AUSTRALIAN MARKETS WEEKLY

Tobin's Q: Alive and well in Australian housing

In this issue

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Ask the Economists

Ask the FX Strategists

Ask the Interest Rate Strategists

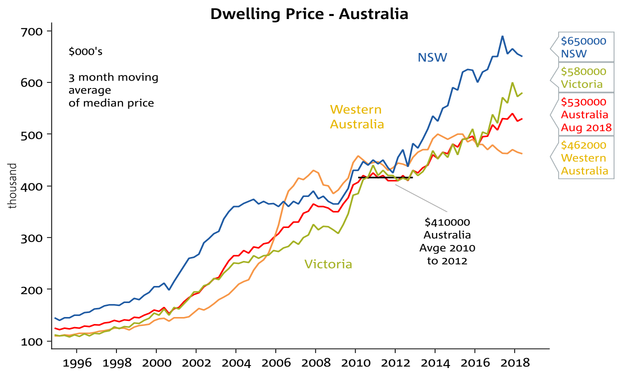
- Nationwide dwelling prices have fallen 4% since their peak in November 2017. How much further will prices decline? We look at various valuation methods for residential property, with a particular focus on Tobin's-Q. Tobin's Q posits that an asset price should be anchored by its cost of construction or replacement value.
- There is strong evidence to suggest Tobin's Q has been alive and well in Australia's residential property market. The surge in the Q-ratio for Units to around 30% above its historic norm by mid-2015 resulted in an equally large surge in dwelling supply, as developers took advantage of increased profitability. More recently the Q ratio has fallen, to now be 7% overvalued, due to a mix of rising construction costs and flat/lower unit prices as this new dwelling supply has come on stream. Other valuations measures validate this conclusion, with the House Price-to-Income and House Price-to-Rent ratios both around 12% above their long run trends at Q1 2018.
- These overvaluations don't necessarily mean dwelling prices will fall by this amount. What they more likely mean is that nationwide dwelling prices will be flat to a little lower ahead as household incomes, rents, and/or construction costs catch-up with current dwelling prices.
- NAB economists see a further modest correction in some dwelling prices ahead – the modesty supported by the low level of unemployment and mortgage rates.
- The AUD/USD saw further selling pressure on Friday, thanks to the combination of heightened likelihood that President Trump will impose additional tariffs on Chinese imports and faster growth in US wages in Friday's US payrolls report.
- The President threatened to sharply escalate the US trade war with China, saying his administration could move "very soon" to impose tariffs on $200bn in imports from Beijing, with levies on a further $267bn in products "ready to go on short notice". The AUD/USD tested 0.71 on Friday and has been trading close to that level this morning. While the USD benefited from safe haven and rates support, the AUD was Friday's standout loser in the FX space.
- While the market is on high alert to US tariff news, local and offshore data will also be closely watched. Locally, after today's speech on evolving household risks from RBA's Michele Bullock (Assistant Governor, Financial System), there is the NAB Business Survey tomorrow, the monthly Westpac-MI Consumer Sentiment on Wednesday (both of these releases were polled after the change in PM), then the ABS Labour Force report on Thursday (NAB forecasts 5.3% unemployment). Offshore, China releases its key monthly activity reports on Friday, while the US releases its CPI report for August, another key signpost for global rates and inflation watchers.
- **Australian economy forecasts:** After last week's Q2 GDP, NAB will release updated economy forecasts on Wednesday in NAB's *The Forward View – Australia*. Please email the economists if you would like to receive a copy of this publication.

Key markets over the past week

	Last	% chg week		Last	bp / % chg week
AUD	0.7113	-1.4	RBA cash	1.50	0
AUD/CNY	4.89	-0.7	3y swap	2.07	2
AUD/JPY	78.9	-1.5	ASX 200	6,144	-2.8
AUD/EUR	0.615	-0.9	Iron ore	68	3.1
AUD/NZD	1.089	-0.2	WTI oil	68.1	-2.4

Source: Bloomberg

Chart 1: Dwelling Prices Correct – Selected States



Source: National Australia Bank, Corelogic, Macrobond.

Peter Jolly, Global Head of Research

A Q Ratio for Australian Dwelling Prices

Nationwide dwelling prices have fallen by 4% since their peak in November 2017.

