AUSTRALIAN MARKETS WEEKLY

US recession probabilities – markets send amber signals

In this issue

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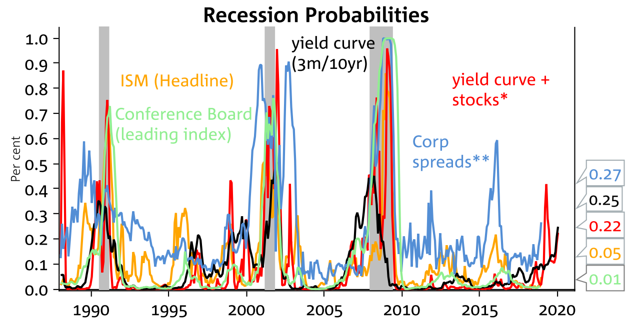
- **In the first AMW of the New Year we investigate the important issue of the likelihood of a US recession occurring over the next 12-18 months.**
- **We do this by examining a number of indicators that have tended to signal the prospects of US recession. The shape of the yield curve (the difference between the yields of shorter and longer-dated bonds) has been a very reliable indicator, with inversions in the curve tending to occur some 9-18 months ahead of recession.**
- **Our analysis suggests the 90-day/10 year Treasury bond curve historically has been the best performing of a number of different yield curve indicators in signaling US recession. This curve has not inverted, but has flattened significantly in recent times.**
- **Further, we have statistically converted the message of the yield curve, into implied probabilities of recession, based on historical outcomes. The statistical conclusion is that markets are currently flashing an amber warning signal of US recession, with yield curve shapes currently suggesting around a 15-25% chance of US recession occurring over the next 10-18 months. While this is a relatively higher chance than has been the case at any time since the GFC, market implied pricing/yield curve inversion is not yet at the 40-60% critical levels whereby US recession tends to follow.**
- **Now of course correlation is not the same as causation, so it's also important to try to understand why implied recession probabilities are currently elevated or in other words, why yield curves are currently so flat.**
- **We see three inter-related fundamental drivers: (i) rising US short-term interest rates (the curve flattens during tightening cycles); (ii) growth slowdowns in Europe and China; and (iii) US-China trade war effects/concerns. With the Fed now signalling that it can be more cautious on further US interest rate increases and with the US and China working on some trade agreement, the "influence" from two of these three factors should reduce in coming months.**
- **We will need to remain alert to signs of further slowing in China and Europe – these are now both very large economies, capable of significantly influencing US and global growth. In a quiet Australian week (with only Housing Finance to be released on Thursday; Mkt. and NAB -1.5% m/m after +2.2% in Oct.), we'll be watching China Trade figures (today), together with any guidance on Chinese/European growth coming from US earnings season, which kicks off today. For now, our conclusion is that market pricing is not high enough to suggest a near-term US recession.**
- **In terms of markets, the relief rally in equity and commodity markets continues on the back of more positive sentiment towards trade negotiations and the Fed signalling its preparedness to remain patient on further US rate rises. The $A has benefited as a result, but also from a strengthening in the CNY (remember there has been a strong correlation between the $A and Asian currencies and markets in recent months). Yields however, were a little lower over the week as European data disappointed at the end of last week.**

Key markets over the past week

	Last	% chg week		Last	bp / % chg week
AUD	0.7204	0.8	RBA cash	1.50	0
AUD/CNY	4.87	0.0	3y swap	1.90	-2
AUD/JPY	78.2	0.6	ASX 200	5,777	1.7
AUD/EUR	0.628	0.9	Iron ore	74	1.8
AUD/NZD	1.056	-0.2	WTI oil	51.6	6.8

Source: Bloomberg

Chart of the week: US recession models; 25% chance



* Assumes S&P500 remains at present levels from today until end 2019
** Uses the Excess Bond Premium and Credit Spreads from Gilchrist and Zakrajsek
*** Combines ISM, NFIB and Uni Michigan Consumer Sentiment
**** Conference Board Leading Index is only updated until November 2018
Source: National Australia Bank. Macrobond

