to internet access, recruitment targets for age, sex, household income, credit card ownership and location (i.e. capital city or regional area) were set so that the sample would be reasonably representative of the Australian population. To account for different response rates across the various demographic categories, the Bank weighted the responses so that the final sample aligned with Australian Bureau of Statistics and HILDA population benchmarks.<sup>[12]</sup>

## Footnotes

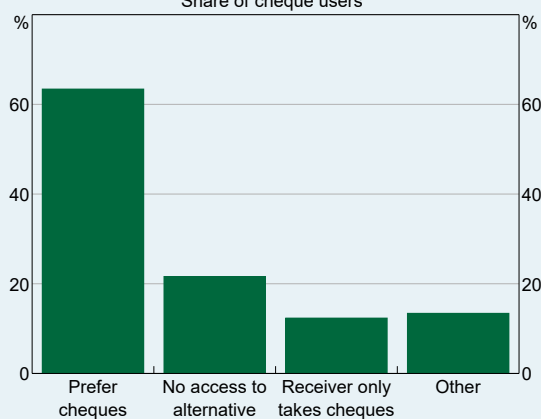
- [\*] James Caddy, Luc Delaney and Chay Fisher are from Payments Policy Department; Clare Noone is from International Department, having worked on the survey when she was in Payments Policy Department. Cameron Dark and Ed Tellez from Payments Policy Department also made significant contributions to the survey.
- [1] The Bank has conducted Consumer Payments Surveys every three years since 2007. For information on previous surveys see Emery, West and Massey (2008); Bagnall, Chong and Smith (2011); Ossolinski, Lam and Emery (2014); Doyle, Fisher, Tellez and Yadav (2017a and 2017b).
- [2] Roy Morgan Research conducted the 2019 CPS on behalf of the Bank.
- [3] In the 2016 CPS, debit and credit cards combined were used more frequently than cash.
- [4] A detailed report and additional data will be published later in 2020.
- [5] For previous discussions of the use of cash in the economy see, for example, Davies, Doyle, Fisher and Nightingale (2016) and Meredith, Kenney and Hatzvi (2014).
- [6] As discussed below, the share of online payments was stable in 2019 and cards were used for a similar proportion of these payments as in the 2016 survey.
- [7] People who had made one or more contactless mobile device payments over the week of the survey made 45 per cent of their in-person payments using this method.
- [8] In 2007, cash was used for almost 90 per cent of purchases at (non-supermarket) food retailers.
- [9] Growth in the use of debit cards relative to credit cards is consistent with aggregate data from the Bank's Retail Payments Statistics, which show that growth in debit card transactions has outpaced that in credit cards since the mid 2000s.
- [10] See, for example, Bullock (2018).
- [11] See Reserve Bank of Australia (2019).
- [12] This paper uses unit record data from the Household, Income and Labour Dynamics in Australia (HILDA) Survey. The HILDA Project was initiated and is funded by the Australian Government Department of Social Services (DSS) and is managed by the Melbourne Institute of Applied Economic and Social Research (Melbourne Institute). The findings and views reported in this paper, however, are those of the author and should not be attributed to either DSS or the Melbourne Institute.
- [13] See, for example, Lowe (2019).

### Box B: The Decline of Cheques

The 2019 Consumer Payments Survey provided further evidence of the long-term decline in the cheque system, with personal cheques seldom used for consumer payments. Cheques accounted for only 0.2 per cent of the payments made during the week of the survey, a similar rate to that recorded in 2016. As in previous surveys, cheque use was concentrated among older Australians; all of the cheque payments made in the 2019 survey were made by respondents over 50, with 80 per cent of these made by those aged over 65. Personal cheques were often used for relatively large consumer expenditures such as household bills and services.

Because cheques are used so infrequently, it will be appropriate at some point to wind up the cheque system.<sup>[13]</sup> In this context, it is important that alternative payment methods are available and accessible for those who rely on cheques. For people who continue to use cheques, the majority indicated that this reflected a preference to use cheques for some payments, although smaller shares reported that they had no access to an alternative means of payment or that the receiver only took cheques (Graph B1).

**Graph B1**  
Reasons for Cheque Use  
Share of cheque users\*



\* Made a personal cheque payment in the last 12 months; respondent could choose more than one response  
Source: RBA calculations, based on data from Roy Morgan Research

## References

- Bagnall J, S Chong and K Smith (2011), *Strategic Review of Innovation in the Payments System: Results of the Reserve Bank of Australia's 2010 Consumer Payments Use Study*, Sydney.
- Bullock M (2018), 'Financial Technology and Payments Regulation', Keynote speech at the 5<sup>th</sup> Bund Summit on Fintech, Shanghai, 8 July.
- Davies C, M-A Doyle, C Fisher and S Nightingale (2016), 'The Future of Cash', *RBA Bulletin*, December, pp 43–52.
- Doyle M-A, C Fisher, E Tellez and A Yadav (2017a), 'How Australians Pay: New Survey Evidence', *RBA Bulletin*, March pp 59–65.
- Doyle M-A, C Fisher, E Tellez and A Yadav (2017b), 'How Australians Pay: Evidence from the 2016 Consumer Payments Survey', RBA Research Discussion Paper No 2017-04.
- Emery D, T West and D Massey (2008), 'Household Payment Patterns in Australia', in *Payments System Review Conference*, Proceedings of a Conference, Reserve Bank of Australia, Sydney, pp 139–176.
- Lowe P (2019), 'A Payments System for the Digital Economy', Address to the 2019 Australian Payments Network Summit, Sydney, 10 December.
- Meredith J, R Kenney and E Hatzvi (2014), 'Cash Use in Australia', *RBA Bulletin*, June, pp 43–54.
- Ossolinski C, T Lam and D Emery (2014), 'The Changing Way We Pay: Trends in Consumer Payments', RBA Research Discussion Paper No 2014-05.
- Reserve Bank of Australia (2019), *Review of Retail Payments Regulation: Issues Paper*, November.

# The Cost of Card Payments for Merchants

Kateryna Occhiutto<sup>[\*]</sup>



Photo: Hispanolistic – Getty Images

## Abstract

Data on merchants' costs of accepting card payments show large differences in payment costs across both merchants and card systems. Smaller businesses typically face higher payment costs than larger businesses, credit card transactions are generally more expensive than debit cards, and debit card transactions tend to be more costly for most merchants when processed through the international card schemes compared with the domestic debit scheme. Overall costs of accepting card payments have nevertheless declined over the past decade, following the implementation of various reforms by the Bank.

## Introduction

Merchants incur costs when they accept a payment from a customer. In the case of card payments, businesses are typically charged a 'merchant service fee' by their financial institution for processing each transaction.<sup>[1]</sup> These fees can differ depending on the type of card the customer chooses to pay with and the card network through which the transaction is processed. Merchants may recover these costs either through surcharging – where the cost of accepting a particular type of payment is passed on to the customer directly – or by factoring them into the prices of goods and services charged to all of their customers.

Cards are the most frequently used payment method in Australia, representing just over 60 per cent of the total number of consumer retail payments (Caddy *et al* 2020). Strong growth in card payments has been driven by the rising popularity of debit cards, which accounted for around 72 per cent of the total number of card payments in 2019, up from 57 per cent a decade ago. This shift towards debit cards would have helped reduce total merchant payment costs because debit cards tend to be less expensive for merchants to accept than credit cards. At the same time, however, the overall cost of debit card payments has increased. This has been driven by a shift in the share of transactions processed through the domestic eftpos network



towards the generally more expensive Visa and Mastercard debit networks.

The Reserve Bank’s Payments System Board has responsibility for promoting stability, efficiency and competition in the payments system. In line with its mandate, the Board has implemented a number of reforms that have contributed to a decline in merchant fees for card payments over the past two decades. These reforms included imposing caps on interchange fees (which are a key component of merchant service fees), improving the information available to merchants about their payment costs, and generally promoting competition between the card schemes. The Bank views merchant payment costs as an important issue to monitor, given the rapid growth in the use of electronic payment methods by Australian consumers and the possibility that smaller businesses may not be well served by the payments industry.

This article examines developments in merchant payment costs using various sources of data available to the Bank. Drawing on a database of merchant-level payment costs, the article shows how much the cost of accepting card payments varies not only across different card schemes, but also across different merchants. Most notably, smaller businesses tend to face significantly higher merchant fees than larger businesses. The data also confirm that debit cards are much cheaper for businesses to accept than credit cards, and that debit transactions tend to be more costly for merchants of all sizes when processed via the international card schemes.

### Insights from the Retail Payments Statistics

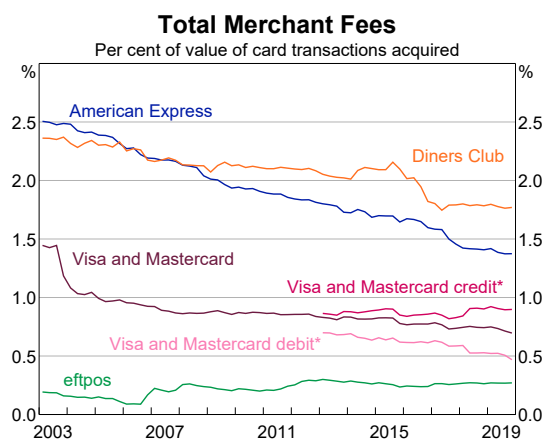
The Reserve Bank publishes quarterly data on average merchant fees for the main card systems operating in Australia.<sup>[2]</sup> The data show that the cost of accepting a card payment is highly dependent on the type of card used by the customer and the scheme through which the transaction is processed (Graph 1).<sup>[3]</sup> Payments made through the domestic debit scheme, eftpos, are generally the least expensive, costing merchants an average of 0.3 per cent of the transaction value in the December 2019 quarter. This compares with an average merchant fee of 0.5 per cent for Visa and

Mastercard debit card transactions, and 0.9 per cent for Visa and Mastercard credit card transactions. The three-party card schemes, American Express and Diners Club, are the most expensive, with average merchant fees of around 1.4 per cent and 1.8 per cent of the transaction value, respectively.<sup>[4]</sup>

The differences in the costs of accepting different types of cards reflect the pricing policies of both acquirers and the card schemes. One significant component of the merchant fee is the wholesale interchange fees paid from the merchant’s financial institution (the acquirer) to the cardholder’s financial institution (the issuer) for each transaction. Interchange fees are set by the card networks and can vary based on factors such as the type of card, the size and type of merchant, and the transaction size.<sup>[5]</sup> For example, cards that provide rewards to the cardholder (such as platinum credit cards) have higher interchange fees and are therefore typically more expensive for businesses to accept than non-rewards cards. More generally, credit cards tend to have higher interchange fees than debit cards and interchange fees for eftpos transactions are lower on average than those for Visa and Mastercard debit. Certain types of merchants – particularly very large merchants and those that the schemes may consider to be ‘strategic’ – may also qualify for lower interchange fees.

Another component of the merchant fee is the scheme fees that acquirers pay to the card schemes.

**Graph 1**



\* Prior to changes in reporting methodology in June 2018, the average fee reported for Visa and Mastercard debit cards was slightly overstated and the average fee reported for Visa and Mastercard credit cards was slightly understated; the overall average fee for Visa and Mastercard was unaffected by the reporting change

Source: RBA

There is little transparency around scheme fees, but there are indications that they have been increasing and putting upward pressure on merchant service fees in recent years.

The third key component of the merchant fee is the acquirer margin. This component is also likely to be driven by a range of factors, including the size of the merchant, the services being provided and the type of pricing plan (discussed further in the ‘Payment costs across merchants’ section below).

Some of the differences in the average merchant fees across schemes could also be explained by compositional differences in transaction types. For example, the merchant fee data for Visa and Mastercard debit cards, unlike those for eftpos, include transactions on foreign-issued debit cards, which have significantly higher interchange fees than domestic transactions. Also, as eftpos has yet to support remote transactions, all eftpos transactions are made at the point of sale (card-present). Visa and Mastercard, on the other hand, facilitate card-not-present transactions (such as online purchases), which may attract different interchange and/or scheme fees.

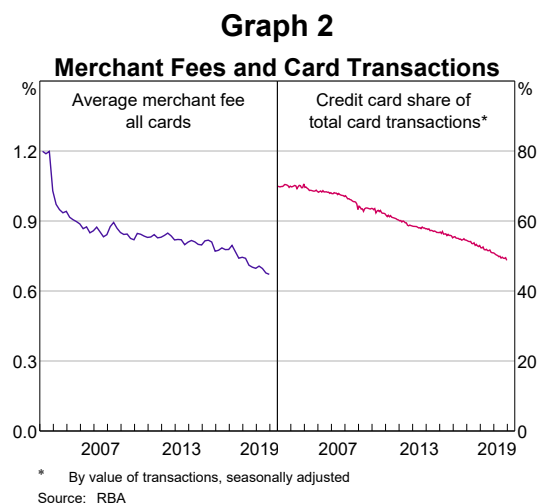
Taking a longer run perspective, there has been a significant decrease in economy-wide average merchant fees since the early 2000s (Graph 2). This reflects both the marked shift from credit cards towards debit cards, which tend to be less expensive, as well as the decline in average merchant fees for most payment systems (as seen in Graph 1). Most notably, there was a large drop in average merchant fees for Visa and Mastercard following the Bank’s initial card payments reforms in the early 2000s, which included the imposition of interchange fee benchmarks and removal of no-surcharge rules.<sup>[6]</sup> A reduction in the Bank’s interchange fee benchmark for debit cards in 2017 has contributed to a further decline in average fees in the Visa and Mastercard debit schemes in recent years. While not subject to the same regulations as four-party schemes, American Express and Diners Club have also significantly reduced their fees over this period as they sought to remain competitive with the other schemes.<sup>[7]</sup>

## Disaggregated Data on Merchant Payment Costs

While the aggregate data allow us to compare average merchant fees across different schemes, they do not allow us to look at the distribution of payment costs across different merchants. Accordingly, in late 2019, the Bank asked eight large acquirers to provide anonymised merchant-level data on the costs to their merchants of accepting different types of cards.<sup>[8]</sup> For each merchant, the data included the total value of card payments processed through each of the four-party card schemes (eftpos, Debit Mastercard, Visa Debit, Mastercard credit, Visa credit and UnionPay) in the 2018/19 financial year, as well as the corresponding value of merchant fees charged by the acquirer. These data matched the information that acquirers are required to provide their merchants each year under the surcharging framework of the Bank and the Australian Competition and Consumer Commission.<sup>[9]</sup>

After some initial ‘cleaning’ of the dataset to remove outliers, we were left with a database of card acceptance costs for almost 672,000 merchant accounts, with a total of \$502 billion of transactions processed through the four-party card schemes in 2018/19.<sup>[10]</sup> The sample accounts for around 85 per cent of the total value of four-party credit and debit card transactions reported in the Retail Payments Statistics.<sup>[11]</sup>

The database had a high degree of variation in merchant size, allowing us to analyse how the cost



of accepting card payments varies across different businesses. Less than 1 per cent of the merchant accounts in the sample had annual (four-party scheme) card turnover of more than \$10 million; 88 per cent of merchant accounts had annual turnover of less than \$1 million; and 43 per cent had annual turnover of less than \$100,000 (Graph 3). The smallest 80 per cent of merchants (by number) accounted for only 15 per cent of the total transaction values in the database. However, the true size of merchants in the sample may be understated. This is because individual outlets within chains or franchises may be treated by some acquirers as separate merchant accounts and receive separate merchant statements, even if their payments contracts are arranged on a group basis.<sup>[12]</sup>

**Payment costs across merchants**

Graph 4 shows how the cost of accepting card payments (averaged across all four-party card schemes) varies based on the size of the merchant. It is apparent from the darker areas in the heat map that merchants with a higher value of card transactions tend to pay less for accepting card payments than smaller ones. Almost all of the merchants in the sample with more than \$10 million of annual card transactions had average card acceptance costs of less than 1 per cent. In contrast, average payment costs for smaller merchants were typically higher and more widely dispersed. For example, half of the merchants with

annual card turnover below \$100,000 faced average payment costs in excess of 1.5 per cent of their transaction values.

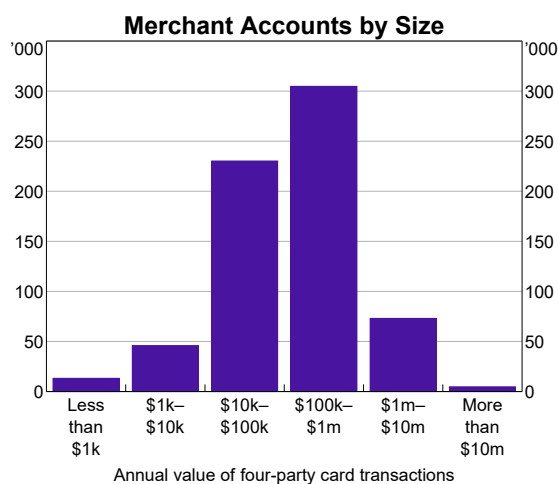
Further perspectives on payment costs can be obtained by dividing the sample of merchants into deciles, such that each decile contains 10 per cent of the total transaction values in the survey dataset. The first decile includes around 480,000 merchant accounts with average annual four-party card transactions of \$105,000; the 10th decile includes 31 merchant accounts, each averaging more than \$1.6 billion in card transactions per year. There were no eftpos transactions for any of the merchant accounts in the 10th decile, which suggests that they are all billers or online-only merchants (who are likely to have a single merchant account with their acquirer). It seems likely, however, that there are some similarly sized ‘bricks and mortar’ businesses that accept eftpos but they do not show up in the largest decile in the dataset because they have multiple merchant accounts with their acquirer.

The analysis of payment costs across the deciles confirms that, for the different four-party card schemes, average payment costs generally decline as merchant size increases (Graph 5).<sup>[13]</sup>

There are several possible explanations for why smaller businesses tend to have higher average payment costs:

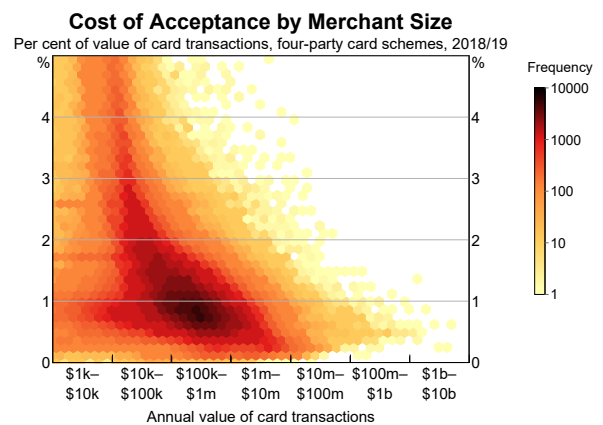
- There are some fixed costs associated with providing payment services to merchants (such as the provision of terminals) and smaller

**Graph 3**



Source: RBA

**Graph 4**



Source: RBA

businesses have a lower volume of transactions to spread these over.

- Larger merchants are more likely to benefit from favourable interchange rates from card schemes (such as ‘strategic’ rates or particular industry rates).
- There may be some impediments to competition in the acquiring market for smaller merchants. One of these impediments may be high barriers to switching. For example, the costs of searching for, and switching to, another acquirer may outweigh the benefits for a business with low transaction volumes. The practice of bundling acquiring services with other business banking services (such as loans) may also contribute to actual or perceived costs of switching to another acquirer. More broadly, smaller merchants may have less negotiating power in relationships with their acquirers and may be less likely to choose, or be offered, plans that would minimise their payment costs.

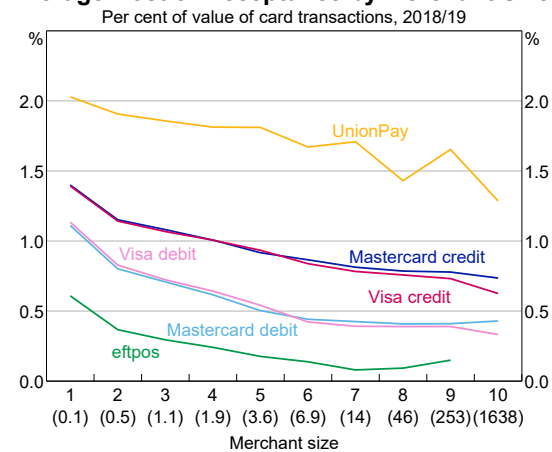
Acquirers typically offer several types of pricing plans to their customers, which differ in how individual card transactions are priced. At one end of the spectrum is ‘interchange-plus-plus’ pricing, where the cost to the merchant of each transaction is made up of the applicable interchange fee, the scheme fee that the acquirer has to pay to the card scheme, and an acquirer margin. There are also blended-rate plans, where the merchant is charged

a specified per-transaction fee either for each scheme (e.g. a single rate for all Visa debit and credit transactions) or for multiple schemes (e.g. a single rate for all Visa and Mastercard transactions). Another option is the fixed-rate or ‘simple merchant plan’, which charges a fixed monthly fee for a certain value of card transactions, irrespective of the card type or network. These simple merchant plans – which are typically reserved for smaller businesses – may be easier to understand for some merchants. They also reduce the month-to-month volatility of payment costs for the merchant. However, the fixed price means that merchants would pay the same rate for a debit card transaction as for a credit card transaction, even though debit transactions normally cost the acquirer much less to provide.

A number of reforms implemented by the Payments System Board in recent years are likely to have put downward pressure on the cost of card payments, particularly for smaller merchants. Most notably, new standards implemented in July 2017 reduced the weighted-average interchange fee benchmark for debit card transactions and introduced caps on individual interchange fees in both the credit and debit card schemes.<sup>[14]</sup> As noted earlier, larger merchants typically benefit from low (or ‘strategic’) interchange fees on all their card transactions. Smaller merchants, on the other hand, usually bear the full cost of high interchange fees on premium and commercial cards issued in the Visa and Mastercard systems. Capping interchange fees should therefore have brought down the costs of accepting such payments for smaller merchants. When we compare the 2018/19 data against a corresponding dataset collected by the Bank for the 2016/17 financial year, we see that there has been a modest fall in smaller merchants’ average costs of accepting Visa and Mastercard credit cards since the implementation of the interchange fee caps (Graph 6). There was also a small decrease in the average cost of Visa and Mastercard debit transactions (5 basis points on average across all merchant size deciles), though this was concentrated among mid-sized merchants. Since mid 2017, acquirers have also been required to provide merchants with easy-to-understand information about their costs of accepting

**Graph 5**

**Average Cost of Acceptance by Merchant Size\***



\* Merchants ranked in value deciles, with the average annual value of card transactions (\$m) in 2018/19 for each decile shown in parentheses  
Source: RBA

payments through each of the card schemes regulated by the Bank. This information is primarily designed to assist businesses in their surcharging decisions, although greater transparency about payment costs may also help them in negotiating a better deal with acquirers.

