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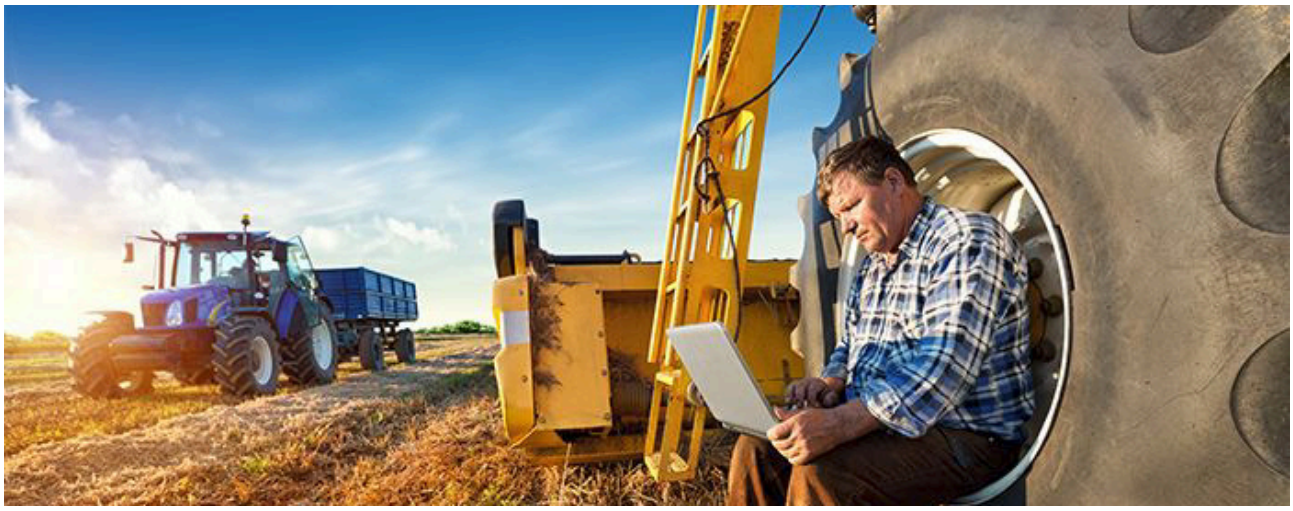
Which Firms Drive Business Investment? New Evidence on the Firm-size Distribution

Lachlan Dynan[*]



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Abstract

Business investment plays a key role in our current and future economic prosperity. Aggregate investment can be difficult to predict, however. This may be because different firms face different investment environments, and the factors behind their decisions can vary. This gives rise to the question: which types of firms are most important for driving aggregate outcomes? Detailed, firm-level data shows that large firms account for a significant share of investment in Australia, and are the major drivers of the patterns in aggregate non-mining investment. Understanding how firms of various sizes contribute to overall outcomes will help us to gauge the potential impact of any differences they might face, including via policies, on investment outcomes and the economy.

Introduction

Business investment is an important determinant of both current and future economic outcomes. Investment in assets – such as machinery, buildings and software – not only supports current economic activity, but also adds to the economy's productive capacity and income-earning potential. Despite its importance for current and future economic growth, trends in aggregate investment have proven difficult to model. Investment is one of the most volatile components of GDP, which makes it hard for economic models to explain changes from quarter to quarter or even between years (Cockerell and Pennings 2007). Longer-term trends, such as the weak levels of non-mining investment over the past decade, have also been difficult to fully explain (Hambur and Jenner 2019; van der Merwe *et al* 2018).

The sum of many (different) parts

Aggregate business investment is the sum of the investment decisions of many firms across the economy. Traditionally, economic models of aggregate investment have made the (implicit) assumption that the factors affecting firms' investment decisions are similar across all firms. However, there is an increasing appreciation that there may be more variation than was once assumed. Firm size has been found to be associated with important differences in the factors that may influence firms' investment decisions. For example:

- There are large differences in the cost of debt, with smaller firms typically paying higher interest rates than larger firms. The onset of the global financial crisis saw differences between small and large business lending rates increase further (Hambur and La Cava 2018b).
- Smaller firms typically find it harder to access external finance compared with larger firms, which means internal financing (such as cash flow) may be more important for investment (Carpenter and Petersen 2002).
- Smaller firms' balance sheets and credit access may be more affected by monetary policy shocks (Gertler and Gilchrist 1994; Ehrmann 2000).
- Uncertainty has been shown to affect firm investment behaviour (Bloom 2009; Moore 2016), and studies suggest smaller firms may be more sensitive to changes in uncertainty than larger firms (Ghosal and Loungani 2000).
- Changes in the economic cycle can be felt differently across the firm-size distribution. Studies have found that smaller firms experience larger fluctuations in sales and investment over the business cycle (Crouzet and Mehrotra 2020), and their revenue streams are generally more volatile from period to period (Connolly, Norman and West 2012). The COVID-19 pandemic is likely to have affected smaller firms more severely compared with larger firms (Lewis and Liu 2020).
- Firms of different sizes can face different tax obligations, some of which may be directly relevant to investment decisions such as depreciation allowances. Depreciation allowances were introduced by the Australian Government during the global financial crisis and again during the pandemic. In both instances, the benefit to firms varied according to their size (Rodgers and Hambur 2018).

How might these differences translate to aggregate investment outcomes? A key piece of information to link the firm-level outcomes to overall outcomes is an understanding of the firm-size distribution of investment – that is, how much firms of differing sizes contribute to overall investment outcomes. However, until now, our insight into the firm-size distribution of investment has been limited.

Globally, some notable studies have highlighted the importance of the firm-size distribution for understanding aggregate output outcomes (see Gabaix 2011), and there have been a few extensions into the area of investment, with similar findings (Gala and Julio 2012; Grullon, Hund and Weston 2013). Large, firm-level data sets using administrative sources have become increasingly available for research purposes over recent years, and this has made the construction and analysis of full distributions of investment, output and other economic variables feasible and reliable, both in Australia and overseas.

Data and approach to constructing the distributions

This article draws on the Australian Bureau of Statistics (ABS) Business Longitudinal Analysis Data Environment (BLADE) to construct distributions of investment and output by firm size. BLADE combines annual business tax data from business activity statements (BAS) with information from ABS surveys and other administrative data, covering almost all Australian companies and unincorporated businesses. BAS data contains information on firms' output (revenue), capital purchases (investment), wages and operating expenses.

The focus is on private businesses (incorporated and unincorporated) in the non-mining sector, from 2001/02 to 2016/17. The mining sector is excluded as it is well known that it is dominated by a handful

of very large firms, whereas very little is known about the non-mining sector. This analysis only includes data up to 2017 because small businesses were no longer required to report capital expenditures to the Australian Taxation Office (ATO) in their BAS from 2018. Firms with annual output less than $10,000 have also been excluded.

In this work, firms are classified by revenue (hereafter referred to as output). For each year of the sample period, firms are categorised based on their output using two different approaches: ranked by percentiles; and grouped by pre-defined size categories (small, medium, large and very large).

Large firms account for a very large share of business investment …

Business investment is highly concentrated in the economy's largest companies. The top 20 per cent of firms by output represent around 80 per cent of all investment, while the top 1 per cent of firms account for around half of all non-mining investment activity (Graph 1).

Around 93 per cent of all firms by number are small businesses (with annual output of less than $2 million), and a further 6 per cent are medium-sized (with annual output above $2 million but less than $50 million) (Graph 2; Graph 3; Graph 9 in Appendix).[1] Together, small and medium enterprises (SMEs) represent more than 99 per cent of all private non-mining firms, but around 60 per cent of non-mining investment.[2]

Large firms ($50 million to $5 billion output) represent just 0.3 per cent of all firms but account for more than one-third of all investment. Very large firms (more than $5 billion annual output), of which there were only around 30 in 2017 (or 0.005 per cent of firms), accounted for just under 10 per cent of all investment activity.

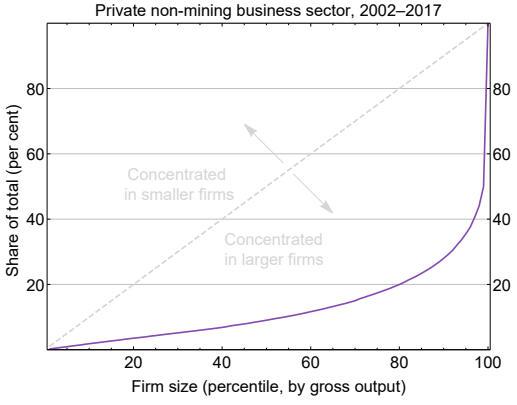
… and are the major drivers of the growth patterns and volatility in aggregate investment

The concentration of investment among the economy's largest firms means they play a significant role in determining the patterns in aggregate non-mining investment over time, in terms of both growth and volatility (Graph 4;

Graph 1

Cumulative Distribution of Investment

Private non-mining business sector, 2002–2017

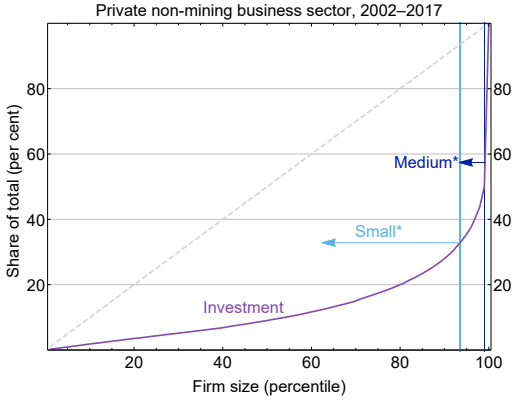


Sources: ABS; RBA

Graph 2

Cumulative Distribution of Investment

Private non-mining business sector, 2002–2017



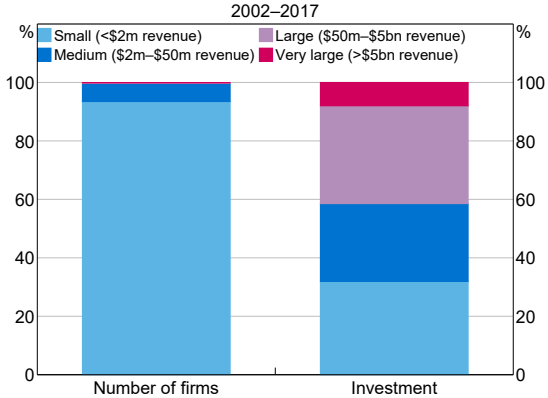
* Small businesses are classified as those with < $2 million revenue; medium businesses are those with revenue between $2 million and $50 million; large and very large businesses are not shown

Sources: ABS; RBA

Graph 3

Compositions by Business Size Categories*

2002–2017



* An extended version of this Graph, including output, can be found in the Appendix (Graph 9)

Sources: ABS; RBA

Graph 5).[3] Investment by the top 1 per cent of firms accounts for around half of all investment, and also tends to be more volatile (in aggregate) compared with the investment behaviour of smaller firms; over the sample period, annual investment growth of the top 1 per cent of firms was around twice as variable as that of other firms. As a result, investment by the top 1 per cent of firms explains more than 80 per cent of the variation in aggregate investment.

A large part of the difference in variability is likely due to the number of firms being aggregated in these two groups.[4] Firm-level investment tends to be 'lumpy' or 'intermittent' as firms concentrate their investment in a particular period rather than making smooth adjustments to their capital stock over time (see Doms and Dunne 1998; Caballero, Engel and Haltiwanger 1995; Cooper and Haltiwanger 2006). Variability at the firm level is less likely to 'wash out' for the top 1 per cent of firms simply due to the significantly smaller number of firms being aggregated.

The finding that firm-level outcomes at the economy's biggest firms can explain a large degree of variation in economic aggregates was highlighted by Gabaix (2011). Gabaix argued that, contrary to the common assumption at the time, firm-level shocks do not average out in the aggregate. This was because large firms accounted for a significant share of economic activity and so aggregate fluctuations could result from granular, firm-specific origins.

Others have extended the work of Gabaix and found large firms to be important drivers of aggregate investment growth for the United States (see Gala and Julio 2012; Grullon, Hund and Weston 2013). However, we are not aware of any similar studies for Australia.

The concentrated nature of investment broadly reflects the concentration in output

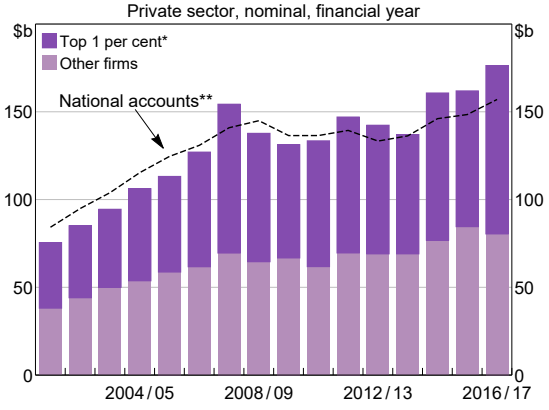
Why is investment so concentrated among the largest firms? Is it that larger firms invest proportionally more of their output than smaller firms? Or do large firms simply account for a larger share of economic activity? The answer appears to be the latter – large firms account for an extremely large share of economy-wide output. In fact, the distribution of output is even more concentrated than investment (Graph 6). The largest 1 per cent of firms account for almost 70 per cent of output, compared with 50 per cent for investment.

The highly concentrated nature of the output distribution is consistent with empirical evidence on firm size distributions globally. Similarly shaped distributions are found in natural and biological phenomena, languages (word frequency), network theory, wealth distributions, city sizes and more (see Axtell 2001; Gaffeo, Gallegati and Palestrini 2003; Gabaix 2016).[5]

Graph 4

Non-mining Investment by Firm Size

Private sector, nominal, financial year

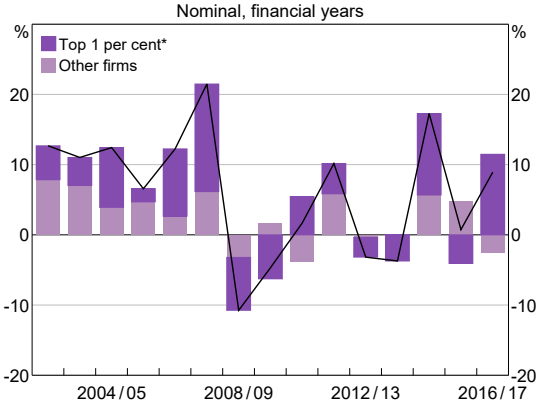


* By annual gross output (revenue)
** Annual national accounts; private non-mining business investment
Sources: ABS; RBA

Graph 5

Contribution to Growth in Investment

Nominal, financial years



* By gross output; total sales or revenue
Sources: ABS; RBA

For the investment distribution, there do not appear to be any clear examples of papers that have actually constructed and presented the economy-wide investment distribution by firm size, internationally or domestically, making direct comparisons difficult.

The more concentrated nature of the output distribution suggests that, on average, small firms actually invest more heavily than large firms relative to their output; this is consistent with observations of US firms (Gala and Julio 2016). It is not obvious why this is, but a few potential reasons may be: smaller firms are more likely to be younger firms, and younger firms are found to be more capital-intensive (Hambur and Jenner 2019); smaller firms may be more present in more capital-intensive industries; or firm size acts as a proxy for firms' unobservable real investment opportunity set (Gala and Julio 2016). Future work could further investigate the differences in capital intensity by firm size in Australia and their implications.

The distribution of investment has become more concentrated over time

Since the early 2000s, very large firms have grown their share of investment, from an average of 4 per cent over 2002–2007 to almost 10 per cent over 2012–2017. Meanwhile, small firms' share of investment has declined, while the shares of medium and large firms have been roughly steady.[6]

To the extent that the output and investment distributions are related, the result of higher concentration among larger firms is consistent with Hambur and La Cava (2018a), who found that the share of industry sales accounted for by the largest Australian businesses (or 'business concentration') has gradually risen since the start of this century.[7]

What are the possible implications of this rising concentration of output and investment for aggregate investment dynamics? First, increased concentration of investment among a handful of firms may mean that industry-specific or firm-specific factors (such as those specific firms' investment opportunities, demand outlook and balance sheet) may become more important for explaining changes in aggregate investment. Second, given the literature tends to find that larger firms are relatively less responsive to or affected by changes in the economic cycle, cash flow, uncertainty and monetary policy stance, then it's possible that their increased share of investment could mean aggregate investment has become less responsive to these variables over time.

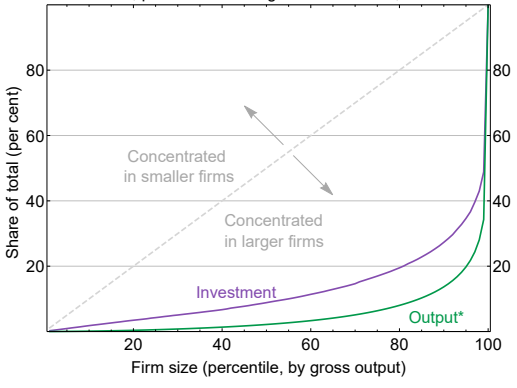
The distributions of output and investment vary across industries

In all industries, larger firms account for most of the investment, but the range of investment distributions by industry is wide (Graph 8). For both output and investment, the agriculture and accommodation, food, personal & other services industries are the least concentrated, while the utilities and media & telecommunications industries

Graph 6

Distribution of Investment and Output

Cumulative, private non-mining business sector, 2002–2017



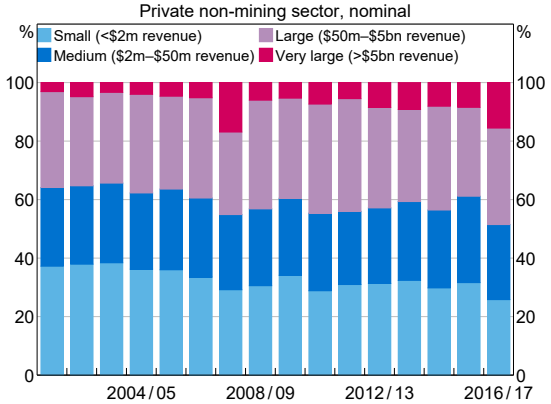
* Gross output; total sales or revenue

Sources: ABS; RBA

Graph 7

Share of Investment by Firm Size

Private non-mining sector, nominal



Sources: ABS; RBA

are the most concentrated. The differences in concentration across industries are large: in agriculture, the bottom 80 per cent of firms account for around 30 per cent of investment; in utilities, the bottom 80 per cent represent just 5 per cent of investment. The results by industry, based on output, are broadly consistent with that of previous studies on market concentration, including Hambur and La Cava (2018a), Leigh and Triggs (2016) and Kumar, Rajan and Zingales (1999). Further detail by industry is shown in the Appendix.

There are likely to be many reasons behind the variation in concentration across industries, but a few potential explanations include differences in barriers to entry, economies of scale, financial frictions, capital-intensity, industry maturity, and other industrial organisation factors (see Bain 1954; Kumar, Rajan and Zingales 1999; Rossi-Hansberg and Wright 2007; Audretsch *et al* 2004).

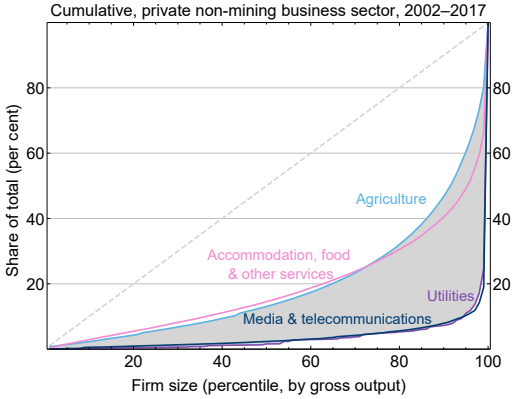
Conclusions and implications

Large firms in Australia, as measured by revenue, make up a very large share of non-mining investment. The concentrated nature of the investment is consistent with (and in fact less pronounced than) the concentration of broader economic activity, at both the aggregate and industry levels. Understanding these distributional issues helps us to explain why investment is volatile at the aggregate level: if investment is lumpy for the country's largest firms, this will carry through to the aggregate because of their large share of investment activity. This also underscores the value of the Bank's business liaison program, which includes many of the country's biggest firms, for analysing and understanding investment. The broader policy implication of this work is that the conditions faced by the economy's largest firms – the economic, tax and financial environments – are likely to be important influences on aggregate investment and other economic outcomes.

Graph 8

Industry Distributions of Investment*

Cumulative, private non-mining business sector, 2002–2017



* Shaded area represents the range of other industry curves (further detail is in the Appendix)

Sources: ABS; RBA

The non-mining business investment distribution has also become more concentrated over time in Australia, with a handful of top firms playing an increasing role in aggregate outcomes. This may mean that industry-specific or firm-specific factors may have become relatively more important over time for explaining aggregate investment outcomes. Similarly, if larger firms are relatively less responsive to or affected by changes in the economic cycle, cash-flow, uncertainty and monetary policy stance, as suggested by studies in other economies, then their increased share of investment may have reduced the average responsiveness of investment to these variables over time. However, these implications need to be more thoroughly investigated, especially in the Australian context, for conclusions to be drawn; this presents as an interesting avenue for potential future work.

We have focused on the contribution of firms of various sizes to aggregate investment outcomes. While larger firms are likely to contribute a larger share to aggregate investment, we have not addressed the important contribution of smaller firms to productivity, dynamism and other economic spillovers. Indeed, small and medium firms account for a large share of employment (Connolly, Norman and West 2012). Our preliminary analysis of this issue has found that small firms invest a larger share of their output back into investment. Future work could further investigate the reasons behind this, how it relates to productivity and dynamism, and the relative sensitivity of smaller firms' investment decisions to policy changes.

Understanding the distributions of investment and output helps to gauge how differences in the economic environment faced by firms may translate

to economy-wide outcomes. For example, if a particular policy emerged that targeted firms of a particular size, insights from the distribution will help to gauge its maximum possible direct impact on economy-wide investment. Previously, this was difficult and the accuracy of estimates would have been poor.

In relation to monetary policy, the international literature has tended to find that the transmission of monetary policy to firms, via the balance sheet and credit channels, is more modest for large firms compared to small. This could be investigated in the Australian context using the micro-data in BLADE, including how transmission effects by firm size have interacted with changes in the firm-size distribution to reach an aggregate effect. If findings are similar to overseas, it's possible that a more concentrated distribution may have had the effect of dampening the average or aggregate transmission of monetary policy over time to the business sector through these channels.

Appendix A

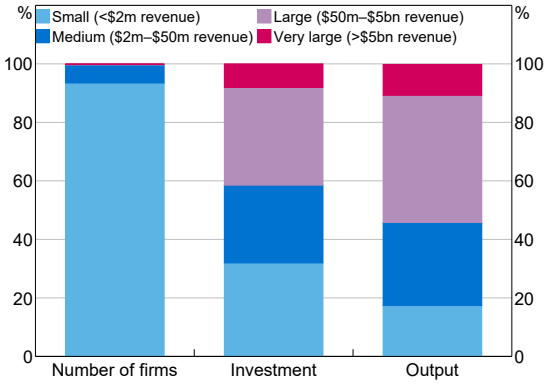
Graph 9 is an extension of Graph 3, showing output in addition to number of firms and investment.

The charts following show the distributions of output and investment by industry, grouped by goods industries (Graph 10; Graph 11) and services industries (Graph 12; Graph 13). For the investment distributions by industry, the steps in some industry-specific distributions are likely reflective of the lumpy nature of investment activity compared with the smoother production of output. This becomes more visible in the disaggregated data with smaller sample sizes.

Graph 9

Compositions by Business Size Categories

2002–2017

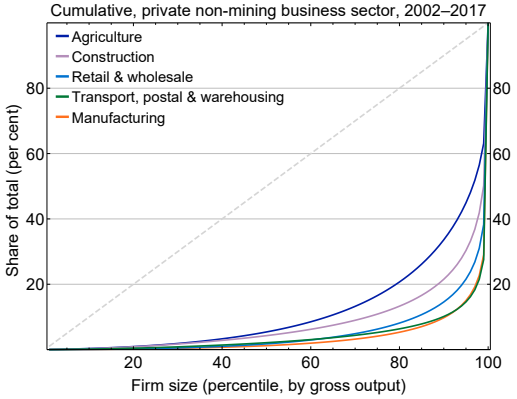


Sources: ABS; RBA

Graph 10

Industry Distributions of Output*

Cumulative, private non-mining business sector, 2002–2017



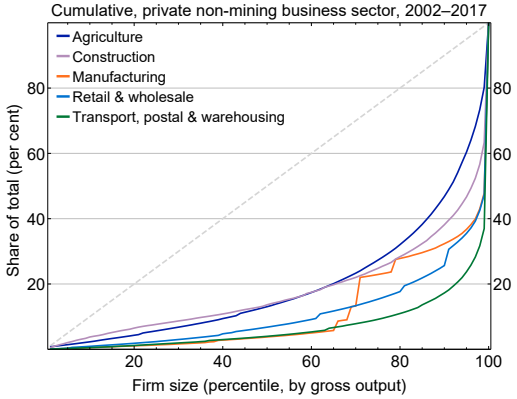
* Gross output; total sales or revenue

Sources: ABS; RBA

Graph 11

Industry Distributions of Investment

Cumulative, private non-mining business sector, 2002–2017

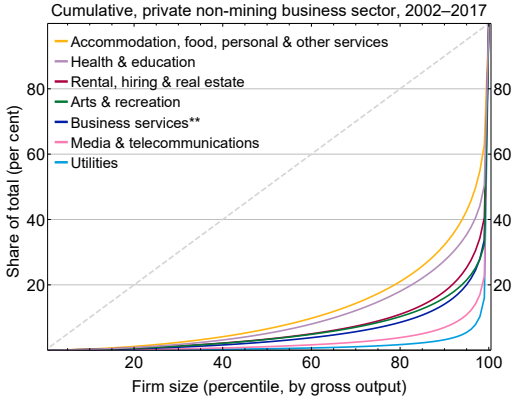


Sources: ABS; RBA

Graph 12

Industry Distributions of Output*

Cumulative, private non-mining business sector, 2002–2017



* Gross output; total sales or revenue

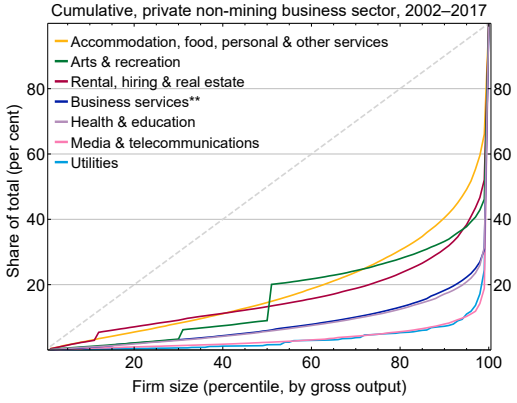
** Includes finance & insurance, professional, scientific & technical services, and administration & support services

Sources: ABS; RBA

Graph 13

Industry Distributions of Investment

Cumulative, private non-mining business sector, 2002–2017



* Includes finance & insurance, professional, scientific & technical services, and administration & support services

Sources: ABS; RBA

Footnotes

[*] The author is from International Department, but completed this work while in Economic Analysis Department. The author would like to thank Tom Rosewall, Gianni La Cava, Matthew Carter, Tim Taylor, Benjamin Beckers, David Lancaster and Rachael Fitzpatrick for their much valued input at various stages of this work.

