The Economic Effects of Low Interest Rates and Unconventional Monetary Policy

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Abstract

The cash rate is currently at its effective lower bound and the Reserve Bank has put in place a suite of alternative monetary policy tools. This article uses the Bank's macroeconometric model of the Australian economy, MARTIN, to analyse the implications of a constrained cash rate and illustrate how unconventional monetary policies can support the Australian economy. By lowering interest rates that are typically affected indirectly through changes in the cash rate, unconventional policies can stimulate economic activity through many of the same channels as conventional monetary policy.

Introduction

A number of structural changes have contributed to a low interest rate and low inflation environment over the past decade, in Australia and across many advanced economies. These include demographic change, a decline in potential output growth and changes in households' and firms' risk appetite. Each of these factors has tended to lower the neutral real interest rate, which is the level of the real interest rate that brings about full employment and maintains economic activity around its potential, while keeping inflation steady (McCririck and Rees 2017) (Graph 1).

The decline in the neutral real interest rate implies that, for any given inflation rate, nominal interest rates will fluctuate around a lower average level (the real interest rate is the nominal interest rate less the inflation rate). So, with a lower neutral interest rate, in order for the stance of monetary policy to be expansionary, the nominal cash rate must also be set at a relatively low level. This has been the case in recent years in Australia. There has been a need for

expansionary monetary policy and, consequently, the cash rate target has been set well below the neutral rate in order to support the economy and have inflation return to the target range.

A lower neutral interest rate increases the likelihood that the nominal cash rate will reach an effective lower bound (ELB), the rate below which changes in the cash rate have a diminishing effect on borrowing and lending rates. Interest rates below this level may strain parts of the banking system, which can reduce credit supply and encourage more cautious behaviour by households and firms, such that the net effect may not be stimulatory (Committee on the Global Financial System 2019; Brunnermeier and Koby 2018).

The key consequence of having the policy rate constrained by its ELB is that conventional monetary policy is unable to provide further stimulus to fully offset negative shocks. During previous easing phases of the monetary policy cycle, the nominal cash rate has been cut by around 250 basis points on average. During the global financial crisis it was cut by over 400 basis points. At low interest rates, that range of policy space is unavailable, and so it is difficult for conventional monetary policy to counteract a large negative shock in the way that it has previously.

As such, unconventional monetary policies may be implemented to counter economic downturns when the policy rate is near the ELB. These policies aim to alter financial variables other than short-term interest rates in order to provide additional

monetary stimulus. Unconventional monetary policy is of particular relevance in the current environment. The COVID-19 pandemic and ensuing mandated shutdowns have seen the Bank lower the cash rate target to 0.25 per cent, which is considered to be the ELB for Australia in the current circumstances (Debelle 2020; Lowe 2019). In addition, the Bank has enacted several policies to alleviate the effects of a slowing economy and ensure sufficient liquidity within the financial system. These stimulatory policies have been deployed along with a very large fiscal stimulus and support program.

This article first analyses the economic consequences of being unable to reduce the cash rate below its lower bound. We then explore the economic effects of conventional and unconventional monetary policies using the Bank's full-system macroeconometric model, MARTIN. The model captures domestic economic activity, the labour market, prices, and some overseas and financial market channels, and accounts for feedback between these variables (Ballantyne *et al* 2020). While the model is not equipped to evaluate specific policy interventions, such as government bond purchases or term lending facilities, it can be used to illustrate the different channels of monetary policy transmission that can be targeted through unconventional tools. These channels provide insight into the similarities and differences between typical cash rate cuts and alternative measures, as well as the potential effects of the specific policy package launched in response to COVID-19.

An important caveat is that the MARTIN model is based on average historical – and mostly linear – relationships between variables. As a result, the model results may not fully capture the effects of large movements in variables that have not occurred in the past, nor interactions between variables. These limitations may be particularly pertinent given the unprecedented changes that have occurred during the COVID-19 pandemic. Nevertheless, the model results provide a framework that can be useful for assessing the impact of different policy tools.

