Bulletin

JUNE 2020

RESERVE BANK OF AUSTRALIA

Bulletin

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Transactional Banking at the RBA in Extraordinary Times

Talina Leung[*]

Photo: Stefan Mokrzecki – Getty Images

Abstract

The Reserve Bank of Australia (RBA) is the banker to the Commonwealth of Australia, supporting the Australian Government in its daily banking needs. During extraordinary times, such as the bushfires of the 2019/20 summer season or the current COVID-19 pandemic, demands on banking services are heightened as additional payments are made to Australians who require funds immediately. By modernising its products and service offerings and the underlying technology, the RBA has ensured payment and banking systems are fit to perform these tasks securely and reliably. In the past, additional payments during extraordinary times required additional effort and at times unconventional means. Today, government payments can be made seamlessly, even during crisis situations, ensuring funds are received without unnecessary delays.

Introduction

The RBA's Banking Department provides two key banking functions to the Australian Government and its agencies: core banking services and transactional banking services. Banking and registry services are also provided to a number of overseas central banks and official institutions. Core banking services are derived from the RBA's role as a central bank and its main function is the daily consolidation of account balances held by Australian Government agencies into the government's Official Public Account held at the RBA. This happens regardless of which financial institution the various government agencies bank with. The RBA also provides the government with a term deposit facility as well as an overdraft facility in the event of unexpected demand for government cash balances.

Transactional banking services are similar to traditional banking and payment services offered by other commercial financial institutions.[1] The RBA provides a range of products and services that allow government agencies to make and receive

payments. Around 90 Australian Government agencies use these transactional banking services and around 350 million payments are processed annually, with a total value of $1.1 trillion. This includes payments received by government agencies and payments made such as welfare, health, payroll and vendor payments.

In recent years, the RBA completed a program of work to modernise its banking systems. It also participated in the build and launch of the New Payments Platform (NPP), a payment system to facilitate fast, data-rich payments. These improvements mean that the RBA is well equipped to support the Australian Government when circumstances require agencies to deliver either small or large targeted payment programs to the community.

Domestic Payment Systems

The key objective of the RBA's transactional banking function is to deliver secure and efficient services that meet the banking and payment needs of Australian Government agencies. This ensures government payments can be delivered in a reliable, timely and secure manner. Underpinning this are a number of payment systems and infrastructure that has been built specifically to handle the high volume and specific requirements of the government.

Direct Entry

Almost all government payments are processed via the domestic, low-value direct entry system. The majority of payments are regular social welfare and pension payments administered by Services Australia.[2] Direct entry payment instructions are received in files and are processed in batches. Multiple batches are processed each business day. A large proportion of regular payments are processed through the Government Direct Entry System (GDES). The GDES leverages the industry's direct entry system but with specific rules for government payments, including the early delivery of payments to banks ahead of the payment value date. This makes government funds available in recipients' accounts by 9.00 am (AEST/DT) on the value date.

While direct entry payments are suitable for regular, recurring payments, there are other payment options available when there is an element of urgency.

High-value Payments System (HVPS)

In urgent situations, the government may make payments via the High-value Payment System (HVPS), which settles on a real-time gross settlement (RTGS) basis using the Reserve Bank Information and Transfer System. These payments are irrevocable and in most cases funds are available in the recipient's account within 15 minutes. RTGS payments are suitable for high-value transactions or where funds need to be received urgently and with certainty on the same business day. However, the processing of government payments using this system is limited due to its settlement hours being more restrictive and only available Monday to Friday. This system has been available since 1998.

The New Payments Platform (NPP)

A newer and more convenient fast payment option is the NPP, where government agencies can make fast, data-rich payments 24 hours a day, every day of the year (Fitzgerald and Rush 2020). NPP payments are settled irrevocably in real-time using the RBA's Fast Settlement Service. Funds are available in the recipient's account almost immediately. NPP payments can be made between bank accounts held at different financial institutions, provided both institutions are NPP participants.[3] In addition to speed of the payments, the NPP also provides richer data with the option of including up to 280 characters of information, compared with the 18 characters allowed for direct entry payments.

The NPP was introduced in February 2018 and is still a new service offering in the payments industry. Initial uptake was slower than expected due to delays from some financial institutions in delivering core functionality to their account holders (Fitzgerald and Rush 2020). Consequently, rollout activities of some major banks were not completed until 2019. Since then, usage of the NPP has picked up as the number of reachable bank accounts has increased substantially.

Table 1: Cheques as a Percentage Share of Total Payments

	2013	2016	2019
Consumer Payments Survey[(a)]	0.4	0.2	0.2
Government Payments	3.5	1.7	0.6

(a) Source: 2019 Consumer Payments Survey (Caddy *et al* 2020)

While some financial institutions have started migrating direct entry payments to the NPP, it is expected regular payments, especially those with a recurring nature, will continue to be made via direct entry until the equivalent functionality for making frequent, recurring payments is available in the NPP (Fitzgerald and Rush 2020). This is also the case with government payments, where the majority are regular payments made via direct entry and only a very small number of payments are currently processed via the NPP (Graph 1).[4]

Despite the low volumes, it is important to note the NPP has provided significant changes to the payments landscape in Australia. There is now more choice for making payments than ever before and payments are faster and more flexible (Lowe 2019). An example of how the NPP is directly benefiting Australians was evident during the recent Australian bushfires where the government was able to provide immediate funds to people who were impacted.

Cheques

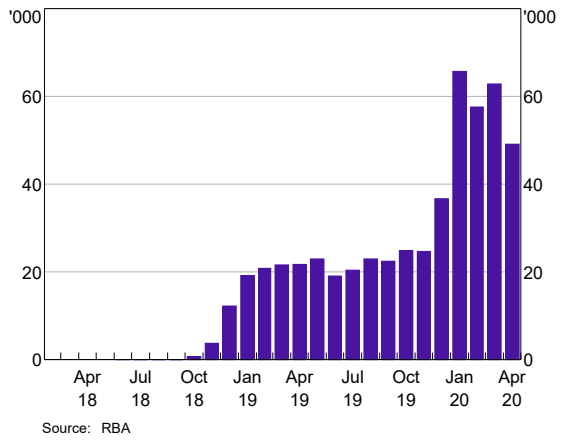
The RBA's Consumer Payments Survey results show that Australian consumers have been switching to electronic payment methods for several years. The share of government payments made via cheque is now at a similarly low level as the government implemented substantial policy changes over the past decade (Table 1).

Since 2009/10, cheque payments have declined by more than 85 per cent (Graph 2). The most notable falls were in 2013/14 when the Australian Taxation Office stopped issuing cheques for personal income tax refunds, and in 2016/17 when Medicare stopped issuing cheques for paid claims. Instead, these payments are now made more quickly via direct deposits using the direct entry system with cleared funds received in recipient accounts.

There is general acknowledgement that it will be appropriate to wind up the cheque system at some point in the future (Lowe 2019). However, industry must provide an alternative payment method for those people who still rely on cheques. It is possible the alternative may be a new payment solution that makes use of the NPP infrastructure.

Graph 1

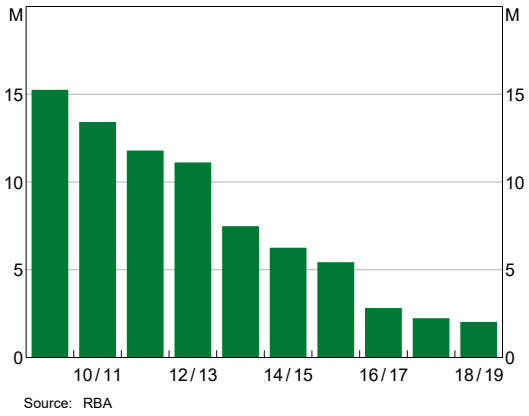
NPP Payments by Government Agencies Banking with the RBA



Graph 2

Cheque Payments by Government Agencies Banking with the RBA

2009/10 to 2018/19



System Modernisation

Transactional banking services offered by the RBA have evolved over the years with the emergence of new technology and payment capabilities. A key milestone is the recent completion of the RBA's program of work to upgrade its banking systems and infrastructure. The objective was to migrate mainframe-based systems to a more contemporary and flexible platform using modern programming language and architecture. The seven-year upgrade took place through several major releases and was completed in August 2019.[5]

In addition to system improvements, the RBA has also been involved in other projects to adopt new payment capabilities, including those offered by the NPP. Significant effort was devoted to the build, test and implementation phases to ensure the government was in a position to process and receive payments using the new platform from day one. The RBA expects the NPP to provide further capabilities that can provide efficiencies and other benefits for government payments. An example is the 'Mandated Payments Service', which is scheduled for early 2022 and is expected to operate in a similar way to existing direct debit arrangements (NPPA 2019).[6]

Banking Department has also worked closely with government agencies to support their payment modernisation initiatives and programs of work. This includes digital transformations that are taking place across the government and providing better-integrated solutions. One example is the use of Application Programming Interface capabilities for government payments. These capabilities enable full integration with government systems, facilitating real-time payments. The new technologies and 24/7 capabilities introduced by the RBA ensures the government can meet the growing expectations of the community around reliability and speed of payments.

Crisis and Disaster Relief Payments

The improvements to the business architecture and technologies that underpin the RBA's banking and related payment systems provide greater choice to agencies in the implementation of extraordinary government programs in response to crises, such as natural disasters, bushfires or pandemics. To demonstrate the progress made, this section describes how the government provided urgent financial relief following some of the country's natural disasters.

For Cyclone Larry in 2006 and the Black Saturday bushfires in 2009, eligible claimants were provided a cashable cheque or authorised claim form in order to receive urgent funds. For Cyclone Larry, the claimant and a Services Australia staff member had to both be physically present at a bank branch in order to complete and authorise the claim before the claim form was presented to the bank teller and cashed. For Black Saturday, the recovery centres established near the disaster zones were used by Services Australia staff members to issue cheques for approved claims, which were negotiated for cash at the nearest bank branch or at a mobile cash unit trucked into the disaster zone.

These cash and cheque arrangements were cumbersome, inefficient and created security risks. As such, the government was frustrated at the lack of an electronic payment system that would meet the needs of the community in times of disruption. This frustration led to Services Australia expanding their use of the RBA's RTGS service. While RTGS is designed for large value market transactions and priced accordingly, there were no technical or legal limitations precluding low-value transactions by Services Australia. At that time, it was the only payment system that could provide payments to a beneficiary's bank account on the same business day. In 2009, Services Australia and the RBA undertook systems development work to enable Services Australia's welfare system to generate RTGS payments. Later that year, Services Australia was able to use the RTGS system to make urgent payments during crises as well as urgent welfare payments in normal times.

In January 2010, in response to fires in Western Australia and floods in Queensland, Services Australia used RTGS to make urgent disaster relief payments; making almost 13,000 payments using RTGS on 17 January. While this was a significant improvement on cash and cheque payment methods, the hours at which the RTGS system

operates restricted Services Australia to business days between the hours of 9.00 am and 4.00 pm (AEST/DT). At that time, Australia did not have a payment system that could deliver funds electronically and quickly to bank accounts outside of business hours observed on the country's south-eastern seaboard.

The launch of the NPP in February 2018 addressed significant gaps within the payments landscape including the ability to send funds to bank accounts within seconds – 24 hours a day, 365 days a year. Services Australia commenced sending emergency welfare payments through the NPP in October 2018, including Australian Government Disaster Recovery Payments, and has acknowledged the service has transformed the way financial assistance is provided to people facing emergency situations (Services Australia 2019). An individual can now see the funds in their bank account via their online banking service or mobile app before leaving the Services Australia office or ending their phone call, providing a vastly improved experience to those most in need.

The Australian Government also uses the NPP to make real-time disaster relief payments, including during recent bushfires. The 2019/20 bushfires caused extensive damage across several Australian states and territories. More than 10 million hectares of land were destroyed in southern Australia, which is greater than the combined area burned in the Black Saturday and 1983 Ash Wednesday bushfires (CSIRO 2020). The impact was unprecedented and widespread with thousands of homes lost, 33 deaths and many communities were severely affected. The bushfire smoke was extensive and caused hazardous air quality levels across New South Wales, Victoria and the Australian Capital Territory, resulting in increased health issues being reported.

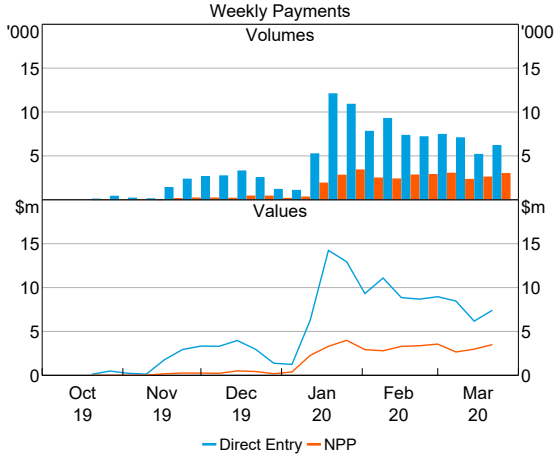
The number of bushfire relief payments processed was much higher than previous natural disasters. Payment volumes were more than the total number of disaster recovery payments made in the 2018/19 financial year, which included the far north Queensland floods and Northern New South Wales bushfires.[7] During this period, the RBA processed more than 136,000 bushfire relief payments with a total value of around $163 million approved by Services Australia (Graph 3). Almost one in four payments were made via the NPP and only a small handful of payments were made via RTGS. It is worth noting more than 3,600 NPP payments were processed on a weekend or public holiday, which is something that was not possible only a couple of years ago. All of these payments were processed within the existing business as usual payment arrangements.

Conclusion

The emergence of new payment system capabilities has enabled the government to make immediate payments at any time on any day. This has made a difference to many Australians in need of urgent financial assistance. This was evident during the recent Australian bushfire disaster, which affected many households and businesses. The new payment infrastructure used to process government payments has also ensured the seamless processing of additional stimulus payments relating to the COVID-19 pandemic, along with other regular government payments to support the community.

Graph 3

2019/20 Bushfire Disaster

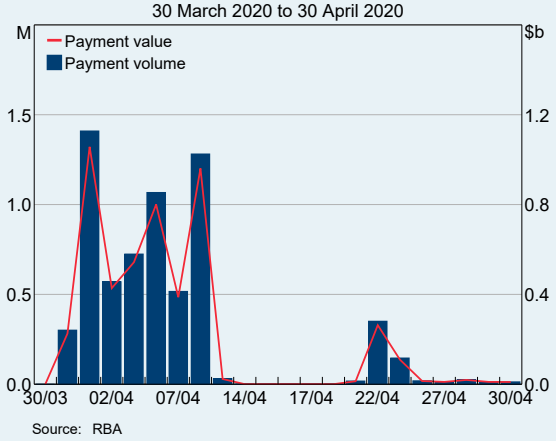


Source: RBA

Box: COVID-19

The Australian Government is providing a number of stimulus measures to support households and businesses during the COVID-19 pandemic, which includes two $750 Economic Support Payments (ESP). Between 30 March and 29 May 2020, Services Australia paid out close to $5.3 billion during Phase 1 of the ESP. The highest daily volumes were processed the week before Easter, with ESP payments accounting for more than 50 per cent of regular payments. Graph 4 demonstrates payments made between 30 March and 30 April, the period in which most of the Phase 1 payments were made. Similar to previous relief payments, the RBA's upgraded systems were able to process the additional payments as part of normal business activities and deliver payments to people affected by the economic slowdown due to COVID-19.

Graph 4
Economic Support Payments
30 March 2020 to 30 April 2020



Source: RBA

Footnotes

[*] The author is from Banking Department and thanks Stephanie Connors and Kristin Langwasser for their valuable assistance and contributions.

[1] The provision of these services is consistent with the RBA's responsibilities under the *Reserve Bank Act 1959* and are provided in line with the government's competitive neutrality guidelines. This means the RBA competes with commercial financial institutions for business at tenders.

[2] Services Australia was formerly known as the Department of Human Services and includes the Centrelink, Medicare and Child Support programs.

[3] Bank accounts include accounts held at Authorised deposit-taking institutions such as banks, credit unions and building societies.

[4] The increase in NPP payments from December 2019 to March 2020 reflects additional payments processed as part of the Australian bushfire relief.

[5] The program's significance to the government and broader community has been recognised at an industry level, including being awarded a 'Project of National Significance' at the 2020 ITnews Benchmark Awards.

[6] The 'Mandated Payments Service' will allow account holders to establish and manage standing authorisations (or consents) for payments to be initiated from their account by third parties.

[7] Based on the number of claims finalised for the Australian Government Disaster Recovery Payment (Services Australia 2019).

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Economic Effects of the Spanish Flu

James Bishop[*]

Photo: Reserve Bank of Australia – PN-006877

Abstract

The Spanish flu reached Australia in 1919 and remains the country's most severe pandemic in terms of health outcomes. At the peak of the pandemic, sickness due to influenza temporarily incapacitated 2 per cent of the labour force. However, despite the social distancing measures used by governments to contain the virus, few job losses in this period were due to a lack of available work. The labour market also recovered quickly, but it is not clear how relevant this experience is for the modern economy.

Introduction

The outbreak of COVID-19 infections and the associated containment measures have significantly affected the Australian economy. When faced with a shock like COVID-19, economists usually look to the historical record for a guide as to how things might play out. Although there have been a number of pandemics since the turn of the 20th century, the most severe in terms of health outcomes was the Spanish flu, which began in 1918 and lasted until 1920.

This article discusses the effects of the Spanish flu on the labour market and GDP in Australia. It does this by analysing the economic data and other evidence for the period. While the Spanish flu provides a useful case study, its usefulness is tempered by the differences in the economy and its institutions in 1919 compared with the same in 2020. Using the Spanish flu period to draw lessons on the economic effects of pandemics is additionally challenging because it also coincided with a period of major economic adjustment after the end of the war. I begin by providing a brief overview of the timeline and epidemiology of the Spanish flu and the measures used by authorities to contain the virus.

The Spanish flu was less deadly in Australia than other countries

Globally, the Spanish flu pandemic occurred in three main waves – the first in early 1918, the

second and most deadly from September 1918 to January 1919, and the third from February 1919 through the remainder of the year.[1]

Graph 1 shows estimates of mortality rates over time.[2] According to these estimates, 2.1 per cent of the world's population died from Spanish flu. The mortality rates were particularly high in countries with large populations (notably India), which explains why the 'weighted' mortality rate exceeds the 'unweighted' rate in Graph 1.

Because of Australia's remoteness and rapid quarantine response, it was one of the few countries to avoid Spanish flu during 1918 (Graph 1). The first case appeared in Melbourne, on 9 or 10 January 1919, before spreading to Sydney and South Australia by the end of the month (Graph 2; Graph 3) (National Museum of Australia 2020). In Perth, the combination of the city's relative isolation and effective state border quarantine control meant that Spanish flu did not arrive there until June 1919. Similarly, the virus did not reach Tasmania until August. By the end of 1919, the pandemic was over.

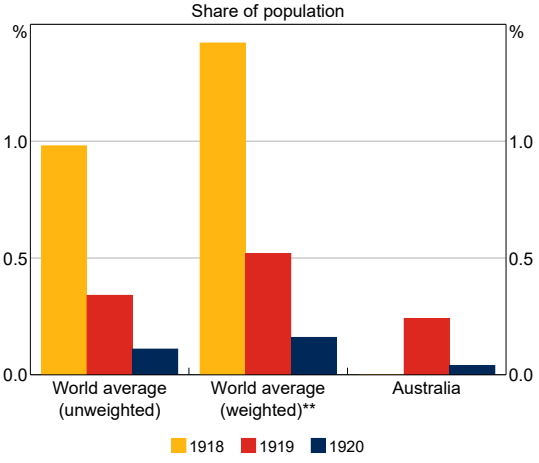
Some regions experienced multiple waves of infections and mortality. For example, Sydney – which had the highest mortality rate of any metropolitan area in Australia – experienced two waves of the epidemic characterised by rapidly rising then falling infections. Epidemiologists continue to debate the reasons why some regions had multiple waves of infections, although the imposition and removal of social distancing measures is a leading explanation.[3]

Mortality rates for Spanish flu were highest for those aged 18 to 40. In NSW, more than half of all deaths were in this age group. This stands in sharp contrast to most other influenza pandemics, such as the 1891 influenza pandemic (and the current COVID-19 pandemic), where the majority of deaths were in people aged over 60 (Curson and McCracken 2014). These differences in the age distribution of mortality should be kept in mind when attempting to draw parallels between the labour market implications of Spanish flu to those of COVID-19.

Graph 1

Deaths from Spanish Flu*

Share of population

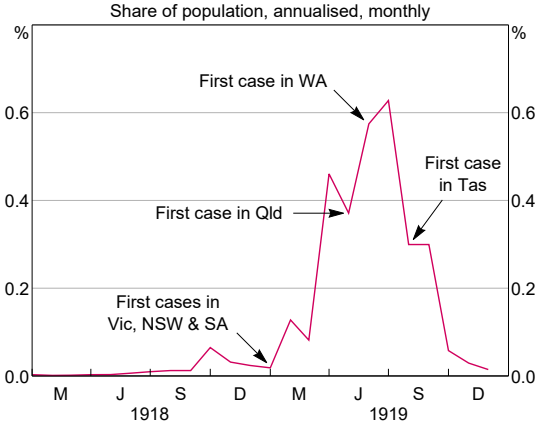


* Estimates based on excess flu and flu-related deaths over 1918–20
** Weighted by population of country
Source: Barro et al (2020)

Graph 2

Flu-related Deaths in Australia

Share of population, annualised, monthly

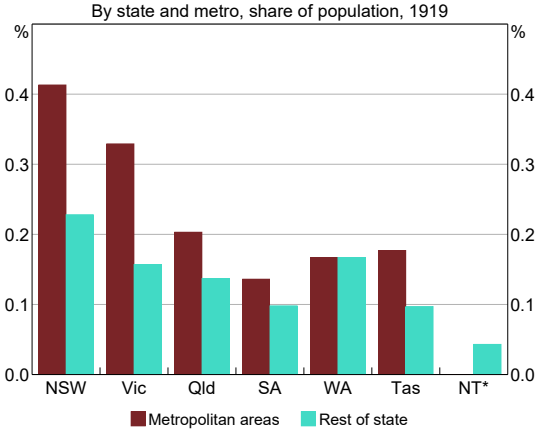


Source: Commonwealth Bureau of Census and Statistics (1920)

Graph 3

Flu-related Deaths in Australia

By state and metro, share of population, 1919



* NT did not have a metropolitan area in 1919
Source: Commonwealth Bureau of Census and Statistics (1920)

The containment measures were similar to that being implemented today

The economic effects of a pandemic depend in large part on the measures used to contain the spread of the virus. Many of those measures implemented during the Spanish flu pandemic are remarkably similar to those used in the current pandemic. For example, on 28 January 1919 – the day after NSW was proclaimed to be 'infected' – all libraries, schools, churches, theatres, halls and indoor entertainment venues were shut down. Six days later, racecourses and hotels were closed and people on public transport and in public places were required to wear masks. NSW schools remained closed throughout February (McQueen 1976).[4] Other states implemented similar measures to contain the virus. Movement by public transport was restricted and state borders were closed. Streets were sprayed with the disinfectant phenyl and the public were urged to practice cough etiquette, regular handwashing, ventilation and disinfection (Curson and McCracken 2014). These travel bans, quarantine and social distancing measures are similar to those used by governments today.[5]

While various containment measures were employed, most were not in place for the duration of the pandemic, and each state and region had a different response. For example, in early March 1919 the low rate of infection led NSW authorities to assess that the threat had passed and so most containment measures were lifted (Caley *et al* 2008). However, these measures were reinstated later in the month following a sharp rise in infections. Containment measures then remained in place until mid May when they were lifted for a second time, and were not again reinstated despite another wave of infections (NSW State Archives & Records 2020).

Research on the economic effects is limited

Research on the economic effects of the Spanish flu is limited by the lack of economic statistics for this era. Garrett (2008) instead uses historical newspaper reports to gauge the effects of the pandemic on US businesses. The effects were large. For example, the *Arkansas Gazette* in October 1918 was reporting a 30 per cent fall in grocery sales and a 40–70 per cent fall in sales at merchants and department stores. At the same time, sales of medical drugs and mattresses were surging. The *Commercial Appeal* (Memphis) was reporting that severe labour shortages were affecting industrial output.

More recent studies released since COVID-19 have found evidence of large and statistically significant effects of the Spanish flu on economic activity. For example, Barro *et al* (2020) found that the Spanish flu reduced real GDP per capita by around 6 per cent in the typical country over the period 1918–21. Correia, Luck and Verner (2020) found that Spanish flu reduced US manufacturing output by 18 per cent, though their findings have been challenged (Rinaldi, Lilley and Lilley 2020).

The paper by Correia *et al* (2020) also emphasises the important link between government containment measures and economic outcomes. In theory, the economic effects of containment measures could be positive or negative. They are also hard to separately identify. For example, while containment measures do restrict any economic activity that relies on social interactions, many households would have reduced social interactions regardless of government intervention in order to reduce their risk of becoming infected. Furthermore, government restrictions can help solve 'coordination problems' associated with containing the virus, and thus can, in theory, reduce the overall economic disruption caused by a pandemic in the medium term. Interestingly, Correia *et al* found US cities that implemented early and extensive interventions in response to the Spanish flu experienced stronger economic growth after the pandemic subsided relative to those that did not. But as noted above, the accuracy of their methodology has been questioned by Rinaldi *et al* (2020) and further work in this area is needed.

In the remainder of the article I discuss the evidence on the economic effects of the Spanish flu in Australia. To do so, I draw on a range economic data and qualitative information from newspapers and government reports from the time.

Figure 1 : Newspaper Clipping

SHOP TRADE HIT

Effects of the 'Flu

No Crowds of Bargain-Seekers

BIG MAIL ORDER BUSINESS.