Tapas Strickland, Markets Strategist, Markets

US recession probabilities

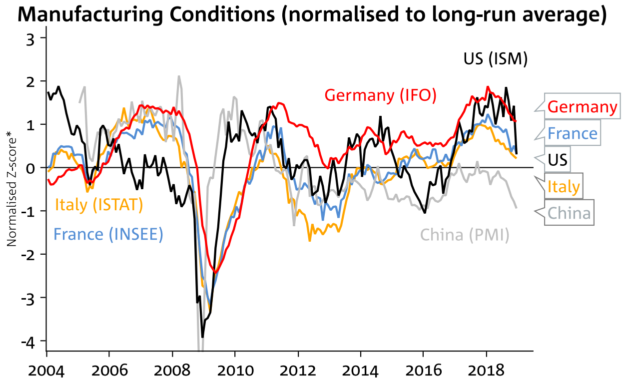
- **Is the US about to stumble into a recession? That is a key question being asked by many following the sharp fall in equities (down 19.8% since mid-Sept at one point, now pared to a 13.0% drop) and a yield curve that is slightly inverted at the shorter-end (2y/5y curve -0.9bps, though 3m/10y is still positive).**
- **We have run probit models to determine what US recession probability is currently priced by yield curves. We find curves are consistent with a 15-25% chance of a US recession occurring over the next 10-18m. The 3m/10yr yield curve is a marginally better predictor of recessions historically and suggests a 25% chance of recession by Jan-2020.**
- **Equity markets are suggesting a higher probability of recession, but should be discounted somewhat given recent volatility. Adding recent changes in stock prices to a yield curve model suggests a 40% chance of recession by April 2019, but should equities stabilize from here this probability falls to 25%.**
- **Do these odds align with sentiment and the hard data? In short no. Both Business and Consumer Surveys suggest little likelihood of a near-term recession (0-16% chance), while hard data remains solid overall outside of housing. The exception is ISM New Orders *less* Inventories which is implying a 29% chance of recession this year – something to watch given its use by some as a reliable recession signal.**
- **Our preferred recession models suggest a 25% chance of recession but importantly this is below the 40-60% critical level where recessions inevitably follow. We conclude therefore there is little risk of a near-term US recession. However, given global uncertainties we stand ready to alter this view should the 40-60% threshold be reached for these models.**
- **It's worth considering what macro fundamentals are generating these yield curve (recession) probabilities. We see three fundamental, inter-related reasons:**
    - **Fed tightening – yield curves typically flatten as the Fed tightens and invert as the market expects the Fed is at risk of over-tightening;**
    - **Weakness in global economic indicators, particularly in China and Europe (progressively occurring since mid-2018 and becoming more pronounced – trade wars are a factor); and**
    - **A lack of inflationary pressures both in the US and globally in general – low oil prices a factor.**
- **With the Fed now listening to markets and signaling caution/patience about further tightening and with the US and China now working toward a trade deal, the second longest US expansion on record seems likely to extend for a little while longer. However, US growth is still likely to slow. A forthcoming note from NAB's Chief Economist Alan Oster finds yield curves and recent equity market developments suggest US GDP slows to a 1¼% y/y pace by Dec 2019 from its current 3.0% y/y pace all other things being equal, before restrengthening to around 2% growth as lower oil prices support growth albeit with a longer lag.**

Markets are worried about a potential US slowing

As we enter 2019 there are some concerns developing over the US outlook. Growth is slowing a touch faster than expected as the 'fiscal sugar rush' effect starts to fade. There are also some signs of slowing in the interest rate-sensitive areas of the economy (e.g. housing) and from the recent tightening in financial conditions.

The global economy also seems to be slower than expected with Europe and China PMIs looking particularly weak in recent months (Chart 2). A soft US Dec ISM has also led many to question whether the US economy can remain insulated from the rest of the world, with the ISM recently falling sharply to levels more consistent with those seen in Europe. Anecdotes from Fed Districts have also found businesses are "more concerned about future business conditions" with some on pause "in anticipation of slowing economic conditions".

Chart 2: Manufacturing activity is slowing in the world



Source: National Australia Bank, Macrobond

Should we be worried that the US economy is about to stumble into a downturn? To help answer this question we ran a series of probit models to see what probability of recession is currently implied by market pricing and whether this aligns with sentiment indicators and other hard data.

Yield curves – why so flat and what do they portend?

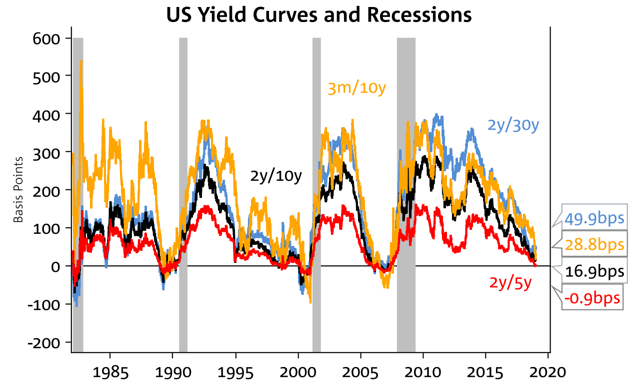
One of the best predictors of US recessions has historically been the yield curve, specifically the 3m/10y Treasury yield curve. An initial inversion in this curve has tended to occur 9-18 months prior to a recession. The finding is well documented with a yield curve inversion having correctly predicted every recession bar one false signal (the curve inverted in 1997 during the Asian crisis, though there was no mid-1990s US recession) (Chart 3).[1] Curve inversions are closely tied to Fed monetary policy actions with an inversion typically occurring when the market sees risks building that rates rise too high for the economy. As former-Fed Chair Yellen observed: "I think it's a myth that expansions die of old age"…they are killed by the Fed when inflation rises faster than expected.