Graph 1

Real Interest Rates

* Estimated up to December 2019
Sources: ABS; RBA
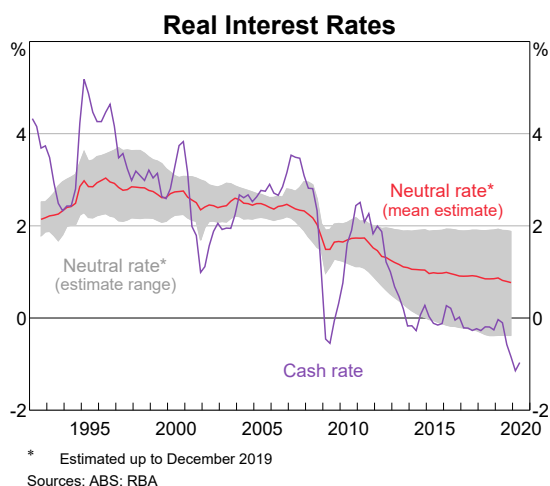
Consequences of an Effective Lower Bound

There are a number of implications of not being able to lower the cash rate beyond its lower bound, which we examine below. In the following analysis we take the ELB to be 0.25 per cent, although the cash rate has moved below 25 basis points due to the large supply of liquidity in the cash market (Debelle 2020). The constraints arising from the ELB and its implications for the economy are relevant at any particular level that the ELB is estimated to be.

More variable and adverse outcomes

A consequence of the cash rate being constrained by the ELB is that the central bank would be unable to stimulate the economy sufficiently, using conventional policies, in response to negative economic shocks. As such, it could take longer to get the economy back to full employment and for inflation to reach its target.

To illustrate the potential economic effect of a constrained cash rate, we use the MARTIN model to consider a range of outcomes for key economic variables in both the presence and absence of a lower bound constraint on the cash rate. We examine the path of the unemployment rate and inflation given a series of shocks to the economy.[1] We take the starting point of the economy to be what is reflected in the November 2019 *Statement on Monetary Policy* (SMP) forecasts, as they represent the economy prior to the onset of the COVID-19 pandemic. We first allow the cash rate to respond as if it were not constrained by the lower bound, then repeat the exercise for when the cash rate cannot fall below the ELB.

We find that the effect of positive and negative economic shocks are similar when there is no constraint on the cash rate. This is because the cash rate can respond to the shocks with expansionary or contractionary settings as required, albeit with a lag. As such, inflation and unemployment outcomes are typically symmetrically distributed around their baseline paths after a number of years (Graph 2). When the cash rate is constrained, however, there tends to be a wider range of possible economic outcomes, and an adverse economic outcome becomes more likely.

For example, three years from the date of the initial economic shock, the unemployment rate is around four times more likely to have increased by 1 percentage point when the cash rate cannot fall below the ELB. Put another way, out of a large set of possible scenarios, there is a 12 per cent chance the unemployment rate will have risen by more than 1 percentage point with an ELB constraint compared with just a 3 per cent chance when there is no constraint on the cash rate. For inflation, the outcomes are also less favourable when there is an ELB constraint. However, the difference is small as a result of the relatively flat Philips curve relationship estimated in the model. Specifically, when the cash rate is constrained, inflation returns to baseline after three years 20 per cent less often.

These results are representative of the implications of the ELB when the starting point for the cash rate is close to the ELB and there is some slack in the economy. However, the initial state of the economy matters in these types of illustrations. If there were already considerable slack in the economy prior to it being hit by a negative shock, for example, a larger reduction in the cash rate would be necessary than if the economy had been operating above capacity. Similarly, conventional monetary policy is more likely to become constrained if the initial value of the cash rate is close to the ELB. Therefore, if this exercise were repeated on a set of forecasts where there was very little slack in the economy and the cash rate was much higher, the effects would be

Graph 2

Probability Distribution of Economic Outcomes

12 quarters from inital shock; stylised demand shock
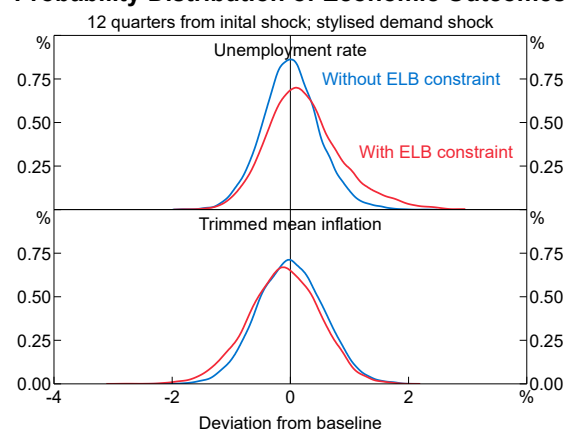
Source: RBA

different and the ELB would represent less of a constraint.