The influenza epidemic has hit trade badly in Sydney. To what extent this is the case it is difficult to say; but the estimates of some representative retail traders are published below.

Women who generally throng the shops at this season of the year are staying at home; but, on the other hand, a much bigger business is being done in delivery orders.

Source: 'Shop Trade Hit', *The Sun*, 6 February 1919, p 5, viewed 1 June 2020. Available at <http://nla.gov.au/nla.news-article222644593>.

Newspapers and reports from the time paint a mixed picture about the economic effects …

The Victorian factory inspectors' report for 1919 paints a mixed picture about the effects of Spanish flu on manufacturing activity (CIFS 1920). Output was reported to be 'well maintained' during 1919 with 'plentiful' orders. But it was also reported that 1919 would have been a 'record year' had business not been 'dislocated' and 'progress retarded' by several factors, one of which was the Spanish flu. The influenza 'not only considerably reduced the number of employees temporarily, but the regulations prescribed to prevent its spread restricted the movement of purchasers'. Nonetheless, the report notes that 'retail shopkeepers had a very good year', particularly those selling high-quality goods.

The *NSW Industrial Gazette* also painted a mixed picture of the effects of influenza on the NSW economy (DLISS 1919). The first mention of Spanish flu was in the March 1919 edition, where it was reported that there had been a decline in job search and hiring activity in February that was due in part to 'the restrictive effect on certain industries of the impending epidemic'. Newspapers from the time also reported that retail trade in Sydney was 'hit badly', with the volume of sales falling by 25–40 per cent for several 'large, representative' retailers due to a sharp decline in foot traffic (Figure 1).[6] Retailers responded by ramping up mail order facilities, which were in strong demand due to the epidemic. The entertainment industry was also affected, with reports that between 5,000 and 6,000 cinema employees were 'thrown out of work' in metropolitan Sydney due to the compulsory closure of cinemas.[7]

Although the removal of government restrictions in early March meant employees could resume work in cinemas and theatres, restrictions were soon

reimposed (Department of Labour and Industry and Social Services 1919). In addition, even after the restrictions were lifted for a second time, voluntary social distancing by households meant theatres were 'playing to half empty houses'.[8] In June, there were some reports of businesses being 'paralysed' by the pandemic, such as in Maitland NSW where offices, shops and factories were 'practically at a standstill'.[9]

There were reports of 'slackness' in some trades in mid 1919 due to the influenza, with caterers, waitresses, jewellers and theatrical employees being most affected (Department of Labour and Industry and Social Services 1919). On the other hand, it was reported that 'labour demand exceeded supply' in the construction sector and for female labour in domestic services.[10] While the incapacitation of employees left some firms with labour shortages, businesses in some sectors were able to manage these labour shortages through greater use of overtime hours.

… while quantitative data point to reasonably large economic effects

In this section I discuss some quantitative estimates of the effect of Spanish flu on the labour market and activity. A complicating factor in this analysis is the difficulty in distinguishing the effects of the Spanish flu from those of the war. When Spanish flu began transmitting through the Australian community in early 1919, the war was well and truly over; however, there were lingering effects of the war on economic activity. In particular, the Australian economy was in a period of transition from the public-led demand growth during the war to private-led growth thereafter. The subtraction from GDP due to the removal of the wartime stimulus was considerable, and is likely to have had a large influence on economic outcomes during the period in which the Spanish flu was spreading (Graph 4). In terms of the labour market, returning veterans also needed to be re-absorbed into the labour market and it is unclear from the aggregate data how smoothly this transition went. Where possible, this article tries to disentangle the separate effects of the Spanish flu from the effects of the war, although in many cases I was not able to do this convincingly.

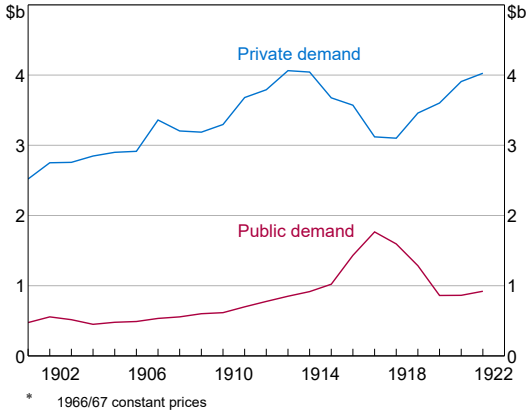
Labour market impacts

The most reliable source of labour market data for the period are those reported by trade unions to the Commonwealth Bureau of Census and Statistics.[11]

These data show that the unemployment rate for union members rose by 3 percentage points during the Spanish flu (Graph 5). It is likely that most of this increase was caused by the pandemic. The peak in unemployment in the June quarter 1919 coincided with the peak in the flu-related death rate in that year. Moreover, the increase in unemployment during the first half of 1919 was driven by an increase in unemployment due to sickness, which the Commonwealth Bureau of Census and Statistics (1922) directly attributed to the flu epidemic. It is important to note that the statistics reported by trade unions did not require a person to be 'actively seeking work' and 'available for work' in order to be classified as unemployed, in contrast to current ABS definitions.[12] In the Labour Force Survey (LFS), people who are not currently in work due to illness are classified as 'not in the labour force' or 'employed' (but working zero hours), depending on whether they retain their job during their period of illness. All things considered, we should think of this rise in 'unemployment' due to illness during the Spanish flu as a decline in some broader concept of labour supply, rather than a rise in the rate of unemployment. At its peak the epidemic appears to have temporarily incapacitated 2 per cent of employees.

Graph 4

Domestic Final Demand*



* 1966/67 constant prices
Source: Butlin (1977)

Unemployment due to 'a lack of work' also rose during the Spanish flu, contributing 1 percentage point to the overall increase (Graph 5). This at least partly reflects the effect of containment measures used by governments, which significantly restricted economic activity, as well as the effect of the pandemic on aggregate demand. However, the size of this increase in unemployment was very modest and within the usual range of quarterly changes in the series. Unemployment due to other reasons also rose during the pandemic, which may be due to more people taking time off work to care for sick relatives (which, again, would be classified as not in the labour force or employed in the LFS).

The muted rise in unemployment owing to a lack of work is surprising given the extent of the social distancing responses. It is unclear why this is the case. One possibility is that the decline in labour demand (due to social distancing) was matched by a decline in labour supply (due to illness). Another possibility is that the union survey is not representative of the broader labour market. While the high degree of unionisation meant the survey covered half of the total labour force, the sample was weighted towards industries like building and metal trades. Unskilled casual labour, agriculture, and the self-employed were not captured in the survey (Forster 1965). It is possible that the containment measures had a different (i.e. larger) effect on those sectors that were not surveyed than those that were.

Differences in the timing of the epidemic across the states also supports the conclusion that the rise in unemployment (broadly defined) in 1919 was mainly due to the Spanish flu rather than other factors, such as the tapering of wartime stimulus. The unemployment rate in the 'first-infected states' (NSW, Victoria and South Australia) peaked one quarter before the 'last-infected states' (Western Australia and Tasmania), consistent with the timing of the virus spread (Graph 6). Although the unemployment rate rose sharply, it also fell sharply once the pandemic abated in late 1919. The speed of recovery in the labour market and absence of any obvious scarring effects is noteworthy.

In some industries, Spanish flu also led to industrial unrest. The Seamen's Union, whose members lived in cramped quarters on ships, organised one of the most protracted set of strikes in Australian history in an attempt to improve the safety of their living conditions (McQueen 1976). Waterside workers refused to unload ships for fear of infection and some public workers demanded 'epidemic pay' (Curson and McCracken 2014).

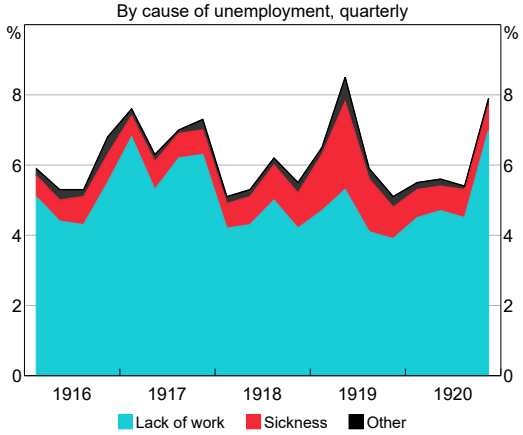
Effect on GDP

The seminal collection of historical GDP data for Australia is that compiled by Matthew Butlin (1977). Butlin's data suggest that GDP rose by 2¼ per cent in 1918/19 and fell by 5½ per cent in 1919/20, which are the two financial years that spanned the Spanish flu outbreak in Australia (Graph 7). Average

Graph 5

Unemployment Rate*

By cause of unemployment, quarterly



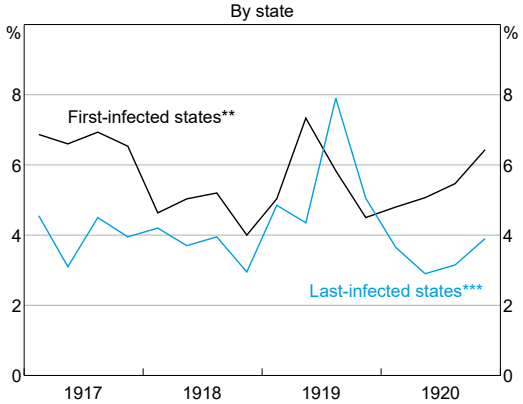
* Union members only

Source: Commonwealth Bureau of Census and Statistics

Graph 6

Unemployment Rate*

By state



* Union members only

** Vic, NSW and SA (first cases in January 1919)

*** WA and Tas (first cases in June and August, respectively)

Source: Commonwealth Bureau of Census and Statistics

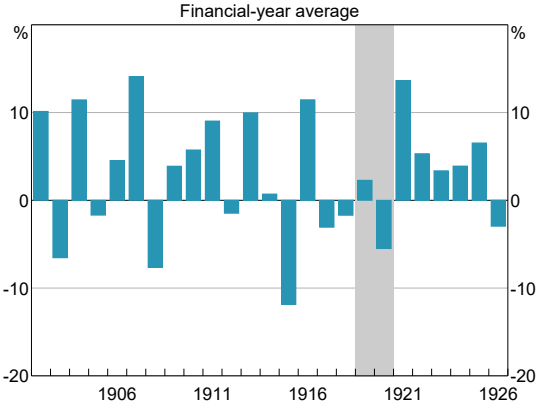
growth for these two years was similar to that in the two years leading up to the epidemic. At face value, this might lead one to think that Spanish flu had a small effect on GDP. The strong growth in the years following the epidemic may also lead us to believe that any effects of Spanish flu on the level of output were quickly reversed, with the recovery exhibiting a 'V-shaped' pattern.

However, we do not know the counterfactual. As discussed earlier, it is difficult to isolate the effects of the Spanish flu from other shocks, such as the removal of the wartime stimulus. Indeed, much of the decline in GDP growth during this period is accounted for by a large subtraction from public demand, while private demand was resilient (Graph 8).

Graph 7

Real GDP Growth*

Financial-year average



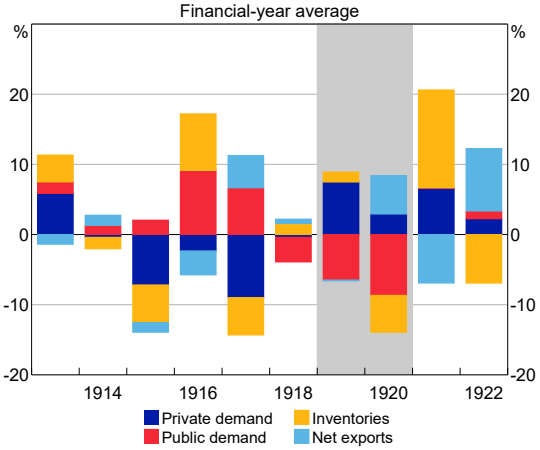
* Spanish flu period shaded

Source: Butlin (1977)

Graph 8

Contributions to Real GDP Growth*

Financial-year average



* Spanish flu period shaded

Source: Butlin (1977)

A recent study by Barro *et al* (2020) does a better job of controlling for 'third factors', and specifically the effect of the war. They look at the variation in Spanish flu intensity across 42 countries and over time to estimate the effect of the Spanish flu on GDP. Their regressions control for the effects of the war using a variable that captures the intensity of each country's participation in the conflict.[13] They find that Spanish flu reduced real GDP per capita by 6 per cent in the typical country. However, applying their model estimates to the Australian mortality rates implies that the pandemic reduced Australian GDP by only ¾ per cent. Their models do not fit the data well and it is unclear whether mortality is a good proxy for the disruption in Australia so there is significant uncertainty around this estimate.

Overall, the effects of the Spanish flu on Australian GDP are very hard (if not impossible) to pin down due to the inability to control for other factors that influenced economic growth.

Does this help with our analysis of COVID-19?

The Australian economy is markedly different today than it was in 1919. In 1919, agriculture and manufacturing each accounted for one-quarter of total employment, compared with 2½ per cent and 7 per cent nowadays. In 1919 the exchange rate was pegged to the pound sterling and the world was less globalised. Two-thirds of Australia's exports were rural and half of all Australia's exports were to the United Kingdom. Industrial disputes were pervasive and most employees were paid award wages. Female labour supply (in the market sector) was far lower than it is today, and the technology to work from home was obviously far more limited.

The response of fiscal policy in 1919 was also different than that used in response to COVID-19. A simple measure of the fiscal impact – the change in the consolidated fiscal balance as a share of GDP – suggests that fiscal policy in Australia was broadly neutral, or slightly contractionary during the Spanish flu (though this simple metric is distorted by the war), while being highly expansionary in 2020.[14] Government support for households during Spanish flu generally took the form of in-kind transfers of food, blankets, clothing and rent

assistance, rather than cash transfers (NSW State Archives & Records 2020). Support for businesses often took the form of partial compensation for losses sustained due to the restrictions, although in many cases this compensation was paid out many months after the pandemic had passed.

Most importantly, more of household consumption is 'social' these days than it was in the past (although it was hard to find data on spending patterns in 1919) (Keogh-Brown *et al* 2010). Social consumption can be more easily postponed or abandoned relative to the type of consumption common in 1919 (e.g. food, housing and clothing). All else being equal, a larger share of 'social' consumption in the basket means that any effects on GDP will be larger now than in the past. Given these many differences, it is unclear how useful Australia's Spanish flu experience is for the current situation.

The Spanish flu period highlights how disruptive a pandemic can be to economic activity. In saying that, and being mindful of how different the Australian economy is now, the Spanish flu period and the strong economic growth that followed shows that rapid recoveries from pandemics are possible if the public health aspects are not too prolonged. A surprising feature of the Spanish flu episode was how quickly the labour market appears to have recovered.

Footnotes

[*] The author is from Economic Research Department.

[1] The 1918–19 pandemic is often called the 'Spanish flu', not because it originated in Spain, but due to its first being widely reported there.

[2] These estimates are from Barro, Ursúa and Weng (2020), which draw on many sources and cover more than 90 per cent of the world's population in 1918.

[3] The beginning of both epidemic waves in Sydney followed a lifting of social distancing measures, which has led some epidemiologists to conclude that those measures played an important role in the dynamics of infection (Caley, Philp and McCracken 2008). Similar conclusions have been drawn using data for US cities, with studies finding that social distancing measures during the Spanish flu flattened the curve in the sense of reducing peak mortality rates (Bootsma and Ferguson 2007; Hatchett, Mecher and Lipsitch 2007; Markel *et al* 2007; Barro 2020). There are other possible explanations for the two epidemic waves in Sydney, such as seasonal changes in virus transmissibility and multiple circulating viruses (see Caley *et al* (2008) for a discussion).

[4] In other states, schools were closed for at least part of 1919 either because of government decree or because teachers were sick.

[5] The shortage of hospital beds in NSW led to the creation of hundreds of temporary hospitals in private houses, schools, showground buildings, churches, gaols, bowling clubs, tearooms, drill halls and courthouses. With many health workers incapacitated with influenza, these temporary hospitals were often staffed by lay volunteers (Curson and McCracken 2014).

[6] The declines were 30–40 per cent at David Jones and 25 per cent at Marcus Clark & Co. (department stores) and Nock & Kirby (hardware and general goods) (source: 'Shop Trade Hit', *The Sun*, 6 February 1919, p 5, viewed 1 June 2020. Available at <http://nla.gov.au/nla.news-article222644593>).

[7] 'Showmen's Troubles', *The Sydney Morning Herald*, 29 January 1919, p 11, viewed 1 June 2020. Available at <http://nla.gov.au/nla.news-article15822283>.

[8] 'Our Sydney Letter', *Newcastle Morning Herald and Miners' Advocate*, 16 June 1919, p 4, viewed 1 June 2020. Available at <http://nla.gov.au/nla.news-article139442782>.

[9] 'Business Paralysed in Maitland', *Singleton Argus*, 21 June 1919, p 6, viewed 1 June 2020. Available at <http://nla.gov.au/nla.news-article80753563>.

[10] While advertisements for domestic help had earlier called for a 'trained nurse' (who could command any wage), the market for domestic help became so tight that requests were simply for 'someone who has some knowledge of household duties'.

[11] These data are available in the *Commonwealth Year Books*. Excluded are unions whose members had permanent employment (e.g. rail workers and public servants) or those employed on a casual basis (e.g. wharf labourers). Although few unions paid unemployment benefits, most kept unemployment registers. A useful discussion of the value and reliability of the trade union data is in Forster (1965).

[12] According to Forster (1965), to be regarded as unemployed in the union reports a person had to be *out of work* for three or more days in the specified reference week.

[13] The authors measure war intensity as the ratio of military combat deaths to total population. Some of the variation used to identify the effects of the Spanish flu on GDP

growth comes from countries that experienced the Spanish flu but were not involved in the war.

[14] The smaller fiscal response during Spanish flu likely reflects the large debt burden accumulated during the war and a lack of understanding about countercyclical fiscal policy (the Spanish flu occurred before Keynesian economic ideas became mainstream in the 1930s). The automatic stabilisers were also not operating very strongly, as progressive income taxes were a smaller share of tax revenue (more than half of all revenue was from indirect taxes like customs and excise duties) and because 1919 preceded the introduction of unemployment and sickness benefits in the 1940s. The public sector was also a smaller part of the economy in 1919, with tax revenue being below 10 per cent of GDP.

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News Sentiment and the Economy

Kim Nguyen and Gianni La Cava[*]

Photo: Allkindza – Getty Images

Abstract

The large and immediate effect of the COVID-19 pandemic on economic activity has increased the need for more real-time indicators of the economy. This article discusses a new indicator of `news sentiment', which uses a combination of text analysis, machine learning and newspaper articles. The news sentiment index complements other timely economic indicators and has the advantage of potentially being updated on a daily basis. The news sentiment index captures key macroeconomic events, such as economic downturns, and typically moves ahead of survey-based measures of sentiment. Related indicators, such as the news uncertainty index, similarly help to better understand real-time developments in the Australian economy.

Real-time Economic Indicators and the COVID-19 Pandemic

Policymakers need to assess the state of the economy in a timely manner to devise appropriate policy responses. The COVID-19 pandemic has disrupted daily life and economic activity and its rapidly evolving nature has increased the need for real-time indicators of the Australian economy. The most common measure of economic activity, GDP growth, is not observed in real time as it is compiled on a quarterly frequency and published with a lag. Policymakers also closely monitor a range of partial indicators of the economy that are more timely, such as survey-based measures of consumer and business sentiment, as well as financial and labour market data. But even these measures are published with lags of weeks or months, and some rely on samples of the population, which introduces sampling variability.

This article discusses a real-time indicator for the Australian economy developed using an alternative approach based on text analysis of news articles. A `news sentiment index' (NSI) is constructed that measures the net balance of positive and negative words used by journalists in news articles about the economy. In making decisions, consumers and

business managers are likely to rely on high-frequency information that is broadcast through the news media. To the extent that the information in news media captures a broad audience, it could be more representative than survey data provided by professional data providers (Thorsrud 2018). This indicator can be used to track economic conditions on a daily basis (Shapiro, Sudhof and Wilson 2017).

The text-based approach used in this article is flexible; not only can it proxy for sentiment but also the level of uncertainty in the economy. Broadly speaking, 'sentiment' captures people's beliefs about the mean of the distribution of future economic outcomes (the first moment) while 'uncertainty' captures the variance of people's beliefs (the second moment) (Haddow *et al* 2013). There is now extensive research showing that both more negative sentiment and higher uncertainty are associated with lower spending and investment, and hence can predict weaker economic conditions (for example Moore (2017); Bloom (2014); Shapiro, Sudhof and Wilson (2017); Barsky and Sims (2012); Benhabib and Spiegel (2019)). However, some research suggests that survey-based sentiment indicators provide limited new information about the state of the economy (Roberts and Simon 2001). It is possible, though, that alternative sources of information about sentiment, such as the news media, are useful for nowcasting the economy – that is, understanding the present or very recent past. The news media might offer new information that household and business surveys do not or the same information earlier.

The text-based approach can be extended to develop sectoral measures of both sentiment and uncertainty. This includes estimates of news sentiment for housing markets in each capital city, as well as measures of uncertainty that are more closely tied to financial markets. The article also presents some novel estimates of sentiment about monetary policy news, which appear to help predict changes in the cash rate even after accounting for other important factors, such as the RBA's forecasts for the economy.

Measuring News Sentiment

Sentiment is hard to measure as it is not directly observed. Common survey-based measures of sentiment typically ask respondents about their beliefs about current economic conditions as well as expectations for future economic conditions. This article takes a different approach and constructs a proxy for sentiment based on the language used by journalists in news reports on the economy.

There are two general approaches for quantifying sentiment in text – the dictionary (or lexicon) and the machine learning-based approaches. The dictionary-based approach relies on pre-defined lists of words with each word either classified as positive, negative, neutral, or indicating uncertainty. The machine learning approach predicts sentiment of any given set of text after training models with a large set of text that has been assigned sentiment ratings by human readers. For example, models have been developed using social media data, such as Twitter, that provide text that is combined with user feedback to identify the sentiment of the posts. This approach is better able to capture the nuances in human language but it is more complex and less transparent.

This article follows the simpler dictionary-based approach to construct an NSI. The NSI measures the net balance of words used by journalists that are considered to be `positive' and `negative'. When journalists use more positive words and/or fewer negative words, this is an indicator that sentiment is rising in the economy. This type of index has been used before for other countries, such as the United States, Japan and Europe (see, for instance, Scotti (2016); Shiller (2017); Buckman *et al* (2020); Larsen and Thorsrud (2018); and Fraiberger (2016)).

The raw data used in constructing the NSI consist of daily news extracted from the Dow Jones Newswires Archive (DNA). Each article listed in the database includes metadata such as publication time, language, region and category. After removing duplicates and selecting only articles that are written in English by Australian media outlets to cover the Australian economy, the resulting dataset includes around 300,000 articles. The data span the period from September 1987 to April 2020 and the

sample covers more than 600 newspapers, though *The Australian*, The *Sydney Morning Herald* and The *Australian Financial Review* are the main sources.

Common steps in the natural language processing literature are taken to clean the raw dataset before analysis: numbers, punctuation marks, white spaces, and common stop words are removed from each article. All words are then reduced to their respective 'stem', which is the part of a word that is common to all of its inflections (for example, `performs', `performing', and `performed' are reduced to `perform').

To measure the sentiment of a set of text, that is, whether or not the news is positive or negative, the Loughran–McDonald dictionary is used. This is a word list specific to the domain of economics and finance (see Loughran and McDonald (2011) for more details). The NSI is constructed by counting the number of times that negative and positive words appear in the cleaned text of articles. A news uncertainty index (NUI) is also constructed by counting the number of articles that contain uncertain words. The most common positive, negative and uncertain words in March 2020 are shown in (Figure 1).

To construct the time-series of NSI, the articles are sorted by date of publication and the data are divided into blocks of time, which could be a day. For each time period (t), we compute the sentiment index by subtracting the count of negative words from the count of positive words and then dividing by total word count:

$$NSI_t = \frac{Positive_t - Negative_t}{Wordcount_t}$$

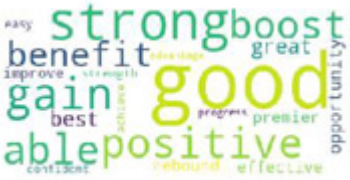
Between September 1987 and March 2020, on average there are around two more negatives than positives for every 100 words in the articles, with a standard deviation of less than one word. The raw data indicate a trend towards relatively more negative words over time so the series is de-trended. The indicator is also standardised to have a mean of zero and a standard deviation of one.

News Sentiment and Economic Conditions

The news sentiment index clearly moves with fluctuations in economic conditions at a monthly frequency, with sharp declines in economic downturns, such as the early 1990s recession, the 2008/09 Global Financial Crisis (GFC) and the pandemic-led contraction more recently (Graph 1).

As mentioned above, the NSI can also be constructed on a daily basis. Because of this, the NSI has the potential to identify turning points in economic activity before other partial indicators, such as survey-based sentiment measures that are available on a monthly basis. For example, based on

Figure 1

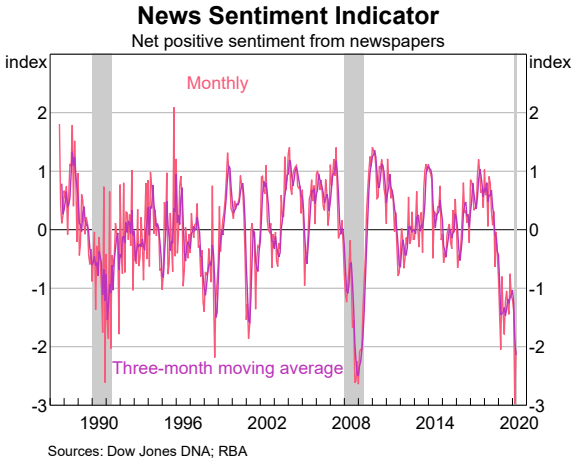


Positive

Negative

Uncertain

Graph 1



a 30-day moving average, the NSI was pointing to a sharp drop-off in activity caused by the COVID-19 pandemic in early March, well before the public release of the business survey results at the end of March (Graph 2, right panel). Similarly, the 30-day moving average of the NSI appeared to pick the turning point in economic activity in February 2009 before there were clear signs of a recovery in sentiment based on the business surveys (Graph 2, left panel).