**Payment costs across card schemes**

The merchant-level data can be used to measure the average difference in the costs of different types of cards when holding merchant size constant; this is represented by the gap between the lines in Graph 5. The analysis indicates that eftpos is on average around 37 basis points less expensive than Visa and Mastercard debit, which, in turn, are around 36 basis points cheaper than Visa and Mastercard credit. Notably, the cost differential between eftpos and the international debit networks tends to be largest for small merchants (52 basis points for the smallest merchants, compared to 25 basis points for the largest merchants that have eftpos transactions). UnionPay costs are significantly higher than those of all the other four-party schemes, although this may not be surprising since most UnionPay transactions in Australia are made with overseas-issued cards, which attract higher interchange fees than domestic cards.<sup>[15]</sup>

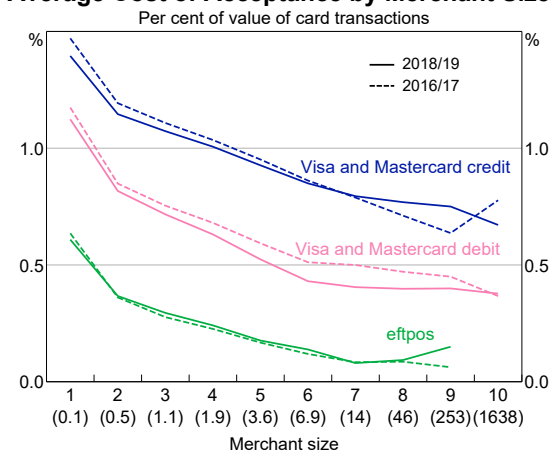
The data also allow us to examine how compositional differences in transaction types affect debit costs. Specifically, the impact of card-not-

present transactions (which currently cannot be processed through the eftpos network) on payment costs can be estimated by dividing the merchant accounts into those with transactions from all three debit networks, and those with just Visa and Mastercard transactions. The former group are more likely to be ‘regular’ point-of-sale merchants, whereas the latter are likely to be billers or online businesses. The results show that Visa and Mastercard debit costs are broadly similar (and on average around 36 basis points higher than eftpos) regardless of whether the merchant also accepts eftpos or not (Graph 7). This implies that card-not-present transactions are not the main factor explaining the cost difference between eftpos and the international schemes.<sup>[16]</sup>

While the merchant-level data show that eftpos is the lowest-cost scheme for the large majority of merchants, there is a small share of merchants for which this is not the case (Table 1). Visa and Mastercard pricing is usually percentage-based, while eftpos is typically priced on a cents-per-transaction basis. This means that businesses with low average transaction values (such as coffee shops) may see little difference in their payment costs and, in some circumstances, may face higher acceptance costs for eftpos. The merchant-level data suggest that Visa and Mastercard debit is materially less expensive for around 9 per cent of merchants (which account for about 5 per cent of the value of card transactions), and there is little

**Graph 6**

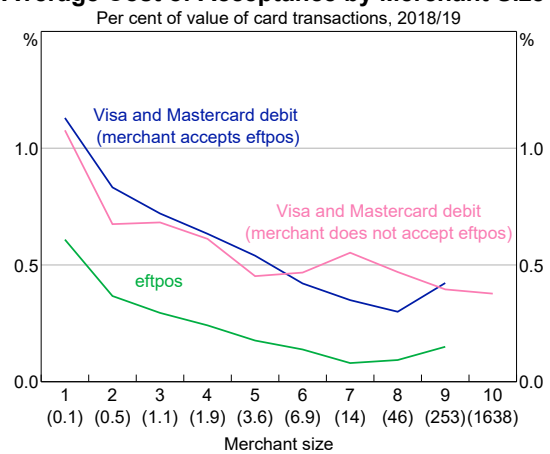
**Average Cost of Acceptance by Merchant Size\***



\* Merchants ranked in value deciles, with the average annual value of card transactions (\$m) in 2018/19 for each decile shown in parentheses  
Source: RBA

**Graph 7**

**Average Cost of Acceptance by Merchant Size\***



\* Merchants ranked in value deciles, with the average annual value of card transactions (\$m) in 2018/19 for each decile shown in parentheses  
Source: RBA

**Table 1: Difference in Debit Costs**

Per cent of sample, 2018/19

	By value of transactions	By number of merchants
Visa/Mastercard debit cheaper than eftpos by >10bps	4.8	8.8
Cost difference within $\pm 10$ bps	12.2	15.4
eftpos cheaper than Visa/Mastercard debit by >10bps	83.0	75.9

Source: RBA

difference between the costs of the debit networks for a further 15 per cent of merchants. The latter group would presumably include merchants on the 'simple pricing plans' offered by some acquirers, where all transactions cost the same regardless of the network through which they are processed. More than 90 per cent of merchants that pay the same fee for all card types are in the smallest size decile, consistent with simple merchant plans largely being targeted at smaller businesses.

### Debit Cards and Least-cost Routing

With debit cards emerging as the most frequently used payment method in Australia, the cost to merchants of accepting these cards has been an important area of focus for the Payments System Board.

A key feature of the Australian card market is that most domestically issued debit cards are dual-network debit cards. These cards allow point-of-sale transactions to be routed either through eftpos or one of the other debit networks (Visa Debit or Debit Mastercard). When a cardholder inserts their dual-network debit card into a terminal to make a payment, they are asked to select the network for processing the transaction (for example, by pressing CHQ or SAV for eftpos or CR for Debit Mastercard or Visa Debit). In contrast, if the cardholder makes a contactless ('tap-and-go') payment, the default is for the transaction to be automatically routed to the network which has been programmed as the default by the issuing financial institution. Until around 2016, contactless payments were only available through the two international networks, which completed their rollout of contactless cards around 2012. With those networks being generally more expensive for merchants, the increasing use of contactless functionality by consumers resulted in a

marked increase in payment costs for some merchants. Now that eftpos has also enabled contactless functionality, there is scope for merchants to choose to send contactless dual-network debit card transactions via the network that costs them the least to accept. This functionality is known as least-cost routing.

Least-cost routing can help merchants reduce their payment costs and can also increase competitive pressure between the debit schemes, providing greater incentives for them to lower their fees. The possible economy-wide reduction in payment costs is potentially very large, given that merchant fees for debit card transactions totalled \$1.3 billion in 2019. Furthermore, in most cases, cardholders will be indifferent about which network processes their transactions. The three debit networks offer similar protections to cardholders from fraud and disputed transactions and all of them typically draw funds from the same deposit account.<sup>[17]</sup> However, to the extent that customers do have preferences regarding card networks, they can override the merchant's choice of network by inserting their card and selecting their preferred network rather than tapping the card.

Recognising the benefits that least-cost routing could have for competition and efficiency in the payments system, the Payments System Board has been encouraging the industry to provide this functionality to merchants. However, industry progress has been disappointingly slow. While a few smaller acquirers began offering least-cost routing to their merchants in the first half of 2018, the major banks (which acquire around 77 per cent of the total value of debit card transactions) only launched this capability between March and July of 2019. There are also some key differences in the functionality offered by acquirers. For example, only

some acquirers offer a version that maximises merchant savings by enabling routing based on transaction size as well as payment network.<sup>[18]</sup> In addition, some acquirers have not made their least-cost routing functionality available on all the payment terminals they support, and some banks only offer the functionality to merchants on select pricing plans (typically those used by larger merchants). The Board has highlighted its expectation that acquirers will promote least-cost routing to all of their merchant customers, since merchant awareness is an important factor affecting the degree of downward pressure on payment costs across the economy that can be realised from this initiative.

More broadly, the Board will continue monitoring the industry's progress on providing least-cost routing to merchants, and will seek to ensure that schemes and financial institutions do not respond in a way that undermines the potential benefits to competition. The Bank will also be considering this issue as part of the current Review of Retail Payments Regulation. In particular, the Bank has sought stakeholder views on the functioning of least-cost routing to date, and whether additional regulatory action is required to enhance competition and efficiency in the debit card market (RBA 2019).

## Footnotes

[\*] The author is from the Payments Policy Department, and thanks Tony Richards, Chris Thompson, Gerard Kelly and Cameron Dark for their contributions to this work.

[1] The financial institution that provides services to a merchant to allow it to accept card payments, usually a bank, is known as the 'acquirer'. In the case of American Express and Diners Club, merchant fees are paid directly to the card scheme.

[2] The RBA's Retail Payments Statistics are available at <<https://www.rba.gov.au/payments-and-infrastructure/resources/payments-data.html>>.

[3] These data are the average merchant fees for each system, including any per-transaction fees and other fees (such as the costs of renting a terminal to accept cards and monthly or annual account fees) charged to merchants by their financial institutions. Visa and Mastercard merchant fees are combined in this data set.

[4] A typical card transaction involves four parties – the cardholder, the cardholder's financial institution (the

## Conclusions

There has been a broad-based decline in average merchant fees across the economy over the past two decades reflecting various reforms introduced by the Reserve Bank's Payments System Board. However, significant differences in merchant fees for the different card networks remain, with transactions processed through the domestic debit scheme, eftpos, being materially cheaper on average for most merchants than the international debit schemes. Merchant-level data also show that smaller businesses typically face much higher card payment costs than larger merchants.

Some ongoing developments, such as the continued rollout of least-cost routing functionality to merchants, are expected to facilitate greater competition between card schemes and acquirers. In turn, the Bank expects to see further downward pressure on payment costs faced by businesses. The Bank will also be assessing the state of competition in the acquiring market as part of the current Review of Retail Payments Regulation, with a particular focus on whether the needs of smaller merchants are being sufficiently met by acquirers.<sup>[19]</sup> ❖

issuer), the merchant and the merchant's financial institution (the acquirer). In a three-party card network, the scheme is both the issuer and the acquirer.

[5] The card schemes publish interchange fee schedules on their websites.

[6] A summary of the Bank's card reforms can be found in RBA (2015) and RBA (2019).

[7] American Express and Diners Club are not subject to the Bank's interchange standards that apply to the four-party schemes. However, the two schemes have modified their surcharging rules to be consistent with the Bank's standard on merchant pricing, which gives merchants the right to surcharge card payments up to their cost of acceptance for each scheme. The ability of merchants to surcharge more expensive payment methods can put competitive pressure on schemes and acquirers to lower their merchant fees.

- [8] This was an update on a data collection first undertaken in 2017, the results of which were presented in Richards (2017).
- [9] Since mid 2017, acquirers and payment facilitators have been required to provide merchants with periodic statements that clearly set out their average cost of acceptance for each of the card payment systems regulated by the Bank. For further information, see <<https://www.rba.gov.au/payments-and-infrastructure/review-of-card-payments-regulation/q-and-a/card-payments-regulation-qa-conclusions-paper.html>>.
- [10] The raw data contained a number of outlier values where the cost of acceptance was reported as either negative or extremely large. It is likely that these outliers were either calculation errors or anomalies, and so convey little information about merchants' payment costs in normal circumstances. Many of the observations removed through the data cleaning process represented inactive merchant accounts with very small transaction amounts.
- [11] The Retail Payments Statistics includes data from a broader range of acquirers (including Coles Group Limited and Woolworths Group Limited, which self-acquire), but excludes UnionPay.
- [12] For simplicity, the remainder of this article will use the terms 'merchant' and 'merchant account' interchangeably.
- [13] Given the similarities between the average merchant fees charged by acquirers for Visa Debit and Debit Mastercard transactions, and for Visa and Mastercard credit card transactions, we combine the costs of these two schemes for the remainder of this discussion. Mastercard and Visa merchant fees are not able to be separately identified in the Retail Payments Statistics (for example, as shown in Graph 1).
- [14] For further information, see <<https://www.rba.gov.au/payments-and-infrastructure/review-of-card-payments-regulation/q-and-a/card-payments-regulation-qa-conclusions-paper.html>>.
- [15] There are currently no restrictions on the interchange fees levied on transactions made using foreign-issued cards.
- [16] The data do not allow us to say how much of the remaining gap is due to some Visa and Mastercard transactions being on foreign-issued debit cards, which are more expensive. However, this is unlikely to account for a significant part of the gap since available data suggest that only around 2 per cent of debit transactions acquired in Australia are made using foreign-issued cards. (This is the share as reported by financial institutions to the Bank in the Retail Payments Statistics collection. The actual share of transactions made on foreign-issued debit cards may be a little higher though, because some reporting institutions have difficulties differentiating foreign-issued debit and credit cards and report all such transactions as part of their credit card data.)
- [17] However, the Bank is aware that a few, mainly smaller, financial institutions still offer legacy deposit account products where the cardholder may be charged a fee for exceeding a specified number or value of eftpos transactions each month, with no equivalent fee for international scheme transactions. Such account structures may have been understandable a decade ago but would not appear to have any justification now given that the direction of interchange payments (from acquiring towards issuing institutions) have been the same for eftpos and the two international debit schemes since around 2012.
- [18] For example, a merchant might derive the most benefit from least-cost routing if transactions below a certain value are processed through Visa or Mastercard (which have percentage-based pricing), and transactions above that value are routed through eftpos (which is typically priced on a cents-per-transaction basis).
- [19] Information related to the Bank's Review of Retail Payments Regulation is available at <<https://www.rba.gov.au/payments-and-infrastructure/review-of-retail-payments-regulation/>>.

## References

Caddy J, L Delaney, C Fisher and C Noone (2020), 'Consumer Payment Behaviour in Australia', RBA *Bulletin*, March. Available at <<https://www.rba.gov.au/publications/bulletin/2020/mar/consumer-payment-behaviour-in-australia.html>>.

Reserve Bank of Australia (2015), 'Review of Card Payments Regulation: Issues Paper', March. Available at <<https://www.rba.gov.au/payments-and-infrastructure/review-of-card-payments-regulation/pdf/review-of-card-payments-regulation-issues-paper.pdf>>.

Reserve Bank of Australia (2019), 'Review of Retail Payments Regulation: Issues Paper', November. Available at <<https://www.rba.gov.au/payments-and-infrastructure/review-of-retail-payments-regulation/pdf/review-of-retail-payments-regulation-issues-paper-nov-2019.pdf>>.

Richards T (2017), 'Merchant Payment Costs and Least-cost Routing', Australian Payment Summit 2017, Sydney, 13 December. Available at <<https://www.rba.gov.au/speeches/2017/sp-so-2017-12-13.html>>.



# Developments in Banks' Funding Costs and Lending Rates

Susan Black, Dmitry Titkov and Lydia Wang<sup>[\*]</sup>

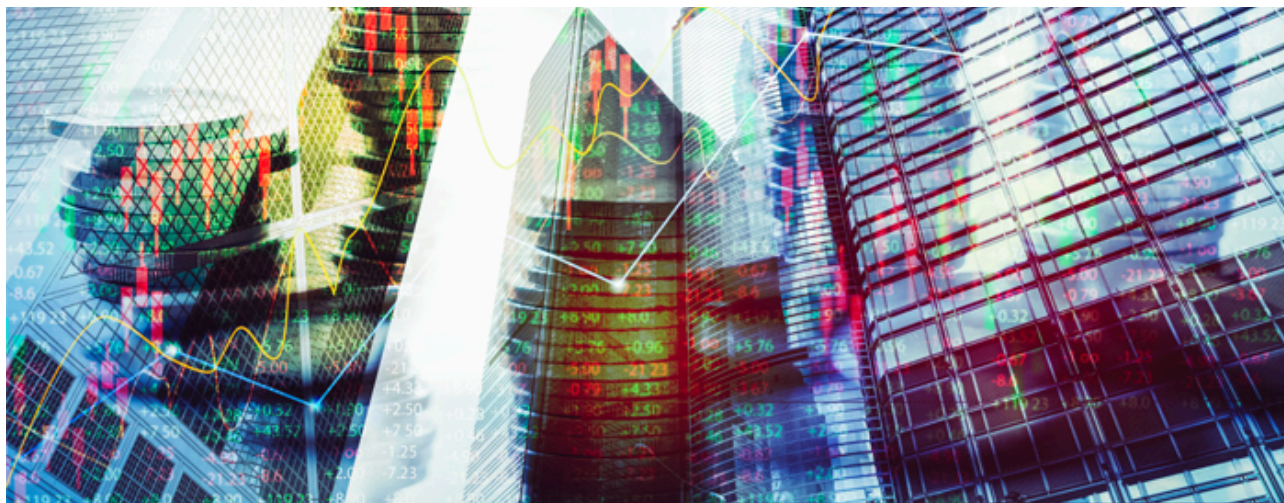


Photo: Busakorn Pongparnit – Getty Images

## Abstract

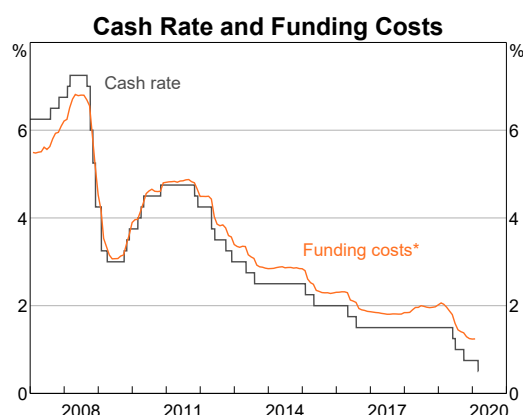
Banks' funding costs declined over 2019, driven by reductions in the cash rate. Lenders passed most of the decrease in funding costs through to interest rates on mortgages and business loans. Funding costs and lending rates are at historical lows.

## Funding costs and lending rates declined with the cash rate in 2019

The cash rate is a key determinant of the overall cost of banks' funding (Graph 1). This is because the level of the cash rate is an anchor for other interest rates in the Australian financial system. The pass-through from the cash rate to funding costs and lending rates is an important channel of monetary policy (Brassil, Cheshire and Muscatello 2018). The transmission of the cumulative 75 basis points of reductions in the cash rate in 2019 to Australian financial conditions – including to lower funding costs for banks – has been in line with historical experience (Kent 2019). Most of the decrease in funding costs was passed through to the interest rates offered by lenders for mortgages and business loans. This article updates previous Reserve Bank research, focusing on developments in the major

banks' funding costs and lending rates over 2019 (Black and Titkov 2019).<sup>[1]</sup>

**Graph 1**



\* RBA estimates of overall outstanding hedged debt and deposit costs for the major banks  
Sources: ABS; AFMA; APRA; ASX; Bloomberg; major bank liaison; major banks' websites; RBA; Refinitiv; Securitisation System; Tullett Prebon; US Federal Reserve; Yieldbroker

Consistent with the low level of the cash rate, banks' funding costs are at historically low levels. The decrease in funding costs over 2019 largely reflected the effects of reductions in the cash rate on wholesale debt costs and (retail and wholesale) deposit rates (Graph 2). The decline in these costs continues to flow through to banks' overall cost of funding, as term funding is replaced at lower interest rates. As discussed in more detail below, much of the major banks' wholesale debt and deposit costs are ultimately linked (either directly or via hedging) to bank bill swap (BBSW) rates. BBSW rates declined by more than the cash rate over 2019, as the tighter conditions in money markets from 2018 eased. On the other hand, the average interest rate paid on at-call deposits declined by a little less than the cash rate over 2019. This was primarily because, as is typical, the interest rates on many transaction accounts (which are usually close to zero) did not change following the cash rate reductions. The larger decline in wholesale funding costs broadly offset the smaller decline in some deposit rates. Overall, the major banks' funding costs are estimated to have decreased by a little more than the cash rate over 2019.

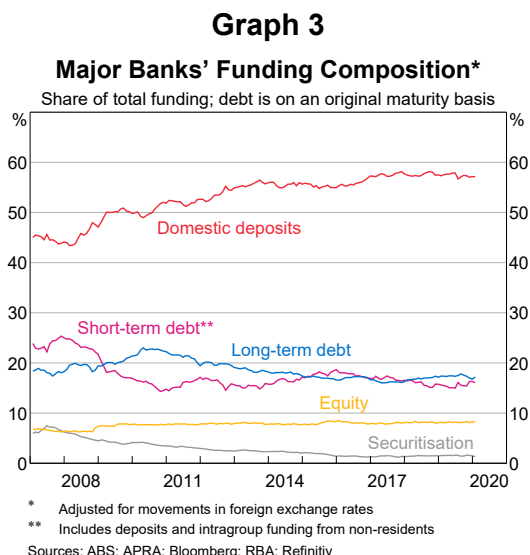
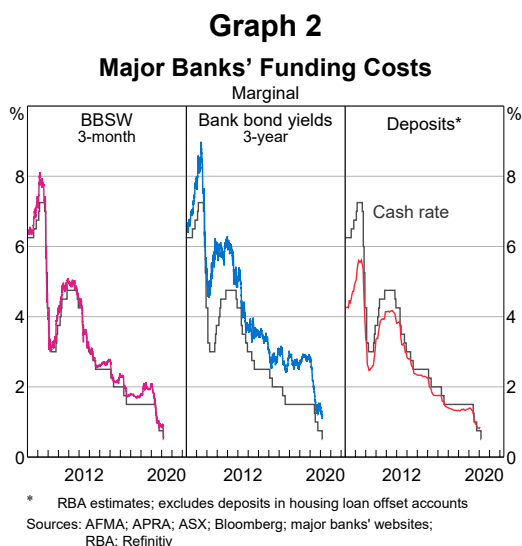
A large share of the decrease in funding costs flowed through to major banks' lending rates. The average rate paid on outstanding variable-rate housing loans decreased by almost 70 basis points following the 75 basis point decline in the cash rate in 2019, amid strong competition for new borrowers. Following the 25 basis point reduction in

the cash rate in March 2020, the major banks have lowered their standard variable rates (SVRs) on housing loans by 25 basis points. Fixed rates for new mortgages declined by around 100 basis points in 2019, consistent with a similar decline in swap rates, which are often used as a benchmark for pricing fixed-rate loans. Interest rates on loans to businesses also decreased, particularly the interest rates paid by large businesses, which tend to move with BBSW rates. Like banks' funding costs, the interest rates at which households and businesses can borrow are at historically low levels, reflecting the low level of the cash rate.

### Deposits continue to be the largest source of bank funding

Banks obtain funding from retail deposits, wholesale deposits, wholesale debt and equity. Excluding equity, around two-thirds of the major banks' funding is from deposits. Short- and long-term wholesale debt (including securitisation) make up the remaining third of non-equity funding, in roughly equal shares. The composition of the major banks' funding in terms of these broad categories was little changed over 2019 (Graph 3).<sup>[2]</sup>

A little under half of the major banks' deposits are sourced from households; the rest are from businesses, financial institutions (with a large share from superannuation funds) and the government (Graph 4, left panel). Deposits from households are typically smaller than those from other sources and



therefore face 'retail' rates of interest. Although some small- and medium-sized businesses may also face retail deposit rates, larger non-household depositors have access to wholesale debt markets, and the rates in these markets are used by banks as a benchmark for pricing some non-household deposits. For the purpose of this article, all non-household deposits are categorised as 'wholesale' deposits.

There has been some switching by both retail and wholesale depositors from term deposits to at-call deposits over the past year (Graph 4, right panel). This shift was supported by narrower spreads between term and at-call rates, as the interest rates offered for new term deposits fell by more than the rates on at-call accounts in 2019 (discussed further below).

### Banks' demand for new long-term debt funding has been low

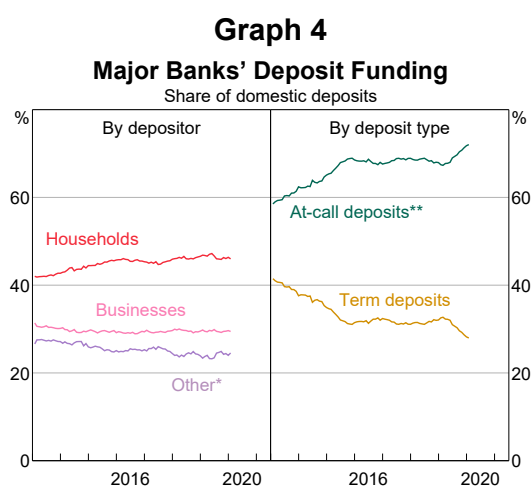
The total share of funding sourced by the major banks from wholesale debt markets was little changed over 2019, though there was a slight shift from long- to short-term debt within this. The value of long-term debt issued in 2019 was more than offset by the value of securities that matured, such that issuance was negative in net terms over the year. This has in part reflected lower demand from the major banks for new long-term debt funding in 2019 than in recent years because modest growth

in their balance sheets reduced the need for additional term funding.

The composition of the major banks' new long-term debt funding was also different from prior years (Graph 5). Bond issuance was at its lowest level since 2011; by contrast, issuance of Tier 2 hybrid securities picked up significantly in the second half of 2019. This followed an announcement by the Australian Prudential Regulation Authority (APRA) in July 2019 that the major banks would be required to increase their total loss-absorbing capital by the beginning of 2024. Hybrid securities have both equity- and debt-like features, and can be used to fulfil a part of banks' regulatory capital requirements.

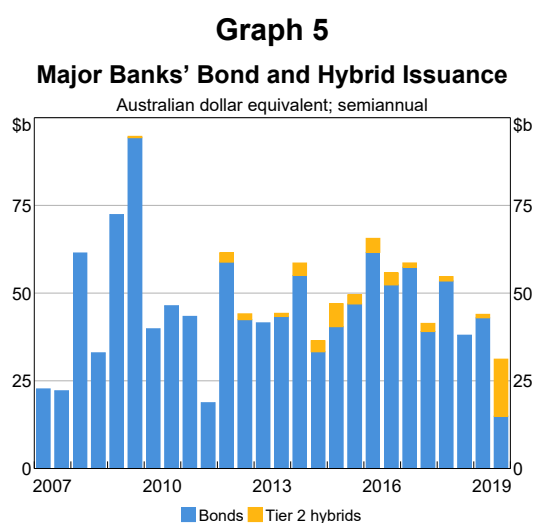
### The share of funding from equity has been stable

In addition to deposits and wholesale debt, banks obtain a portion of their funding from equity. The major banks' share of funding from equity has been stable over recent years, though they have increased their stock of equity funding by around \$50 billion since mid 2015. This increase was largely in response to changes in prudential regulations that increased the amount of capital that banks are required to hold. The major banks have all met APRA's 'unquestionably strong' capital benchmarks, which were put in place ahead of new prudential standards that are expected to take effect at the start of 2022.



\* Includes deposits from financial institutions and the government  
\*\* Includes deposits in housing loan offset accounts and non-interest-bearing deposits

Sources: APRA; Bloomberg; RBA; Refinitiv



Sources: Bloomberg; KangaNews; Private Placement Monitor; RBA

## Banks' funding costs declined to historic lows

As discussed above, the major banks' (non-equity) funding costs are estimated to have declined to historically low levels in 2019 (Graphs 1 and 2). This decline largely reflected the effects of reductions in the cash rate in 2019. Overall, the transmission of the cash rate reductions to banks' funding costs has been in line with historical experience (Graph 6).