Interest rates remain lower for longer

When the cash rate is constrained by a lower bound, it may also have to remain at a low level for an extended period. To understand why, it is instructive to consider the typical conventional monetary policy response to a large, negative and unexpected demand shock to the economy. Using the same initial conditions as the earlier example, we impose a large negative demand shock. (While the COVID-19 pandemic is a specific example of a large negative event, this exercise uses a simple shock to GDP and does not include the specific features of the pandemic.) We again compare economic outcomes when the cash rate can respond as needed to outcomes when the cash rate is constrained by the ELB.

In the case where there is no lower bound constraint, the central bank could lower the cash rate to a level sufficient to counteract the negative shock (Graph 3). There would still be a period of high unemployment and low inflation, but monetary policy would be able to provide stimulus to limit the severity of the downturn and to hasten the recovery. In the situation where the cash rate is constrained by the lower bound, inflation and unemployment would take much longer to reach their respective targets. To compensate for this shortfall in economic stimulus, the cash rate would need to remain lower for a longer period of time to help the economy recover from the negative shock. These findings are also broadly in line with research in other countries (Schmidt 2016; Chung *et al* 2019).

The analysis, however, abstracts from the role of fiscal and other policies, which would most likely be deployed in the face of such a large contraction (as has been the case during the COVID-19 pandemic). Furthermore, the experience overseas, and more recently in Australia, shows that there is scope to deploy a wider monetary policy toolkit beyond changes to the cash rate. The next section uses the framework of the MARTIN model to explore how monetary policy can provide stimulus to the economy through so-called unconventional monetary policies.

Economic Outcomes of Unconventional Monetary Policy

Unconventional monetary policy measures can be used to provide additional stimulus when the cash rate is at its ELB. A cash rate cut affects economic activity by first lowering other interest rates, such as those faced by businesses, households and the government, as the cash rate serves as a benchmark to anchor short- and long-term rates (Atkin and La Cava 2017). Even when the cash rate is at its ELB, there is often space for these other rates to fall further. Unconventional policies can lower borrowing rates that are typically influenced indirectly by cutting the cash rate, thereby stimulating economic activity through many of the same transmission channels as conventional monetary policy (such as the exchange rate, saving/investment, cash flow and asset price/wealth channels).

The choice and design of different monetary policy options depends on the specific economic or financial market conditions that they are intended to address. For example, when the Bank lowered the cash rate to 0.25 per cent in March 2020, it also enacted a suite of policies to lower borrowing costs and support the availability of credit to the economy (RBA 2020). Debelle (2020) provides insight into why the Bank chose the specific suite of policy tools used in response to the COVID-19 pandemic, and explains how these actions have influenced financial markets so as to lower

Graph 3

Economic Outcomes from Stylised Shock
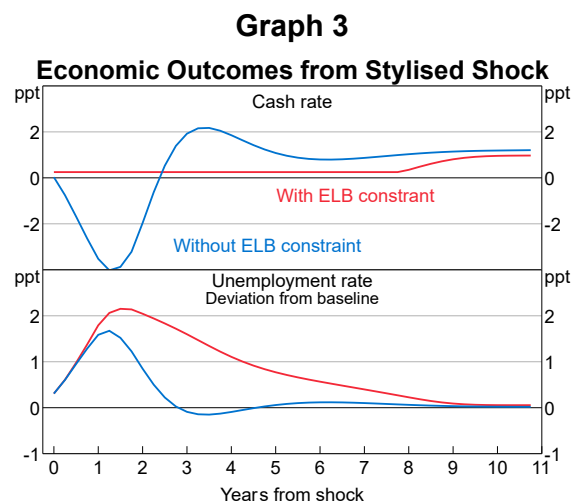
borrowing rates for businesses, households and the government.

