

AUSTRALIAN MARKETS WEEKLY

Modelling a China shock; more work on the potential effect of the coronavirus



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Analysis – Modelling a China shock; more work on the potential effect of the coronavirus on Australia's economy

- Last week we estimated that Australia's new travel ban, which stops non-resident travel from China, could take about 0.15% off annual GDP in Q1 via an impact on tourism and exports of education services, with a bigger temporary effect of more than 0.5% in the quarter itself. This assumes the bans last for two months, where the risk is it may take longer to contain the outbreak (the SARS outbreak in 2003 lasted for about nine months).
- With China at the heart of the outbreak, we took a different approach to estimating the potential impact of the virus, analysing the impact of an assumed 1% shock to Chinese growth on Australia, allowing for spillovers to other key trading partners. The work suggests that Australian GDP would be 0.3% lower after about a year, which can be used as a simple rule-of-thumb until we learn more about the coronavirus's impact on China. Reserve Bank analysis using its macroeconomic model also reports a 0.3% hit from a 1% slowdown in Chinese growth, although the effect increases to 0.5% on a more disruptive slowdown in China.

The week ahead – NAB business survey; RBNZ on hold; coronavirus; Fed testimony

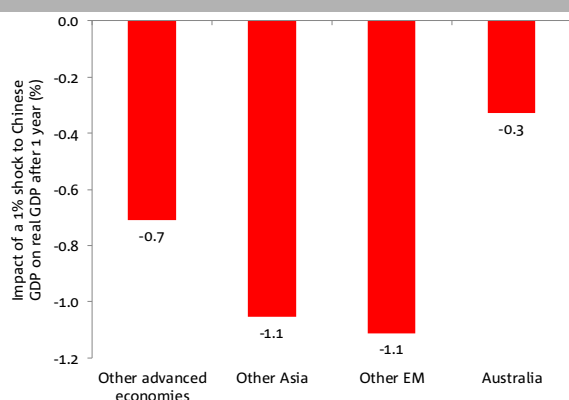
- **Australia/NZ.** The January NAB business survey is due Tuesday and will be closely watched to judge the extent to which recent bushfires weighed on sentiment. Home loans should continue to rise alongside house prices. We expect the RBNZ to keep the OCR steady at 1.00% on Wednesday. The coronavirus and increasingly dry local weather could weigh on the outlook, but the RBNZ will also need to acknowledge positive news since November's MPS, which might otherwise have seen the bank strike a slightly hawkish tone.
- **International.** The coronavirus will likely dominate scheduled CPI and credit figures in China. Fed Chair Powell's congressional testimony is on Tuesday (House) and Thursday (Senate), while Governor nominees Shelton and Waller have confirmation hearings on Thursday. Annual core US inflation is expected to be little changed at 2.2% on Friday and retail sales due the same day is likely to remain solid. The Democratic nomination process is important, with the New Hampshire Primary on Tuesday. UK GDP is expected to fall 0.1% decline in Q4 after a strong Q3. A more recent pick-up in the services PMI suggests activity should improve, sidelining the BoE.

Key markets over the past week

	Last	% chg week		Last	bp/% chg week
AUD	0.6678	-0.2	RBA cash	0.75	0
AUD/CNY	4.68	1.1	3y swap	0.70	9
AUD/JPY	73.2	0.7	ASX 200	6,988	0.9
AUD/EUR	0.610	0.8	Iron ore	79	1.1
AUD/NZD	1.043	0.7	Brent oil	54.0	-0.8

Source: Bloomberg

Chart of the week: Impact of a 1% shock to China's GDP



Modelling a China shock; more work on the potential effect of the coronavirus on Australia’s economy

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Australia’s travel ban has halted tourists and students from China

In last week’s weekly, we made some rough calculations of the initial effect of the novel coronavirus (aka nCov) on Australia’s exports of tourism and education services. We concentrated on tourism and education services because Australia had introduced restriction on international travel on 1 February. This involves denying entry to people arriving from mainland China, with exemptions for Australian citizens, permanent residents and their immediate families. At the same time, the government now recommends that Australians not travel to China due to the risk from the virus and has required non-essential diplomatic staff to return to Australia.