[1] The definition of small business according to revenue is drawn from the ATO's definition in place until 2016/17. For medium-sized firms and SMEs more broadly there is no universally agreed definition. However, by revenue (or output), $50 million is a commonly used threshold. For example, this is used in the APRA/ABS/RBA reporting standard (ARS 701) for EFS collection, as well as NAB's SME business surveys, and the government's Coronavirus SME Guarantee Scheme. The threshold for very large businesses ($5 billion) is somewhat arbitrary, but is also partly informed by the Australian Government's 2020 investment incentives, which excluded firms with revenue greater than $5 billion.

[2] The small business share of business counts and value added in this analysis is broadly consistent with previous work by Connolly, Norman and West (2012), who found that small businesses represent around 96 per cent of businesses and around one-third of economic activity. I find a similar share of businesses are small firms, and that small firms represent around 27 per cent of profits or value added.

[3] There are a number of potential reasons for any differences between BAS (and BLADE) data and the national accounts, including: BAS data on investment includes land purchases, while the national accounts do not; most components of national accounts investment draw upon ABS survey data, rather than economy-wide sources; and mining and non-mining classifications of investment may differ to some degree

[4] To draw stronger conclusions here, a full analysis of firm-level 'lumpiness' or volatility in investment by firm-size is required, as well as how it interacts with the distribution. This is feasible with the data in BLADE, and could be an avenue for future work.

[5] There is substantial literature focused on why the firm-size distribution is so concentrated in larger firms, dating back as far as Gibrat (1931) who argued that the distribution was a natural consequence of firms growing (in percentage terms) randomly and independently of one another. Meanwhile, others have argued that important determinants of the distribution are: frictions such as access to finance, which enhance larger firms' ability to survive and grow (Cabral and Mata 2003); and large firms' ability to take advantage of investments in R&D may be greater (Pagano and Schivardi 2003).

[6] A slight disadvantage of size categorisations is that they may be susceptible to upward drift in firm classifications over time due purely to inflationary effects on firm output. However, when looking at the cumulative distributions according to firm percentile rankings, which are immune to the above-mentioned effects, it remains clear that distribution of investment has become more concentrated in larger firms since the early 2000s – for example, the top 1 per cent of firms have grown their share of investment from 49 per cent in the early 2000s to 54 per cent by 2017.

[7] I also find that the distribution of output has become more concentrated: the top 1 per cent of firms have grown their share of output from less than 64 per cent in the early 2000s to 67 per cent by the later part of the sample.

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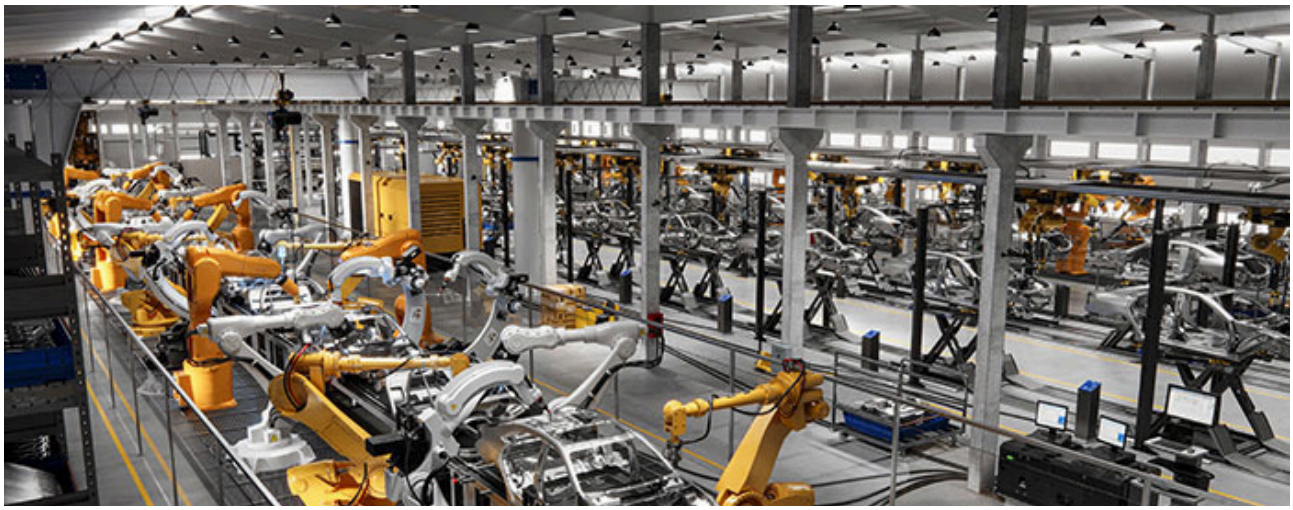
Why Are Investment Hurdle Rates So Sticky?

Henry Edwards and Kevin Lane[*]



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Abstract

Firms commonly evaluate potential investment projects by comparing expected returns to a hurdle rate. Survey evidence suggests that hurdle rates have remained high and well above the weighted average cost of capital (WACC) in recent years, as has the *ex post* return on invested capital for Australian-listed companies. This stickiness is a marked contrast to the decline in interest rates. This article reviews the evidence for why hurdle rates are so far above the WACC, and why they have remained so sticky over time. Proposed reasons include the perception that returns available on potential projects are unrelated to the level of interest rates. In addition, firms may avoid reducing hurdle rates to minimise the risk of regret, and some business managers could view long-term declines in interest rates as temporary.

Introduction

Firms commonly evaluate potential capital expenditure projects by comparing expected project returns to a hurdle rate, which is determined by each firm and reflects the minimum acceptable rate of return for a project. Firms typically use hurdle rates that are well above the weighted average cost of capital (WACC) and are sticky (i.e. do not move much) over time. This result has been observed through several central banks' liaison programs in recent years, including in Australia, Canada, Sweden and the United Kingdom. Similar observations can be traced back in the literature to at least the 1930s (Meade and Andrews 1938).

There are two major implications for central banks:

1. If hurdle rates are sticky, then business investment will be less sensitive to monetary policy than if hurdle rates were adjusted with interest rates, although monetary policy will still affect business investment through other channels.
2. The low sensitivity of business investment to interest rates could cause the neutral (or

equilibrium) rate of interest to be more sensitive to shocks in the aggregate supply of savings than otherwise. This is because if investment is not sensitive to interest rates, then interest rates will have to adjust further to bring savings and investment into equilibrium after a shock to the aggregate supply of savings.[1]

Despite the important implications of firms maintaining sticky hurdle rates, the underlying reasons behind their stickiness are not particularly well understood.

This article describes movements in hurdle rates, the WACC and realised returns on capital in recent years, and reviews the literature to understand why some firms have been reluctant to reduce hurdle rates. Several recent developments aid this task. First, National Australia Bank (NAB) added a question on the level of hurdle rates to its quarterly business survey in 2015. Second, media coverage and commentary from executives have revealed insights on the investment decisions of large businesses, many of which have elected not to change hurdle rates (Richardson 2020; Thomson 2021). Third, more empirical studies have been published, complementing qualitative findings with evidence on the relative importance of the various reasons for hurdle rates being above the WACC.[2] These developments allow us to improve our understanding of how firms consider potential changes to hurdle rates in the face of declines in the WACC.

Financial considerations for investment

Financial theory suggests that firms should invest in a project when the net present value of the project's cash flows is positive. A project's net present value will be positive when the return of the project is greater than the WACC. The WACC provides a measure of the average cost of capital for a company, or (equivalently) the average rate of return that debt and equity investors require when providing funding to a company. The WACC is calculated as the weighted average of the cost of equity (the cost of raising new shares) and the after-tax cost of debt (the interest rate when borrowing). It follows that firms should use a hurdle rate equal to the WACC when evaluating investment decisions. This implies that lower interest rates flow through to a reduced WACC and to a lower hurdle rate, increasing the number of viable projects and thereby boosting investment.

The hurdle rate channel is not the only mechanism through which interest rates can affect investment. Lower interest rates boost investment through a variety of channels, including stronger demand for products, higher after-interest cash flows and higher net worth (as a decline in interest rates boosts asset prices). This variety of mechanisms makes identifying the hurdle rate channel difficult. In addition, changes in interest rates may reflect other information, such as the state of the economy or the perceived creditworthiness of the firm.

Studies have generally found that the user cost of capital affects investment, though the effects arise through components other than the cost of capital. Evidence that the cost-of-capital component affects investment is generally weak (Sharpe and Suarez 2021). La Cava and Hambur (2018) found evidence that interest rates appear to affect investment; however, they found no effect from the overall cost of capital, which is the rate more closely related to the hurdle rate channel.[3]

Movements in hurdle rates, the WACC and returns on capital

A substantial body of evidence suggests that firms use hurdle rates that are well above the WACC. In liaison, firms have reported using hurdle rates of 12–15 per cent or higher, and note that these rates have not changed for many years (Lane and Rosewall 2015). Several firms also reported complementing these hurdle rates with stricter methods to assess investments, such as the payback period – that is, the number of years expected for the capital outlay to be returned by the cash flows generated from the project. Required payback periods of three to five years are common, implying a more aggressive threshold for investment than hurdle rates of 15 per cent.

The evidence from liaison has been confirmed in surveys. For Australian firms, the earliest data known to the authors are from a 2014 Deloitte survey, showing that the median hurdle rate was around

13 per cent (Deloitte 2014). Likewise, the NAB Business Survey pointed to a mean hurdle rate of around 13 per cent in 2015, which is consistent with Bank liaison from around that time. NAB Survey data show that the average hurdle rate has been relatively steady over the past six years.

Meanwhile, the WACC for a representative BBB-rated non-financial business is estimated to be about 6 per cent, having fallen by around 2 percentage points since 2014 (Graph 1). This reflects a larger fall of around 3 percentage points in the cost of debt (as reflected by the yield on a seven-year BBB bond), while the cost of equity has declined by around 2 percentage points. The cost of equity has typically had a weight of around 60–70 per cent in the WACC over this period, meaning that the decline in the WACC has not been as large as the decline in interest rates might suggest. As reported in the *Australian Financial Review* in 2019, a number of firms stated they had considered reducing their hurdle rate in light of the decline in interest rates (Thomson and Boyd 2019). While some firms reduced their hurdle rate, many firms decided against doing so.

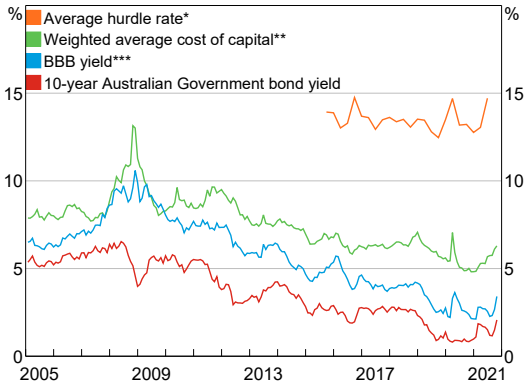
While we do not have a long time series for hurdle rate data in Australia, evidence from overseas suggests that hurdle rates have been sticky for a number of decades. For example, data for US firms show that the median hurdle rate stayed around 15 per cent from the mid-1980s until 2012 (Sharpe and Suarez 2021), over which time there was a significant decline in interest rates.

To the extent that companies evaluate projects by comparing the expected returns to their required hurdle rate, the overall level of returns on capital across the economy should be higher than the average level of hurdle rates (because the hurdle rate is the required expected return on a marginal project). Since businesses have been reluctant to reduce hurdle rates, possibly over a very long horizon, it follows that firms' *ex post* returns on capital should have stayed elevated. Indeed, an elevated level of returns on real assets has been noted for other countries, even as interest rates declined.[4] Data from Australian-listed firms confirm this finding – the aggregate return on invested capital (ROIC) has been high and relatively constant over the past 20 years, notwithstanding a large decline in 2020 due to the COVID-19 pandemic (Graph 2).[5]

The precise level of ROIC is difficult to pin down, as it is sensitive to the accounting assumptions used. Nonetheless, the stability in ROIC is robust to different estimation formulas, and is evident in the return on assets (ROA) (Graph 3).[6] When resources companies are included, measures of returns are more volatile, reflecting the sensitivity of their returns to commodity prices.

Graph 1

Hurdle Rates and the Cost of Capital

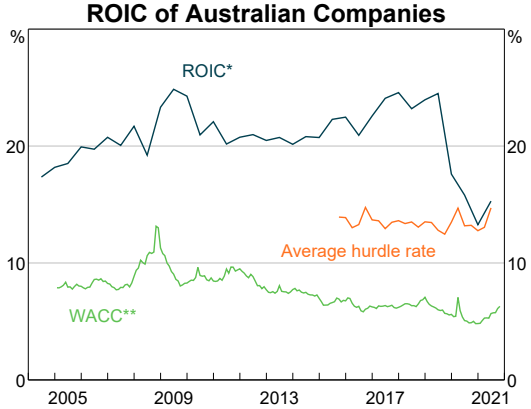


* Simple average across industries
** Weighted average cost of capital (WACC) is market-value weighted average of the cost of equity and the after-tax cost of debt for a BBB-rated non-financial corporation
*** Yield on seven-year bonds for BBB-rated corporations

Sources: ABS; Bloomberg; Morningstar; NAB; RBA

Graph 2

ROIC of Australian Companies



* Return on invested capital (ROIC) is annual after-tax operating income divided by the sum of fixed assets and net working capital minus cash holdings; excludes financials and resources companies
** Weighted by market value measure of gearing for private non-financial corporations

Sources: ABS; Bloomberg; Morningstar; NAB; RBA

Why are hurdle rates above the WACC?

There are several potential reasons for why hurdle rates are above the WACC, including because:

- there is insufficient managerial capacity to proceed with all available projects
- managers or owners are not diversified, so they are exposed to considerable risks relating to the performance of their firm
- there may be value in waiting for more information before making an investment decision
- managers may feel that there is a tendency to overestimate expected cash flows.

These are discussed below.

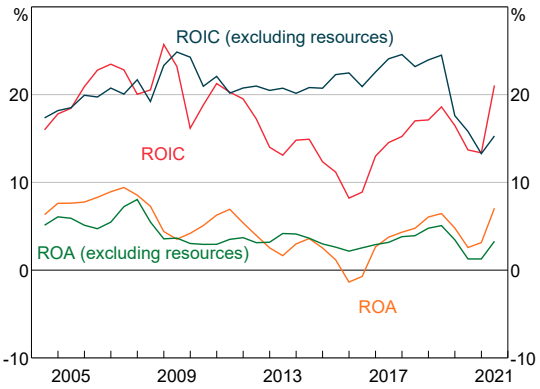
Capital rationing due to insufficient managerial or operational capacity

Firms may use high hurdle rates to screen projects because of insufficient managerial or operational capacity. At any given time, management or staff may not have the capacity to proceed with all projects that have a rate of return exceeding the WACC. Similarly, management may consider that proceeding with a marginal project might preclude investing in a higher-return project in the future.

When capital is rationed in this way, the level of the hurdle rate may become a secondary consideration. Instead, investment decisions may depend primarily on the perceived level of returns available on potential projects, in addition to the spare level of managerial or operational capacity. If firms perceive there are sufficient projects offering high returns consistent with current managerial capacity, then they will be content with a hurdle rate well above the WACC. As discussed below, it seems reasonable from the perspective of individual firms that perceived returns on investment opportunities may be unrelated to the level of interest rates. If true, then the hurdle rate will also be unrelated to the level of interest rates.

Graph 3

ROIC and ROA of Australian Companies*



* Return on assets (ROA) is net income divided by total assets; return on invested capital (ROIC) is annual after-tax operating income divided by the sum of fixed assets and net working capital minus cash holdings; excludes financial companies

Sources: Morningstar; RBA

There is strong evidence that firms use high hurdle rates to ration capital due to insufficient managerial or operational capacity. Jagannathan *et al* (2016) found that firms reporting constraints on 'management or manpower' tend to use higher hurdle rates than other firms. Also, surveys have found that it is common for firms to forgo projects with returns exceeding the hurdle rate due to resource constraints, such as a shortage of labour or management's time and expertise (Graham and Harvey 2011). Some firms may also use high hurdle rates to ration capital between multiple business lines or regional operations, although the importance of this mechanism has not been tested in the literature.

Firm-specific risk and diversification problems

In the textbook case, the WACC provides investors with compensation for exposure to economy-wide risks, such as the effects of an economic downturn. Investors can diversify their investments, and so do not require compensation for taking on firm-specific risks. However, owners of companies might not be diversified in practice (particularly owners of unlisted companies), and so could require compensation for exposure to firm-specific risks.

Additionally, managers may also be highly exposed to firm-specific risks, including the reputational damage associated with loss-making investments (Scharfstein and Stein 1990). In this sense, a reluctance to use a lower hurdle rate may be a symptom of a 'principal–agent' problem between managers and shareholders. If hurdle rates were high to compensate managers for firm-specific risks, we may expect shareholders to push for lower hurdle rates at listed firms.[7] The absence of this

pushback suggests that shareholders consider hurdle rates to be at an appropriate level. Alternatively, it may be that the dispersal of ownership makes it difficult for shareholders to influence a firm's hurdle rate, which may not be publicly known.

Firm-specific risk, irreversibility and the value in waiting for more information

There is a second reason why firm-specific risk might influence hurdle rates. When the cash flows arising from investments are uncertain and when investments are irreversible, there can be value in waiting for more information to avoid the risk of taking on a loss-making investment. In these circumstances, investment decisions should not be based on whether the expected rate of return exceeds the WACC. Instead, firms should invest only when the returns are high enough to offset the lost value of waiting – or some estimate of that value, given it is likely to be hard to measure. The required rate of return in this case should be above the WACC by some margin.

Evidence supports the notion that firm-specific risk is associated with higher hurdle rates. Jagannathan *et al* (2016) found that around two-thirds of executives surveyed reported that risks unique to the firm influenced the firm's hurdle rate. They also found a positive relationship between the level of firm-specific risk implicit in a firm's equity returns and its hurdle rate. However, this study did not establish whether firm-specific risk influences the hurdle rate because of insufficient diversification or because there is value in waiting for more information (or something else). There is evidence that firm-specific risk weighs on investment due to both diversification issues and because there is value in waiting for more information, suggesting that both mechanisms might influence the hurdle rate.[8]

Optimism bias

Some firms may have concerns that forecasts of project cash flows are biased upwards, such that the *ex post* return on capital will be lower than the expected return from the project. If so, using a hurdle rate equal to the WACC would lead to accepting projects that reduce firm value, since the returns would fall short of those required by investors. Although using a high hurdle rate may seem intuitively appealing, doing so creates a bias against longer-term projects. This is because the values of longer-dated cash flows will be discounted more heavily. Further, optimism bias cannot explain the growing divergence between hurdle rates and the WACC, unless the perceived level of optimism bias has increased over time.

The evidence is mixed as to whether an optimism bias explains why hurdle rates exceed the WACC. Overall, surveys suggest that many firms in the United States appear conscious of optimism bias, but that it is not a key determinant of the level of hurdle rates.[9] Data on the *ex post* return on capital, though imprecise due to measurement issues, provide tentative evidence that companies have earned a high return on capital in aggregate. This may suggest that concerns around optimism bias are unwarranted (see Graph 2 above).

Why are hurdle rates sticky?

There are several potential reasons why hurdle rates could be sticky, including because:

- risk and uncertainty may be perceived to increase when interest rates decline
- managers may reason that there are sufficient potential projects to engage managerial resources without reducing the hurdle rate
- firms may look through declines in interest rates because projects are long term and the WACC might increase
- the cost of equity may not decline with interest rates, causing the cost of capital to be more stable than otherwise
- the appropriate level of hurdle rates is uncertain
- there may be insufficient competitive pressure to reduce hurdle rates.

Risk/uncertainty increases when interest rates decline

Some firms have stated that risk has increased as interest rates have declined, or that risk tends to be higher when interest rates are lower. This

perception implies that the hurdle rate should be less variable than the WACC. As noted above, a firm's exposure to economy-wide risk is already reflected in the WACC. Nonetheless, it may be that firm-specific risk is perceived to increase when interest rates decline, which could justify a larger wedge between the hurdle rate and the WACC (as outlined above). However, it is not clear that firm-specific risk has trended higher over time as interest rates have declined. For example, a daily measure of annual firm-specific volatility for listed Australian businesses has been close to its post-2004 average during 2021 (Graph 4).

The absence of a long-term relationship between interest rates and firm-specific risk is perhaps unsurprising. While interest rates can decline during downturns, interest rates have trended lower over the past decade partly due to declines in the neutral rate – not simply because monetary policy has been successively eased over time (McCririck and Rees 2017). Alternatively, it may be that firms' perceptions of risk increase following negative shocks. The global financial crisis may have led firms to place high weights on the probability of downside tail risk events (Jones 2021).

Capital needs to be rationed due to insufficient managerial or operational capacity, and achievable returns are unrelated to the level of interest rates

If the hurdle rate is a by-product of capital rationing, then the level of the hurdle rate depends on two factors: the desired amount of capital expenditure given operational and managerial capacity; and the perceived level of returns available on potential projects. Within this framework, hurdle rates could stay constant because firms sense that achievable returns from potential projects are unrelated to – and have not declined with – long-term interest rates.

This line of reasoning is consistent with a refrain provided in liaison that approved projects tend to have returns well above the hurdle rate, so reducing the hurdle rate would have no effect on investment; US firms provided similar views (Sharpe and Suarez 2021). This reasoning is also supported by the level of *ex post* returns on capital being notably higher than average reported hurdle rates from the NAB Survey (Graph 2).

Sharpe and Suarez (2021) showed that firms with stronger expected growth reported that their investment plans would be less sensitive to changes in interest rates than firms with weaker expected growth. This could be because firms with stronger growth potential expect available returns to be above the hurdle rate, so the hurdle rate is less binding for these firms.

The WACC might increase, and projects are long term

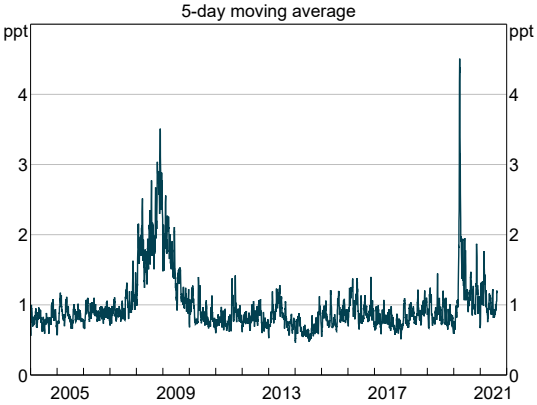
Many firms have justified keeping their hurdle rate constant because their capital expenditure projects have a long time horizon. Some firms prefer to employ a 'through-the-cycle' approach to investment, recognising that rates may increase. This view appears to reflect a broad expectation that interest rates will revert to some long-term average, perhaps anticipating that declines in the neutral interest rate will be reversed. Even so, using a high hurdle rate will penalise more distant cash flows, creating a bias towards shorter-term projects.

Additionally, while some investment is very long term, a large portion of investment has a much shorter horizon. In liaison, many firms have reported complementing the hurdle rate with thresholds that favour short-term projects, such as payback periods of three to five years.

Graph 4

ASX 200 Firm-specific Volatility

5-day moving average



* Market value-weighted average of absolute daily residuals from rolling 250-day regressions of firm-level returns on ASX 200 returns

Sources: RBA; Refinitiv

The cost of equity is not considered to move in line with interest rates

In the capital asset pricing model, the cost of equity depends on the risk-free interest rate plus a risk premium to compensate for a firm's exposure to economy-wide risks.[10] Changes in interest rates would therefore influence the cost of equity and the WACC. However, firms may employ assumptions that result in a smoother profile of the estimated cost of equity, such as using a historical average for the risk-free rate (Graham and Harvey 2015). More generally, firms may assume a smooth cost of equity due to uncertainty around the parameters required to estimate the figure, such as the company's sensitivity to economy-wide risks. Some firms have also reported that, despite declines in risk-free rates, investors still expect high returns on equity.