Using the MARTIN model, we quantify the economic responses to changes in interest rates that can be targeted through unconventional policy.[2] Taking as given the transmission of alternative policy actions to the broader interest rates in the economy, the modelling can inform our understanding of the potential macroeconomic effect of different monetary policy tools, depending on the specific interest rate(s) they influence. We do not examine the specific policies implemented in response to the COVID-19 pandemic, or do we calibrate the analysis to try to measure the effects of those policies to date. Rather, this exercise provides a framework for understanding the effect of unconventional monetary policies on the Australian economy through the interest rates they influence.

We consider three interest rate categories affected by a cash rate cut:

1. Government bond yields (2-year and 10-year yields)

2. Business lending rates

3. Household mortgage rates.

We isolate the effects of each by imposing a reduction in the given rate, while leaving all other conditions in the model unchanged, and comparing the path of key economic variables to a model baseline. In each case (as well as the baseline), it is assumed that the cash rate remains at the lower bound. We impose a reduction of 50 basis points for each interest rate in the first quarter of the exercise and, for simplicity, it remains at the new level thereafter (in reality, a reduction in rates of these magnitudes or durations may or may not be feasible through unconventional policy tools).

Government bond yields

We first explore the effects of a reduction in govern-ment bond yields relative to a stylised baseline projection. The Reserve Bank Board implemented two policies in response to COVID-19 that would be expected to lower government bond yields (RBA 2020). The first is guidance as to the future path of policy rates, where the cash rate will remain low until progress is being made towards full employ-ment and the Board is confident that inflation will be sustainably within the target band. This is likely to affect the interest rate on longer-term bonds given that those rates reflect expectations of current and future short-term interest rates. The Bank is also explicitly targeting the 3-year Australian Government bond yield, reinforced through purchases of government bonds in the secondary market.

We impose an immediate 50 basis point reduction in the yield on both 2-year and 10-year government bonds.[3] This is comparable with the approximately 30 and 50 basis point decline in Australian 2- and 10-year government bond yields, respectively, over the weeks following the 19 March 2020 policy announcement. (However, rates had declined prior to this, as financial market participants expected further cash rate cuts.) We then hold these bond yields constant at this lower rate over our analysis horizon. This modelling approach is loosely analogous to a yield curve target program in which the central bank purchases government bonds in sufficient quantities to achieve a stated target yield (or in this case, a persistent deviation from the model baseline yield).

Lower government bond yields – relative to the rest of the world, whose bond yields are left unchanged in the model – lead to a depreciation in the real trade-weighted exchange rate (real TWI) of around 3 per cent compared with the baseline. This depreciation is somewhat larger than typically observed following a 50 basis point cash rate cut, as government bond yields (a key determinant of the exchange rate) tend to move less than one-for-one with changes in the cash rate. The lower level of the real exchange rate incentivises households and businesses to substitute away from foreign goods and services towards Australian ones, and increases the competitiveness of Australian exports, which leads to a reduction in imports and an increase in export volumes. Growth in net exports accounts for around half of the effect of lower government bond yields on the level of GDP (Graph 4, upper right panel). In contrast, a 50 basis point cash rate cut has a more balanced effect on the different components of GDP (Graph 4, upper left panel).

The reduction in government bond yields also leads to a modest increase in business investment and consumption. Lower yields reduce the cost of capital for firms by lowering the discount rate applied to future earnings, boosting equity prices; equity accounts for around 60 per cent of Australian business financing (Connolly and Jackman 2017). The lower cost of capital, in combination with increased demand for Australian goods following the exchange rate depreciation, contribute to a modest increase in business investment. Nevertheless, this effect is small, as business investment tends to be relatively insensitive to borrowing costs (Lane and Rosewall 2015). Higher equity prices also boost consumption by increasing household wealth.