To recap those estimates:

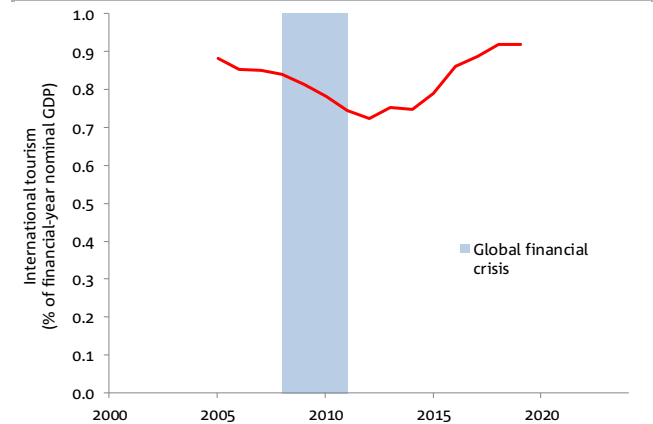
- Net international tourism was \$18 billion in 2018-19, or 0.9% of GDP, where Tourism Australia data suggest that China accounts for 27% of the total. Given that Australian tourism in China is relatively small, this suggest that Chinese tourist arrivals account for about 0.3% of annual GDP.
- Net trade in education services was \$35b in 2018, or 1.9% of GDP, and is dominated by higher education. China accounted for 33% of net trade, or 0.6% of GDP.

In a simple calculation, if tourism and education were both disrupted for, say, two months by the recently-imposed travel ban, this would subtract about 0.15pp off annual GDP in Q1 (the *quarterly* subtraction would be larger at about 0.55% in Q1).

By way of comparison, the Reserve Bank’s latest forecasts incorporate a 0.2% hit to Q1 GDP from the impact of virus on tourism exports.¹ This means the bank implicitly

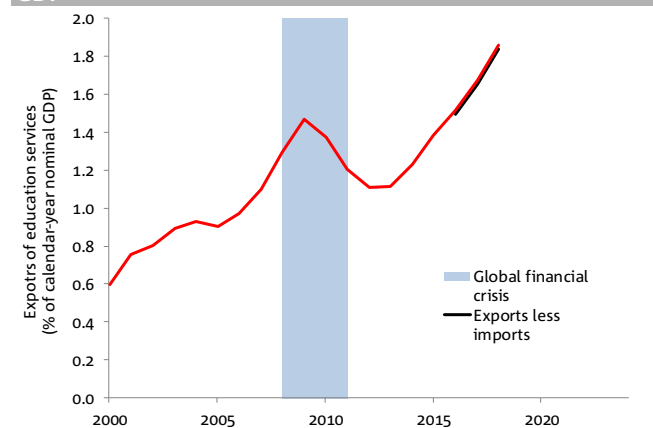
assumes that exports of education services will not be affected, although the bank was at pains to emphasise that “things are very fluid and we don’t quite know [the impact]”.

Chart 1: International tourism accounts for 0.9% of Australia’s GDP



Source: Australian Bureau of Statistics, National Australia Bank

Chart 2: Trade in education services accounts for 1.9% of GDP



Source: Australian Bureau of Statistics, Department of Foreign Affairs and Trade, National Australia Bank

Although it is too early to tell, the impact of the coronavirus would clearly be much larger than expected if the disruption lasts longer. In this respect, it is worth noting that the SARS outbreak ran for about nine months.

At the same time, it is possible that the temporary effect of the bushfires is smaller than suggested by our preliminary analysis that pointed to a 0.4pp hit to growth in Q1 with a 0.1% subtraction from annual GDP.

Taking a broader perspective, we looked at the impact of weaker Chinese growth on Australia

With China at the centre of the coronavirus outbreak, we have estimated the potential effect of the virus on Australia from a different angle, exploring the impact of a shock to Chinese growth allowing for spillovers to Australia’s other key trading partners.

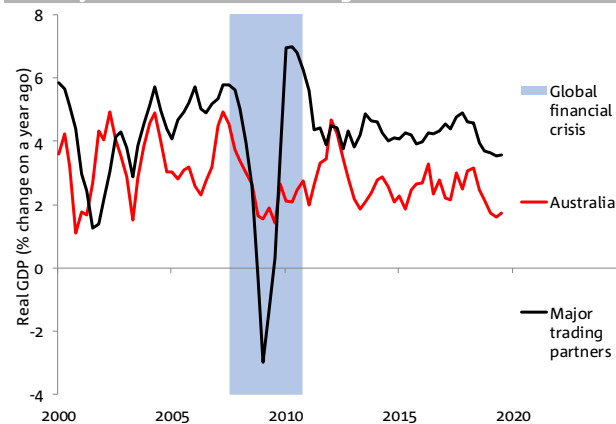
We did this by estimating a simple VAR model of quarterly real GDP over the period from 2000 to 2019,

of Australia Proof Committee Hansard, Canberra, 7 February 2020.