The NSI can tell us about the state of the economy today, but econometric analysis shows that it can also predict changes in other closely watched economic indicators, such as the unemployment rate, one month ahead (see Appendix B). This is true even controlling for other timely indicators of the economy. Relatedly, the NSI can also help with dating business cycles.

News Uncertainty

A measure of news uncertainty can also be constructed based on high-frequency information contained in news articles. The NUI is constructed in a slightly different fashion to the NSI. The NUI is estimated by calculating the share of *articles* that express uncertainty (through terms such as 'risk', 'uncertainty' and 'volatility'), rather than the share of *words* that express uncertainty. This is due to the more limited number of times that words expressing uncertainty appear in news articles.

In March 2020, the NUI rose to a record high level indicating that the pandemic has caused more economic uncertainty among Australian households and businesses than during the GFC (Graph 3). The NUI also strongly correlates with publicly available measures of economic uncertainty, such as the Economic Policy Uncertainty Index developed by Baker, Bloom and Davis (2016). Both uncertainty indicators eased in April.

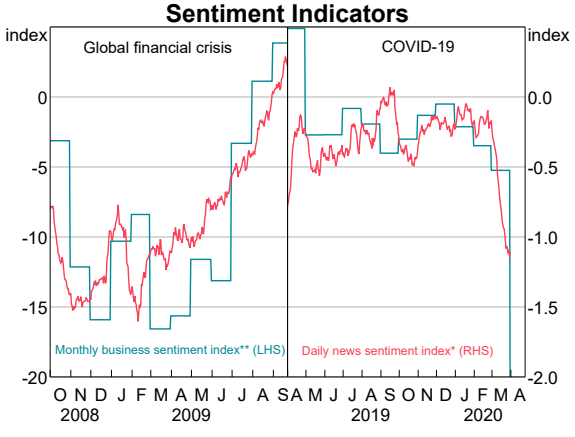
Similar to the NSI, the NUI appears to have some predictive power for general business conditions. For example, analysis based on Vector Autoregressive Regressions suggests that increases in the NUI are associated with subsequent declines in survey-based measures of business investment that are available on a monthly basis (see Appendix B).

Housing News Sentiment

Based on the same text-analysis framework, NSIs can be constructed for specific sectors and regions. Shifts in sentiment are believed to be important in housing markets (Soo 2018). As such, a housing news sentiment index (H-NSI) has been developed using housing market-related news articles.[1] The H-NSI indicates that sentiment in the Australian housing market deteriorated towards the end of March 2020 (Graph 4). This is consistent with other high-frequency indicators, such as weekly auction clearance rates, that suggested a sharp decline in housing activity soon after the coronavirus

Graph 2

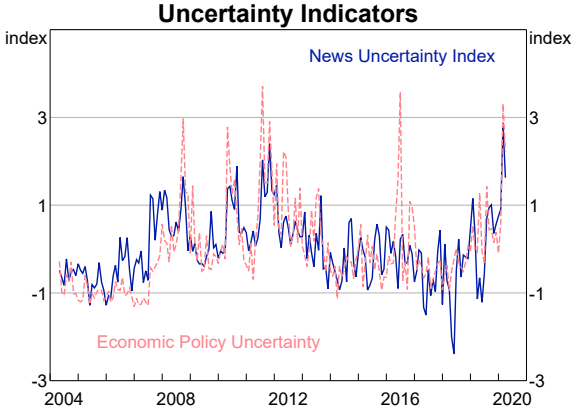
Sentiment Indicators



* Thirty-day moving average
** Based on NAB Business Conditions Survey
Sources: Dow Jones DNA; NAB; RBA

Graph 3

Uncertainty Indicators



Sources: Dow Jones DNA; PolicyUncertainty.com; RBA

containment measures were put in place in Australia.

Housing news sentiment can also be constructed for individual capital cities (and regional areas) based on samples of local newspapers (e.g. The *Sydney Morning Herald* for Sydney and *The Age* for Melbourne). The local housing news sentiment captures key fluctuations in local house prices for Sydney and Melbourne (Graph 5). Similar measures appear to capture local housing price cycles in the United States (Soo 2018). However, based on current estimates, the local H-NSI are less correlated with housing price growth in other capital cities.

Banking News Sentiment and Uncertainty

Along similar lines, news sentiment and uncertainty can be estimated for articles that specifically mention the banking sector through related terms (see Appendix A). Banking-related articles account for about 5 per cent of total economics news-related articles. Notably, in recent months, banking news sentiment has dropped but not to the same levels seen during the GFC, while banking news uncertainty has risen to a high level. And there are times in the past in which banking sector sentiment fell and uncertainty rose relative to other sectors of the economy. For instance, this can be clearly seen during the Banking Royal Commission period between 2017 and 2018 (Graph 6). This suggests that there are meaningful differences in news sentiment and uncertainty across sectors.

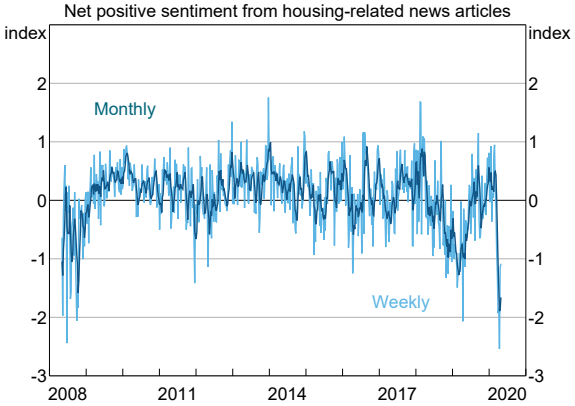
Monetary Policy News Sentiment

Finally, a monetary policy news sentiment index (MP-NSI) has been developed for articles that mention terms specifically related to monetary policy, such as 'monetary policy', 'cash rate', and 'RBA'. These articles account for about 15 per cent of total articles about the economy. The resulting index is quite volatile from month to month (Graph 7). Despite this, the index is correlated with the stance of monetary policy as measured by 'monetary policy shocks' (for example Romer and Romer (2004) for the United States, and Bishop and Tulip (2017) and Beckers (2020) for Australia). These 'shocks' capture changes in the cash rate that are not systematically related to changes in the RBA's forecasts for economic activity and inflation. This suggests that in setting monetary policy the RBA takes into account additional, qualitative information about the future direction of the

Graph 4

Housing News Sentiment Index

Net positive sentiment from housing-related news articles

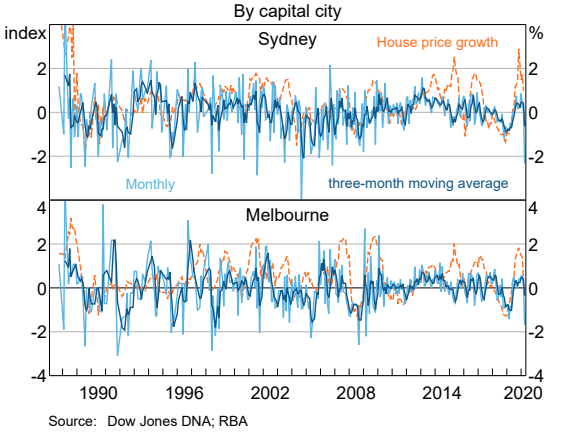


Sources: Dow Jones DNA; RBA

Graph 5

Housing News Sentiment and Prices

By capital city

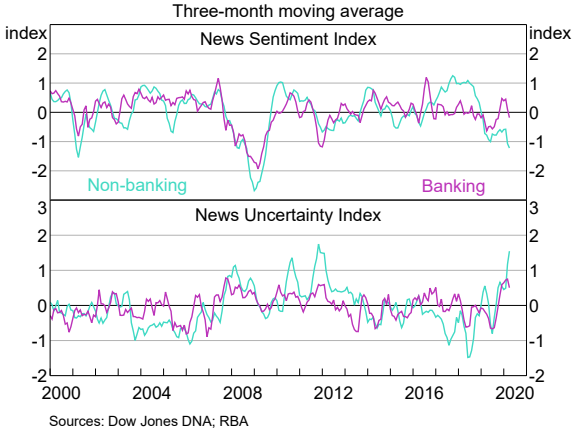


Source: Dow Jones DNA; RBA

Graph 6

Banking vs Non-banking News Indicators

Three-month moving average



Sources: Dow Jones DNA; RBA

Table A1: List of Terms Used to Identify News Topics

Housing market	Banking	Monetary policy
housing house real estate townhouse apartment	banking bank financial institution cba nab anz wbc commonwealth bank of australia westpac australia and new zealand banking group national australia bank (EXCLUDES "central bank")	monetary monetary policy cash rate rba central bank reserve bank of australia

economy (over and above what is captured in the RBA's forecasts), that is also evident in news articles; some of this information might be taken into account in the Bank's assessment of risks around the central forecasts, but not in the central forecasts themselves. Research on US monetary policy similarly suggests that the tone of the narrative around the Federal Reserve's forecasts predicts their forecast errors for GDP growth and unemployment (and explains the Federal Reserve's policy decisions over and above their forecasts) (Sharpe, Sinha and Hollrah 2018).

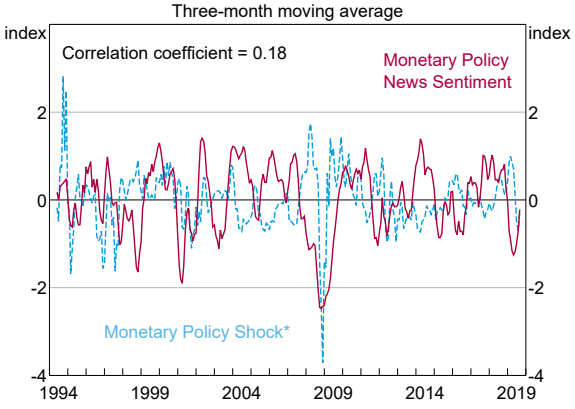
Conclusion

The NSIs introduced in this article can be useful in times of sudden economic change as is currently being experienced in Australia and around the world. The NSI appears to be useful both to understand the current state of the economy and to help predict economic conditions in the near term. The sharp decline in news sentiment in 2020 coincides with the significant ramp-up in news coverage of the COVID-19 pandemic and its economic impact. Some related indicators, such as the NUI and the housing NSI, are also useful real-time indicators of the economy.

Graph 7

Monetary Policy News Sentiment Index vs Monetary Policy Shock

Three-month moving average



* Measured by Beckers (2020)

Sources: Dow Jones DNA; RBA

Appendix A: List of Terms Used to Identify News Topics

Table A1 shows the terms we use to construct sector or topic specific news indicators. Terms are simplified to lower case and singular. Compound terms must be matched in whole.

Appendix B: Granger-Causality Tests

Vector autoregression (VAR) models are used to test Granger-causality between the variables. Table B1 presents the Granger-causality results of three equations with key macroeconomic measures as dependent variables and NSI or NUI as explanatory variables. The VAR system is estimated at a monthly frequency and includes survey-based measures of consumer and business sentiment as control variables, and five lags of all variables.

The marginal significance levels are reported for the hypothesis that all five lags of the given right hand side variable can be excluded. In other words, the excluded variable does not Granger-cause the equation variable.

Table B1: Granger-causality results

Marginal significance level (p value)

Equation variable	Excluded variable	F	Marginal significance level
Change in unemployment rate	NSI	3.82	0.00
NAB investment activity index*	NUI	2.46	0.03
Ai Group Performance of Construction index**	NUI	2.69	0.02

* This index is a survey-based indicator of capital expenditure, conducted by NAB.

** This index is a survey-based indicator of business activity in the Australian construction industry, conducted by the Australian Industry Group and covering residential building, non-residential building and engineering construction.

At the 5 percent level of statistical significance, all three null hypotheses are rejected, suggesting that the NSI Granger-causes changes in the unemployment rate and the NUI Granger-causes both of the business investment indicators.

Footnotes

[*] The authors work in Economic Research Department.

[1] Housing-related articles are defined by Dow Jones' real estate subject code. This code is determined by a proprietary algorithm that is consistent across newspapers and over time. It excludes routine real estate property listings. Housing-related articles can also be identified using other methods such as simple term searches and more sophisticated topic modelling. These methods yield similar results but the Dow Jones classification of real estate articles is found to be the most robust over time and across different newspapers.

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Why Study (or Not Study) Economics? A Survey of High School Students

Tanya Livermore and Mike Major[*]

Photo: Phil Boorman – Getty Images

Abstract

There has been a stark decline in the size and diversity of the Year 12 Economics student population since the early 1990s. The Reserve Bank has commissioned a comprehensive survey of students to gain quantitative evidence of the factors contributing to this decline. The survey responses highlight that while economics in general is perceived to be important for society, many students lack an interest in, or understanding of, Economics as a subject. This finding is even more pronounced for students who are female, those from a lower socio-economic background and those from regional schools.

Background

The Bank recognises the importance of education and is committed to supporting economic literacy in Australia, particularly among high school students. Nationally, there has been a dramatic decline in Year 12 Economics enrolments of around 70 per cent over the past three decades (Graph 1). To obtain deeper insight into this fall, the Bank previously conducted a case study of New South Wales, for which we were able to obtain a rich set of school-level data (as summarised in Dwyer (2017)). Alongside a similarly stark fall in Economics enrolment numbers in New South Wales, the diversity of the student population has also declined. Where there were roughly equal numbers of male and female students in the early 1990s, males have outnumbered females two-to-one in recent years (Graph 2). The shares of students from low socio-economic backgrounds and regional locations have also fallen substantially.

Why does the size and diversity of the Economics student population matter?[1] The number of students who study Economics influences the level of economic literacy in society. While there is no

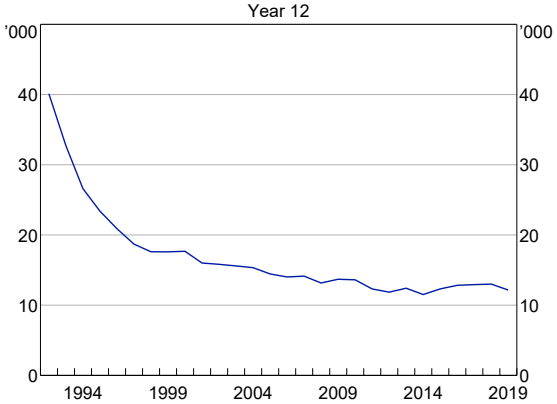
one definition of economic literacy, it encompasses an ability to apply economic skills and frameworks to explain or debate much of the world in which we live – from understanding opportunity costs in our personal decisions, through to forming a view about the efficacy of economic policies. Moreover, as studying Economics is often the start of a pathway to a career in economics, the diversity of the student body ultimately shapes the discipline. And with economists playing an integral role in determining economic policies, there are wider social benefits when the pipeline of future economists is broadly representative of society.

Why have Economics enrolments declined? The lack of enrolments in Economics could reflect students' preferences for other subjects ahead of Economics, the subject not being offered by schools, or a combination of these factors.

The Bank's liaison with educators has cited a number of factors that may explain the lack of Economics enrolments. First, too few educators are equipped to teach Economics and too little relevant Australian economic content is available, providing school leaders with limited incentive to offer (or promote) the subject. Second, it has been reported that many students do not select Economics because they do not understand what it is and how it might be relevant to them. Indeed, until the COVID-19 pandemic, there had been a lengthy period in which Australian households were not exposed to a major economic contraction or the extensive economic reforms that were a feature of national debate in the 1980s and early 1990s, drawing less attention to the relevance of economics to everyday life. Third, the introduction of Business Studies to the New South Wales Higher School Certificate (HSC) in the early 1990s saw a large number of students take up the subject instead of Economics, with reports Business Studies is perceived as being easier to learn and more helpful for employment (Graph 3).

Graph 1

Economics Enrolments in Australia*

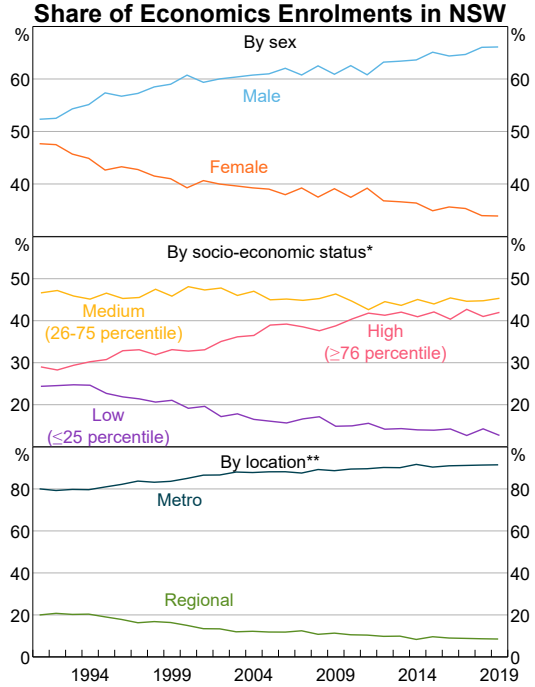


* Data from New South Wales, Queensland and Western Australia included from 1992; South Australia included from 1993 and Victoria included from 1995

Sources: NESA; QCAA; RBA; SACE Board; SCSA; VCAA

Graph 2

Share of Economics Enrolments in NSW



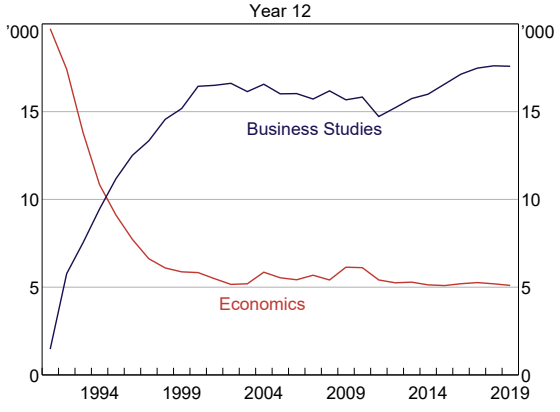
* Based on the socio-economic status of the school's location

** Metro includes schools in major cities; regional includes regional, remote and offshore schools

Sources: NESA; RBA

Graph 3

Economics and Business Studies Enrolments in NSW



Sources: NESA; RBA

Table 1: Sample of Schools

By stratum

	Population Number of schools	Sampled Number of schools
Metro government boys	20	1
Metro government co-ed	211	11
Metro government girls	23	3
Metro non-government boys	36	1
Metro non-government co-ed	165	16
Metro non-government girls	44	1
Regional government	190	14
Regional non-government	81	4
Total	**770**	**51**

Source: NESA, RBA

Educators have provided valuable qualitative insights into some of the broad constraints on Economic enrolments. However, a comprehensive survey of students themselves was needed to gain quantitative evidence of the factors contributing to the decline in Economics enrolments, particularly the diversity trends. As such, the survey asked students about how and why they choose subjects, as well as what is influencing their preferences for Economics (in particular their perceptions of Economics).

While there is large body of literature that draws on surveys of students at different stages of their learning, no published research in Australia or internationally has drawn on surveys of high school students' perceptions of economics, or what determines their decision to study (or not study) economics in senior high school. Consequently, the Bank-led survey contains a unique primary source of data with which to examine the drivers of falling participation and diversity in economics.

Survey Methodology

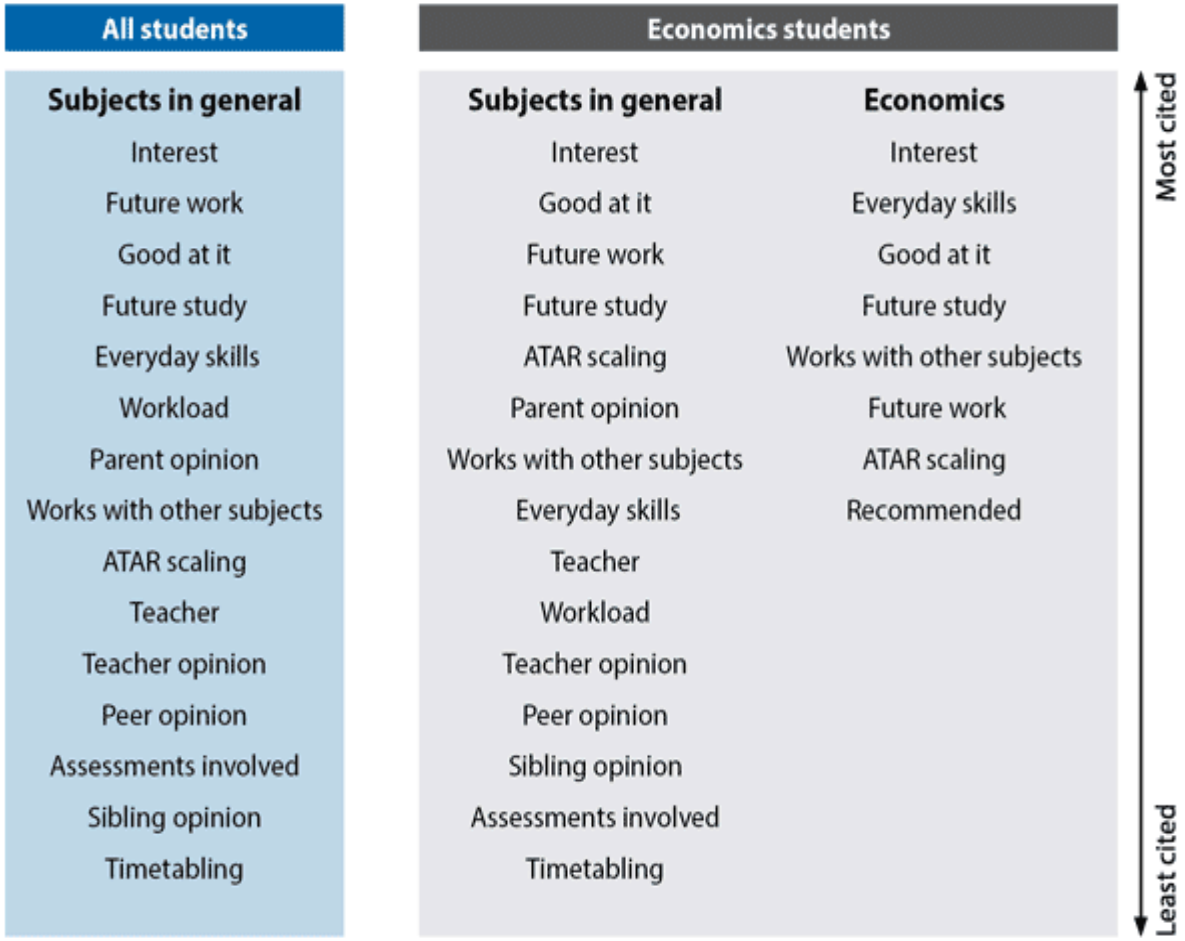
The Bank collaborated with Ipsos to undertake the 'High School Students' Subject Selection Survey' of Year 10, 11 and 12 students in New South Wales in 2019. We chose to survey schools in New South Wales, rather than other states, as a rich set of school-level data are already available to the Bank to enrich the analysis. There are also extensive permissions processes and logistical challenges that vary across the state education systems, which made it infeasible to survey multiple states in a timely way.

The overarching aim was to ensure a representative sample of the New South Wales Year 10–12 student population. The sampling frame (or relevant population) consisted of 770 schools in New South Wales after excluding institutions deemed out of scope and without approval to approach.[2]

The sample population was stratified at the school level to attain a sample with representative coverage of the government and non-government sectors, and metro and regional locations. A total of 51 schools completed the survey between July and September 2019.[3] The schools fall within eight strata, covering school sector (government or non-government), school type (co-ed, girls or boys) and location (metro or regional) (Table 1).

Each participating school was asked to administer the survey to as many Year 10, 11 and 12 students as they were willing. A total of 4,826 students completed the survey. The survey was completed in class by students on computers or devices under the supervision of a teacher.[4] Responses identified as being from potential 'skimmers' (i.e. students who completed the survey in an implausibly short time) were excluded, yielding a final sample of 4,698 responses. The characteristics of the sample are broadly representative of the NSW student population in terms of sex, school sector, and

Figure 1: Reasons for Choosing Subjects



Source: RBA

geographical area (see Appendix A). Of Year 11 and 12 students in the sample, 10 per cent study Economics, consistent with the state-wide figures.

Results

Reasons for choosing subjects

Why do students choose any subject? Whether looking at all students or only Economics students, the most common and most important reasons cited for selecting subjects in general were interest, perceived competence and whether the subject would be relevant for future study or work (Figure 1).[5] These reasons were more common than recommendations from parents, teachers, peers or siblings; or factors related to the subject (such as the teacher, timetabling, assessments and workload).[6] However, relative to other students, Economics students placed higher importance on subjects that were perceived to scale well for the Australian Tertiary Admission Rank (ATAR).

Why do students choose Economics? Economics students most commonly cited interest as the reason for selecting Economics, consistent with subjects they selected in general. The second most common reason for choosing Economics was gaining skills for everyday life, which was a lesser consideration for other subjects they selected. Being recommended Economics was the least common reason for choosing it.