The reasons for the “correction” are well understood: 1) the supply of new dwellings has lifted in recent years and started to catch-up with rapid population growth; 2) there has been a slowdown in foreign buying, partly due to a tightening in regulations in Australia; 3) APRA has required mortgage lenders to tighten their lending criteria in recent years; and 4) affordability has reduced as dwelling prices across Australia have lifted a significant 25% since 2012 - and by much more in some cities/suburbs.

How much further will prices decline? As you’d expect there is no simple answer.

For one there is no such thing as a single housing market in Australia and local supply/demand conditions do matter. Clear evidence of this is seen on Chart 1, which shows that the slowdown in the resource sector has meant Western Australian dwelling prices have fallen over the past four years even as prices in NSW and Victoria have surged.

Second, the broader macroeconomic environment matters a lot. If the unemployment rate was moving higher you’d expect the correction in dwelling prices to be larger. Importantly, this dwelling price correction is occurring while Australia’s unemployment rate is low and falling, jobs are plentiful, and even with some adjustment higher recently, mortgage rates are low. All this suggests a shallow correction in dwelling prices ahead.

One way of answering the question as to how overvalued dwelling prices are is to look at prices against fundamental factors. There are different approaches here. Several years ago RBA staffers Ryan Fox and Peter Tulip[1] developed a framework asking whether it was more sensible to buy or rent a dwelling – this was effectively a valuation model for dwelling prices. We can also compare the dwelling price to other “denominators” like CPI inflation, household incomes, or rents – I’ll come back to these valuation approaches a bit later.

Robert Shiller and Tobin’s Q

Back in 2006, near the peak of the US housing boom, Robert Shiller[2] (a Nobel Laureate with additional fame from his book “Irrational Exuberance” which presciently came out just before the US stockmarket crashed in the early 2000s) suggested a simpler way of thinking about a dwelling’s worth was to compare it to the cost of its construction.

He wrote “…If price rises above construction cost, builders will have an incentive to build, which will persist until price again falls to construction cost. If price falls below construction costs, builders cannot make a profit, and so supply will stagnate until population growth and the growth of the economy again raises prices to construction cost.”

Shiller was restating what was first advanced by James Tobin in 1968 that “Q” is the ratio between a physical asset's market value and its replacement value. There is a simplicity and elegance to Q as we no longer need to worry about taxes, discount rates, growth in rents, demographic factors, changes in household preferences, credit availability etc. when thinking about what a dwelling is worth.

We simply ask how does the selling price of a dwelling compare to its replacement value – or its cost of construction?

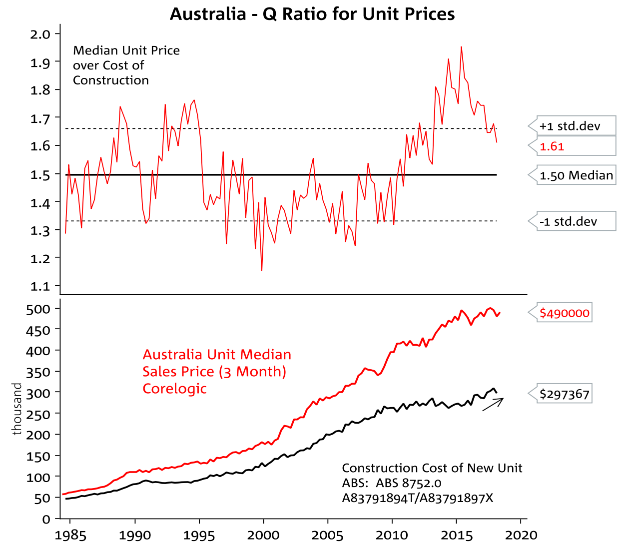
Tobin’s Q - Unit/Apartment prices 7% above construction costs

In September 2016 I presented some calculations for Tobin’s Q applied to Unit/Apartment prices in Australia at a UNSW Business School Real Estate Symposium.

I have just updated those estimates and they suggest Nationwide Unit/Apartment prices were 7% higher than their historic relationship with construction costs in Q1 2018.