¹ House of Representatives Standing Committee on Economics, Reserve Bank of Australia annual report 2019, Commonwealth

covering Australia’s 30 largest export markets that together account for over 90% of exports of goods.

Chart 3: Growth in Australia’s major trading partners is already the slowest since the global financial crisis



Note: Major trading partner real GDP = export-weighted growth in Australia’s 30 largest export markets that together account for more than 90% of exports of goods.
Source: Australian Bureau of Statistics, Department of Foreign Affairs and Trade, International Monetary Fund, World Bank, National Australia Bank

The model spanned:

- **Mainland China**, which is Australia’s largest export market, accounting for 38% of exports of goods;
- **Other Asian trading partners**, which together account for 41% of goods exports (mainly Japan at 15% of exports and South Korea at 6%);
- **United States**, which makes up only 4% of merchandise exports;
- **Other advanced economies**, excluding the US and Japan, which account for 10% of exports of goods (mainly the UK at 4% of exports and New Zealand at 3%);
- **Other emerging market economies**, which account for 2% of exports of goods (mainly the United Arab Emirates at 1%); and²
- **Australia**.

Estimating the model, we tested whether past values of Chinese economic growth influenced growth in other trading partners as well as Australia.³ The results showed that China affected growth in other Asia, other advanced economies, other emerging market economies, but not the United States.

Armed with this information, we used the model to test the impact of an assumed 1% shock to Chinese GDP on Australia, allowing for feedback on other trading

² The selected trading partners account for more than 90% of exports of goods.
Other Asian economies = Hong Kong, India, Indonesia, Japan, Korea, Malaysia, Papua New Guinea, Philippines, Singapore, Taiwan, Thailand, and Vietnam.
Other advanced economies = Belgium, Canada, France, Germany, Italy, Netherlands, New Zealand, Spain, Switzerland, and United Kingdom.
Other emerging market economies = Brazil, Egypt, Saudi Arabia, South Africa, Turkey, and United Arab Emirates.

³ We estimated the model with two lags given we were concerned about overfitting the data.

⁴ VAR model results can be sensitive the ordering of the variables. We attempted to deal with this by estimating

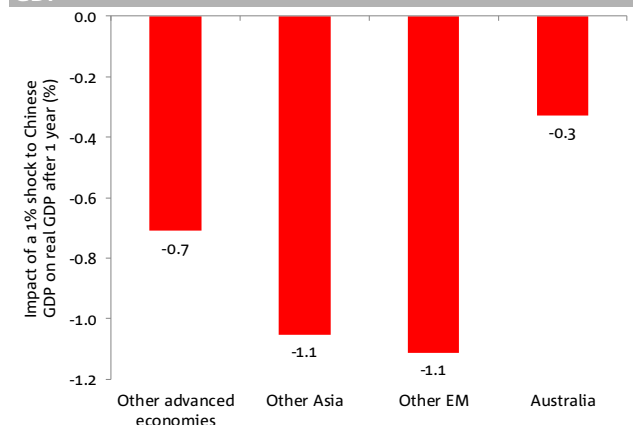
partners.⁴ We opted for a 1% shock as that was similar to the estimated effect of SARS on China calculated in an earlier analysis by former Reserve Bank Board-member Warwick McKibbin.⁵

The results suggested that this shock reduced GDP by 0.7% after one year in Australia’s other advanced economy trading partners and 1.1% in both other Asian export markets and other emerging markets. These are large effects, underscoring China’s sheer size, integration with global supply chains and role as key export market for many advanced and emerging markets.

For Australia, the estimated annual impact of the assumed 1% shock to Chinese GDP is 0.3%, where the impact in the quarter of the viral outbreak is larger. This matches Reserve Bank estimates of a direct shock to Chinese output derived from the bank’s MARTIN macroeconomic model.⁶ However, the bank also used its model to examine a more disruptive scenario, which reinforced the direct effect of weaker Chinese GDP. In this scenario, the hit to Australian GDP from a 1% shock to China’s output was about 0.5%.

This compares with McKibbin and Lee’s estimate that SARS took 1.1% off China’s GDP and 0.1% of Australia’s output.⁷

Chart 4: A 1% shock to Chinese output affects Australia’s other trading partners, taking about 0.3% of Australia’s GDP



Source: Australian Bureau of Statistics, Department of Foreign Affairs and Trade, International Monetary Fund, World Bank, National Australia Bank

generalised impulse response functions that calculate the average impact across every possible ordering of the model’s variables.

