AUSTRALIAN MARKETS WEEKLY

Assessing "lower for longer" rates using the RBA's macro model

National Australia Bank

In this issue

Analysis – Assessing "lower for longer" interest rates using the RBA's macro model

- As the Reserve Bank approaches the limits of conventional monetary policy, it has strengthened its forward guidance, stating that "it is reasonable to expect that an extended period of low interest rates will be required to reach full employment and achieve the inflation target". Although the Reserve Bank has not specified a time period to achieve these goals, a typical policy cycle lasts one to two years and the bank's own forecasts suggests rates could stay low for at least two years.
- Normal rules-of-thumb on the effectiveness of interest rates are based on modelling of a rate cut that lasts one year. We used the Reserve Bank's MARTIN macro model to explore forward guidance by estimating the impact of holding the cash rate at low levels for a longer period of time. Our analysis showed that the longer the cash rate is held at low levels, the larger the impact on the economy. The results also underscore how higher house prices and a lower exchange rate are part and parcel of the transmission mechanism of lower interest rates.
- Notwithstanding some limitations of the MARTIN model - particularly around pass-through of the cash rate to mortgage rates - the results demonstrate that the level of the cash rate matters. Given conventional monetary policy is close to exhaustion, we plan to extend this work by using the model to explore the impact of fiscal policy on the economy, although we are mindful that the model was not designed for such a purpose.

The week ahead – NAB business survey; US-China trade talks

- In Australia, the October RBA Board minutes are released on Tuesday and should maintain the dovish tone adopted in post-meeting press release, which emphasised the goal of full employment. On Thursday, unemployment should hold at 5.3% in September (market: 5.3%) alongside weaker employment growth of 10k (market: 17k). We expect Wednesday's NZ CPI to rise 0.7% in Q3 and 1.5% over the year, compared with the RBNZ's August MPS expectation of a 0.5% quarterly increase. Importantly, a good part of the upward surprise for the RBNZ will likely come in the non-tradables element, suggesting an upward bias to core inflation.
- Globally, markets will digest the partial ceasefire in the US-China trade war. On Friday, China's annual GDP growth is expected to tick down to 6.1% in Q3. Industrial production the same day should reflect weak manufacturing growth. US retail sales are due Wednesday, with industrial production on Thursday. There is an EU Summit on 17-18 October. We still expect an extension past the 31 October deadline, but a deal is possible. The US is due to impose tariffs on the EU on 18 October in response to illegal state subsidies to Airbus. August industrial production on Monday will likely be weak.

To contact NAB's market experts, please click on one of the following links:

Ask the Economists

Ask the FX Strategists

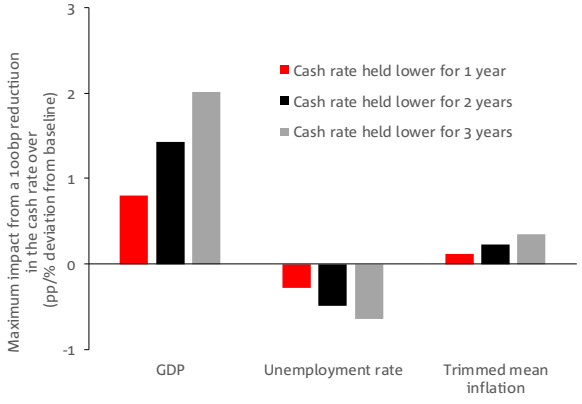
Ask the Interest Rate Strategists

Key markets over the past week

	Last	% chg week		Last	bp/% chg week
AUD	0.6783	0.7	RBA cash	0.75	0
AUD/CNY	4.79	-0.8	3y swap	0.73	10
AUD/JPY	73.5	1.7	ASX 200	6,643	1.2
AUD/EUR	0.615	0.2	Iron ore	88	0.0
AUD/NZD	1.075	0.4	WTI oil	54.4	3.1