The appropriate level of the hurdle rate is uncertain

Liaison information confirms that many firms set the hurdle rate using intuition or a rule of thumb, and there are genuine reasons why the appropriate hurdle rate may be unknowable. First, managers may have some intuition that there is value in waiting for more information, without precisely estimating the value of waiting. Second, managers may perceive the existence of optimism bias, without being able to exactly quantify its magnitude. Finally, if managers are basing their hurdle rate on the WACC, they may employ simplifying assumptions when calculating the WACC, and estimating what the WACC will be in the future can be difficult.

Ritov and Baron (1990) discussed two phenomena that discourage action in the presence of uncertainty: the perception of missing information encourages inaction, as people would prefer to be more informed before making a decision; and action can lead to greater regret than inaction. If the correct level of the hurdle rate is unknown then these psychological forces may discourage firms from reducing their hurdle rate.

There is no competitive impetus to reduce hurdle rates

Some companies have noted that their competitors have not been investing and there has not been much competitive pressure to reduce hurdle rates. If there was greater competition between firms to invest, or if competitors reduced hurdle rates, then there would be greater impetus for other firms to lower hurdle rates and increase investment.

Farhi and Gourio (2019) argued that rising market power is one of the key drivers of the increasing wedge between returns on private capital and the risk-free rate. If returns on private capital are related to the level of hurdle rates, then a rise in market power (decrease in competition) may be partly driving the stickiness of hurdle rates. Separately, if hurdle rates are high because there is value in waiting for more information, then an increase in competition may cause firms to lower their return thresholds. This is because the threat of a competitor investing in a similar project reduces the value of waiting for more information, thereby lowering the optimal hurdle rate.

Conclusion

Data from the NAB Survey suggest that hurdle rates have been broadly stable on average since 2015. Similarly, we find that *ex post* returns on capital have been steady for non-resources firms over the past decade. The stability of returns stands in contrast to the decline in interest rates, but it is consistent with the stability in hurdle rates.

Empirical studies suggest that hurdle rates may be set well above the WACC to ration capital in the face of insufficient operational or managerial capacity. There is some evidence that firm-specific risk influences the level of hurdle rates, although the exact mechanism is unclear. At the same time, there is a strong theoretical argument for firms to use a high hurdle rate to account for the value of waiting for more information. However, there is little direct evidence that this reason is important in practice.

There is less empirical evidence on why hurdle rates are sticky. Some firms appear to use hurdle rates to ration capital when there is insufficient managerial or operational capacity to take on all potential

projects. This means there may be no impetus to reduce these rates so long as there are enough potential projects to engage existing resources. Further, if the optimal hurdle rate is uncertain, keeping the hurdle rate steady could be appealing to avoid the risk of regret. Remarks from business managers also point to other reasons why firms have not reduced hurdle rates, such as an expectation that much of the decline in interest rates will be temporary and that shareholders' required returns on equity have not declined. Further, while the WACC has fallen with lower interest rates, the fall has been smaller than the decline in long-term bond yields would suggest. This is because the largest determinant of the WACC is the cost of equity, which has declined only slightly in recent years.

Footnotes

[*] The authors are from Domestic Markets Department.

[1] However, dwelling investment is highly sensitive to interest rates, somewhat mitigating this effect.

[2] See Banerjee, Kearns and Lombardi (2015); Jagannathan *et al* (2016); Sharpe and Suarez (2021).

[3] More broadly, in Australia non-mining business investment over the past decade has been at low levels compared with history, and mining investment has declined since its peak in 2012 (Debelle 2017). A low level of business investment since the global financial crisis has also been noted in other advanced economies (Banerjee *et al* 2015).

[4] See Banerjee *et al* (2015); Jones (2021); Farhi and Gourio (2019).

[5] Return on invested capital is annual after-tax operating income divided by the sum of fixed assets and net working capital minus cash holdings. For operating income, we use earnings before interest and tax.

[6] Return on assets is annual net income divided by total assets.

[7] Firms that reduced their hurdle rate closer to the WACC could, in principle, invest in more value-adding opportunities. This would lead to a higher company value, albeit at the expense of a lower percentage return on a larger capital stock.

[8] First, Panousi and Papanikolaou (2012) showed that investment is more sensitive to idiosyncratic risk at firms with higher rates of ownership by managers. This points to a principal–agent problem caused by insufficiently diversified managers. Separately, Bulan, Mayer and Somerville (2009) reported suggestive evidence that optionality is important. They argued that heightened competition reduces the option value of waiting, since firms could be pre-empted by rivals.

[9] Survey evidence has shown that around 40 per cent of firms have reported either rejecting projects with a positive net present value due to concerns around optimism bias or adjusting hurdle rates upwards to account for optimism bias (Graham and Harvey 2011; Jagannathan *et al* 2016).

[10] The capital asset pricing model is commonly used by firms in the United States and Europe (Graham and Harvey 2001), and is commonly employed in Australia (Lane and Rosewall 2015).

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Do RBA School Talks Improve Student Outcomes?

Peter Rickards[*]

Peter Rickards and Jess Dunphy talking to high school students. Photo: Reserve Bank of Australia

Abstract

As part of our education program, the Reserve Bank of Australia (RBA) conducts school talks to promote economic literacy and encourage a larger and more diverse group of students to study economics. To formally evaluate this aspect of our education program, we surveyed students before and after school talks in a randomised control trial and the results were assessed relative to a control group. We found that RBA school talks improve both perceived and actual understanding of key economic concepts and increase the confidence of students, including those who are less socially advantaged. Importantly, smaller talks conducted online were perceived to be just as useful as those conducted in person, which suggests that the geographic reach of the school talks program could potentially be expanded considerably without sacrificing quality or student outcomes.

Introduction

There has been a stark decline in the size and diversity of the economics student population in Australian high schools since the early 1990s (Dwyer 2018; Livermore and Major 2021). To address this decline and promote economic literacy in the wider community, the Reserve Bank of Australia (RBA) established a public education program in 2016 to support teachers and students. This article presents the results of a study designed to evaluate the student outcomes of one component of this education program: educational talks to high school students.

In the talks delivered to Year 11 and 12 students and their teachers, RBA economists discuss and answer questions about monetary policy and current economic conditions (two components of the Economics syllabus across the states). These talks typically run for one hour, which includes 40 minutes for a detailed presentation delivered by

an RBA economist and 20 minutes answering questions from students and teachers on monetary policy, economics and careers. The talks aim to improve the economic literacy and confidence of students and teachers, inspire students who may be interested in further study or a career in economics, and increase the diversity of the economics student cohort and profession.

Over the past five years, around 22,000 high school students across all education sectors and states in Australia have attended an RBA school talk about monetary policy and current economic conditions (Graph 1). These students were mostly in Years 11 and 12. RBA talks to high school students more generally have reached more than 30,000 pupils over the same period. The education program has consistently received positive feedback from economics teachers. However, it is important to consider the feedback of students who attend these talks to evaluate the effectiveness of the talks program, specifically: are the school talks improving student confidence, understanding and perceptions of economics? Such feedback can be used to further improve the school talks program. To obtain a robust indication of the program's effectiveness, a controlled experiment using surveys of students' feedback was conducted.

Survey design and methodology

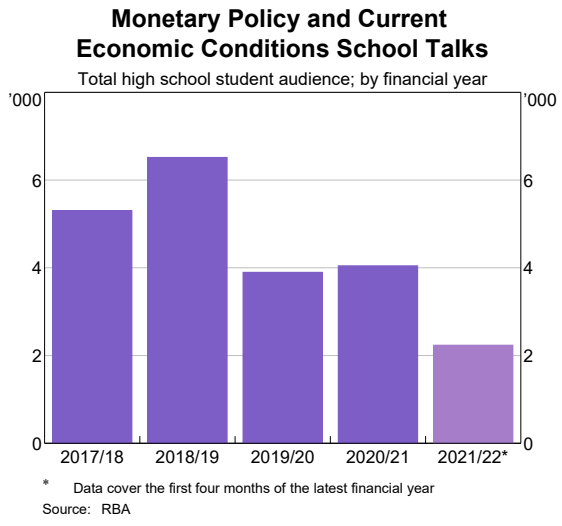
To quantitatively evaluate whether the school talks program leads to improved outcomes for students, we asked student participants to complete two surveys, and assessed changes in their responses over this time. The surveys included questions on: student confidence with economics; their interest in further study or a career in economics; and their understanding of concepts covered in the school talks program, such as the RBA's inflation target and the current rate of inflation (for the full list of survey questions, see Appendix A). The potential sample consisted of Year 11 and 12 students in schools across Australia who participated in the school talks.

As students were likely to be learning additional content between the first and second survey, as well as the fact the survey itself may have invoked some thinking around these issues, we utilised a randomised control trial design to more rigorously consider the impact that school talks have on student outcomes. We randomly allocated some schools to a treatment group and other schools to a passive control group.[1] For the treatment group, one survey was administered prior to the RBA school talk and one survey afterwards, such that the change in responses across the two surveys would reflect the impact of the school talk as well as other influences. The control group was administered both surveys prior to the RBA school talk. Therefore, if there were changes in the responses across the two surveys in the control group, this would reflect some random variation as well as students learning from sources other than the RBA talk – including from taking the first survey, for example. Typically, control groups do not receive a treatment or intervention.[2] However, we decided this would not be appropriate in this study, as we aimed to support all students with a school talk. Instead, the control group received a talk following their two survey responses.

Students completed the two surveys around one week apart. This spacing was chosen to strike a balance between measuring medium- to long-term information retention and reducing the interference of teaching or other interventions in the responses.

Figure 1 below illustrates this survey design. The orange boxes represent the first and second survey of the control group administered prior to the students receiving the school talk. The green boxes represent the first and second survey of the

Graph 1



treatment group administered either side of the talk.

The surveys were administered by teachers and were designed to take up little teaching time. Participation was voluntary and each survey took students on average nine minutes to complete. Between May and August 2021, a total of 2,900 students across 99 schools submitted at least one survey. In order to identify changes in student responses, both surveys needed to be completed and clearly attributable to the *same* student, yielding a final sample for comparison of 658 students across 64 schools; 342 across 40 schools in the treatment group and 316 across 24 schools the control group.[3]

We measured the changes in responses across the two treatment group surveys relative to the change in responses across the two control group surveys to evaluate the effect of the school talk on student outcomes. That is, once we had controlled for the additional learning taking place over a week, as well as each student's pre-existing confidence, perceptions and understanding, how did the change in confidence, perceptions and understanding of students in the treatment group differ to the changes in the control group? For further information, we asked students for their feedback on the school talk itself.

Results

Student-perceived value of the talks

The survey included a number of questions asking for feedback on the talk: was the talk useful, engaging, clear and helpful for understanding key economic concepts? The students were given seven options, ranging from strongly disagree to strongly agree; the average and median student response was 'agree' to each of these questions (Graph 2). While this positive feedback may be partly due to response bias, it is consistent with the anecdotal positive feedback received from teachers over the past few years.

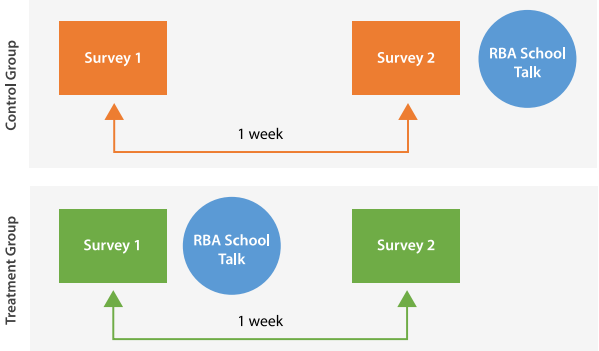
Four formats of talks were examined:

- Webinar: large multi-school online events with one RBA presenter.
- At school: an RBA economist provided an in-person talk in a school classroom or auditorium, typically to one class at a time.
- At the Bank: an RBA economist provided an in-person talk at the RBA Head Office in a small room, typically to one or two small classes at a time.
- 1:1 Zoom: an RBA economist provided a talk over Zoom, typically to one class at a time.

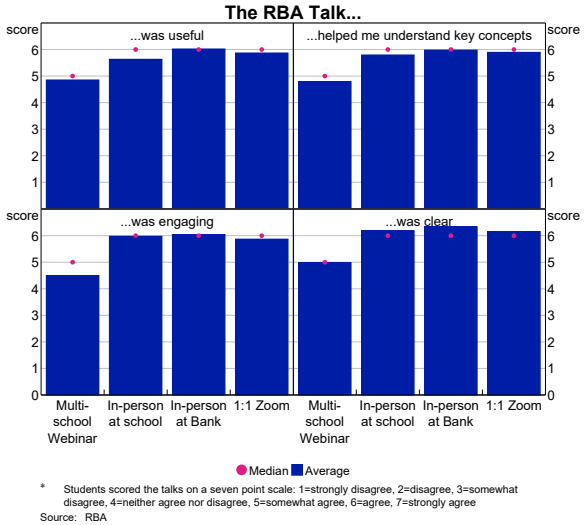
All different formats of talks received positive feedback in an absolute sense – that is, scores were greater than four (which represented indifference). However, student responses indicated that the Webinars were not as useful, engaging, clear or helpful as talks provided in the other formats.

There are likely a number of reasons why Webinars received less-positive feedback. First, the Webinar

Figure 1: Pre-Post Test Randomised Control Trial Design



Graph 2



* Students scored the talks on a seven point scale: 1=strongly disagree, 2=disagree, 3=somewhat disagree, 4=neither agree nor disagree, 5=somewhat agree, 6=agree, 7=strongly agree

Source: RBA

series was designed to be somewhat shorter than the other talks in order to hold the attention of students. Anecdotal feedback from teachers suggested the talks may have been too short to cover the content in great detail. Additionally, Webinars had much larger audiences (up to 10 schools in each Webinar) than other talks (which were delivered to a maximum of two schools at a time). Due to the size of the audiences in the Webinars, interactivity and engagement was limited to students or teachers typing questions into a 'Q&A' function. Anecdotal feedback suggested students often watched the Webinar on a large screen in a classroom or hall, unable to be seen by or engage with the speaker. It is likely that this lack of interactivity reduced the level of engagement and perceived usefulness of the talks overall.

In contrast to the Webinars, the 1:1 Zoom talks, which were also conducted online with single classes or single schools were perceived to be just as useful, engaging, clear and helpful as the talks provided in person. The less-positive responses to the Webinars were therefore likely due to their passive nature when delivered to large groups, rather than simply because they were online.

Student-perceived understanding and confidence

Understanding economic concepts is difficult and, given the constantly changing nature of economics, many teachers have reported that staying up to date with current economic conditions is challenging.[4] Therefore, an important part of evaluating whether the talks program is effective was to consider how students' perceived understanding of, and confidence with, economic concepts and economic conditions changes after receiving a talk. In both surveys, we asked students to rate their understanding of monetary policy, current economic conditions and their overall confidence in completing their economics subject on a scale of one to five (with five being the most understanding and confident).

Student self-reported understanding of monetary policy was found to have improved considerably in the treatment group, while there was no discernible change in the control group (Graph 3). (The treatment effect is estimated to be 0.38 standard deviations – a large effect in education settings, although within the range of effects from studies looking at self-reported outcomes of programs (Durlak et al 2011)). The improvement was evident for both Year 11 and Year 12 students in the sample.

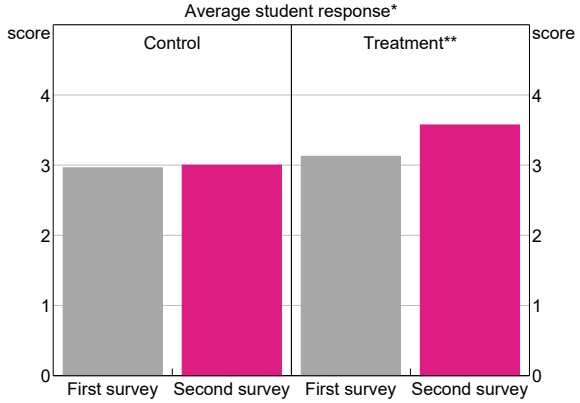
Students' self-reported understanding of current economic conditions also improved in the treatment group when compared to the control group (Graph 4). Students reported a higher baseline understanding for current economic conditions than for monetary policy, which makes sense given the timing of the study during the COVID-19 pandemic when the students were likely to be highly attuned to the volatile economic conditions.

Student confidence in completing and understanding their economics subject was also found to improve across the two surveys in the treatment group, while it remained stable in the control group. These improvements were not as large as those for the specific questions relating to understanding monetary policy and current economic conditions, but still represented a statistically significant change relative to the control group. This relatively smaller treatment effect likely reflects the fact that monetary policy and current economic conditions make up only a portion of the Economics syllabus that students are required to learn and understand.

Graph 3

Student Self-reported Understanding of Monetary Policy

Average student response*



* On a scale of 1 to 5 (with 1 being the least and 5 being the most)

** The difference between treatment and control groups is statistically significant at the 1 per cent level, accounting for gender, year level and socioeconomic status

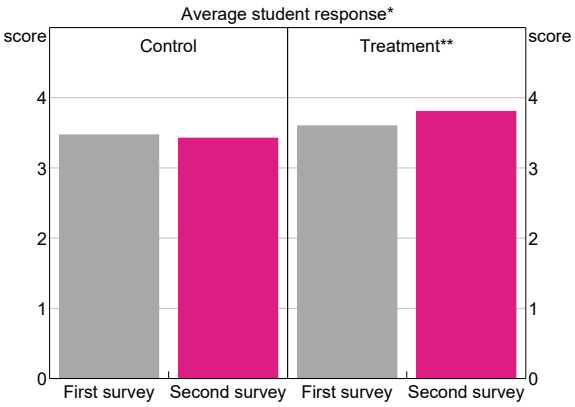
Source: RBA

Across all three of these questions on student-perceived understanding and confidence, there did not appear to be a difference between male and female students. Likewise, both Year 11 and Year 12 students reported improvements in confidence and understanding following the RBA school talk. Furthermore, the socioeconomic status of students and whether the student attended a government or non-government school did not appear to determine their perceived changes in understanding or confidence.

Self-reported interest in further study and a career in economics were broadly unchanged between the first and second survey. This was consistent across the control and treatment group. While the talks were perceived to have improved student understanding of monetary policy and current economic conditions, the talks themselves did not influence their career or study plans immediately after the talk. This is not completely surprising. Students were surveyed around one week after the 40-minute school talk – it is unlikely that such a small intervention would invoke a large change in the aggregate career path or study intentions of students within such a short timeframe. While there was no change in the responses between the first and second surveys, the initial survey responses on these two questions suggested that female students were much less interested in further study or a career in economics than male students. These findings are in line with previous research (Lovicu 2021; Livermore and Major 2021).

Graph 4

Student Self-reported Understanding of Current Economic Conditions

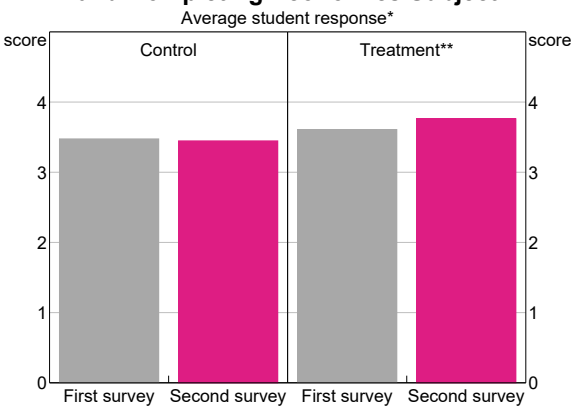


* On a scale of 1 to 5 (with 1 being the least and 5 being the most)
** The difference between treatment and control groups is statistically significant at the 1 per cent level, accounting for gender, year level and socioeconomic status

Source: RBA

Graph 5

Student Self-reported Confidence Understanding and Completing Economics Subject



* On a scale of 1 to 5 (with 1 being the least and 5 being the most)
** The difference between treatment and control groups is statistically significant at the 1 per cent level, accounting for gender, year level and socioeconomic status

Source: RBA

Measured student understanding

While *perceived* understanding is an important element of students' confidence and engagement with economics, *actual* understanding is also important – securing an increase in actual understanding is one of the more ambitious outcomes of the school talks program.[5]

The RBA school talks were found to increase the measured learning (or understanding) of information covered, in addition to improving student-perceived understanding. We constructed a high-level indicator of understanding by tallying all the responses of the knowledge-based questions and identifying the number that were correct. We found there was an increase in the total correct responses between the first and second survey in the treatment group, while there was no similar improvement in the control group. Upon accounting for students' self-reported sex, year and their school's socioeconomic status, we found the difference between the treatment group and control group was statistically significant and thereby that the RBA school talks improved students' measurable understanding.[6] This reinforces the above finding that students believe they understand more about monetary policy and

current economic conditions following an RBA school talk.

The improvements in measured understanding and information retention in the treatment group were found across all the formats used to deliver the school talks: Webinars; talks conducted at the RBA; talks conducted at the school; and Zoom talks conducted with one or two schools. Therefore, despite the Webinar talks receiving slightly less positive student feedback (discussed above), they still resulted in information being conveyed to and retained by students. This is likely because the Webinars covered the key concepts, even if they did not include as much time for student engagement and reinforcement.

Male and female students both benefited and did not appear to have a different response to the RBA school talks. Likewise, whether a student goes to a government or non-government school did not appear to determine their improvement in understanding. Socioeconomic status also did not appear to be a determining factor in how students received or retained information from the RBA talk.

Improvements in understanding were evident for both Year 11 and Year 12 students. However, there was a much larger increase in measured understanding among Year 11 students than year 12 students (Graph 7). This was primarily due to the nature of the questions asked; Year 12 students had a much higher measured understanding of the content prior to the talk and as a result we did not see as large an increase in their scores. In contrast, Year 11 students had lower pre-talk measured understanding and so we saw much larger increases following an RBA talk.

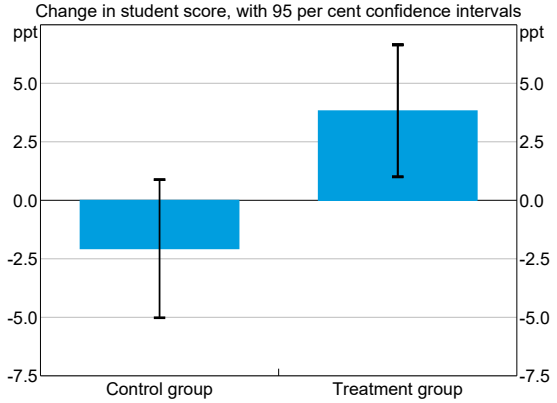
Among Year 11 students, we saw large increases in measured understanding of relatively simple monetary policy concepts following a school talk, such as knowledge of the RBA's inflation target and the tools used to conduct monetary policy (i.e. whether it is taxes, government spending or interest rates). In contrast, the survey measured a smaller improvement for Year 12 students, because their pre-talk understanding was already very high (prior to the talk, 92 per cent of Year 12 students correctly identified the Bank's inflation target, compared with 67 per cent of Year 11 students). It is important to note here that Year 12 students may have gained a deeper understanding of these concepts as a result of the school talk – for example, there is a big difference between knowing the RBA inflation target is 2–3 per cent and understanding what an inflation target is used to achieve and why. The surveyed 'knowledge' questions were unable to identify these changes in understanding, but the student self-reported increases suggest this might have been the case. More detailed questions may have identified these changes, but would have come at an increased time burden for teachers and students, which may have weighed on participation.

More complex questions that involved understanding the decision rules behind monetary policy or the mechanisms involved also saw increases in measured understanding in the

Graph 6

Measured Student Understanding

Change in student score, with 95 per cent confidence intervals

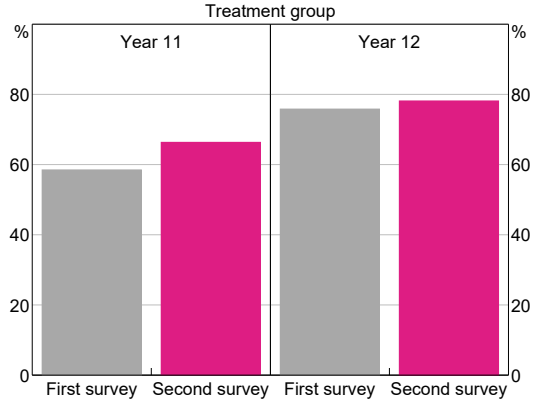


Source: RBA

Graph 7

Correct Responses on Knowledge Questions

Treatment group



Source: RBA

treatment group. For example, students were given an inflation rate and an unemployment rate and asked which direction the cash rate should be moved in order to fulfil the RBA's objectives.[7] There was a statistically significant increase in the number of students correctly identifying the required or likely direction of interest rates. In contrast, survey questions that separately identified and investigated the transmission mechanisms of monetary policy saw no discernible increase in correct student responses. This likely reflects the complexity of these concepts; because RBA school talks are only 40 minutes long, there is a trade-off between explaining these concepts and mechanisms in more detail and covering other content, such as an update on current economic conditions.

Overall, following the school talks, students were more able to correctly identify current economic conditions, the basic features of monetary policy and the decision rules involved in monetary policy; however, they did not exhibit a measured increase in their understanding of the mechanisms through which monetary policy operates.