⁵ See Jong-Wha Lee and Warwick McKibbin, *Estimating the global economic cost of SARS*, Institute of Medicine Forum on Microbial Threats, National Academies Press, 2004.

⁶ See Rochelle Guttman, Kate Hickie, Peter Rickards and Ivan Roberts, *Spillovers to Australia from the Chinese economy*, Reserve Bank of Australia Bulletin, June 2019.

⁷ See Jong-Wha Lee and Warwick McKibbin, *Estimating the global economic cost of SARS*, Institute of Medicine Forum on Microbial Threats, National Academies Press, 2004.

More work needs to be done on the potential effect of a China slowdown

This work provides a simple rule-of-thumb that can be scaled as we learn more about the effect of the virus on Chinese growth. We plan to do more work on the potential effect of the virus on Australia, but this simple

VAR analysis reinforces the view weaker Chinese growth have a clear impact on Australia's economy until public health measures can contain the outbreak and activity can return to normal levels.

Kieran Davies

CALENDAR OF ECONOMIC RELEASES

Country	Economic Indicator	Period	Forecast	Consensus	Actual	Previous	GMT	AEDT
Monday 10 February 2020								
CH	New Yuan Loans CNY	Jan		3081		1140		10 to 15 Feb
CH	Money Supply M2 YoY	Jan		8.6		8.7		10 to 15 Feb
JN	BoP Current Account Balance	Dec		524.2		1436.8	23.50	10.50
CH	CPI YoY	Jan		4.9		4.5	1.30	12.30
CH	PPI YoY	Jan		0		-0.5	1.30	12.30
US	Fed's Daly speaks in Dublin			--		--	18.45	5.45
US	Fed's Harker speaks on economic outlook			--		--	20.15	7.15
Tuesday 11 February 2020								
NZ	ANZ Truckometer Heavy MoM	Jan		--		-2.5	21.00	8.00
AU	Home loans approvals MoM	Dec		--		1.8	0.00	11.00
AU	NAB Business Conditions	Jan		--		3	0.30	11.30
UK	Industrial Production YoY	Dec		--		-1.6	9.30	20.30
UK	Monthly GDP (MoM)	Dec		--		-0.3	9.30	20.30
UK	GDP YoY	4Q P		--		1.1	9.30	20.30
US	NFIB Small Business Optimism	Jan		--		102.7	11.00	22.00
US	Fed's Daly speaks in Dublin			--		--	11.00	22.00
US	Fed's Powell testifies before house			--		--	15.00	2.00
US	Fed's Bullard speaks on policy			--		--	18.30	5.30
US	Fed's Kashkari speaks			--		--	19.15	6.15
Wednesday 12 February 2020								
AU	RBA's Heath speaks in Sydney on statement on monetary policy			--		--	20.50	7.50
NZ	RBNZ Official Cash Rate	Feb 12	1	1		1	1.00	12.00
EC	Industrial Production WDA YoY	Dec		--		-1.5	10.00	21.00
US	Fed's Harker speaks on economic outlook			--		--	13.30	0.30
US	Fed's Powell testifies before senate			--		--	15.00	2.00
Thursday 13 February 2020								
NZ	RBNZ Governor testifies before parliament			--		--	19.10	6.10
JN	PPI YoY	Jan		1.5		0.9	23.50	10.50
AU	Consumer Inflation Expectation	Feb		--		4.7	0.00	11.00
GE	CPI MoM / YoY	Jan F		--		-0.6 / 1.7	7.00	18.00
US	CPI MoM / YoY	Jan		0.2		0.2 / 2.3	13.30	0.30
Friday 14 February 2020								
NZ	BusinessNZ Manufacturing PMI	Jan		--		49.3	21.30	8.30
NZ	Food Prices MoM	Jan		--		-0.2	21.45	8.45
GE	GDP SA QoQ / YoY	4Q P		--		0.1 / 0.5	7.00	18.00
EC	GDP SA QoQ / YoY	4Q P		--		0.1 / 1	10.00	21.00
US	Retail Sales Advance MoM	Jan		0.3		0.3	13.30	0.30
US	Industrial Production MoM	Jan		-0.3		-0.3	14.15	1.15
US	U. of Mich. Expectations / Sentiment	Feb P		--		90.5 / 99.8	15.00	2.00
Upcoming Central Bank Interest Rate Announcements								
New Zealand, RBNZ		Feb 12	1.00	1.00		1.00		
Australia, RBA		Mar 3	0.75	0.75		0.75		
Canada, BoC		Mar 4	1.75	1.75		1.75		
Europe, ECB		Mar 12	-0.50	-0.50		-0.50		
Japan, BoJ		Mar 19	-0.10	-0.10		-0.10		
US, Federal Reserve		Mar 18	1.5/1.75	1.5/1.75		1.5/1.75		
UK, BOE		Mar 26	0.75	0.75		0.75		