## The cost of wholesale funding decreased by more than the cash rate

Much of the major banks' wholesale funding costs are ultimately linked to BBSW rates, which declined by more than the cash rate over 2019 (Graph 7, left panel). For wholesale debt costs, these links can be direct (such as where debt is issued at a spread to BBSW rates) or indirect (as a result of the major banks' interest rate hedging practices, where BBSW rates are used as reference rates). The rates paid on wholesale term deposits also tend to be benchmarked against BBSW rates, though the interest rates on some at-call accounts (particularly, transaction accounts) for wholesale depositors are less sensitive to BBSW rates.<sup>[3]</sup>

BBSW rates are heavily influenced by (actual and expected) cash rate reductions. In 2019, BBSW rates declined by more than the cash rate, even when accounting for expectations of a further reduction in the cash rate. This was because the spreads

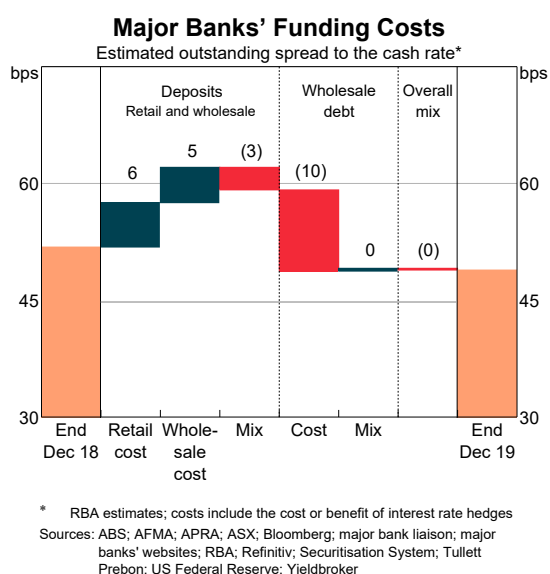
required by investors to hold short-term bank debt narrowed, following elevated money market spreads throughout most of 2018 (Graph 7, right panel). The narrower BBSW spreads reflected reduced tightness in domestic and foreign money markets.<sup>[4]</sup> Overall, the 3-month BBSW rate declined by more than 100 basis points over 2019 (compared with a decline of around 80 basis points in the 3-month overnight indexed swap rate).

The major banks' wholesale debt costs are estimated to have declined alongside the decline in BBSW rates (Graph 8). In addition, the cost of sourcing new long-term debt fell by a bit more than the decline in BBSW rates, owing to a larger decline in long-term reference rates; this fall in the marginal cost of long-term debt is continuing to flow through to the outstanding cost, as maturing term funding is being replaced at lower interest rates. As a result, the major banks' overall cost of wholesale funding is estimated to have fallen by more than the cash rate over 2019. Changes in the mix of wholesale debt funding had little overall effect on funding costs: the slight shift from long- to short-term debt supported the decline in the overall cost of wholesale funding, but this was offset by the major banks' increased issuance of (more expensive) Tier 2 hybrid securities.

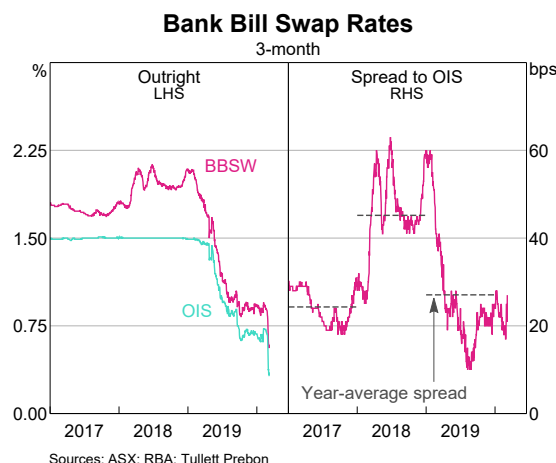
## Deposit rates are at historic lows

Following the cumulative 75 basis points of reductions in the cash rate in 2019, banks decreased the interest rates paid on most types of deposits. The average decrease was smaller for the rates paid

**Graph 6**



**Graph 7**



on at-call deposits than for the rates offered on new term deposits, some of which fell by more than the cash rate over 2019. These declines are continuing to flow through to the cost of outstanding deposits, as maturing term deposits are replaced at lower interest rates. Overall, the major banks' deposit costs are estimated to have declined by a bit less than the cash rate over 2019, though the decline was supported by changes in the mix of deposit funding to (less expensive) at-call deposits from term deposits, as well as the major banks' hedging practices.

Over 2019, the major banks lowered their rates on various deposit accounts (Graph 9), including on:

1. interest-bearing at-call accounts for retail depositors, such as online and bonus saver accounts, by an average of 65–80 basis points
2. new retail term deposits by around 100 basis points
3. new wholesale term deposits by more than 100 basis points, reflecting the fall in BBSW rates over the year.

However, as is typical, the interest rates on many transaction accounts (which are usually close to zero) did not change following reductions in the cash rate, for both retail and wholesale depositors. Following the reductions in the cash rate last year, the major banks were estimated to be paying no or low interest (between zero and 25 basis points) on a little over one-quarter of their deposit funding (Graph 10). This compares with around 10 per cent

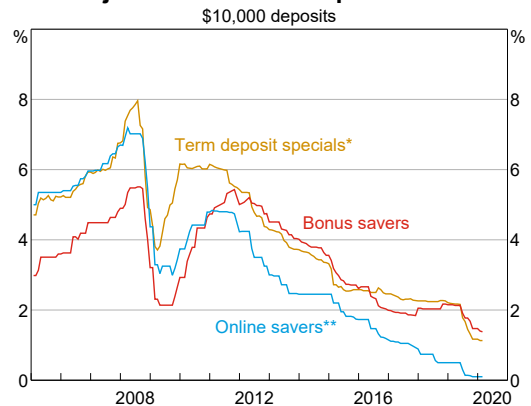
of deposits paying no or low interest before the reductions in the cash rate. However, the major banks enter into hedges for at least their non-interest-bearing deposits, such that the hedged costs of their non-interest-bearing deposits decreased in line with BBSW rates in 2019. Over time, as these hedges expire (and are replaced at lower interest rates), banks' deposit funding costs will increase a little.

### Housing and business lending rates are also at historic lows

Most of the cumulative 75 basis points of cash rate reductions in 2019 has flowed through to mortgage rates paid by households. Interest rates on outstanding variable-rate housing loans have declined by almost 70 basis points (Graph 11).

**Graph 9**

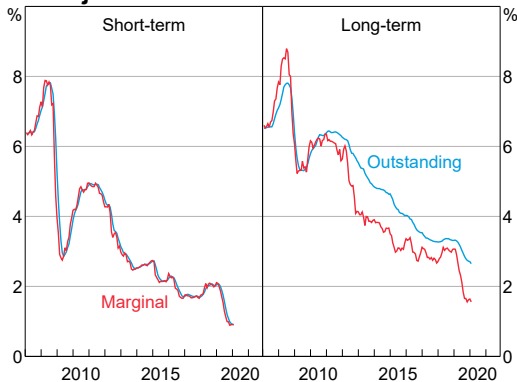
**Major Banks' Retail Deposit Rates**



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

**Graph 8**

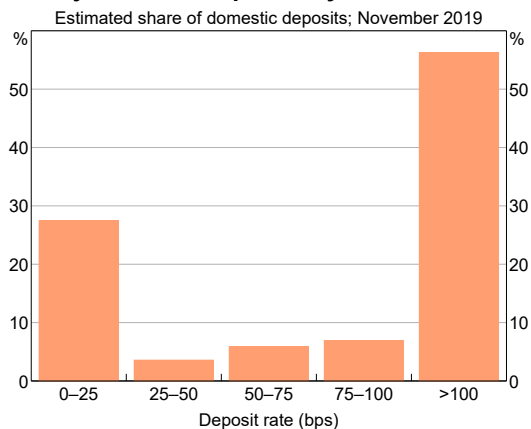
**Major Banks' Wholesale Debt Costs\***



\* RBA estimates; costs do not include interest rate hedges  
 Sources: AFMA; APRA; ASX; Bloomberg; RBA; Refinitiv; US Federal Reserve; Yieldbroker

**Graph 10**

**Major Banks' Deposits by Interest Rate**



Source: RBA estimates based on major bank liaison

Following the reductions in the cash rate in 2019, lenders lowered their SVRs on housing loans by an average of 60 basis points, which automatically flowed through to all variable-rate loans. The average rate paid on outstanding variable-rate loans declined by more than this, reflecting strong competition for new high-quality borrowers as well as households switching away from interest-only loans (which generally have higher interest rates). Following the 25 basis point reduction in the cash rate in March 2020, the major banks have lowered their SVRs on housing loans by 25 basis points.

Rates for fixed-rate housing loans have also declined. Over the past year, the major banks reduced their advertised 3-year fixed lending rates by around 100 basis points for owner-occupiers. This decline was consistent with a similar decline in interest rate swap rates, which are often used as a benchmark for pricing fixed-rate loans (given that they reflect expectations about the future path of the cash rate).

Interest rates on loans to large businesses – which tend to move with BBSW rates – are estimated to have declined over recent months and are at very low levels (Graph 12). Lending rates for medium and, to a lesser extent, small businesses have also decreased over recent months.<sup>[5]</sup>

### Banks' lending spread widened a little over 2019

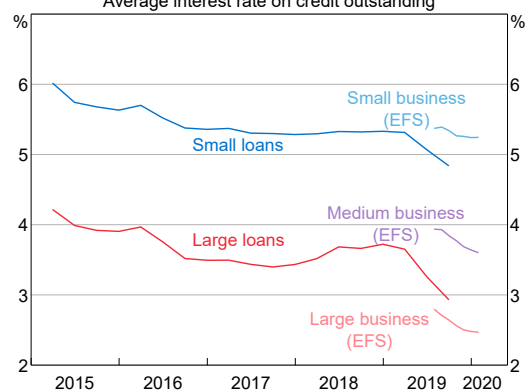
A bank's implied spread on its outstanding lending is the difference between its average lending rate

and average cost of debt and deposit funding.<sup>[6]</sup> We estimate that the implied lending spread for the major banks widened a little over 2019 (Graph 13). Although the major banks passed on most of the cash rate reductions in 2019 to lending rates, the implied lending spread widened because their funding costs declined by slightly more than the cash rate reductions. This largely reflected the narrowing in BBSW spreads in the first quarter of 2019. Following the 25 basis point reduction in the cash rate in March 2020, the major banks have lowered their SVRs on housing loans by 25 basis points. ✎

**Graph 12**

**Business Lending Rates**

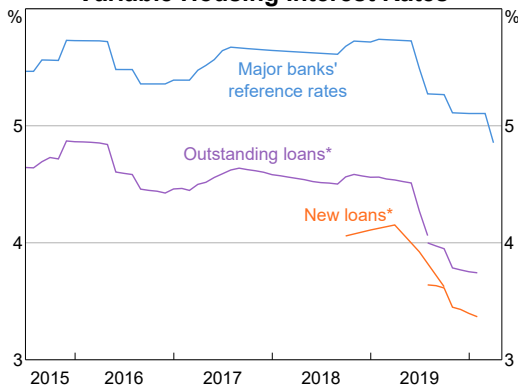
Average interest rate on credit outstanding



Sources: APRA; RBA

**Graph 11**

**Variable Housing Interest Rates**

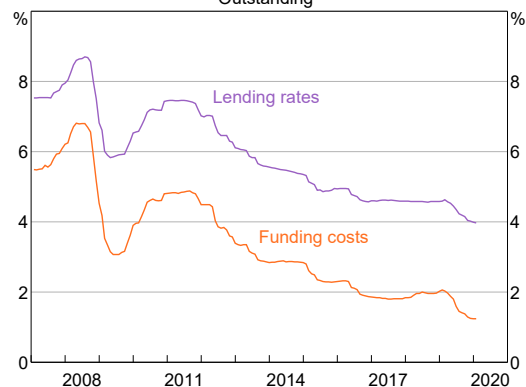


\* Series break in July 2019; thereafter, data based on EFS collection  
Sources: APRA; banks' websites; CANSTAR; RBA; Securitisation System

**Graph 13**

**Funding Costs and Lending Rates**

Outstanding\*



\* RBA estimates for the major banks  
Sources: ABS; AFMA; APRA; ASX; Bloomberg; CANSTAR; major bank liaison; major banks' websites; RBA; Refinitiv; Securitisation System; Tullett Prebon; US Federal Reserve; Yieldbroker

## Footnotes

- [\*] The authors are from Domestic Markets Department.
- [1] RBA estimates of banks' funding costs are now informed by interest rate data collected in the new Economic and Financial Statistics (EFS) collection. Incorporating these new data into our methodology has revised our estimates of funding costs up marginally in recent years. For more information on the EFS collection, see Bank, Durrani and Hatzvi (2019) and RBA (2020).
- [2] RBA estimates of banks' funding composition were revised last year when improved balance sheet data became available with the EFS collection. The major banks' share of funding from deposits was revised a bit lower. For more information, see RBA (2019), 'Domestic Financial Conditions', *Statement on Monetary Policy*, November pp 43–54.
- [3] For more information on the influence of BBSW rates on the major banks' funding costs, see Black and Titkov (2019).
- [4] For a further discussion see RBA (2019), 'Domestic Financial Conditions', *Statement on Monetary Policy*, February, pp 43–56.
- [5] The EFS collection provides more disaggregated data on the lending rates paid by businesses; these data are broken down by small, medium and large businesses, instead of small and large business loans. For more information, see RBA (2020).
- [6] This measure differs from some commonly reported measures of bank profitability as it excludes the effects of non-loan interest-earning assets, such as cash and liquid assets.

## References

- Bank J, Durrani K and Hatzvi E (2019), 'Updates to Australia's Financial Aggregates', *RBA Bulletin*, March, viewed 22 January 2020. Available at <<https://www.rba.gov.au/publications/bulletin/2019/mar/updates-to-australias-financial-aggregates.html>>.
- Black S and Titkov D (2019), 'Developments in Banks' Funding Costs and Lending Rates', *RBA Bulletin*, March, viewed 22 January 2020. Available at <<https://www.rba.gov.au/publications/bulletin/2019/mar/developments-in-banks-funding-costs-and-lending-rates.html>>.
- Brassil A, J Cheshire and J Muscatello (2018), 'The Transmission of Monetary Policy through Banks' Balance Sheets', in *Central Bank Frameworks: Evolution or Revolution?*, Proceedings of a Conference, Reserve Bank of Australia, Sydney, pp 73–122.
- Kent C (2019), 'The Usual Transmission – Monetary Policy and Financial Conditions', Speech at Finance & Treasury Association, Sydney, 13 August.
- RBA (Reserve Bank of Australia) (2020), 'Box D: Enhancing the Transparency of Interest Rates', *Statement on Monetary Policy*, February, pp 59–61.
- RBA (2019), 'Domestic Financial Conditions', *Statement on Monetary Policy*, February, pp 43–56.
- RBA (2019), 'Domestic Financial Conditions', *Statement on Monetary Policy*, November, pp 43–54.

# Renewable Energy Investment in Australia

Timoth de Atholia, Gordon Flannigan and Sharon Lai<sup>[\*]</sup>



Photo: zhongguo – Getty Images

## Abstract

Renewable energy investment has increased significantly in Australia over recent years, contributing to a continuing shift in the energy generation mix away from traditional fossil fuel sources. Current estimates suggest that investment in renewable energy has moderated from its recent peak and is likely to decline further over the next year or two. In the longer term, the transition towards renewable energy is expected to continue. Significant coal-fired generation capacity will be retired over coming decades and is likely to be replaced mainly by distributed energy resources and large-scale renewable energy generators, supported by energy storage.

## Introduction

Investment in renewable energy generation has increased markedly in Australia over recent years, driven by a combination of factors including government policy incentives, elevated electricity prices and declining costs of renewable generation technology. This investment is contributing to a changing energy mix in Australia. Over the past decade, the share of electricity generation from renewable sources has increased steadily to be nearly 20 per cent in 2018 (Graph 1).<sup>[1]</sup> This share was higher in 2019 and is expected to continue increasing as projects that are currently under

construction or have been recently completed begin generating output.

Investment in renewable energy generation is expected to moderate in the near term as some of the recent drivers unwind and because of challenges with integrating renewable energy sources into the electricity grid. However, over the longer term, the transition towards renewable energy generation is expected to continue as ageing coal-powered stations are retired and the process of decarbonisation continues.

This article discusses recent developments in large-scale and small-scale renewable energy investment



in Australia and the drivers of this investment. It then considers the implications of increased renewable generation for the electricity grid and energy storage investment. Finally, the article considers the outlook for investment in renewable energy generation, transmission infrastructure and storage.

### Large-scale Renewable Energy Generation Investment

Investment in large-scale renewable energy projects increased significantly between 2016 and 2019. It is estimated to have accounted for nearly 5 per cent of non-mining business investment at its recent peak in 2018. This investment was completed almost entirely by the private sector, with large-scale renewable projects driving much of the strong growth in private sector electricity-related investment during this period (Graph 2). Investment in new renewable energy projects over recent years has been broadly evenly split between wind and solar farms. Queensland, Victoria and New South Wales have accounted for the vast majority of projects.

Renewable energy investment has supported activity and employment, particularly in regional areas where large-scale renewable generators tend to be located. Information from the Reserve Bank’s liaison with energy industry stakeholders suggests that most components associated with renewable energy generation are imported (e.g. solar panels

and wind turbines). Nonetheless, there are spillovers to domestic firms, with some contacts suggesting that local content accounts for 25–40 per cent of total costs. This local content is mainly engineering, construction and installation services.<sup>[2]</sup> Some manufacturing firms have also reported stronger demand for locally produced electricity generation-related equipment.

### Drivers of Investment

A number of factors have driven investment in large-scale renewable projects since 2016, including elevated wholesale electricity prices, government policy incentives, declining technology costs and improved access to finance.

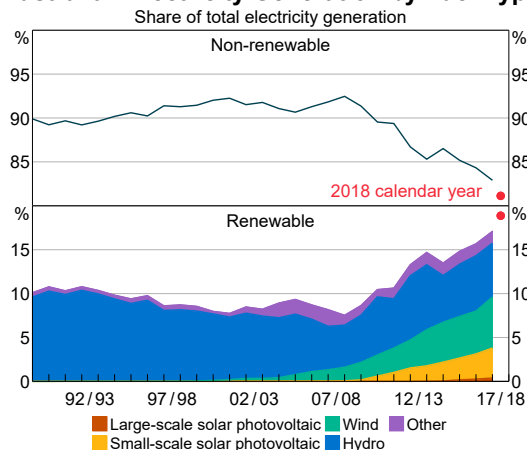
### Wholesale electricity prices

Investment in renewable energy generation has been supported by a significant increase in wholesale prices in the National Electricity Market (NEM) since 2015. The NEM is the electricity grid that covers the east coast and southern states of Australia. Western Australia and the Northern Territory have separate grids.

Wholesale prices in the NEM are determined by supply and demand. Supply-side factors appear to have been the main driver of higher wholesale electricity prices because demand for electricity has been broadly stable over recent years. In the early 2010s there was an oversupply of generation

**Graph 1**

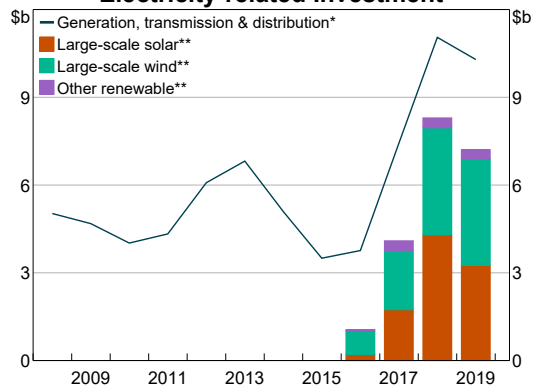
**Australian Electricity Generation by Fuel Type**



Source: Department of the Environment and Energy

**Graph 2**

**Electricity-related Investment**



\* Renewable and non-renewable; work done by the private sector for the private sector; 2019 observation annualised  
 \*\* Capital expenditure is assumed to be distributed equally over the project’s life; ‘other renewable’ includes large-scale battery, biomass, pumped hydro and hybrid  
 Sources: ABS; Clean Energy Council; Clean Energy Regulator; company websites; Deloitte Access Economics; public reports; RBA

capacity, which helped keep prices low (Wood, Blowers and Percival 2018; Rai and Nelson 2019; Simshauser 2019). The supply-demand balance has tightened considerably since then as a number of (primarily coal-fired) generation plants have been retired. Two brown coal-fired plant closures, Northern in South Australia (2016) and Hazelwood in Victoria (2017), had a particularly notable impact on supply. These plant closures removed over 2 gigawatts (GW) of relatively cheap generation capacity, which was equivalent to 5 per cent of total NEM capacity in 2015/16 (AER 2018).<sup>[3]</sup> The withdrawal of this coal-fired generation meant that higher-priced gas and black coal-fired generation became more important in the NEM, particularly during periods when renewable power was not being generated. At around the same time, the price of gas and, to a lesser extent, black coal rose strongly, increasing the cost of electricity generation using these inputs. This contributed to increases in the average price of wholesale electricity (Wood *et al* 2018; Rai and Nelson 2019; Graph 3).

### Government policies

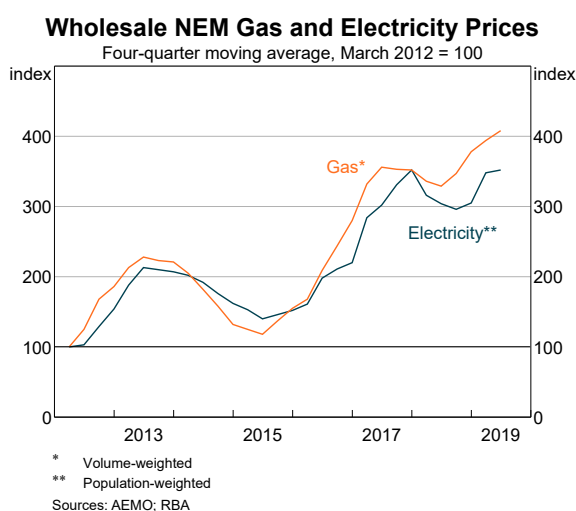
Government climate change-related policies have also encouraged investment in large-scale renewable electricity generation. One key Australian Government policy is the Renewable Energy Target (RET), which targets 33,000 gigawatt hours (GWh) of additional large-scale renewable electricity generation by 2020.<sup>[4]</sup> The RET incentivises the

development of new renewable energy power stations. It does this by requiring liable entities, predominantly electricity retailers, to source an annually increasing proportion of their electricity requirements from renewable generators. Under the RET, renewable power plants can create large-scale generation certificates (LGCs) for each megawatt hour (MWh) of renewable electricity generated. These certificates can then be sold or transferred to liable entities or other companies looking to surrender certificates voluntarily.<sup>[5]</sup>

Over 2015 and 2016, the LGC spot price more than doubled to around \$85/MWh in response to an expected shortfall in certificates (AER 2017). This supported renewable energy investment by providing an important revenue stream alongside earnings from the sale of electricity. The price of a certificate has more than halved since mid 2018 because it has become clear that the generation capacity from renewable energy power plants completed and under construction would be sufficient to meet the RET (CER 2019b).

State government policies have also encouraged renewable generation investment. These policies are more varied and include reverse auctions (where renewable energy projects bid for power supply contracts with the state government), state-based renewable energy targets and other commitments. While not all state-based commitments are legislated, they tend to target a larger proportion of renewable generation than the national RET (Table 1).

**Graph 3**



### Cost of electricity generation

The costs of wind- and solar-generated electricity have decreased markedly over the past decade. While it is difficult to compare the cost of electricity generation from different sources, one common approach is to use the Levelised Cost of Electricity (LCOE) measure. This represents the present value of the cost of building and operating a power plant over its assumed life. While renewable power plants have quite high fixed costs, their operating costs are very low owing to the zero cost of fuel (e.g. wind and sunlight). The LCOE for new renewable power plants has fallen significantly over the past decade and is estimated to be between 40 and 60 per cent

**Table 1: Renewable Energy Generation by State**

	Actual in 2018 %	Renewable energy generation commitment <sup>(a)</sup>
NSW	17	No commitment
Vic	17	25 per cent by 2020, 40 per cent by 2025, 50 per cent by 2030
Qld	9	50 per cent by 2030
WA	8	No commitment
SA	51	No commitment
Tas	95	100 per cent by 2022
ACT	54	100 per cent by 2020
NT	4	50 per cent by 2030
Aus	19	23.5 per cent by 2020

(a) State RET or equivalent

Sources: Climate Council; Department of the Environment and Energy; State government websites

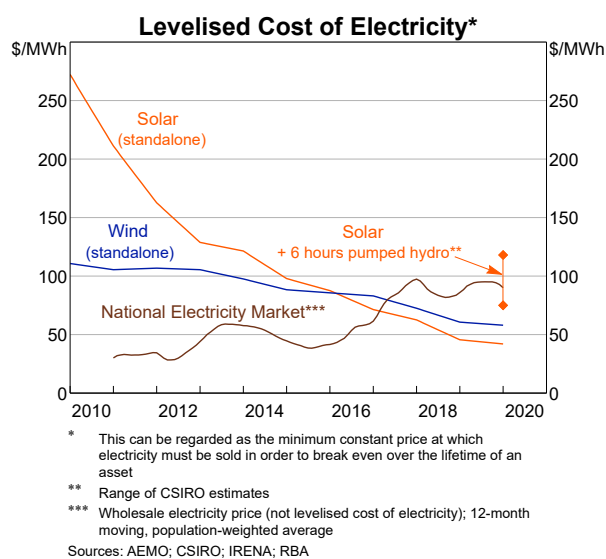
of the cost of a new fossil fuel plant (Graham *et al* 2019) (Graph 4). This decline in the cost of new renewable generation has been driven by technological innovation as well as falling manufacturing and installation costs. On this measure, a new generation-only renewable plant is much cheaper to build than a new fossil fuel plant. However, if the cost of storage is incorporated, the case is less clear.<sup>[6]</sup> For example, LCOE estimates for a new renewable plant with six hours of pumped hydroelectricity storage is around that of a new coal-fired plant (Graham *et al* 2019). This estimate does not incorporate the risk that a new coal-fired power plant could encounter greenhouse gas emissions constraints over the course of its economic life. Once possible emission constraints are priced, the LCOE of a new coal-fired plant is higher than a new renewable generation plant with storage.