The risks of this particular scenario in this cycle seems low in the short run given Fed calls for patience amid a "muted" inflation outlook – the recent sharp fall in oil

[1] The San Francisco Fed has a number of recent papers on the yield curve and what these curves mean for the near-term outlook. The papers find that the 3m/10y curve remains the best predictor of recessions (predicting all recessions bar 1997 which did not end in recession) and that there is little value gained in adjusting the yield curve for the term premium as some have suggested in the past. Nevertheless they do caution that QE could be impacting the interpretation. See Christensen (2018) and Bauer and Mertens (2018) for more details.

prices and low inflation expectations suggest little risk of an inflation outbreak (see Nov-18 NAB note: "Inflation upside evaporates, giving the Fed room to pause in 2019"). A tight labour market is the most significant upward medium-term inflation risk.

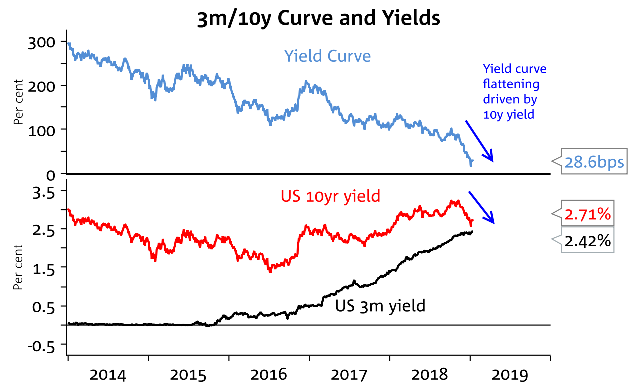
Chart 3: Yield curves have flattened; 2/5s inverted



Source: National Australia Bank, Macrobond

In recent months, the sharp flattening has been driven by the longer end as concerns about global growth and equity market weakness weighed. At the short-end, 3m bill yields have largely followed the Fed Funds rate, which has been steadily rising over 2018 (Chart 4).

Chart 4: Curve flattening since Nov driven by the 10yr



Source: National Australia Bank, Macrobond

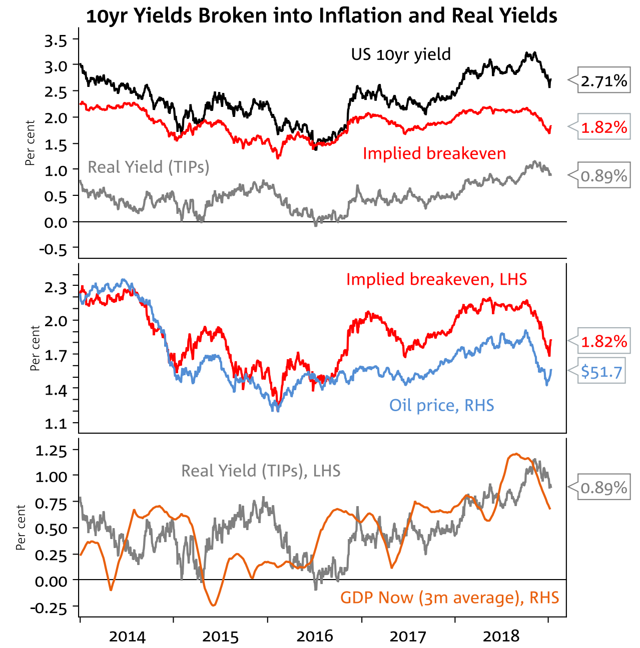
It is often difficult to attribute to any single factor why 10y yields have fallen sharply in recent times – some 68 bps at one stage from a high of 3.24% to a low of 2.55% and now 2.70%.

One way to delve into what is driving yields lower is to break nominal yields into their real and breakeven inflation components. Doing so reveals that around 40bps (or 60%) of the fall in nominal yields was due to a decline in the inflation breakeven component which correlates closely with the oil price: WTI oil fell some 43% at one stage (Chart 5).

The other 28bps (or 40%) of the move was driven by real yields and is likely correlated with the slowing seen in the US economy which has been picked up by the Atlanta Fed GDP Now Series which has been tracking a slowing in growth as the effects of the 'fiscal sugar rush' fade.

It is worth noting that both the moves in oil and some moderation in US growth are likely linked also to the slowing being seen in China and Europe (Chart 2 earlier) as well as concerns of a Fed policy mistake and the tightening in financial conditions that has resulted from the equity market sell-off and a widening in credit spreads. The decomposition also suggests a steepening in the yield curve is unlikely until oil prices recover.

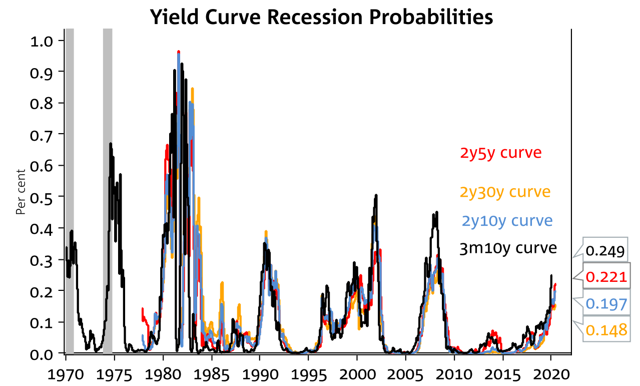
Chart 5: 10yr yield fall driven by lower oil and growth



Source: National Australia Bank, Macrobond

The flattening in the yield curve seen so far reveals market pricing implies a 25% chance of a recession over the next 12 months. Other maturity yield curves can give a slightly longer lead, but importantly still suggest the chances of a recession are moderate over the next 12-18 months. While a 25% probability is relatively high, it's important to note the critical threshold appears to be around the 40% mark, while present curves give only a 15-25% chance (Chart 6).