GMT: Greenwich Mean Time; AEDT: Australian Eastern Daylight Time

FORECASTS

Economic Forecasts																				
	Annual % change				Quarterly % change															
	2018	2019	2020	2021	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	2.7	1.4	1.4	2.0	0.5	0.8	0.3	0.4	0.3	0.3	0.1	0.2	0.3	0.5	0.6	0.5	0.4	0.4	0.5	0.6
Underlying Business Investment	1.3	-3.0	-2.4	3.2	1.0	-1.0	-1.4	-0.4	0.9	-1.2	-2.9	-1.3	-0.1	-0.1	0.5	0.9	0.9	0.9	0.9	1.0
Residential Construction	4.7	-7.1	-7.8	-0.7	3.4	2.5	0.4	-3.0	-1.6	-3.7	-1.7	-2.4	-2.2	-2.0	-1.2	-0.4	0.4	-0.2	0.6	0.7
Underlying Public Spending	4.4	4.8	4.6	3.6	1.4	-0.5	2.0	0.7	1.0	1.7	1.7	0.8	1.1	1.1	0.9	0.9	0.9	0.9	0.8	0.8
Net Exports (a)	0.9	1.4	0.1	0.0	0.6	0.0	0.4	-0.1	0.4	0.5	0.2	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Inventories (a)	0.1	-0.3	0.1	0.0	-0.1	0.3	-0.3	0.1	-0.1	-0.4	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Domestic Demand (q/q %)	-	-	-	-	0.9	0.3	0.5	0.1	0.3	0.3	0.2	0.1	0.3	0.4	0.6	0.6	0.6	0.6	0.7	0.7
Dom Demand (y/y %)	2.9	1.0	1.4	2.4	3.7	3.3	2.6	1.8	1.2	1.2	0.9	0.9	1.0	1.0	1.4	2.0	2.3	2.4	2.5	2.6
Real GDP (q/q %)	-	-	-	-	0.9	0.7	0.3	0.2	0.5	0.6	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.7
Real GDP (y/y %)	2.7	1.8	2.0	2.4	3.1	3.2	2.5	2.1	1.7	1.6	1.7	2.0	1.9	1.8	1.9	2.1	2.2	2.3	2.4	2.5
CPI headline (q/q %)	-	-	-	-	0.4	0.4	0.4	0.5	0.0	0.6	0.5	0.7	0.4	0.4	0.5	0.6	0.5	0.5	0.6	0.7
CPI headline (y/y %)	1.9	1.6	2.0	2.2	1.9	2.1	1.9	1.8	1.3	1.6	1.7	1.8	2.2	1.9	1.9	1.9	2.1	2.2	2.3	2.4
CPI underlying (q/q %)	-	-	-	-	0.5	0.5	0.4	0.4	0.2	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5
CPI underlying (y/y %)	1.8	1.4	1.6	2.0	1.9	1.8	1.8	1.8	1.5	1.4	1.4	1.5	1.6	1.6	1.7	1.7	1.8	1.9	2.0	2.1
Private wages (q/q %)	-	-	-	-	0.5	0.6	0.5	0.6	0.5	0.5	0.5	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	2.2	2.2	2.3	2.5	2.6	2.6	2.7	2.7	2.8	2.8
Unemployment Rate (%)	5.3	5.3	5.5	5.6	5.5	5.6	5.1	5.0	5.1	5.2	5.4	5.2	5.4	5.4	5.5	5.6	5.6	5.5	5.6	5.6
Terms of trade	1.8	5.4	-6.5	-1.8	3.3	-1.2	0.7	2.6	3.3	1.4	0.3	-4.5	-1.9	-1.9	0.0	-1.9	-0.3	0.2	0.2	0.6
Current Account (% GDP)	-2.1	0.7	-0.1	-0.5	-2.1	-2.6	-2.1	-1.3	-0.4	0.9	1.6	0.7	0.4	0.0	-0.1	-0.5	-0.6	-0.5	-0.5	-0.4