### Financing for new projects

Finally, improved access to finance for developers of renewable generation power plants has been important in supporting increased investment. This is particularly important because investment in large-scale renewable energy generation tends to be highly geared. Liaison contacts suggest gearing ratios are often between 60 and 85 per cent. Domestic banks appear to have provided a significant proportion of this finance. There is evidence that project financing arrangements have

evolved over the past couple of years, with increased overseas financing and the use of sophisticated financial contracts.

Long-term power purchase agreements (PPA) assist developers to obtain finance by providing revenue surety. Historically, developers typically entered into PPAs with electricity retailers, who had obligations to purchase electricity from renewable sources under the RET. Over the past few years, however, projects have been increasingly supported by PPAs with other corporate entities. Corporate PPAs can take many forms but often involve the corporate entity entering into an electricity supply contract directly with the generator. Corporates are entering

**Graph 4**

into PPAs to reduce their electricity costs and exposure to price volatility as well as to meet environmental commitments. The electricity prices specified in corporate PPAs appear to have declined over the past five years or so, with prices in some recently signed contracts well below the current NEM wholesale electricity price.

The Clean Energy Finance Corporation (CEFC) and the Australian Renewable Energy Agency (ARENA) have also played an important role in helping developers obtain finance by directly financing projects and encouraging private investment. These agencies have directly invested around \$8.5 billion in clean energy-related projects since their inceptions. They estimate that this investment has encouraged a further \$25 to \$30 billion of additional private sector investment (ARENA 2019 and CEFC 2019).

### Small-scale Renewable Energy Investment

Australia's small-scale renewable generation capacity has grown rapidly in recent years and is now equivalent to around 20 per cent of the NEM's total capacity. Spending on small-scale generation (mainly rooftop solar electricity and heating) has increased in recent years to around \$3.5 billion in 2019 (Graph 5).

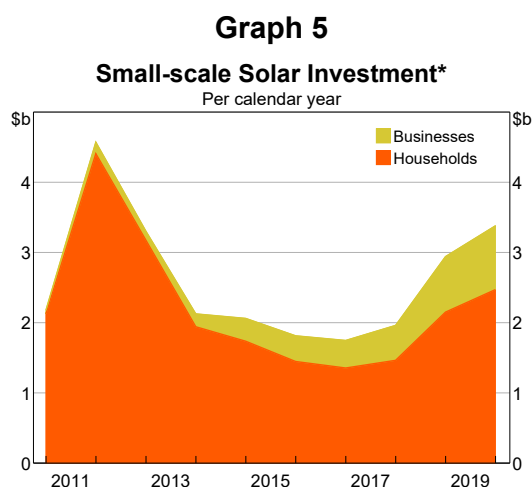
Households have been the main driver of small-scale renewable investment and around one-

quarter of dwellings are now fitted with rooftop solar panels. This has been incentivised by government policies, including the Australian Government's small-scale technology certificate scheme and state-based feed-in tariffs. These incentives, and the high price of retail electricity, has meant that the 'payback period' (i.e. the amount of time it takes for energy savings/income to offset purchase and installation costs) for a typical residential solar installation has declined and currently ranges between four and six years for most states. The decline in payback periods over recent years has been driven mainly by high retail electricity prices and falling costs of solar panel systems (GEM 2016, 2019).

There has also been an increase in businesses installing rooftop solar over recent years. Firms are estimated to have accounted for more than 20 per cent of the spending on small-scale renewable generation in 2019. Businesses tend to have larger electricity consumption needs than households and they also often have the ability to install larger systems (i.e. more roof space). Liaison suggests businesses are increasingly considering investment in rooftop solar panels.

### Renewable Energy Grid Integration

Significant new renewable generation capacity has been added to the NEM over the past couple of years (Graph 6). The changing mix of electricity generation towards a higher share of renewables and the retirement of coal-fired generation presents challenges for maintaining power system stability. This is because renewable energy generation sources have different physical characteristics to conventional sources, have weather-dependent output and are being located in remote parts of the electricity grid. The existing NEM transmission system was designed to transport power from large centralised generators (generally coal-fired plants) to end users. In contrast, renewable energy power plants tend to be geographically dispersed based on the availability of wind and solar resources. In some cases they are being built in areas of the grid with insufficient transmission capacity. The increasing prevalence of distributed energy resources (e.g. rooftop solar panels on residential



\* Small-scale solar installations are defined as having capacities below 100kW; investments below 15kW are assumed to be households; investments above 15kW are assumed to be businesses; 2010–2018 use Bloomberg small scale solar investment data; 2019 is an estimate based on Australian small scale solar capacity increases and cost reductions

Sources: APVI; Australian Energy Council; Bloomberg New Energy Finance; Clean Energy Regulator; IRENA; RBA

properties) also presents challenges for network stability.

These challenges are generating uncertainty and leading to financial losses for renewable energy developers and contractors involved in construction, presenting a downside risk to new investment. Partly as a result of the rapidly increasing supply of renewable energy generation capacity, the Australian Energy Market Operator (AEMO) has been intervening in the market more frequently to maintain system security. For example, some renewable energy generators have had their output constrained because of insufficient grid capacity. In addition, some generators located in weak areas of the grid have faced significant reductions in marginal loss factors, reducing the revenue earned for electricity produced.<sup>[7]</sup> Tighter technical standards on connecting to the grid (such as requiring generators to install extra technology) have also led to connection delays and higher costs for new projects.

### Energy Storage

Solar and wind generation rely on meteorological variables, which may not be in sufficient supply at times when electricity is needed. As a result, storage is required to match supply and demand for energy. Batteries and hydroelectricity are the most common forms of storage in Australia, although emerging

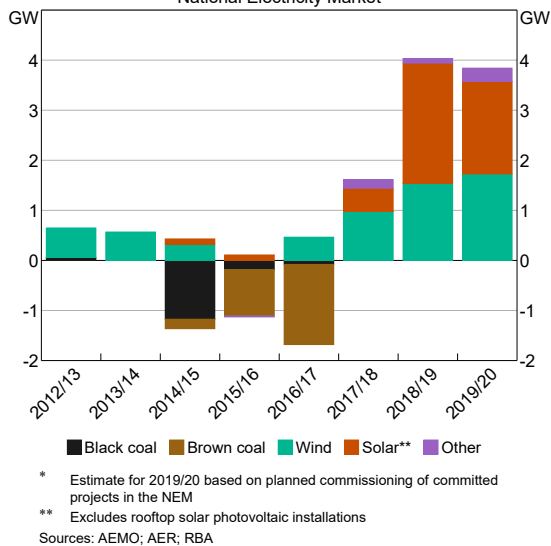
hydrogen storage technologies are also being proposed and trialled.

Investment in batteries has been limited to date because of the relatively high cost per unit of electricity stored. While investment in small-scale battery storage has increased in recent years, battery installations still significantly lag total rooftop solar installations (Graph 7). A more supportive policy environment and declining costs of battery storage are likely to have contributed to the recent increase in investment. Investment in large-scale batteries has also been fairly limited. Battery systems are fast to dispatch, meaning they can respond quickly to demand requirements, although the amount of energy they can hold is relatively small.<sup>[8]</sup>

Hydroelectricity can produce larger amounts of electricity over a longer duration when compared with battery storage. It operates by running water through hydroelectric turbines. Pumped hydropower facilities store electricity during periods of high supply or low demand by pumping water to an elevated reservoir where it can be used later to generate hydroelectricity. Pumping facilities can be built into existing hydroelectric plants and expand the amount of power they can dispatch considerably. There are over 100 hydroelectricity plants and three major pumped hydroelectricity plants currently operating in Australia which, combined, provide between 5 and 7 per cent of Australia’s electricity supply (ARENA 2020).

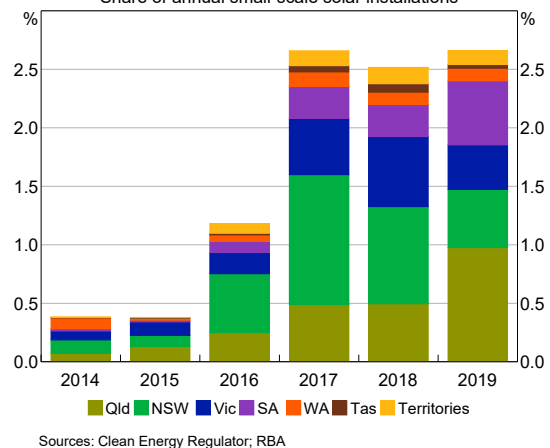
**Graph 6**

**New Generation Investment and Withdrawals\***  
National Electricity Market



**Graph 7**

**Solar with Concurrent Battery Installations**  
Share of annual small-scale solar installations



## Investment Outlook

Investment activity in large-scale renewable generation projects has moderated from its 2018 peak and current estimates suggest it will decline further over the next year or two. However, the outlook for investment over the longer term remains positive. The pace of future investment will depend on factors including wholesale electricity prices, the government policy environment and electricity grid considerations. Investment in the transmission network and energy storage will help support a continued increase in renewable energy generation.

### Large-scale renewable energy generation

A number of factors suggest that investment activity in renewable energy will decline over the next couple of years. Some of the drivers of the increase in large-scale renewable investment over the past few years have become less supportive. In addition, electricity grid connection challenges have created uncertainty for renewable energy developers.

The generation capacity of new large-scale renewable projects that reached financial close in 2019 fell by around half compared with 2018 (Graph 8). However, the decline in investment activity in 2020 is not expected to be as sharp as implied by the fall in committed capacity, partly because delays have pushed out the construction timelines of a number of projects. While it can take several years for new projects to obtain development approvals and arrange finance, construction times are relatively short for many projects.<sup>[9]</sup> The relatively quick construction timelines of renewable energy projects creates some uncertainty for the investment outlook. If the investment environment becomes more favourable and grid integration issues are alleviated, projects could be added to the investment pipeline quite rapidly.

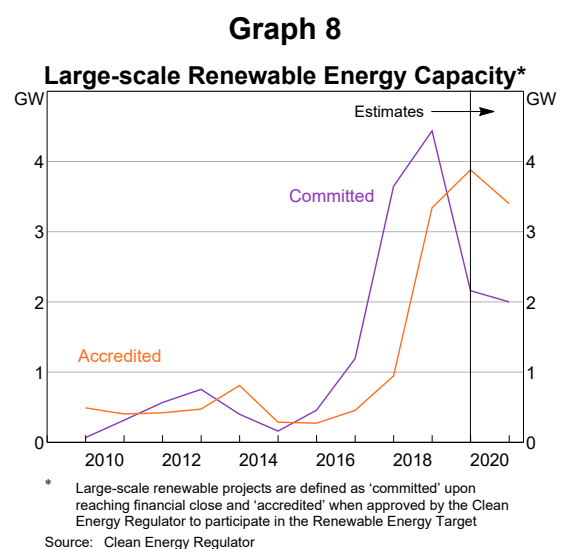
### Near-term drivers

Developments in wholesale electricity prices are affecting returns for renewable generation plants and are likely to be weighing on decisions about future investment in large-scale renewable generation. There has been a notable change in

how wholesale electricity prices evolve over the course of a day (intraday pricing). Daytime prices have declined significantly relative to the morning and evening peaks, mainly because of increased solar generation. This is most evident around the middle of the day when solar output is at its highest (Graph 9). The decline in intraday pricing appears to have occurred faster than expected. Occasionally, during days of abundant sunlight and wind, the large electricity load generated by renewables can drive prices negative, reducing returns for generators. In addition, wholesale electricity price futures suggest a decline in the average price over coming years, in large part due to the increase in renewable generation capacity. Average wholesale prices remain higher than the LCOE of new renewable generation but this gap is expected to narrow. As a result, wholesale electricity prices are expected to provide less support for future investment.

The Australian Government's RET has been met by the recent increase in renewable electricity generation capacity (CER 2019a). LGC futures have declined to around \$15/MWh in 2022 and may decline further as more renewable capacity comes on line (Mercari 2020). As a result, the RET is unlikely to provide much support for investment in renewable generation in the future.

Weak system strength in some remote parts of the electricity network has made it challenging to connect and integrate renewable generation sources, leading to significant delays in grid



connections (AEMO 2020; CER 2020). Some associated regulatory actions in response to these issues have included output constraints, marginal loss factor reductions and the imposition of additional technical requirements on new generators. These challenges are likely impacting new renewable energy investment and general confidence in the sector (CEC 2019).

### Medium- and longer-term drivers

While near-term drivers of investment in new renewable generation have weakened, medium- and longer-term factors remain positive. There continues to be strong interest from firms, households and investors in renewable energy investment. A substantial number of projects have secured development approvals but are not yet committed. While electricity demand in the NEM is expected to remain broadly flat over coming years, the potential uptake of electric vehicles represents an upside risk (AEMO 2018). Electric vehicles could both increase electricity demand and provide storage for the network by allowing households to draw down upon their batteries during periods of high demand, strengthening the economic case for further renewable energy investment.

Many of Australia's coal-fired power-plants will be retired over the longer term. Around 63 per cent or 15GW of capacity is expected to be removed from the NEM by 2040 (AEMO 2019b). The next major withdrawal of capacity is likely to be the Liddell coal-fired power station (1.8 GW), which is expected

to close in 2023 (AEMO 2019a). As capacity is removed from the system, new generation will be required to replace it, much of which is likely to come from renewable sources. There is also the potential for some coal-fired plants to retire early, leading to higher wholesale electricity prices. This would encourage further investment in renewable generation.

Current state government policies are supportive of renewable investment over the longer term, with most state and territory governments targeting at least 40 per cent renewable generation by 2030. However, existing Australian Government policy will provide less support than in the past given the RET has been met. Liaison with energy industry stakeholders suggests that uncertainty around future national policy direction is constraining investment.

There is increasing awareness both domestically and globally of the macroeconomic and financial stability risks posed by climate change.<sup>[10]</sup> For example, energy-intensive firms face risks if pricing or regulation changes require them to transition to lower-carbon means of production faster than expected. The climate change-related concerns of individuals, firms, financial institutions and investors are likely to continue to support investment in renewable energy.

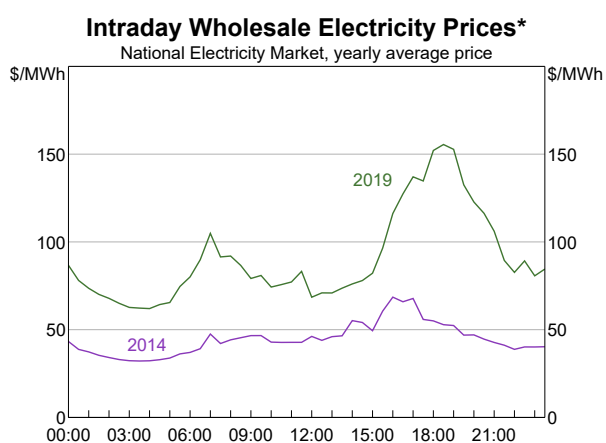
### Small-scale renewable energy generation

Household investment in rooftop solar generation is expected to continue, though some liaison contacts expect the growth in installations to ease in the next few years. This is due to the relatively high level of saturation and declining retail electricity prices and incentives. Investment in rooftop solar by businesses is likely to remain robust with many business liaison contacts indicating that they are considering installing generation capacity. A continued decline in the cost of these technologies and awareness of climate change issues should continue to support rooftop solar investment.

### Transmission and storage

Improvements to transmission infrastructure and investment in energy storage are required to help maintain electricity grid stability and support a

**Graph 9**



\* Population weighted  
Sources: ABS; AEMO; RBA

continued increase in renewable energy generation. AEMO's draft 2020 Integrated System Plan identifies over 15 potential projects to strengthen the transmission grid, with eight of these classified as priority projects (AEMO 2019b).<sup>[11]</sup> The total investment cost associated with these priority grid projects is likely to be at least \$5 billion.<sup>[12]</sup> The Integrated System Plan also recommends that design and approval works for a second interconnector between Victoria and Tasmania should be progressed to permit delivery by 2027/28.

Investment in electricity storage is likely to increase over coming years to help balance supply and demand within the NEM. An increasing number of renewable generation projects are likely to incorporate some form of battery storage and a number of pumped hydroelectricity projects are either being considered or are under construction in Australia. Pumped hydroelectricity projects tend

to be relatively large and capital-intensive. For example, the Snowy 2.0 pumped hydroelectricity project will add around 2GW capacity at a cost of between \$3.8 and \$4.5 billion (Snowy Hydro 2017). Emerging hydrogen storage technologies may also have a significant role to play. Hydrogen can be stored and distributed in similar ways to natural gas by being liquefied or piped as gas. This makes hydrogen a potential future export for Australia as well as a means of domestic energy storage. The Council of Australian Governments' National Hydrogen Strategy suggests hydrogen production could contribute significantly to the economy by 2050 (COAG 2019). However, investment in supporting infrastructure and further cost reductions in this technology would be required before this becomes commercially viable at a large scale (CSIRO 2018). ❖

## Footnotes

[\*] The authors are from Economic Analysis Department.

[1] The *Australian Energy Statistics* dataset is updated annually. The latest data on electricity generation are for 2018. See Department of the Environment and Energy (2019) for details.

[2] Large-scale renewable energy projects require significantly less labour during the operations and maintenance phase than the construction phase.

[3] Watts (W) are used to quantify rates of energy transfer. In this article they are generally used to refer to capacity, or the maximum rate at which energy can be produced by generating assets. Watt-hours (Wh) are units of energy, used in this article to refer to energy output.

[4] The accreditation of power stations and creation of large-scale generation certificates continues under the RET until 2030. See *Renewable Energy (Electricity) Amendment Bill 2015*.

[5] Some companies that are not liable entities under the RET choose to surrender large-scale generation certificates as part of their commitment to reducing their environmental impact.

[6] Storage allows electricity generated by a renewable power plant to be dispatched when needed.

[7] AEMO sets marginal loss factors annually (for the upcoming financial year) for every generator in the NEM. Marginal loss factors are forward-looking projections that take into account the portion of electricity that is

expected to be 'lost' during transmission. A lower marginal loss factor means that a higher share of electricity is expected to be lost, which reduces a generator's revenue for the electricity they produce. For details of the marginal loss factors applicable for 2019/20, see AEMO (2019d).

[8] The largest lithium-ion battery in the world (the Tesla battery at the Hornsdale Power Reserve in South Australia) has a 100MW capacity and can store 129MWh of electricity. By comparison, over 4,000 MW of new renewable capacity was accredited in 2019 (CER 2020). The largest individual project accredited was the Coopers Gap Wind Farm, with a generation capacity of 453MW.

[9] The average build time for solar projects is around a year, while wind projects have longer average construction periods of around 18 months.

[10] For discussions of the economic and financial stability-related implications of climate change for Australia, see Debelle (2019) and RBA (2019).

[11] As at February 2020, two of the priority projects are committed and one has been granted regulatory approval.

[12] This is based on indicative cost estimates provided in the *Draft 2020 ISP Transmission Outlook Summary* (AEMO 2019c), as well as published capital costs of the priority projects already committed. It does not include any costs associated with design and approvals works for a second interconnector between Victoria and Tasmania.



## References

- AEMO (Australian Energy Market Operator) (2018), '2018 Electricity Statement of Opportunities', August.
- AEMO (2019a), '2019 Electricity Statement of Opportunities', August.
- AEMO (2019b), 'Draft 2020 Integrated System Plan', 12 December.
- AEMO (2019c), 'Draft 2020 ISP Transmission outlook summary', 12 December. Available at <<https://aemo.com.au/energy-systems/major-publications/integrated-system-plan-isp/2020-integrated-system-plan-isp>>.
- AEMO (2019d), 'Updated Loss Regions and Marginal Loss Factors: FY 2019-20', June 2019.
- AEMO (2020), 'Challenges to generation connection in the West Murray zone', February, viewed 2 March 2020. Available at <<https://aemo.com.au/en/news/challenges-to-generation-connection-in-the-west-murray-zone>>.
- AER (Australian Energy Regulator) (2017), 'State of the Energy Market', Performance Report, May.
- AER (2018), 'AER Electricity Wholesale Performance Monitoring Hazelwood Advice', March. Available at <[https://www.aer.gov.au/system/files/AER%20electricity%20wholesale%20performance%20monitoring%20-%20Hazelwood%20advice%20-%20March%202018\\_0.PDF](https://www.aer.gov.au/system/files/AER%20electricity%20wholesale%20performance%20monitoring%20-%20Hazelwood%20advice%20-%20March%202018_0.PDF)>.
- ARENA (Australian Renewable Energy Agency) (2019), *Annual Report 2018-19*. Available at <<https://arena.gov.au/assets/2019/10/arena-annual-report-2018-19.pdf>>.
- ARENA (2020), 'Hydropower and Pumped Hydro Energy Storage', arena.gov.au site, 30 January. Available at <<https://arena.gov.au/renewable-energy/pumped-hydro-energy-storage/>>.
- CEC (Clean Energy Council) (2019), 'Clean Energy Outlook – Confidence Index – December 2019', cleanenergycouncil.org.au site, 28 November. Available at <<https://assets.cleanenergycouncil.org.au/documents/resources/reports/clean-energy-outlook/clean-energy-council-confidence-index-dec-2019.pdf>>.
- CEFC (Clean Energy Finance Corporation) (2019), *Annual Report 2018-19*. Available at <<https://annualreport2019.cefc.com.au/>>.
- CER (Clean Energy Regulator) (2019a), '2020 Large-scale Renewable Energy Target capacity achieved', 4 September. Available at <<http://www.cleanenergyregulator.gov.au/About/Pages/News%20and%20updates/NewsItem.aspx?ListId=19b4efbb-6f5d-4637-94c4-121c1f96fcfe&ItemId=683>>.
- CER (2019b), 'Large-scale generation certificate market update – February 2019', cleanenergyregulator.gov.au site, 1 March. Available at <<http://www.cleanenergyregulator.gov.au/RET/Pages/About%20the%20Renewable%20Energy%20Target/How%20the%20scheme%20works/Large-scale%20generation%20certificate%20market%20update%20by%20month/Large-scale-generation-certificate-market-update---February-2019.aspx>>.
- CER (2020), 'Quarterly Carbon Market Report – December Quarter 2019', February.
- COAG (Council of Australian Governments) Energy Council (2019), 'Australia's National Hydrogen Strategy', November. Available at <<https://www.industry.gov.au/data-and-publications/australias-national-hydrogen-strategy>>.
- CSIRO (Commonwealth Scientific and Industrial Research Organisation) (2018), 'National Hydrogen Roadmap', Available at <<https://www.csiro.au/en/Do-business/Futures/Reports/Hydrogen-Roadmap>>
- Debelle G (2019), 'Climate Change and the Economy', Address at the Centre for Policy Development, Public Forum, Sydney, 12 March.
- Department of the Environment and Energy (2019), 'Australian Energy Update 2019', Final Report, September.

- GEM (Green Energy Markets) (2016), 'Small-scale Technology Certificates Data Modelling for 2016 to 2018 – Attachment 1', Report to the Clean Energy Regulator, February. Available at <<http://www.cleanenergyregulator.gov.au/DocumentAssets/Documents/Green%20Energy%20Markets%20February%202016%20-%20Attachment.pdf>>.
- GEM (2019), 'Updated STC Forecast 2019–2023', Report to the Clean Energy Regulator, September. Available at <<http://www.cleanenergyregulator.gov.au/DocumentAssets/Documents/Small-scale%20solar%20PV%20modelling%20report%20by%20GEM%20%E2%80%93%20October%202019.pdf>>.
- Graham P, J Hayward, J Foster and L Havas (2019), 'GenCost 2019-20: Preliminary Results for Stakeholder Review – Draft for Review', CSIRO, December.
- Mercari (2020), 'LGC Closing Rates', Mercari.com.au site, 10 March. Available at <<http://lgc.mercari.com.au/>>.
- Rai A and T Nelson (2019), 'Australia's National Electricity Market after Twenty Years', *Australian Economic Review*, Early View, pp 1–18.
- RBA (Reserve Bank of Australia) (2019), 'Box C: Financial Stability Risks from Climate Change', *Financial Stability Review*, October, pp 57–62.
- Renewable Energy (Electricity) Amendment Bill 2015* (Cth).
- Simshauser P (2019), 'Lessons from Australia's National Electricity Market 1998–2018: The strengths and weaknesses of the reform experience', *Cambridge Working Papers in Economics* 1972.
- Snowy Hydro (2017), '2017 Snowy 2.0 Feasibility Study'. Available at <<https://www.snowyhydro.com.au/our-scheme/snowy20/snowy-2-0-feasibility-study/>>.
- Wood T, D Blowers and L Percival (2018), 'Mostly Working: Australia's wholesale electricity market', Grattan Institute, 1 July. Available at <<https://grattan.edu.au/report/mostly-working/>>.