Chart 6: Yield cuves give 15-25% chance of US recession



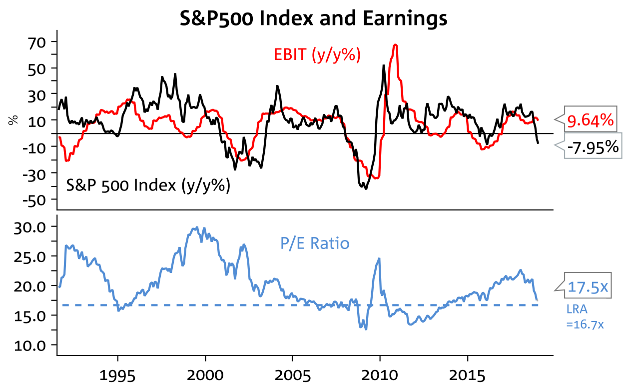
Source: National Australia Bank, Macrobond

Table 1: US Recession Indicators - Financial Market Indicators

	Lead property (peak correlation)	Explanatory Power (R2)	Recession Probability (Probit Model)
Yield Curves			
3m/10yr	10-12 months	0.28	25%
2y/5yr	16-20 months	0.30	22%
2y/10y	16-19 months	0.30	20%
2y/30y	13-20 months	0.30	15%
Credit Spreads			
High Yield	0-1 months	0.49	2%
Excess Bond Premium	0-1 months	0.27	10%
Equities			
S&P 500 (y/y%)	0-3 months	0.15	40%
Russell 2000 (y/y%)	0-3 months	0.11	37%
Financial Conditions Indexes			
BBG Financial Conditions Index	0-1 months	0.36	6%

Equity markets can also provide some extra information on recessions, though these signals tend to be more volatile with less information content compared to the signal from yield curves. In Table 1 we present the pseudo McFadden R2 to serve as a comparison between the models. Generally y/y returns in the S&P500 are a better indicator of recessions than the small cap Russell 2000. It is also possible that some of the recent declines in equities reflect a valuation story rather than an earnings story (see Oct-18 NAB note: Stock market valuations – how overvalued are we?) (Chart 7).

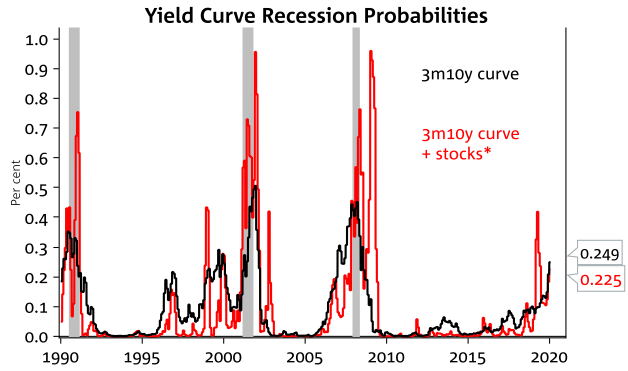
Chart 7: Equity fall driven by valuations or earnings?



Source: National Australia Bank, Macrobond

Combining equity moves with yield curves though can still improve the fit of a yield curve probit model with R2's moving up from 0.30 to 0.48 (though this comes at the expense of the shorter warning signal since equities only lead recessions by around 3m y/y). At present this analysis suggests there is a 40% chance of a recession by April 2019, but this probability reduces to around 25% should equities stabilise from here (Chart 8). Some stabilisation in equities has occurred in recent days given optimism around the US/China trade talks and the Fed signalling a more cautious/patient monetary policy stance.

Chart 8: Yield cuves + stocks 22-40% chance of recession

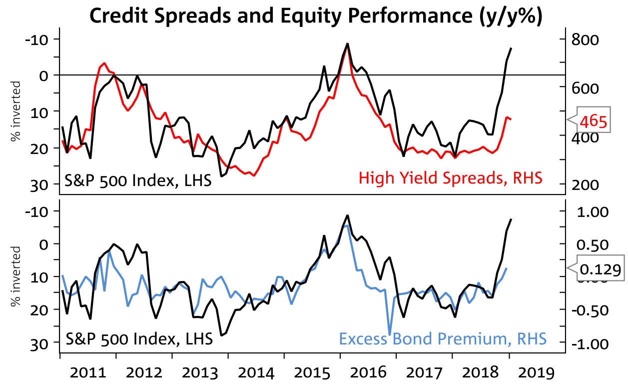


* Assumes S&P500 remains at present levels from today until end 2019
Source: National Australia Bank, Macrobond

Recession probabilities from credit spreads

General financial conditions in contrast are not a great predictor of recessions in a probit model, partly because the extreme tightening in conditions that occurred during the Great Recession was so unprecedented. Credit spreads are a better predictor, but they have not deteriorated to the extent implied by the equity sell-off and are currently giving a fairly low chance of a recession (Chart 9). The Fed has also made some attempt to capture investor sentiment in the corporate bond market via the Excess Bond Premium. We find this sentiment measure is more contemporaneous (rather than being forward looking as yield curves are) with Fed modelling suggesting this measure is giving a 27% chance of a US recession.