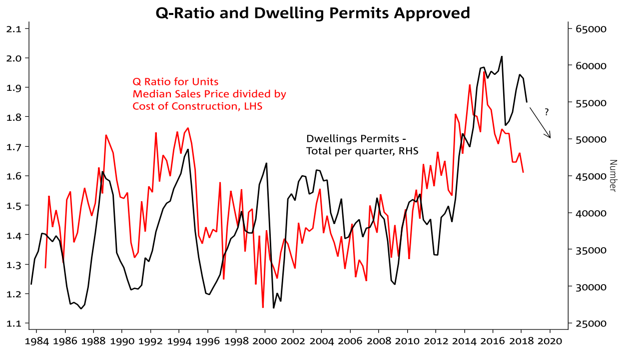
The reason for choosing the Unit or Apartment is that a good part of the lift in dwelling prices (especially for housing) has actually been a lift in land prices. Now, supply of residential land a reasonable commuting distance from our major cities CBDs is surely not fixed in the long-run in a country as vast as Australia – multiple and major infrastructure spending should increase its supply. In practice, however, capacity enhancing

Chart 2: Q-Ratio: Prices run ahead of construction costs



Source: National Australia Bank Calcuations, ABS, Corelogic, Macrobond

Chart 3: Q ratio leads dwelling supply



Source: National Australia Bank, Macrobond. Construction Cost of New Dwelling ABS: ABS 8752.0 A83791534L/A83799385R

1 https://www.rba.gov.au/publications/rdp/2014/2014-06.html

2 http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.324.3942&rep=rep1&type=pdf Shiller, Page 64

infrastructure generally arrives with a (long) lag which has meant the price of existing residential land a reasonable distance from our major cities CBDs has lifted sharply in price.

For my Q calculation I control for land prices as best I can by looking at the price of a Unit or Apartment against its construction or replacement cost.

The results are shown in Chart 2, with the top panel suggesting the Q ratio was 1.61 in Q1 2018 against a thirty year median of 1.5. So the median unit price is about 7% over its historic relationship with construction/replacement costs.

The first point to note is that the Q ratio does not average 1. This is mostly because there is still some element of land in a unit price. It could also be that the quality/size of Units changes through time.

The results are encouraging, however, in that the Q-ratio does have mean reversion tendencies suggesting over time the selling price of a Unit is indeed anchored by its cost of construction or replacement value.

Four additional points

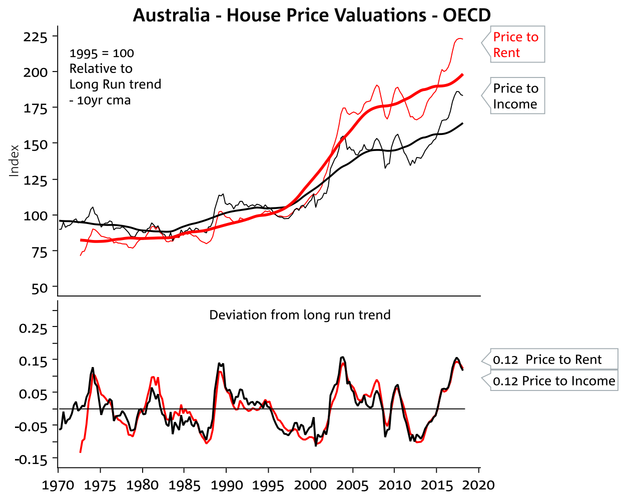
First, higher construction costs. The 7% gap is not the same as saying Unit prices are overvalued by 7% and will necessarily fall by that amount. The valuation gap could also be closed by the cost of construction going up – as the bottom panel in Chart 2 shows, in recent years it has mostly been the latter with the average construction cost of a unit up around 11% in the past three years due in part to capacity constraints in the construction industry.

I'd add, that for those focussed on the housing affordability issue, this Tobin's Q calculation suggests that if more than can be done to lower the cost of construction of new dwellings (standardisation, prefabrication, etc) then this will also have a knock-on to the price of existing dwellings as well.

Second, the supply response. Tobin's Q posits that a higher Q means an increase in profitable opportunities for residential property developers and with that an increase in the supply of new units ahead. Chart 3 shows this is precisely what has happened, with the surge in Q from 2012 leading to an equally large surge in dwelling permits being issued for new residential construction. The moderation in Q more recently suggests some levelling out in residential construction activity is likely in the years ahead.