Profile of Economics students

Who chooses Economics? Without controlling for other factors, Economics students in our sample were significantly more likely to be male, from a higher socio-economic background, attend school in a major city, attend an all-boys school or choose

subjects based on ATAR scaling. This is unsurprising given the aggregate enrolment numbers, and the representative nature of our sample. A key advantage of the survey data, however, is that we are able to isolate which factors are most important to the likelihood of choosing Economics (see Appendix B for details of the model). For example, is it actually the case that males are more likely to study Economics, or can this be explained by other factors?

The result that there is a greater likelihood of males and students with higher socio-economic backgrounds studying Economics holds true even when we take into account their other demographics, other subject choices, whether students perceived Economics as interesting, as well as school-specific factors. This suggests that these differences between the sexes and students of different socio-economic backgrounds exist across schools, as well as within schools.

The finding that regional students were less likely to study Economics than students from major cities was evident even when accounting for other factors, though there was no longer a difference when accounting for the socio-economic background of schools. Consequently, one reason why regional schools may have lower participation in Economics is that, on average, they tend to have a lower socio-economic background than metro schools.

In terms of the schools sector, there was no difference across government and non-government schools in isolation. However, once controlling for other factors (most notably socio-economic background), students from non-government schools were less likely to study Economics. This again highlights that socio-economic background is an important driver of student participation in Economics.

Perceptions of Economics

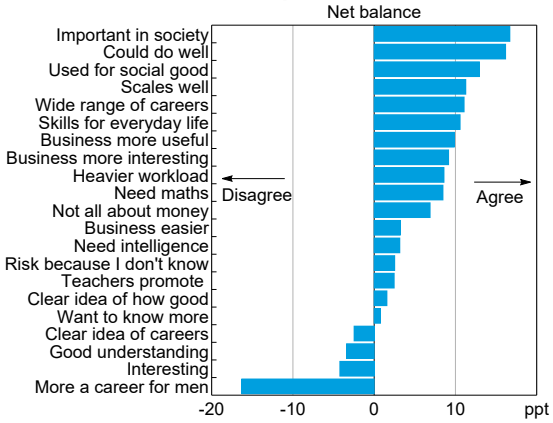
Analysing the characteristics of students who chose Economics is one way to understand low participation and diversity. However, given this is a binary outcome – that is, they choose Economics or not – it does not allow us to consider how definitively students did or did not choose Economics. Asking all students in the survey (across Years 10–12) about their perceptions of Economics regardless of whether or not they chose it, can shed light on the reasons for lower participation and diversity in Economics enrolments. We asked students a range of statements about Economics and students were instructed to state the extent to which they agree or disagree with the statements on a five-point Likert scale (from 'strongly disagree' to 'strongly agree').

What positive perceptions do students have about Economics? Students typically believe that economics (in general) can be used for social good and has a wide range of career opportunities (Graph 4). They also do *not* tend to believe economics is more of a career for men – a result contrary to anecdotal feedback. In general, students believe they could do well at Economics and that it scales well for the ATAR. They perceive that Economics provides skills for everyday life, and isn't all about money.

What negative perceptions do students have about Economics? Students generally do not perceive Economics as interesting and have little desire to know more about it. Economics is perceived as having a heavier workload than most other HSC subjects. And while Economics is seen as providing skills and tools for everyday life, students generally indicated they prefer to study Business Studies because they think it will be more useful for their future and more interesting. These results are in line

Graph 4

Perceptions of Economics*



* Share of respondents who strongly agree minus share who strongly disagree

Source: RBA

with insights from liaison and the revealed preference for Business Studies over Economics in enrolment data. While students perceive economics (in general) to have a wide range of career opportunities, students are less likely to have a clear understanding of Economics (the subject) or the careers available if they were to choose Economics (as a subject).

Do perceptions of Economics differ across sub-groupings of students? Females, students from schools with a low socio-economic background, and those in regional areas generally had more 'negative' perceptions of economics. This is consistent with declining diversity shown in enrolments trends. In particular, females were less likely than males to 'find Economics interesting', feel they 'could do well in Economics', 'have a clear idea of how good they would be at Economics' and 'want to know more about Economics' (Graph 5). Females were also more likely to believe that Economics is 'a risk to study because they don't know what it is about'. Furthermore, female students perceived that teachers were less likely to promote Economics as a subject, compared with male students. Females were also more likely than males to perceive Business Studies as easier, more useful and more interesting than Economics. In terms of career development, females had fewer clear perceptions of career opportunities from studying economics. However, females were less likely to perceive 'economics as a career for men'.

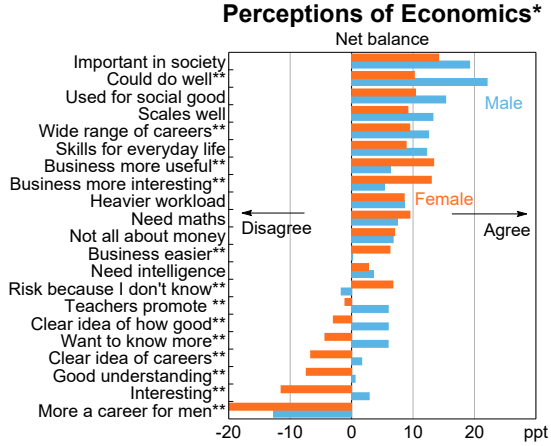
Many of these trends were also present for students in schools with a low socio-economic background (compared with high socio-economic) and regional areas (compared with metro areas) (Graph 6). In particular, a 'confidence gap' exists to the disadvantage of students from low socio-economic background and regional locations, who are less likely to feel they 'could do well in Economics'. These sub-groups are also more likely to believe that Economics is 'a risk to study because they don't know what it is about'. Importantly, these findings remained even when accounting for whether schools did or did not offer Economics in their schools.

Students who studied Commerce as a Year 10 elective also tended to have more positive perceptions of Economics (Graph 7). This suggests that Commerce may be an important stepping stone to students studying Economics. However, as the uptake and gender diversity of students in Commerce in Year 10 is much greater than in Economics in Year 11 and Year 12, this suggests that male students are more likely to transition from Commerce to Economics than female students.

Are there aspects of Economics perceptions that are consistent among sub-groups? There were no meaningful differences in perceptions between the sexes or across region or socio-economic background about needing to be 'intelligent' or 'good at maths' in order to study Economics, or about the workload or scaling of Economics. There

Graph 5

Perceptions of Economics*

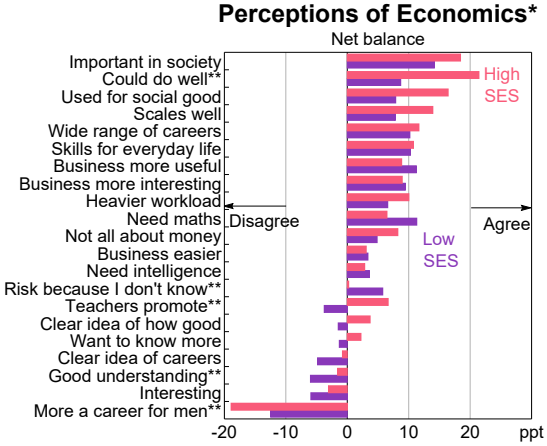


* Share of respondents who strongly agree minus share who strongly disagree
** Statistically significant difference at the 5 per cent level after controlling for school type, socio-economic status and language

Source: RBA

Graph 6

Perceptions of Economics*



* Share of respondents who strongly agree minus share who strongly disagree
** Statistically significant difference at the 5 per cent level after controlling for gender, school type and language

Source: RBA

were also no significant differences about whether economics is important, useful for social good or equips you with skills for everyday life across sex, region or socio-economic background.

Topics of interest in Economics

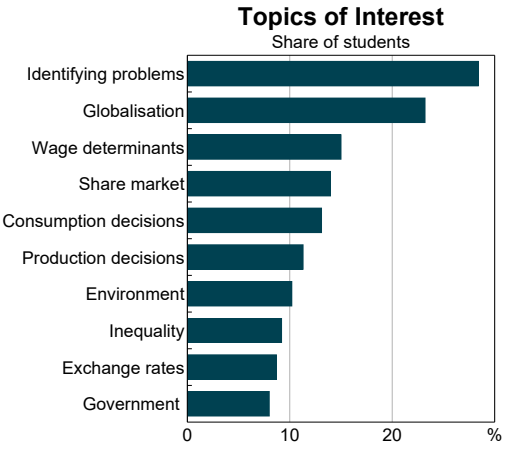
What Economics topics are students most interested in? The survey gave students a list of Economics topics (based on the Economics syllabus) and asked students to select the two that were most interesting. This enables us to consider whether the low uptake of Economics by some student sub-groups could reflect differing interests across students. It also enables us to consider which aspects of Economics could be highlighted when promoting Economics as a subject choice. Students highlighted that 'identifying problems' and 'globalisation' were the most interesting topics; however, these differed by sex (Graph 8). In particular, female students were more likely to cite 'identifying problems', whereas male students were more likely to cite the 'share market' (Graph 9).

Implications of Initial Insights

The survey has identified areas where the efforts of the Bank's public education program – and the economics profession more broadly – can be directed to increase participation and diversity in Economics. The results may also inform how educators and careers advisors communicate with students about subject choices, and in particular Economics.

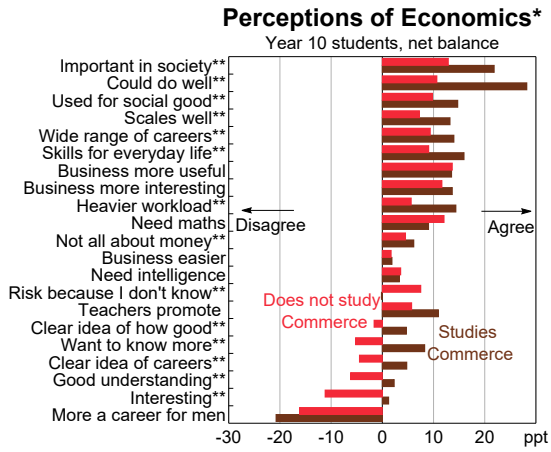
How could Economics be promoted to attract more students? We now know more about the perceived 'strengths' of Economics as well as its 'image problem'. Consequently, there is a great deal of scope to fill information gaps for students, focusing on how Economics meets the criteria of the things that matter most to students – namely, being interesting and providing future work and study paths. Additionally, positioning Economics as a subject that provides skills for everyday life could yield greater interest, as those who chose Economics rated this reason highly, and students in general consider everyday skills of relatively high importance when choosing subjects.

Graph 8



Source: RBA

Graph 7

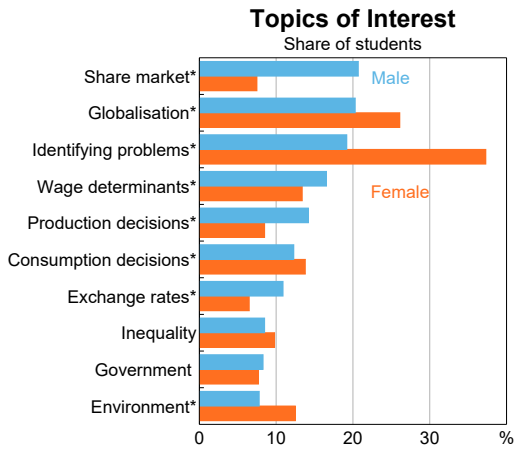


* Share of respondents who strongly agree minus share who strongly disagree

** Statistically significant difference at the 5 per cent level after controlling for gender, school type, socio-economic status and language

Source: RBA

Graph 9



* Statistically significant difference at the 5 per cent level after controlling for school type, socio-economic status and language

Source: RBA

We have also learnt more about differences in perception by students according to their sex, location and socio-economic background.

The results confirmed the view from liaison with educators that Business Studies is perceived as easier and more relevant for employment. Nonetheless, we learnt that students believe they have potential to do well at Economics and that it provides a range of career options. This result, however, is more typical of the views of males than females; a 'confidence gap' also exists in favour of students from high socio-economic backgrounds and metro areas. With important perception differences across types of students, tailoring communications that increase awareness of Economics to female and regional students, as well as those from a low socio-economic backgrounds, could help reduce the perceived risks associated with studying it. Highlighting the usefulness of Economics as a field of study may also help encourage students from these sub-groups to study Economics. In particular, given that girls expressed greater interest in identifying problems, it may be useful to draw to their attention that Economics is essentially about identifying and solving problems. In fact, this could be of longer-term value given the strong result that girls did not see economics as more a career for men.

Conclusion

In order to effectively tackle the decline in the number and diversity of Economics enrolments, it is imperative to understand the underlying drivers of this fall. Asking students directly about their decision-making process for subject selection, and their perception of economics, has enabled a quantitative assessment of these drivers. The survey results confirm the view that Economics has an image problem, with students lacking interest and a good understanding of what the subject is about. The results also confirm that there are clear differences in perceptions about economics by sex, socio-economic background and metro-regional location that are consistent with trends in enrolments. There are, however, a number of surprising insights that contradict preconceptions. Students generally believe they could do well in Economics and that economics offers a range of career opportunities (that are not more suited to men than women). Students also feel that economics is used for social good, is important for society and not just all about money. This gives us comfort that some core elements of economics have broad appeal. The challenge is to build interest, relevance and understanding to motivate high school students to study Economics.

Appendix A: Sample Characteristics

Table A1: Sample, by Student Characteristics[(a)]

	Students in:		
	Sample Number	**Sample** Proportion (%)	**Population** Proportion (%)
Year			
– Year 10	2,677	55	36
– Year 11	1,297	27	34
– Year 12	852	18	30
Sex			
– Male	2,176	45	50
– Female	2,443	51	50
Speaks another language other than English at home			
– Yes	1,561	32	35
– No	3,088	64	65
Studies Economics (Year 11 or 12 only)[(b)]			
– Yes	189	9	9
– No	1,960	91	91
Total sample	**4,826**	**100**	**100**
Total completes	**4,698**		

(a) Categories do not sum to total where responses fall into an 'unknown' or 'prefer not to say' category

(b) Population proportion is based on Year 12 enrolments only

Sources: ACARA, NESA, RBA

Table A2: Sample, by School Characteristics[(a)]

	Students in:		
	Sample Number	**Sample** Proportion (%)	**Population** Proportion (%)
School Sector			
– Government	2,705	56	59
– Non-government	2,121	44	41
School Type			
– Co-ed	3,586	74	82
– All-boys	578	12	7
– All-girls	662	14	11
Selective Type			
– Selective	73	2	–
– Non-selective	4,753	98	–
Area			
– Metro	3,756	78	78
– Regional	1,070	22	22
Index of Community Socio-Educational Advantage (ICSEA)			
– Quartile 1 (Lowest)	605	13	28
– Quartile 2	1,373	28	22
– Quartile 3	679	14	25
– Quartile 4 (Highest)	2,169	45	25
Total sample	**4,826**	**100**	**100**
Total completes	**4,698**		

(a) Categories do not sum to total where responses fall into an 'unknown' or 'prefer not to say' category

Sources: ACARA, NESA, RBA

Appendix B: Regression

Table B1: Regression Coefficient Estimates[(a)]

Year 11 and 12 students

	Propensity to Choose Economics Marginal effects of probit model		
	(1)	(2)	(3)
Male	0.06***	0.06***	0.04**
Bilingual	0.02	0.02	0.01
ICSEA		0.11***	
Regional school	−0.10**	0.03	−0.10**
Non-government school	0.02	−0.08**	0.02
All-boys school	0.04*	0.04*	0.05*
All-girls school	−0.12***	−0.07**	−0.14***
Finds Economics interesting			0.07***
Observations	2,041	1,995	1,606
Pseudo R-squared	0.11	0.21	0.25

***, ** and * represent statistical significance at the 1, 5 and 10 per cent level, respectively

(a) Robust standard errors clustered at the school level

Source: RBA

Footnotes

[*] Tanya Livermore is in the Information Department and Mike Major is in the Economic Research Department. The authors would like to thank Jacqui Dwyer and Benjamin Beckers for their help and suggestions.

[1] For a further discussion, see Dwyer (2018).

[2] Schools deemed out of scope included distance education providers, TAFE, international school campuses and schools without enrolment figures. Approvals were not obtained from the Catholic Education Office for all diocese, and therefore 19 schools had to be excluded from the population.

[3] A total of 90 schools were recruited, with 51 completing the survey. Fourteen schools expressed a willingness to participate but were unable to do so within the allocated fieldwork periods and 25 schools declined to participate post recruitment. The most common reasons for declining post recruitment included being unable to find a teacher to facilitate the research, or students being bound by other commitments that prevented completion within the specified fieldwork period.

[4] The average time taken to complete the survey was 10 minutes.

[5] Students were able to choose multiple reasons.

[6] However, together, about two-thirds of students cited they selected subjects based on recommendations from either a teacher, parent, sibling or peer.

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Bank Fees in Australia

Stephanie Crews and Michelle Lewis[*]

Photo: Vicki Smith – Getty Images

Abstract

The Reserve Bank's 23rd annual bank fees survey shows that, overall, banks' income from fees declined in 2019. Fee income from households decreased, largely driven by lower fees from deposit accounts. A number of reforms related to merchant services contributed to banks' fee income from businesses growing at a slower pace than in recent years.

Banks' overall income from fees declined in 2019

The Reserve Bank's annual bank fee survey provides information on the fee income earned by banks through their Australian operations.[1] The survey focuses on fee income from the provision of loans, deposit services and payment services. The 2019 survey included 15 institutions, capturing 90 per cent of the Australian banking sector by balance sheet size.[2] Fee income from operations outside of Australia and from funds management and insurance operations are not covered by the survey. This article summarises the results from the latest survey, covering banks' financial years ending in 2019.[3]

Domestic banking fee income declined in 2019 (Table 1). This was driven by lower fee income from households, which more than offset an increase in fee income from businesses. Fees charged to households accounted for around one-third of banks' fee income and fees charged to businesses accounted for the remainder. The ratio of lending fee income to assets (loans) declined a little, continuing the trend of recent years (Graph 1). Deposit fee income was broadly stable relative to the value of deposits.

Fee income from households decreased …

Banks' fee income from households declined by 7 per cent in 2019, which followed a similar decline in 2018, and compares with modest growth in the preceding few years. The recent declines were primarily driven by decreases in fee income from household deposits (Graph 2, Table 2). Fee income from households continued to be largely made up of fees on credit cards (43 per cent), housing loans

Table 1: Banks' Fee Income

	Households		Businesses		Total	
	Level	Growth	Level	Growth	Level	Growth
	$ million	Per cent	$ million	Per cent	$ million	Per cent
2016	4,349	–0.2	7,695	0.9	12,043	0.5
2017	4,490	3.3	7,959	3.4	12,449	3.4
2018	4,203	–6.4	8,189	2.9	12,392	–0.5
2019	3,917	–6.8	8,383	2.4	12,300	–0.7

Source: RBA

Table 2: Banks' Fee Income from Households

	2017	2018	2019	Annual growth 2019	Average annual growth 2013–18
	$ million	$ million	$ million	Per cent	Per cent
Loans	3,284	3,235	3,114	–3.7	2.2
– Housing	1,265	1,175	1,087	–7.5	–0.4
– Personal[(a)]	349	354	325	–8.2	0.2
– Credit Cards	1,670	1,706	1,702	–0.2	4.9
Deposits	1,138	912	744	–18.4	2.2
Other Fees[(b)]	67	56	59	5.4	–11.9
Total	4,490	4,203	3,917	–6.8	0.5

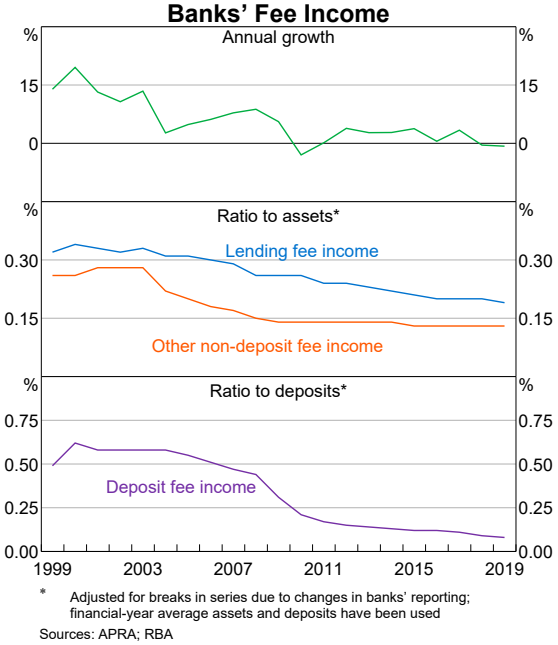
(a) Fee income from personal loans in 2016 was affected by a transfer of assets

(b) Includes banking-related fee income from households that cannot be directly related to an individual deposit or loan account (e.g. travellers' cheque or foreign exchange fees)

Source: RBA

Graph 1

Banks' Fee Income



* Adjusted for breaks in series due to changes in banks' reporting; financial-year average assets and deposits have been used

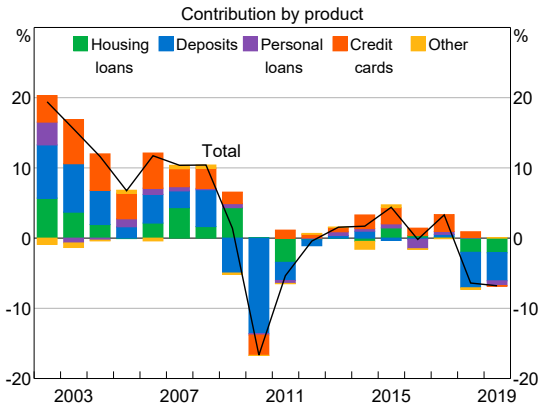
Sources: APRA; RBA

(28 per cent) and deposits (19 per cent). All components of household fee income declined in 2019, except for banking-related fee income that cannot be directly related to an individual deposit or loan account ('other' fee income).

Graph 2

Growth in Household Fee Income

Contribution by product



Source: RBA

Table 3: Unit Fees on Credit Cards[(a)]

	2017	2018	2019	Annual growth 2019 Per cent
Annual fees ($)				
– Non-rewards cards	69	54	54	−1.2
– Rewards cards	208	203	211	3.8
– All cards	150	138	140	1.4
Other fees				
– Foreign currency conversion fees (per cent of value)	2.8	2.5	2.6	3.5
– Late payment fee ($)	18	19	19	−0.1

(a) Simple average of advertised fees for cards issued by the major banks; only cards that are available to new cardholders are included in the sample; note that changes in the sample affect the average fee; includes fee-free cards; does not include any fee waivers or reductions; as at December of each year. Growth calculations are based on unrounded numbers.

Source: RBA

Fee income from deposit accounts fell by 18½ per cent in 2019, reflecting broad-based declines in account-servicing fees, transaction fees and fees from other sources. Some banks noted lower transaction fees due to a reduction in ATM fees and the removal of transaction fees related to specific products. This follows a sharp decline in fee income from deposit accounts in 2018 due to a number of banks abolishing the ATM withdrawal fees charged to cardholders from other financial institutions from late 2017. The reduction in fee income from transaction fees on deposits is also consistent with the decline in ATM use in recent years as consumers have increasingly switched from cash to electronic payment methods (Caddy *et al* 2020). The increased prevalence of fee waivers was also noted by some banks as the reason for reduced account servicing fees.

Fee income from housing loans declined by 7½ per cent in 2019, reflecting a decrease in account-servicing fees and lower volumes of new and refinanced housing loans over much of the survey period. Income from fees on personal loans declined by 8¼ per cent. This was largely driven by a reduction in account-servicing fees, although banks also noted that volumes of new personal loans declined over the year.[4] More recently, many banks have removed some fees, such as those for repayment holidays, in response to COVID-19.

Banks' fee income from credit cards declined a little, in contrast to previous years where it had typically contributed to growth in banks' fee income from households. Banks' income from account-servicing fees on credit cards increased, but this was more than offset by declines in transaction and exception fees (which includes dishonour, late payment and break fees). Some banks cited a reduction in late fees due to the use of SMS alerts to remind customers of payment due dates. Changes in unit fees were mixed in 2019 – annual fees on rewards cards and foreign currency conversion fees increased, while annual fees on non-rewards cards and late payment fees declined only marginally (Table 3).

Income from exception fees charged to households declined again in 2019 (Graph 3).[5] This largely reflected lower exception fees on transaction deposits. Some banks noted that a contributing factor was the removal of informal overdrafts, which resulted in a decline in honour and dishonour fees. The removal of these overdrafts was consistent with one of the recommendations of the Royal Commission into misconduct in the Banking and Superannuation and Financial Services Industry. Income from exception fees charged to households on credit card products was also a driver of the decline, partially due to a lower volume of late payment fees.

Table 4: Bank's Fee Income from Businesses

	2017 $ million	2018 $ million	2019 $ million	Annual growth 2019 Per cent	Average annual growth 2013-18 Per cent
Deposit accounts	601	583	584	0.1	–1.0
– of which: exception fees	62	70	69	–0.3	11.1
Loans	3,243	3,278	3,371	2.9	2.0
– of which: exception fees	44	41	49	19.6	–0.7
Merchant service fees	2,911	3,146	3,213	2.2	7.0
Bank Bills[(a)]	27	15	9	–38.9	–22.6
Other	1,162	1,169	1,206	3.2	–1.5
Total	7,959	8,189	8,383	2.4	2.8
– of which: exception fees	106	111	118	7.0	5.8

(a) Levels have been revised due to a financial institution reporting on a different basis in 2019. Levels have been back-cast to ensure consistent reporting.

Source: RBA

… while fee income from businesses increased slightly

Total fee income from businesses increased by 2½ per cent in 2019, due to higher fee income from both small and large businesses (Graph 4, Table 4). Growth in fee income mainly reflected increases in business loan fees and 'merchant service fee' income from processing card transactions (Graph 5). The contribution to fee income from business deposit services was little changed. Fee income from businesses continued to consist largely of fee income from loans (40 per cent) and merchant service fees (38 per cent).