Source: Bloomberg

Chart of the week: The effect of keeping rates low



Kieran Davies, Kaixin Owyong

Assessing "lower for longer" interest rates using the RBA's macro model

- **As the Reserve Bank approaches the limits of conventional monetary policy, it has strengthened its forward guidance, stating that "it is reasonable to expect that an extended period of low interest rates will be required to reach full employment and achieve the inflation target". Although the Reserve Bank has not specified a time period to achieve these goals, a typical policy cycle lasts one to two years and the bank's own forecasts suggests rates could stay low for at least two years.**
- **Normal rules-of-thumb on the effectiveness of interest rates are based on modelling of a rate cut that lasts one year. We used the Reserve Bank's MARTIN macro model to explore forward guidance by estimating the impact of holding the cash rate at low levels for a longer period of time. Our analysis showed that the longer the cash rate is held at low levels, the larger the impact on the economy. The results also underscore how higher house prices and a lower exchange rate are part and parcel of the transmission mechanism of lower interest rates.**
- **Notwithstanding some limitations of the MARTIN model – particularly around pass-through of the cash rate to mortgage rates – the results demonstrate that the level of the cash rate matters. Given conventional monetary policy is close to exhaustion, we plan to extend this work by using the model to explore the impact of fiscal policy on the economy, although we are mindful that the model was not designed for such a purpose.**

The cash rate is at a record low and the RBA has strengthened its forward guidance

Over the past five months, the Reserve Bank has cut the cash rate three times, reaching a new record low of 0.75% in October. Alongside the latest cash rate reduction, the bank emphasised that "it is reasonable to expect that an extended period of low interest rates will be required to reach full employment and achieve the inflation target".[1]

This signal about future policy builds on Governor Lowe's earlier comment that "it is reasonable to expect an extended period of low interest rates [because] on current projections it will be some time before inflation is comfortably back within the target range" by linking low interest rates to the achievement of both full employment – where the bank estimates the NAIRU is 4.5% – and the 2-3% inflation target.[2]

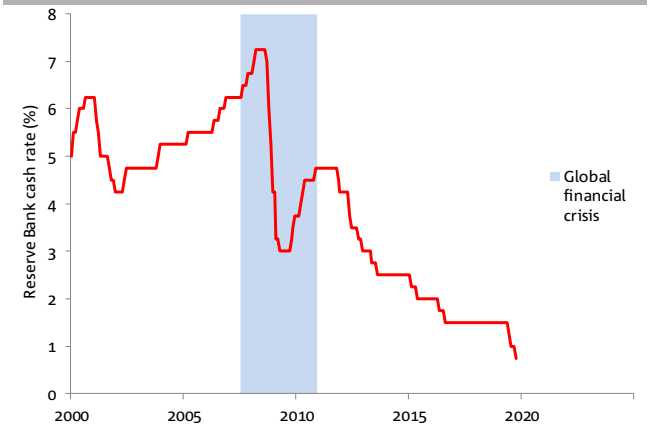
These comments mark the first time that the Reserve Bank has been explicit about the outlook for monetary policy (although we note that the bank's economic forecasts are broadly conditioned on market expectations of low interest rates). They can be regarded as a form of forward guidance, which historically the Reserve Bank has shied away from, presumably because it had placed greater weight on the flexibility to respond to changing circumstances, where it may have been concerned that deviating from guidance could affect the bank's credibility.

Notwithstanding such misgivings, the Reserve Bank obviously feels that forward guidance can now play a useful role as conventional monetary policy approaches its limits and as bank staff prepare contingency plans for unconventional policy.

Certainly, the Bank for International Settlements (BIS) review of unconventional monetary policy tools – which was overseen by Governor Lowe – strongly emphasised the importance of forward guidance, arguing it played an "indispensable role" in periods of heightened uncertainty about both the economic outlook and the ability of central banks to deal with challenges when policy rates reached the effective lower bound.[3]

In Australia's case, Governor Lowe said earlier this year that a negative cash rate was technically possible, but it is clear from his parliamentary testimony that the Reserve Bank would be uncomfortable taking the cash rate below the 0.25-0.5% range seen in the UK and the US.[4] At the same time, financial markets are unsure whether the Reserve Bank will achieve its target, with the 10-year bond breakeven inflation rate well below the 2-3% band. Thus it is not surprising that with the cash rate now only fractionally above that range the bank has decided to be clearer about its policy intentions.