Three, other measures suggest dwelling prices are around 10% overvalued compared to their long-run trend. As noted earlier, there are multiple ways to value residential property but two simple methods are to compare the dwelling price to rent or household income. The OECD does this calculation for many countries and I've shown these for Australia on Chart 4 where very clearly the price-to-income and price-to-rent ratios have surged in recent years/decades. Some of this increase is justified by fundamental factors – the fall in mortgage interest rates over the past few decades means that it takes less income to fund a house purchase of the same price, which justifies some upward trend to both these ratios.

Chart 4: House prices 12% overvalued.



Source: National Australia Bank Calcuations, OECD, Macrobond.
Price to Rent and and Income - deviation from 10year cma.

Chart 4 also demonstrates we get large cyclical deviations from the long run trends in these ratios – either partly or entirely driven by the normal bull/bear characteristics we see in all asset markets through time. The bull market of recent years has lifted the price-to-rent and price-to-income ratios to around 12% above their long run trends.

Again, this doesn't mean that dwelling prices will necessarily fall 12% – it does seem likely, however, that dwelling prices will stall or correct somewhat for a period as incomes and rents play catch-up to dwelling prices.

Fourth and finally, what is NAB's forecast for residential property ahead? Our economists expect that the weakness in dwelling prices seen over the past year is likely to persist in 2018 and 2019 – though we expect moderate rather than sharp price falls. The declines over 2018 to date have been more significant than we initially expected and NAB now expects a slightly larger decline in 2018 and a smaller fall in 2019, driven by continued weakness in Sydney and Melbourne as well as a sharper decline in unit prices in Brisbane. We also expect house prices to flatten in aggregate in 2020 – implying a peak to trough fall of 6.5% and 2.5% in Sydney and Melbourne respectively.

Conclusion

We have looked at various valuation methods for residential property, with a particular focus on Tobin's-Q for Nationwide Unit/Apartment prices. Tobin's Q posits that an asset price should be anchored by its cost of construction or replacement cost.

We find strong evidence that Tobin's Q has been alive and well in Australia's residential property market recently. In response to a surge in the Q-ratio, to around 30% above its historic norms in mid-2015, we have seen a resultant surge in dwelling supply as developers have taken advantage of increased profitability. More recently the Q ratio has fallen due to a mix of rising construction costs and flat to lower unit prices as new dwelling supply has come on stream. Currently, the Q-ratio is around 7% above its long run trend.

Other valuations measures validate this conclusion, with the House Price-to-Income and House Price-to-Rent ratios both around 12% above their long run trends at Q1 2018.

Now these overvaluations don't necessarily mean that dwelling prices will fall by this amount. What they likely mean is that nationwide dwelling prices will be flat to slightly lower ahead as household incomes, rents, and/or construction costs catch-up with current dwelling prices.

NAB economists expect additional weakness in dwelling prices ahead – especially where the supply response has been greatest. The forecast sees a peak to trough fall in Sydney and Melbourne house prices of 6.5% and 2.5%. This would still best be described as a modest correction in dwelling prices – with its modesty supported by the low level of unemployment and mortgage rates.

Table 1: NAB Hedonic House Price Forecasts (%)

	2015	2016	2017	2018f	2019f
Sydney	15.5	10.7	2.1	-3.7	-0.7
Melbourne	15.8	9.5	9.1	-2.3	0.0
Brisbane	6.9	2.7	3.1	0.1	0.0
Adelaide	3.8	3.8	3.3	1.5	1.7
Perth	-4.2	-2.9	-2.6	-0.7	-0.2
Hobart	7.0	9.6	12.9	8.4	1.7
Cap City Avg	**11.2**	**7.3**	**4.0**	**-1.8**	**-0.1**

SOURCE: CoreLogic, NAB Economics

Table 2: NAB Hedonic Unit Price Forecasts (%)

	2015	2016	2017	2018f	2019f
Sydney	13.1	5.8	5.4	-1.6	-2.4
Melbourne	7.5	4.7	8.4	-1.4	-1.9
Brisbane	1.1	-3.0	-1.2	-2.4	-4.5
Adelaide	2.4	0.6	0.5	1.4	0.5
Perth	-2.8	-6.3	-0.9	-5.0	-0.2
Hobart	1.1	6.4	9.1	5.3	1.2
Cap City Avg	**8.2**	**3.5**	**5.1**	**-1.7**	**-2.2**