Chart 9: Spreads have not widened as far as stocks imply

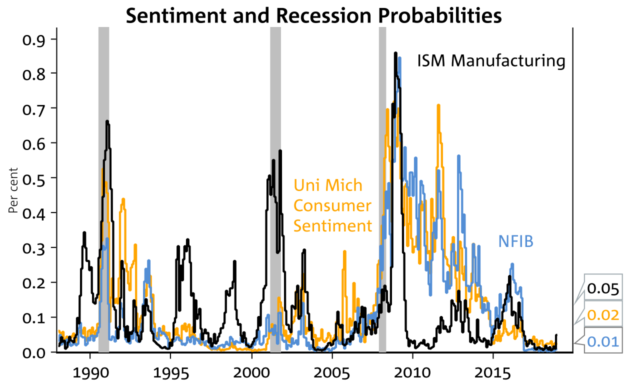


Source: National Australia Bank, Macrobond

Sentiment indicators

Sentiment indicators towards a recession are more mixed with a range of indicators from Businesses and Consumers currently suggesting only a 0-5% chance of recession (Chart 10). It's worth noting that sentiment indicators tend to be more coincident than forward looking (peak correlation occurs at t=0) and are partly correlated to the stock market so in general they give little indication on the probability of a recession beyond a 0-2m horizon.

Chart 10: Biz/Consumer Sentiment gives low probability



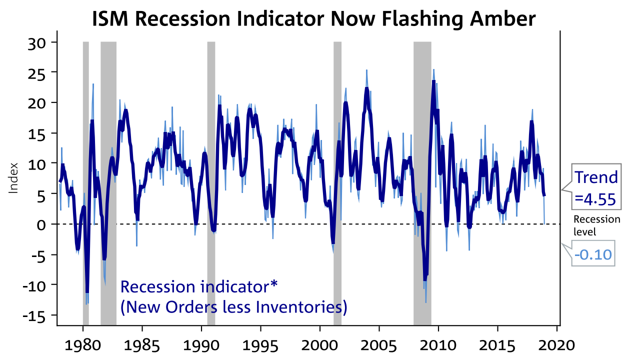
Source: National Australia Bank, Macrobond

Table 2: US Recession Indicators - Sentiment Indicators

	Lead property (peak correlation)	Explanatory Power (R2)	Recession Probability (Probit Model)
Business Sentiment			
ISM Total Index	0 to 2 months	0.36	5%
ISM New Orders	0 to 2 months	0.38	16%
ISM New Orders *less* Inventories	1 to 7 months	0.16	29%
NFIB Headline Index	0 to 1 months	0.26	1%
Consumer Sentiment			
Uni Michigan - Total	0 to 1 months	0.22	2%
Uni Michigan - Biz Conditions Past 12m	0 to 1 months	0.51	0%
Uni Michigan - Biz Conditions Next 12m	0 to 4 months	0.13	13%
Conference Board - Total	0 to 1 months	0.14	2%

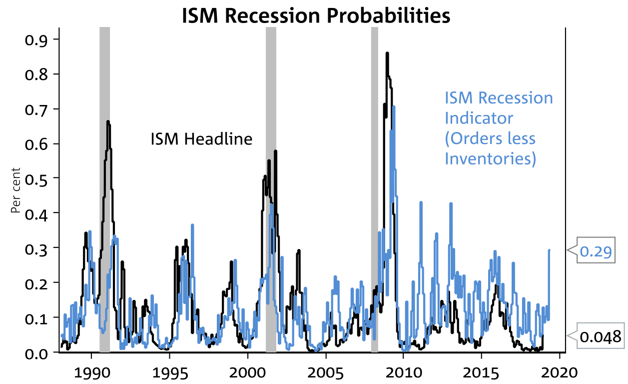
One exception to that conclusion is when we look at the forward looking components of the surveys. The ISM New Orders *less* Inventories measure is a commonly cited recession indicator and at the moment is flashing amber. Although on the brink of signalling recession, we have only had one month of data during a period of significant market volatility – and one when trade wars may also be influencing the economic data - so it will be important to continue to monitor these signals over the coming months. Using these forward looking ISM components in a probit model suggests a 13-29% chance of a recession (Chart 11 and 12).

Chart 11: ISM New Orders *less* Inventories are amber



* Dark Blue line is the 3-month cma trend in the recession indicator
** Shaded areas are recessions as per the NBER
Source: National Australia Bank, ISM

Chart 12: Forward looking ISM measure a 29% chance



Source: National Australia Bank, Macrobond

Real activity and leading indicators

Hard data tends to lag indicators of recessions. We also looked at the most forward-looking partials to see whether they can give any leading signals. All are suggesting little risk of recession, but given the government shutdown we do not have recent data for most of the indicators. The most forward-looking real indicator is Jobless Claims which can give a 1-5m lead on a recession – this indicator presently only suggests a 4% chance of recession, but will be important to follow in coming months. (This indicator unfortunately is impacted by the government shutdown).