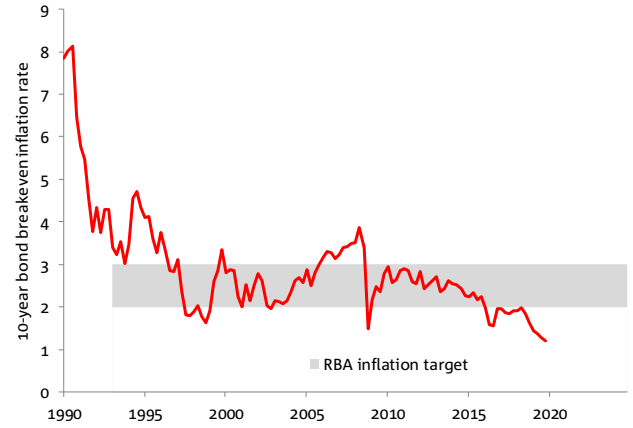
Chart 1: Conventional monetary policy is approaching its limit …



Source: Reserve Bank of Australia, National Australia Bank

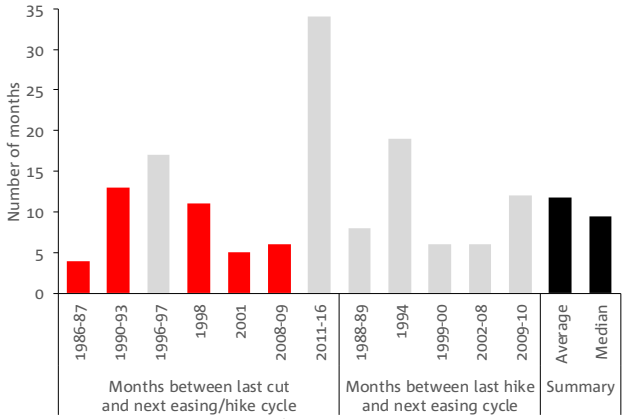
[1] See Reserve Bank of Australia, *Statement by Philip Lowe, Governor: Monetary policy* decision, 1 October 2019.
[2] See Reserve Bank of Australia Governor Lowe, *Inflation targeting and economic welfare*, 25 July 2019.
[3] See Bank for International Settlements, *Unconventional monetary policy tools: a cross-country analysis*, Committee on the Global Financial System Papers No. 63, October 2019.
[4] See Reserve Bank of Australia Governor Lowe, *Question and answer session*, Adelaide, 20 June 2019 and Commonwealth of Australia, *Reserve Bank of Australia annual report 2018*, House of Representatives Standing Committee on Economics Official Committee Hansard, Canberra, 9 August 2019.

Chart 2: ... and financial markets are unsure whether the Reserve Bank will meet its inflation target



Source: Reserve Bank of Australia, National Australia Bank

Chart 4: ... while the average and median gaps between policy cycles is about one year



Source: Dungey and Hayward, Reserve Bank of Australia, National Australia Bank

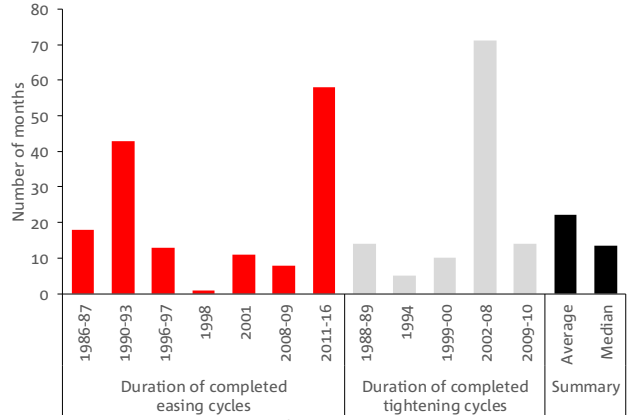
The RBA's MARTIN model shows that a longer period of low interest rates has a greater economic impact

With the Reserve Bank signalling that rates are likely to stay low for an extended period, we examined the potential impact of keeping interest rates "lower for longer" on the economy using the RBA's MARTIN macroeconometric model.[5]

Historically, the Reserve Bank has analysed the impact of changes in interest rates using a variety of models by assuming a change in the cash rate holds for a year, after which the change is unwound as the model converges to its long-term equilibrium.

The assumption that the changed cash rate holds steady for one year is arbitrary, but has been often used by the Reserve Bank. It also accords with past experience in that the average and median gaps between the end of one policy cycle and the start of the next one is one year. In contrast, the average duration of a policy cycle is longer at about two years, although the median duration is also about one year.

Chart 3: The average duration of a policy cycle is about two years and the median duration is about one year ...



Source: Dungey and Hayward, Reserve Bank of Australia, National Australia Bank

Although the Reserve Bank has stopped short of specifying a time period in its forward guidance, we think it expects rates to be low for more than a year. Indeed, the August Statement on Monetary Policy suggests that rates could remain low for at least two years because it forecast that underlying inflation would only reach the bottom of the 2-3% target band by mid 2021, with unemployment still above the NAIRU at 4.9% by the end of 2021.