# The Road to Australian Dollar Funding

Elliott James and Christian Vallence<sup>[\*]</sup>



Photo: ilbusca – Getty Images

## Abstract

A key feature of Australia's financial system is that nearly all liabilities are denominated in, or hedged into, Australian dollars. A pre-condition for this state of affairs is that investors are willing to hold Australian dollar-denominated assets. Investor confidence in Australian dollar assets is supported by Australia's sound institutional framework, history of positive macroeconomic outcomes, and well-functioning financial system. Australia's journey to funding in its own currency spanned nearly a century and involved various costs. Today, these funding arrangements confer substantial benefits to the Australian economy, including by reinforcing the same positive economic, financial and institutional outcomes that made Australian dollar funding possible in the first place.

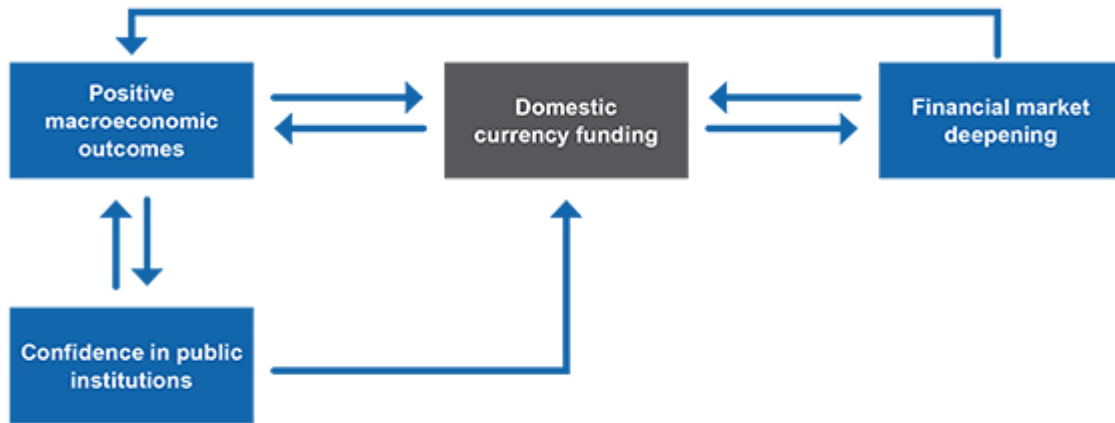
## Introduction

Nearly all debt and equity liabilities of Australia's governments, corporations and banks, including – crucially – those owed to foreigners, are denominated in, or hedged into, Australian dollars (Graph 1).<sup>[1]</sup> This includes all Commonwealth and state government debt, which is issued entirely in Australian dollars; Australia's equity liabilities, which are also wholly denominated in Australian dollars; and the bulk of debt issued by banks and other corporations, which is either denominated in Australian dollars or hedged using derivatives.<sup>[2]</sup> The small share of liabilities that are denominated in

foreign currency are likely to have natural hedges, such as foreign currency export earnings or foreign currency-denominated assets (Berger-Thomson and Chapman 2017).

Australia is part of a select group of countries for whom long-term, domestic currency financing of governments and private entities is the norm. These are mostly advanced economies, but also include several emerging market economies. While these countries do not have the 'exorbitant privilege' of the United States, their ability to fund in their own currency confers considerable economic benefits at little cost.<sup>[3]</sup>

**Figure 1: Positive Feedback Loop**



Source: RBA

### Domestic Currency Funding, Economic Growth and Financial Development Are Mutually Supportive

Australia benefits from a positive feedback loop between domestic currency funding and institutional, economic and financial market development (Figure 1). As discussed below, domestic currency funding, together with the floating exchange rate, improves macroeconomic outcomes in Australia, which in turn supports domestic currency funding by encouraging further investment in Australian financial assets. Positive economic outcomes also support public trust in, and the maintenance of, sound institutions and

public policy frameworks, which in turn support confidence in Australian dollar assets. Moreover, domestic currency funding itself is self-perpetuating: as financial transactions between foreign and domestic investors increase, capital market depth also increases, which encourages the development of hedging markets, which in turn facilitates a further increase in financial transactions (Lowe 2017). The strength of these positive feedback loops is evidenced by the fact that, once firmly attained, there are few – if any – examples of a country losing the ability to cost-effectively borrow in its own currency.<sup>[4]</sup>

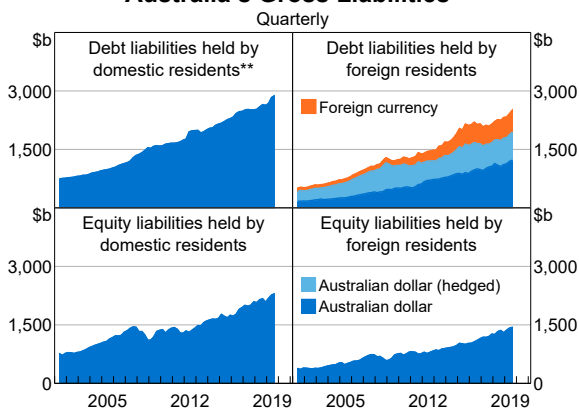
### Funding in Australian Dollars Requires Confidence in Australia’s Institutions, Economy, Financial Markets and Banking Sector

To reach the point where widespread funding in domestic currency is feasible, several pre-conditions must be met:

- investors must be willing to hold assets domiciled in Australia
- investors must be willing to hold assets denominated in Australian dollars
- there must exist well-functioning capital and hedging markets, and sound domestic financial institutions, to facilitate the creation and exchange of domestic currency assets.<sup>[5]</sup>

**Graph 1**

#### Australia’s Gross Liabilities\*



\* Includes the liabilities of the banking, non-financial corporate and government sectors, held (directly or indirectly) by domestic households and the rest of the world; hedge ratios inferred from ABS Foreign Currency Exposure surveys

\*\* May exclude some foreign currency-denominated debt liabilities not held with intra-group counterparties

Sources: ABS; RBA

These pre-conditions are relevant for domestic as well as foreign investors. Domestic agents will prefer to primarily hold domestic currency assets, as their future consumption will be largely in domestic currency. However, in the face of high inflation or extreme currency depreciation, they may prefer to hold foreign currency assets as insurance. Such preferences are often seen in countries with a history of default and high inflation, such as a number of countries in Latin America. Foreign investors do not have a pressing need to hold Australian dollars but, provided those pre-conditions are met, may be attracted to Australian dollar assets if they can earn favourable risk-adjusted returns.

### Establishing Australia's country credibility

Investors will only provide funding where they have a reasonable expectation that their claim can and will be met. Australia is one of only a handful of countries where the sovereign government has never defaulted on its foreign debts.<sup>[6]</sup> As a result, the Australian Government has developed a high level of trust in its commitment to repay its debts. Much of this trust was built by experiencing several large external shocks without defaulting, particularly during the Great Depression.

Investors must also have confidence that a financial claim on a public or private entity can be enforced. Such confidence is aided by the existence of sound institutions, particularly legal and judicial systems. Other institutional arrangements, such as sound corporate governance practices, accounting frameworks and bankruptcy procedures, also help to enhance investor confidence, particularly with respect to private sector entities. Overall, studies have found that sound legal and political institutions are associated with larger domestic currency bond markets, less foreign currency debt and better economic performance in general.<sup>[7]</sup> Australia is widely regarded as having had high-quality institutions for much of its modern history.<sup>[8]</sup>

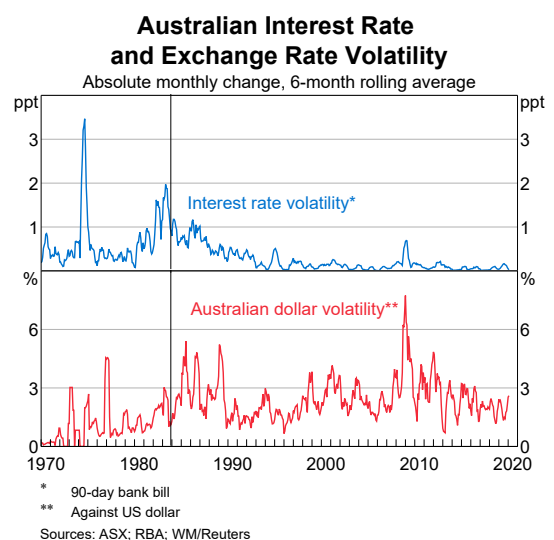
More broadly, other things being equal, investors will also tend to prefer countries with a stable macroeconomic environment, because it reduces both the variance of returns and the likelihood of large negative returns (Burger and Warnock 2007).

In Australia, macroeconomic stability has been promoted by sound frameworks for fiscal and monetary policy, particularly following the move to a floating exchange rate in the 1980s and inflation targeting in the 1990s, as well as a sound regulatory framework that has promoted financial stability (Stevens 2013) (Graph 2). These frameworks contributed to Australia's relatively strong performance during the major financial crises of the 1990s and 2000s, and have supported lower volatility in output and inflation over recent decades.

### Establishing Australia's currency credibility

Inflation and currency depreciation can also be a source of losses for investors. This is true for both domestic investors, who face a loss of real purchasing power, as well as foreign investors, whose investment may be worth less in their home currency. Thus, for countries wishing to fund in their domestic currency, there are benefits from demonstrating that inflation can be kept low and stable in the face of shocks and that the currency trades in line with fundamentals. This reduces the scope for authorities to use devaluation opportunistically, and allows the exchange rate to act as a shock absorber, moderating macroeconomic outcomes. Consistent with this, monetary policy credibility is associated with larger domestic currency bond markets and less reliance

**Graph 2**

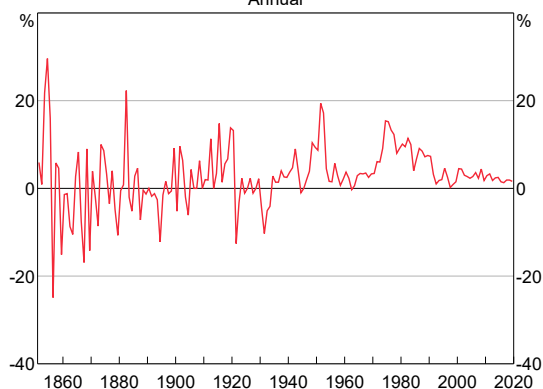


on foreign currency debt (Burger and Warnock 2006).

In Australia, inflation has been moderate for much of the nation's recent history, although this was not always the case. In colonial times, consumer price inflation was unstable, with annual price changes sometimes exceeding 20 per cent (Graph 3). High and variable inflation has also featured, on occasion, in the post-war period. Even so, annual inflation has averaged only 4 per cent since the beginning of the 20th century, and where there has been high inflation, it has usually coincided with high inflation in the rest of the world (Caballero, Cowan and Kearns 2005). Since the introduction of inflation targeting in 1993, inflation has been low and stable, consistent with the Reserve Bank's goal of achieving an annual inflation rate of around 2–3 per cent over time.

Australia's exchange rate is market determined. Indeed, the Australian dollar is viewed as one of the most freely floating currencies globally (IMF 2019). Australia's currency was floated in 1983. In the decade that followed, the exchange rate was somewhat volatile, and the Reserve Bank used both market transactions and changes in interest rates to reduce significant misalignment in the value of the currency.<sup>[9]</sup> Over time, volatility has declined and intervention in the exchange rate is now rare.

**Graph 3**  
**Consumer Price Inflation\***  
Annual



\* Sydney Retail Price Index from 1850–1900, C Series Retail Price Index from 1901–48, and Consumer Price Index from 1949–2019  
Sources: ABS; Commonwealth Bureau of Census and Statistics; RBA

## Establishing capital markets

The development of a domestic government bond market is a key early step towards domestic currency funding.<sup>[10]</sup> A domestic government bond market allows the government to fund in domestic currency. With less foreign currency exposure, the monetary authorities can float the exchange rate with less risk that a depreciation will tighten financial conditions. This reduces the need to intervene in the currency, supporting currency credibility, while also allowing the exchange rate to act as an automatic stabiliser. Once the capital account is open, a liquid government bond market acts as a simple and low-risk introduction for foreign investors to a country and its currency, and, over time, can encourage them to hold a wider array of domestic currency assets. A market-based government bond market also helps to establish a risk-free yield curve, which is essential for developing an efficient hedging market.

The development of Australia's domestic government bond market began during World War I. Prior to the war, most of Australia's debt was issued by colonial or state government bodies in London, denominated in British pounds and purchased by non-residents (Graph 4).<sup>[11]</sup> When the London market closed during the war, the Commonwealth Government began to issue significant volumes of domestic currency debt in the Australian market to Australian residents. Domestic issuance jumped again during World War II as budget deficits rose and increased further in the decades that followed, in part supported by regulations that required financial institutions to hold government securities (Grenville 1991). By the late 1970s, almost all government debt was being issued domestically to Australian residents in Australian dollars (Graph 5).<sup>[12]</sup>

The financial reforms of the 1980s sparked the beginning of foreign inflows into Australian Government bonds. It also marked the beginning of the internationalisation of the Australian dollar as a currency for funding and investment more generally.<sup>[13]</sup> Initially, foreign investors were attracted by the high rates of interest available on Australian debt, and then continued to invest as Australian dollar assets became widely accepted as

an investment class. More recently, many foreign central banks have begun to invest a small share of their foreign exchange reserves in Australian Government bonds. Reflecting these developments, foreign ownership has risen steadily, peaking at nearly 80 per cent in the early 2010s (Graph 6).<sup>[14]</sup>

The reforms of the 1980s also sparked a dramatic increase in both the demand for, and supply of, Australian dollar funding to the private sector, facilitating the development of Australia’s corporate bond and equity markets. Prior to the reforms, regulation of banks and capital flows ensured that Australian banks and businesses were mostly funded in Australian dollars by Australian residents (Black *et al* 2012).<sup>[15]</sup> Since deregulation, the stock of bonds on issue by Australian corporations has increased from a negligible amount to around

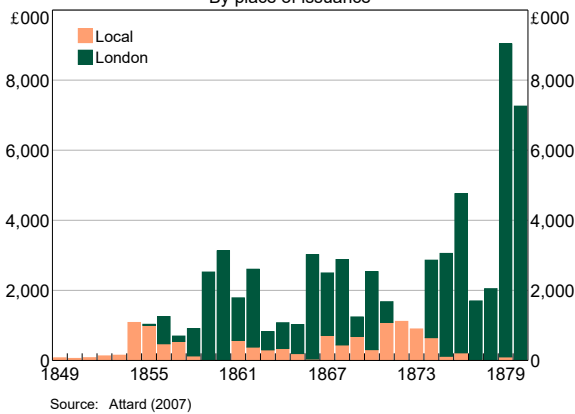
50 per cent of GDP, while the amount of equity on issue has risen from 30 per cent to about 100 per cent of GDP (Graph 7). Much of this supply was met by demand from foreign residents, with foreign ownership rising to about 40 per cent of Australian equities and two-thirds of Australian corporate bonds by the early 2000s (Black and Kirkwood 2010).

**The role of hedging markets and sound institutions**

Currency hedging markets increase the scope for private entities to fund in domestic currency by allowing exchange rate risk to be separated from funding and investment decisions.<sup>[16]</sup> Borrowers

**Graph 4**

**Colonial Government Debt Issuance**  
By place of issuance



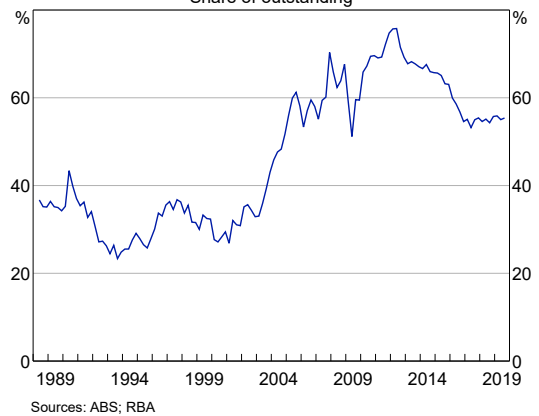
**Graph 5**

**Australian Government Debt on Issue in Australia\***  
Share of total government debt on issue



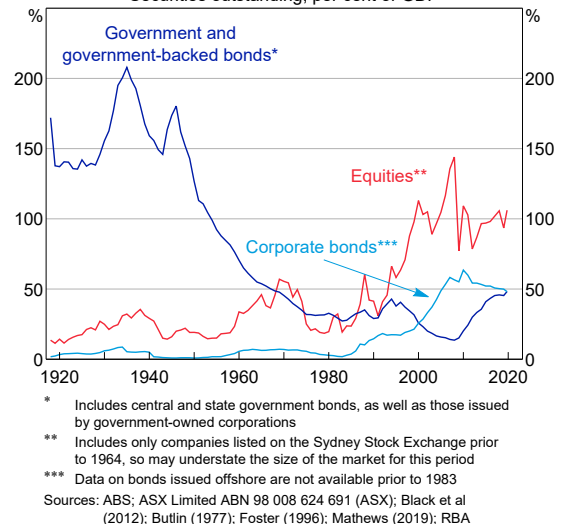
**Graph 6**

**Non-resident Ownership of Australian Government Bonds**  
Share of outstanding



**Graph 7**

**Australian Financial Markets**  
Securities outstanding, per cent of GDP



**Table 1: Estimates of Foreign Currency Risk Transferred using Derivatives<sup>(a)</sup>**

A\$ billion, as at 31 March 2017

<b>Transferred by:</b>	
Australian banks and non-financial corporations	425
<b>Acquired by:</b>	
Other Australian residents	98
Non-resident issuers of A\$ debt <sup>(b)</sup>	215
Other non-residents <sup>(c)</sup>	112

(a) Numbers may not sum due to rounding

(b) Assumes all long-term non-government securities issued in Australia (Kangaroo bonds, A\$188 billion) and half of long-term Australian dollar securities issued offshore by non-residents (Eurobonds, \$A55 billion) are swapped into foreign currency

(c) Residual after subtracting Kangaroo bonds and Eurobonds on issue

Sources: ABS; RBA

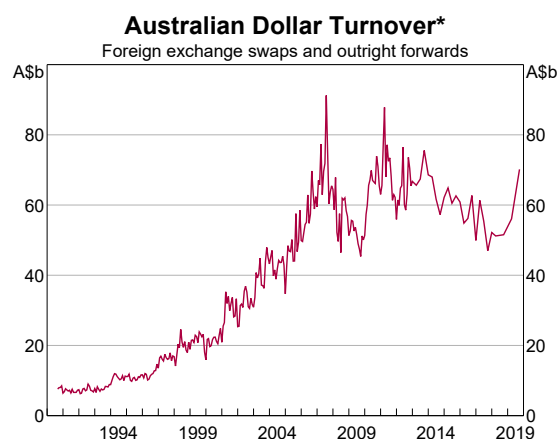
can then access international capital markets without bearing exchange rate risk, including small businesses and households which rely on banks for their debt funding. Without currency hedging markets, Australian banks, which raise a portion of their funding in foreign currency, would either have to lend in Australian dollars and assume exchange rate risk directly, or pass on the exchange rate risk to borrowers by lending in foreign currency. Instead, currency hedging markets allow banks to pass on their exchange rate risk to other parties. These parties may be domestic participants with an opposing currency position to those of the Australian banks, such as superannuation funds seeking to diversify into foreign assets without incurring exchange rate risk. They may also be non-residents, including those that have issued Australian dollar-denominated bonds in the onshore (Kangaroo) or offshore markets, as well as foreign investors seeking to take on Australian dollar risk (Debelle 2006). Though subject to considerable uncertainty, estimates of these transfers are provided in Table 1.

More generally, currency hedging markets provide a mechanism for an economy to acquire insurance from external providers against events that cause a depreciation of the exchange rate (Caballero *et al* 2005). Without such markets, the vulnerability of the financial system and economy to shocks can increase. As a result, the government may need to provide insurance in the form of a fixed exchange

rate backed by ample foreign exchange reserves, which can be costly.

In Australia, it took time for deep and liquid hedging markets to develop after the exchange rate was floated. Development was spurred, in part, by the increase in Australian dollar volatility that accompanied the float, as well as the need to hedge the interest rate and foreign exchange risks associated with the increase in foreign currency borrowing that accompanied deregulation (Graph 8). Today, Australian dollar hedging markets are widely viewed as deep and liquid and capable of efficiently transferring exchange rate risk around the financial system.

The banking system plays a critical role in this process. Banks raise most of Australia's offshore and

**Graph 8**

\* Average daily turnover for the month of the RBA Turnover Survey; data are monthly to January 2013, quarterly to April 2018, and semi-annual thereafter

Source: RBA



foreign currency debt and are typically the counterparty to entities acquiring Australian dollar exposure via hedging markets. Accordingly, well-capitalised banks, with robust risk management practices and regulatory oversight, are critical to this arrangement. Australia's banks are among the highest-rated in the world, with capital ratios likely well within the top quartile of equivalent banks internationally.<sup>[17]</sup>

### The role of external events

Sometimes, economic or financial shocks have helped re-orientate funding towards domestically issued, domestic currency instruments. For instance, in Australia's case, the closure of international markets during the world wars acted as a catalyst for the government bond market to develop. Another example is the rise in net capital inflows over the late 1970s and early 1980s. This contributed to the opening of the capital account and the floating of the Australian dollar, which set the stage for the development of Australia's capital and hedging markets. The introduction of compulsory superannuation also encouraged the development of domestic capital and hedging markets. Finally, the high inflation episode of the late 1980s contributed to the establishment of a credible framework for monetary policy, which was important for encouraging investment in Australian financial assets.

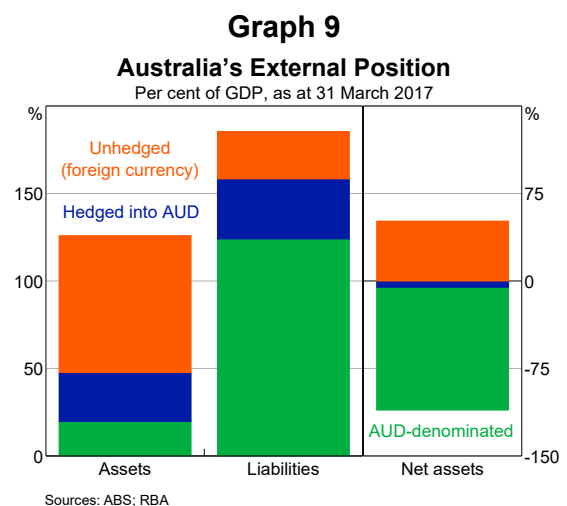
### Funding in Domestic Currency Confers Considerable Benefits to the Economy ...

Funding in domestic currency has several benefits for the Australian economy. Most importantly, it allows the exchange rate to be a shock absorber (DeBelle 2019). If Australian entities funded their Australian dollar assets with unhedged foreign currency, then a depreciation of the exchange rate would increase the amount of Australian dollars needed to service their debts. Funding in domestic currency eliminates this adverse 'financial channel' and instead allows a depreciation to stimulate the economy through the 'trade channel'.<sup>[18]</sup> In fact, because Australia's foreign currency liabilities are largely hedged, while Australia's foreign currency assets are largely unhedged, depreciations of the

exchange rate increase the Australian dollar value of foreign currency assets relative to foreign currency liabilities, thereby reducing Australia's overall net foreign liability position (Graph 9).

Funding in domestic currency also helps the Reserve Bank to implement monetary policy, promote financial system stability and manage Australia's foreign exchange reserves:

- Because the vast bulk of Australian liabilities are denominated in, or hedged into, Australian dollars, and thus tied to Australian interest rates, the Reserve Bank is able to more effectively influence financial conditions in Australia (Kent 2018). Were this not the case, public or private entities could have sizable unhedged foreign currency borrowings, and their cost of funding would be more directly affected by interest rates abroad. Moreover, the Reserve Bank might otherwise need to respond to a monetary tightening abroad, for example, to prevent a depreciation of the exchange rate from tightening domestic financial conditions.<sup>[19]</sup>
- Because Australian banks effectively fund in Australian dollars, the Reserve Bank can act as the lender of last resort in times of crisis by extending Australian dollar liquidity. For example, during the global financial crisis, the Reserve Bank provided Australian dollar liquidity to Australian banks when offshore funding markets were disrupted. This was only possible because Australian banks required Australian



dollars, not foreign currency, unlike some banks in parts of Europe and Asia.<sup>[20]</sup>

- Funding in Australian dollars enables the Reserve Bank to hold smaller foreign exchange reserves than may otherwise be the case, because domestic borrowers do not need to be insured against large currency mismatches. This is beneficial because Australia's foreign exchange reserves have historically yielded less than domestic securities (Vallence 2012).