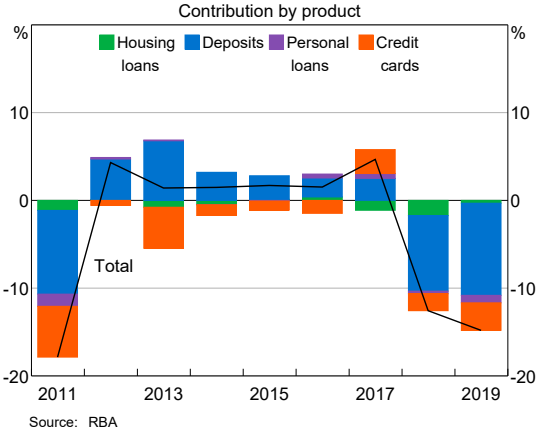
Fee income from business loans increased by 3 per cent in 2019, reflecting higher fee income from large businesses, while fee income from loans to small businesses declined slightly. The increase in fee income from large businesses mostly reflected an increase in fee income from account-servicing fees, though fee income from transaction services and exception fees also increased. The increase in fee income from business loans is consistent with higher volumes of loan approvals over the survey period.

Merchant service fee income as a share of the value of credit and debit card transactions declined further in 2019 (Graph 6). This reflected the

Graph 3

Growth in Household Exception Fee Income

Contribution by product

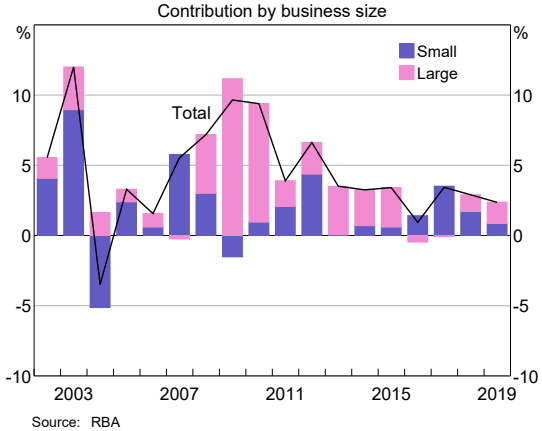


Source: RBA

Graph 4

Growth in Business Fee Income

Contribution by business size



Source: RBA

continued shift from credit to debit cards, where the latter usually has lower fees, and declines in the average (per transaction) merchant fee for each type of card. The decline in the economy-wide costs of card acceptance has been driven to a significant extent by the various reforms and policy initiatives undertaken by the Payments System Board since the early 2000s (Occhiutto 2020). The implementation of least-cost routing by a number of major financial institutions starting in mid-2018, which allows businesses to direct contactless debit card transactions to the network that costs them the least to accept, is also likely to have contributed to downward pressure on unit fees paid by merchants.

Fee income from business deposits was little changed in 2019, as a slight increase in deposit fees received from small businesses was offset by a decrease in fees from large businesses. Around two-thirds of fee income from business deposits was for deposit services provided to small businesses. The growth in deposit fee income from small businesses was a result of increased collection of account-servicing fees. The income from transaction and other fees from small businesses decreased. The decline in deposit fee income from large businesses was due to a reduction in account-servicing and other fee income.

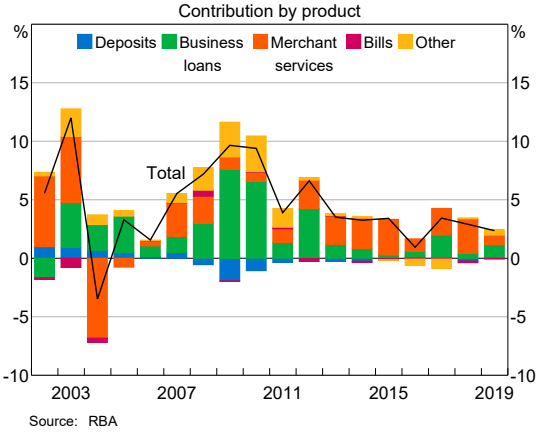
Bank bill fee income declined over 2019, which continues the trend seen in the past few years. This reflected businesses continuing to shift from bank bills to other, more flexible lending products. Bank bill fee income from both large and small businesses declined.

In recent months, to assist businesses who are under pressure from the impacts of COVID-19, several banks have announced that they have temporarily removed or reduced fees for card acceptance services and waived some other fees on business products (such as those establishing a loan and on deposits).

Graph 5

Growth in Business Fee Income

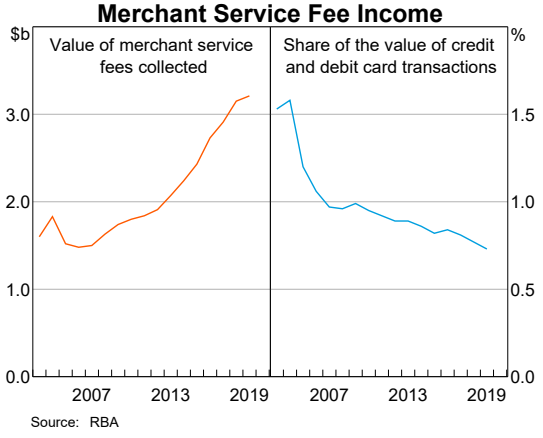
Contribution by product



Source: RBA

Graph 6

Merchant Service Fee Income



Source: RBA

Footnotes

[*] The authors are from the Domestic Markets Department.

[1] The data from the survey are published in the Reserve Banks's Statistical Table C9 and are subject to revisions.

[2] Survey results have been affected by mergers and acquisitions among participating institutions and some changes in participants' methodology (where possible, this has been reflected in revisions to data reported in previous years).

[3] All data from the survey are based on individual banks' financial years, which differ across banks, but range from the year ending March to December 2019. (The data in Table 3 were not collected through the survey and are instead based on calendar years). Improved data on bank fees are due be reported from March 2021 in the new Economic and Financial Statistics (EFS) collection – these data are designed to be more consistent across institutions, including because they will be based on a consistent reporting period. For more information on the EFS collection, see Bank, Durrani and Hatzvi (2019).

[4] The personal loan category includes fees associated with term loans, margin loans to households, and home-equity loans where the predominant purpose is not known; the category excludes credit card lending.

[5] Exception fees form part of fee income from deposits, housing loans, personal loans and credit cards.

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Cash Use in Australia: Results from the 2019 Consumer Payments Survey

Luc Delaney, Nina McClure and Richard Finlay[*]

Photo: Toni Faint – Getty Images

Abstract

The Bank's 2019 Consumer Payments Survey (CPS) suggests that the use of cash for transactions has continued to fall alongside growing use of electronic payment methods. Despite this, a substantial share of consumers still use cash intensively, with this share having reduced only a little over recent years. These high cash users are more likely to be older, have lower household income, live in regional areas, and/or have limited internet access. The survey suggests that around one-quarter of consumers would face major inconvenience or genuine hardship if they could no longer use cash, although most respondents stated that their current access to cash was convenient. The survey was conducted before the emergence of COVID-19 and the associated social distancing measures, however, and so did not capture any change in behaviour that may have resulted from this.

Introduction

The Bank undertook its fifth triennial Consumer Payments Survey (CPS) in November 2019. Survey participants were asked to record details about every transaction they made for a week, and to provide extra information on cash holdings, perceptions of cash access, and payment preferences in a post-survey questionnaire. More than 1,000 individuals completed the survey, recording more than 11,000 in-person transactions in total, as well as around 2,000 transactions that were not done in-person. Caddy, Delaney and Fisher (2020) gives a broad overview of the survey results, including use of online payments and newer payment methods. The focus of this article is cash, including the demographics of cash use, access to cash and other payment methods, and cash holdings, and so we limit our analysis to in-person payments, where consumers have the option to use cash if they so wish.[1]

The CPS suggests that Australian consumers are continuing to switch to electronic payment methods in preference to cash, although the share of in-person payments made in cash was still substantial at 32 per cent by number and 19 per cent by value in 2019, down from 43 and 30 per cent, respectively, in 2016 (Graph 1). For comparison, if one considers all payments, including online payments where cash use is not an option, cash made up 27 per cent by number and around 10 per cent by value in 2019 (Caddy *et al* 2020).

The fall in the cash share of in-person transactions over the three years to 2019 was particularly pronounced for smaller payments, which reflects consumers increasingly using contactless 'tap-and-go' options for these purchases (Graph 2). Just under half of in-person transactions in the 2019 CPS valued at $10 or less were made using cash, compared with 66 per cent in 2016. Consistent with previous surveys, cash use was lower for higher-value transactions, with only 16 per cent of in-person transactions over $50 made using cash in 2019. Cards are now preferred over cash for all payment amounts over $5.

Despite the continued move away from cash and towards cards for in-person payments, the survey showed that some consumers still use cash intensively, and that the share of those doing so had declined only modestly over the previous three years. In particular, while almost half of the participants used cash for less than 20 per cent of in-person transactions (henceforth defined as 'low cash users'), around 15 per cent used cash for 80 per cent or more of in-person transactions (whom we define as 'high cash users') (Graph 3). At the extremes of the distribution, 10 per cent of participants used cash for *all* in-person transactions in 2019 (compared with 12 per cent in 2016) while 30 per cent did not use cash at all during the 2019 survey week (compared with 18 per cent in 2016).

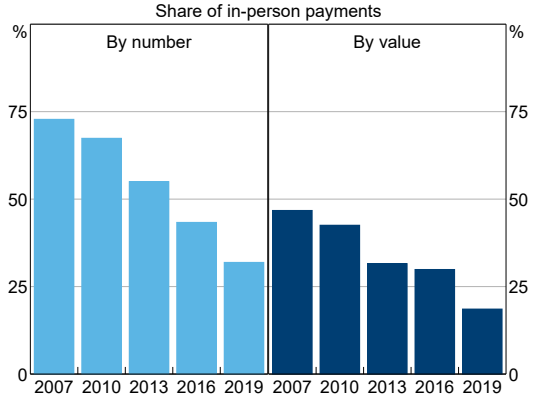
Demographics of Cash Use

In addition to highlighting overall trends in cash use, the CPS confirmed differences in cash use across demographic groups. Older survey

Graph 1

Cash Payments

Share of in-person payments

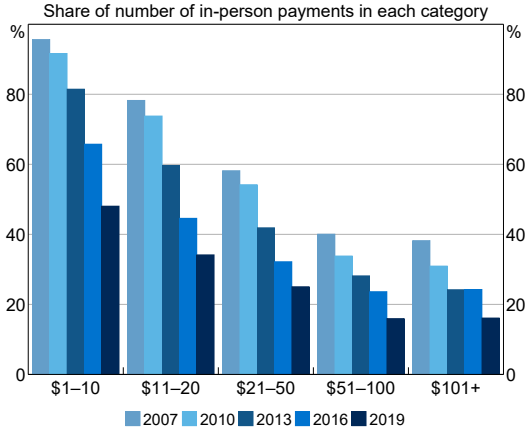


Source: RBA calculations, based on data from Colmar Brunton, Ipsos and Roy Morgan Research

Graph 2

Cash Payments by Size

Share of number of in-person payments in each category

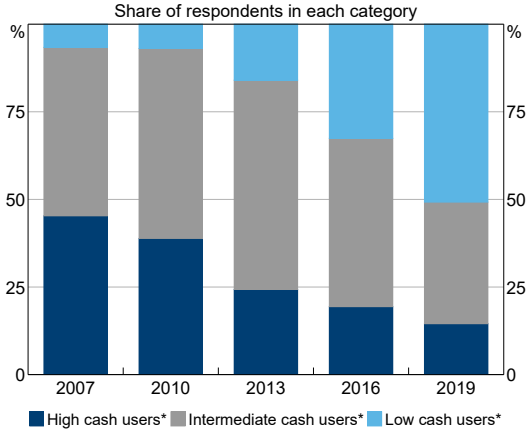


Source: RBA calculations, based on data from Colmar Brunton, Ipsos and Roy Morgan Research

Graph 3

In-person Cash Use

Share of respondents in each category



* Frequency based on share of in-person payments in cash (low: ≤ 20 per cent , high: ≥ 80 per cent

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

participants were relatively more likely to be high cash users, with almost 40 per cent of those aged 65 and above in this category, compared with only 4 per cent of 18–29 year olds (Graph 4). Correspondingly, 70 per cent of 18–29 year olds were low cash users compared with 24 per cent of those aged 65 and above. While these results suggest that age is positively correlated with cash use, they do not tell us if this is because older people simply prefer to use cash, on average, more than younger people do, or if other characteristics – for example the average income of older people, or typical transaction sizes – are driving the result. To disentangle the effects of different demographic and transaction-level factors, we use regression analysis (see Table A1). The regression results confirm that the probability of using cash for an in-person transaction increases with age: after controlling for other variables, we estimate that people aged 65 and above are five times, or equivalently 25 percentage points, more likely to use cash for an in-person transaction, relative to people aged 18–29 years.

Payment behaviour also differed somewhat depending on the participant's area of residence, with those in regional areas tending to use cash a little more intensively: around 18 per cent of participants living in regional areas were high cash users, compared with 13 per cent for capital cities, while around 44 per cent were low cash users, compared with 54 per cent for capital cities (Graph 5). After controlling for other factors, however, the regression results do not indicate that one's area of residence in and of itself has a direct impact on cash use; rather, participants who live in regional areas tended to be older and have inferior internet access relative to capital city dwellers, and these factors are associated with higher cash use (discussed further below).

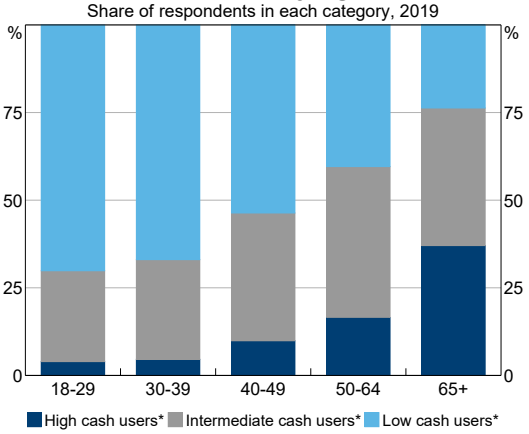
Survey participants with lower household incomes were more likely to be high cash users, while those with higher household incomes were more likely to be low cash users (Graph 6). For example, for households whose income was in the lowest 25 per cent of the population (i.e. the first income quartile shown in Graph 6), around 30 per cent were low cash users and another 30 per cent were high cash users. For households whose income was in the top 25 per cent of the population (the fourth income quartile) around 65 per cent were low cash users and only 3 per cent were high cash users. Similar to area of residence, however, the regression results suggest that it is not household income itself that is driving this result. Rather, household income is correlated with other factors that are associated with cash use, including age, credit card ownership and internet access.

As mentioned, a number of factors other than age, area of residence, and household income are associated with differing degrees of cash use (Table A1). One particularly strong predictor of cash use was whether participants had accessed the

Graph 4

Cash Use by Age

Share of respondents in each category, 2019



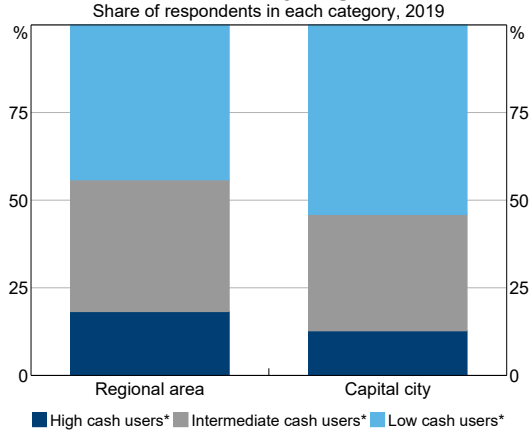
* Frequency based on share of in-person payments in cash (low: ≤ 20 per cent, high: ≥ 80 per cent)

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

Graph 5

Cash Use by Region

Share of respondents in each category, 2019



* Frequency based on share of in-person payments in cash (low: ≤ 20 per cent, high: ≥ 80 per cent)

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

internet in the past three months, or had internet access on their mobile phones, with 'no' answers associated with a 10–15 percentage point increase in the likelihood of cash use. This may be because those who choose not to – or cannot – access the internet simply prefer cash to newer payment methods, because they find newer payment methods difficult to use, or some combination of the two. Education level was also associated with differing degrees of cash use, although to a lesser extent than internet access: participants with a Bachelor's degree or higher were 7 percentage points less likely to use cash, all else equal, compared with participants who had not completed further education past high school. Ownership of a credit card was associated with a 4 percentage point reduction in the probability of cash use. Regarding characteristics of the payment itself, payments related to food, leisure, and in-person bills were all relatively more likely to be made with cash, while higher-value payments were associated with less cash use.

Cash Attitudes and Access to Payments

Cash use – choice or necessity?

In-person cash transactions in the 2019 survey were mainly made by people who prefer to use cash, rather than people who had to use cash because of barriers to using other payment methods. In particular, survey respondents were asked to list their preference for different in-person payment methods, as well as the reason for the preference. Overall, around half of all cash transactions were made by people who listed cash as their most preferred in-person payment method, rising to around 90 per cent for those listing cash as one of their top three methods. The most common reasons for preferring cash were for budgeting or financial management purposes, and a preference for cash for smaller transactions.

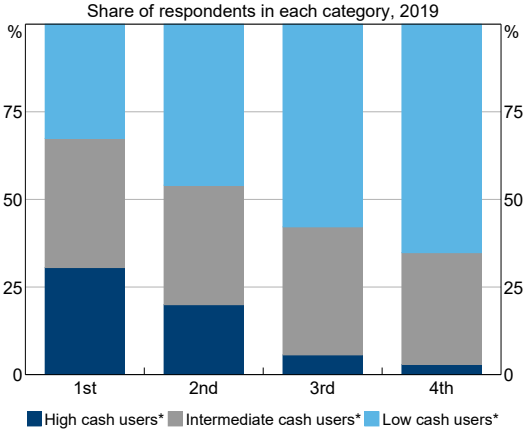
The survey also asked whether respondents would be affected if shops stopped accepting cash or if it became difficult to withdraw cash, as is becoming the case in some northern European countries. The majority of high cash users in the CPS reported that they would experience a major inconvenience or genuine hardship if cash were no longer available, while, perhaps unsurprisingly, only a minority of low cash users felt the same (Graph 7).

Participants who indicated that they would experience a major inconvenience or genuine hardship were asked why they needed to use cash rather than another payment method. Of these respondents, around 25 per cent listed privacy or security concerns as the most important reason, around 20 per cent cited merchant acceptance, while around 15 per cent reported that they needed to use cash for budgeting purposes (Graph 8). Overall, around 40 per cent of

Graph 6

Cash Use by Household Income

Share of respondents in each category, 2019



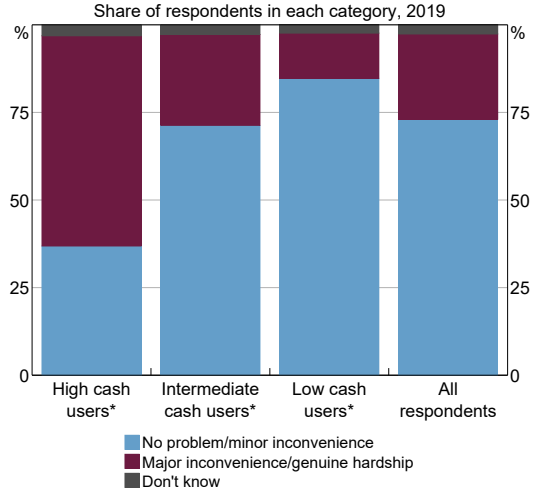
* Frequency based on share of in-person payments in cash (low: ≤ 20 per cent, high: ≥ 80 per cent)

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

Graph 7

Effects of No Cash

Share of respondents in each category, 2019



* Frequency based on share of in-person payments in cash (low: ≤ 20 per cent, high: ≥ 80 per cent)

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

respondents indicated that their need to use cash was based on preference (including due to security and privacy concerns, and for budgeting). Around 50 per cent of respondents indicated that their need to use cash was based on barriers to using other payment methods (merchant acceptance, payments to family and friends, and having limited access to the technology – including reliable internet access – required for some other payment methods).

Access to cash services and other payment methods

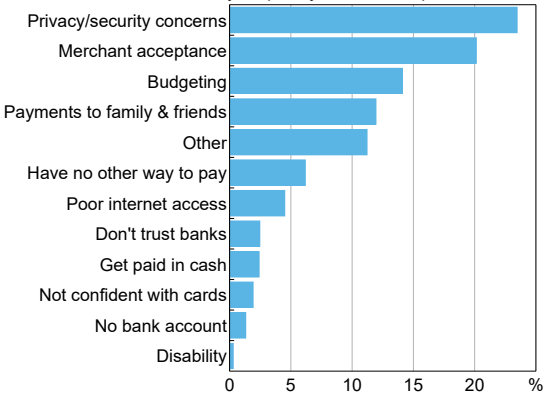
As discussed in Delaney, O'Hara and Finlay (2019), access to cash deposit and withdrawal services as measured by distance to the nearest access point appears to be good for the majority of Australians, although the provision of cash access points has fallen over recent years and this trend seems likely to continue. In this context, the 2019 CPS asked participants about their perceptions of access to cash withdrawal and deposit services. The results were in line with the earlier research, with around 90 per cent of respondents indicating that access to cash withdrawal was convenient, and around 60 per cent of those who make cash deposits saying that access to these services was convenient (Graph 9). Focusing on high cash users, almost 95 per cent indicated that their access to cash withdrawal was convenient, while more than 80 per cent indicated that cash deposit was convenient. Low cash users were slightly less likely to report that access to cash was convenient. This may indicate that poor access is causing some people to use cash less often. Conversely, some people may think cash withdrawal (and cash use in general) is inherently inconvenient, and therefore choose to use other payment methods.

While most participants stated that their access to cash is currently good, access to new payment methods may be limited for some people as this often relies on users having both access to, and familiarity with, new technology. It is important that the payments system works for all Australians, and if some groups are excluded from certain types of payment methods this could be a concern. The 2019 survey indicated that access to the technology that underpins some newer payment methods is limited for a large number of high cash users, with around half of all high cash users – equivalent to 7 per cent of respondents – having no mobile internet access, for example (Graph 10). The regression analysis discussed earlier also indicates that those without mobile internet access are 13 percentage points more likely to use cash for an in-person transaction (Table A1). If access to cash deteriorated – for example due to the cost of cash distribution rising and banks responding by withdrawing cash access points – these consumers would find it harder to make payments. This would be a particular concern for older Australians and those with low household income or who live in regional areas, who tend to have inferior access to mobile internet, and use cash more, compared with younger Australians in urban areas.

Graph 8

Why Do You Need to Use Cash?

By frequency, share of respondents, 2019*



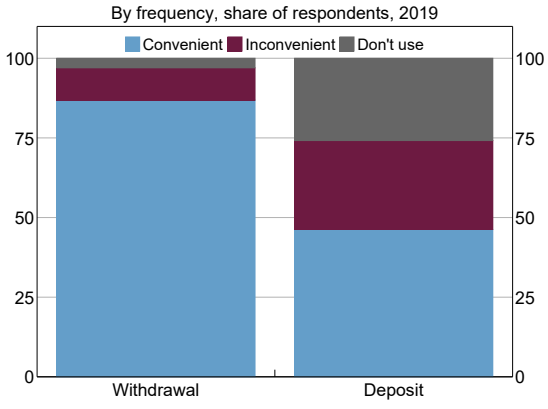
* Of the 277 respondents who indicated it would be difficult if shops stopped accepting cash or they could no longer withdraw cash

Sources: based on data from Roy Morgan Research; RBA calculations

Graph 9

Access to Cash Services

By frequency, share of respondents, 2019



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

Table 1: Cash Top-ups

	2007	2010	2013	2016	2019
Share of respondents making one or more top-ups (%)	86	72	76	45	48
Number of cash top-ups per person per week	1.4	1.6	1.5	0.7	0.8
Median value of top-up ($)	100	100	60	100	80

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

Cash Top-ups

As part of the CPS, participants were asked to record any cash top-ups that they made during the survey week. Consistent with the decline in the use of cash for transactions, the share of respondents making cash top-ups has also decreased over time: 86 per cent of respondents in the 2007 survey made at least one top-up, compared with 48 per cent in the 2019 survey, although this was little changed over the past three years (Table 1). Similarly, the average weekly number of top-ups per person as recorded in the CPS has almost halved, from 1.4 in 2007 to 0.8 in 2019. On the other hand, the median value of cash top-ups, at $80 in 2019, has remained relatively stable since the 2007 survey. Together, these results suggest that as consumers use cash less, they are choosing to withdraw cash less frequently, rather than reduce the value of each top-up.

Consistent with previous surveys, these top-ups tend to occur either via ATMs or via other non-bank sources (wages, transfers from friends, etc.), rather than at a bank branch or via cash-out at the point of sale. Survey results indicate that people typically make around 17 ATM withdrawals per year (roughly one withdrawal every three weeks), down from around 47 in 2007 (roughly one withdrawal per week), with the 2019 CPS suggesting that around 14 per cent of ATM withdrawals are made at ATMs which charge a fee.