Accordingly, we ran simulations with the MARTIN model of a cash rate reduction of 100bp, held over periods of one, two and three years. Following this "shock", the cash rate was then allowed to return to equilibrium.

Summarising the results, we calculated the percentage change in the level of key economic and financial indicators from the baseline scenario to after the cash rate had been reduced. Focusing on the maximum – or peak – effect on these indicators, we found:

- **GDP is higher.** The maximum boost to the level of real GDP is 0.8% when the cash rate is held lower for one year. If the cash rate is held low for two years, the peak boost is 1.4%, which increases to 2.0% if the cash rate is held low for three years.
- **Unemployment is lower.** The maximum reduction in the unemployment rate is 0.3pp when the cash rate is held lower for one year. For a two-year shock, the unemployment rate is 0.5pp lower, while it is 0.6pp lower for a three-year shock.
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- **Inflation is slightly higher.** Annual underlying inflation is at most 0.1pp higher following a one-year shock to the cash rate, but 0.2pp and 0.3ppt higher in response to a shock lasting two and three years, respectively.
- **The real exchange rate is significantly lower.** The real TWI is 1.4% lower at the peak of its response to a one-year shock. The peak decline increases to 2.2%

[5] See Alexander Ballantyne, Tom Cusbert, Richard Evans, Rochelle Guttmann, Jonathan Hambur, Adam Hamilton, Elizabeth Kendall, Rachael McCririck, Gabriela Nodari and Daniel Rees, *MARTIN has its place: A macroeconometric model of the Australian economy*, Reserve Bank of Australia Discussion Paper RDP 2019-07, August 2019.

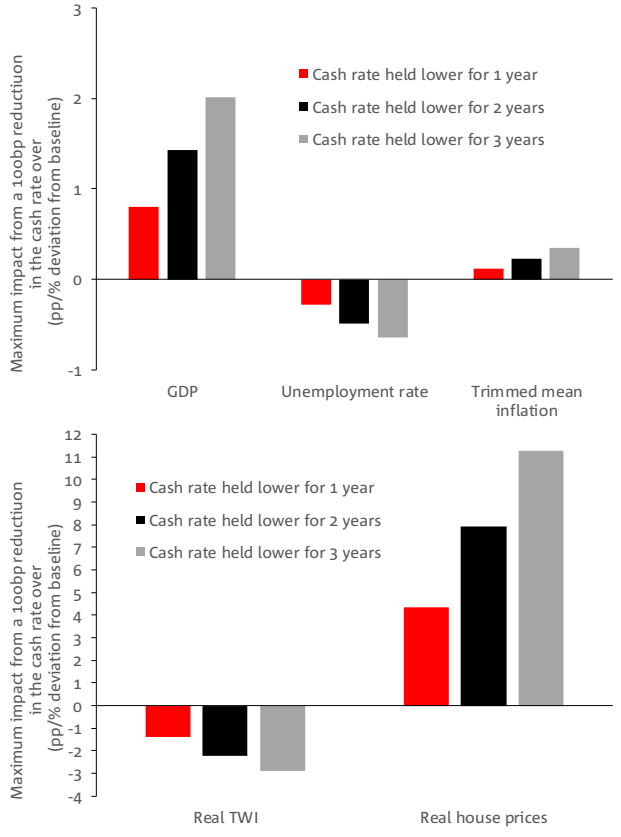
and 2.9% if the lower cash rate is maintained for two and three years, respectively.

- **Real house prices are substantially higher.** Real house prices are 4% higher at their peak when the cash rate is held lower for one year. The boost increases to 8% and 11% if the shock is held for two and three years, respectively.

These results make clear that a longer period of low interest rates produces a larger impact on the economy. This is because the economic effect of monetary policy reflects the *level* of the cash rate relative to the neutral rate rather than just the change in the cash rate, a point often made by Governor Stevens. It also makes clear that traditional rules-of-thumb that are based on cash rate reductions lasting only a year are likely to underestimate the effect of keeping rates lower for longer.