Australia's ability to fund in domestic currency includes the ability to fund by issuing Australian dollar-denominated equity. Studies have found that equity is generally a more stable source of funding and, in the case of foreign direct equity, can reduce the risk of sharp capital flow reversals ('sudden stops').<sup>[21]</sup> The servicing costs of equity also tend to fall in bad times, whereas the servicing costs of debt remain fixed (and can even increase). This can help cushion the economy in times of financial stress.

### ... but Also Entails Some Costs.

Although there are many benefits associated with funding in domestic currency, the transition has not been free of costs. In Australia, many of these costs were paid in the immediate period after the financial system was deregulated and the capital account was liberalised, and have since dissipated. Other costs, such as the premium Australian entities pay to swap foreign currencies for Australian dollars, remain a feature of the Australian financial system. However, these costs are small relative to the considerable benefits of funding in Australian dollars.

### Transition costs

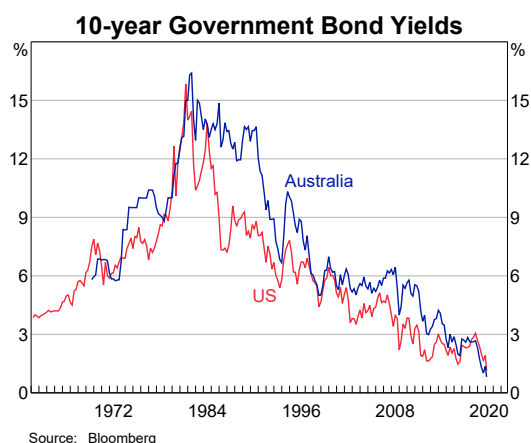
For some time after the financial reforms of the early 1980s, financial markets applied a risk premium to Australian assets relative to other major economies. Yields on 10-year Australian Government bonds, for instance, were high relative to those of the United States (Graph 10). In large part, this reflected the expectation that inflation would be higher and more uncertain in Australia than in the rest of the world. The Commonwealth Government had also yet to prove its credibility under the more open and

transparent tender system for issuing government debt (Battellino and Plumb 2011).

Nevertheless, the high returns on offer during much of the 1980s and 1990s encouraged foreign investment in Australian dollar securities. Over time, risk premiums decreased, particularly following the adoption of inflation targeting in the 1990s. This was supported by Australia's performance during the inflationary episode of the mid 1990s and the Asian Financial Crisis, which demonstrated the effectiveness and credibility of Australia's economic policy framework, especially its framework for monetary policy.<sup>[22]</sup>

Transitioning to a deregulated and liberalised financial system also involved a number of other costs. Countries often experience a financial crisis after liberalisation, as the risk management practices of banks and regulators are initially underdeveloped. In Australia, lending standards declined over the late 1980s and borrowing using commercial property as collateral increased. This resulted in large losses for many banks when there was a sharp correction in that market in the early 1990s recession (Kent and Lowe 1997). In addition, it took time for market participants to adjust to – and hedge – the higher exchange rate volatility associated with the floating exchange rate regime. For instance, surveys at the time suggest that more than half of Australian importers and manufacturers had essentially no hedging in place in the year after the Australian dollar was floated (Becker and Fabbro 2006). Some non-financial firms also took out unhedged Swiss franc loans in the mid 1980s, only

**Graph 10**



to incur significant losses when the Australian dollar more than halved in value against the Swiss franc between 1985 and 1986.<sup>[23]</sup> In the end, these episodes were a salutary lesson for Australian businesses, banks and regulators and contributed to the strengthening of risk management and hedging practices.

### Steady-state costs

Australia continues to pay a modest premium to borrow in Australian dollars in two main ways. First, risk-free rates in Australia have historically been higher than those of the major international currencies (although this gap has narrowed in recent years). These higher interest rates have reflected structural factors, such as Australia's higher potential growth rate.

Second, for entities raising Australian dollar funding in the domestic corporate bond market, the small size of the domestic market relative to offshore markets typically results in higher bond spreads for Australian dollar debt issued domestically. Alternatively, Australian banks and firms can issue foreign currency debt in the much larger and more liquid offshore bond markets, where terms and pricing are generally more favourable, and hedge the currency exposure using cross-currency interest rate swaps. The cost of hedging the foreign currency risk is reflected in the basis swap spread Australian borrowers pay to receive Australian dollars. Historically, this spread has been small but positive, reflecting excess demand for Australian dollars in the cross-currency swaps market. These additional costs – the higher spread in the local bond market and cost of hedging offshore issuance – are broadly similar, having averaged around 20 basis points over the past 5 years (Graph 11). This outcome is unsurprising, given that domestic funding and (hedged) offshore funding are partial substitutes.

### Footnotes

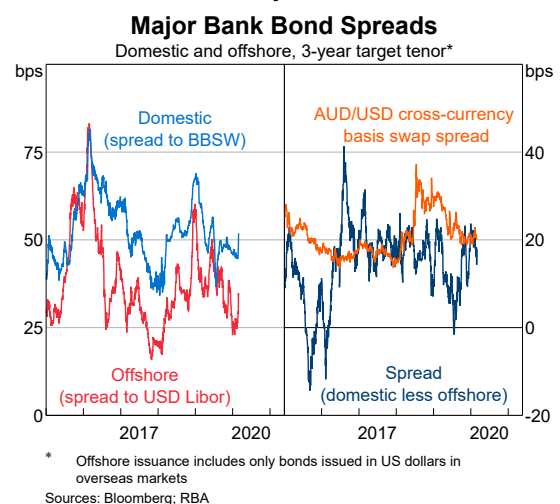
[\*] The authors are from International Department, and thank Julie Guo, Isabel Hartstein, Maxwell Sutton and Zhan Zhang for their valuable assistance.

In addition to debt, companies raise funds in Australian dollars by issuing equity. Although some amount of equity is necessary to protect against losses, its loss-absorbing qualities also make it a relatively expensive form of funding compared with debt and internal funding. A substantial share of Australia's external liabilities are in the form of equity – more so than many other advanced economies – which results in significant payments to non-residents and contributes to Australia's net income deficit.

### Conclusion

The ability to consistently and cost-effectively borrow in domestic currency confers considerable benefits to an economy. Only a limited number of countries have reached such a point, and have often required many years to establish the necessary institutional, economic and financial arrangements. Australia's journey spanned a number of decades, and involved a mixture of good institutions, good policy decisions and, at times, good luck. Today, own-currency borrowing supports positive economic and financial outcomes in Australia, which in turn reinforces Australia's ability to fund in its own currency. ✎

**Graph 11**



[1] In this article, we use the gross debt and equity liabilities of the banking, non-financial corporate and government sectors. To avoid double counting, we exclude intermediated liabilities within those sectors, such that all liabilities are (directly or indirectly) owed to Australian

- households or the rest of the world. Foreign currency hedging data are from the Australian Bureau of Statistics (ABS) Foreign Currency Exposure survey.
- [2] Equity raised offshore by Australian entities is recorded by the ABS as Australian dollar funding, because the entity is domiciled in Australia and its valuation (market or book) is in Australian dollars. Several large Australian companies are dual-listed on overseas stock exchanges, but those liabilities represent the equity liabilities of foreign companies domiciled overseas, and therefore are not foreign currency liabilities for Australia.
- [3] The term ‘exorbitant privilege’ was coined by Valéry Giscard d’Estaing in the 1960s, then the French Minister of Finance (Treasurer). It reflects the fact that the United States can borrow at reduced rates of interest because of the US dollar’s status as the international reserve currency. As a consequence, the United States earns more income on its (higher yielding) foreign assets than it pays in interest on its foreign liabilities, despite having significant net foreign liabilities. See, for instance, Gourinchas and Rey (2005) and Curcuru, Dvorak and Warnock (2010).
- [4] The collapse of Tsarist Russia and the Austro-Hungarian Empire in 1917 and 1918, respectively, are possible examples, but both involved a complete reconfiguration of political institutions.
- [5] See Caballero *et al* (2005).
- [6] The others are mainly Anglophone and Nordic countries (e.g. the United States, Canada, New Zealand, Denmark, Finland and Norway; see Reinhart and Rogoff 2009). For more on Australia’s (lack of) default history, see Caballero *et al* (2005).
- [7] See, for instance, Acemoglu, Johnson and Robinson (2005), Bordo, Meissner and Redish (2005) and Burger and Warnock (2006).
- [8] For instance, Australia has consistently been among the 10 highest ranked countries in the *Economic Freedom of the World Index*, which rates countries on, among other things, the quality of their government, legal system, property rights and regulatory system. For further discussion, see Macfarlane (2004), Bordo *et al* (2005) and Belkar, Cockerell and Kent (2007).
- [9] See Macfarlane (1993) and Stevens (2013).
- [10] See Eichengreen and Hausmann (1999), Bordo *et al* (2005), and Bordo (2006) for more on the importance of domestic bond markets. For a recent and comprehensive discussion of the symbiotic relationship between economic growth and financial markets, and the factors that support financial market development more generally, see BIS (2019).
- [11] Australia’s currency was effectively pegged to the UK pound during this period, which reduced exchange rate risk for foreign investors. The Australian pound was introduced in 1910 and pegged to the UK pound (under the gold standard). The Australian dollar was introduced in 1966. The dollar moved through several regimes, including pegs to the UK pound, the US dollar, and a basket of currencies, before being floated in 1983 (Debelle and Plumb 2006).
- [12] The Commonwealth Government’s last overseas issuance was in 1987. Focus then shifted to onshore issuance. Virtually all outstanding Commonwealth Government debt has been denominated in Australian dollars since 2004. For a comprehensive discussion of foreign currency borrowing by the Australian Government, see Australian Office of Financial Management (AOFM) (2004). For a more expansive history of Australia’s Government debt market, see Bordo *et al* (2005), Caballero *et al* (2005) or Belkar *et al* (2007).
- [13] A currency is said to be ‘internationalised’ if it is used as an invoicing currency for international trade, in cross-border flows of funding and investment, and as a reserve currency held by central banks. While most of Australia’s international trade continues to be invoiced in foreign currencies, the Australian dollar has gained widespread acceptance as a currency for offshore funding and investment, including, to an extent, as a minor reserve currency. See Lowe (2014), Debelle (2016) and Lowe (2017) for further discussion.
- [14] Another important reform over the late 1970s and early 1980s was the move to a market-based tender system for determining government bond prices. Previously, the government set the yield on securities to be issued and the market determined the volume (with any shortfall met by issuing Treasury Bills to the Reserve Bank). That was reversed under the tender system, with the government setting the volume of securities to be issued and the market determining the yield. See AOFM (2011).
- [15] Prior to the 1980s, foreign investment in Australian financial assets was significantly constrained: foreigners held less than 1 per cent of domestically issued Australian Government bonds and less than 10 per cent of Australian corporate bonds (Black *et al* 2012).
- [16] Hedging markets themselves do not confer currency credibility. Rather, they are a mechanism by which foreigners with confidence in the domestic currency can acquire exposure to it.
- [17] See RBA (2019).
- [18] Kearns and Patel (2016) find that the financial channel partly offsets the trade channel in emerging market economies (where unhedged foreign currency borrowing is prevalent), but is weaker in advanced economies.
- [19] Nonetheless, foreign monetary policies can still influence Australian financial conditions. For instance, an easing in foreign monetary policy can place upward pressure on the Australian dollar, which is contractionary for the Australian economy. Easier monetary policies abroad can also narrow global risk premiums, including for Australian

borrowers (Rey 2013). See Jacobs (2019) for further discussion.

- [20] To alleviate a shortage of US dollar liquidity during the global financial crisis, central banks around the world established temporary swap lines with the US Federal Reserve, enabling them to provide US dollar liquidity in their respective markets in exchange for local currency. For more on US dollar swap arrangements between central banks, see RBA (2008).
- [21] See Levchenko and Mauro (2007), Kose *et al* (2009) and Catão and Milesi-Ferretti (2013). The literature offers mixed conclusions, however, about the optimal mix of funding for advanced economies. See, for instance, Becker and Noone (2009).
- [22] See Debelle (2018).
- [23] See Becker and Fabbro (2006), Battellino and Plumb (2011) and Ballantyne *et al* (2014).

## References

- Acemoglu D, S Johnson and JA Robinson (2005), 'Institutions as a Fundamental Cause of Long-Run Growth', in Aghion P and SN Durlauf (eds), *Handbook of Economic Growth*, Vol 1A, Chapter 6, Elsevier BV.
- AOFM (Australian Office of Financial Management) (2004), 'Annual Report 2003–04', pp 37–48.
- AOFM (2011), 'Annual Report 2010–11', pp 43–54.
- Attard B (2007), 'New Estimates of Australian Public Borrowing and Capital Raised in London, 1849–1914', *Australian Economic History Review*, 17(2), pp 155–177.
- Ballantyne A, J Hambur, I Roberts and M Wright (2014), 'Financial Reform in Australia and China', RBA Research Discussion Paper No 2014-10.
- Battellino R and M Plumb (2011), 'A Generation of an Internationalised Australian Dollar', in Currency Internationalisation: Lessons from the Global Financial Crisis and Prospects for the Future in Asia and the Pacific, BIS Papers No 61, Bank for International Settlements, Basel, pp 202–217.
- Becker C and C Noone (2009), 'Volatility in International Capital Movements', RBA Research Discussion Paper No 2009-09.
- Becker C and D Fabbro (2006), 'Limiting Foreign Exchange Exposure through Hedging: The Australian Experience', RBA Research Discussion Paper No 2006-09.
- Belkar R, L Cockerell and C Kent (2007), 'Current Account Deficits: The Australian Debate', RBA Research Discussion Paper No 2007-02.
- Berger-Thomson L and B Chapman (2017), 'Foreign Currency Exposure and Hedging in Australia', RBA *Bulletin*, December, pp 67–76.
- BIS (Bank for International Settlements) (2019), 'Establishing Viable Capital Markets', CGFS Papers, No 62, July.
- Black S and J Kirkwood (2010), 'Ownership of Australian Equities and Corporate Bonds', RBA *Bulletin*, September, pp 25–33.
- Black S, J Kirkwood, A Rai and T Williams (2012), 'A History of Australian Corporate Bonds', RBA Research Discussion Paper No 2012-09.
- Bordo MD (2006), 'Sudden Stops, Financial Crises, and Original Sin in Emerging Countries: Déjà vu?', NBER Working Papers 12393, NBER.
- Bordo MD, CM Meissner and A Redish (2005), 'How 'Original Sin' was Overcome: The evolution of external debt denominated in domestic currencies in the United States and the British Dominions 1800–2000', in Eichengreen B and R Hausmann (eds), *Other People's Money*, University of Chicago Press, Chicago, pp 122–153.
- Burger JD and FE Warnock (2006), 'Local Currency Bond Markets', IMF Staff Papers, 53(Special Issue), pp 133–146.
- Burger JD and FE Warnock (2007), 'Foreign Participation in Local Currency Bond Markets', *Review of Financial Economics*, 16(3), pp 291–304.

- Butlin M (1977), 'A Preliminary Annual Database 1900/01 to 1973/74', RBA Research Discussion Paper No 7701.
- Caballero RJ, K Cowan and J Kearns (2005), 'Fear of Sudden Stops: Lessons from Australia and Chile', *Journal of Economic Policy Reform*, 8(4), pp 313–354.
- Catão LAV and GM Milesi-Ferretti (2013), 'External Liabilities and Crises', IMF Working Paper No. 13/113.
- Curcuru S, T Dvorak and F Warnock (2010), 'Decomposing the U.S. External Returns Differential', *Journal of International Economics*, 80, pp 22–32.
- Debelle G (2006), 'The Australian Foreign Exchange Market', Address to Insto's Foreign Exchange Conference, Sydney, 17 November.
- Debelle G (2016), 'Developments in Global FX Markets and Challenges in Currency Internationalisation from an Australian Perspective', RMB FX Forum (appearance via video link), Beijing, 18 May.
- Debelle G (2018), 'Twenty-five Years of Inflation Targeting in Australia', Address at RBA Conference 2018, Sydney, 12 April.
- Debelle G (2019), 'A Balance of Payments', Address to the Economic Society of Australia, Canberra, 27 August.
- Debelle G and M Plumb (2006), 'The Evolution of Exchange Rate Policy and Capital Controls in Australia', *Asian Economic Papers*, 5(2), pp 7–29.
- Eichengreen B and R Hausmann (1999), 'Exchange Rates and Financial Fragility', NBER Working Paper No 7418.
- Foster RA (1996), *Australian Economic Statistics: 1949–50 to 1994–95*, Occasional Paper No 8, rev 1997, Reserve Bank of Australia, Sydney.
- Gourinchas P-O and H Rey (2005), 'From World Banker to World Venture Capitalist: US External Adjustment and the Exorbitant Privilege', NBER Working Paper 11563.
- Grenville S (1991), 'The Evolution of Financial Deregulation', in I Macfarlane (ed) (1991), *The Deregulation of Financial Intermediaries*, Proceedings of a Conference, Reserve Bank of Australia, Sydney, pp 3–35.
- IMF (2019), 'Annual Report on Exchange Arrangements and Exchange Restrictions 2018', 16 April. Available at <<https://www.imf.org/en/Publications/Annual-Report-on-Exchange-Arrangements-and-Exchange-Restrictions/Issues/2019/04/24/Annual-Report-on-Exchange-Arrangements-and-Exchange-Restrictions-2018-46162>>.
- Jacobs D (2019), 'How Do Global Financial Conditions Affect Australia?', RBA *Bulletin*, December, viewed 21 February 2020. Available at <<https://www.rba.gov.au/publications/bulletin/2019/dec/how-do-global-financial-conditions-affect-australia.html>>.
- Kearns J and N Patel (2016), 'Does the Financial Channel of Exchange Rates Offset the Trade Channel?', *BIS Quarterly Review*, December, pp 95–113. Available at <[https://www.bis.org/publ/qtrpdf/r\\_qt1612i.pdf](https://www.bis.org/publ/qtrpdf/r_qt1612i.pdf)>.
- Kent C (2018), 'US Monetary Policy and Australian Financial Conditions', The Bloomberg Address, Sydney, 10 December.
- Kent C and P Lowe (1997), 'Property-Price Cycles and Monetary Policy', in *The Role of Asset Prices in the Formulation of Monetary Policy*, BIS Conference Papers Vol. 5, pp 239–263.
- Kose MA, E Prasad, K Rogoff and S Wei (2009), 'Financial Globalization: A Reappraisal', IMF Staff Papers, 56(1), pp 8–62.
- Levchenko AA and P Mauro (2007), 'Do Some Forms of Financial Flows Help Protect against 'Sudden Stops'?', *World Bank Economic Review*, 21(3), pp 389–411.
- Lowe P (2014), 'Some Implications of the Internationalisation of the Renminbi', Opening Remarks to the Centre for International Finance and Regulation Conference on the Internationalisation of the Renminbi, Sydney, 26 March.

- Low P (2017), 'Renminbi Internationalisation', Remarks to the RMB Global Cities Dialogue Dinner, Sydney, 27 April.
- Macfarlane I (1993), 'The Exchange Rate, Monetary Policy and Intervention', *RBA Bulletin*, December, pp 16–25.
- Macfarlane I (2004), 'Geography, Resources or Institutions?', Address to 'The Bottom Line' Luncheon, Melbourne, 25 August.
- Mathews T (2019), 'A History of Australian Equities', RBA Research Discussion Paper No 2019-04.
- RBA (Reserve Bank of Australia) (2008), 'Box B: US Dollar Swap Arrangements between Central Banks', *Statement on Monetary Policy*, November, pp 23–25.
- RBA (2019), *Financial Stability Review*, October.
- Reinhart CM and K Rogoff (2009), *This Time is Different: Eight Centuries of Financial Folly*, Princeton University Press, Princeton.
- Rey H (2013), 'Dilemma not Trilemma: The Global Cycle and Monetary Policy Independence', in *Global Dimensions of Unconventional Monetary Policy*, A Symposium Sponsored by the Federal Reserve Bank of Kansas City, Kansas City, pp 285–333.
- Stevens G (2013), 'The Australian Dollar: Thirty Years of Floating', Address to the Australian Business Economists' Annual Dinner, Sydney, 21 November.
- Vallence C (2012), 'Foreign Exchange Reserves and the Reserve Bank's Balance Sheet', *RBA Bulletin*, December, pp 57–64.

# Regional Variation in Economic Conditions

Fiona Price<sup>[\*]</sup>



Photo: omersukrugoksu – Getty Images

## Abstract

Differences in economic conditions between capital cities and regional areas have widened since the early 2000s. Some regional areas, particularly outer regional and remote areas, have faced considerable structural changes and have taken longer than other regions to adapt to these developments. Most regional labour markets appear to have adjusted quite well to the differences in regional economic conditions, though the adjustment process may have been more difficult for some regions.

## Introduction

Monetary policy is, by design, a national policy. While there is only one policy interest rate for the Australian economy, the Reserve Bank makes a considerable effort to understand the underlying drivers of the aggregate economic data. In particular, the Bank seeks to understand developments at the regional and industry level. For almost two decades, the Bank's Regional and Industry Analysis team, spread across five states, has gathered timely information on how economic conditions have varied across regions, industries and demographic groups (RBA 2014).

This article explores the differences in economic conditions across regions that are split into three broad groups: capital city regions; non-mining regional areas; and mining regional areas.<sup>[1]</sup> Capital city regions and regional areas are defined using the Greater Capital City Statistical Areas (as set out by the Australian Bureau of Statistics), while mining regional areas are defined as regional areas that had more than 5 per cent of the workforce directly employed in the mining industry in 2012. The article then explores differences in the exposures of these regions to some key drivers of structural change, and how different regions have adapted to these



drivers as well as the differences in economic conditions in recent decades.

### Economic conditions across regions

Differences in economic conditions across the three region groups have increased since the early 2000s (Graph 1). At the aggregate level, economic growth has been somewhat weaker over this period, particularly in the past decade or so. This weakness in conditions has been more pronounced in regional areas. Mining regional areas have experienced a large economic cycle in recent decades, related to the mining investment boom. From the mid 2000s to around 2012, the construction of new mining projects boosted growth in output and employment in these areas, but from 2012, economic activity started to slow or, in many cases, decline as mining projects moved from the construction to operational phase.

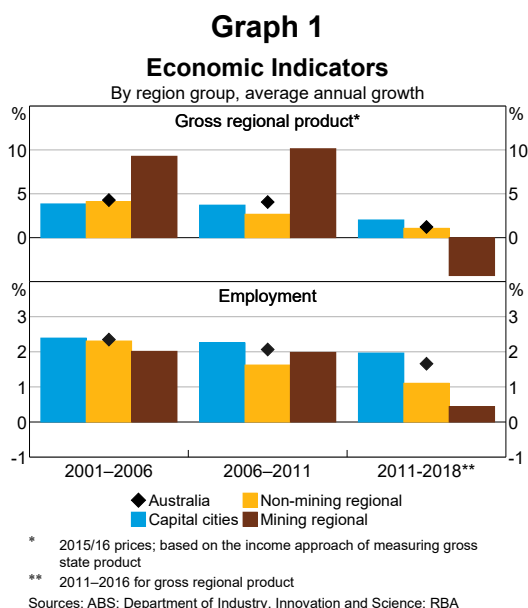
It is unsurprising that economic conditions vary across regions at any particular point in time. Regions are often exposed to different economic developments given their geographical dispersion and different characteristics, including industry and labour force composition, availability of natural resources and location. In addition, regions can have different capacities to adapt to these developments, which can be cyclical or structural in nature. An example of a cyclical event that has contributed to regional economic differences is the severe

drought that is currently affecting most of Australia.<sup>[2]</sup> This has had a particularly large impact on regional areas with significant exposures to the agriculture industry. This article focuses on the role that longer-term structural developments may have had in the observed differences in regional economic conditions.

Previous work by the Reserve Bank has highlighted how the Australian economy has faced substantial structural change in recent decades (see, for example, Adeney (2018), Plumb, Kent and Bishop (2013), Lowe (2012), Connolly and Lewis (2010)). As economies develop and living standards rise, the structure of the economy necessarily changes: new industries emerge, especially in the service sector, while the relative share of industries such as agriculture declines. These shifts generate considerable benefits but can impose transition costs on some regions, industries and demographic groups.

One of the key structural changes in the Australian economy (and many other economies) in recent decades has been the shift in activity away from goods-related industries towards services industries.<sup>[3]</sup> While the level of output in most goods-related industries has not fallen since 2000, the share of total output for many goods-related industries has declined given the strong growth in output in a number of service industries. For employment, both the level and share of total employment in some goods-related industries have declined in recent decades, notably agriculture and manufacturing (Graph 2). The shift towards services has been most evident in employment, since services industries tend to be more labour intensive and some goods-producing industries have become more capital intensive over time.

Another important structural change in the Australian economy has been the expansion in the mining industry. Since 2000, mining output and employment have more than doubled and the mining industry's share of total output has risen from 6 per cent to around 9 per cent. The share of mining employment has also increased, but it remains quite small because mining is a capital-intensive industry.