SOURCE: CoreLogic, NAB Economics

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CALENDAR OF ECONOMIC RELEASES

Country	Economic Indicator	Period	Forecast	Consensus	Actual	Previous	GMT	AEST
Monday, 10 September 2018								
NZ	REINZ House Sales YoY	Aug				0.7	10 to 14 September	
CH	Money Supply M2 YoY/New Yuan Loans CNY	Aug		8.6/1370		8.5/1450	10 to 15 September	
JN	GDP SA QoQ / Annualised QoQ	2Q F		0.7/2.6		0.5/1.9	22.50	9.50
JN	GDP Deflator YoY	2Q F		0.1		0.1	22.50	9.50
JN	BoP Current Account Balance	Jul		1893.2		1175.6	22.50	9.50
CH	PPI YoY / CPI YoY	Aug		4/2.1		4.6/2.1	0.30	11.30
AU	RBA's Bullock speaks on 'The Evolution of Household Sector Risks' in Albury						2.05	13.05
UK	Trade Balance	Jul		-2100		-1861	7.30	18.30
UK	Industrial Production MoM / YoY	Jul		0.2/1.1		0.4/1.1	7.30	18.30
UK	GDP (MoM)	Jul		0.1		0.1	7.30	18.30
UK	Monthly GDP 3M/3M Change	Jul		0.5		0.2	7.30	18.30
US	Fed's Bostic Discusses Economic Outlook						15.00	2.00
Tuesday, 11 September 2018								
NZ	ANZ Truckometer Heavy MoM	Aug				-0.4	21.00	8.00
AU	NAB Business Conditions/Confidence	Aug		/		12/7	0.30	11.30
JN	Machine Tool Orders YoY	Aug P				13.1	5.00	16.00
SW	Riksbank's Ingves in London Roundtable						6.15	17.15
UK	Claimant Count Rate / Jobless Claims Change	Aug		/		2.5/6.2	7.30	18.30
UK	ILO Unemployment Rate 3Mths	Jul		4		4	7.30	18.30
GE	ZEW Survey Current Situation / Expectations	Sep		72/-13.5		72.6/-13.7	8.00	19.00
US	NFIB Small Business Optimism	Aug		108.1		107.9	9.00	20.00
EC	ECB's Nouy Speaks in Strasbourg, France						11.00	22.00
CA	Housing Starts	Aug		217.5		206.314	11.15	22.15
US	Wholesale Inventories MoM	Jul F		0.7		0.7	13.00	0.00
Wednesday, 12 September 2018								
AU	Westpac Consumer Conf Index	Sep				103.6	23.30	10.30
AU	RBA's Thompson (Deputy Head Payments Policy) speaks in Sydney						0.00	11.00
EC	Industrial Production SA MoM / YoY	Jul		-0.5/1		-0.7/2.5	8.00	19.00
US	MBA Mortgage Applications	7 Sep				-0.1	10.00	21.00
CA	Capacity Utilization Rate	2Q		86.8		86.1	11.30	22.30
US	PPI Final Demand MoM/YoY	Aug		0.2/3.2		0/3.3	11.30	22.30
US	Fed's Bullard Speaks to CFA Society Chicago						12.30	23.30
US	U.S. Federal Reserve Releases Beige Book						17.00	4.00
Thursday, 13 September 2018								
NZ	Food Prices MoM	Aug				0.7	21.45	8.45