Chart 5: Holding the cash rate low for longer increases its estimated effect

(Peak estimated response to 100bp rate cut)		Cash rate held lower for: 1 year	2 years	3 years
Real GDP	%	0.8	1.4	2.0
Unemployment rate	pp	-0.3	-0.5	-0.6
Annual trimmed mean inflation	pp	0.1	0.2	0.3
Real TWI	%	-1.4	-2.2	-2.9
Real house prices	%	4	8	11



Source: Reserve Bank of Australia, National Australia Bank

The model results underscore the importance of higher house prices and a lower exchange rate

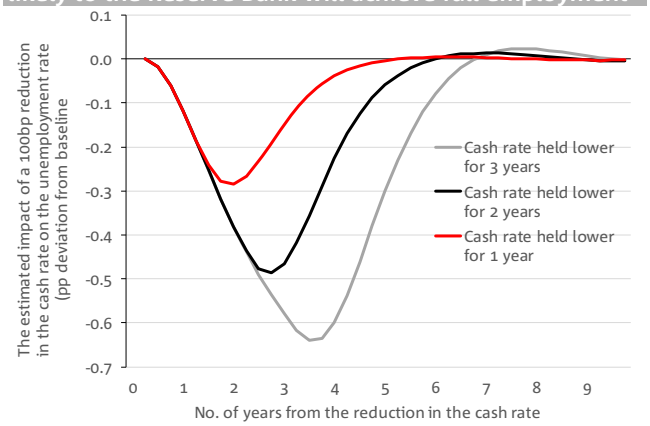
The model results also reinforce the importance of higher house prices and a lower exchange rate in the transmission of lower interest rates to higher economic growth and inflation. Although the estimated response of house prices to lower interest rates is large, this partly reflects the inflexibility of the supply side of the housing market, which acts to amplify the impact of interest rates on prices. The results also mirror previous work by the Reserve Bank that highlighted the responsiveness of house prices and residential construction to the cash rate (e.g. the authors of the discussion paper on the MARTIN model noted that "the asset pricing channel accounts for close to half of the overall GDP response to changes in interest rates").

In our view, this work suggests that the Reserve Bank will interpret rising house prices and a falling exchange rate as signs that low interest rates are working. House prices have risen in recent months and this modelling suggests that a further increase is likely. The real TWI has also fallen although the Reserve Bank is watching its peers closely as lower world interest rates would partly undo the impact of the bank's recent rate cuts.

Reduced pass-through to lending rates tempers these results

The MARTIN model results show the importance of forward guidance in that keeping interest rates lower for longer makes it more likely that the Reserve Bank will be able to reduce unemployment and lift inflation.

Chart 6: Keeping rates lower for longer makes it more likely to the Reserve Bank will achieve full employment



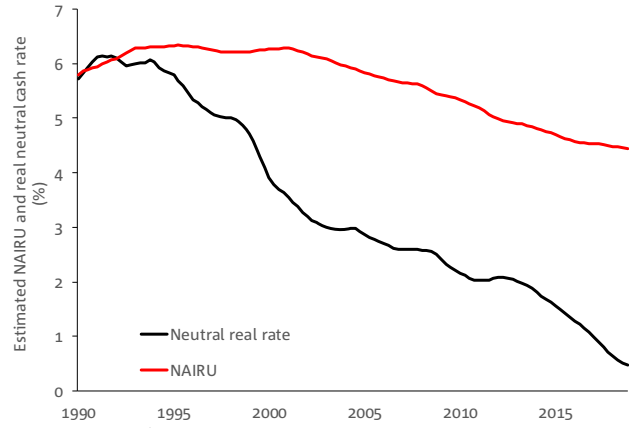
Source: Reserve Bank of Australia, National Australia Bank

However, we note the MARTIN model assumes one-for-one pass-through from the cash rate to mortgage rates. In practice, the pass-through has varied over time, which the Board takes into account when setting the cash rate. For example, this year the Reserve Bank has reduced the cash rate by 75bp, while we estimate that the discounted variable mortgage rate for owner-occupiers has fallen by 56bp. The Board would also be mindful that the pass-through of further rate cuts could be incomplete given deposit rates are near zero.

Expressed another way, the above scenarios assume that the neutral interest rate remains unchanged for the foreseeable future, whereas the Reserve Bank estimates show a trend decline over recent years, similar to other advanced economies. If the neutral rate did fall further, then the cash rate is less stimulatory, all else equal,

The scenarios also assume that the NAIRU holds steady rather than continue its downward trend. If the NAIRU does fall further, then a lower NAIRU points to more spare capacity in the labour market for a given unemployment rate. This hampers the ability of monetary policy to stimulate the economy by requiring a larger cut in the cash rate.