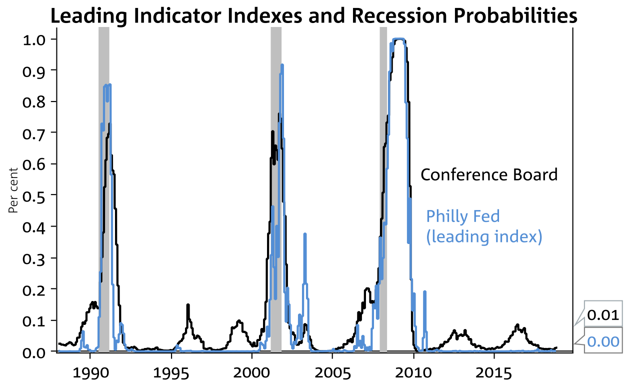
Table 3: US Recession Indicators - Real Activity Indexes and Leading Indicators

	Lead property (peak correlation)	Explanatory Power (R2)	Recession Probability (Probit Model)
Real activity series			
Industrial Production (y/y%)*	0-1 months	0.22	14%
Retail Sales Control (y/y%)*	0-2 months	0.07	7%
Building Permits (y/y%)*	0-3 months	0.35	6%
Jobless Claims (y/y)	1-5 months	0.38	4%
Leading and Co-incident Indexes			
Conference Board Leading Index*	0-2 months	0.49	1%
Philidephia Fed Leading Index**	0-2 months	0.70	0%

* Note latest update only available to November 2018
** Note latest update only available to October2018

A number of aggregate leading indicators are also readily available on a monthly basis – most incorporating the partial data we are looking at. Both the Conference Board Leading Index and the Philly Fed Leading Index have given a good read on whether the economy is on the verge of recession – but again these indicators are largely contemporaneous rather than leading (Chart 13). Note both of these indicators have not been updated since Oct/Nov due to the government shutdown delaying key inputs.

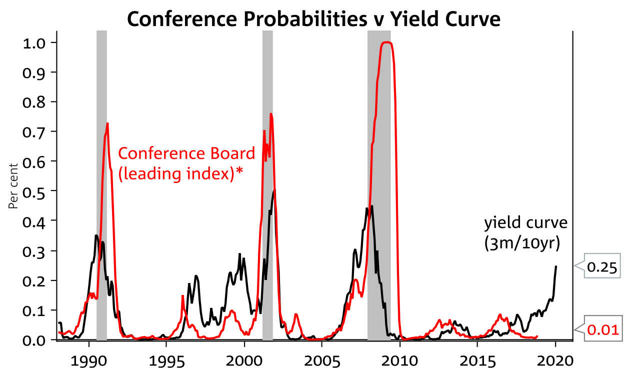
Chart 13: Leading indexes very good but late guide



Source: National Australia Bank, Macrobond

While the Conference Board leading index is not showing any chance of a recession, it is very dated due to the government shutdown and still broadly consistent with what the yield curve had implied in Nov 2018, which was only an 8% chance of recession (Chart 14).

Chart 14: Conference board indicator is dated



* Conference Board Leading Index is only updated until November 2018
Source: National Australia Bank, Macrobond

Addendum – dating recessions

Recessions in the US are dated by the National Bureau of Economic Research (NBER). The NBER does not define a recession in terms of two consecutive quarters of declining real GDP, rather it defines it as a significant decline in economic activity, normally visible in real GDP, real income, employment, industrial production and wholesale-retail sales (see NBER for details). None of the variables used by the NBER to date recessions seem remotely close to recession with very strong December Payrolls, while the Atlanta Fed GDP Now estimate points to very reasonable GDP growth of 2.8% in Q4 2018.

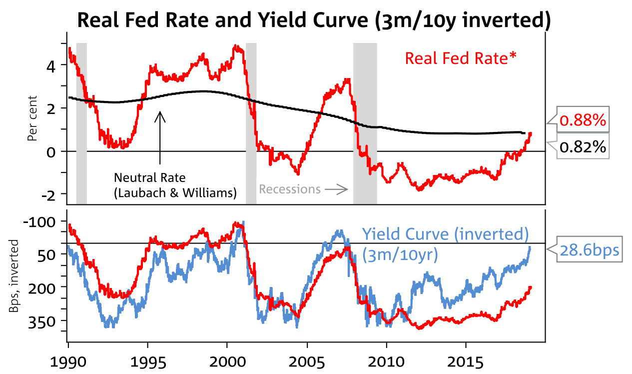
Implications

Our analysis of recession probabilities based on yield curves and other forward looking indicators have markets inferring a 15-25% chance of US recession over the next 10-18 months. Similar probabilities have also been given by economists in recent surveys (see WSJ Survey Economists see US recession risk rising) Importantly those odds are at their highest level since the 2008 Great Recession, but are still below the 40-60% critical level that is typically recorded in a recession. As such we interpret these signals as an amber warning light, which warns of the possibilities of a potential recession should the Fed continue to hike rates or should global economic conditions continue to deteriorate – trade wars an obvious factor here. Complicating the picture somewhat is the government shutdown which has delayed the publication of a number of key data inputs into leading indexes such as the Conference Board.