These structural developments have affected regions in different ways. Compared with capital city regions, non-mining regional areas have experienced a larger shift in the industry share of employment towards services in the past couple of decades. On the other hand, mining regional areas have experienced a smaller shift towards services given their exposure to the expansion in the mining industry. Overall, this suggests that different rates of structural change could help to explain the differences in economic conditions across region groups in recent decades.

### A measure of regional structural change

There is no standard measure of structural change, but a common measure is an index that captures the change in economic activity across different parts of the economy over a specified time period (Connolly and Lewis 2010). For example, no change in the relative importance of different industries over the time period would imply an index with a value of zero. Graph 3 shows an employment structural change index for each region group, which measures how the industry structure of employment changed over five-year periods.<sup>[4]</sup> This measure can provide an indication of periods of significant structural change and identify the region groups that have experienced higher rates of change.

This measure suggests that capital city regions have generally experienced lower rates of structural change compared with regional areas, particularly mining regional areas. Over time, the median rate of structural change has been relatively steady for capital city regions, but has varied for regional areas more generally. Consistent with mining projects shifting from the construction to the operational phase, mining regional areas experienced a noticeable increase in the median rate of structural change around 2013. In recent years, there has been an increase in the median rate of structural change for non-mining regional areas, though this has reversed somewhat in the past year or so.

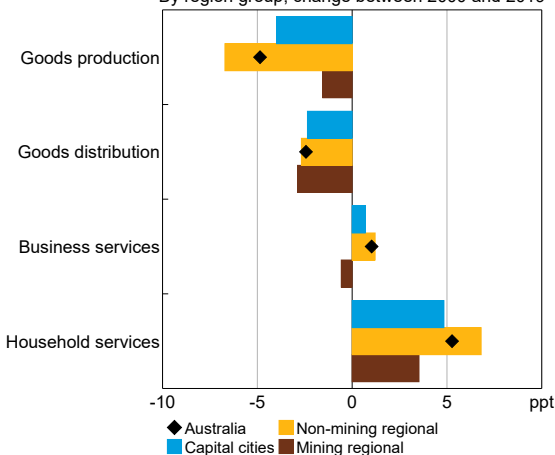
In addition to the differences across region groups, Graph 3 also shows the distribution of the rate of structural change within region groups. In particular, there is significant variation in the rates of structural change across non-mining regional areas; some of these regions have experienced similar rates of structural change to capital city regions, while others have experienced much higher rates of structural change.

### Exposures to key drivers of structural change

The differences in the rates of structural change across and within region groups can be partly explained by different exposures to some of the common drivers of structural change in recent decades. This section explores three of the key

**Graph 2**

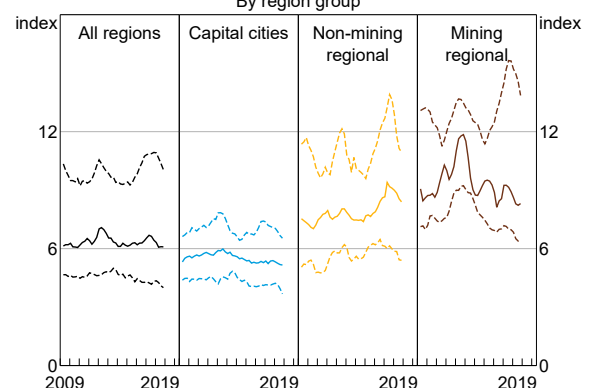
**Industry Employment Shares\***  
By region group, change between 2000 and 2019



\* Share of total employed  
Sources: ABS; RBA

**Graph 3**

**Employment Structural Change Index\***  
By region group



\* Half the sum of the absolute five-year change in five-year average industry employment shares; solid lines are medians and dotted lines are 10th and 90th percentiles  
Sources: ABS; RBA

drivers of structural change in the Australian economy: the industrialisation of east Asia; technological change; and demographic change.

### Industrialisation of east Asia

The industrialisation of east Asian economies, particularly China, has significantly affected the structure of the Australian economy. One effect has been the surge in global demand for the main components of steel – iron ore and metallurgical coal – and energy sources, including natural gas and thermal coal. In response, the Australian mining sector expanded, resulting in a large cycle in mining investment, an increase in employment in the mining industry and a significant rise in resource exports (Graph 4).

This expansion in the mining industry has been concentrated in Western Australia and Queensland, particularly in more remote regional areas within close proximity to natural resources as well as some cities where mining companies are headquartered. There have also been spillovers to other regions with exposures to industries that support the mining sector (e.g. manufacturing, mining services) and have workforces with skills that can be transferred to the mining sector (Langcake and Poole 2017, D'Arcy *et al* 2012).

Another effect of the industrialisation of east Asian economies has been the emergence of new low-cost manufacturers. This has changed the global manufacturing market in recent decades. China's share of the global manufacturing market increased

from around 10 per cent to 30 per cent between 2005 and 2018. As a result, like in many advanced economies, manufacturing activity as a share of output has fallen in Australia over the past couple of decades.

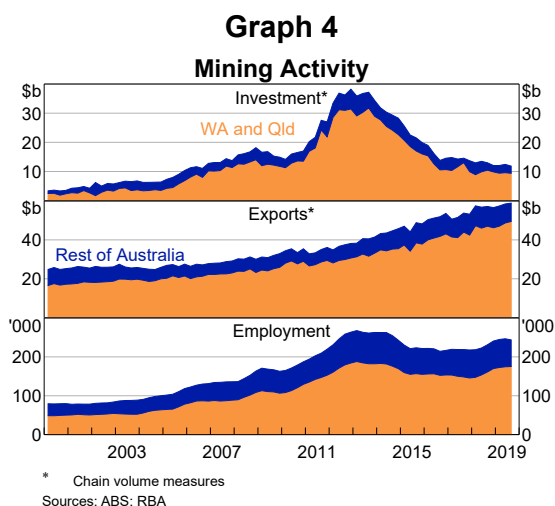
The regions most affected by the decline in the manufacturing sector tend to be located on the outskirts of capital cities where there is access to a large potential workforce and land is relatively affordable (Productivity Commission 2017). A well-known example of the varied impacts across regions is the decline in Australia's car manufacturing sector, which has had particularly large effects on North Adelaide and Geelong.

### Technological change

Another important factor driving change in the Australian economy has been the emergence of new technologies. Technology innovation has profoundly affected households and businesses, and has significantly altered the size and functioning of some industries.

New technologies have enabled the automation of routine manual processes, which has contributed to the decline in employment in some goods-related industries, such as agriculture and manufacturing. The rise of e-commerce and price comparison technologies has noticeably affected the nature of competition and concentration of the retail trade industry (Hambur and La Cava 2018). New technologies have also contributed to an expansion in knowledge-intensive market services, including financial services and professional, scientific & technical services.

Technological change has supported activity in inner capital city regions because these industries tend to rely on a critical mass of skilled labour and the knowledge spillovers associated with agglomeration (Henderson 2010). On the other hand, the outer regions of capital cities and regional areas have been particularly affected by the decline in employment in goods-related industries as a result of automation. The effect of e-commerce on regional areas is unclear, since it has opened up new markets for regional businesses but some of these businesses may have more difficulty



competing if they are further from distribution networks.

## Demographics

Similar to other advanced economies, Australia's population is ageing and the large 'baby boomer' cohort has started to reach retirement age in the past decade or so. This demographic change has contributed to a significant expansion in the health care and social assistance sector. All else equal, it would also weigh on labour supply, but in recent times increased participation rates across a range of age groups has offset this effect. To some extent, strong growth in net overseas migration over the past couple of decades has also helped to moderate the effect of the ageing baby boomer cohort on the population age structure, since migrants coming to Australia tend to be younger than the resident population.

While the increase in net overseas migration has partly offset the ageing population at the aggregate level, the story varies at the regional level. In particular, regional areas are ageing at a faster rate than capital cities (Graph 5). For example, over the past two decades the share of population over 65 years old has increased by around 10 percentage points in several regional areas, such as Wide Bay and Tasmania – South East, while in capital city regions this share has increased by much less or even declined. Consistent with this, there has been a larger increase in the share of employment in the health and social assistance services industry in regional areas compared with capital city regions.

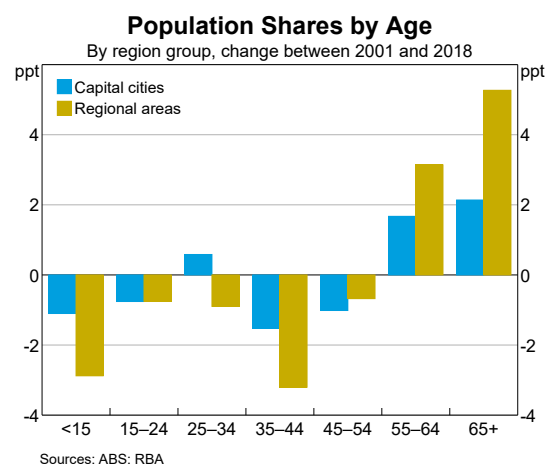
The faster ageing in regional areas reflects a couple of factors. Net overseas migration has tended to be focused on capital cities (particularly Sydney and Melbourne) rather than regional areas, partly because international students comprise a significant proportion of overseas migration and many universities are located in capital cities. Also, younger overseas and inter-regional migrants are more attracted to capital cities given the greater diversity and depth of job opportunities relative to regional areas (Fujita and Thisse 2002).

## Adaptability to structural change

As well as having different exposures to some of the key drivers of structural change, regions are likely to have different abilities to adapt to structural change. When jobs are lost as a result of structural change, it usually takes time for people to retrain for and find jobs in different industries, and businesses take time to adapt their business models or grow to capitalise on new opportunities. These adjustments can take longer in some contexts than in others, and in the interim, this process can weigh on economic conditions. The literature identifies a number of regional characteristics that are associated with adaptability, many of which fall into the following four broad categories:<sup>[5]</sup>

- **Industry diversity.** Regions with a more diverse economic base can transfer resources more easily across industries. Any industry-specific shock should be more muted in regions with multiple industries, since resources can flow to industries that did not experience the shock.
- **Human capital.** The knowledge, experiences and skills of people within a region affect the region's capacity to take advantage of new economic opportunities, for example through innovation or starting new businesses. These characteristics will also affect firms' decisions to invest in the region. The supply of labour in a region is also important, though people can often move across regions if required.
- **Physical capital.** The availability of infrastructure, equipment and technology affects a

**Graph 5**



**Table 1: Characteristics related to adaptability to structural change**

By region group, average in 2016

	Capital city regions	Non-mining regional areas	Mining regional areas
Industry diversity index <sup>(a)</sup>	3.9	3.2	2.3
Share of population with university education (%)	29.6	16.0	13.5
Patents per 1,000 population (no) <sup>(b)</sup>	0.4	0.2	0.1
Remoteness index <sup>(c)</sup>	1.2	2.3	3.1
Access to internet (%)	85.7	77.8	74.9
Average individual income (\$) <sup>(d)</sup>	68,023	53,622	63,371
Average household wealth (\$) <sup>(d)</sup>	1,184,230	764,924	813,472

(a) A modified Herfindahl index that increases as a region's industrial diversity increases to match the diversity of the Australian economy; see Lawson and Dwyer (2002) for more information

(b) Average in 2015

(c) Remoteness index has value of 1 for major city, 2 for inner regional, 3 for outer regional, 4 for remote and 5 for very remote; average index of SA1 regions within SA4 region

(d) 2017/18 dollars

Sources: ABS; RBA

region's ability to take advantage of new economic opportunities. The presence of physical capital that improves connectivity and access to resources both within the region and with other regions/countries should lower costs and increase productivity, which increases firms' willingness to invest in the region.

- **Financial capital.** Regions with higher incomes and wealth or greater access to credit tend to be better placed to manage a decline in economic conditions and take advantage of new economic opportunities.

Compared with capital cities, regional areas tend to have: a less diverse industry structure; a less educated population; lower connectivity with other regions and markets; and lower income and wealth (Table 1). In particular, mining regional areas are less connected with other regions and have lower industry diversity. In addition to having significant exposures to the recent drivers of structural change, regional areas are also more likely to have characteristics associated with lower adaptability to structural change. Overall, this suggests that these regions have taken longer to adapt to recent structural developments.

### Adjustment to differences in regional economic conditions

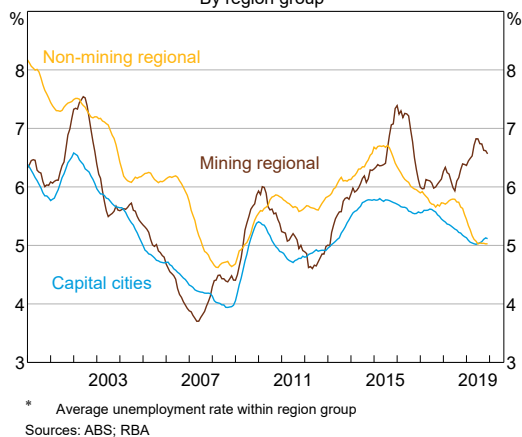
In recent decades, economic conditions have tended to be weaker for regions that have experienced higher rates of structural change. Many of these regions have had significant exposures to the key drivers of structural change as well as lower adaptability to structural change. This section considers how regions have adjusted to the differences in economic conditions, focusing in particular on the labour market adjustment mechanism, and whether the adjustment process may have been more difficult for some regions.

Regional labour markets appear to have adjusted quite well to the differences in economic conditions across region groups. The variation in unemployment rates across regions has remained broadly steady since the early 2000s (Lowe 2018). Moreover, the average unemployment rates in capital cities and non-mining regional areas have recently converged for the first time since the data have been available, suggesting that the labour market adjustment mechanism may have become more efficient in recent years (Graph 6). In contrast, the average unemployment rate in mining regional areas has remained above the average unemployment rates of the other region groups for the past five years or so, suggesting that the labour market

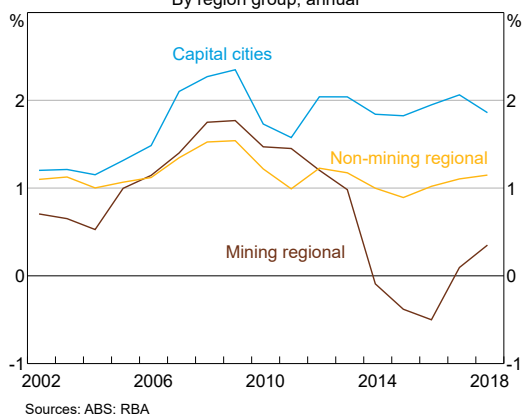
adjustment mechanism in these regions may have been less efficient.

Population flows across regions are likely to have supported the labour market adjustment process, with people moving from regions with fewer employment opportunities into regions with more employment opportunities. For example, population growth has been higher in capital city regions compared with regional areas in recent years, consistent with the stronger economic conditions in capital city regions (Graph 7). While unemployment rates in mining regional areas have been above those of other region groups, there is still evidence that population flows have supported the labour market adjustment process; population flows into mining regional areas were strong during the mining investment boom and subsequently declined as the boom came to an end.

**Graph 6**  
**Unemployment Rates**  
By region group\*



**Graph 7**  
**Population Growth**  
By region group, annual



While regional labour markets have adjusted relatively well to the differences in economic conditions in the past decade or so, the adjustment process may have been more difficult for some regions, particularly regional areas. If structural change reduces employment opportunities in the region and induces a large decline in the local population, this can further weaken economic conditions in the region through, for example, a weaker housing market and a general decline in demand for local goods and services. Outer regional and remote areas may be more vulnerable to a large decline in population, since these regions tend to have lower industry diversity (and therefore fewer alternative employment opportunities) and commuting to other regions for employment tends to be a less viable option.

In regions where people face greater barriers to moving, higher rates of structural change may contribute to poorer social and economic outcomes associated with long-term disadvantage, such as higher long-term unemployment rates and lower youth engagement rates. This can have lasting effects on the region through the loss of skills and income.

The barriers to moving may be larger in regional areas compared with capital city regions. Regional areas tend to have a less educated population and lower levels of income and wealth, which are characteristics that are associated with greater barriers to moving. Higher education and skill levels can increase the economic returns of moving (Productivity Commission 2014, Clark 2013).

Moreover, the potential returns from moving for people with lower education and skill levels may have fallen in recent years, since much of the recent employment growth has been concentrated in non-routine cognitive jobs, which tend to require higher education and skill levels (Heath 2016). The costs associated with moving may be a significant barrier for people with lower income and wealth (Productivity Commission 2014, Mitchell 2008). There are fixed costs to moving regions, such as relocation costs and the costs associated with home sales and purchases. Also, housing costs tend to be higher in regions where there are more employment opportunities and those relying on public

housing face the risk of losing subsidised accommodation if they move.

## Conclusion

Differences in economic conditions between capital cities and regional areas have increased over the past 15 years. This partly reflects some regional

areas having significant exposures to the key drivers of structural change and taking longer to adapt to these structural developments, particularly outer regional and remote areas. Population flows have generally helped regional labour markets adjust to differences in regional economic conditions, though the adjustment process may have been more difficult for some regions. ❖

## Footnotes

[\*] Author is from the Economic Analysis Department

[1] Regions in this article refer to Statistical Area Level 4s (SA4s), which are the largest sub-state regions in the Australian Statistical Geography Standard 2016 as defined by the Australian Bureau of Statistics. These regions are bound by population requirements and can cut across or combine highly interconnected regions, which has implications for regional economic analysis.

[2] Droughts are generally considered to be cyclical events, at least from an economic standpoint (Debelle 2019). More frequent droughts could be considered a structural development, but this is not addressed in this article.

[3] Goods-related industries include those involved in goods distribution (retail, wholesale, and transport) and goods production (agriculture, mining, manufacturing, utilities and construction). Services industries include those that provide household services (accommodation & food,

education, health, arts & recreation, and other services) and business services (professional, scientific & technical, administrative & support, rental, hiring & real-estate, information media & telecommunications, and financial & insurance). The public administration & safety industry is excluded from the analysis.

[4] The only reliable economic data available to construct a regional structural change index are SA4 employment data from the Australian Bureau of Statistics; these data are available from October 1998 onwards. Other regional economic data, such as investment and activity, are not available at a regular frequency.

[5] For example, see Productivity Commission (2017) and Dinh *et al* (2016). There are other characteristics that influence a region's adaptability to structural change not discussed in this article.

## References

- Adeney R (2018), 'Structural Change in the Australian Economy', *RBA Bulletin*, March, viewed 9 January 2020. Available at <<https://www.rba.gov.au/publications/bulletin/2018/mar/structural-change-in-the-australian-economy.html>>
- Clark W (2013), 'Life Course Events and Residential Change: Unpacking Age Effects on the Probability of Moving', *Journal of Population Research*, 30, pp 319–334.
- Connolly E and C Lewis (2010) 'Structural Change in the Australian Economy', *RBA Bulletin*, September, pp 1-10.
- D'Arcy P, L Gustafsson, C Lewis and T Wiltshire (2012), 'Labour Market Turnover and Mobility', *RBA Bulletin*, December, pp 1–12.
- Debelle G (2019), 'Climate Change and the Economy', Speech at Public Forum hosted by the Centre for Policy Development, Sydney, 12 March.
- Dinh H, B Freyens, A Daly and Y Vidyattama (2016), 'Measuring Community Economic Resilience in Australia: Estimates of Recent Levels and Trends', *Social Indicators Research*, June, pp 1–20.
- Fujita M and J Thisse (2002), *The Economics of Agglomeration*, Cambridge University Press, Cambridge UK.
- Hambur J and G La Cava (2018), 'Business Concentration and Mark-ups in the Retail Trade Sector', *RBA Bulletin*, December, viewed 24 January 2020. Available at <<https://www.rba.gov.au/publications/bulletin/2018/dec/business-concentration-and-mark-ups-in-the-retail-trade-sector.html>>

- Heath A (2016), 'The Changing Nature of the Australian Workforce', Speech at CEDA – Future Skills: The Education and Training Pipeline, Brisbane, 21 September.
- Henderson J (2010), 'Cities and Development', *Journal of Regional Science*, 50(1), pp 515–540.
- Langcake S and E Poole (2017), 'The Resources Economy and the Terms of Trade Boom', *RBA Bulletin*, September, pp 27–33.
- Lawson J and J Dwyer (2002), 'Labour Market Adjustment in Regional Australia', RBA Discussion Paper No 2002-04.
- Lowe P (2012), 'The Changing Structure of the Australian Economy and Monetary Policy', Speech at the Australian Industry Group 12<sup>th</sup> Annual Economic Forum, Sydney, 7 March.
- Lowe P (2018), 'Regional Variation in a National Economy', Speech at the Australia-Israel Chamber of Commerce (WA), Perth, 11 April.
- Mitchell W (2008), 'Labour Mobility and Low-paid Workers', report commissioned by the Australian Fair Pay Commission, December.
- Plumb M, C Kent and J Bishop 2013, 'Implications for the Australian Economy of Strong Growth in Asia' RBA Research Discussion Paper No 2013-03.
- Productivity Commission (2014), *Geographic Labour Mobility*, Research Report, April.
- Productivity Commission (2017), *Transitioning Regional Economies*, Study Report, December.
- Reserve Bank of Australia (RBA) (2014), 'The RBA's Business Liaison Program', September, pp 1–6.



# Demographic Trends, Household Finances and Spending

Tomas Cokis and Kate McLoughlin<sup>[\*]</sup>



Photo: xavierarnau, filadendron and Thurtell – Getty Images

## Abstract

The share of the population in their peak earning and spending years (ages 35–54) has decreased over the past decade, while the share aged 65 and above has increased. Demographic change has tended to reduce aggregate growth in household income and consumption, but by less than what previous patterns of household spending would suggest. This is because older households have earned and consumed more than in the past, and they have become wealthier. By contrast, growth in spending by younger households has been subdued, consistent with their weak income growth. The different earning and spending behaviour of households across different age groups will continue to affect trends in aggregate household consumption and income as the population ages further.

## Background

The Australian population is getting older. Over the past decade, the share of the population aged 65 and above has risen sharply and the share of the population in the peak stage of their lives for earning income and consuming (those aged 35–54) has declined noticeably (Graph 1). The demographic shift to an older population has been shaped by the large ‘baby boomer’ generation (those born between 1946 and 1964), who have driven changes to the age composition of the

Australian population for five decades. The baby boomer generation began reaching the retirement age in the past decade, significantly increasing the share of the population aged over 65.

Large inflows of relatively young migrants have supported population growth and increased the share of the population aged 25–34 over the 2010s (Graph 2).<sup>[1]</sup> Despite this, the population has continued to grow older on average because the large baby boomer generation have begun to move into the 65 and over category and because of the

ongoing trend increase in life expectancy. By contrast, people aged 35–54 have made only a very modest contribution to growth in the population, unlike in prior decades when the baby boomers moved through this age group. As a result, the number of people at retirement age per 100 working-age people (those aged between 15 and 64) has risen from around 20 to 25 over the past decade and is expected to rise further over the next decade.

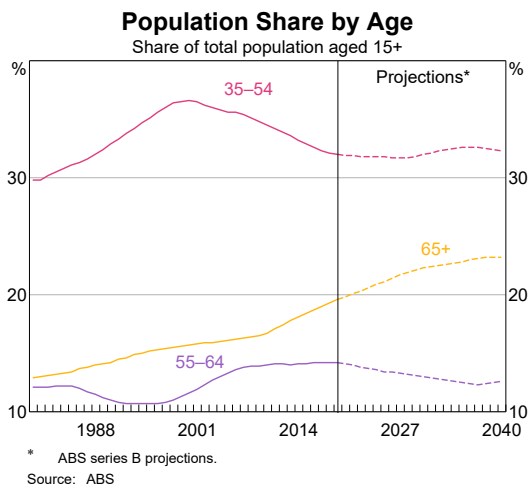
Alongside these demographic developments over the past decade, there have been noticeable changes in key economic indicators for the household sector. Disposable income grew at a reasonably strong pace over the 1990s and 2000s, but income growth has been subdued over the

2010s (Graph 3). Growth in household consumption has also slowed. The saving ratio increased noticeably starting from the mid 2000s, but has declined more recently. A range of structural and cyclical factors have contributed to these trends. These include: the global financial crisis; the mining boom and its unwinding; higher levels of household debt; weakness in non-labour income; growth in household income tax revenue; and the recent downturn in the housing market.<sup>[2]</sup>

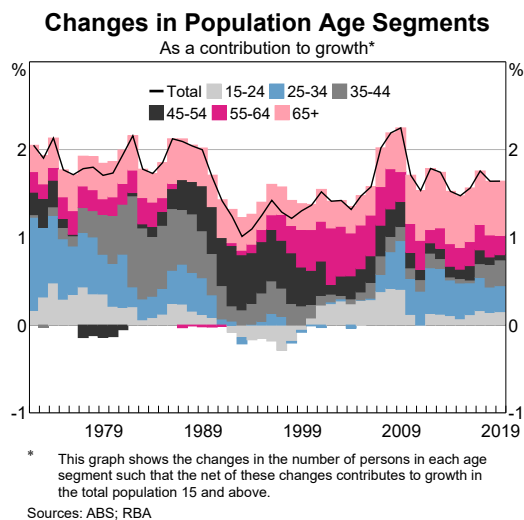
Considering the contribution demographics have made to these trends, alongside these other factors, can help us further understand developments to date and how they might evolve in the future.