Chart 7: The estimated impact of a lower cash rate would be reduced by a further fall in the neutral rate



Source: Reserve Bank of Australia, National Australia Bank

The level of the cash rate matters

Notwithstanding the above limitations to our scenario analysis, the results demonstrate that the level of the cash rate matters and that how far the cash rate is reduced will also depend on the patience of the central bank. Given conventional monetary policy is now close to exhaustion, we plan to extend this work by using the model to explore the impact of fiscal policy on the economy, although we are mindful that the model was not designed for such a purpose.

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Kaixin Owyong

CALENDAR OF ECONOMIC RELEASES

Country	Economic Indicator	Period	Forecast	Consensus	Actual	Previous	GMT	AEST
Monday 14 October 2019								
EC	Industrial Production WDA YoY	Aug		-2.6		-2	9.00	20.00
UK	BOE Cunliffe speaks on monetary policy in London						12.10	23.10
Tuesday 15 October 2019								
NZ	Net Migration SA	Aug		--		5100	21.45	8.45
AU	RBA October Minutes	Oct					0.30	11.30
CH	CPI YoY	Sep		2.9		2.8	1.30	12.30
CH	PPI YoY	Sep		-1.2		-0.8	1.30	12.30
JN	Industrial Production MoM	Aug F		--		-1.2	4.30	15.30
US	Fed Bullard speaks at Bloomberg Conference in London						8.25	19.25
UK	Jobless Claims Change	Sep		--		28.2	8.30	19.30
UK	ILO Unemployment Rate 3Mths	Aug		3.8		3.8	8.30	19.30
UK	BOE Governor Carney speaks in Parliamentary Testimony						8.30	19.30
GE	ZEW Survey Current Situation	Oct		-24		-19.9	9.00	20.00
GE	ZEW Survey Expectations	Oct		-25		-22.5	9.00	20.00
US	Empire Manufacturing	Oct		0		2	12.30	23.30
US	Fed Daly speaks at Los Angeles World Afffairs Council						19.30	6.30
Wednesday 16 October 2019								
NZ	Dairy Auction Avg. Winning Price MT	Oct 15		--		3306	early am	
NZ	CPI QoQ	3Q	0.7	0.6		0.6	21.45	8.45
NZ	CPI YoY	3Q	1.5	1.4		1.7	21.45	8.45
AU	Westpac Leading Index MoM	Sep		--		-0.28	23.30	10.30
UK	CPI YoY	Sep		1.9		1.7	8.30	19.30
EC	CPI YoY	Sep F		0.9		1	9.00	20.00
US	Retail Sales Advance MoM	Sep		0.3		0.4	12.30	23.30
CA	CPI YoY	Sep		2		1.9	12.30	23.30
CA	CPI Core- Common YoY%	Sep		1.8		1.8	12.30	23.30
UK	BOE Governor Carney takes part in panel at IMF event						13.00	0.00
US	Fed Evans discusses economy and monetary policy						14.45	1.45
UK	ECB Chief Economist Lane speask in Washington						15.00	2.00
US	Fed releases beige book						18.00	5.00
UK	BOE Governor Carney speaks at Harvard						22.00	9.00
Thursday 17 October 2019								
AU	RBA Debelle gives speech in Sydney						22.10	9.10
AU	Employment Change	Sep	10	17		34.7	0.30	11.30
AU	Unemployment Rate	Sep	5.3	5.3		5.3	0.30	11.30
AU	Participation Rate	Sep		66.2		66.2	0.30	11.30
US	Housing Starts	Sep		1318		1364	12.30	23.30
US	Philadelphia Fed Business Outlook	Oct		7.8		12	12.30	23.30
US	Industrial Production MoM	Sep		-0.1		0.6	13.15	0.15
US	Fed Williams speaks in New York						20.20	7.20
Friday 18 October 2019								
AU	RBA Lowe speaks at "Governor Talk" at the IMF, Washington						20.00	7.00
JN	Natl CPI Ex Fresh Food YoY	Sep		0.3		0.5	23.30	10.30
JN	Natl CPI YoY	Sep		0.2		0.3	23.30	10.30
CH	Retail Sales YoY	Sep		7.8		7.5	2.00	13.00
CH	Fixed Assets Ex Rural YTD YoY	Sep		5.5		5.5	2.00	13.00
CH	Industrial Production YoY	Sep		4.9		4.4	2.00	13.00
CH	Industrial Production YTD YoY	Sep		5.5		5.6	2.00	13.00
CH	Retail Sales YTD YoY	Sep		8.1		8.2	2.00	13.00
CH	GDP SA QoQ	3Q		1.5		1.6	2.00	13.00
CH	GDP YoY	3Q		6.1		6.2	2.00	13.00
US	Fed Kaplan speaks in Washington						13.00	0.00
US	Fed George speaks at Fed energy and economy conference						14.05	1.05
US	Fed Clarida speaks on economy and policy outlook						15.30	2.30
Upcoming Central Bank Interest Rate Announcements								
Europe, ECB		Oct 24	-0.50	-0.50		-0.50		
US, Federal Reserve		Oct 30	1.75/2	1.75/2		1.75/2		
Japan, BoJ		Oct 31	-0.10	-0.10		-0.10		
Australia, RBA		Nov 5	0.75	0.75		0.75		
UK, BOE		Nov 7	0.75	0.75		0.75		
New Zealand, RBNZ		Nov 13	0.75	0.75		1.00		