Cash Holdings

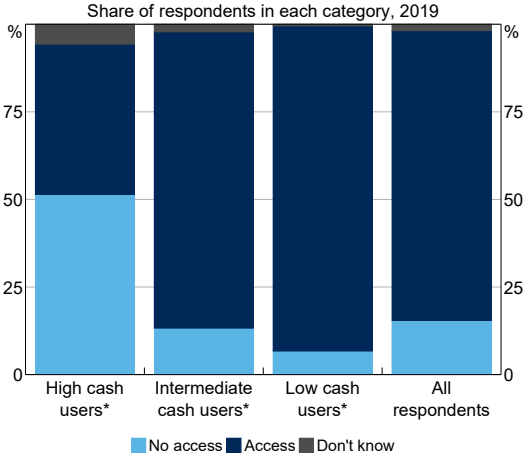
Survey participants were asked to record the number and value of banknotes held in their wallets. Around one-fifth of people held no cash in their wallet, up from 8 per cent in 2013, but little changed from 2016 (Graph 11). At the other extreme, the share of respondents holding more than $100 in their wallet fell from 32 per cent in 2013 to 29 per cent in 2019, although again this was little changed from 2016. These data indicate that even though cash use is declining, most people continue to hold cash in their wallet, often for precautionary purposes.

Of the people who hold cash in their wallet, the most important reason for doing so – other than for

Graph 10

Cash Use and Mobile Internet Access

Share of respondents in each category, 2019



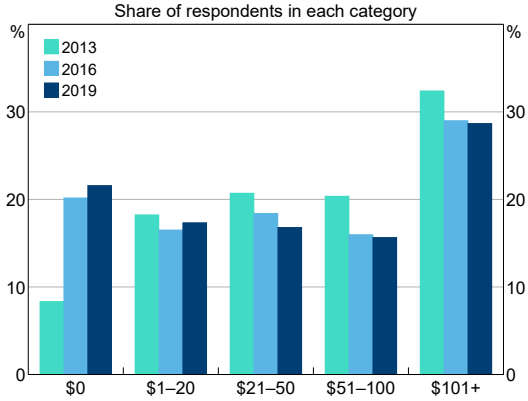
* Frequency based on share of in-person payments in cash (low: ≤ 20 per cent, high: ≥ 80 per cent)

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

Graph 11

Wallet Cash Holdings by Year

Share of respondents in each category



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

day-to-day purchases – was for emergency transactions (42 per cent of respondents), followed by issues relating to accessibility of cash, including minimising ATM withdrawal times or fees (20 per cent of respondents) (Graph 12). People who reported holding cash outside their wallet also cited emergency transactions as the most important reason, followed by saving for large purchases. These results suggest that many consumers perceive cash to be important as a back-up payment method.

Almost 40 per cent of respondents indicated that they typically hold cash somewhere other than their wallet, with around 15 per cent of respondents reporting holding up to $100, while 3 per cent reported holding more than $1,000 (Graph 13). Scaling up these estimates to the entire population would suggest that Australians hold roughly $4 billion in cash outside of their wallets, which is equal to around 5 per cent of the total value of Australian banknotes on issue. While sizeable, this is nonetheless likely to be an underestimate, since people who hold a large amount of cash may not be willing to disclose this in a survey (see also Finlay, Staib and Wakefield (2018)).

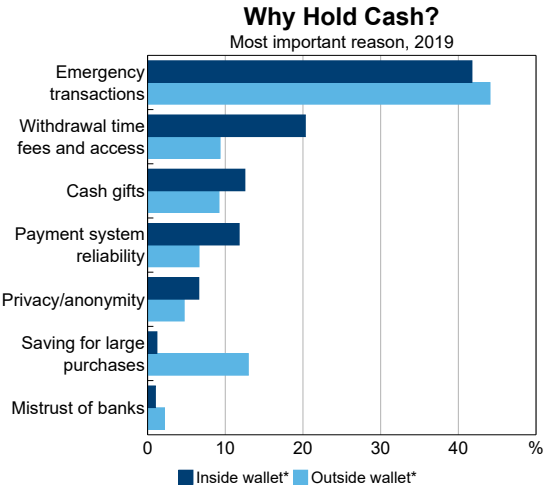
Conclusion

Results from the 2019 Consumer Payments Survey suggest that the use of cash for transactions has continued to fall alongside growing use of electronic payment methods. Despite this, a substantial number of consumers continue to use cash intensively. These high cash users tend to have one or more of the following characteristics: they are more likely be older, live in regional areas, have lower household income, and/or have relatively poor internet access.

The survey results suggest that a large majority of consumers are currently satisfied with their level of access to cash services, although as the provision of cash access points falls this will bear ongoing monitoring. A large share of respondents indicated that their use of cash was based on preference, while some indicated that factors out of their control, such as poor internet access, prevented them from using non-cash payment methods. Consistent with this, the majority of high cash users in the survey indicated that they would suffer a major inconvenience or genuine hardship if they could no longer withdraw cash or if merchants stopped accepting cash. Alongside the decline in the use of cash for payments, the CPS suggests that consumers are holding less cash on-person, and are making cash top-ups less frequently.

Overall, the survey suggests that Australian consumers are continuing to switch to electronic means of payment in preference to cash, but that a substantial number of consumers continue to have a preference or need to use cash.

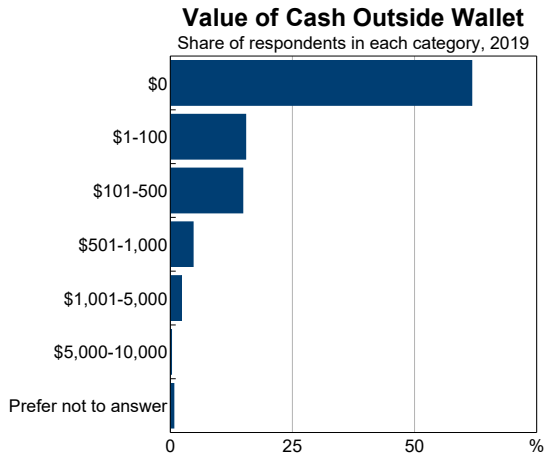
Graph 12



* Share of respondents who hold cash inside and/or outside their wallet

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

Graph 13

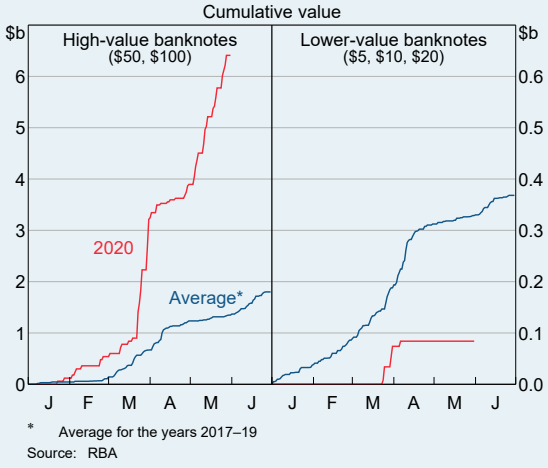


Source: RBA calculations, based on data from Roy Morgan Research

Box A: COVID-19 and Cash Demand

Over the second half of March 2020, and following the COVID-19 outbreak and associated social and economic impacts, a larger-than-usual volume of $50 and $100 banknotes, worth around $2.6 billion, were purchased by commercial banks to meet both current and expected future customer demand (Graph A1). These purchases were made in response to, and in anticipation of, increased store-of-wealth demand by the public; indeed, fears about COVID-19 prompted a shift from cash to contactless payment methods at the point of sale, reducing transactional cash demand. At the time, some banks noted a substantial increase in high-value cash withdrawals at branches, and a decline in cash deposits, although ATM withdrawals fell (RBA 2020). This sharp rise in demand abated in early April, although demand has since picked up again in anticipation of an easing in social distancing restrictions.

Graph A1
Banknote Purchases
Cumulative value



* Average for the years 2017–19
Source: RBA

To put the increase into perspective, the total value of banknotes in circulation grew by 5.6 per cent in seasonally adjusted terms over the March quarter, around four times faster than average, although by less than during the global financial crisis when the value of banknotes in circulation increased by 11.5 per cent over the final quarter of 2008.

Box B: Merchant Acceptance of Cash and Cards[2]

For a consumer to be able to use their preferred payment method, the merchant they are visiting must accept it. Most Australian merchants with a physical presence accept payment via both cash and card, although there are examples where this is not the case: Spice Alley in Sydney is card-only, while most people probably know of at least one café, restaurant, or take-away store that is cash-only.

To investigate the prevalence of cash- or card-only stores, we conducted a survey of randomly chosen retail outlets. The survey was run in January and February 2020, and retail businesses or services that had a physical shop-front were in-scope. So cafes, grocers, and hairdressers, for example, were included. But online-only stores, trades people, wholesalers, or any other type of business that a regular consumer would not typically walk into and buy something from were excluded. To generate a random sample of businesses to survey, we made use of the fact that every business in Australia has an 11-digit Australian Business Number (ABN). In particular, we randomly generated 11-digit numbers, used the government's ABN Lookup service to see if the number corresponded to an ABN, and, if it did, and that business was identifiable and in-scope, we contacted the business and asked them whether they accepted cash and/or cards as a payment method.[3]

In total we contacted 470 businesses, 467 of which accepted cash as a payment method and 462 of which accepted cards. As our sample was a random draw from the population of consumer-facing businesses with a physical presence, we can use these numbers to estimate the total share of in-scope Australian businesses accepting cash and/or cards (Table B1).[4]

Table B1: Share of Merchants Accepting Cash and Cards

January/February 2020

	Accept cash?	Accept card?
Number answering 'yes'	467	462
Total number surveyed	470	470
Estimate of share (per cent)	99.4	98.3
95 per cent confidence interval (per cent)	(98.1, 99.9)	(96.7, 99.3)

Source: RBA

Overall, our results suggest that the vast majority of consumer-facing businesses in Australia with a physical presence accept both cash and cards, and that consumers can in most circumstances freely choose which payment method to use. However, the survey was run before social isolation measures associated with COVID-19 were put in place, and it will be important to monitor merchant acceptance of cash and cards to see if the current crisis leads to any permanent change in practice.

Appendix A: Logit Regression Results

Table A1 shows the results of a regression where the dependent variable is whether or not a transaction was made using cash, and the explanatory variables either relate to the individual making the transaction (e.g. their age), or the transaction itself (e.g. the value of the transaction). In the table, the odds ratio for a given explanatory variable is defined as the probability of using cash given that a respondent/transaction falls within that variable category (e.g. the respondent is between the ages of 30 and 39), divided by the probability of using cash given that a respondent/transaction does not fall within that variable category; an odds ratio above 1 implies that using cash is more likely for that group or transaction type. The change in probability is the marginal change in the probability of using cash if a respondent/transaction falls within that variable. Odds ratios greater than one are associated with positive marginal changes in probability

Table A1: Logit Regression Results[(a)]

Dependent variable: whether or not a transaction was made using cash

Independent variable		Odds ratio	Change in probability
Gender	Male	1.23*	0.03*
Age (years)	30–39	1.72***	0.07***
	40–49	3.15***	0.16***
	50–64	4.74***	0.24***
	65+	5.00***	0.25***
Region	Capital city	0.95	−0.01
Occupation	Professional	0.72	−0.05
	Labourer or tradesperson	0.63	−0.07
	Managerial	0.68	−0.06
	Clerical or administrative	0.87	−0.02
	Sales	0.63	−0.07
	Unemployed	1.06	0.01
	Student	1.23	0.04
	Retired	1.03	0.01
	Other	0.45	−0.12
Maximum education	Diploma, certificate etc.	0.78*	−0.04*
	Bachelor degree or higher	0.65***	−0.07***
Household income	$40,000–$79,999	0.94	−0.01
	$80,000–$129,999	0.74*	−0.05*
	$130,000 and over	0.72*	−0.05*
Own credit card?	Yes	0.79**	−0.04**
Accessed internet in last three months?	No	1.88***	0.11***
Internet access on mobile phone?	No	2.12***	0.13***
Payment purpose	Food retail	1.93***	0.10***
	Goods	1.19*	0.03*
	Transport	0.40***	−0.11***
	Petrol	1.07	0.01
	Leisure	3.97***	0.24***
	Holiday	0.95	−0.01

Independent variable		Odds ratio	Change in probability
	Bills	1.80**	0.09**
	Services	1.17	0.02
	Other	3.68***	0.22***
Payment amount	$11–$20	0.51***	−0.12***
	$21–$50	0.28***	−0.22***
	$51–$100	0.16***	−0.29***
	Over $100	0.14***	−0.31***
Constant		0.36	n/a
Number of observations		11,178	n/a

***, ** and * represent statistical significance at the 1, 5 and 10 per cent level, respectively

(a) Estimated using transaction-level data with clustered standard errors; the base transaction is by a female aged 18–29 years who lives in a regional area, works in community or personal services, has an education level of Year 12 or below, has a household income of below $40,000, does not own a credit card, has accessed the internet over the past three months, and has mobile internet access, with the transaction itself $10 or less and made at a supermarket

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

Footnotes

[*] The authors are from Note Issue Department.

[1] Note that the survey was conducted before the emergence of COVID-19 and the associated social distancing measures, and so will not capture any change in behaviour that may have resulted from this; see 'Box A: COVID-19 and Cash Demand' for a discussion of banknote demand over recent months. The assumption that consumers can in general choose how they wish to pay – that is, that merchants typically accept both cash and cards – is discussed further in 'Box B: Merchant Acceptance of Cash and Cards'. Also note that survey respondents are unlikely to report any shadow economy transactions that they undertake; to the extent that these types of transactions are more likely to be made using cash than other payment methods, this may result in some understatement of the use of cash.

[2] Special thanks to Shanah Catley, Jayaprakash Narayanan, Aidan O'Hara, Jessica Pantic and Priyanka Ranjan for helping with this survey.

[3] Of roughly 5 million randomly generated numbers that conformed to the ABN number format (see <https://abr.business.gov.au/Help/AbnFormat>), around 100,000 were actual ABNs, of which around 10,000 were active, registered for GST and for entities that could possibly be retail businesses (e.g. excluding self-managed superannuation funds, unit trusts and the like), of which roughly 500 were retail businesses that we were able to contact.

[4] The number x of positive responses to the question 'do you accept cash?' can be thought of as a random draw from a Binomial distribution of size $n = 470$. The best estimate of the (unknown) probability p that a randomly selected business will answer 'yes' is given by x/n, while a $1 - \alpha$ confidence interval is given by $(B(\alpha/2, x, n - x + 1), B(1 - \alpha/2, x + 1, n - 1))$ where $B(q,b,c)$ is the q th quantile from a beta distribution with parameters b and c ; see Clopper and Pearson (1934). Note that we could only collect responses from businesses that were identifiable via an internet, White Pages or Yellow Pages search, and which we were able to contact, which could potentially introduce some bias into our results.

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Quality Change and Inflation Measurement

Stephanie Parsons[*]

Photo: Peter Dazeley – Getty Images

Abstract

Households' perceptions of inflation can differ from inflation as measured by the Consumer Price Index (CPI). One factor that may contribute to this difference is that the CPI seeks to take into account changes in the quality of many items that households buy. Around 2–3 per cent of the CPI basket is adjusted for quality change each quarter, with the prices of consumer durables most affected. While a range of methods have been developed to help statisticians identify and quantify quality change, it remains a challenging area of price measurement.

Introduction

Headline inflation has declined from an average annual rate of around 2¾ per cent over the 2000s to 1¾ per cent over the past five years. Households' expectations for inflation over the next year, as measured by the Melbourne Institute of Applied Economic and Social Research each month, have also declined over the same period but remain around 2 percentage points higher than actual inflation (Graph 1). Indeed, by this measure, households' inflation expectations have tended to be higher than actual inflation for more than two decades.

Despite lower measured inflation in recent years, concerns about the cost of living – both the level of prices and the rate of inflation – remain widespread in the community.[1] The quarterly NAB Consumer Anxiety Survey consistently finds that the cost of living is a more significant source of concern for consumers than their own health, job security and ability to fund retirement, or government policy. There are a number of potential explanations for why households remain concerned about the cost of living in an environment of low measured inflation:

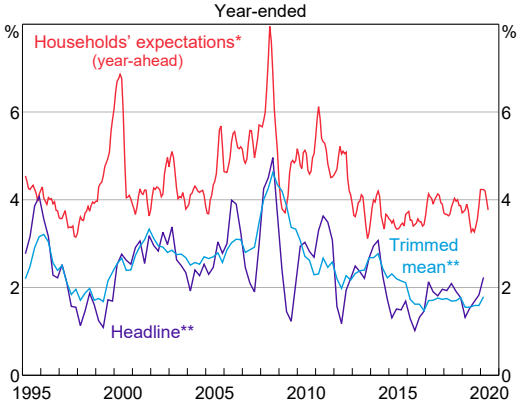
- Growth in aggregate household disposable income has been subdued over the past decade. Growth in aggregate household spending has also slowed over the same period (Cokis and McLoughlin 2020).
- Statistical measures of inflation are constructed using a fixed basket of goods and services. While this basket is representative of the spending of all households in aggregate in a given year, it is not necessarily representative of the spending of any given household in the current period. Statistical measures of inflation are also based on average prices, which might not be the same as the prices paid by a given household.
- Measured inflation seeks to take into account changes in the quality of items that households buy. However, it is difficult for households to adjust for quality change in their experience of inflation.
- Psychological biases can contribute to differences between measured and perceived inflation. For example, research suggests that when forming perceptions and expectations of inflation, individuals tend to overweight large price increases they incur and price changes for items they purchase frequently.[2]

This article focuses on the adjustment for quality in measured inflation. It explains why quality adjustment is necessary to ensure that statistical measures of inflation can serve a variety of purposes, but can lead to a gap between measured inflation and the inflation experienced by households. This article also explains why it is important for policymakers to be aware of the effect of quality adjustment on measured inflation.

Graph 1

Consumer Price Inflation

Year-ended



* Smoothed

** Excludes interest charges prior to the September quarter 1998; adjusted for the tax changes of 1999–2000

Sources: ABS; Melbourne Institute of Applied Economic and Social Research; RBA

How Is Inflation Measured?[3]

The CPI is a statistical measure of the prices of goods and services that households buy. The percentage change in the CPI provides a measure of consumer price inflation. Australia's inflation target is to keep the CPI rate of inflation between 2 and 3 per cent per annum on average over the medium term.[4] The CPI is often used in contract indexation, some wage negotiations and to produce inflation-adjusted economic statistics.

The Australian Bureau of Statistics (ABS) constructs the CPI each quarter by collecting millions of prices for the goods and services that households buy.[5] The items included in the CPI are chosen based on the spending patterns of households in capital cities and are fixed for a year. The ABS calculates average price changes for each item every quarter and aggregates these price changes into 87 expenditure classes (ECs). Using household expenditure weights for each EC, the ABS then calculates the overall rate of inflation for each capital city and all capital cities combined.

Statisticians can face many challenges when constructing measures of inflation. One issue that can often arise is that the features or characteristics of an item can change between periods. The CPI aims to capture only 'pure' price changes, so there is a need to account for any price change that has resulted from changes in the 'quality' of goods and services over time. Statisticians use a range of techniques to quantify changes in quality, some of which are discussed below.

An Example of Quality Change

The quality of a good or service is determined by its features or characteristics from which consumers derive value. Consider the case of mobile phones. Each year or so, mobile phone manufacturers tend to release new models with improved features, such as faster processors and better cameras. Statisticians

might not be able to observe the price of the old model in a given quarter because it has been discontinued, so instead must estimate the value of the improved features in the new model in order to make the old and new models comparable.

Using the specific example of an Apple iPhone, the launch price of new models has tended to be similar to or higher than the launch price of previous models (Graph 2).[6] If statisticians deem that consumers will place a positive value on the improved features in the new model, measured inflation will be lower than inflation observed from simply comparing launch prices. Indeed, the measured price of mobile phone handsets in the CPI has fallen by 18 per cent since mid 2015. Note that statistical quality adjustments aim to capture the average quality derived across all consumers; in reality, some consumers will derive more value or use from particular features than other consumers.

How Does Quality Adjustment Work in Practice?

The ABS performs quality adjustments in line with international best practice. In all cases, the ABS makes quality adjustments by changing the measured price of the old model in the base period to make it comparable with the observed price of the new model in the current period. Continuing with the mobile phone example, this would involve inflating the observed price of the old model in the previous quarter to be comparable with the price of the new model (with better features) available in the current quarter.

Because the nature of quality differs across goods and services, a range of methods are available to perform quality adjustments. These methods can be based on product size, production or retail costs, expert judgement and information from other items in the basket (ABS 2019a). For example:

- Motor vehicles are quality adjusted using the internationally recognised 'Delphi method'. When new models are introduced with different features, a panel of ABS analysts estimate the value of those features to consumers, with the median estimate used to perform the quality adjustment.
- Grocery items are often quality adjusted to account for changes in weight or volume. This type of quality adjustment tends to result in an increase in measured inflation because grocery items more commonly become smaller in size without a commensurate reduction in price ('shrinkflation'). The use of transactions 'scanner' data in the Australian CPI since 2014 has enabled the ABS to more easily identify and adjust for changes in the quality of grocery items arising from changes in size, weight or volume (ABS 2019b). These data capture detailed information on transactions at the point of sale and account for 16 per cent of all data in the CPI.

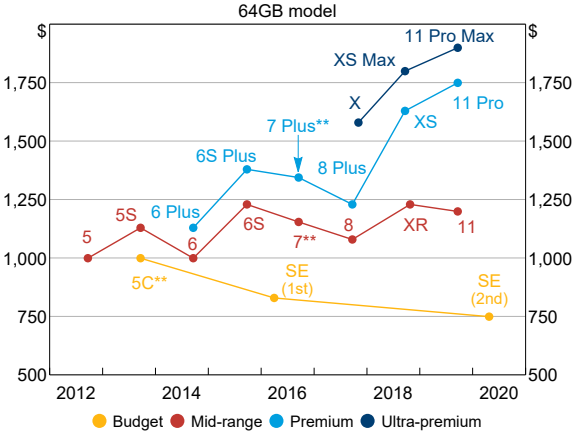
Another method for performing quality adjustments is hedonic modelling, which involves using a statistical model to estimate the price of an item based on its observable features. While the ABS does not currently conduct any hedonic quality adjustments internally, changes in personal computer prices are calculated based on a hedonically adjusted index produced by the US Bureau of Labor Statistics (ABS 2019a). This index shows that computer prices have fallen by around 25 per cent over the past five years.

Improvements in quality adjustment techniques over time have enabled statisticians to more accurately measure pure price changes. However, statisticians still face significant challenges

Graph 2

iPhone Launch Prices*

64GB model



* iPhone is a trademark of Apple Inc, registered in the US and other countries

** Estimated using prices for other storage capacities

Sources: Apple; RBA

estimating quality change for services. Changes in the quality of services can be difficult to measure objectively, and can occur slowly and subtly over time. Because of these challenges, the ABS adjusts a limited number of services prices for quality change (ABS 2019a; ABS 2019b).

How Prevalent Is Quality Adjustment in the CPI?

In a typical quarter, 2–3 per cent of items in the Australian CPI are adjusted for changes in quality (ABS 2019b). Some items are quality adjusted more frequently than others (Graph 3).[7] For example:

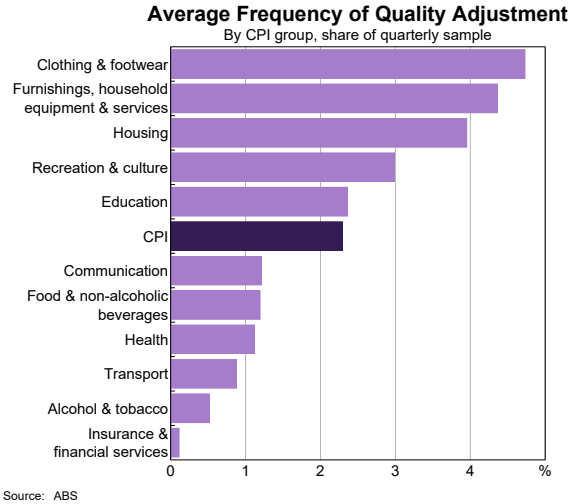
- **Consumer durables** prices are subject to the most frequent quality adjustment. The prices of items such as motor vehicles, furniture, household appliances and televisions are often quality adjusted to capture rapid advances in technology and the introduction of new models. Quality adjustments are also commonly made to clothing prices. This reflects the relatively high rate of stock turnover for clothing; when an item is no longer sold and is replaced in the CPI sample, this triggers a quality adjustment.[8] However, quality changes for clothing tend to be largely cosmetic, resulting in relatively small quality adjustments. Overall, quality adjustments to the prices of consumer durables tend to lower measured inflation.
- **Rents and new dwelling prices** are also frequently adjusted for quality change. For rents, these adjustments tend to be for compositional changes in the stock of rented dwellings or to account for major alterations and additions. No quality adjustments are made for maintenance or repairs that restore a dwelling to a previous level of quality. For new dwelling prices, quality adjustments reflect changes in dwelling designs as well as the use of purchase incentives and bonus offers such as upgraded appliances or additional features. The magnitude of quality adjustments for purchase incentives and bonus offers reflects both take-up rates and the estimated additional value to consumers. Liaison information suggests that purchase incentives and bonus offers for new dwellings were particularly prevalent over most of 2019 as housing activity slowed. Overall, quality adjustments to rents and new dwelling prices tend to lower measured inflation.
- **Grocery food** prices are adjusted for quality change arising from changes in product size. As discussed above, these adjustments tend to increase measured inflation. In the United Kingdom, researchers at the Office for National Statistics found that quality adjustments to grocery food prices have resulted in measured inflation being slightly higher than non-quality-adjusted inflation in recent years (Ochirova 2017; Corless 2019).

One of the few examples where services prices are quality adjusted in the CPI is education. Quality adjustments are mainly applied in the March quarter each year to reflect new school fees or changes in contact hours for tertiary students. Limited adjustments are applied to the prices of other services, usually on a case-by-case basis, owing to the difficulties associated with objectively measuring quality change.