Implications of results

There are a number of important implications and learnings from these results:

1. Previous Bank research has found that there are both interest and performance reasons why Year 12 students who study economics do not preference or enrol in economics in university (Lovicu 2021). While our survey analysis found no change in student interest in further study following an RBA school talk, we identified large and significant changes in confidence, as well as in both perceived and actual understanding of key economic concepts. The school talk interventions are therefore among the factors that may assist students to overcome these performance barriers to enrolling in economics at university. While these improvements were found across the diversity spectrum in this survey, Lovicu (2021) found that less socially advantaged students are more likely to face performance barriers. Therefore, to the extent that these school talks improve student performance, they may benefit socially disadvantaged students more, increasing the size and diversity of the economics student cohort.
2. The survey responses suggest that online talks, if targeted correctly, can be just as effective for economic literacy and advocacy as talks conducted in person. In-person talks, especially those where an RBA economist attends a school, can be resource intensive and less practical for schools located outside of capital cities. The survey responses suggest that talks can be delivered to schools in an online format without any considerable loss of quality or impact. As a result, the school talks program could be expanded considerably to areas outside New South Wales, as well as to more remote and regional areas. While the vast majority of schools teaching economics are in metro areas, this assistance to teachers and students who were previously unable to participate is likely to further improve the diversity and size of the economics student cohort.
3. Tailoring talks to the year level of the students participating is likely to be beneficial. The surveys showed that there are very different levels of understanding of the core concepts of monetary policy between Year 11 and Year 12 students. As such, Year 12 students may benefit more from a thorough explanation of the intricate details and complexities of monetary policy and the current economic environment, with less time spent on the more basic concepts. Of course, the level of presumed knowledge may depend upon the school and cohort. Therefore, having a flexible approach to the content and structure of the school talks is likely to lead to further improvements in understanding.

These results point to a number of avenues for further work. In particular, overseas research has found the role-modelling effect to be important to understanding and engagement (D'Acunto, Fuster and Weber 2021). It is possible that the characteristics of the economist presenter in the RBA school talks may lead to a differentiated result.

For example, female students may respond more positively to talks conducted by female economists. We intended to test this hypothesis; however, the limited sample of schools and the fact that a majority of the talks were conducted by a male economist, meant this was not possible. Further work could explore this representation issue.

Overall, results from this survey and other feedback from students and teachers enables the RBA Education team to continually adapt the talks to ensure they remain valuable for teachers and students. For example, the feedback on Webinars has resulted in us extending the duration of the Webinar talks going forward.

Conclusion

The Reserve Bank delivers school talks to Year 11 and Year 12 students to improve economic literacy and encourage a larger and more diverse student economics cohort. Students who participated in the school talks and survey program found them useful, helpful for understanding key economic concepts and engaging. Student-perceived understanding of monetary policy and current economic conditions was also found to increase following the RBA school talk, leading to improved student confidence with their economics subject. In addition to these perceived effects, measured understanding of the content covered in the school talk also increased.

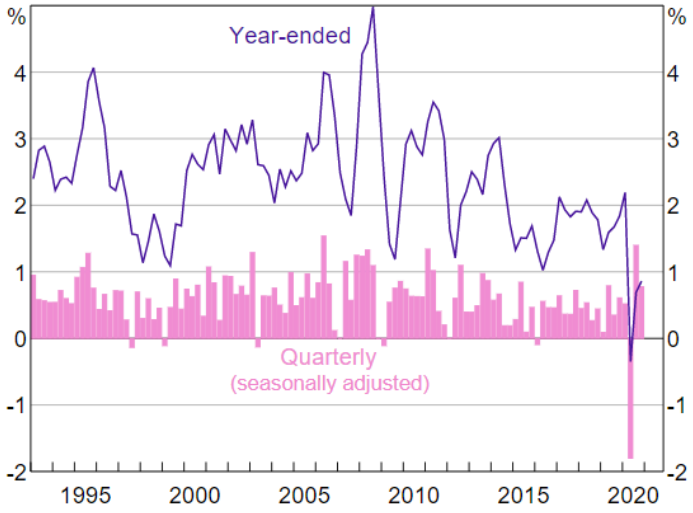
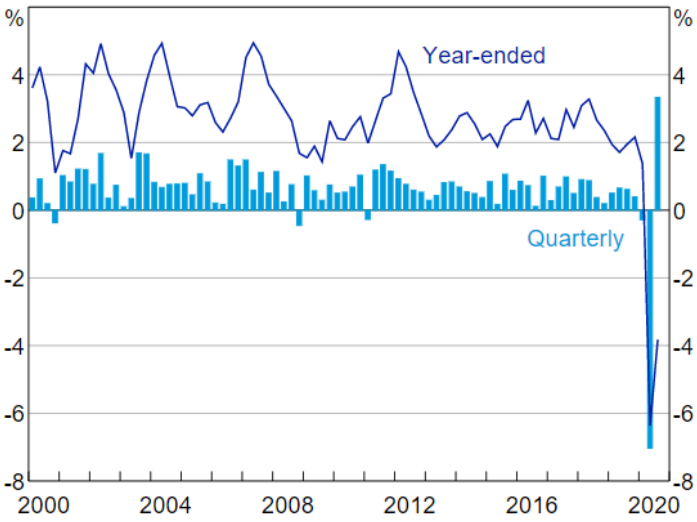
These findings corroborate the strong positive feedback from teachers over the past few years. Additionally, these results provide some guidance for the future of the school talks program. These results suggest that students find small online talks similarly engaging, useful and helpful for understanding key economic concepts as talks conducted in person. Therefore, the geographic reach of the school talks program could likely be expanded considerably without sacrificing the quality of the content provided to students. Further, the content and delivery of the school talks could be more targeted for Year 11 and Year 12 students, respectively.

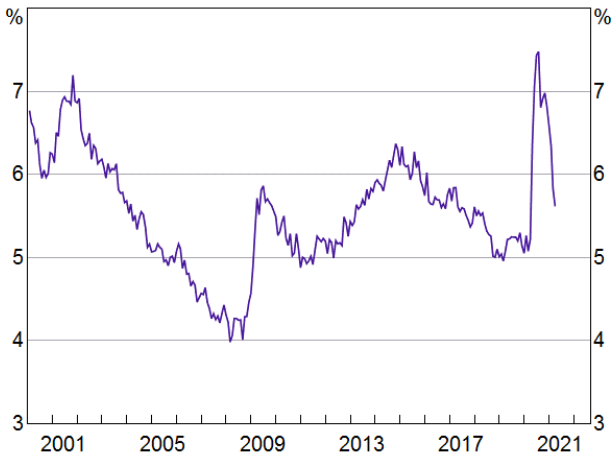
These proposed changes, as well as the existing benefits students derive from the school talks, should enable students to engage more effectively with economics content, lead to further improvements in economic literacy, and continue to contribute positively to the size and diversity of the economics student population.

Appendix A

Table A1: Example Student Survey[(a)]

	Question	Answer
Q1	Please enter the unique number that your teacher has allocated you for this survey	[free text]
Q2	What school do you attend?	[free text]
Q3	How would you describe your gender?	• Male • Female • Other • Prefer not to say
Q4	In which year will you finish Year 12?	• 2021 • 2022 • 2023
Q5	Which of the following functions do you think the RBA performs? (Multiple answers permitted)	• Acts as a bank for the Government • Provides bank accounts for the general public • Conducts monetary policy • Looks after financial stability • Oversees the payments system • Prints banknotes • Oversees Australia's tax system • None of the above
Q6	Imagine that you've just received a pay rise of 2% at your job. Inflation is expected to be 3% per year. After one year, would you be able to buy more than today, exactly the same as today, or less than today with your pay?	• More than today • Exactly the same as today • Less than today • Not sure
Q7	What is the Reserve Bank's inflation target? Inflation between:	• 0–1 per cent • 1–2 per cent • 2–3 per cent • 3–4 per cent • 4–5 per cent • 5–6 per cent • Not sure
Q8	Throughout 2020 and the COVID pandemic, the unemployment rate was: *(Hint: the NAIRU is the level of the unemployment rate where inflation is stable and in-line with the RBA's inflation target)*	• Below the NAIRU (natural rate) • At the NAIRU (natural rate) • Above the NAIRU (natural rate) • Not sure
Q9	Throughout 2020 and the COVID pandemic, the inflation rate was:	• Below the RBA's target range • Within the RBA's target range • Above the RBA's target range • Not sure
Q10	When the RBA changes monetary policy, it mainly influences …?	• Taxes • Government spending • Interest rates • Not sure
Q11	It's decision time! It is 2025 and Philip Lowe, Governor of the Reserve Bank, is asking you for advice on what to do with the cash rate. The unemployment rate is 8 per cent and inflation is 1 per cent. To help the RBA board fulfil their mandates, what should you tell Phil?	• Increase the cash rate • Don't change the cash rate • Decrease the cash rate • Not sure
Q12	If the RBA decided to **raise** the cash rate (make monetary policy **more contractionary**), what would likely happen to the unemployment rate?	• Decrease • Stay the same • Increase • Not sure
Q13	If the RBA decided to **lower** the cash rate (make monetary policy **more expansionary**), what would likely happen to housing prices?	• Decrease • Stay the same • Increase • Not sure
Q14	If the RBA decided to **lower** the cash rate, what would typically happen to the **exchange rate** ?	• Depreciation • Stay the same

	Question	Answer
		• Appreciation • Not sure
Q15	Imagine that you have passed the driving test and have just got your provisional license. You have bought a new car to cruise around in. To pay for the car you took out a loan with an interest rate of 5 per cent. If the RBA **lowers** the cash rate, what do you expect to happen to the interest rate on your car loan and the repayments you must make?	• Increase • Decrease • Stay the same • Not sure
Q16	Congratulations! Your application to work at the RBA just got accepted. After a few months of working you have some savings in your bank account. The RBA then decides to **raise** the cash rate. What would this RBA cash rate decision do to your likelihood of spending money on a car?	• More likely to spend money on a car • Less likely to spend money on a car • Not sure
Q17	What typically happens to Australian asset prices and wealth when the RBA **lowers** the cash rate?	• Asset prices and wealth decrease • No change to asset prices and wealth • Asset prices and wealth increase • Not sure
Q18	What key economic variable is displayed in the graph below? 	• Unemployment rate • GDP growth • Inflation
Q19	What key economic variable is displayed in the graph below? 	• Unemployment rate • GDP growth • Inflation • Exchange rate
Q20	What key economic variable is displayed in the graph below?	• Unemployment rate • GDP growth • Inflation • Exchange rate

Question	Answer
 Sources: ABS; RBA	
Q21 How would you describe the RBA's overall stance of monetary policy over 2020 and the COVID pandemic?	• Expansionary (trying to speed-up the economy) • Neutral • Contractionary (trying to slow-down the economy) • Not sure
Q22 How would you describe the Government's overall stance of fiscal policy over 2020 and the COVID pandemic?	• Expansionary (trying to speed-up the economy) • Neutral • Contractionary (trying to slow-down the economy) • Not sure
Q23 On a scale of 1 to 5 (with 1 being the least and 5 being the most), please rate your: • Understanding of monetary policy • Understanding of current economic conditions • Confidence that you have the tools to manage your finances • Confidence in understanding and completing your economics subject • Interest in further study in economics • Interest in a career in economics	

(a) This is an example of one of the surveys administered. Students were given slight variations to the economics questions 11–16 in their follow-up survey

Footnotes

[*] The author completed this work while with the Public Access and Education team. This work was made possible by the participation of schools, which was facilitated by the NSW Department of Education, the Victorian Department of Education, principals, teachers and students. We would particularly like to thank Alexander Symonds, Christine Dowd, Christine Reid and Bronwyn Hession for providing guidance on the school surveys, and Andrea Fitzpatrick for participating in a pilot. I would like to thank Tanya Livermore and Christina You for their support with both the survey design and organisation of the school talks. This work benefited considerably from the advice and feedback provided by participants at internal presentations, in particular James Bishop and Adam Gorajek.

[1] Randomisation is by schools rather than students because treatment is administered at the school level rather than the individual level. Individual-level randomisation would require teachers to administer the survey to different students at different times, or exclude some students from the talks (though these excluded students may affected by proximity-based knowledge spillovers from students given the treatment).

[2] In some fields, like psychology, the control group often receives a different treatment that has been shown to be effective.

[3] This large drop in participation for the second survey is likely to reflect the competing demands of students and teachers, along with disruptions stemming from the reintroduction of lockdowns. Specifically, some schools did not complete the second survey at all, some students within schools did not complete the second survey, resulting in the inability to match a student's first and second survey.

[4] An RBA survey of 262 high school economics teachers conducted in 2021 identified that staying up to date with economic conditions was by far the most commonly cited challenge.

[5] An improvement in measured understanding is also not subject to a response bias from students reporting better understanding simply because they received a talk.

[6] While our analysis controlled for males and females, students were asked 'how would you describe your gender?' with four response options: 'male'; 'female'; 'other'; and 'prefer not to say'.

[7] To ensure clarity of the question and remove doubt around measurements and exact targets, students were given large deviations from the RBA objectives – for example, an unemployment rate of 8 per cent and inflation rate of 1 per cent.

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The Central Bank's First Economist

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Leslie Melville (circled) at the Imperial Economic Conference, Ottawa, July 1932 (RBA Archives, PN-019030)

Abstract

In 1930, when officials from the Bank of England came to Australia to assist Australian governments with their budgetary problems, they found that the original Commonwealth Bank, then Australia's central bank, did not have an economist on its staff. They urged the Bank's Governor to appoint a qualified economist and recommended Leslie Melville, Professor of Economics at the University of Adelaide. Melville joined the Bank in March 1931. Some two decades later, when he left to become Vice-Chancellor at the Australian National University, Dr HC Coombs wrote to him saying that he had 'made a contribution to the theory and practice of central banking which is without equal in the world'. As Melville's 100th birthday approached in 2002, the Australian National University decided to hold a public lecture in his honour. Governor Ian Macfarlane was invited to give the inaugural lecture. He concluded that Melville was 'one of the most distinguished Australians of the past century'. The 20th Melville Lecture will be given in early 2022 by the Treasury Secretary, Dr Steven Kennedy. Ahead of this event, the latest records to be released in the Bank's new digital archive, Unreserved, include Melville's papers in digitised form. This article traces Melville's life and career, and his significance as the Bank's first economist.

Introduction

Until the early 1930s, the original Commonwealth Bank – then Australia's central bank from which the Reserve Bank of Australia was later formed – lacked economic expertise.[1] This was evident in its preparation for the return to the gold standard in the mid-1920s, which was heavily criticised and led to amendments to the Commonwealth Bank Act.

When the Treasurer, Dr Earle Page, introduced the new legislation into the Parliament in 1924 he declared that he was creating a central bank.[2] But it soon became clear that the Bank needed expert advice on central banking.[3] It also needed economic expertise. Consequently, in 1930, when Sir Otto Niemeyer and Professor TE Gregory from the Bank of England came to Australia to advise the

federal and state governments on how to put their finances in order, they recommended that the Bank appoint an economist to its staff.[4] In early 1931 the Bank offered the position to Leslie Melville, Professor of Economics at the University of Adelaide.[5] As the central bank's first economist, Melville immediately set about to establish what became known as the Economist's Branch.[6] He began to collect and analyse statistical data, and prepared regular reports for the Commonwealth Bank Board on economic and financial conditions in Australia and overseas.

In 1953 Melville left the Bank to become Vice-Chancellor of the Australian National University (ANU). In early 2002, as his 100th birthday approached, the university decided to hold a public lecture to celebrate the occasion. Ian Macfarlane, Governor of the Reserve Bank, was invited to give the inaugural lecture. After researching Melville's career at the Commonwealth Bank, Macfarlane concluded that 'you could be forgiven for thinking that Melville was the central bank'. In his assessment of Melville's long career as adviser to the central bank and Australian governments from the 1920s to the 1970s, Macfarlane judged that 'any objective assessment of achievements would place Sir Leslie among the most distinguished Australians of the past century' (Macfarlane 2002). Macfarlane's successors, Glenn Stevens and Philip Lowe, in their Melville lectures, came to similar conclusions. Stevens noted that Melville was 'one of the revered father figures of the economics profession, and of central banking in Australia' (Stevens 2008). Though he never met Melville, Stevens said that 'it does not take long in reading about his contribution to the economic life of the nation to see what a remarkable man he was'. The present Governor, Philip Lowe, in the 2019 Melville Lecture, agreed that the Reserve Bank has 'a lot to thank Leslie Melville for' (Lowe 2019).

Melville was present in the audience at the ANU to hear Macfarlane's lecture, but he died suddenly in Canberra a little over a month later. The ANU then decided to hold an annual memorial lecture to honour its former Vice-Chancellor. In early 2022 Dr Steven Kennedy, the Australian Treasury Secretary, will present the 20th Sir Leslie Melville Memorial Lecture.

Life and career

Leslie Galfreid Melville was born at Marsfield on Sydney's north shore on 26 March 1902, the son of a bank manager.[7] He was the youngest of four children, the eldest of whom was killed on the western front shortly before the end of the First World War. After attending primary schools in Rose Bay and Darlinghurst, Melville won a scholarship to Sydney Church of England Grammar School (Shore) at North Sydney. There he excelled at mathematics, so much so that he was known as the 'Isaac Newton of Shore'. In his matriculation year he topped the state in mathematics.

Proceeding to the University of Sydney, Melville enrolled for a degree in engineering. Later he switched to mathematics when he decided to pursue a career as an actuary. Working part-time at the government superannuation board he changed his university course again to economics, enabling him to combine mathematics and economics. In his spare time he studied to qualify as an actuary through the London Institute of Actuaries. At age 22, and before he had completed either his economics degree (which he continued through correspondence) or his actuarial studies, he was appointed Public Actuary of South Australia. In this position he established a superannuation fund for public servants and provided advice to friendly societies. Frequently he was asked by the South Australian Government to advise it on economic matters. He played a prominent part in discussions leading to the Financial Agreement of 1927, gave evidence in 1928 to the Royal Commission on the Australian Constitution, and again in 1929 before the Royal Commission on the Finances of South Australia as Affected by Federation. He also presented South Australia's case as a claimant state of the Commonwealth. It was this work that stimulated his interest in federal–state financial relations and led much later to his appointment as Chairman of the Commonwealth Grants Commission.

In 1929 Melville was appointed Professor of Economics at the University of Adelaide, the first occupant of the position. He was reluctant to apply and did so after the closing date for applications at the urging of the Vice-Chancellor, Sir William

Mitchell.[8] As the only permanent member of the Department of Economics, he taught courses in economics and economic statistics. He also gave public lectures on the economic problems confronting Australia and the measures required to restore stability. In the summer of 1930/31 he worked in the Economic Department of the Bank of New South Wales, filling in for Professor Edward Shann, the first senior economist employed by an Australian bank.

Melville resigned his chair at Adelaide when he was appointed to the Commonwealth Bank in March 1931. The appointment at the Bank was originally for one year and was extended for another five years, before becoming permanent until he left in 1953. In 1932, in a progressive appointment, Melville appointed a woman, Willmott Debenham, a University of Sydney graduate in economics, as his Assistant Economist. Melville saw Debenham as an economist first and the best person for the role. When she was compelled to resign from the Bank on her marriage to JG (Jock) Phillips, later Governor of the Reserve Bank, Melville appointed Dr HC Coombs to the vacant post; Coombs would become the last Governor of the Commonwealth Bank and the first Governor of the Reserve Bank.

Before his appointment to the Commonwealth Bank, Melville had joined with other economists to provide advice on measures to deal with the Great Depression, including devaluation of the Australian pound. In 1931 he was appointed to the influential Copland Committee, established to advise the Australian Loan Council on the 'Possibilities of Reaching Equilibrium in Australia'; it was this committee that formulated the 'Premiers' Plan', which, according to JM Keynes, 'saved the economic structure of Australia' (Keynes 1932). The following year Melville was appointed to the Wallace Bruce Committee, which reviewed the progress of the Premiers Plan at the invitation of the Prime Minister, Joseph Lyons. Later in 1932 he attended the Imperial Economic Conference in Ottawa and in 1933 he went to the World Economic Conference in London. Returning home from Ottawa through London he sought the views of economic experts including Keynes, Hawtrey, Stamp, Clay, Gregory and Layton on the Australian exchange rate. Keynes invited him to lunch at his home in Bloomsbury, later taking him to Cambridge where he participated in Keynes' famous Monday evening discussion group at King's College. Melville was to meet Keynes on a number of subsequent occasions and they were frequent correspondents; often the discussion turned to Keynes' investments in Australian Government securities.

As the possibility of war loomed in the late 1930s, the government appointed a committee of economists – the Financial and Economic Advisory Committee (F and E Committee) – to provide advice on war finance. Melville was an original member of the committee. Guided by Keynes' *How to Pay for the War*, the committee maintained that additional war-related expenditure could be met, at least to begin with, by drawing upon unemployed resources rather than having to rely on taxation or direct measures such as rationing. National income estimates were used for the first time to measure actual and potential gaps between total output and expenditure. By participating in this work, Melville played a vital role in helping to construct Australia's war economy, as the papers and minutes of the F and E Committee amply attest.

Another aspect of the F and E Committee's work, of which Melville played a defining role, was Australia's response to war assistance provided by the United States. Article 7 of the Mutual Aid Agreement between the United States and the United Kingdom, and subsequently between the United States and Australia, required recipients of American assistance to work toward the dismantlement of barriers to international trade, including the preferential tariffs between members of the British Empire.[9] Australia's response to Article 7 was the so-called 'Full Employment Approach' (or 'Positive Approach'): in return for Australia's support for US plans for post-war international trade and finance, the United States and other world economic powers would commit to domestic policies aimed at maintaining full employment. The rationale was that buoyant levels of demand in the world economy would assist small, open economies like Australia to preserve internal and external balance. The 'Full Employment Approach' was taken by Australian delegates to all the major international

conferences during and immediately after the war, including most notably at Bretton Woods in 1944.[10] LF Giblin, Melville and Coombs were the principal authors of the 'Full Employment Approach' (Cornish 1981; Cornish and Schuler 2013).

As well as his work for the F and E Committee, Melville was chosen to lead the Australian delegation to the important British Commonwealth talks on finance and trade in London in 1944. Keynes, who also attended the conference, was so impressed with Melville's contribution at the conference that he wrote to Giblin saying:

> I saw … a good deal of Melville's conduct of his business at the meetings. You can feel very confident that he upheld the dignity and integrity of Australia with the most marked success … he handled himself most impressively, was clear, cogent and never unreasonable, put his point forcibly yet moderately, and achieved, in my judgment, as much as was humanly possible to move matters in the direction he desired. He had quite a difficult task and accomplished it supremely well.[11]

Later in 1944, Melville was appointed by Prime Minister Curtin to lead Australia's delegation to the United Nations (UN) Monetary and Financial Conference at Bretton Woods, which created the International Monetary Fund (IMF) and the World Bank. There he had mixed success in achieving the government's objectives and was embarrassed when he was instructed not to sign the Final Act incorporating the conference resolutions. Instead, he was simply to certify that the record of proceedings was accurate. Melville himself was not altogether satisfied with what had been agreed at Bretton Woods, preferring greater exchange rate flexibility, larger quotas and borrowing rights, and an increased obligation on creditor nations to assist countries experiencing external payments problems. In the end he urged the government to support Australian membership of the IMF and World Bank. In 1945 he observed the first meeting of the governors of both institutions at Savannah, Georgia, as the representative of Australia. From 1947 to 1950 he chaired the UN Economic and Social Council's sub-committee on Employment and Economic Stability.

In 1948 Melville's career suffered a setback when the Prime Minister and Treasurer, JB Chifley, nominated Dr Coombs to fill the position of Governor of the Commonwealth Bank. Coombs himself agreed that the position should have gone to Melville, admitting that he had argued without success in favour of Melville in discussions with the Prime Minister.[12] The decision, however, was a political one, motivated by Chifley's disappointment over the rebuff to his plans to nationalise the private banks. Melville was subsequently appointed Assistant Governor (Central Banking), declining offers to become Ritchie Research Professor of Economics at the University of Melbourne and Director of the Research School of Social Sciences at the new national university in Canberra; earlier he had narrowly missed out to Copland for the position of inaugural Vice-Chancellor at the ANU (Cornish 2007). He decided to take a year's sabbatical leave to familiarise himself with the latest mathematical and econometric techniques in economics, and to work on the draft of a book he was writing entitled *The Unstable State*, which sought to apply dynamics to existing economic theory.[13] (A digitised copy of *The Unstable State* is available for the first time in Unreserved along with his Bank papers.) Melville's sabbatical year ended in 1950 when he was appointed Executive Director for Australia and some other countries at the IMF and World Bank in Washington. There he became a powerful advocate of the convertibility of sterling and related currencies. When he retired from the Commonwealth Bank on his return to Australia in 1953 to succeed Copland as the ANU's Vice-Chancellor, Coombs wrote to him saying that 'in the years you were with the Bank, you made a contribution to the theory and practice of central banking which is without equal in the world'.[14]

At the ANU, Melville continued the work of his predecessor to create a university of world stature. By the end of his seven-year term this objective was accomplished. One of his final and most difficult tasks was to negotiate the amalgamation of the

ANU and Canberra University College. After the Vice-Chancellorship he resumed his career as one of the nation's most prominent economic advisers. He wrote articles on policy issues, was appointed to government advisory committees, occupied a seat on the Board of the Reserve Bank, and chaired at Coombs' invitation the regular meetings of university economists with the Governor of the Bank.[15] During this period, Prime Minister Menzies appointed him to several government committees, including the Economic Advisory Council and the Immigration Planning Council.

The most important appointment he accepted after leaving the ANU was Chairman of the Tariff Board. This was always going to be a difficult assignment for one who strongly believed that Australia's tariff protection was excessive and that tariff-making required a rational rather than an emotional approach. After two years of considerable turbulence he resigned following irreconcilable differences with the Minister for Trade, John McEwen. The Minister, according to Melville, 'was trying to bully the [Tariff] Board into recommending higher tariffs than were justified on any basis. Finally I got fed up with this business and felt I couldn't go along with it any longer' (Cornish 1993, p 29).