GMT: Greenwich Mean Time; AEST: Australian Eastern Standard Time

FORECASTS

Economic Forecasts

	Annual % change				Quarterly % change															
					2018				2019				2020				2021			
Australia Forecasts	**2018**	**2019**	**2020**	**2021**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**
Household Consumption	2.6	1.4	1.7	2.3	0.5	0.8	0.3	0.4	0.3	0.4	0.3	0.3	0.4	0.5	0.6	0.5	0.6	0.6	0.6	0.6
Underlying Business Investment	1.2	-2.1	0.2	1.9	0.7	-0.8	-2.1	0.1	-0.2	-0.6	-0.3	-0.5	0.1	0.1	1.1	0.5	0.4	0.4	0.2	0.4
Residential Construction	4.8	-8.6	-8.1	-0.9	3.3	2.8	0.1	-2.8	-2.2	-4.4	-2.7	-2.4	-2.1	-1.3	-1.7	-0.5	0.1	0.2	0.5	0.8
Underlying Public Spending	4.3	4.2	3.8	3.6	1.4	-0.1	2.1	0.8	1.1	1.4	0.4	0.8	1.1	1.1	0.9	0.9	0.8	0.8	0.8	0.9
Net Exports (a)	0.8	1.6	-0.1	-0.2	0.6	0.0	0.4	-0.2	0.4	0.6	0.3	0.3	0.0	0.0	-0.1	0.0	0.0	0.0	-0.1	0.0
Inventories (a)	0.1	-0.4	0.1	0.1	0.0	0.2	-0.3	0.2	-0.1	-0.5	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Domestic Demand (q/q %)	--	--	--	--	0.9	0.5	0.4	0.2	0.1	0.3	0.2	0.2	0.5	0.5	0.6	0.6	0.7	0.7	0.7	0.7
Dom Demand (y/y %)	2.8	0.9	1.7	2.6	3.5	3.3	2.5	2.0	1.2	1.0	0.8	0.8	1.2	1.4	1.9	2.2	2.5	2.6	2.7	2.8
Real GDP (q/q %)	--	--	--	--	1.0	0.7	0.3	0.1	0.5	0.5	0.5	0.5	0.6	0.5	0.7	0.6	0.6	0.6	0.6	0.7
Real GDP (y/y %)	2.7	1.7	2.2	2.5	3.1	3.1	2.6	2.2	1.7	1.4	1.6	2.0	2.1	2.1	2.3	2.4	2.4	2.6	2.5	2.6
CPI headline (q/q %)	--	--	--	--	0.4	0.4	0.4	0.5	0.0	0.6	0.4	0.6	0.4	0.4	0.5	0.7	0.5	0.5	0.6	0.7
CPI headline (y/y %)	1.9	1.5	1.8	2.2	1.9	2.1	1.9	1.8	1.3	1.6	1.6	1.6	2.0	1.7	1.8	1.9	2.0	2.1	2.3	2.3
CPI underlying (q/q %)	--	--	--	--	0.5	0.5	0.4	0.4	0.2	0.4	0.3	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5
CPI underlying (y/y %)	1.9	1.4	1.5	1.9	1.9	1.9	1.8	1.8	1.5	1.4	1.4	1.3	1.5	1.5	1.5	1.6	1.7	1.9	2.0	2.0
Private wages (q/q %)	--	--	--	--	0.5	0.6	0.5	0.6	0.5	0.5	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Private wages (y/y %)	2.1	2.3	2.5	2.8	1.9	2.1	2.1	2.3	2.4	2.3	2.3	2.3	2.4	2.5	2.6	2.6	2.7	2.7	2.8	2.8
Unemployment Rate (%)	5.3	5.2	5.4	5.5	5.5	5.6	5.1	5.0	5.0	5.2	5.2	5.3	5.3	5.4	5.5	5.5	5.5	5.4	5.5	5.4
Terms of trade	2.0	3.2	-7.9	1.8	3.3	-1.3	1.1	3.0	3.1	1.5	-4.4	-4.7	-2.6	-0.6	0.9	-0.2	1.2	0.6	-0.1	-0.1
Current Account (% GDP)	-2.1	0.3	-1.0	-0.8	-2.2	-2.7	-2.2	-1.4	-0.2	1.2	0.5	-0.3	-0.9	-1.1	-1.0	-1.0	-0.8	-0.7	-0.8	-0.9