The Fed is acting cautiously in this environment and Chair Powell has already confirmed a more cautious 2019 Fed outlook. In a recent interview Powell stated he is "listening carefully" to markets with "muted inflation" giving the Fed room to be "patient and see how the economy goes". In that interview Powell drew a parallel to the 2016 Fed pause where the Fed went on hold for 3 quarters following a tightening in financial conditions and some worries over global growth.

Similar thoughts have also been echoed by other FOMC members. Some Fed members have even explicitly mentioned the possibility of cuts should conditions deteriorate more than expected (Bostic, Bullard and Rosengren) and are also re-considering their estimates of neutral given muted inflation. On neutral, it is worth noting that real rates are around the neutral levels as suggested by Laubach and Williams' r* analysis.

Chart 15: Fed may be closer to neutral than first thought

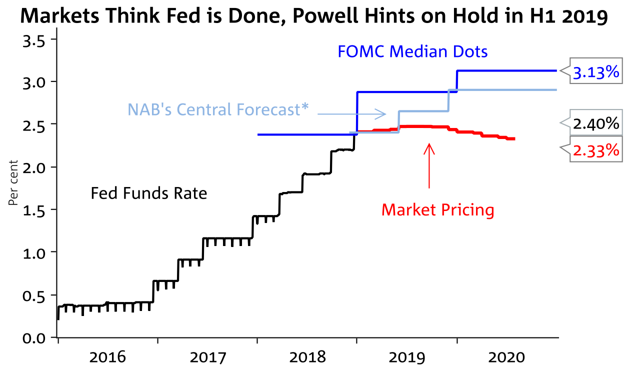


* Deflated using backward looking Core-PCE
Source: National Australia Bank, Macrobond

With the Fed listening and being cautious, this cycle which is the second longest on record is likely to extend for a little while longer yet. However, US growth is still likely to slow. A forthcoming note from NAB Chief Economist Alan Oster finds yield curves are consistent with GDP slowing to a 1¼% y/y pace by Dec 2019 from its 3.0% y/y pace. This importantly would be below what the FOMC currently forecasts for growth. Growth then picks back up due to the longer lagged effect of lower oil prices.

Markets in this environment are pricing very little from the Fed in 2019 and are pricing some probability of the Fed cutting rates in 2020 – July 2020 being 50% priced for a cut. NAB's current view is of the Fed pausing in H1 2019 and then hiking in H2 as the labour market continues to tighten. The risk to this view is that the Fed does not feel compelled to hike given uncertainties over growth and an inflation outlook that appears benign despite a tightening labour market.

Chart 16: Markets price very little from the Fed in 2019



* NAB's Upper Bound forecast less 10bps to account for difference between Effective Funds Rate
Source: National Australia Bank, Bloomberg