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

Exchange Rate Forecasts						
	10-Feb	Mar-20	Jun-20	Sep-20	Dec-20	Mar-21
Majors						
AUD/USD	0.667	0.68	0.69	0.70	0.71	0.71
NZD/USD	0.64	0.65	0.65	0.66	0.67	0.67
USD/JPY	109.7	109	109	108	110	108
EUR/USD	1.09	1.14	1.16	1.16	1.17	1.17
GBP/USD	1.29	1.35	1.35	1.35	1.33	1.36
USD/CNY	7.00	7.05	7.00	6.90	6.85	6.85
USD/CAD	1.33	1.31	1.30	1.30	1.31	1.32
USD/CHF	0.98	0.98	0.96	0.96	0.96	0.96

Australian Cross Rates						
	10-Feb	Mar-20	Jun-20	Sep-20	Dec-20	Mar-21
AUD/NZD	1.04	1.05	1.06	1.06	1.06	1.06
AUD/JPY	73.2	74	75	76	78	77
AUD/EUR	0.61	0.60	0.59	0.60	0.61	0.61
AUD/GBP	0.52	0.50	0.51	0.52	0.53	0.52
AUD/CNY	4.67	4.79	4.83	4.83	4.86	4.86
AUD/CAD	0.89	0.89	0.90	0.91	0.93	0.94
AUD/CHF	0.65	0.67	0.66	0.67	0.68	0.68

Interest Rate Forecasts						
	10-Feb	Mar-20	Jun-20	Sep-20	Dec-20	Mar-21
Australian Rates						
RBA cash rate	0.75	0.75	0.25	0.25	0.25	0.25
3 month bill rate	0.92	0.85	0.35	0.35	0.35	0.35
3 Year Swap Rate	0.70	0.65	0.50	0.45	0.35	0.45
10 Year Swap Rate	1.13	1.15	1.02	1.02	0.92	1.02
Offshore Policy Rates						
US Fed funds	1.75	1.75	1.75	1.75	1.75	1.75
ECB deposit rate	-0.50	-0.50	-0.50	-0.50	-0.50	-0.50
BoE repo rate	0.75	0.75	0.75	0.75	0.75	0.75
BoJ excess reserves rate	-0.10	-0.20	-0.30	-0.30	-0.30	-0.30
RBNZ OCR	1.00	1.00	1.00	1.00	1.00	1.00
China 1yr lending rate	4.35	4.10	4.10	4.10	4.10	4.10
China Reserve Ratio	12.5	12.0	12.0	12.0	12.0	12.0
10-year Bond Yields						
Australia	0.97	1.00	0.90	0.90	0.80	0.90
United States	1.58	1.80	1.80	1.80	1.80	1.90
New Zealand	1.29	0.95	1.05	1.10	1.30	1.45

Sources: NAB Global Markets Research; Bloomberg; ABS

Global GDP				
	2018	2019	2020	2021
Australia	2.7	1.8	2.0	2.4
United States	2.9	2.3	1.7	1.8
Eurozone	1.9	1.2	1.1	1.4
United Kingdom	1.4	1.3	1.0	1.5
Japan	0.3	1.1	0.6	0.9
China	6.6	6.1	5.9	5.8
India	7.4	5.1	6.2	7.1
New Zealand	2.8	2.2	2.2	2.0
World	3.6	3.0	3.2	3.5

Commodity prices (\$US)						
	10-Feb	Mar-20	Jun-20	Sep-20	Dec-20	Mar-21
Brent oil	54.5	65	66	67	68	68
Gold	1570	1490	1510	1520	1540	1550
Iron ore	na	79	76	72	68	71
Hard coking coal*	150	145	150	152	150	153
Thermal coal	70	72	70	68	70	72
Copper	5648	5700	5725	5750	5850	5900
Aus LNG**	10	11	11	11	11	11

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

** Implied Australian LNG export prices

CONTACT DETAILS

Market Economics

Kieran Davies
Chief markets economist
+61 2 9237 1406
kieran.davies@nab.com.au

Tapas Strickland
Senior Economist
+61 2 9237 1980
tapas.strickland@nab.com.au

Kaixin Owyong
Economist, Markets
+61 2 9237 1980
kaixin.owyong@nab.com.au

Markets Research

Ivan Colhoun
Global Head of Research
+61 2 9237 1836
ivan.colhoun@nab.com.au

Group Economics

Alan Oster
Chief Economist
+61 3 8634 2927
alan.oster@nab.com.au

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