Thereafter, until his effective retirement in the late 1970s, Melville worked first as a consultant to the Development Advisory Service of the World Bank, leading missions to Syria and to the Philippines, where he was stationed for two years. On his return to Australia, he undertook several government assignments, including inquiries into: Wages and Industry in the Territory of Papua and New Guinea; the Oil Industry's Terms and Conditions for the Refining of Indigenous Crude Oil; the Treasurer's Proposals for a New Superannuation Scheme for Australian Government Employees; and the Commonwealth Committee of Enquiry on Health Insurance. Throughout the 1950s he had been a member of the Board of the Commonwealth Bank; he was appointed to the Board of the Reserve Bank in 1959 and remained a member until 1974 (except for the period when he worked for the World Bank). He joined the Commonwealth Grants Commission, and for eight years was its Chairman. For most of this time he held a Visiting Fellowship in the Department of Economics at the ANU's Research School of Pacific Studies. There he participated actively in seminars and occasionally presented papers.

Ideas and policies

Melville dismissed any suggestion of belonging to a particular school of economic thought. During the 1930s he was often regarded as a 'deflationist' rather than an 'expansionist'. Giblin certainly thought that Melville was 'a strong deflationist' (Cornish 1999, p 130). Roland Wilson also asserted that 'Melville was fairly notorious for his deflationary views'.[16] Although the claim is arguable, it has to be balanced by Melville's strong support for devaluation, which he believed was necessary for the purpose of limiting deflation. In fact, Melville's interpretation of the causes of the Great Depression, and the policy position he held during the Depression and recovery, were remarkably consistent. In the case of Australia, the Depression was the result of a combination of internal and external influences. The nation had borrowed extravagantly in the 1920s; much of it was spent on public works of an unproductive nature. The servicing of external debt had become unsustainable by the late 1920s, a problem made worse when export prices plummeted as a result of the Depression. It was Melville's view that Australia would have experienced a sharp downturn in economic activity for domestic reasons alone, though he conceded that the international depression greatly magnified local difficulties.

For Melville, the task facing Australia in 1930 was to absorb the loss of real income without creating further problems. In his policy advice he offered three recommendations. The first was to stabilise public finance by bringing state and Commonwealth budgets closer to a balanced position; he considered that this was essential for the restoration of confidence. The second was to reduce domestic costs; this did not amount simply to a cut in wages, but a reduction in all incomes, including those derived from the ownership of capital. Third, he believed there was little hope of restoring prosperity without a recovery of prices, both international and domestic; here, Melville was

a strong supporter of exchange rate flexibility and internationally coordinated attempts to reflate economic activity. He was emphatic that Australia could not adopt a unilateral policy of increased government expenditure in the face of the massive loss of confidence by overseas investors. Yet he was realistic enough to admit that budget deficits could not be eliminated immediately and that borrowing from the banking system by the issue of Treasury bills might have to be maintained for some time, even though he supported in principle the funding of floating debt. On the other hand, he was never faint-hearted about the necessity of wage cuts, continuing to advocate them throughout the 1930s as a stabilisation measure.

Melville's most persistent policy recommendation, however, concerned the exchange rate. While he continued to see merit in seeking to preserve exchange stability in normal circumstances, he supported adjustments to the exchange rate – even a floating rate – when external conditions deteriorated fundamentally. He was opposed to the determination by Sir Robert Gibson, the Chairman of the Board of the Commonwealth Bank, to restore parity with sterling and return the currency to the gold standard (Cornish 1993). As a member of the Wallace Bruce Committee, Melville supported recommendations for a further devaluation (from A£125 to A£140 = £stg 100) and additional wage cuts, believing they would strengthen the balance of payments and provide greater scope for monetary expansion. He never concealed his disappointment that Keynes did not support the committee's argument for a further devaluation.

When in 1936 the government established a Royal Commission on the Australian Monetary and Banking Systems, Melville took the opportunity to explain his position on monetary policy in a written statement and in oral evidence.[17] He asserted that the objectives of monetary policy were threefold: the stability of economic conditions; the maximum level of output; and full employment. He acknowledged that it would be difficult to achieve all these objectives simultaneously and choices between them would have to be decided. The authorities should use all the available policy instruments – including the exchange rate, credit controls and the rate of interest – to ensure that optimum choices were made. For the purpose of controlling credit, he agreed that private banks should be compelled to lodge a certain proportion of their deposits with the Commonwealth Bank. A variation of this idea was recommended by the Royal Commission and applied by the monetary authorities during the Second World War, becoming the principal mechanism for controlling credit growth for some decades thereafter. Melville himself would have preferred to conduct monetary policy by market operations, having been the major force behind the failed attempt by the Commonwealth Bank in the mid-1930s to use open market operations. For him, the Special Accounts mechanism (later Statutory Reserve Deposits) adopted during the war represented a second best solution.

Because of the inherent complexity of the economic policy process, Melville saw the need to follow simple rules. It was necessary, he wrote in his submission to the Royal Commission, to 'select one factor in the economy and attempt to fix it, at the same time endeavouring, as far as possible, to make every other factor in the economy adapt itself to the fixed factor'. His choice of policy anchor was the exchange rate. 'Having regard to the necessity for Australia to trade on friendly terms with other countries, her need for overseas capital, and the convenience of traders and financiers', he considered it 'best in her case to fix the exchange rate and adapt the economy to that fixed rate'. In these circumstances, domestic policy would be guided by the level of foreign reserves: monetary policy would be eased when the reserves rose and tightened when the reserves fell. However, while he recommended that the exchange rate should provide the anchor – or compass, to use his terminology – upon which monetary and other policy settings should be adjusted or guided, this did not mean that he supported a fixed exchange rate in all circumstances. On the contrary, there would be 'exceptional circumstances' when the exchange rate would have to be adjusted to avoid excessive deflation (or inflation).

Melville greatly admired Keynes, both as a person and as an economist. Yet there was always some

ambivalence about his allegiance to Keynes (Cornish 1993). He admitted that he was greatly stimulated by many of Keynes' theoretical arguments and policy proposals. But he was not committed to them in their entirety. He accepted the broad Keynesian framework of aggregate demand and its key determinants. He agreed also that an economy dependent solely on market forces would not necessarily tend to full employment and that there were strong grounds for managing the level of aggregate demand by public policy, especially by monetary policy in normal circumstances, and perhaps by fiscal policy when the economy was greatly depressed. For the most part, he endorsed Keynes' approach to war finance, the Bretton Woods system and full employment. Yet there were always qualifications.

Melville over the years spoke and wrote on a number of contemporary policy issues. When he was at the IMF in the early 1950s he participated in the debate on currency convertibility, especially sterling convertibility. At first he opposed sterling convertibility, on the grounds that the United Kingdom was 'bankrupt and couldn't really make their currency convertible at that time. In effect, there was no alternative for them but to have something like the Sterling Area'. But as time progressed it seemed to him that nothing was being done to dismantle the Sterling Area and so he began to support convertibility, writing an influential paper on the subject when he was at the IMF, which was widely circulated.[18] He disclosed in a later interview that he did not write the paper at the prompting of the Australian Government, though he was aware that it favoured convertibility. On his return to Australia he wrote an article for *Australian Quarterly* setting out his reasons for supporting convertibility. In essence, he was concerned that, by being a member of the Sterling Area, Australia was forced to buy goods from the United Kingdom at higher prices than they could be purchased from the US (Melville 1954).

In four important papers written between 1942 and 1946 Melville focused on the prospects for achieving full employment after the war. In these publications he addressed both theoretical and policy issues (Melville 1942, 1945, 1946a, 1946b).

While he supported the emphasis that was placed on achieving full employment through the management of aggregate demand, he questioned the government's aim to maintain the level of unfilled vacancies in excess of the numbers registered as unemployed. Rather, he thought the government should aim to achieve an unemployment rate of not less than 3 per cent, since there would always be some frictional and structural unemployment. Of the policy instruments available for the purpose of maintaining employment, he conceded that monetary policy might be too weak in exceptional circumstances to arrest powerful deflationary forces. Instead, fiscal policy, centred on the expansion of government expenditure in the form of public works, might be necessary to combat unemployment. But he cautioned that a great deal of prior planning of public works would be required. On several occasions he doubted that a small, open economy such as Australia could successfully apply unilaterally an expansionary domestic policy aimed at combatting unemployment, especially at times when the international economy was in a depressed state. Nor was he convinced that the new international institutions such as the IMF would be able to assist countries like Australia in these circumstances. Above all, there was the strong possibility that a fully employed economy would give rise both to a permanent state of inflation and to inefficiencies in the utilisation of resources as the sellers of goods and services – and of labour – acted to exploit their market strength in conditions of buoyant demand.

On the question of floating exchange rates, Melville took a pragmatic view. His preference was for a fixed but adjustable rate somewhat along the lines of what had been agreed at Bretton Woods, though with greater scope for adjustment. But for that to work there would have to be a reliable anchor, which there had not been since the US dollar went off the gold standard in 1971. Since that time, there was no country that he would have liked the Australian dollar to be anchored to, and accordingly there was no alternative to a floating rate. In the early 1990s he admitted that he would have preferred to return to the Bretton Woods system under the guidance of the IMF. But to succeed, he

thought that Germany, Japan and the United States would have to adopt firmer monetary and fiscal policies. If that were to happen, he said, 'we'd then have a very firm anchor on which we could link the Australian dollar' (Cornish 1993, p 37).

On the question of central bank independence, Melville agreed that the Reserve Bank 'ought to be made as independent as possible', but he did not believe that it could be 'completely independent of government'. For him, that was 'not realistic'. Nor did he think it was necessary since the Bank, according to its statute, was 'free to challenge the government. If the government tells it to do something, it can say, 'we won't'. The government can then only make the Bank fall into line by having the nature of the dispute, and the government's directive to the Bank, tabled in Parliament'. Referring to the situation as it was in the early 1990s, he was 'inclined to think that is about as independent as you can get' (Cornish 1993, p 38).

Character and honours

Melville was a person of his time and social circumstances. Born in the second year of Federation, he worked for most of his life in institutions created by the Commonwealth. He possessed a restrained and earnest temperament, and was never one to seek the limelight. Though a university professor for scarcely two years, he continued throughout his life to adopt a detached and scholarly attitude, being generally addressed at the Commonwealth Bank – though not at his insistence – as 'Professor Melville'. He distrusted flamboyance and excessive exuberance, and was quick to condemn opinions and actions that appeared to him to be irresponsible. He never doubted his own abilities, which were substantial. Nor did he shy away from responsibility, which had been thrust upon him at a remarkably early age. He continued throughout his career to regard himself primarily as an economist and was proud of the respect with which economics and economists had come to be held within Australia by the middle of the 20th century. He served as President of the Economic Society of Australia and New Zealand (later the Economic Society of Australia), having joined it as a foundation member in Adelaide in 1925. He was also President of Section G (Economics) of ANZAAS (Australian and New Zealand Association for the Advancement of Science). He was elected a Distinguished Fellow of the Economic Society of Australia upon his 90th birthday in 1992, an honour that gave him great satisfaction. In 1943 he was elected a Fellow of the Social Science Research Council (SSRC), the precursor of the Academy of the Social Sciences in Australia, of which he became an Honorary Fellow; he had been a member of the first group of Fellows of the SSRC and was its Chairman from 1953 to 1958. He was the author of more than 30 published articles, lectures, reports and submissions to public enquiries, but the bulk of his writing can be found in unpublished papers and memoranda at the archives of the Reserve Bank in Sydney and the National Archives of Australia in Canberra. He was made a Commander of the British Empire (CBE) in 1953 and created a Knight of the British Empire (KBE) in 1957. Honorary degrees were conferred upon him by the ANU and the universities of Sydney and Toronto. He was a Fellow of both the Institute of Actuaries (London) and the Actuaries Institute of Australia.

On the occasion of Sir Leslie Melville's 100th birthday, Ian Macfarlane rightly remarked that Melville was one of 'the most distinguished Australians of the past century'. He, more than any other person, introduced central banking to Australia. He represented Australia at many of the most significant international economic conferences of the 20th century, chaired one of the United Nations most important economic committees, was the chief executive of what became one of the world's great universities, chaired the Australian Tariff Board and the Commonwealth Grants Commission, led World Bank missions to developing countries, chaired countless government committees at the request of Australian Prime Ministers and senior government ministers, and continued to present papers at university seminars into his eighties (Arndt 2000). The Reserve Bank can be justly proud that Leslie Melville was the first economist appointed to the nation's central bank.

Footnotes

[*] Selwyn Cornish is the Reserve Bank of Australia's Historian and an Associate Professor at the Australian National University. The author acknowledges the assistance of Jacqui Dwyer, Virginia MacDonald and Greg Tyler.

[1] For more information about how the Reserve Bank evolved from the Commonwealth Bank of Australia to become an independent central bank, see RBA, 'Explainer: Origins of the Reserve Bank of Australia'. Available at <https://www.rba.gov.au/education/resources/explainers/origins-of-the-reserve-bank-of-australia.html>.

[2] See Commonwealth of Australia (1924), *Parliamentary Debates*, Vol 106, p 1265.

[3] Montagu Norman, the Governor of the Bank of England, was invited to Australia to advise the Bank. Unable to visit himself, he sent one of his senior officials, Sir Ernest Harvey, whose advice was that the Commonwealth Bank should follow the design and practices of the Bank of England, shedding its commercial banking functions and using market operations to conduct monetary policy. However, Australia was yet to develop a short-term money market and the Parliament was not ready to establish a separate central bank (Giblin 1951, pp 37–46).

[4] See RBA Archives C.3.15.10.7, Ernest Riddle to Montagu Norman, 25 August 1931.

[5] See RBA Archives BM-M-5.

[6] This was later the Reserve Bank's Research Department and since the early 1990s the Bank's Economic Group.

[7] See Cornish (1993) and National Library of Australia (undated).

[8] See University of Adelaide Archives, Series 200/26/29, LG Melville to Registrar, 23 February 1929.

[9] These preferential arrangements had been established at the British Empire Economic Conference in Ottawa in 1932 to foster closer relations among British Empire countries as they sought to recover from the Great Depression.

[10] These conferences included: the Food and Agriculture Conference in Hot Springs, Virginia, in 1943; the International Labour Conference in Philadelphia in February 1944; the Monetary and Financial Conference at Bretton Woods in 1944; the United Nations Conference in San Francisco in 1945; and the various international trade conferences culminating in the Havana Conference in 1948.

[11] See Kings College Archives (University of Cambridge), JM Keynes to LF Giblin, 24 March 1944.

[12] See RBA Archives GHC-48-2, HC Coombs to LF Giblin, 3 December 1948.

[13] See RBA Archives GGM-55-1-A & GGM-55-1-B and Melville (undated).

[14] See RBA Archives ST-PR-35, HC Coombs to LG Melville, 13 January 1954.

[15] See RBA Archives C.3.15.9.29 & C.3.15.9.30.

[16] See RBA Archives GLG-51-5, R Wilson to LF Giblin, 7 December 1949.

[17] See Commonwealth of Australia (1937a, 1937b).

[18] See RBA Archives C.3.7.6.43; Melville (1952); Cornish (1993).

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Recent Changes to the Reserve Bank's Liquidity Operations

Sean Dowling[*]

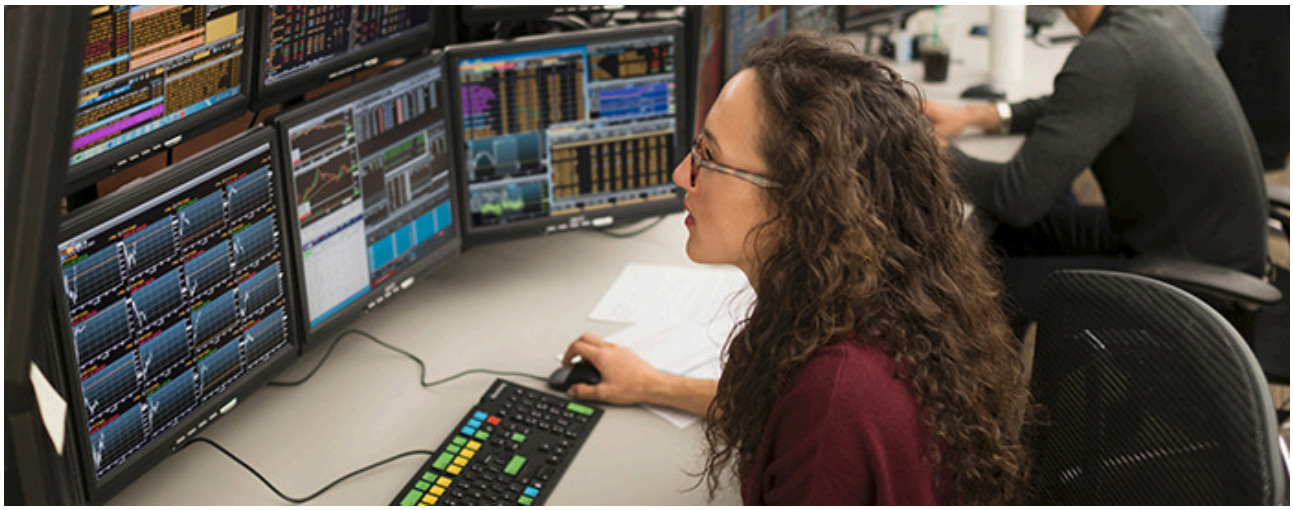


Photo: Tetra Images – Getty Images

Abstract

The Reserve Bank's policy measures to support the economy in the wake of the COVID-19 pandemic have significantly increased liquidity in the banking system. Consequently, market participants have had less need to use some of the Reserve Bank's liquidity operations and facilities. In response, the Bank reduced the frequency of its regular open market liquidity operations from daily to weekly. It also removed the requirement for financial institutions that make payments outside of business hours to source additional liquidity from the Bank via open standing facility repos so long as they are holding sufficient Exchange Settlement balances. This article outlines these recent operational changes.

Introduction

Prior to March 2020, the cash rate was the sole operational target for monetary policy in Australia. The cash rate is the interest rate at which commercial banks lend Exchange Settlement (ES) balances to one another on an overnight unsecured basis in the cash market. ES balances are at-call deposits held at the Reserve Bank of Australia (RBA) that commercial banks use to settle their payments obligations. In order to ensure that the cash rate remained close to the target determined by the Board, the RBA tightly managed the supply of ES balances (also known as 'system liquidity') to closely match the demand from commercial banks. Because the interest rate paid on ES balances is below the cash rate, commercial banks had an incentive to lend their surplus ES balances to other banks in the cash market.[1] In order to keep the cash rate at the target, the RBA needed to supply between $2 billion and $3 billion in system liquidity.[2]

In response to the COVID-19 pandemic, the RBA used a number of monetary policy tools to support the economy and to address disruptions to the smooth functioning of financial markets (Dowling and Printant 2021). These policy measures have

contributed to a significant increase in system liquidity, with the supply of surplus ES balances having risen to around $380 billion (Graph 1). As a result, the supply of ES balances has exceeded demand and, as expected, the cash rate has decreased to below the cash rate target of 0.10 per cent, to be close to the interest rate on ES balances (currently zero per cent).

Reflecting the increase in system liquidity, market demand for liquidity from the RBA's regular open market operations (OMO) has declined significantly. The large supply of ES balances has also reduced the need for the RBA to provide liquidity through open standing facility repos (open repos), which some banks were required to use to ensure they could meet their after-hours payments obligations.[3] The RBA has responded to these developments by changing some of the parameters of these operations and facilities. This article describes these changes in greater detail.

The Reserve Bank has reduced the frequency of its regular open market liquidity operations

Before March 2020, the RBA ensured that the cash rate remained near the target by carefully setting the supply of ES balances. If the supply of ES balances was too low (relative to banks' demands), banks would have had an incentive to bid for ES balances at a higher interest rate – above the cash rate target. Alternatively, as is currently the case, if the supply of ES balances is greater than demand, banks have an incentive to lend their surplus ES balances at a lower interest rate – below the cash rate target.

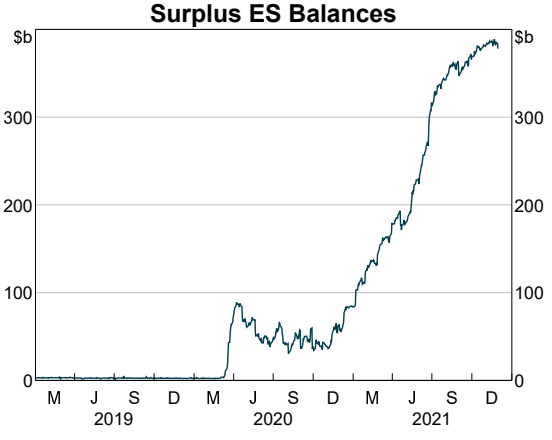
The overall demand for ES balances is driven by banks' liquidity needs and tends to be fairly stable from day to day. In order to permit the smooth functioning of the payments system, commercial banks need sufficient ES balances to make payments on behalf of their customers. However, banks generally have little use for these ES balances once their customers have completed their payments activity for the day.[4] Banks have an incentive to lend any surplus ES balances because the interest rate they can receive by lending ES balances in the cash market is higher than the interest rate paid by the RBA on ES balances held overnight.

The demand for liquidity tends to be steady from one day to the next. In contrast, absent an active response by the RBA, the supply of ES balances would fluctuate on a daily basis due to transactions between the RBA (and its clients) and commercial banks. In particular, the RBA is the banker for the Australian Government. So, for example, large tax payments by households or businesses will reduce the supply of ES balances in the banking system. This is because when a household or business pays tax to the government, their bank uses its ES balances to make this payment to the RBA. Alternatively, when the government makes payments to households or businesses – such as social security payments, tax refunds or infrastructure spending – this will increase the supply of ES balances.

Prior to the pandemic, the RBA would offset these transactions by operating daily in financial markets, in order to keep the supply of ES balances relatively stable. The main tool used to achieve this was OMO, where the RBA buys or sells securities under repurchase agreement (repo) or outright via competitive auctions. On most days, the RBA would inject liquidity by buying securities under repo or buying them outright (in exchange for ES balances).[5] Because these operations were designed to offset other transactions expected to affect system liquidity, the dealing amounts each day were determined by these external factors. Auction participation was typically strong, with total

Graph 1

Surplus ES Balances



Source: RBA

bids almost always comfortably exceeding the intended auction size (Graph 2).

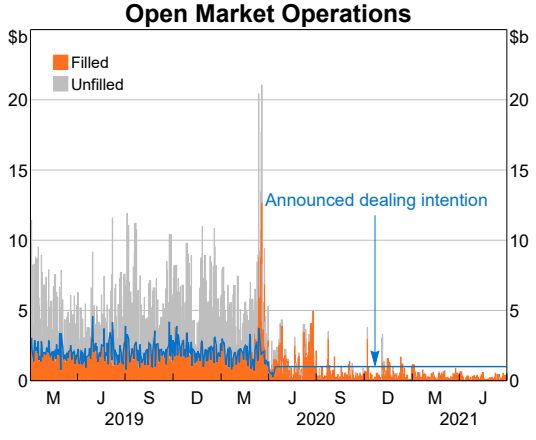
The purpose and operation of OMO has changed since the onset of the pandemic. System liquidity has increased significantly due to the RBA's policy measures to support the economy – most notably, the Term Funding Facility (TFF) and the Bond Purchase Program. The RBA has chosen not to offset this increase in system liquidity, which has provided more monetary stimulus than would otherwise be the case (Kent 2020). Accordingly, OMO are no longer conducted to closely manage the supply of ES balances, but rather to complement the RBA's other policy measures by providing short-term liquidity to participants in the repo market at a fixed interest rate (currently the cash rate target). As a result, OMO dealing amounts are now largely determined by the demand for repo funding.

During the early stages of the pandemic, the demand for OMO repo funding rose significantly. Financial institutions sought precautionary liquidity owing to a high degree of uncertainty over the economic outlook, while bond market dealers needed to fund a growing inventory of bonds that they had purchased from clients facing their own liquidity needs.[6] The RBA met this demand by providing substantially more liquidity and for longer maturities than usual through its daily operations. However, since then, the demand for liquidity via the RBA's OMO has declined significantly, reflecting the substantial increase in system liquidity and substitution towards longer-term TFF funding. Prior to the pandemic, the total stock of outstanding OMO repos (the OMO repo book) tended to fluctuate between $40 billion and $70 billion, and typically made up between 30 per cent and 50 per cent of cash borrowed in the Australian dollar repo market. More recently, the size of the OMO repo book has declined to around $6 billion, representing less than 5 per cent of cash borrowed in the repo market. This decline reflects both a drop in the number of OMO participants and a decrease in the average stock of outstanding repos with each OMO participant. Indeed, at times the number of counterparties with OMO repos outstanding with the RBA has been as low as one-quarter of pre-pandemic levels; around 10 per cent of daily OMO auctions have received no bids at all (Graph 3). The size of the OMO repo book has also become less volatile over time, suggesting that the remaining demand for OMO repo funding is quite stable.

The decline in OMO participation is expected to persist, given the outlook for liquidity in the banking system to remain very high in coming years. The RBA is continuing to purchase government bonds, which is adding further liquidity to the system. The maturity of both TFF repos and the RBA's existing holdings of government bonds will eventually lead to a decline in ES balances, though this will take place over a number of years. Reflecting this, surplus ES balances are projected to remain greater than $100 billion until at least the end of 2025 (based on announced policy measures and other technical assumptions).

Graph 2

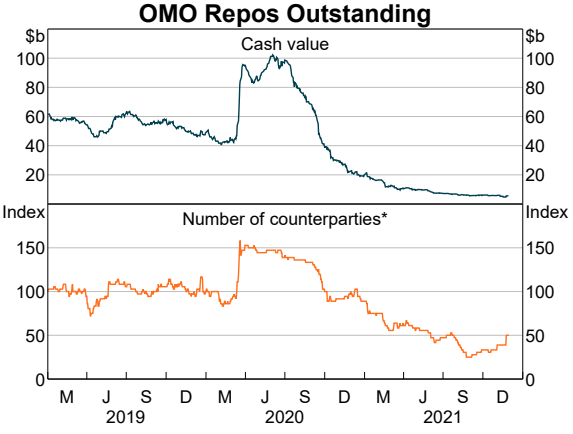
Open Market Operations



Source: RBA

Graph 3

OMO Repos Outstanding



* Indexed at 100 on 1 January 2019

Source: RBA

With the demand for repo liquidity via OMO low, and likely to remain so for some time, the RBA has reduced the scheduled frequency of its regular OMO. Since 6 October 2021, OMO have been scheduled on a weekly basis rather than daily. These operations are run every Wednesday or, in the event that the Wednesday is not a business day, on the following business day. The RBA also selects preferred terms such that new OMO repos will mature only on Wednesdays (or the next business day). Under these arrangements, counterparties will have the opportunity to bid for new funding at OMO when their existing OMO repos mature.[7] The RBA has continued to offer two preferred terms at most OMO auctions, with a maximum term around three months, consistent with the standard practice for daily OMO over the past year.