This article uses an Australian Bureau of Statistics (ABS) dataset that combines household-level information from the Household Expenditure Survey (HES) and the Survey of Income and Housing (SIH) with the national accounts to explore what effect demographic changes are likely to have had on household consumption and income over recent decades.<sup>[3]</sup> In this dataset, the relevant household information, such as age, is grouped according to a designated 'household reference person.'<sup>[4]</sup> This dataset is broadly representative of the Australian household sector and includes persons living in non-private dwellings (such as nursing homes) and persons in very remote communities, who are often out-of-scope in micro datasets.<sup>[5]</sup> Consistent with the changes in the aggregate population, the share of households with reference persons' aged 55 and above in this

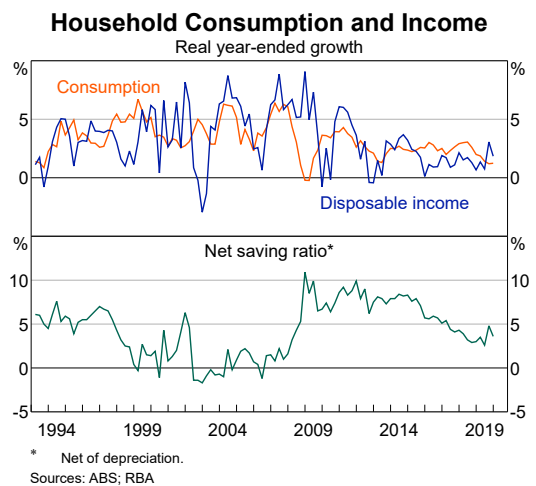
**Graph 1**



**Graph 2**



**Graph 3**



dataset has increased from around one-third in 2004 to nearly half in 2018. The descriptive statistics offered by these data do not allow demographic effects to be isolated from other variations between households that may have been correlated with age. Nonetheless, they allow an examination of the average differences between households of different ages and how those differences contribute to the aggregate household sector and economy.

### Income and consumption tend to decline with age ...

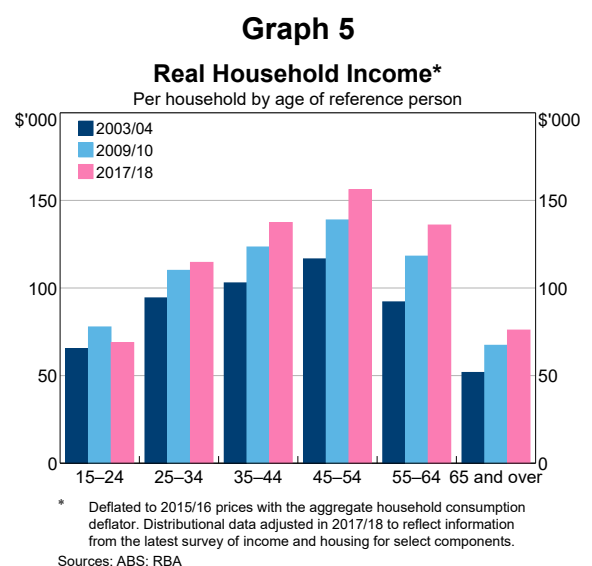
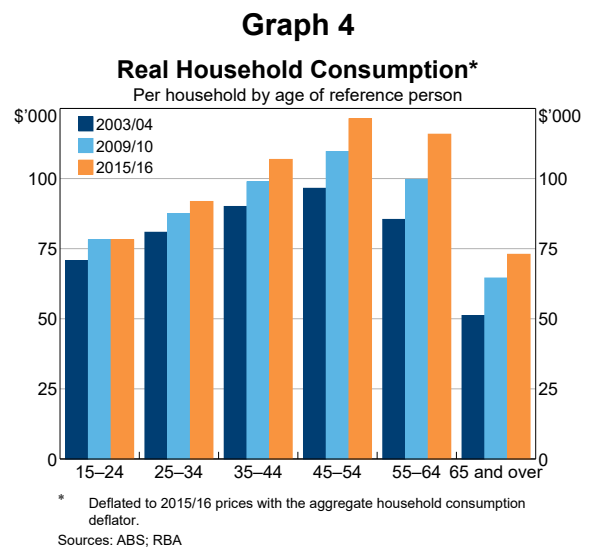
Some portion of the slowing in consumption growth over the past decade is likely to be due to the ageing of the population. This is because the distribution of average household consumption by age in Australia follows a hump-shaped pattern: spending generally increases through the working life of a household, rising noticeably for households aged 35–54 in the stage of their life where many households support children and then declines once they retire. The decline in consumption is particularly pronounced for households aged 65 and over (Graph 4).<sup>[6]</sup> The reasons for a reduction in average spending for the 65 and above category would vary by household, but some likely explanations include a reduction in income as people enter retirement (discussed further below), lower weekly expenses (such as transport and eating out) after exit from the workforce, no longer needing to support children and actual or perceived inadequate savings for retirement.<sup>[7]</sup> The decline in the consumption of older households is not as large when incorporating social transfers provided by the government (discussed further below).

The ageing of the population is also likely to have made some contribution to the slowing in income growth over the past decade. Similar to the distribution of consumption by age, household income generally increases through the working life of a household and then declines as they approach retirement (Graph 5). Households aged 65 and above typically have lower levels of income than those aged 25–54, and around 40 per cent of households 65 and over are in the lowest income quintile.<sup>[8]</sup> However, these older households are

typically wealthier; only 25 per cent are also in the lowest two wealth quintiles.

### However, stronger income growth over the past decade has supported higher consumption growth for older households

The impact of the growing number of older households on aggregate consumption has been partly mitigated by a shift in the shape of the lifetime consumption distribution over the past decade. Average consumption per household aged 55 years and above has grown nearly twice as fast as the average of other households (Graph 6). In 2017/18, households aged 55–64 consumed more on average (\$123,000) than those aged 35–44 (\$111,000), although less than those aged 45–55



(\$128,000). Stronger consumption growth for older households has partly reflected stronger growth in their incomes, compared with other age groups. Changes in household composition (such as children staying at home for longer or increased life expectancy) may be another contributing factor to consumption growth per household.

By contrast, the youngest households (those aged 24 and below) on average saw no growth at all in their consumption and a decline in their real income in the six years following the global financial crisis. The smaller share of the population comprised of these households, relative to prior decades, means that the effect on aggregate consumption has been smaller than it otherwise would have been.

Aggregate growth in household disposable income has slowed noticeably over the past decade and has been lower than consumption growth for most of the past five years. But, as noted above, income growth across the age distribution has varied. Income growth was stronger for older households than for younger ones (Graph 7).<sup>[9]</sup> For example, households aged 15–24 had more disposable income than households aged 65 and over in 2003/04, but in 2017/18 earned about the same, and they still had significantly less wealth. As in the case of consumption, stronger growth in older households’ incomes has reduced the effect of the ageing population on aggregate income.

For households aged 55–64 years, a key driver of stronger growth in overall income relative to other

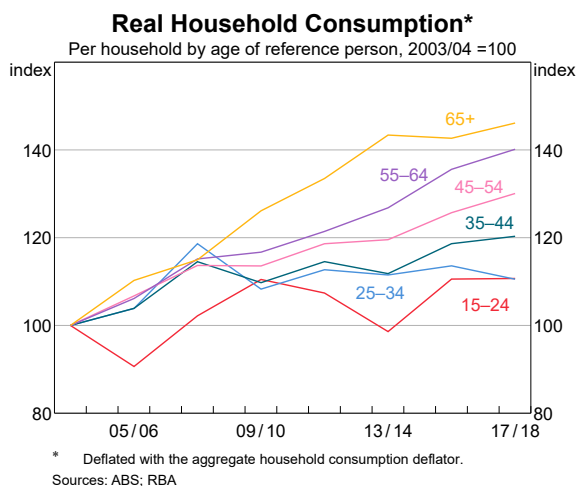
households has been strong growth in labour income. This has been supported by increased participation in the labour force, mainly by women. The female participation rate for those aged 55–64 years has increased from around 30 per cent in 1999 to a little more than 60 per cent in 2020.<sup>[10]</sup> For households aged 65 and above, growth in income over the past 15 years has also been supported by strong growth in non-labour sources of income such as financial income, rental income and social assistance income.<sup>[11]</sup>

Financial income has grown more strongly than any other source of household income over the past 15 years. All age groups have benefited, but older households benefited the most because they hold more financial wealth, on average. Total financial returns for households over this period would be even larger if capital gains were included, but financial income in the national accounts excludes capital gains. This understates the total financial returns of households, particularly for older households because they receive the largest share of their income from financial wealth.

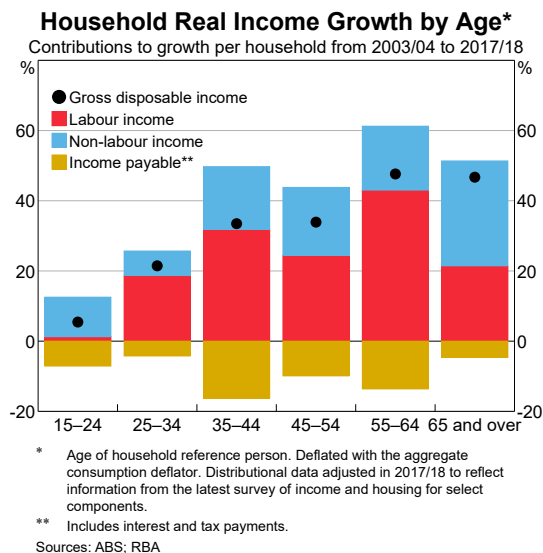
### Older households save less of their current income than younger households

Households across most age groups increased their rate of saving in the mid 2000s, likely driven by precautionary motives, lower expectations for future income growth and declines in wealth.<sup>[12]</sup>

**Graph 6**



**Graph 7**



Over the following six years, households aged 35–44 years increased their rate of saving further while the rate of saving for older and younger households was relatively unchanged (Graph 8). While older households generally save less than younger households, older households still had positive savings over the past 15 years, on average.

Since 2015/16, the aggregate saving rate in Australia has declined, as disposable income growth has been weaker than consumption growth. While distributional data on saving are not available for the past couple of years, historical experience suggests that demographics are likely to have contributed in some part to the further decline in the saving rate since 2016, as the share of older households, who save less, has increased. The relative increase in the saving rates of younger households over this time has mitigated this effect on the aggregate saving rate. A simple scenario that uses 2015/16 saving per household and population shares from 2003/04 suggests that in the absence of changes in demographics over this time, the saving rate would have been 1 percentage point higher in 2015/16. As the population continues to age this may weigh further on the saving rate.

### Superannuation has also supported consumption by older households

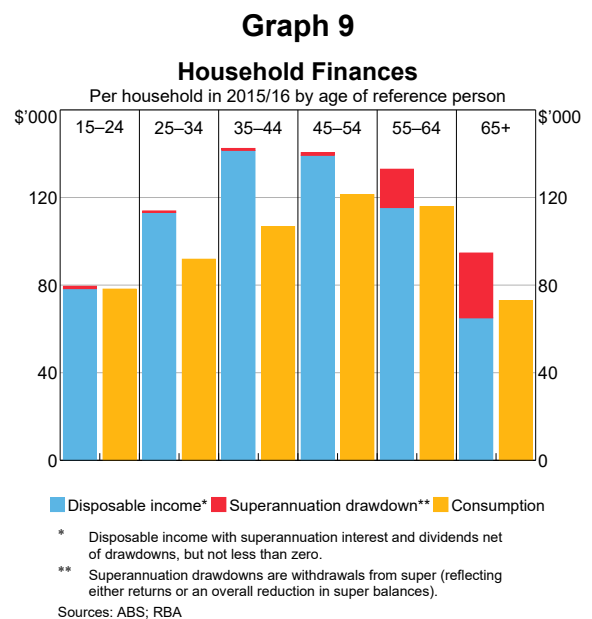
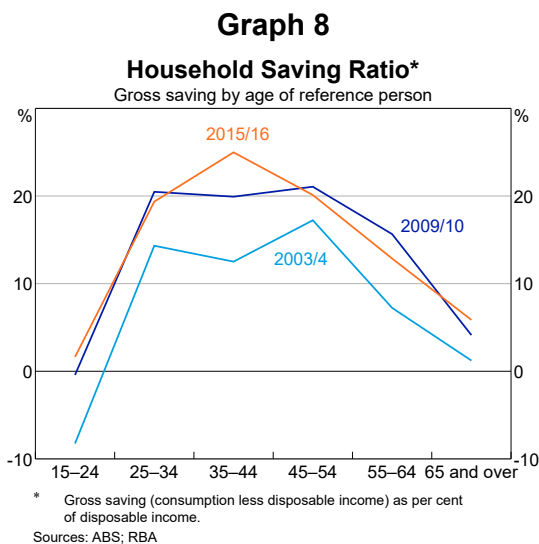
Superannuation has played an important role in households’ choices for smoothing consumption as they approach and enter retirement, giving them the option of drawing down their superannuation

to fund spending above their income. The drawdown of super has supported older households to consume more on average (Graph 9).

### Growth in household consumption has been supported by strong growth in asset prices, particularly for older households

Past research has identified a relationship between household wealth and consumption.<sup>[13]</sup> Net wealth has increased for all age groups, although the largest gains in dollar terms have accrued to older households (Graph 10). The average Australian household’s wealth – under the definitions in the national accounts – increased in nominal terms from around \$500,000 in 2004 to close to \$1.1 million in 2015/16. The average wealth of households aged 15–34 increased by around \$90,000 over this period, while for households aged 55 and above it increased by \$630,000. Older households have accumulated considerably more wealth than households of the same age in the past, consistent with the increase in their consumption.<sup>[14]</sup>

Housing wealth increased strongly from 2003/04 to 2017/18, but debt owed by households grew even more strongly. While households aged 65 and above hold the least debt on average, these households (and those aged 55–64) have also seen a trend increase in the average housing debt per household relative to households of their age in the



past, meaning that older households are now approaching or in retirement with more debt, on average (Graph 11).

The growth in housing wealth and debt in part reflects increased ownership of investment properties by older households. For older households, housing debt is roughly evenly split between owner-occupied and other properties, while for households aged 54 and below housing debt is largely for the property they live in. Data from the Australian Taxation Office indicate that increased ownership of investment properties over the past two decades has been driven by those aged 50 and above (Graph 12).

### Social welfare has also supported consumption by older households

Households across all age groups are supported by sizeable social transfers from the state.

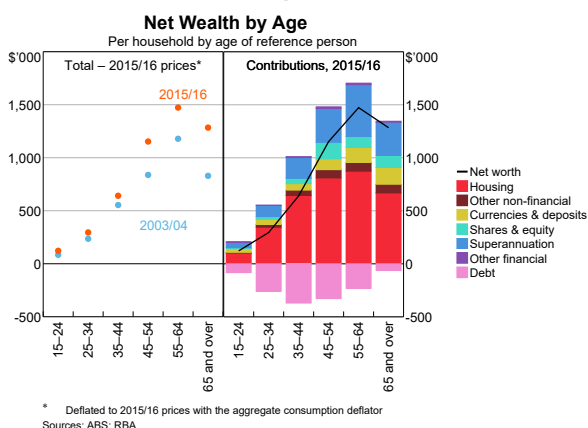
Consideration of these public transfers gives a more complete picture of the set of resources available to households and helps explain the relatively resilient private consumption of older households because private income and consumption has been supplemented by support from the state.

Social assistance income provided to households aged 65 and above has increased around 30 per cent in real terms over the period 2003/04 to 2017/18 (Graph 13). Pension income has grown in excess of both the consumer price index and the wage price index since 2003, partly reflecting a number of policy changes.<sup>[15]</sup> Social assistance income declined a little in 2017/18 for older households, on average. This seems to reflect, at least in part, a larger share of part pensions.

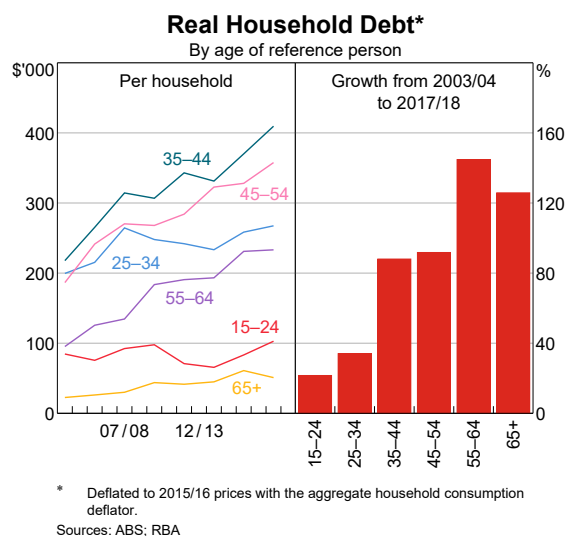
Growth in nominal social assistance income has been subdued for all other households since 2003/04; in real terms, it has declined a little. The typical household aged 64 and below receives no social assistance income from the state. While unemployment benefits did increase a little towards the end of the mining boom, these only account for 15 per cent of social assistance.

Once other transfers, such as child care and education benefits (for example, subsidies for education), are included, the social welfare benefits

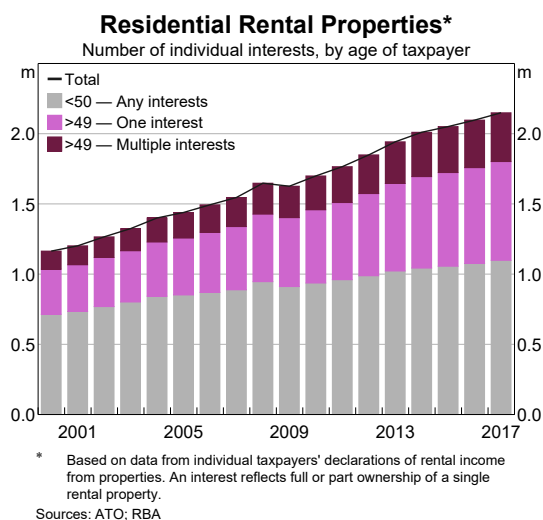
**Graph 10**



**Graph 11**



**Graph 12**



are a little more evenly distributed across age groups in nominal dollar terms (Graph 14). These ‘transfers in kind’ also include aged care and benefits received through the National Disability Insurance Scheme. Social transfers in kind are captured by measures of government spending and are not included in household consumption growth. Total spending on these transfers has grown significantly over the past 15 years, which has been an important driver of growth in public consumption and economic activity.

### Conclusions and considerations for the outlook

Australia, as in many countries, is experiencing large demographic shifts. Some portion of the slowing in aggregate consumption and household disposable income growth over the past decade is likely

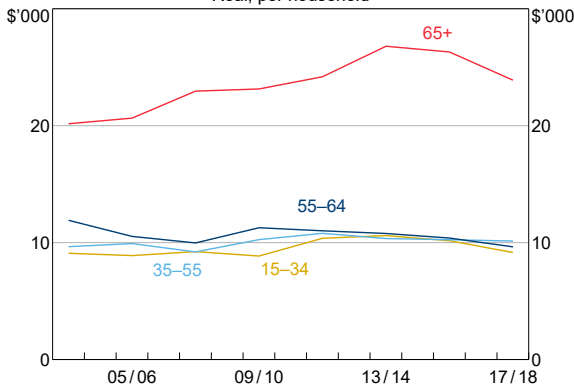
because of demographic changes as more households have moved into a stage of their lives where they earned and spent less, on average. These effects have been smaller than what previous patterns of household spending would suggest because older households are spending more than in the past. This expenditure has been supported by relatively strong growth in income, large increases in wealth and withdrawals from superannuation.

Over the coming decade, a further strong increase in the share of households aged 65 and above is expected. Further impacts on consumption and income are likely, although these are likely to happen over a number of years. The increase in young overseas migrants over the past decade should support the share of the population that are of working age over the coming decade. This has made Australia relatively well placed, compared with many other advanced economies, to adjust to the effects of an ageing population. ✎

**Graph 13**

**Social Assistance Income by Age\***

Real, per household



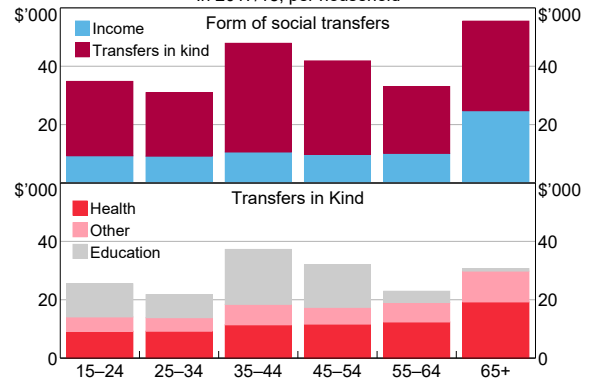
\* By age of household reference person. Deflated to 2015/16 prices with the aggregate consumption deflator. Distributional data adjusted in 2017/18 to reflect information from latest survey of income and housing.

Sources: ABS; RBA

**Graph 14**

**Social Welfare Benefits by Age\***

In 2017/18, per household



\* Age of household reference person

Sources: ABS; RBA

### Footnotes

- [\*] The authors are from Economic Analysis Department. Sincere thanks are extended to Adam Sinclair who provided substantive analysis and drafting in the earlier stages of this work. The authors would also like to thank Iris Day, Fiona Price, Diego May and Peter Tulip for their helpful suggestions.
- [1] Australia has experienced strong net overseas migration relative to most other advanced economies, most of which has been accounted for by people under the age of 35. For more information on net migration in Australia and Australia’s demographic position relative to other

advanced economies see Lowe (2018) Demographic Change and Recent Monetary Policy.

- [2] For further discussion see Lowe (2011), Stevens (2011) and Ellis (2019).
- [3] Adjustments have been made to this dataset for 2017/18 for select components to incorporate information from the latest Survey of Income and Housing, which was not available when the dataset was compiled. However, these adjustments are less sophisticated than the original methodology: the ABS is expected to publish an update

later this year, which will include data from the latest survey.

- [4] The household reference person is selected by the ABS based on a range of factors including home ownership status, income and age of the individuals within a household.
- [5] The household sector in this data includes unincorporated enterprises and excludes the not-for-profit sector. Throughout the article, disposable income refers to income after tax and interest payments.
- [6] Even once changes in the composition of households, such as children leaving home, are accounted for, consumption for the average household still declines for households 65 and above.
- [7] Increased average life spans mean that the 65 and above category now includes more households of a significantly older age, making it difficult to infer from these data how the decline in consumption for those aged 65 and above may vary as these households age further.
- [8] Based on more detailed data from the Survey of Income and Housing. The shares of households aged 65 and above in the lowest income quintile are 38 per cent for equivalised disposable income and 44 per cent for unequivalised in 2017/18.
- [9] Income growth has been stronger for older households even after controlling for changes in household composition by using equivalised disposable income from the survey of income and housing.
- [10] For further discussion see DeBelle (2019).
- [11] Financial income includes interest receipts, dividends from financial institutions, private corporations and governments and a measure of estimated interest and dividend earnings on households' superannuation balances in each quarter.
- [12] For further discussion see Price and Finlay (2014).
- [13] May G, G Nodari and D Rees (2019).
- [14] For further discussion on this topic see Wood D and K Griffiths (2019).
- [15] A number of policy changes have boosted pension income, including the 10 per cent one-off increase to the pension rate for singles in 2009 and changes to eligibility; for example, the introduction of the work bonus, which excludes a certain amount of income from the pension income test.

## References

- DeBelle G (2019), 'Employment and Wages', Speech at the Australian Council of Social Service (ACOSS) National Conference 2019, Canberra, 26 November.
- Ellis L (2019), 'What's Up (and Down) With Households?', Speech at the Housing Industry Association March Industry Outlook Breakfast, Sydney, 26 March.
- Lowe P (2011), 'Changing Patterns in Household Saving and Spending', Speech at the Australian Economic Forum 2011, Sydney, 22 September.
- Lowe P (2018), 'Demographic Change and Recent Monetary Policy', Address to Anika Foundation Luncheon, Sydney, 8 August.
- May G, G Nodari and D Rees (2019), 'Wealth and Consumption', RBA *Bulletin*, March, viewed 11 March 2019 Available at <<https://www.rba.gov.au/publications/bulletin/2019/mar/wealth-and-consumption.html>>.
- Price F and R Finlay (2014), 'Household Saving in Australia', RBA Research Discussion Paper No 2014-03.
- Stevens G (2011), 'The Cautious Consumer', Address to The Anika Foundation Luncheon, Sydney, 26 July.
- Wood D and K Griffiths (2019), 'Generation gap: ensuring a fair go for younger Australians', Grattan Institute, Grattan.edu.au site, 18 August, viewed 11 March 2020. Available at <<https://grattan.edu.au/report/generation-gap/>>.