AU	RBA's Holloway (Deputy Head Note Issue) speaks in Sydney						22.10	9.10
JN	PPI MoM / YoY	Aug		0.1/3.1		0.5/3.1	22.50	9.50
JN	Core Machine Orders MoM / YoY	Jul		5.7/4.3		-8.8/0.3	22.50	9.50
AU	Consumer Inflation Expectation	Sep				4	0.00	11.00
AU	Employment Change / Unemployment Rate	Aug	15K/5.3	18/5.3		-3.9/5.3	0.30	11.30
AU	Participation Rate	Aug	65.6	65.6		65.5	0.30	11.30
GE	CPI MoM / YoY	Aug F		0.1/2		0.1/2	5.00	16.00
UK	Bank of England Bank Rate	13 Sep		0.75		0.75	10.00	21.00
UK	BOE Asset Purchase Target	Sep		435		435	10.00	21.00
EC	ECB Deposit Facility Rate	13 Sep		-0.4		-0.4	10.45	21.45
EC	ECB Main Refinancing Rate / Marginal Lending Facility	13 Sep		0/0.25		0/0.25	10.45	21.45
EC	ECB President Draghi Holds Press Conference in Frankfurt						11.30	22.30
CA	New Housing Price Index MoM	Jul		0.1		0.1	11.30	22.30
US	CPI MoM / YoY	Aug		0.3/2.8		0.2/2.9	11.30	22.30
US	CPI Ex Food and Energy MoM / YoY	Aug		0.2/2.4		0.2/2.4	11.30	22.30
US	Initial Jobless Claims	8 Sep		210		203	11.30	22.30
EC	ECB Publishes Macroeconomic Projections						12.30	23.30
US	Fed's Bostic Gives Speech on Economy and Monetary Policy						16.15	3.15
Friday, 14 September 2018								
NZ	BusinessNZ Manufacturing PMI	Aug				51.2	21.30	8.30
CH	Industrial Production YoY	Aug		6.2		6	1.00	12.00
CH	Retail Sales YoY	Aug		8.8		8.8	1.00	12.00
CH	Fixed Assets Ex Rural YTD YoY	Aug		5.7		5.5	1.00	12.00
JN	Industrial Production MoM/YoY	Jul F		/		-0.1/2.3	3.30	14.30
EC	Trade Balance SA	Jul		16.2		16.7	8.00	19.00
UK	BOE's Carney speaks in Dublin						9.00	20.00
US	Retail Sales Advance MoM	Aug		0.4		0.5	11.30	22.30
US	Retail Sales Ex Auto and Gas	Aug		0.5		0.6	11.30	22.30
US	Industrial Production MoM	Aug		0.3		0.1	12.15	23.15
US	Capacity Utilization	Aug		78.3		78.1	12.15	23.15
US	U. of Mich. Sentiment / Expectations	Sep P		96.8/		96.2/87.1	13.00	0.00
US	U. of Mich. Expectations	Sep P				87.1	13.00	0.00
Upcoming Central Bank Interest Rate Announcements								
UK, BOE		13-Sep	0.75%	0.75%		0.75%		
Europe, ECB		13-Sep	-0.4%	-0.4%		-0.4%		
Japan, BoJ		19-Sep	-0.1%	-0.1%		-0.1%		
US, Federal Reserve		26-Sep	2-2.25%	2-2.25%		1.75-2%		
New Zealand, RBNZ		27-Sep	1.75%	1.75%		1.75%		
Australia, RBA		2-Oct	1.5%	1.5%		1.5%		
Canada, BoC		24-Oct	1.75%	1.75%		1.5%		