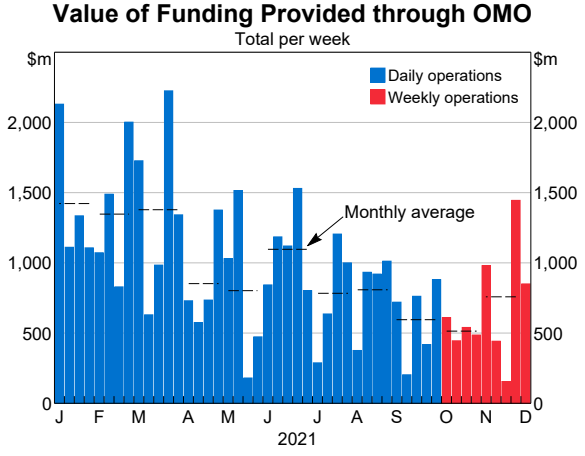
Since the shift to weekly OMO, there has been little change in OMO participation. On average, each weekly OMO has been around $660 million, compared to an average weekly OMO value of $600 million to $800 million in the three months prior to the change (Graph 4). The number of counterparties with OMO repos with the RBA has increased, but remains well below pre-COVID-19 levels.

With the reduction in the frequency of OMO, financial institutions might need to source more liquidity from private markets if the timing of any additional funding needs do not coincide with an OMO auction. Some OMO participants may want to diversify their funding sources, which would improve the robustness of their liquidity management frameworks. However, the effect of the move to weekly OMO on market activity is likely to be modest in the current environment, given the small role that OMO repos currently play in funding markets. Financial institutions should generally be able to access funding from sources other than OMO without difficulty, such as unsecured lending markets or the private repo market, given the high level of system liquidity.

As has always been the case, the RBA will continue to monitor conditions in funding markets closely, and it could conduct additional OMO if required. In particular, the Bank could announce additional OMO on business days outside of the scheduled weekly auctions and/or at other times of day if warranted by market conditions.

Graph 4

Value of Funding Provided through OMO



Source: RBA

Banks that make payments outside of business hours are no longer required to contract open repos with the Reserve Bank

Financial institutions can settle some payments outside of business hours as long as they hold sufficient ES balances, including those made using the direct entry (DE) system and via the New Payments Platform (NPP). These platforms are used to settle regular payments such as salaries, dividends and recurring bills, along with 'pay anyone' transactions initiated by consumers and businesses using internet banking applications.[8]

During normal business hours, financial institutions can borrow cash in interbank markets to ensure they hold sufficient ES balances to meet their payments obligations. However, some DE payments settle late in the evening, after interbank markets have closed, and the NPP operates 24 hours a day, seven days a week. Financial institutions must hold sufficient liquidity at the close of business each day to make these after-hours payments, when other sources of ES balances are unavailable.

As discussed above, before the pandemic the RBA tightly managed system liquidity in order to keep the cash rate around the target. When after-hours payments were first introduced in 2013, the supply of ES balances was relatively low, and would have

been too small to meet financial institutions' liquidity needs for these payments.

To ensure the smooth functioning of the payments system, the RBA made funding available through open repos, which allowed ES account holders to source additional ES balances via repos without a predetermined maturity date. Financial institutions were required to source and retain enough liquidity through this facility to meet their after-hours payments. The RBA would determine a minimum and maximum open repo position annually for each institution; these limits were set in consultation with the institution, and based on their previous payments trends and any expected changes in their activity over the coming year. The minimum open repo position was determined with reference to after-hours payments needs, with the maximum open repo position set at a modest margin above that, or at a larger margin if needed to meet intraday liquidity needs (discussed further below). To ensure that financial institutions did not face a disincentive to hold this additional liquidity, the interest rate on open repos was set to be equal to the interest rate received on the corresponding ES balances held at the RBA, so there was no net cost arising for a bank with open repos.

The RBA's corridor around the cash rate target took account of these additional ES balances, such that they had no effect on the implementation of monetary policy. Financial institutions were still free to lend any ES balances in excess of their open repo position (surplus ES balances) in interbank markets, and earn a higher interest rate than if they had left the funds in their ES account. Conversely, institutions with ES balances below their open repo position had an incentive to borrow the necessary funds as they were required to pay an interest rate of 0.25 per cent above the cash rate target on any shortfall in ES balances.

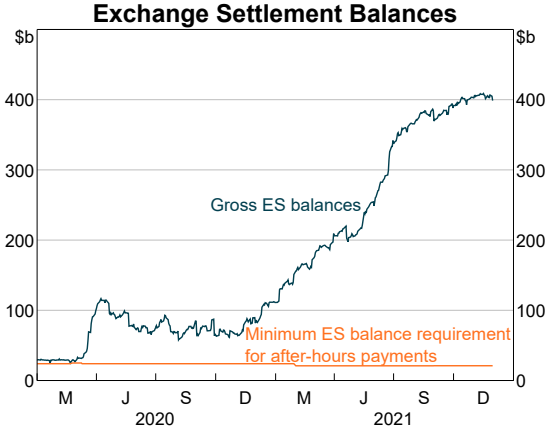
Following the RBA's policy response to the pandemic, gross ES balances have risen substantially, to be currently around $400 billion.[9] In contrast, earlier this year the RBA assessed that financial institutions collectively only needed to hold around $20 billion to support after-hours payments. As a result, there is currently more than enough liquidity in aggregate to facilitate after-hours payments without institutions needing to source additional ES balances via open repos with the RBA, and this is likely to remain the case for a number of years (Graph 5).

In response to these developments, on 1 September 2021 the RBA removed the requirement for financial institutions with after-hours payments to source additional ES balances via open repo. While institutions with after-hours payments are still required to hold a minimum amount of ES balances, they do not need to hold open repos to meet these liquidity needs. Accordingly, financial institutions with enough additional liquidity were able to partly or fully unwind their open repos. Consistent with the previous arrangements, the RBA will continue to assess the minimum ES balances that financial institutions require for after-hours payments, following consultations with the affected institutions and taking into account historical after-hours payments patterns and likely future developments.

The RBA continues to offer a maximum open repo position modestly above institutions' minimum ES balance requirement. While total ES balances are currently very high, this liquidity is not evenly distributed. As a result, open repos may remain the preferred option for some institutions with low ES balances to meet their after-hours liquidity requirements. Moreover, the additional liquidity provided by open repos may help some institutions with ES accounts to manage their intraday liquidity

Graph 5

Exchange Settlement Balances



Source: RBA

needs. Because ES account balances are never permitted to decline below zero, liquidity managers may need access to additional intraday liquidity in order to meet their payments obligations. Open repos can provide this liquidity; while institutions need to ensure that their ES balance is at least as large as their open repo position overnight, these funds can be drawn down during the day to make payments so long as they are replenished before the cash market closes.

Since these changes came into effect in September 2021, the total stock of outstanding open repos has declined from $24 billion to $4 billion. This reflects the decision of most financial institutions to meet their intraday and after-hours liquidity needs from ES balances without using open repos. Nevertheless, open repos continue to play a role in the liquidity management of some ES account holders.

Conclusion

The RBA's policy response to the pandemic has led to a substantial increase in system liquidity. As a result, and broadly as expected, there has been a decrease in demand from market participants to source liquidity from the RBA. The RBA has responded to these developments by making some changes to its regular liquidity operations and facilities. The scheduled frequency of OMO auctions has been reduced from daily to weekly, reflecting a decline in the size of the OMO repo book and fewer institutions regularly participating in OMO auctions. Separately, institutions that make payments outside of business hours will no longer be required to source liquidity from the RBA via open repos, reflecting the fact than many of these institutions can readily obtain sufficient liquidity from other sources in the current high-liquidity environment.

Footnotes

[*] The author is from Domestic Markets Department, and would like to thank all staff in Monetary Policy Implementation section for their contributions to this article.

[1] An institution's surplus ES balance is equal to its gross ES balance less the institution's minimum ES balance requirement (as determined by the RBA). For more information on the calculation of the minimum ES balance requirement and surplus ES balances, see RBA (2021).

[2] For a more detailed description of the RBA's monetary policy framework before the pandemic, see Domestic Markets Department (2019).

[3] For more information on the RBA's open repos, see RBA (2021). For a more in-depth discussion of the role played by open repos in providing liquidity to the payments system, see Fraser and Gatty (2014).

[4] The demand for ES balances may rise if banks face greater uncertainty regarding their future liquidity needs. In these cases, banks may demand additional ES balances for precautionary reasons. Separately, banks may demand ES balances to hold as high quality liquid assets (HQLA). Under the Liquidity Coverage Ratio (LCR), banks are required to hold a minimum amount of HQLA to meet their expected cash outflows. In Australia, only ES balances or government bonds issued by the Australian Government or the state and territory borrowing authorities qualify as HQLA. Some banks are also permitted to hold other securities to fulfil their LCR if they have agreed to a Committed Liquidity Facility (CLF) with the RBA. However, the size of banks' CLF will be progressively reduced during 2022, reaching zero by the end of 2022 (APRA 2021). As a result, banks may need to source additional HQLA to replace the CLF, which may increase the demand for ES balances. For more information on the LCR, see APRA (2018). For more information on the CLF, see Brischetto and Jurkovic (2021)

[5] The RBA was a net supplier of liquidity to the banking system via OMO. This is because, in aggregate, all other transactions between the RBA (and its clients) and the private sector drained liquidity. This included issuing banknotes, purchases of foreign currency and gold by the RBA, and net cash received by the Australian Government and held on deposit at the RBA. For a more detailed discussion, see Robertson (2017).

[6] For a more in-depth discussion on the increase in bond dealers' liquidity needs during the early stages of the pandemic, see Debelle (2020) and Finlay, Seibold and Xiang (2020).

[7] This may not be the case if participants bid for terms other than the RBA's preferred terms.

[8] For a more in-depth discussion of the implementation of after-hours payments for the DE system, see Debelle (2013) and Fraser and Gatty (2014). For more details on the introduction of the NPP, see Rush and Louw (2018).

[9] An institution's surplus ES balance is equal to its gross ES balance less the institution's minimum ES balance requirement (as determined by the RBA). This is why aggregate gross ES balances (around $400 billion) are larger than surplus ES balances (around $380 billion). For more information on the calculation of the minimum ES balance requirement and surplus ES balances, see RBA (2021).

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Implications of the IMF's SDR Allocation for Australia and the Global Economy

Ben Hollebon and Kate Hickie[*]

Photo: Martin Barraud – Getty Images

Abstract

As part of the global policy response to address the economic challenges associated with the COVID-19 pandemic, in August 2021 the International Monetary Fund (IMF) allocated US$650 billion worth of Special Drawing Rights (SDRs) to its members, providing a significant boost to global liquidity. This article details the workings of SDRs and describes how vulnerable countries can use this additional liquidity in a range of ways, including to support spending on their country's crisis response. It also considers how countries that do not have a need for this liquidity, like Australia, may use a share of their SDR allocation to assist more vulnerable countries.

Introduction

Policymakers around the world have responded to the ongoing challenges facing the global economy as a result of the COVID-19 pandemic by providing significant policy support. This has included substantial monetary and fiscal support in individual countries as well as assistance via international organisations, such as the International Monetary Fund (IMF), and via other international arrangements, such as bilateral swap lines established between central banks.[1]

As part of the global policy response, the IMF allocated the equivalent of US$650 billion in Special Drawing Rights (SDRs) to its members in August this year. This was the first allocation of SDRs since the global financial crisis. The allocation was intended to support the resilience and stability of the global economy by assisting countries to address balance of payments pressures that have arisen due to the pandemic. While the allocation benefits all countries that are IMF members, it is particularly helpful for emerging market economies and low-income countries that have had less capacity to respond to the effects of the COVID-19 crisis.

What is an SDR?

SDRs are an international reserve asset created by the IMF to supplement the official reserve holdings

of its member countries.[2] Reserve assets are owned by country authorities and are a key layer of defence in a foreign currency liquidity crisis. Other types of reserve assets include official foreign currency holdings, gold holdings and reserve positions at the IMF (i.e. funds lent by a country to the IMF). Reserves can be used to dampen volatility in a country's exchange rate, manage the level of a country's exchange rate, repay official sector international debts and provide foreign currency liquidity to the financial system during periods of stress.

The SDR is not a currency and so cannot be used directly in transactions. However, it can be sold to other member countries in exchange for five 'freely usable' currencies (US dollars, euros, Chinese renminbi, Japanese yen and pounds sterling) and therefore acts as a source of liquidity.[3] Essentially, the SDR system allows a country to access reserves that are held by countries whose holdings are more than adequate, thereby broadening the protection afforded by the global pool of reserve assets.

While countries can buy and sell SDRs directly with each other, in practice the exchange is usually coordinated by the IMF through voluntary trading arrangements (VTA), where a number of IMF members with strong external positions (including Australia) agree to exchange SDRs for specific currencies within pre-agreed limits with other IMF members.[4] The value of the SDR is determined daily by the IMF based on a weighted average of these five freely usable currencies. Conceptually, SDRs derive their value from the fact that countries are willing to hold them and accept them in exchange for actual currencies.

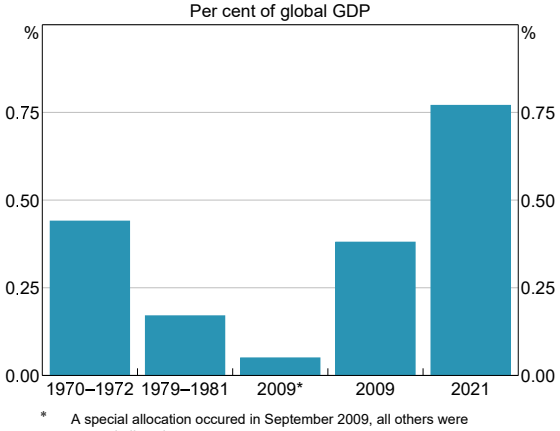
While the IMF has the authority to create new SDRs, under the IMF's Articles of Agreement it can only do so to meet a long-term global need to supplement existing reserve assets. It also needs to be done in a manner that promotes the attainment of the IMF's goals and that avoids economic stagnation and deflation, or excess demand and inflation (IMF 2021e). Given these conditions, SDR allocations are rare in practice and have only occurred in exceptional circumstances, including during the global financial crisis. Indeed, there have only been four general allocations of SDRs to this point (1970–1972, 1979–1981, 2009 and 2021) (Graph 1). In a general allocation, countries receive both an asset (SDR holdings) and a liability (SDR allocation) of equal value. (The allocation is a liability because it would have to be repaid if a country withdrew from the IMF or the SDR scheme itself was dissolved.) The value is proportional to each country's quota in the IMF.[5] There was also a one-time special SDR allocation, which occurred in September 2009 to correct for the fact that members that had joined since 1981 had not received an SDR allocation from the IMF over that time. It is worth highlighting that, given an SDR allocation involves an increase in assets and a matching rise in liabilities, an allocation does not represent a transfer of wealth.

There is a cost involved in using SDRs. Countries receive interest on their SDR holdings and are required to pay interest on their SDR allocation. Accordingly, if a country keeps its SDR holdings equal to its allocation, it will earn zero net return. However, if it decides to sell some of its SDRs in exchange for one of the five freely usable currencies – and so its SDR holdings fall below its SDR allocation – a country will be required to make a net interest payment on the difference between its holdings and allocation. In contrast, if a country buys SDRs – and so its holdings are above its allocation – it will receive a net interest payment. The relevant interest rate (the SDR interest rate) is calculated weekly by the IMF and is based on relevant interest rates for each of the five freely usable currencies (Graph 2).[6] Overall, the SDR

Graph 1

SDR Allocations

Per cent of global GDP



* A special allocation occured in September 2009, all others were general allocations

Sources: IMF; World Bank

mechanism is self-financing because at an aggregate level interest payments and receipts cancel each other out (IMF 2018).

Implications of the 2021 general SDR allocation

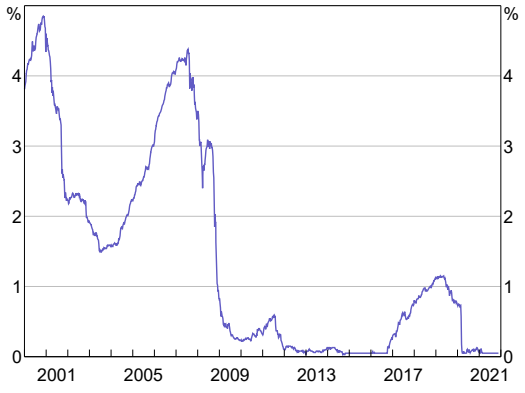
Overseas economies

Many countries experienced notable falls in their reserve assets as a result of the COVID-19 crisis. For example, reserves in emerging market and developing economies (EMDEs) outside Asia declined by around US$95 billion in 2020, reflecting the contraction in exports and global economic activity as well as strong and persistent capital outflows (IMF 2021d).[7] Overall, the IMF estimated that the pandemic increased the global shortfall between the current level of reserves and the projected long-term level of required reserves by around US$200 billion, to between US$1.1 trillion and US$1.9 trillion (IMF 2021d). The recent SDR allocation will go some way to addressing this long-term demand for global reserves. However, as a general allocation, SDRs were distributed to IMF member countries in line with their quota shares in the IMF rather than their relative need for reserves. As a result, around 40 per cent of the total allocation went to the G7 countries, with a similar share going to all EMDEs combined (Graph 3).

The extent to which the allocation addresses countries' individual needs for reserves varies significantly, reflecting not only differences in the value of SDRs received but also the differences in countries' existing reserves. In particular, the allocation increased advanced economies' official reserve assets (ORA) by an average of around 18 per cent, compared to an average increase of around just 7 per cent for EMDEs.[8] This difference partly reflects the fact that advanced economies typically choose to hold modest reserves (as a share of the size of their economies) compared with many EMDEs. That said, while the allocation had a relatively small impact on the ORA of most major emerging market economies, it provided a significant boost for a number of developing economies that had low levels of reserves (Graph 4). For example, the allocation increased Sri Lanka's ORA by 28 per cent and Ecuador's ORA by 18 per cent.

Graph 2

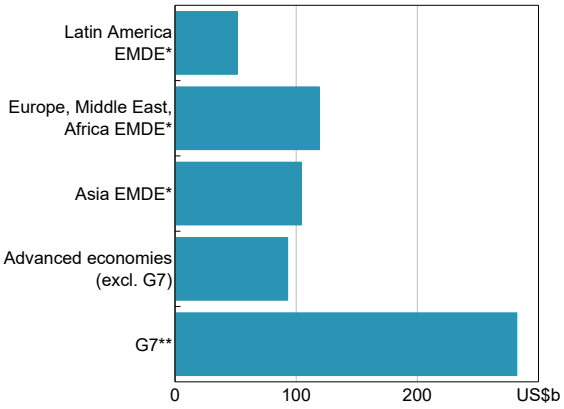
SDR Interest Rate



Sources: IMF; RBA

Graph 3

2021 SDR General Allocation



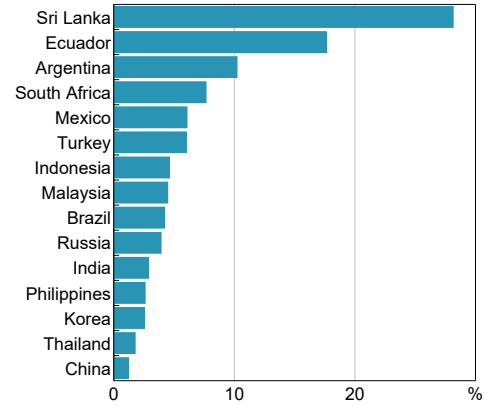
* Emerging market and developing economies
** US, UK, Canada, France, Italy, Germany, Japan

Sources: IMF; RBA

Graph 4

2021 SDR General Allocation

Per cent of official reserve assets*



* As at July 2021

Sources: IMF; RBA

While all IMF member countries received a share of the allocation, countries with strong external positions generally have no immediate need to make use of this additional liquidity. As a result, these countries are well placed to use a share of the additional SDRs to support concessional lending for vulnerable countries. In fact, some countries, including Australia, have already made commitments to use specific shares of their allocation to scale up the lending capacity of the IMF's existing Poverty Reduction and Growth Trust (PRGT). This trust is used to provide loans to low-income countries at concessional rates. The G20 has also called on the IMF to develop other options for countries with strong external positions to voluntarily channel a share of their allocated SDRs towards vulnerable countries (G20 2021a). The creation of a new IMF-administered Resilience and Sustainability Trust to assist low-income countries, small states and vulnerable middle-income countries is the main alternative option currently being explored. Overall, countries with strong external positions have already pledged to use around US$45 billion worth of their recent allocations to support more vulnerable countries, and the G20 has set a 'global ambition' to ultimately channel US$100 billion to vulnerable countries in this way (G20 2021b).

For countries with more vulnerable external positions, the increase in their stock of SDR holdings provides them with additional policy capacity. These countries can exchange some (or all) of their SDR holdings for freely usable currencies, which can then be used to purchase goods and services (such as vaccines), invest in public infrastructure or pay down existing foreign currency debt, for example. The decision on what share of SDR holdings to exchange for freely usable currency is likely to be influenced by a number of factors, including:

- *Adequacy of reserves:* countries that experienced a rundown in their reserves during the pandemic may use their SDR allocation to rebuild their buffers of foreign currency assets. Reserves are important for supporting market confidence and preventing destabilising runs on foreign exchange markets, particularly for countries that maintain managed exchange rates.
- *Policy capacity*: countries with large needs and limited market access may look to use their SDR allocation for fiscal purposes. Funds acquired by exchanging SDRs for freely useable currencies could, for example, be used to finance COVID-19 health or vaccination-related expenditures. While the IMF has not provided specific advice on how the additional policy capacity should be used, it has noted that 'consideration could be given to using the policy space provided by the SDR allocation to limit the fallout from COVID-19 and minimise long-term scarring' (IMF 2021b). That said, the IMF has stressed that countries should not use the policy capacity provided to delay needed debt restructuring or macroeconomic reforms, or to pursue unsustainable macroeconomic policies.
- *Institutional arrangements*: a number of countries face institutional restrictions on the interactions between the government and the central bank – for example, central banks may face restrictions on (or be prohibited from) lending to the government in perpetuity in a currency other than the local currency – which may limit their options for using the newly allocated SDRs (IMF 2021b).
- *Availability of IMF facilities*: some countries are already eligible for IMF programs that provide funding at concessional interest rates that are lower than the SDR interest rate. However, typically when a country borrows from the IMF it must agree to adjust its economic policies to address the issues that led it to seek assistance. In contrast, SDRs created in a general allocation can be used *unconditionally*. This means that members can use them to meet short-term liquidity needs without needing to agree to make any adjustments to existing economic policies. This may motivate countries to acquire foreign currency by selling their new SDRs before turning to other IMF facilities.

To date, some countries have used their new SDRs either to bolster reserve assets to assist with prospective foreign exchange needs or to

strengthen their government's fiscal position. For example:

- Ecuador converted all of its new SDRs to US dollars and intends to use the proceeds to address immediate cash flow deficiencies (IMF 2021a).
- Colombia's central bank has sold the US dollar equivalent of the country's SDR allocation to the government in exchange for government bonds, providing US dollar liquidity to the government (Banco de la República 2021).
- The Bahamas intends to use the SDR allocation to add to its reserves in order to support the exchange rate peg (Central Bank of the Bahamas 2021).

Australia

The IMF's recent general SDR allocation increased Australia's SDR holdings by almost SDR6.3 billion to over SDR9 billion. This provided a sizeable boost to Australia's ORA, which includes SDRs as well as foreign currency-denominated assets, gold bullion and Australia's reserve position in the IMF (Graph 5).[9] As outlined above, there is a zero net return from this allocation if Australia keeps SDR holdings equal to the allocation.

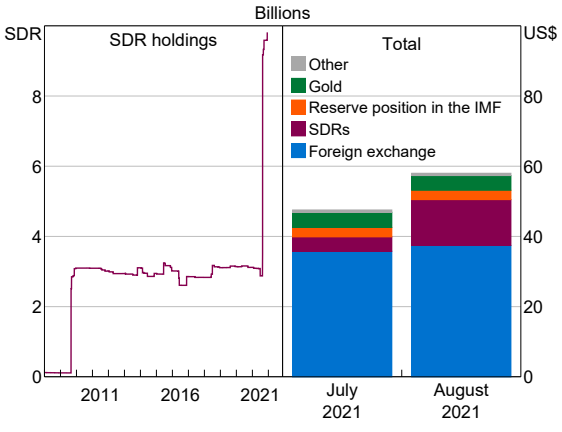
Prior to the most recent SDR allocation, Australia's holdings of SDRs were typically lower than Australia's SDR allocation and so Australia often made small net interest payments in SDRs to the IMF (Graph 6). This partly reflected the fact that, as part of Australia's participation in the IMF's VTA mechanism, Australia received a number of requests to *sell* SDRs to other member countries to allow them to meet their obligations to the IMF or to replenish their SDR holdings. In contrast, it is expected that the most recent allocation will generate an increased demand for Australia (and other countries that are part of the VTA mechanism) to *buy* SDRs from vulnerable countries in exchange for freely usable currencies. Indeed, since the allocation in August, a number of countries have sold SDRs to Australia in exchange for US dollars through the VTA mechanism, which has increased Australia's SDR holdings by around SDR636 million. Hence, Australia's SDR holdings are currently *above* Australia's SDR allocation. If this is maintained Australia will receive small net interest payments from the IMF.