Considerations for Monitoring Inflation

Although only a small share of the CPI basket is quality adjusted each quarter, the size of the adjustment can potentially be meaningful for some items. For example, since mid 2015 the measured price of televisions in the CPI has fallen by over 60 per cent, while the measured prices of computers, cameras and mobile phone handsets

Graph 3



Source: ABS

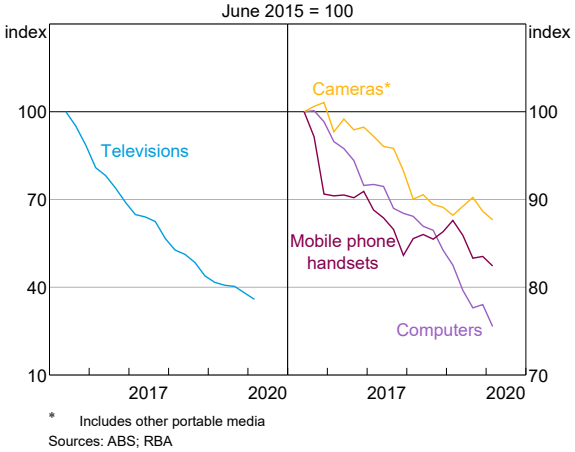
have fallen by between 12 and 24 per cent (Graph 4). The ECs that include these items – audio, visual & computing equipment and telecommunication equipment & services – have together subtracted around 0.2 percentage points from annual CPI inflation each year over the same period. Some of this decline in measured prices can be explained by quality adjustments to capture improved features stemming from technological change. Other factors such as increased competition in the retail sector and changes in the dynamics of exchange rate pass-through have also affected consumer technology prices over this period (Debelle 2018).[9]

Consumers, however, do not pay these lower quality-adjusted prices. As a result, differences between measured and observed inflation could affect households' perceptions of real interest rates and real income growth. This could, in turn, affect consumption, saving and investment decisions.

Quality adjustment could also in principle have implications for monetary policy. If a method change were to have a significant effect on measured inflation, this could alter the interpretation of overall inflation outcomes; if persistent, this could be a consideration for policy.[10] In addition, approaches to quality adjustment can also vary across national statistical offices while remaining within international standards, leading to differences in perceived real outcomes across countries.[11]

Graph 4

Consumer Technology Prices in the CPI



* Includes other portable media

Sources: ABS; RBA

Conclusion

CPI inflation is a measure of pure price changes for a fixed basket of goods and services purchased by households. Statisticians at the ABS use a range of techniques to remove from the CPI any price changes owing to changes in quality. Around 2–3 per cent of the CPI basket is adjusted for quality change in a typical quarter, with the prices of consumer durables most affected. However, households' perceptions of inflation can differ from measured inflation in part because the prices households pay reflect changes in quality as well as pure price changes. Differences between statistical measures of inflation and the inflation rate observed by households can affect households' perceptions of real economic outcomes.

Footnotes

[*] The author is from Economic Analysis Department and would like to thank the ABS Prices branch, particularly Leigh Merrington, for their extensive input.

[1] For a discussion of the conceptual differences between cost-of-living inflation and consumer price inflation, see Jacobs, Perera and Williams (2014).

[2] For a discussion of psychological biases that can affect perceptions of inflation, see Jacobs, Perera and Williams (2014).

[3] For detailed information on how the Australian CPI is constructed, see ABS (2019a). For a short explainer on inflation measurement, see RBA (2018).

[4] CPI inflation is a good target for monetary policy for several reasons: it is calculated independently of the central bank using a transparent method; it is widely recognised and easy to communicate; and it does not get revised (Cockerell 1999).

[5] For a discussion of the effects of the COVID-19 pandemic on price collection and inflation measurement, see ABS (2020).

[6] iPhone is a trademark of Apple Inc, registered in the US and other countries.

[7] ABS (2019a) outlines the structure of the 11 CPI groups presented in Graph 3.

[8] The introduction of 'fast fashion' retailers to the Australian market in recent years has increased the rate of clothing stock turnover.

[9] In addition, increasing data allowances for mobile plans have contributed to measured price falls in the telecommunication equipment & services EC.

[10] Hill (2004) argues that, in some cases, significant and permanent changes to quality adjustment methods may require a change in the inflation target.

[11] For example, Byrne (2019) finds large cross-country differences in mobile phone price inflation as well as differences in approaches to quality adjustment.

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Household Wealth prior to COVID-19: Evidence from the 2018 HILDA Survey

Nicole Adams, Cara Holland, Gabrielle Penrose and Lorenzo Schofer[*]

Photo: Nattakorn Maneerat / EyeEm – Getty Images

Abstract

This article examines the distribution of wealth in Australia prior to the COVID-19 pandemic and considers the implications for the financial resilience of households during the associated economic downturn. In terms of their wealth, most Australian households appear well placed to withstand a temporary fall in income. However, younger households and those working in industries most affected by activity restrictions are likely to be more vulnerable to income loss; only around half of these households could cover three months of expenses out of their liquid assets. Highly indebted households that experience shocks to their income and have limited liquid assets will also find this period particularly challenging. Policies to support household income, as well as those aimed at rescheduling debt repayments, should cushion these effects. The resilience of households will also depend on the timing and sustainability of the economic recovery.

Introduction

The outbreak of COVID-19 is causing major disruptions to economies globally, including Australia. These developments have affected the physical and mental health of Australian households and have also resulted in economic hardship for some due to a decline in income and wealth. An analysis of the distribution of household wealth prior to the pandemic is useful for understanding the financial resilience of households as they entered this challenging time. In particular, it is important to understand the distribution of liquid wealth (such as cash and deposits) and households' capacity to service their debts, as these can influence how resilient households might be if their employment situation changes.

This article explores the distribution of household wealth prior to the COVID-19 pandemic using the Household and Labour Dynamics in Australia (HILDA) Survey. The HILDA Survey is a longitudinal study that has followed a panel of approximately 9,000 households since 2001. Every four years the survey includes a wealth module, which collects detailed information on household assets and liabilities; the latest observation available is for 2018. The representative nature of the survey allows analysis of Australian household wealth (total assets minus total debt) over a range of dimensions and over time. The dataset also includes household demographic information, such as age, industry of current employment, and home ownership status, which is useful in trying to assess impacts of the current economic downturn. To track individual households over time, an individual is designated as the 'household head' and followed across waves of the survey.[1]

Average wealth increased strongly in recent years

Household wealth grew more strongly over the four years from 2014 to 2018 than in the decade prior (Graph 1). Over this period, real (inflation-adjusted) wealth grew by more than 4 per cent per annum, to be $930,000 on average in 2018, with median wealth around $500,000. The primary drivers of increased wealth were growth in the value of housing and superannuation.

Other measures of household wealth, such as the household-level data from the Australian Bureau of Statistics (ABS) Survey of Income and Housing (SIH) and aggregate data from the Australian System of National Accounts (ASNA) also indicate that wealth grew strongly over this period.[2]

Low-wealth households may be disproportionately affected by the COVID-19 economic shock

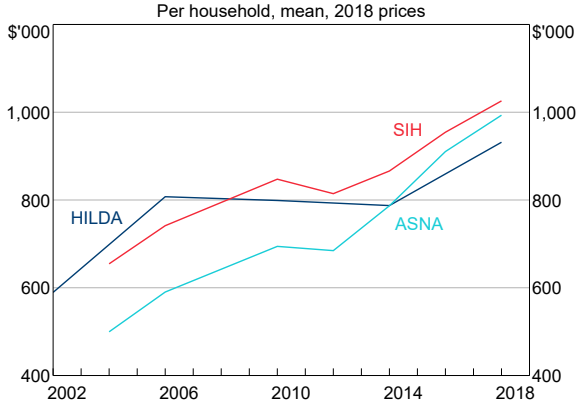
Some Australians are wealthier than others. The ages of household heads and the industry they work in both affect their incomes and thus their capacity to accumulate wealth, as well as the time they have had to do so. Households working in industries such as accommodation and food services, and arts and recreation services, typically had lower levels of wealth (Graph 2). This is partly because these workers earn less on average, and partly because they are disproportionately young people who have not had time to accumulate wealth.[3] Businesses and workers in these industries have been most affected by the current downturn, with one in three jobs in these industries lost between mid March and mid April of 2020 (ABS, 2020).

Households working in industries most affected by containment policies are more likely to work casually than workers in other industries, and are more likely to rent than own their own homes.[4]

Graph 1

Real Household Wealth

Per household, mean, 2018 prices

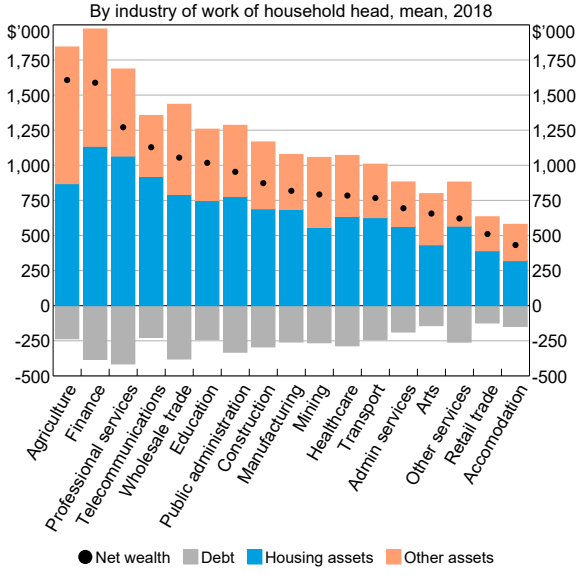


Sources: ABS; HILDA Survey Release 18.0; RBA

Graph 2

Household Wealth*

By industry of work of household head, mean, 2018



* Industries with less than 100 observations are excluded

Sources: HILDA Survey Release 18.0; RBA

Households headed by someone in casual work held, on average, around 30 per cent less wealth in 2018 than households headed by someone who was a permanent employee (Graph 3). Households that rent were much less wealthy than owner-occupier households, even when considering non-housing wealth, such as bank deposits and superannuation. This is partly because renters are on average younger than home owners.

Low-wealth households have smaller liquidity buffers to see them through the downturn

Total household wealth is likely not the best indicator of the financial resilience of households during a temporary contraction in the economy. Instead, it is the 'liquidity' of household wealth that will matter most, at least in the short term. Liquid wealth is defined as assets that can be readily and quickly converted and spent, such as bank deposits and equities. 'Liquid assets' can also include some share of superannuation balances to the extent that households meet the eligibility requirements to access the funds.[5]

Only about 15 per cent of total household wealth was liquid because a large share of assets held by households was in the form of housing or superannuation, which cannot be easily converted into cash. Liquid assets were much more unevenly distributed across households than total wealth: the bottom half of households when ranked by their liquid wealth held less than 2 per cent of all liquid wealth. By comparison, the bottom half of households held 9 per cent of overall wealth when ranked by wealth. Relatedly, the top 10 per cent of households held 44 per cent of liquid wealth, and 29 per cent of total wealth.

Low-wealth and younger households in particular held low stocks of liquid assets in 2018 (Graph 4). These assets are also small relative to expenditure: only half of households headed by someone under 35 held sufficient liquid assets to cover three months of their expenditure, compared with four-fifths of households headed by someone over 65. Household heads working in industries most affected by COVID-19 containment measures also had lower liquid asset buffers, with only half of households in service industries, retail, or accommodation and food services holding more than the equivalent of three months of expenditure in liquid assets, compared with 60 per cent of all other households.

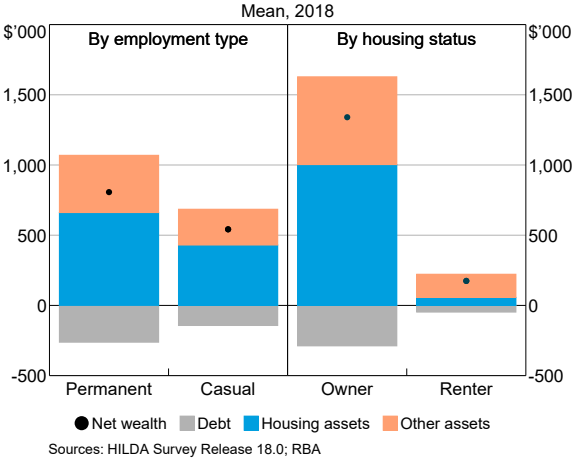
Indebtedness could pose challenges for some households, but appears manageable overall

When households are faced with changes in income over their lifetimes, debt can help to maintain their consumption and to accumulate assets, such as housing. The level of household debt in Australia relative to income increased noticeably

Graph 3

Household Wealth

Mean, 2018

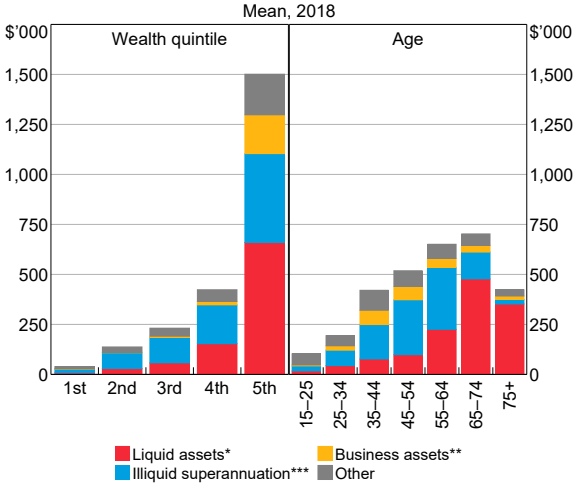


Sources: HILDA Survey Release 18.0; RBA

Graph 4

Non-housing Assets

Mean, 2018



* Cash deposits, equity & cash investments and retiree superannuation
** Value of any businesses owned by the household
*** Superannuation balances held by households yet to retire

Sources: HILDA Survey Release 18.0; RBA

over the four years from 2014 to 2018 and remains high by international standards; the aggregate debt-to-income ratio was close to 190 per cent in 2018.[6] High debt levels can test the resilience of households and their ability to maintain their consumption should they experience an unexpected decline in income. That being said, households with the greatest capacity to service debt – high-income households and households in their prime working years – held the highest levels of debt on average (Graph 5).

Housing debt accounted for a little over 80 per cent of household debt in 2018. High-income households and households headed by people between the ages of 35 to 64 held the largest share of housing debt (Graph 6). Conversely, low-income households and younger households held a small share of housing debt. However, as low-income and younger households are more likely to be employed in industries heavily affected by the virus containment measures, they may find it increasingly difficult to access credit. This is likely to result in challenges in entering the housing market in the near term. If these effects persist, their ability to use debt to accumulate wealth in the longer term will be inhibited.

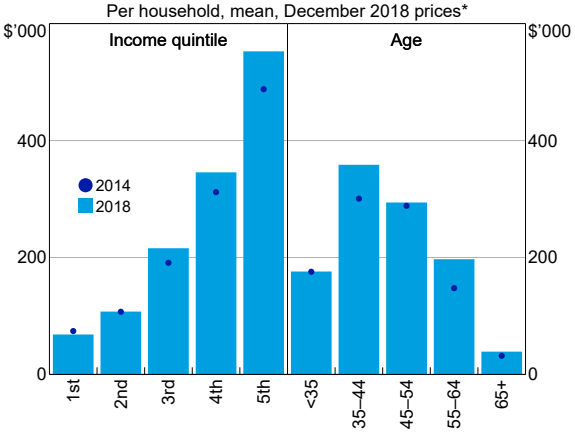
Investor housing debt was highly concentrated among high-income households. This is because high-income households have greater capacity to service debt and greater tax incentives to invest in rental housing. However, the potential low resilience of renters to the COVID-19 crisis poses a risk to indebted investors. Renters generally report experiencing more financial stress events than other household types and hold very limited liquid assets (RBA 2020). Given this, financial stress incidence is expected to be disproportionately high among renters during the COVID-19 crisis, though this will be largely mitigated in the short term by the introduction of rent discounts and deferrals, as well as a temporary suspension of evictions. While these support measures will assist renters, they will result in a permanent loss of rental income for investors. This may leave some investors vulnerable to mortgage stress, particularly those reliant on rental income to service their debts.

Of the households that have owner-occupier debt, the typical (median) low-income household allocated nearly twice the share of disposable income to meet their repayments than the typical high-income household (Graph 7). This suggests that some low-income households have limited capacity to service further debt and are more vulnerable to mortgage stress should they experience a decline in income. However, many households hold sizable buffers in the form of excess mortgage repayments (RBA 2020).[7] While the HILDA Survey does not provide information on excess mortgage repayments, liquid assets can act as an alternative measure of household buffers. High-income households with debt were much more likely to hold enough liquid assets to cover more than three months of housing debt

Graph 5

Real Household Debt

Per household, mean, December 2018 prices*



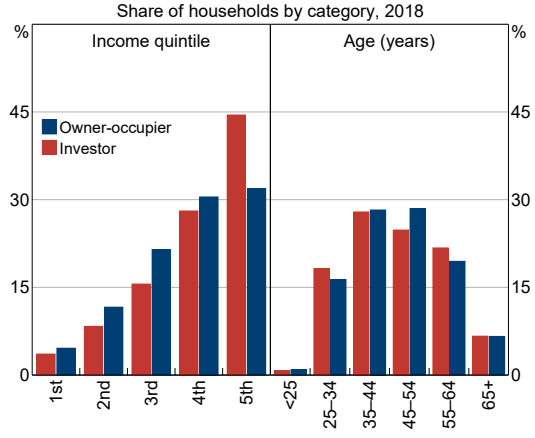
* Excludes households with no debt

Sources: HILDA Survey Release 18.0; RBA

Graph 6

Housing Debt

Share of households by category, 2018



Sources: HILDA Survey Release 18.0; RBA

repayments than low-income households. These buffers, alongside the temporary support measures to mortgagors (discussed below), may support the resilience of households affected by the economic downturn in the short term.

Government policies will ease the pressure on many households

The Australian Government has introduced a number of economic measures to support households during the current economic downturn. These include 'economic support payments' for eligible households and a temporary fortnightly income supplement for recipients of JobSeeker and other selected payments. There have also been temporary changes to eligibility and obligations under Services Australia payments, which has broadened the number of households that are able to access income support.

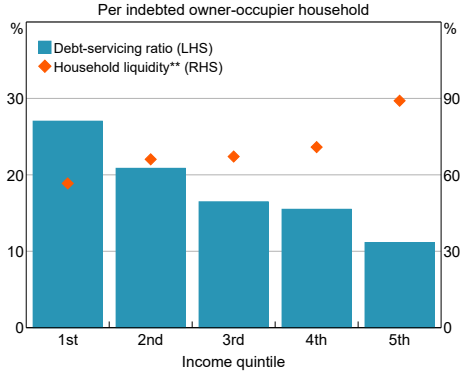
The government has also introduced the JobKeeper Payment, which pays a flat fortnightly wage to eligible workers at firms that have seen substantial declines in their turnover. Eligible workers include full-time and part-time employees, casual employees who have been with their employer for at least 12 months as at 1 March, including those who had been stood down after this date, and certain business owners. These temporary support measures will provide cash flows to many households affected by the economic downturn resulting from the COVID-19 pandemic, and should reduce the need for them to draw down on their liquid assets to cover their basic living expenses.

An additional program introduced to allow more than 1½ million people to access their superannuation early will support household cash flow, but could lead to lower wealth in the future, particularly if it takes some time for these households to rebuild their balances; for example, if withdrawal is followed by a period of unemployment. Eligible individuals are able to access up to $10,000 from their superannuation for each of the 2019/20 and 2020/21 financial years, effectively boosting their liquid assets. The conditions for this early access program include being unemployed, being made redundant or having working hours reduced by 20 per cent or more. Although households that are normally employed in the most affected industries are more likely to be eligible for early superannuation withdrawal, these households also tend to have the lowest superannuation balances. In 2018, one in three households working in food and accommodation services, retail trade, and other services industries held less than $20,000 in superannuation. There are also potential longer-term implications for the accrual of wealth from these early withdrawals because growth in superannuation comes in part from capital gains and interest and dividend earnings on existing balances, as well as from contributions.

Graph 7

Debt-servicing Ratios and Liquidity*

Per indebted owner-occupier household



* Median; include 'minimum' owner-occupier housing debt repayment as a share of household disposable income

** Share of households that held enough liquid assets to cover more than three months of housing debt repayments

Sources: HILDA Survey Release 18.0; RBA

Conclusion

Overall, many Australian households entered the economic contraction associated with the COVID-19 pandemic in a strong wealth position. However, some households are vulnerable to economic hardship. This is due to both the nature of the shock that has hit certain industries and workers more than others, and to the uneven distribution of household wealth, particularly liquid assets, across working households. Households working in the most affected industries are typically younger and less wealthy than others. They tend to hold fewer liquid assets, and as a result are more dependent on government policies to see them through this challenging period. Though these households hold less debt, they are also more

vulnerable to financial stress given their limited cash buffers and lower debt-servicing capacity.

Footnotes

[*] Nicole Adams and Lorenzo Schofer are from Financial Stability Department, Cara Holland is from Economic Analysis Department and Gabrielle Penrose is from Economic Research Department.

[1] The household head is determined by applying the following criteria, in order, until a unique person is selected: i) in a registered or de facto marriage; ii) a lone parent; iii) the person with the highest financial year income; and iv) the eldest person.

[2] For more information on the differences between HILDA and the aggregate national accounts, see Headey, Warren and Wooden (2008).

[3] Around one in four household heads working in service industries, retail, or accommodation and food services was under 30 years old, compared with around one in seven in all other industries.

[4] While here we only consider the industry of the household head, the majority of workers (around 60 per cent) in service industries, retail, or food and accommodation are not the head of their household. For these workers, 80 per cent live in households where the head does not work in one of these industries, meaning income losses in these households may be mitigated.

[5] Here we consider typical eligibility requirements, and exclude the government's early superannuation access scheme that has been implemented over recent months. Implications of the scheme are discussed in more detail below.

[6] See RBA (2020), 'Household Finances – Selected Ratios – E2', Statistical Tables, Household and Business Finance. Available at <https://www.rba.gov.au/statistics/tables/>.

[7] Alternative sources indicate that more than half of households with housing debt have over three months of mortgage repayments in offset accounts or redraw facilities. This suggests households are likely to have larger buffers than those implied in this article.

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HILDA Disclaimer

China's Residential Property Sector

Jonathan Kemp, Anirudh Suthakar and Tom Williams[*]

Photo: Liyao Xie – Getty Images

Abstract

The property sector is a significant driver of economic growth in China and a key source of demand for Australian commodity exports. Authorities have become increasingly wary of financial risks in the sector, and moved to reduce the importance of policies directed at real estate for managing short-run fluctuations in aggregate demand. The effect of COVID-19 on property sales and developer balance sheets necessitated a moderate easing of policy to support the real estate sector, but it only appears to have delayed rather than halted efforts to de-risk the sector.

Privatisation transformed the provision of housing in China

In recent decades, China's residential housing market has undergone significant reform. From the late 1990s, the provision of residential property shifted from being mainly provided by the state to a model where the private provision of housing dominates.[1] Urban home ownership rates have increased from around 50 per cent in 1996 to between 80 and 90 per cent in more recent years (Huang and Clark 2002; Yang and Chen 2014; Huang, Yi and Clark 2020). Chinese home ownership rates are comparable to those in many Eastern European nations, where high home ownership reflects the nature of privatisation in the post-communist period, and is well above the OECD average (Causa, Woloszko and Leite 2019; OECD 2019).

This high rate of ownership also reflects the role of property as an investment vehicle for Chinese households. Sustained property price inflation attracted household investment; around 22 per cent of Chinese urban households own multiple homes (Gan 2018). This has led to real estate accounting for around 60 per cent of household assets in China (Siyang 2020); the average ratio in advanced economies is around 50 per cent (Causa *et al* 2019).

Despite large private holdings of secondary investment properties, rental markets are still developing in China. Around 15 per cent of China's population live in rental housing, which is much

lower than the average in the OECD (JLL 2018; OECD 2020). This low rate reflects limited financial incentives for developers to build and manage rental housing themselves, and households preferring to leave property unoccupied and use it as a store of value. These factors contribute to China's high urban property vacancy rate, which was estimated at 21 per cent in 2017 (Gan 2018).

The property sector is significant to China's economy and Australia's exports

The growth in private home ownership led to residential investment accounting for around 20 per cent of China's GDP at its peak in 2016, which is very high by international standards (Graph 1). Growth in residential investment has contributed significantly to Chinese GDP growth over the past two decades through both direct and indirect channels (Graph 2). These indirect channels includes investment in equipment and purchases of materials used in construction, such as steel.

Given its size, cycles in Chinese GDP often reflect developments in the property sector, and housing represents a direct source of vulnerability for the Chinese economy. The concentration of household assets in property means that a significant decline in prices could also weigh on consumption as households respond to a reduction in their wealth.[2] In addition, proceeds from land use rights accounted for around a quarter of total revenues in the consolidated general government budget in 2019 and are a particularly important source of funding for local governments. Sharp falls in land sales revenue would put a strain on local government finances and could affect other fiscal spending. Such falls are rare but not unprecedented. For example, the slowdown in the Chinese property market between 2014 and 2015 resulted in a decline in land sales revenue of almost 25 per cent. This decline was quickly reversed, with land sales revenues increasing strongly in 2016 and 2017.

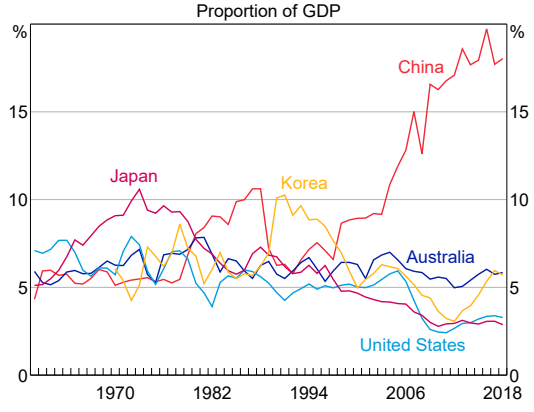
A prolonged downturn in property investment and construction would have considerable consequences for Australian exports. Housing construction in China is steel intensive. We estimate that residential property construction accounts for around one-quarter of China's steel consumption.[3] The effect of a downturn in housing construction would reduce the demand for iron ore and metallurgical coal (which together account for nearly half of Australia's exports to China). A slowing in household income and wealth that would result from such a downturn could also lower demand for other key exports, such as tourism and education services. Weakness in the Chinese economy could also affect Australian exports by lowering growth in other Australian trading partners.