Stronger economic activity leads to a strengthening in the labour market and a pick-up in inflation (Graph 5). The unemployment rate falls by around 30 basis points relative to the baseline after three years. The stronger labour market results in a modest pick-up in wages growth, which supports a further increase in consumption. The combination of higher wages growth and an increase in the price of imported products results in inflation being around 20 basis points higher. As modelled in MARTIN, a policy that lowers government bond yields influences unemployment and inflation almost entirely through its direct influence on the exchange rate. In contrast, the exchange rate channel of *conventional* monetary policy accounts
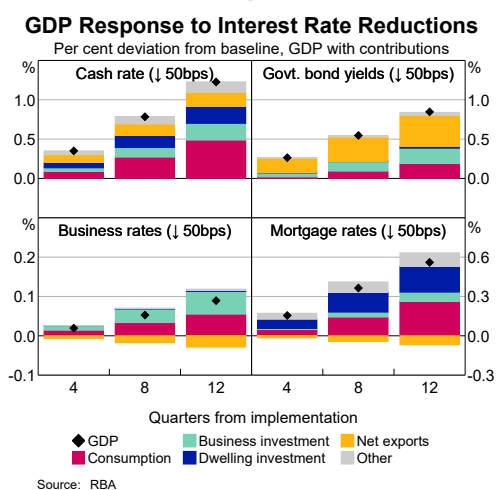
for around one-quarter of the total effect on key macroeconomic variables (Ballantyne *et al* 2020).
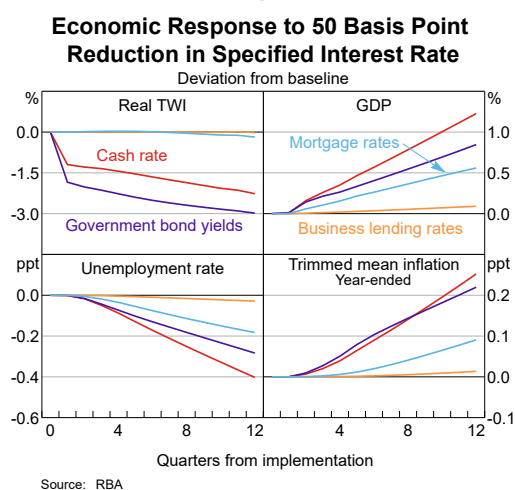
Business lending rates

To consider the economic effect of lower business lending rates, we impose an immediate 50 basis point reduction in the positive spread that exists between business lending rates and the cash rate. Such a reduction could occur as a result of policies that increase the amount of liquidity in the financial system, and so help to reduce banks' cost of funding relative to the cash rate (Kent 2020). This includes government bond purchases as well as the Reserve Bank's Term Funding Facility (TFF), which provides low-cost funding to banks alongside incentives for them to expand lending to businesses. Corporate bond purchases have been used by other central banks to lower borrowing costs, although debt securities play a relatively minor role in Australian business debt funding (Connolly and Jackman 2017). The Bank has broadened its eligibility criteria in recent months to allow corporate bonds to be used as collateral for domestic market operations, which may assist with the smooth functioning of these markets.

As mentioned above, the empirical evidence suggests that lower business interest rates have a limited effect on economic activity. In MARTIN, business investment increases a little further in response to the lower cost of capital. As business investment is relatively import-intensive, a subsequent increase in imports offsets a portion of

Graph 4

GDP Response to Interest Rate Reductions

Per cent deviation from baseline, GDP with contributions

Graph 5

Economic Response to 50 Basis Point Reduction in Specified Interest Rate

Deviation from baseline

the direct contribution of higher business investment to GDP. Higher business investment also reduces unemployment, contributing to an increase in consumption. However, the size of these effects is minimal. Within the MARTIN model, monetary policy stimulates business investment through increasing aggregate demand in the economy, rather than through its influence on the cost of funding.