It is worth noting that Australia's participation in VTA transactions does not alter the *level* of Australia's reserve assets (only the respective proportions held in SDRs and foreign currency). That said, the Reserve Bank typically replenishes foreign currency sold in exchange for SDRs by purchasing foreign currency in long-term swaps against Australian dollars, which does increase the level of Australia's reserve assets (RBA 2021).

Australia has committed to channel approximately SDR250 million of its recent SDR allocation to the IMF's PRGT to support vulnerable countries (Frydenberg 2021). Alongside Australia's existing financial commitments to the IMF, including

Graph 5

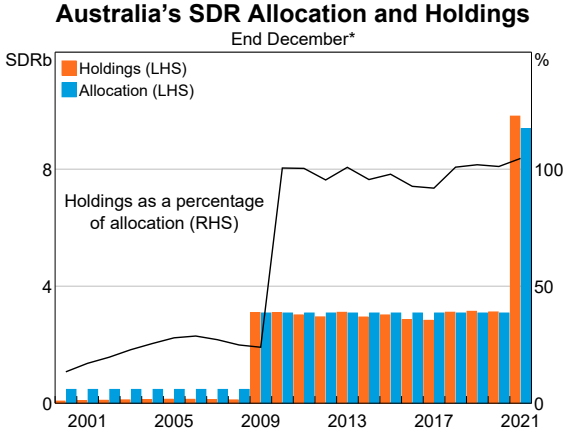
Australia's Official Reserve Assets



Sources: IMF; RBA

Graph 6

Australia's SDR Allocation and Holdings



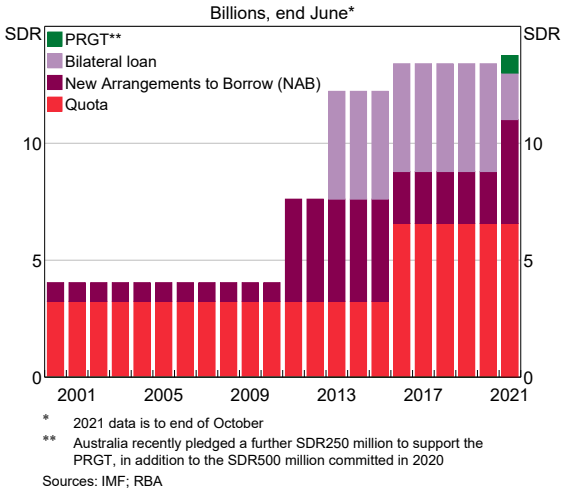
* 2021 data are to 7 December 2021

Sources: IMF; RBA

Australia's existing SDR6.57 billion quota subscription, this new commitment will raise Australia's total financial commitment to the IMF to around SDR13.7 billion (Graph 7).

Graph 7

Australia's Financial Commitment to the IMF



* 2021 data is to end of October

** Australia recently pledged a further SDR250 million to support the PRGT, in addition to the SDR500 million committed in 2020

Sources: IMF; RBA

Conclusion

The IMF's allocation of US$650 billion worth of SDRs has boosted global liquidity. It will help to foster the resilience and stability of the global economy by addressing the long-term need for reserve assets. In particular, the allocation will reduce the need for liquidity constrained countries to pursue contractionary policies, while also providing scope for spending to assist countries recovering from the effects of the pandemic. However, countries with stronger external positions (including Australia) have no immediate need to utilise this allocation, and so they may use a share of their recent allocation to support more vulnerable countries. This would amplify the benefit of the allocation on the global economy.

Footnotes

[*] The authors are from International Department. They would like to thank Anna Park for her advice and comments on earlier drafts.

[1] For more information on the global financial safety net, see Ball, Clarke and Noone (2020).

[2] SDRs status as a reserve asset is derived from the commitments of IMF members to hold and exchange SDRs and accept the value of SDRs as determined by the IMF (IMF 2018).

[3] A 'freely usable' currency is one that is widely used to make payments for international transactions and is widely traded in the principal exchange markets (IMF 2021c).

[4] The IMF also has the power to designate countries with strong external positions to purchase SDRs from countries with weak external positions if necessary. However, since 1987 the SDR market has functioned entirely through voluntary arrangements. There are currently over 30 countries, including Australia, with voluntary SDR trading arrangements.

[5] An individual member country's quota broadly reflects its relative position in the world economy. A country's quota determines not just its share in a SDR allocation, but also the amount of finance it can receive from the IMF, the amount of resources it is obliged to provide the IMF and its voting power.

[6] In 2014, the IMF introduced a floor of 0.05 per cent for the SDR interest rate (IMF 2014).

[7] In contrast, emerging market economies within Asia were able to increase their reserve asset levels in 2020.

[8] Limitations on data availability meant that a subset of advanced economies (Australia, Austria, Belgium, Canada, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Ireland, Israel, Italy, Japan, Korea, Latvia, Lithuania, Malta, Netherlands, New Zealand, Norway, Portugal, Singapore, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, United Kingdom, United States) and EMDEs (Argentina, South Africa, Hungary, Mexico, Turkey, Chile, Colombia, Indonesia, Malaysia, Brazil, Russia, Poland, India, Philippines, Korea, Thailand, China, Sri Lanka, Ecuador, El Salvador, Belarus, Lithuania, Ukraine, Egypt, Bolivia, Panama, Dominican Republic, Romania, Kazakhstan, Bulgaria, Morocco, Croatia, Uruguay, Guatemala) were used to calculate the average increase in official reserve assets.

[9] For more information on the composition of Australia's ORA, see Potter (2017).

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Corporate Debt Covenants in Australia

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Photo: PeopleImages – Getty Images

Abstract

The economic downturn associated with the COVID-19 pandemic has raised questions about the extent to which a deterioration in the financial health of some businesses could lead to breaches of debt covenants – with potential knock-on effects on firm behaviour and loan quality. This article includes a new data set on corporate debt covenants in Australia, developed by applying text analytic techniques on the annual reports of non-financial listed companies. It reveals that the share of companies reporting debt covenants has steadily increased over time from around 10 per cent in 2002 to almost 40 per cent in 2020, although the proportion of firms with covenants that reported a breach has remained stable at roughly 13 per cent. Also, following a breach, firms try to get their financial indicators back on track quickly. This study is a first step in understanding the role of debt covenants as a point of financial friction in the economy.

Introduction

Corporate debt covenants are provisions in debt contracts that set the conditions a borrowing company is obligated to satisfy and the consequences of any violations. Typically, debt covenants specify that the firm must maintain certain financial indicators (e.g. the ratio of profits to interest payments) within certain bounds. A significant deterioration in financial positions – such as one caused by the COVID-19 pandemic – may trigger breaches of debt covenants. As a result, the Australian Securities and Investments Commission (ASIC) highlighted the ability to meet borrowing covenants as a focus area for financial reporting in the COVID-19 environment (ASIC 2020). In addition, debt covenants can affect business activity by making debt financing more expensive following a violation of covenants or by influencing managerial actions even before a covenant is violated.

In theory, debt covenants are designed to protect lenders by restricting risky corporate behaviour and preventing businesses from getting into financial trouble that could adversely affect their ability to repay their loans (Stein 2003). In practice, covenants

are reviewed frequently and violations are common. In any given year, between 10 and 20 per cent of US non-financial companies report a violation in one or more financial covenants (Nini, Smith and Sufi 2012). Further, companies that have problems satisfying covenants are more likely to violate them again in the future (Taylor 2013). The consequences of a breach of covenant vary but generally include some type of penalty, such as an increase in the interest rate or collateral requirements of the loan and, in some cases, liquidation of the company (Greenwald 2019). Therefore, while covenants do not typically impose a hard cap on borrowing and breaches are common, violations are costly enough that businesses seek to avoid them. That, in turn, could influence firm behaviour, including the rate of debt and asset accumulation (Chava and Roberts 2008; Roberts and Sufi 2009; Nini, Smith and Sufi 2009), as well as firms' growth strategies that could affect investment decisions (Billett, King and Mauer 2008).

Debt covenants are an understudied research topic in corporate finance, both internationally and in Australia. In fact, very little is known about corporate debt covenants outside of the United States (see Nini, Smith and Sufi 2012; Lian and Ma 2021) and the United Kingdom (see Chatterjee 2006; Moir and Sudarsanam 2007). An important reason for this lack of research is the challenge associated with obtaining information about corporate debt covenants. This study aimed to fill this gap for Australia by analysing publicly available annual reports of non-financial listed firms via text analytic techniques and constructing a measure of the prevalence and types of debt covenants these firms are exposed to over time. The article is structured as follows. It first outlines the types of debt covenants commonly used in practice. It then describes the data construction process and presents key summary statistics of the data. Finally, it examines differences in firms' characteristics across different debt covenant structures.

Types of debt covenants

The most common types of debt covenants are financial covenants, which are based on financial indicators readily available in corporate balance sheets and profit and loss statements. Financial covenants are usually maintenance based: the borrower must keep the financial indicators under or over certain thresholds, which are typically reviewed every quarter. When the covenants are reviewed, the creditor may tighten or relax the thresholds depending on the borrower's situation (Sansone and Taylor 2007).

Generally, financial covenants can be categorised into two broad categories: asset-based covenants; and earnings-based covenants.

Asset-based covenants (ABCs)

Calculated using balance sheet measures, ABCs typically restrict the firm's maximum amount of debt (or minimum amount of equity) by requiring that it remains below a certain level of leverage or above a net worth threshold. Examples include restrictions on:

- debt-to-equity ratio – the degree to which the company finances its operations through outside funds (debt) versus inside funds (shareholders' equity)
- current assets-to-current liabilities ratio – the company's ability to pay short-term obligations or those due within one year.

To avoid breaching these conditions, the firm can issue more equity or cut back on dividend payments, essentially affecting the firm's capital structure (Christensen and Nikolaev 2012).

Earnings-based covenants (EBCs)

EBCs are formulated using information from both income and balance sheet statements to impose restrictions on the firm's debt servicing or earnings ratio. Examples include:

- interest coverage ratio – a measure of the company's ability to repay the interest component of outstanding debt with its earnings
- debt-to-earnings ratio – a measure of the company's ability to repay its total debt, including both principal and interest components, with its earnings.

In the United States, around 60 per cent of large non-financial firms have EBCs explicitly written into their debt contracts (Lian and Ma 2021). To comply with these restrictions, borrowing firms must regularly monitor and manage their net earnings – for instance, by cutting back on expenses or terminating risky investment projects (Christensen and Nikolaev 2012).

Constructing debt covenants data for Australia

As part of this research, I constructed a database on the prevalence and types of debt covenants used by non-financial listed Australian companies by applying text analytic techniques to their publicly available annual reports, collected from the Connect4 website. I wrote a Python program to first convert the files into readable text and then extracted relevant information from the text as follows:

1. I searched for the term 'covenant' and its inflections in the text. If the search query returned non-empty results, I classified the firm as having debt covenants in that year.
2. I isolated the blocks of text surrounding the mentions of covenants. Figure 1 shows an example of an extracted block of text.
3. In each block of text, I searched for keywords (and their inflections) that indicated the possible types of debt covenants (e.g. interest cover, gearing ratio, leverage ratio).
4. For each type of debt covenant, I counted the appearances of its indicative keywords. If the counter returned a positive value, I classified the firm as having that particular type of covenant. In the example in Figure 1, the firm mentions three types of debt covenants: equity ratio; leverage ratio; and interest cover ratio.
5. Finally, I teased out information about whether the firms complied with or violated their covenants from the reports by counting the appearances of keywords such as 'breach' and 'violate' (and their inflections while incorporating negation). The example in Figure 2 suggests that the firm breached its financial covenants in the period to the date of the report.

This method was not without limitations. Australian companies are not required to report the existence of covenants and, indeed, they may have incentives *not* to report them. For instance, financially vulnerable firms may want to avoid any signal of their poor financial health. Alternatively, financially strong firms may have an incentive to mention covenants and draw attention to their compliance. However, ASIC's financial reporting guideline emphasises that firms need to 'put themselves in the shoes of investors and consider what information investors would want to know' when considering what to disclose in the financial reports (ASIC 2020). To the extent that debt covenants can serve as early warning signs of the firm's financial health and violations can lead to serious consequences such as default, transparent reporting of debt covenants is strongly encouraged by ASIC. In addition, the Australian Accounting Standard on 'Financial Instruments: Disclosures' requires disclosures of non-remedied covenant breaches, as they have material impacts on the

Figure 1: Mentions of Covenants in Firm's Annual Report – An Example

> In addition to the eligible collateral, the Group has several general and financial undertakings which it must comply with including an Equity Ratio covenant, a Leverage Ratio covenant and an Interest Cover Ratio covenant.

Figure 2: Mentions of Breaches in Covenants in Firm's Annual Report – An Example

> During the year ended 31 December 2006, a controlled entity of AHG, Cottman, breached certain financial covenants under its finance facilities with GE Capital Finance Pty Ltd ("GE Capital") and has continued to breach those covenants in the period to the date of this report.

classification of debt in the financial statements (AASB 2020).

Descriptive statistics

The constructed data contained roughly 20,000 observations from 3,742 unique non-financial listed firms between 2002 and 2020. On average, around 22 per cent of firms reported debt covenants, of which 24 per cent also specified the types of covenants. Graph 1 shows that the share of firms reporting debt covenants has steadily increased over time, from around 10 per cent in the early 2000s to nearly 40 per cent in the late 2010s. This could be due to the trend towards greater transparency in corporate reporting rather than reflecting an increase in their use.

The structure of debt covenants within firms reporting covenants also appears to have gone through a significant change around the same time as the global financial crisis. In the early 2000s, most covenants in Australia were earnings based; however, increased use of ABCs and slightly less prevalence of EBCs since that time means that, now, both ABCs and EBCs are reported by roughly 70 per cent of firms. In comparison, corporate debt covenants in the United States, the United Kingdom, Japan and Finland are predominantly earnings based (Lian and Ma 2021; Moir and Sudarsanam 2007; Kochiyama and Nakamura 2014; Niskanen and Niskanen 2004).

The Australian data show that around 13 per cent of firms reporting debt covenants also reported having breached them. This proportion appears to be stable over the years and is consistent with findings in the United States, where 10 to 20 per cent of firms report breaches (Nini, Smith and Sufi 2012).

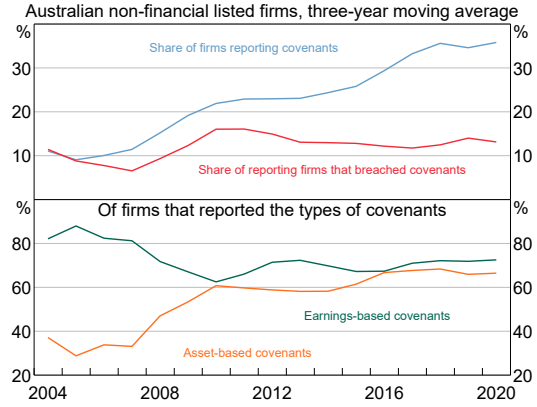
Of interest is the composition within the category of EBCs. It consists of interest coverage (IC) covenants, which set a minimum on the ratio of earnings (usually earnings before interest, taxes, depreciation and amortisation) to interest payments, and other types of EBCs that limit the stock of debt to some multiple of earnings. While IC covenants imply debt limits that are directly sensitive to interest rates, other types of EBCs depend indirectly on interest rates. The distinction suggests that the structure of debt covenants could affect how much a change in monetary policy transmits to real economic activity through tightening or relaxing the financial restrictions imposed by such covenants. For example, an increase in interest rates generally raises a firm's interest costs and increases the likelihood that the firm could breach IC covenants included in its debt contracts. Moreover, as a firm's IC ratio is pushed closer to the critical threshold, the firm may be forced to take business decisions that help steer the covenant away from being violated. Graph 2 shows that, over the years, roughly 40 per cent of firms reporting EBCs are subject to IC covenants only.

The use and structure of debt covenants vary across industries. According to Graph 3, debt covenants are most used in the real estate sector, while the

Graph 1

Trends in Corporate Debt Covenants

Australian non-financial listed firms, three-year moving average

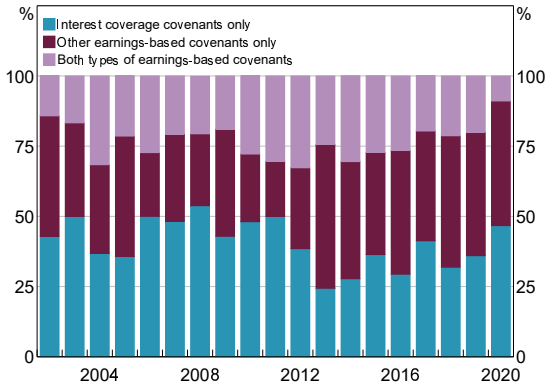


Sources: Connect4; RBA

Graph 2

Composition of Earnings-based Covenants

Australian non-financial listed firms*



* Firms that reported earnings-based covenants

Sources: Connect4; RBA

materials (including mining) and energy sectors have the least use of covenants. ABCs appear more popular in capital-intensive sectors (e.g. real estate and utilities), while EBCs are more prevalent in services sectors (e.g. commercial and professional services, communication services and IT). In addition, utilities and health care sectors stand out as having the largest shares of companies reporting a covenant breach.

Firm's financial characteristics and debt covenants

This study also sought to explore the differences between firms exposed to different structures of covenants. This was done by matching the constructed covenants data with the Morningstar database for balance sheet information.
Graph 4 presents the typical median value for several financial measures for firms with and without covenants, as well as across different covenant configurations. Generally, there is a significant difference between firms with and without covenants, and between firms reporting only ABCs, firms reporting only EBCs and firms reporting both.

First, similar to the United States (Lian and Ma 2021; Greenwald 2019), firms with covenants in Australia are much larger – in both revenue and assets – than firms without covenants. They are also more highly leveraged (higher debt-to-equity and debt-to-asset ratios) but have stronger earnings-to-interest payment ratios. This is unsurprising since larger firms tend to borrow more and have more consistent earnings to cover the cost of debt financing. For more details on firms' balance sheets and debt-to-asset ratios, see Appendix A.

Second, and in contrast to Lian and Ma (2021) who argue that EBCs are not practical for small and young firms with a less-consistent revenue stream, Australian firms reporting only EBCs tend to be of smaller scale than those reporting only ABCs. Interestingly, firms reporting only ABCs appear less leveraged with lower debt-to-equity and debt-to-asset ratios, indicating that they have generally stronger balance sheets or that the ABCs have restricted their opportunity to leverage their assets. Conversely, firms reporting only EBCs have a higher median IC ratio, suggesting that the restrictions on their debt levels relative to their cash flows and net earnings are effective.

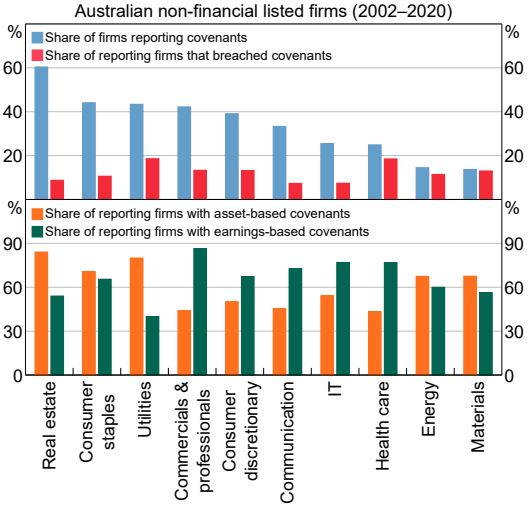
Finally, firms with both types of covenants appear to have the healthiest balance sheets; they are roughly as large as firms reporting only ABCs, while having less leverage and higher earnings-to-interest payment ratios than firms reporting only EBCs.

In addition, this study explored how financial statistics evolve over time for firms reporting covenant breaches. Graph 5 (top panel) shows that an average firm experienced a drop in its earnings-to-interest payment ratio prior to reporting a breach of covenants, after which its IC ratio picked up if it

Graph 3

Reported Debt Covenants by Industry

Australian non-financial listed firms (2002–2020)

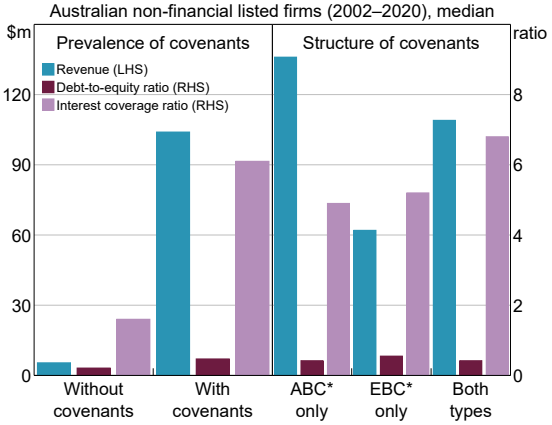


Sources: Connect4; RBA

Graph 4

Financial Characteristics

Australian non-financial listed firms (2002–2020), median



* ABC: Asset-based covenants. EBC: Earnings-based covenants.

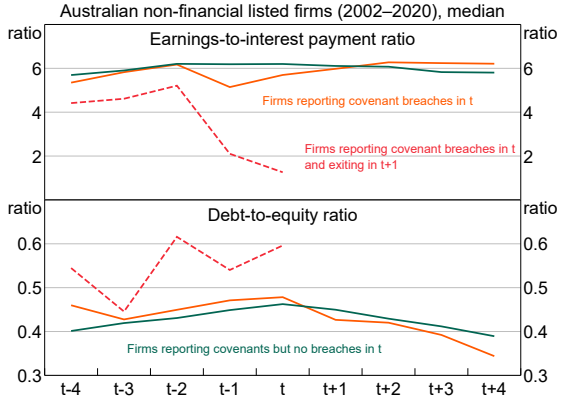
Sources: Connect4; Morningstar; RBA

survived to the next period. Similarly, there appeared to be a substantial reduction in debt-to-equity ratios among surviving firms in the years following a reported breach (Graph 5, bottom panel). This suggests that actions were taken quickly to remedy the worsening financial conditions that had resulted in a breach of covenants. On the other hand, roughly 7 per cent of breaching firms could not stop their financial statistics from deteriorating and ended up exiting the market. In contrast, both financial statistics stayed relatively constant for firms reporting covenants but no breaches.

Graph 5

Financial Statistics and Covenant Breaches

Australian non-financial listed firms (2002–2020), median



Sources: Connect4; Morningstar; RBA

Conclusion

While debt covenants are an important aspect of debt financing, data on covenants have not been readily available and widely studied in Australia. As such, this research employed text analytic techniques to extract information from firms' annual reports about the usage and the types of covenants that Australian non-financial listed firms are exposed to over time. It found that, on average, reporting of debt covenants has increased over time, while the share of firms reporting covenant breaches remains stable. However, both the usage and the composition of debt covenants vary significantly across industries and firms' financial characteristics. Debt covenants benefit financial stability by aligning firm incentives with sound financial behaviour and, in turn, protecting lenders. However, the financial constraints imposed by the covenants may affect firm hiring and investment decisions, while also potentially amplifying shocks to the economy. Exploring the prevalence and structure of corporate debt covenants is the first step towards understanding their role as a financial influence in the economy.

Appendix A

Table A1: Firm's Characteristics by the Prevalence and Structure of Debt Covenants

Non-financial listed firms (2002–2020), median

	No covenants	With covenants	Asset-based covenants only	Earnings-based covenants only	Both types of covenants
Revenue (A$ million)	5.4	104	136	62	109
Debt (A$ million)	1	62	78	34	80
Cash (A$ million)	4.5	15	18	6.1	17
Asset (A$ million)	36	290	380	124	452
Debt-to-equity ratio	0.21	0.47	0.42	0.55	0.42
Debt-to-asset ratio	0.04	0.24	0.23	0.25	0.22
Interest coverage ratio	1.6	6.1	4.9	5.2	6.8
Observations (No.)	15,500	4,613	367	411	319

Sources: Connect 4; Morningstar; RBA

Footnote

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The Indian Banking System

Maxwell Sutton[*]

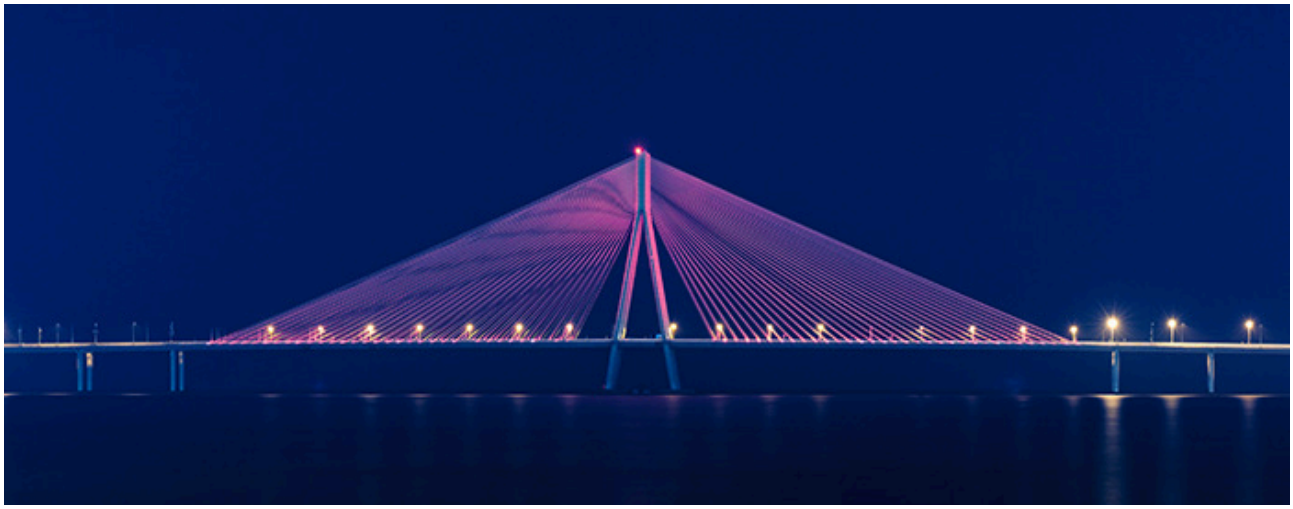


Photo: Vivek Raut / EyeEm – Getty Images

Abstract

Banks play a key role in India's financial system and underpin economic growth. However, during the 2010s, the health of Indian banks deteriorated significantly and a subsequent decline in credit growth contributed to a slowdown in economic activity. Although Indian authorities have taken a number of steps to strengthen the banking system, progress has been difficult and has been further curtailed by the COVID-19 pandemic. While financial linkages between Australia and India remain limited, India is an increasingly important trading partner for Australia, and continued weakness in its banking system is likely to weigh on India's demand for Australia's exports.