Source: NAB Group Economics; (a) Contributions to GDP growth

Exchange Rate Forecasts

	14-Oct	Dec-19	Mar-20	Jun-20	Sep-20	Dec-20
Majors						
AUD/USD	0.678	0.65	0.66	0.67	0.69	0.70
NZD/USD	0.63	0.62	0.62	0.63	0.65	0.65
USD/JPY	108.3	104	104	105	106	106
EUR/USD	1.10	1.12	1.11	1.13	1.14	1.15
GBP/USD	1.26	1.20	1.18	1.20	1.22	1.24
USD/CNY	7.05	7.40	7.40	7.30	7.20	7.10
USD/CAD	1.32	1.36	1.38	1.38	1.36	1.35
USD/CHF	1.00	0.97	0.95	0.96	0.96	0.96
Australian Cross Rates						
AUD/NZD	1.07	1.05	1.06	1.06	1.06	1.08
AUD/JPY	73.5	68	69	70	73	74
AUD/EUR	0.61	0.58	0.59	0.59	0.61	0.61
AUD/GBP	0.54	0.54	0.56	0.56	0.57	0.56
AUD/CNY	4.79	4.81	4.88	4.89	4.97	4.97
AUD/CAD	0.90	0.88	0.91	0.92	0.94	0.95
AUD/CHF	0.68	0.63	0.63	0.64	0.66	0.67

Interest Rate Forecasts

	14-Oct	Dec-19	Mar-20	Jun-20	Sep-20	Dec-20
Australian Rates						
RBA cash rate	0.75	0.50	0.50	0.50	0.50	0.50
3 month bill rate	0.86	0.60	0.60	0.60	0.60	0.60
3 Year Swap Rate	0.73	0.70	0.70	0.85	0.95	1.00
10 Year Swap Rate	1.20	1.05	1.05	1.20	1.35	1.45
Offshore Policy Rates						
US Fed funds	2.00	1.75	1.75	1.75	1.75	1.75
ECB deposit rate	-0.50	-0.60	-0.70	-0.70	-0.70	-0.70
BoE repo rate	0.75	0.75	0.75	0.75	0.75	1.00
BoJ excess reserves rate	-0.10	-0.20	-0.20	-0.30	-0.30	-0.30
RBNZ OCR	1.00	0.75	0.50	0.50	0.50	0.50
China 1yr lending rate	4.35	4.10	4.10	4.10	4.10	4.10
China Reserve Ratio	13.0	12.50	12.00	12.00	12.00	12.00
10-year Bond Yields						
Australia	1.04	0.90	0.90	1.00	1.10	1.20
United States	1.73	1.50	1.50	1.60	1.70	1.80
New Zealand	1.18	0.95	0.95	1.05	1.10	1.30

Sources: NAB Global Markets Research; Bloomberg; ABS

Global GDP

	2018	2019	2020	2021
Australia	2.7	1.7	2.2	2.5
United States	2.9	2.2	1.6	1.8
Eurozone	1.9	1.1	1.1	1.4
United Kingdom	1.4	1.2	1.2	1.5
Japan	0.8	1.0	0.2	0.9
China	6.6	6.3	6.0	5.8
India	6.8	5.7	6.8	7.1
New Zealand	2.9	2.1	2.4	2.0
World	3.6	3.1	3.2	3.5

Commodity prices ($US)

	14-Oct	Dec-19	Mar-20	Jun-20	Sep-20
Brent oil	60.1	70	70	75	75
Gold	1487	1450	1483	1518	1547
Iron ore	na	76	72	68	71
Hard coking coal*	150	170	165	160	155
Thermal coal	68	90	93	90	88
Copper	5764	6300	6225	6150	6125
Aus LNG**	10	12	12	12	12

** FOB quarterly contract prices (thermal coal is JFY contract)*

*** Implied Australian LNG export prices*

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