Household mortgage rates

Household mortgage rates have declined to historic lows in recent months, reflecting the combined effects of forward guidance, lower government bond yields and the TFF (which encourages lending at more favourable rates by lowering bank funding costs). To examine the transmission of lower mortgage rates through the economy, we impose an immediate 50 basis point reduction in the mortgage rate spread to the cash rate in the model.
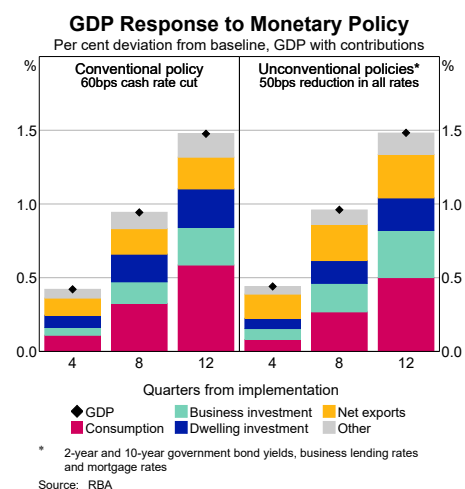
The effect on the economy is much larger than that seen in response to a simulated business lending rate reduction. The lower mortgage rate increases household disposable income through lower interest payments, boosting consumption (the cash flow channel of monetary policy transmission). It also increases demand for housing, increasing GDP through higher dwelling investment and associated costs of housing purchases. This policy also leads to an increase in housing price growth, which increases consumption through a wealth effect (May, Nodari and Rees 2020). The relatively broad-based effects on economic activity lead to a sizeable increase in year-ended GDP growth and a fall in the unemployment rate. However, the effects are smaller than would be seen with a similar-sized cut to the cash rate due to the lack of a substantial response of the exchange rate to lower mortgage rates. By the end of the analysis period, the unemployment rate is around 20 basis points lower than the baseline projections, and inflation is around 10 basis points higher. The effect on inflation is somewhat smaller than in the govern-ment bond yield example due to the absence of the imported inflation channel.

Comparison with a conventional cash rate cut

We finally consider a situation where unconventional policy lowers each of these interest rates in unison – that is, mortgage rates, business lending rates and 2- and 10-year government bond yields all decline by 50 basis points. This represents a comprehensive but stylised suite of alternative measures that affect each of the key interest rates typically influenced by conventional monetary policy. The combined unconventional policies in this example have a similar effect on GDP after three years to a 60 basis point cut to the cash rate (Graph 6). However, the strength of some of the channels of transmission differ. This leads to the unconventional policy suite having a larger effect on net exports and business investment, and a somewhat smaller effect on consumption and dwelling investment, than the conventional cash rate cut.

By the end of the three-year analysis period, the combination of interest rate reductions due to the suite of unconventional policy measures results in a nearly 50 basis point decline in the unemployment rate, and a 30 basis point increase in trimmed mean inflation (Graph 7). This suggests that alternative programs can stimulate the economy with similar outcomes to that of a conventional change to monetary policy, albeit through a greater reliance on the exchange rate channel.

Graph 6

GDP Response to Monetary Policy

Per cent deviation from baseline, GDP with contributions

* 2-year and 10-year government bond yields, business lending rates and mortgage rates

Source: RBA

Discussion

There are a number of reasons why unconventional monetary policies might have a larger or smaller effect than illustrated above.

First, our modelling framework does not capture the ways in which a policy that lowers one rate would also affect other interest rates in the economy. For example, in the case of government bond yields, lower yields do not translate into lower mortgage and business lending rates in MARTIN. In reality, lower bond yields can lower these rates by either signalling that policy rates will remain low for an extended period or, more directly, when used as a benchmark for mortgages and corporate bonds.[4] Indeed, since the Bank launched its comprehensive package of policy measures in response to COVID-19, Australian housing (particularly fixed-rate) and business interest rates have declined to historically low levels. Those effects are not captured in the isolated interest rate examples presented above.
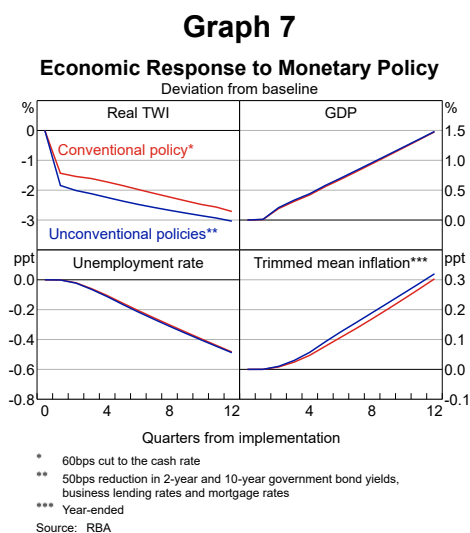
Second, the portfolio balance channel of unconventional monetary policy is absent from our model results. This is where policies that directly lower the rate of return on risk-free assets encourage investors to increase their holdings of assets with higher rates of return. This can include buying stocks or lending to households and firms, thereby encouraging greater investment and consumption. This transmission mechanism is an important way through which unconventional

policies indirectly stimulate a variety of sectors in the economy (Gagnon *et al* 2011).