Banks are the main providers of credit within India's financial system, and account for around half of India's financial assets (Graph 1). Since the 1970s, government-controlled banks have been central to India's development strategy by extending credit to sectors prioritised by governments, such as agriculture and infrastructure (RBI 2005). While Indian authorities have sought to develop a domestic corporate bond market, this remains relatively small and is mostly used by larger firms and financial institutions (Ganguly 2019). Non-bank financial corporations (NBFCs) have grown in recent years as alternative intermediaries of finance; however, a substantial share of funding for NBFCs is ultimately provided by banks. Beyond financing private and state-owned firms, banks are also a significant funding source for governments, through direct loans and buying bonds issued by the central and state governments. More generally, India's capital account has remained relatively closed, and so India remains more reliant on domestic financing sources than comparable emerging market economies.

India's banking system is dominated by government-owned 'public sector banks' (PSBs), which account for around 60 per cent of commercial banking system assets. Since the mid-2010s, these banks have been beset by problems with non-performing loans (NPLs) and low capital levels (Graph 2) (RBA 2019). Over the past two decades, private sector banks have become more prominent and generally have healthier balance sheets with

lower NPL ratios, although some private banks have failed in recent years. Foreign banks are in the strongest financial position but comprise only 7 per cent of commercial banking system assets. Outside the commercial banking system, there are a number of smaller banks that serve the needs of narrower groups of borrowers, including rural cooperative banks, small finance banks, local area banks and payment banks.

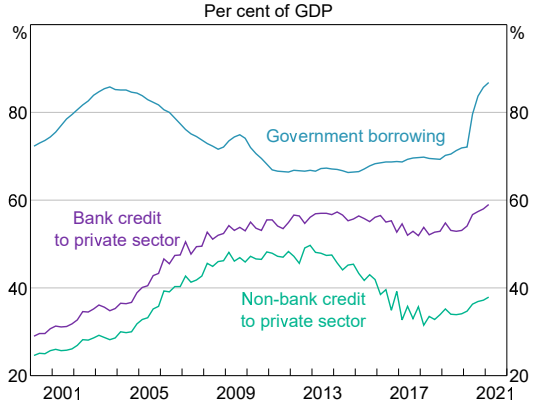
Credit to the non-financial sector in India is equivalent to around 165 per cent of GDP, which is high relative to many other emerging market economies. India's high level of debt and reliance on bank credit magnify the effect of stress in the banking system on economic growth. While direct financial links between Australia and India are limited, potential vulnerabilities in the Indian financial system are important for Australia through the trade channel. India accounts for only 0.6 per cent of Australian investment abroad, and 0.05 per cent of foreign investment in Australia. A few Australian banks have subsidiaries in India; however, their operations are very small. In contrast, India was the destination for around 4 per cent of Australia's exports in 2020. This trade channel was apparent in 2018/19, when weaknesses in India's banking system contributed to a slowdown in Indian economic activity, and weighed on India's demand for Australia's exports (Fairweather and Sutton 2020).

This article examines four factors that are affecting the ability of India's banking system to allocate credit efficiently and support long-term growth: banks' high NPL ratios and low capital levels; high levels of government borrowing from banks; Indian authorities' influence on credit allocation; and the interaction of banks and NBFCs (the shadow banking system).

Graph 1

India – Credit to the Non-financial Sector

Per cent of GDP

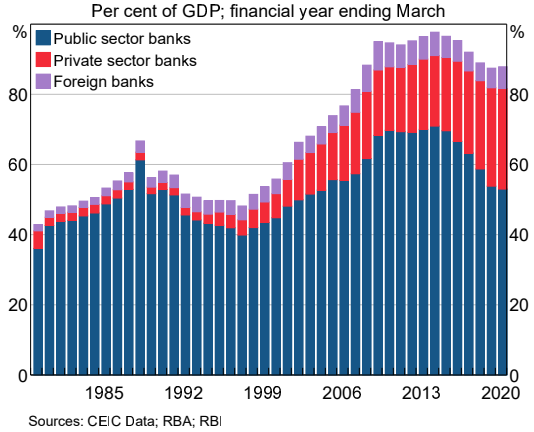


Source: Bank for International Settlements

Graph 2

Indian Banking System Assets

Per cent of GDP; financial year ending March



Sources: CEIC Data; RBA; RBI

Non-performing loans and low capital levels

Since the mid-2010s, the Indian banking system has experienced NPL ratios far higher than other Asian banking systems, and Indian banks have had far lower levels of capital (Graph 3). This has weighed on banks' ability to extend credit because NPLs have reduced banks' profitability and risk depleting already low capital buffers. Low capital levels have also contributed to low Basel III leverage ratios, which have further limited banks' capacity to extend credit.[1] While Indian authorities had previously introduced measures to help banks address their weak balance sheets, the COVID-19 pandemic has hindered progress and in some cases exacerbated existing issues.

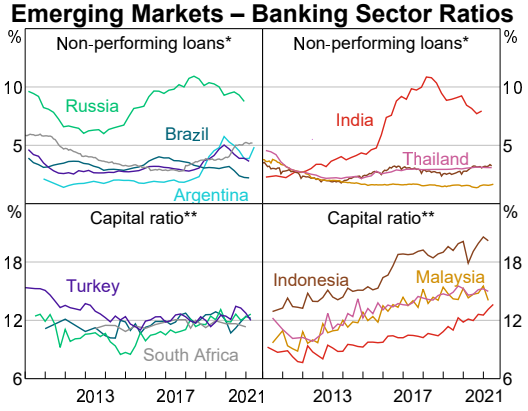
The rise in NPLs has its origins in the mid-2000s. At this time, PSBs began to play a key role in financing a decade-long infrastructure investment boom and expansions in India's mining and steel sectors (RBA 2019). India's Priority Sector Lending (PSL) policy (discussed below) influenced this credit allocation and hindered banks' development of strong risk management practices (Loukoianova and Yang 2018; IMF 2018). During this decade, lending standards weakened, the projects that had been

funded faced bottlenecks and cost-overruns, and corporations' capacity to repay debt declined (IMF 2018). This drove a significant deterioration in PSBs' asset quality, which was for a time masked by delays in asset reclassification. However, in 2015, the Reserve Bank of India (RBI) tightened rules on asset classification and provisioning, which prompted banks to reclassify a large share of loans as 'non-performing' (RBI 2015a).

In the mid-2010s, as NPL ratios began to increase significantly, authorities began to introduce a number of measures to address weaknesses in Indian bank balance sheets. The RBI imposed lending restrictions on some banks to reduce pressures from poor asset quality (Acharya 2018). The RBI also introduced restructuring and resolution frameworks to help banks address their high NPL levels and prevent the 'evergreening' of distressed loans by replacing them with new loans (RBI 2019a). Furthermore, banks needed additional capital to meet the increasing requirements of the Basel III reforms, which were implemented to improve banks' ability to absorb future losses (RBI 2015b). The government injected INR3.16 trillion (US$42 billion) of capital into banks from 2015 to 2020, primarily funded by government bonds. Ten PSBs were merged into four to address the capital levels of the weaker PSBs (RBI 2020a). In mid-2019, the RBI lowered the minimum leverage ratio by 0.5 percentage points to ease pressure on banks' balance sheets (RBI 2019b). Despite this and an improvement in equity levels (helped by capital injections from the government), at the end of 2019 many banks' leverage ratios were close to regulatory minimums, and in some cases below them.

Graph 3

Emerging Markets – Banking Sector Ratios



* Share of total loans
** Ratio of Common Equity Tier 1 capital to risk-weighted assets
Sources: CEIC Data; IMF

While bank balance sheets were beginning to improve into 2020, the onset of the COVID-19 pandemic and resultant activity restrictions severely disrupted Indian economic activity, and weakened the balance sheets of households and businesses.

In response, like many other countries, Indian authorities introduced a number of measures to support households, businesses and financial institutions. Between March 2020 and March 2021, borrowers were allowed to pause repayments on their loans.[2] New restructuring and resolution frameworks were introduced that enabled banks to delay recognising NPLs and smooth their provisioning against losses. Further capital injections have been required, totalling INR200 billion in the year to March 2021, with a further INR200 billion budgeted for the year to March 2022. Since the onset of the COVID-19 pandemic, the RBI has also delayed the final stage of implementing the capital conservation buffer multiple times and kept the countercyclical capital buffer at zero per cent, such that banks' minimum Common Equity Tier 1 (CET1) capital ratios remained at 7.375 per cent, to reduce pressures on bank balance sheets.[3] Despite these measures, some banks have still faced stresses, and in some cases the RBI has had to intervene to resolve them.[4]

Significant risks remain for India's banking system. While headline NPLs have declined, this is partly the result of recent support measures that have delayed banks recognising loans as non-performing.[5] NPLs are likely to rise as these measures are unwound – in July, RBI analysis found that under a scenario where GDP grew by 9.5 per cent in the year to March 2022, banks' NPLs would increase to 10 per cent (RBI 2021b). To help banks address this, in September 2021 the Indian Government announced that it would establish the National Asset Reconstruction Company Limited (NARCL), which will acquire up to INR2 trillion of distressed debt (Press Information Bureau 2021). Nevertheless, some banks will need to raise more capital. In

October 2021, the capital conservation buffer was increased to 2.5 per cent, raising the minimum CET1 capital ratio to 8 per cent. The RBI may also begin gradually raising the countercyclical capital buffer, which would further raise capital requirements. PSBs remain most at risk, given their high levels of NPLs and lower capital levels; however, some private banks are also under significant stress (Graph 4).

As it stands, some banks may face constraints on how much additional credit they can provide without needing to raise additional capital. A tightening in Indian financial conditions could make it more difficult or costly for banks to raise capital, while a slower-than-expected recovery, possibly because of further lockdowns or a delayed vaccine rollout, could drive NPLs even higher.

Government borrowing from banks

At the same time as Indian banks have been addressing their weak balance sheets, they have continued to be an important source of funding for the Indian Government. Banks' demand for government debt is partly a result of regulation; banks in India are subject to the Statutory Liquidity Ratio, which requires them to hold a significant share of their assets as government bonds. While helping to protect the system against liquidity shocks, this has made borrowing by governments cheaper at the expense of banks' profitability and has crowded out bank credit to the private sector (IMF 2019). Banks' purchases of government bonds also lower their Basel III leverage ratios, exacerbating the pressures that Indian banks were already facing. While foreign investors are a potential alternative source of funding for the Indian Government, India has maintained strict limits on foreign ownership of government bonds – currently making up only 6 per cent of outstanding bonds – in part to limit risks associated with capital flow volatility (RBI 2021c).

Since the onset of the COVID-19 pandemic, the Indian Government has significantly increased its bond issuance to fund response measures. This increase in issuance has been largely absorbed by banks and other domestic financial institutions, which increased their government bond holdings by 19 per cent and 17 per cent (Graph 5). Authorities' efforts to improve banks' capital levels through the crisis have helped to improve the leverage ratios of some banks; however, many banks remain close to regulatory minimums (Graph 6).

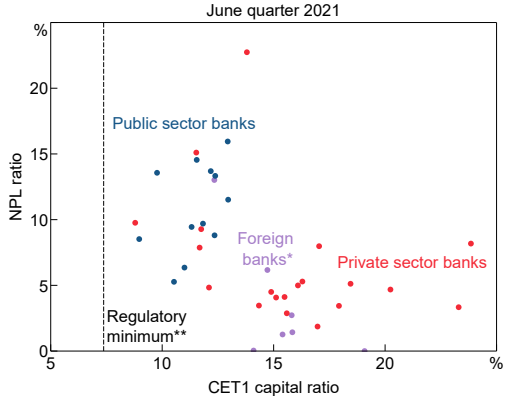
In July, the RBI also raised concerns that banks' profits were becoming more sensitive to changes in government bond yields. Many of the government bonds that PSBs purchased in the year to March 2021 had not been classified as 'held-to-maturity' (RBI 2021b). This means that banks must include changes in the values of those bonds in their profit calculations – higher yields mean lower values and lower profits. A decline in profitability will make it harder for banks to raise equity themselves, by either issuing stocks or through retained earnings.

In the near term, Indian banks are likely to need to continue to purchase significant amounts of government bonds. In its 2021 budget, the Indian Government announced plans to increase its bonds outstanding by INR9.7 trillion (4½ per cent of GDP) in the year to March 2022 (RBI 2021d). Between April and October 2021, the RBI purchased INR2.4 trillion of government bonds to anchor yield expectations as part of its government bond purchase program (RBI 2021e). In October, the RBI announced a pause on additional purchases. For the current financial year, this leaves over INR7 trillion of bonds to be absorbed largely by banks and other domestic financial institutions.

Graph 4

Health of Indian Bank Balance Sheets

June quarter 2021



* March quarter 2021 data for most foreign banks

** 7.375 per cent as of June 2021, including capital conservation buffer; does not include additional CET1 capital required for domestically systemically important banks

Source: S&P Global Market Intelligence

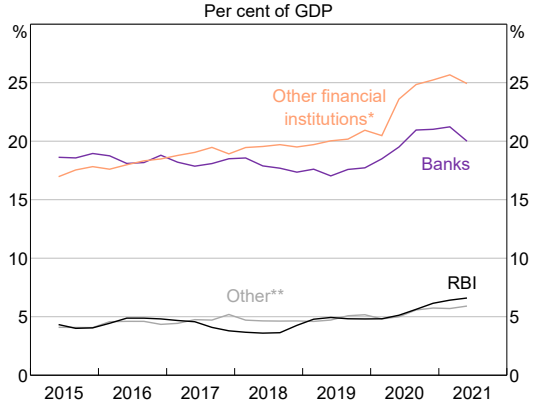
This will present a challenge for banks. If they do not purchase sufficient government bonds, the lower demand could cause government bond yields to rise, which would generate losses for banks on their current government bond holdings. However, additional purchases will put downward pressure on their Basel III leverage ratios and their profitability, and could limit their ability to extend credit (RBI 2021b).

As discussed above, Indian authorities are taking measures to help the financial markets absorb these bonds and are slowly increasing access for foreign investors. Authorities are also seeking inclusion in global government bond indices, which would increase foreign participation in India's bond markets in the medium term.

Graph 5

Ownership of Indian Government Securities

Per cent of GDP



* Includes co-operative banks, primary dealers, insurance companies, mutual funds and provident funds

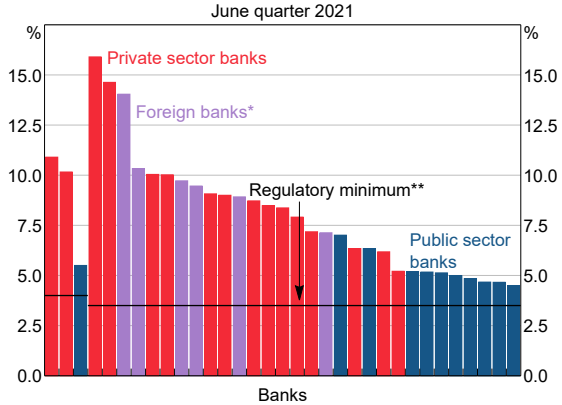
** Includes corporations, foreign institutional investors and state governments

Sources: CEIC Data; RBA; RBI

Graph 6

Indian Bank Leverage Ratios

June quarter 2021



* March quarter 2021 data for most foreign banks

** Currently 4 per cent for domestically systemically important banks; 3.5 per cent for other banks

Source: S&P Global Market Intelligence

Government measures to increase and influence credit allocation

Historically, the Indian Government has played a key role in directing and influencing credit allocation. Beyond its majority ownership of PSBs, one of the ways the government has directed credit has been through its PSL policy. In India, domestic banks are required to extend at least 40 per cent of their credit to sectors selected by the RBI (32 per cent for foreign banks). This is not unique to India – many other Asian economies have used these policies to improve access to credit and support economic development (Creehan 2014). While PSL has boosted access to credit in India, it has led to higher NPLs and has compromised banks' development of strong risk management practices (Loukoianova and Yang 2018; IMF 2018). Perceptions of implicit guarantees also influence credit towards firms backed by government-related entities.

Despite a significant increase in government borrowing since the onset of the COVID-19 pandemic, India's direct fiscal stimulus has been small relative to other economies; instead, the government has placed more emphasis on loans and loan guarantees (Hudson *et al* 2021). Like in many economies during this period, Indian authorities took a number of measures to encourage banks to extend credit, particularly to micro, small and medium enterprises (MSMEs). These measures have included an INR3 trillion loan guarantee scheme and an INR1 trillion targeted long-term repo operation (TLTRO) to provide funding for financial institutions to invest in corporate bonds (Press Information Bureau 2020; RBI 2020e). The government has also continued to direct PSBs to conduct loan fairs to increase outreach to borrowers (Anand and Ahmed 2021).

Credit to MSMEs is providing much needed support to those businesses; however, these loans are also riskier and are likely to contribute to a further rise in NPLs. In the longer term, India faces a difficult task of balancing its development needs with the health of its banking system.

More broadly, continued subdued credit growth remains a significant risk to India's recovery, particularly given the government's emphasis on credit in its support measures. Credit growth at private banks remains well below pre-COVID-19 levels, and PSB credit growth remains historically weak (Graph 7). While banks have attributed this to subdued demand for credit, their net interest margins remain slightly higher than before the pandemic (RBI 2021b). This is consistent with banks' other competing needs, including improving their profitability and capital levels, disposing of NPLs and purchasing government bonds. These issues are likely to continue to weigh on credit growth.

Non-bank financial corporations

NBFCs have grown in recent years as an alternative source of credit for businesses and households. NBFCs currently provide around one-fifth the credit of banks.[6] These 'shadow banks' have been deliberately subject to less rigorous regulation than banks to allow them flexibility to innovate and provide new financial services and increase access to financing (including to those without bank accounts) (RBI 2021f). This was based on the assumption that their activity would remain significantly lower than bank lending and so present a low level of risk. However, less stringent regulation can result in weaker lending standards, facilitate an excessive build-up of leverage, and reduce capital and liquidity buffers within the financial system. NBFCs also receive a significant share of their funding from banks, increasing the risk that stress in NBFCs can spill over to the banking system.

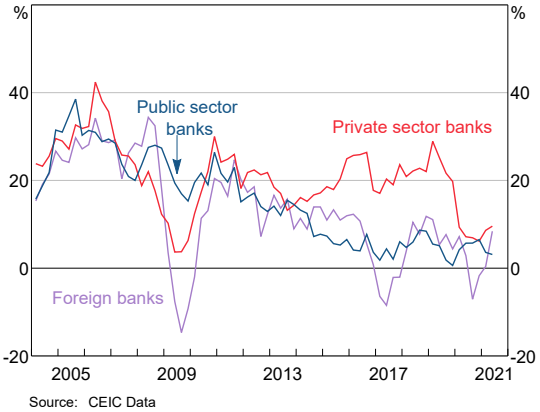
From 2015, NBFCs expanded credit at around twice the pace of banks, with an associated increase in risk (Graph 8).[7] This rapid expansion occurred at the same time that lending by PSBs was constrained (RBA 2019). The demonetisation of India's highest denomination banknotes contributed to an inflow of funds to mutual funds, which in turn purchased NBFC debentures and commercial paper. However, investor sentiment deteriorated following the default of a high-profile NBFC in 2018, which significantly tightened funding conditions for NBFCs.

NBFC credit growth has since slowed dramatically and NBFCs have required continued support from banks. To avoid broader financial distress following the default, authorities introduced a number of measures to stabilise funding conditions. One focus of these measures was to support and incentivise banks to provide more funding to NBFCs – as such, limits on bank lending to individual NBFCs were relaxed, banks were allowed to classify lending to NBFCs for on-lending as priority sector lending, and a partial credit guarantee scheme for credit from PSBs to NBFCs was introduced. In response to the pandemic, authorities have extended and expanded these programs, and introduced further measures – in April 2020, the RBI conducted another TLTRO program worth INR500 billion with

Graph 7

Indian Bank Credit Growth

Year-ended

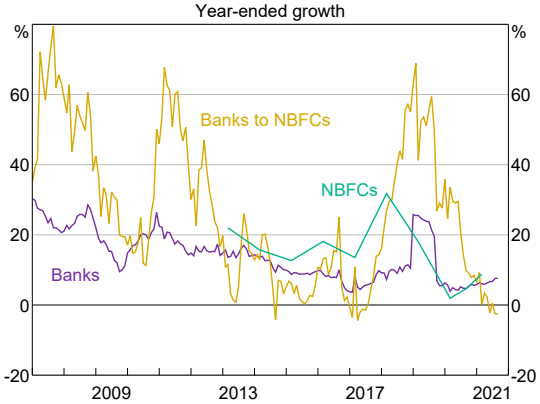


Source: CEIC Data

Graph 8

Indian Bank and NBFC Credit

Year-ended growth



* Non-food credit; excludes lending to non-bank financial corporations (NBFCs)

** Data are provisional

Sources: CEIC Data; RBA; RBI

at least 25 per cent of the funds earmarked for banks to purchase bonds issued by NBFCs.

These measures have helped to stabilise NBFCs; however, they have also increased both the size of linkages and the risk of spillovers from NBFCs to banks (IMF 2021). Eight per cent of bank loans are currently extended to NBFCs. Banks also purchase NBFCs' debentures and commercial paper, although these exposures are smaller. While data on NBFCs' NPLs are limited, provisional data for the March 2021 financial year indicate an average NPL ratio of 6.4 per cent, which is similar to those of Indian banks (RBI 2021b). NBFCs are generally less diversified than banks and so a deterioration in conditions of some sectors of India's economy is likely to weigh on NBFCs (IMF 2021).

Conclusion

Addressing the health issues of the Indian banking system has been a slow and difficult task – and one that has been significantly curtailed by the pandemic. However, the progress made prior to early 2020 has allowed the banking system to weather the COVID-19 storm, despite significant outbreaks and stringent lockdowns.

Despite some improvements, the health of the Indian banking system is likely to constrain its ability to extend credit and support the economic recovery. Efforts are underway to strengthen bank balance sheets further, although banks will need to continue to absorb additional government bond issuance as they do this. Spillover risks from NBFCs also remain elevated. This weak outlook is likely to weigh on India's development and growth, which presents a downside risk to the demand for Australia's exports.

Footnotes

[*] The author completed this work in International Department. The author would like to thank Iris Chan, Eden Hatzvi, Jarkko Jääskelä and Samuel Nicholls for their invaluable input and feedback.

[1] The Basel III leverage ratio is the ratio of Tier 1 capital to assets adjusted for derivative, securities financing and off-balance sheet exposures. Unlike other Basel III capital requirements, the leverage ratio is not risk-weighted so almost all assets are counted equally.

[2] At the end of April 2020, 50 per cent of commercial banks' loans were under such repayment moratoriums; this was 68 per cent for PSBs (RBI 2020b).

[3] The capital conservation buffer is an additional layer of capital that can be drawn down when losses are incurred so as to avoid breaches of minimum capital requirements. The countercyclical capital buffer is a separate capital buffer; its level is adjusted by authorities when credit growth is judged to be excessive or during downturns to support the flow of credit. In May 2021, the RBI also allowed banks to draw down their floating provisions and countercyclical provision buffers for making provisions against NPLs (RBI 2021a). However, many banks have not built up these buffers: in a sample of 28 banks only 12 had such buffers, averaging just 0.3 per cent CET1 capital, and only three banks used them.

[4] For example, in November 2020 the RBI halted the operations of a private bank, Lakshmi Vilas Bank (LVB), which had suffered continuous losses for a number of years and had insufficient capital (RBI 2020c). The RBI subsequently organised LVB's amalgamation with a foreign-owned bank (RBI 2020d).

[5] At the end of June 2021, a sample of 20 banks reported that they had implemented resolution plans under the 'Resolution Framework for COVID-19-related Stress', for accounts worth 1 per cent of their gross loans on average, which otherwise would likely have been NPLs. After the Supreme Court removed the freeze on the classification of loans as non-performing in late March, banks reclassified a significant share of loans in arrears as NPLs, and more loans are expected to be reclassified (RBI 2021b).

[6] In India, NBFCs are companies with financial assets that make up more than 50 per cent of total assets, and generate more than 50 per cent of gross income. Housing finance companies (HFC) are a large subset of NBFCs and provide mortgages and credit for housing construction (RBI 2020f). Prior to 2019, HFCs were largely regulated by the National Housing Bank. However, in 2019 some regulatory powers were transferred to the RBI to further harmonise regulations of HFCs and other NBFCs (RBI 2019c).

[7] See RBA (2019) for more details.

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