The property sector is also important for financial stability in China. Property developers are among the most highly leveraged firms in the economy, including through their use of funding from non-bank lenders and presales.[4] Housing assets are also an important source of collateral for loans in the banking system; it is estimated that property is used

Graph 1

Residential Gross Fixed Capital Formation

Proportion of GDP

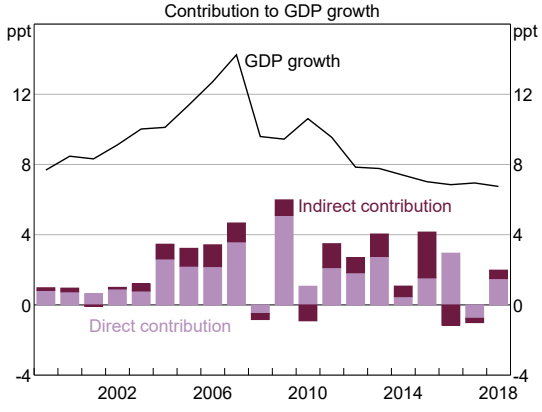


Sources: CEIC Data; NBS; OECD; RBA

Graph 2

China – Residential Investment

Contribution to GDP growth



Sources: CEIC Data; NBS; OECD; RBA

as collateral for around half of all bank loans (Borst 2014; Tham 2017). Given limited direct financial sector links between China and Australia, the transmission of a shock induced by the Chinese financial sector is likely to be mediated by lower activity in China or through global financial markets (Guttmann *et al* 2019).

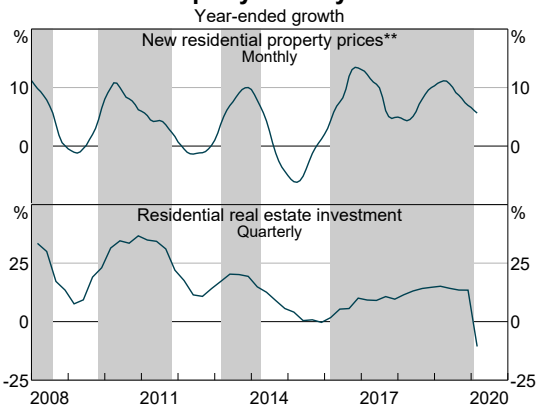
Government policy has had a large influence on price cycles in recent decades

Key indicators of activity in China's property markets – including prices, sales, developer financing and investment – have exhibited cyclical behaviour. The timing and duration of these cycles are influenced to a considerable extent by government policy (Graph 3). Authorities have used various policy tools to both constrain and stimulate activity in the property sector, which has been motivated by a desire to exert control over property prices and economic growth. Over 2010–11, authorities made it more expensive and difficult to access mortgage finance and implemented some restrictions on the number of properties households could purchase, which led to lower property price inflation (Cooper and Cowling 2015). In 2012, authorities eased some of the financing restrictions, and housing price inflation started to rise. A similar pattern of tightening and easing broadly characterised other property market cycles over 2006–09 and 2013–14.

The central government has historically taken a leading role in guiding property policy, but there has been an ongoing push to shift more of the responsibility to local governments (State Council 2011; Shu and Zhang 2019). Formalised as the 'one city one policy' strategy, this push gave local authorities more freedom in setting policies that are appropriate for their property markets (Liu and Qin 2019). Divergences in policy have become more apparent in recent years, as areas with struggling property markets (particularly smaller 'third-tier' cities) introduce more stimulatory measures, while other cities continue to focus on tightening market conditions and constraining price inflation.[5] Nevertheless, cases where higher authorities overruled local authorities show that there are some limits to policy independence.

Graph 3

China – Property Activity Indicators*



* Shaded bands denote periods where central government policy has generally been tightening

** Index growth

Sources: CEIC Data; RBA

The government has also put forward plans for a 'long-term mechanism' – a series of reforms that aim to stabilise property price inflation by increasing the supply of housing and disincentivising speculation (Ding and Lian 2018). This mechanism is seen as an alternative to the short-term shifts in policy that have characterised property market cycles in China (Fan 2017). However, these reforms are unlikely to be fully implemented in the near term. For instance, the introduction of a property tax, one part of the mechanism, has been repeatedly delayed.[6] This tax is designed to reduce speculative behaviour by imposing a cost on the owners of empty homes. However, trial programs in Shanghai and Chongqing in 2011 were limited in scope, and reportedly had little impact on price growth (Rutkowski 2014; China Daily 2013). The lack of further trials in other cities suggests that there remain significant obstacles to the implementation of a national property tax. Other parts of the mechanism, such as the creation of interconnected clusters of cities, appear to be progressing more quickly (e.g. the Pearl River Delta, the Yangtze River Delta, and the Beijing-Tianjin-Hebei area).

The tightening of housing policies since 2016 has been more targeted than in the past

The period from 2016 onwards has seen authorities focus on controlling property price inflation and reducing financial risks in the property sector.

Numerous measures were announced to restrict the flow of credit to both buyers of property and developers, including higher interest rates on mortgage loans and restrictions on developers' bond issuance. A number of cities also introduced restrictions that blocked secondary market sales of newly-purchased housing for periods of two to five years (Sohu 2019). While, as in previous periods, property price inflation fell following the implementation of these tightening policies, the decline was more pronounced in the largest 'first-tier' cities. Price inflation moderated more slowly in medium-sized and smaller cities. Eftimoski and McLoughlin (2019) suggest a combination of uneven policy measures (stricter restrictions in larger cities and looser conditions in smaller cities) and differing demand and supply conditions as explanations for the different pace of changes across city groups.

Housing subsidies provided by authorities under the 'shantytown' redevelopment program have partly offset these tightening policies, particularly in medium-size and smaller cities. Under the program, residents can replace substandard existing housing with either a better quality home or cash compensation that can be used to purchase new housing, although a survey has found that this cash has also been used to increase consumption and pay down debt (Wu 2018). The program has supported activity in property markets and helped reduce developer inventories of unsold housing. However, some officials have claimed that the provision of cash subsidies has contributed to a sharp increase in housing prices in some cities. The program has been scaled back in recent years and is expected to end in 2020.

While official data suggest that housing prices began to accelerate again from mid-2018, alternative data from a private data provider suggest that housing price inflation has been muted in first-tier cities and continued to ease in smaller cities, albeit at a slower pace (Graph 4). The difference between the two measures appears to be due to differences in the reporting of transacted prices. More recently, both the alternative and official measures have started to converge for medium-size and smaller cities, although they still differ in their description of property price inflation in 'first-tier' cities.

Consistent with their push to reduce financial risks in the sector, authorities have shown their willingness to reduce the Chinese economy's reliance on real estate as a source of growth in recent years. The government announced in late 2019 that proceeds from newly issued local government special bonds could no longer be used to finance real estate projects.[7] Previously, much of this bond issuance had flowed to the real estate sector as local governments used proceeds to fund shantytown redevelopment and purchases of land. Mortgage rates have remained high and authorities have been active in looking to limit the flow of other consumer credit that ends up in real estate, with a series of bank inspections conducted by regulators in 2019 to check that non-mortgage loans were not being directed to property (Wu and Han 2019).

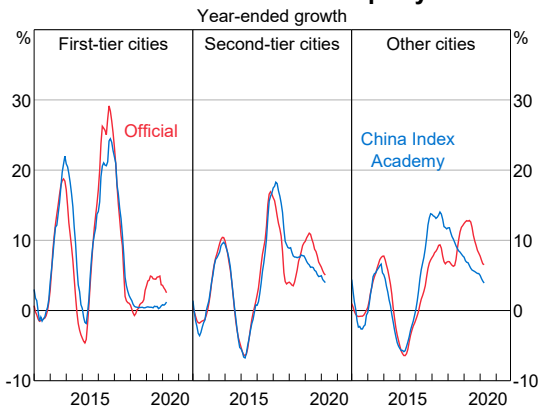
Developer financing has come under increasing pressure

Property developers have typically financed their operations through a variety of funding channels (Graph 5). The most important of these are payments for properties sold off the plan (presales) and 'self-raised' funds, a broad category that includes equity financing. Domestic lending from bank and non-bank financial intermediaries is also a key source of funding; bond issuance, although volatile, has become more important in recent years.

Graph 4

China – New Residential Property Prices

Year-ended growth



Sources: CEIC Data; China Index Academy; RBA

Authorities' ongoing efforts to reduce the amount of finance flowing to property developers reflect a desire to limit 'speculative' behaviour that would bid up the price of land and ultimately feed into higher property prices (Hugage 2019). Government officials have also noted that the real estate sector crowds out other, more productive industries in credit markets, and this likely serves as additional motivation for their push to control the flow of funds into the sector (Li and Yang 2019). This push has led to changes in the funding mix used by developers.

Authorities have pressured banks not to lend funds for land purchases. While local governments appear to have taken the lead on this (Yang and Mitchell 2016), Yao (2019a) notes that developers have been banned from using bank loans to buy land nationally. In response to these restrictions, developers appear to have increased their dependence on non-bank sources of funding, supplied indirectly by banks and by more lightly regulated non-bank financial intermediaries.

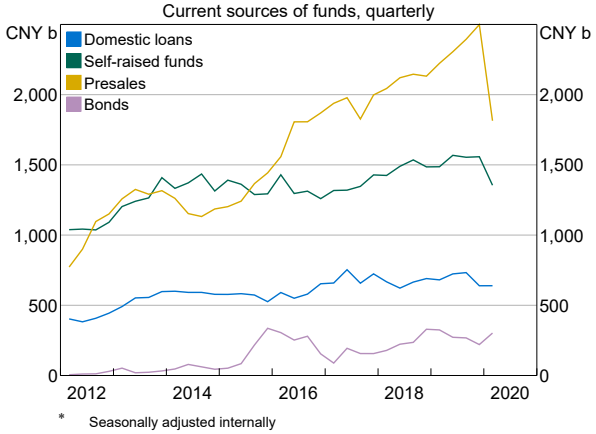
Non-bank sources of funding are considered to be particularly important for smaller developers who lack access to varied sources of finance, and rely on these loans to fund new projects (Feng and Wright 2019). Trust company investments (one source of non-bank financing) in real estate grew strongly through 2017 and 2018, while investments in other industries were contracting as a result of broader efforts by authorities to reduce the amount of non-bank financing in the economy (Graph 6). More recently, authorities have stepped up their efforts to limit the flow of non-bank financing to the real estate sector and have focused specifically on trust companies, leading to a decline in trust company investments in real estate.

Larger developers have increased their use of bond financing in recent years (Graph 7). However, this source of funding is also subject to regulatory risk. For instance, in mid-2019 developers were banned from issuing foreign-currency-denominated bonds unless they guaranteed that the proceeds would be used to pay down maturing, long-term foreign currency-denominated debt (Chen and Leng 2019). Despite these restrictions, total foreign currency issuance in 2019 was substantially higher than in prior years. Restrictions on foreign currency issuance have been eased recently, as funding pressures on developers have escalated due to the impact of the COVID-19 pandemic on property markets (Yoon and Xie 2020). However, developers may struggle to take advantage of this by increasing issuance, as yields on US dollar (USD) developer bonds have risen in recent months (Jim and Shen 2020).[8] This makes it more expensive for developers to issue new debt or refinance existing obligations. These issues add to concerns about the ability of developers to repay their foreign currency bonds, as required repayments will also increase significantly in coming years. Furthermore, research suggests that developers have not generally hedged their foreign currency exposures and a depreciation of the Chinese renminbi (RMB) could

Graph 5

Real Estate Developer Financing*

Current sources of funds, quarterly



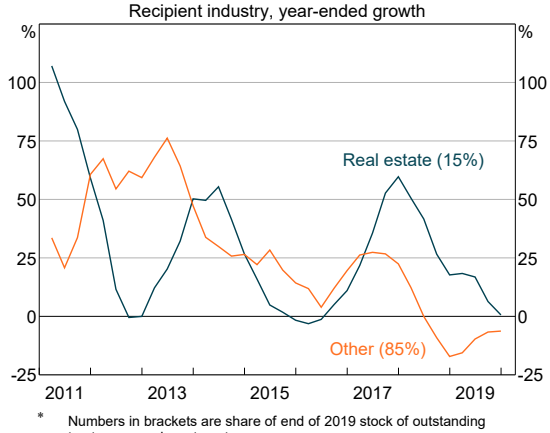
* Seasonally adjusted internally

Sources: CEIC Data; RBA

Graph 6

China – Trust Company Investments

Recipient industry, year-ended growth



* Numbers in brackets are share of end of 2019 stock of outstanding trust company investments

Sources: CEIC Data; RBA

worsen the pressure on their finances (Chui, Illes and Upper 2018).

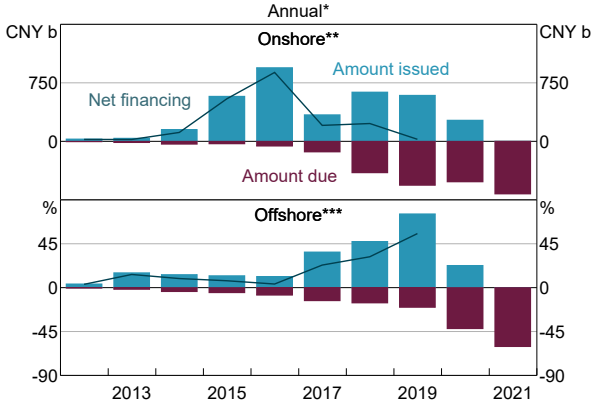
While recent restrictions on the issuance of RMB bonds by developers have tended to be more targeted, this issuance is similarly exposed to regulatory risk.[9] The sharp increase and subsequent decline in RMB bond issuance by developers between 2015 and 2017 was driven by the relaxation and reintroduction of restrictions by regulators.

Increased reliance on presale funding has affected construction investment

Developers have responded to restrictions on accessing other sources of funds by increasing their use of presale funding (Graph 5). While presales have long accounted for the bulk of new residential property sales in China, their share has increased from around 80 per cent to almost 90 per cent since 2016. The importance of this source of funding comes from two distinctive features of the property market. Firstly, buyers often pay the full price at the time the presales contract is signed, so the average value of presales is generally large (Zhou, Zahirovic-Herbert and Gibler 2018). Secondly, in contrast to Australia, presale funds are generally not required to be held in escrow until the property is delivered, although projects are required to have a set completion timeline and meet construction goals before presales are permitted (Bird 2019; Swanson 2014). This means presales are effectively interest-free debt that is repaid through the provision of completed housing.

Graph 7

Real Estate Developer Financing



* Partial data for 2020
** Bonds denominated in Chinese renminbi (CNY)
*** Bonds denominated in foreign currencies (USD, HKD, EUR, JPY, SGD, MYR)

Sources: Dealogic; RBA; WIND Information

A number of restrictions announced by local governments recently suggest that policymakers are becoming more concerned about the risks posed by presale funding. The city of Xi'an is moving to require presale funds to be held by a third party, while the province of Hainan has decided to prohibit presales entirely (Xi'an Housing and Urban–Rural Development Bureau 2019; Wang and Lu 2020).

The increasing reliance on presale funding helps explain changes in the composition of growth in developer investment. Growth in developers' expenditure on construction has been noticeably weak in recent years, while growth in land sales for new residential plots has been stronger (Graph 8). Market reports suggest that, from at least mid-2018, developers have been delaying construction and stretching delivery deadlines beyond contracted deadlines, even as they have prepared land for new construction projects. While regulatory requirements mean that developers are penalised for not commencing construction soon after a land purchase, it appears likely that developers are also starting construction in order to receive approval to presell projects.[10] The lack of an escrow requirement means that funds raised from presales can be used elsewhere (e.g. for additional land purchases or to complete construction on other projects). This has reportedly been a popular strategy for developers to continue growing in an environment where other sources of funding are constrained (Bloomberg News 2018).

However, construction can only be delayed for so long and the stock of presold construction obligations appears to have been growing in recent years – developers have presold more apartments, but there is little evidence that construction has been increasing proportionately.[11] Using official sales data and estimates of the average timeline for construction allows us to provide a rough estimate of when presold apartments will come due.[12] This exercise suggests that a large amount of presold housing will need to be delivered in coming years to meet the rapid rise in presales obligations (Graph 9). The build-up of these obligations may

explain the increasing growth in construction expenditure over 2019, although the strength of this growth is unlikely to be repeated this year as developers suffer cash flow issues due to the impact of the COVID-19 pandemic on presales funding, which declined by 27 per cent in the March quarter.

Tighter financial conditions have also played a role in further weakening the financial positions of smaller developers, who tend to be less profitable and more indebted, fuelling an increase in consolidation within the property sector since 2016 (Graph 10).[13] The consolidation reflects increased mergers and acquisitions activity between real estate companies and reports of an increasing number of bankruptcies (Liu, Wang and Guo 2019). The COVID-19-induced shock to sales revenue has likely further reduced small developers' ability to access funding and continue operating, and is likely to contribute to further consolidation.

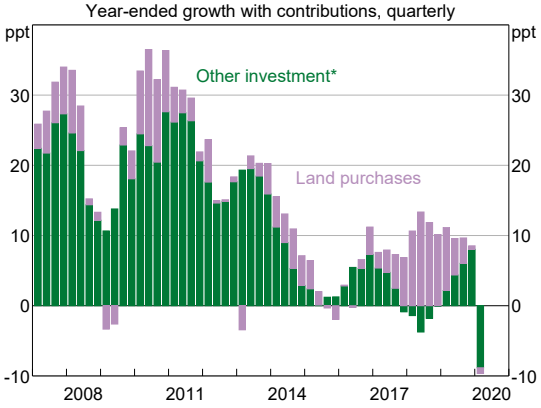
COVID-19 has been a significant shock to China's property sector

Starting from the 2020 Chinese New Year holiday in late January, property transactions effectively ceased and construction sites were closed as a result of restrictions put in place to slow the spread of COVID-19 (Graph 11). The recovery has been gradual following the easing of the restrictions, although property sales are now around their levels from previous years. Despite the disruption, property prices have been broadly stable, perhaps reflecting some offsetting effects from simultaneous lower demand and supply.

Graph 8

China – Real Estate Investment

Year-ended growth with contributions, quarterly



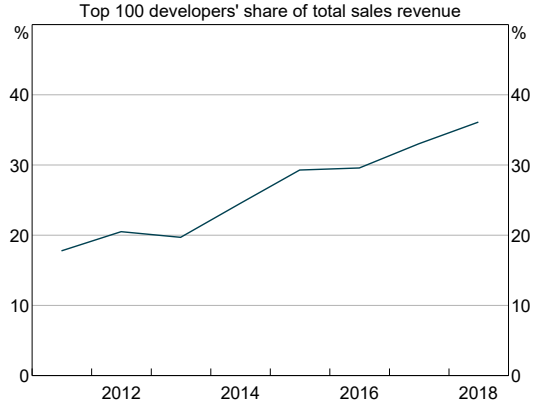
* Construction, installation, equipment purchases and other

Sources: CEIC Data; RBA

Graph 10

Real Estate Sector Concentration

Top 100 developers' share of total sales revenue



* The 100 largest listed developers by sales revenue according to China Real Estate Information Corporation (CRIC); nine companies are excluded due to a lack of data

Sources: CEIC Data; CRIC; RBA; WIND Information

Graph 9

Estimated Presold Construction Obligations

Quarterly

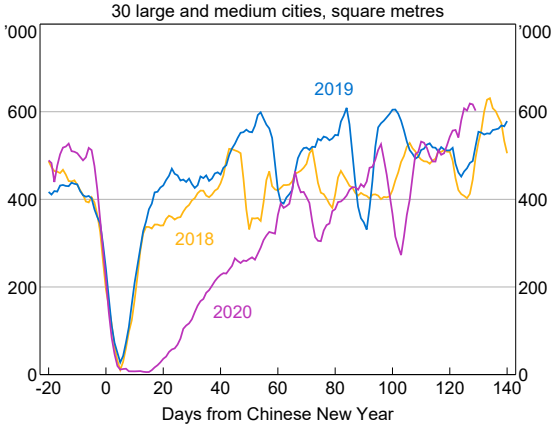
* This does not account for the value of presold housing that has been delivered

Sources: CEIC Data; RBA

Graph 11

China – Property Sales*

30 large and medium cities, square metres



* Seven-day moving average

Sources: RBA; WIND Information

Consistent with their approach over recent years, authorities continue to resist introducing significant stimulus in the property sector. Central regulators have emphasised they do not see real estate as a means to stimulate the economy in the short term, and intend to 'maintain the continuity, consistency, and stability of real estate financial policies' (People's Bank of China 2020). Authorities have been emphasising infrastructure spending (through increased special bond issuance) as a way to boost economic growth, while they continue to de-emphasise the property sector.

Despite the unwillingness to introduce stimulus, the severe shock to the property market as a result of the COVID-19 pandemic has clearly changed the near-term imperatives of property policy. As with actions in other industries, authorities have attempted to mitigate cash flow issues by directing concessional bank lending to firms facing demand shocks, and facilitating bond issuance by easing restrictions. Local governments have also implemented various policies to support developers, including additional flexibility in delivering properties and making it easier for projects to be presold. Still, a focus among developers on bolstering balance sheets may continue to weigh on property investment in coming months.

Local governments have led the response on supporting property demand, through varied policies including small reductions in mortgage rates and downpayment ratios, relaxed presale conditions and facilitating later payment transfers (*Beijing Evening News* 2020). At least 12 cities have withdrawn such measures shortly after they announced them, suggesting that the measures as originally announced may have ultimately been considered too much of a relaxation of policy (Ouyang 2020). Policy easing at the local level is likely to be in place until local authorities are satisfied that their property markets have stabilised.

Beyond the recovery, the decline in investment spending resulting from the conclusion of the shantytown development program will be only partially offset by a program that subsidises renovation of older residential compounds. Over the longer term, we expect residential construction growth to decline gradually as growth in the urban population and disposable income slows. Construction activity will be increasingly driven by replacement of older stock, a phenomenon which is already occurring in the Beijing and Shanghai housing markets. There are both upside and downside risks to this long-term view. Cities with high vacancy rates may be able to absorb substantial numbers of rural-to-urban migrants without the need for further construction. Conversely, demand for newer, better-quality housing as average incomes rise may result in greater replacement activity.

Conclusion

The economic shutdown induced by the COVID-19 outbreak presents the Chinese residential property sector with its greatest shock in recent years. Still, the response by authorities – to ease restrictions only marginally and steer clear of applying significant stimulus – suggests that they remain wary of risks that have built up in the sector.

Even if the recovery is slow and – as expected – property's contribution to China's GDP growth falls, over the long term the Chinese residential property sector is likely to continue to consume a significant quantity of steel and contribute to demand for Australia's key resources exports.

Footnotes

[*] Jonathan Kemp and Tom Williams are from Economic Group. Anirudh Suthakar contributed to this work while in Economic Group.

[1] Private buyers do not own land, but lease it from the government for a period of 20 to 70 years (Zhang 2015). While it is likely that leases will be automatically renewed without cost after expiration, this is not guaranteed.

[2] There is considerable variation in academic estimates of the impact of changes in housing wealth on consumption in China. For instance, He, Ye and Shi (2019) find that a 1 per cent increase in housing wealth would increase consumption by 0.3 per cent, whereas Zhang and Cao (2012) and Chen, Hardin III and Hu (2018) report a 0.1 per cent increase in consumption.

[3] Platts (2019) estimate that property accounts for around 35 per cent of steel consumption in China. Assuming that the steel intensity of residential and non-residential construction is similar, the residential share of floor space completed (71 per cent in 2019) suggests that residential property accounts for 25 per cent of total Chinese steel consumption.

[4] Non-bank lending is generally considered to be riskier than traditional bank lending as it is less regulated and can enable banks to circumvent restrictions on lending to riskier borrowers.

[5] Cities in China are commonly grouped in 'tiers' according to size, ranging from the largest 'first-tier' cities to medium-size 'second-tier' and smaller 'third-tier' cities.

[6] Other aspects of this plan include accelerating the development of rental markets and focusing on the creation of urban clusters around large cities.

[7] In contrast to standard local government bonds, special bonds are used to finance specific projects and revenues from these projects should directly fund repayments on the bond (Holmes and Lancaster 2019).

[8] Most foreign currency debt issued by developers is denominated in USD.

[9] The ability of specific developers to issue debt domestically was restricted in response to 'overbidding' for land (Wu and Jia 2019). Regulators also explicitly barred developers who had not met regulatory requirements from financing projects through issuing bonds.

[10] National regulation mandates that a developer can be charged fees proportional to the amount paid for land use rights if a project has not started within one year of the land use rights being acquired, and the land use rights can be reacquired by the government without compensation if a project has not commenced within two years (The Supreme People's Court of the People's Republic of China 2015).

[11] Data on finalised construction is incomplete as it relies on developers self-reporting when projects are finished, but available evidence from other sources suggest that the pace of construction has slowed in recent years, not increased.

[12] The average timeline to construction has grown from two years to around two-and-a-half years (Yao 2019b). We have used plausible assumptions about the distribution of construction around these averages and available monthly data on the value of presold housing to construct an estimated time series of presold construction obligations. Caveats to this analysis include a lack of precise information on the distribution of construction around the average, and a lack of data on presold construction obligations that have been delivered.

[13] Of over 90,000 firms in the property sector, the majority are smaller developers.

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