Similarly, in the business lending rate example, quantity-based measures to encourage business lending may have a more meaningful effect on economic activity than the price-based example shown here. International experience suggests that the availability of credit, in addition to the cost, is a key channel through which unconventional policy stimulates activity. Previous research using microdata has found that business investment is responsive to lending rates when changes are due to a relaxation in lending standards and increased availability of credit, as opposed to changes in monetary policy (Hambur and La Cava 2018). Indeed, the TFF incorporates features to encourage banks to expand lending to businesses, promoting the availability of credit in addition to lowering interest rates. It is not currently feasible to model such a program in MARTIN, and so the model is likely missing some key channels of transmission from interest rates to business activity.

Finally, unconventional policies that lower various interest rates could have a smaller effect than estimated here if the transmission of those rates to the economy differs to the way it has worked in the past. For example, if

- the stimulatory effect of the exchange rate depreciation is muted, such as through restrictions on international travel put in place during the COVID-19 pandemic;
- actions by other central banks (such as the substantial policy stimulus provided globally in response to COVID-19) place upward pressure on the Australian dollar, muting the expansionary effect of policies that would otherwise be expected to result in a lower exchange rate;
- business or household demand for credit is less responsive to lower interest rates than historical experience suggests, such as due to heightened uncertainty; or
- policies to lower specific interest rates adversely affect market functioning and the banking sector. For instance, lower government bond yields and a flatter government bond yield

Graph 7

Economic Response to Monetary Policy
Deviation from baseline

* 60bps cut to the cash rate
** 50bps reduction in 2-year and 10-year government bond yields, business lending rates and mortgage rates
*** Year-ended
Source: RBA

curve could place pressure on bank profitability and margins, which could stifle lending activity (CGFS 2019). In the most recent experience this has been (at least partially) addressed by remunerating balances held in Exchange Settlement Accounts at the Bank at 10 basis points rather than zero.

Conclusion

Although the cash rate is now at its ELB, alternative monetary policy tools are available to provide stimulus to the economy. Policies that lower government bond yields and household and business lending rates are effective in further reducing the unemployment rate and increasing inflation even though the cash rate is constrained by the ELB. Different tools can be used to affect different channels of transmission. A range of policies deployed in unison lowers the unemploy-

ment rate further and increases inflation in a way that closely replicates the channels of a conventional cash rate cut. Without these alternative monetary policies, and a range of other policies including fiscal stimulus, economic outcomes would be more varied and adverse.

Notwithstanding this, the COVID-19 pandemic poses unique challenges. Some of the responses to it may mute the efficacy of some channels through which monetary policies (conventional and unconventional) typically support the economy, for example the influence of the exchange rate on service exports due to travel restrictions. Nonetheless, the low level of the cash rate and unconventional policy measures will keep borrowing costs low and credit available, and so support businesses and households during the current challenging economic environment. ✈

Footnotes

[*]   Peter Rickards is from Economic Analysis Department; Rochelle Guttmann and Dana Lawson completed this work in Economic Analysis Department.

[1]   To examine a plausible range of outcomes, we perform stochastic simulations as described in Ballantyne *et al* (2020). We randomly select a sequence of historical forecast errors from the model and apply those errors to the future projected path. The cash rate is then allowed to respond to this new path for different economic variables. We do this 10,000 times, and we can then use the results to construct probability distributions.

[2]   We use an expectations-augmented version of the MARTIN model, where 2-year government bond yields and the exchange rate respond immediately to financial participants' reassessment of expectations for future policy rates. A satellite VAR model – consisting of the cash

rate, inflation and the unemployment rate – is used to proxy expectations in the next quarter.

[3]   This calibration implicitly assumes a shift down of the entire yield curve, although there is no explicit yield curve in MARTIN; only 2- and 10-year rates are modelled. These rates can be considered as proxies for medium- and long-term interest rates.

[4]   The signalling channel is likely to be more important in Australia, where most mortgage and business lending rates are variable. In MARTIN, these rates are modelled as being equal to the cash rate plus a simple spread. The business lending rate spread also depends on the level of the unemployment gap.

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