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

FORECASTS

Economic Forecasts

	Annual % change				Quarterly % change																			
					2017				2018				2019				2020							
Australia Forecasts	2017	2018	2019	2020	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
Household Consumption	2.7	2.6	2.4	2.4	0.3	1.0	0.6	1.0	0.3	0.7	0.5	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.7				
Underlying Business Investment	3.0	3.2	5.8	6.0	3.1	0.0	3.7	-0.5	-0.1	2.1	0.0	1.1	2.1	1.3	1.8	1.5	1.3	1.8	1.1	1.3				
Residential Construction	-2.2	-1.4	-2.6	0.4	-3.2	0.3	-2.1	-0.1	0.9	-1.1	-0.6	-0.7	-1.0	-0.5	-0.2	-0.2	0.2	0.3	0.4	0.5				
Underlying Public Spending	4.5	4.8	4.3	4.5	1.0	1.3	1.4	1.2	1.5	0.8	0.9	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1				
Exports	3.5	4.2	4.7	2.5	-1.9	2.9	0.7	-1.5	2.4	0.9	1.7	1.0	1.4	1.3	0.7	0.6	0.5	0.6	0.4	0.7				
Imports	7.8	4.1	4.2	5.3	3.1	-0.1	2.6	1.6	0.5	0.7	0.5	0.9	1.1	1.2	1.4	1.3	1.2	1.4	1.2	1.4				
Net Exports (a)	-1.0	-0.1	0.0	-0.7	-1.1	0.6	-0.4	-0.7	0.3	0.0	0.2	0.0	0.0	0.0	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2				
Inventories (a)	-0.1	0.0	-0.1	0.0	0.4	-0.5	0.1	0.0	0.2	-0.1	-0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Domestic Demand - qtr%					0.7	0.9	0.9	0.8	0.6	0.7	0.5	0.7	0.8	0.7	0.8	0.8	0.7	0.8	0.7	0.8				
Dom Demand - ann %	3.0	2.8	2.8	3.2	2.3	2.6	3.6	3.3	3.2	3.0	2.6	2.5	2.6	2.6	3.0	3.1	3.1	3.2	3.1	3.2				
Real GDP - qtr %					**0.3**	**1.0**	**0.5**	**0.5**	**1.0**	**0.7**	**0.5**	**0.7**	**0.8**	**0.7**	**0.7**	**0.6**	**0.6**	**0.7**	**0.5**	**0.7**				
Real GDP - ann %	2.2	2.9	2.8	2.5	**1.8**	**2.0**	**2.8**	**2.4**	**3.1**	**2.8**	**2.8**	**3.0**	**2.7**	**2.8**	**3.0**	**2.8**	**2.6**	**2.6**	**2.4**	**2.5**				
CPI headline - qtr %					0.5	0.2	0.6	0.6	0.4	0.4	0.6	0.5	0.5	0.4	0.6	0.7	0.6	0.6	0.8	0.9				
CPI headline - ann %	1.9	2.0	2.0	2.6	2.1	1.9	1.8	1.9	1.9	2.1	2.0	1.9	2.0	2.0	2.0	2.2	2.3	2.5	2.7	2.9				
CPI underlying - qtr %					0.4	0.6	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.7	0.7	0.7				
CPI underlying - ann %	1.8	1.9	2.0	2.4	1.7	1.8	1.9	1.9	2.0	1.9	1.9	1.9	1.9	2.0	2.0	2.1	2.2	2.4	2.5	2.7				
Wages (Pvte WPI - qtr %					0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7				
Wages (Pvte WPI - ann %)	1.8	2.1	2.5	2.7	1.8	1.8	1.9	1.9	1.9	2.0	2.1	2.2	2.4	2.5	2.5	2.6	2.6	2.7	2.7	2.8				
Unemployment Rate (%)	5.6	5.5	5.1	5.0	5.9	5.6	5.4	5.4	5.5	5.5	5.4	5.4	5.3	5.1	5.0	5.0	5.0	4.9	4.9	5.1				
Terms of trade	12.3	-0.9	-0.6	-0.1	5.4	-6.0	-0.1	0.4	3.3	-1.3	-3.1	-2.4	-0.4	-1.2	-0.9	0.2	-0.4	0.3	-0.4	0.2				
Annual % change (hide)					24.9	14.7	10.1	-0.7																
G&S trade balance, $Abn	10.2	6.6	-14.5	-31.7	6.4	3.4	1.4	-1.0	4.1	3.0	1.0	-1.5	-1.7	-2.8	-4.6	-5.3	-6.6	-7.2	-8.6	-9.3				
% of GDP	0.6	0.4	-0.7	-1.6	1.4	0.8	0.3	-0.2	0.9	0.6	0.2	-0.3	-0.4	-0.6	-0.9	-1.1	-1.3	-1.4	-1.7	-1.8				
Current Account (% GDP)	-2.5	-2.8	-3.8	-4.6	-1.6	-2.4	-2.6	-3.2	-2.3	-2.5	-2.9	-3.4	-3.5	-3.7	-4.0	-4.2	-4.4	-4.5	-4.8	-4.9				

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

Exchange Rate Forecasts

	10-Sep	Sep-18	Dec-18	Mar-19	Jun-19	Sep-19
Majors						
AUD/USD	**0.7112**	0.73	0.75	0.75	0.75	0.75
NZD/USD	**0.6532**	0.69	0.70	0.70	0.71	0.71
USD/JPY	**110.92**	109.0	110.0	108.0	106.0	104.0
EUR/USD	**1.1557**	1.15	1.18	1.22	1.22	1.25
GBP/USD	**1.2927**	1.32	1.38	1.45	1.47	1.53
USD/CHF	**0.9688**	1.02	1.00	0.98	0.98	0.97
USD/CAD	**1.3174**	1.32	1.28	1.26	1.25	1.25
USD/CNY	**6.8438**	6.50	6.40	6.30	6.23	6.23
Australian Cross Rates						
AUD/NZD	**1.0888**	1.06	1.07	1.07	1.06	1.06
AUD/JPY	**78.9**	80	83	81	80	78
AUD/EUR	**0.6154**	0.63	0.64	0.61	0.61	0.60
AUD/GBP	**0.5502**	0.55	0.54	0.52	0.51	0.49
AUD/CNY	**4.8673**	4.75	4.80	4.73	4.67	4.67
AUD/CAD	**0.9369**	0.96	0.96	0.95	0.94	0.94
AUD/CHF	**0.6890**	0.74	0.75	0.74	0.74	0.73

Interest Rate Forecasts

	10-Sep	Sep-18	Dec-18	Mar-19	Jun-19	Sep-19
Australia Rates						
RBA Cash rate	**1.50**	1.50	1.50	1.50	1.75	1.75
3 month bill rate	**1.93**	1.95	1.95	1.95	2.15	2.15
3 Year Swap Rate	**2.07**	2.15	2.35	2.50	2.80	3.00
10 Year Swap Rate	**2.76**	2.95	3.20	3.30	3.60	3.70
Offshore Policy Rates						
US Fed funds	**2.00**	2.25	2.50	2.75	3.00	3.25
ECB deposit rate	**-0.40**	-0.40	-0.40	-0.40	-0.40	-0.20
BoE repo rate	**0.75**	0.75	0.75	0.75	1.00	1.00
BoJ excess reserves rate	**-0.10**	-0.10	-0.10	-0.10	-0.10	-0.10
RBNZ OCR	**1.75**	1.75	1.75	1.75	1.75	2.00
China 1yr lending rate	**4.35**	4.35	4.35	4.35	4.35	4.35
China Reserve Ratio	**15.5**	16.0	16.0	16.0	16.0	16.0
10-year Benchmark Bond Yields						
Australia	**2.59**	2.80	3.00	3.05	3.30	3.40
United States	**2.94**	3.10	3.25	3.25	3.50	3.50
New Zealand	**2.55**	2.95	3.10	3.20	3.45	3.60

Sources: NAB Global Markets Research; Bloomberg; ABS

Global GDP

Dec year	2015	2016	2017	2018	2019	2020	20 Yr Avge
Australia	2.5	2.6	2.2	2.9	2.9	2.6	3.4
US	2.9	1.5	2.3	2.8	2.3	1.7	2.6
Eurozone	2.1	1.8	2.6	2.1	2.0	1.8	1.5
UK	2.3	1.9	1.8	1.5	1.7	1.6	2.4
Japan	1.4	0.9	1.7	0.9	1.0	0.7	0.8
China	6.9	6.7	6.9	6.5	6.3	6.0	9.2
India	8.2	7.1	6.7	6.8	7.2	6.9	6.6
New Zealand	3.5	4.0	2.8	2.9	2.9	2.7	3.0
World	3.5	3.2	3.8	3.8	3.7	3.5	3.5
MTP Top 5	4.1	3.7	4.2	3.9	3.7	3.1	5.0

Commodity prices ($US)

	10-Sep	Sep-18	Dec-18	Mar-19	Jun-19	Sep-19	Dec-19
Brent oil	68.1	74	72	70	68	67	68
Gold	1196	1282	1305	1327	1331	1344	1368
Iron ore	67.8	61	60	58	60	62	63
Hard coking coal	188	155	150	155	145	140	130
Thermal coal	115	90	93	85	80	75	77
Copper	5920	6725	6825	6875	6950	7050	6900
Aust LNG (*)	14.1	12.6	12.3	11.9	11.6	11.4	11.3

(*) Implied Australian LNG export prices.

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