Tapas.Strickland@nab.com.au

CALENDAR OF ECONOMIC RELEASES

Country	Economic Indicator	Period	Forecast	Consensus	Actual	Previous	GMT	AEDT
Monday, 14 January 2019								
CH	Trade Balance	Dec		51.6		44.74	14 Jan	
CH	Exports YoY / Imports YoY	Dec		2/4.5		5.4/3	14 Jan	
AU	Melbourne Institute Inflation MoM/YoY	Dec		/		0/1.6	0.00	11.00
EC	Industrial Production SA MoM / YoY	Nov		-1.5/-2.1		0.2/1.2	10.00	21.00
Tuesday, 15 January 2019								
NZ	NZIER Business Opinion Survey						21.00	8.00
NZ	Food Prices MoM	Dec	-0.6			-0.6	21.45	8.45
JN	Machine Tool Orders YoY	Dec P				-17	6.00	17.00
EC	Trade Balance SA	Nov		12.8		12.5	10.00	21.00
US	Empire Manufacturing	Jan		11.3		10.9	13.30	0.30
US	PPI Final Demand MoM	Dec		-0.1/2.5		0.1/2.5	13.30	0.30
EC	ECB's Draghi Presents 2017 Annual Report in Strasbourg						15.00	2.00
NZ	QV House Prices YoY	Dec				3.5	16.00	3.00
US	Fed's Kashkari Speaks on Regional Economy in Minnesota						16.30	3.30
US	Fed's George Speaks on Economy and Monetary Policy Outlook						18.00	5.00
US	Fed's Kaplan Speaks in Plano, Texas						18.00	5.00
Wednesday, 16 January 2019								
NZ	Dairy Auction (GDT-weighted price index)	16 Jan	2 to 4%			2.80%	early am	
NZ	N.Z. Government 5-Month Financial Statements						21.00	8.00
NZ	Electronic Card Transactions	Dec	-0.5			-0.2	21.45	8.45
AU	Westpac Consumer Conf Index	Jan				104.4	23.30	10.30
JN	Core Machine Orders MoM / YoY	Nov		3/0.1		7.6/4.5	23.50	10.50
JN	PPI YoY	Dec		1.8		2.3	23.50	10.50
GE	CPI MoM / YoY	Dec F		0.1/1.7		0.1/1.7	7.00	18.00
EC	EU27 New Car Registrations	Dec				-8	7.00	18.00
UK	CPI MoM / YoY	Dec		0.2/2.1		0.2/2.3	9.30	20.30
UK	CPI Core YoY	Dec		1.8		1.8	9.30	20.30
UK	RPI MoM / YoY	Dec		0.5/2.9		0/3.2	9.30	20.30
UK	PPI Output NSA MoM / YoY	Dec		0/2.9		0.2/3.1	9.30	20.30
US	MBA Mortgage Applications	11 Jan				23.5	12.00	23.00
US	Retail Sales Advance MoM	Dec		0.1		0.2	13.30	0.30
US	U.S. Federal Reserve Releases Beige Book						19.00	6.00
US	Total Net TIC Flows	Nov				42	21.00	8.00
US	Fed's Kashkari Speaks on Panel About Financial Crisis			/		/	23.30	10.30
Thursday, 17 January 2019								
JN	BOJ Kuroda and Amamiya make a speech at G20 Synposium						0.00	11.00
AU	Home Loans MoM	Nov	-1.5	-1.5		2.2	0.30	11.30
UK	Bank of England Credit Conditions & Bank Liabilities Surveys						9.30	20.30
EC	CPI Core YoY	Dec F		1		1	10.00	21.00
EC	CPI MoM / YoY	Dec		0/1.6		-0.2/1.9	10.00	21.00
EC	ECB's Lautenschlaeger Speaks in Dublin						11.00	22.00
US	Building Permits / Housing Starts	Dec		1290/1253		1328/1256	13.30	0.30
US	Initial Jobless Claims	12 Jan		220		216	13.30	0.30
US	Philadelphia Fed Business Outlook	Jan		10		9.4	13.30	0.30
US	Fed's Quarles Speaks at Insurance Industry Forum						15.45	2.45
Friday, 18 January 2019								
NZ	BusinessNZ Manufacturing PMI	Dec				53.5	21.30	8.30
JN	Natl CPI YoY / Ex-Fresh Food YoY	Dec		0.3/0.8		0.8/0.9	23.30	10.30
NZ	Non Resident Bond Holdings	Dec				56.2	2.00	13.00
JN	Industrial Production MoM / YoY	Nov F		/		-1.1/1.4	4.30	15.30
UK	Retail Sales Inc Auto Fuel MoM/YoY	Dec		-0.8/3.6		1.4/3.6	9.30	20.30
CA	CPI NSA MoM / YoY	Dec		-0.4		-0.4	13.30	0.30
CA	CPI Core- Common YoY%	Dec		1.9		1.9	13.30	0.30
US	Fed's Williams Speaks on Economic Outlook and Monetary...						14.05	1.05
US	Industrial Production MoM / Capacity Utilisation	Dec		0.2/78.5		0.6/78.5	14.15	1.15
US	U. of Mich. Sentiment / Expectations	Jan P		96.8/		98.3/87	15.00	2.00
US	Fed's Harker Speaks Symposium on Prosperity						16.00	3.00
Upcoming Central Bank Interest Rate Announcements								
Japan, BoJ		23-Jan	-0.1%	-0.1%		-0.1%		
Europe, ECB		24-Jan	-0.4%	-0.4%		-0.4%		
US, Federal Reserve		30-Jan	2.25-2.5%	2.25-2.5%		2.25-2.5%		
Australia, RBA		5-Feb	1.5%	1.5%		1.5%		
UK, BOE		7-Feb	0.75%	0.75%		0.75%		
New Zealand, RBNZ		13-Feb	1.75%	1.75%		1.75%		
Canada, BoC		6-Mar	2%	2%		1.75%		

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

FORECASTS

Economic Forecasts

Australia Forecasts	Annual % change 2017	2018	2019	2020	Quarterly % change 2017 Q1	2017 Q2	2017 Q3	2017 Q4	2018 Q1	2018 Q2	2018 Q3	2018 Q4	2019 Q1	2019 Q2	2019 Q3	2019 Q4	2020 Q1	2020 Q2	2020 Q3	2020 Q4
Household Consumption	2.4	2.5	2.3	2.5	0.4	0.8	0.6	1.1	0.3	0.9	0.3	0.5	0.7	0.6	0.7	0.6	0.6	0.6	0.7	0.7
Underlying Business Investment	3.7	1.9	3.2	5.1	3.3	0.3	3.7	0.4	0.8	-0.8	-1.1	0.2	1.7	1.1	1.8	1.3	1.1	1.5	0.8	1.0
Residential Construction	-2.4	4.7	-7.7	-8.6	-3.8	0.2	-1.3	0.3	3.8	1.9	1.0	-2.5	-2.6	-3.1	-2.9	-2.3	-2.2	-1.9	-2.0	-0.9
Underlying Public Spending	4.5	4.3	4.1	4.5	1.1	1.4	1.0	1.1	1.4	0.5	1.5	0.6	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Exports	3.5	5.4	4.0	2.8	-1.9	2.8	0.8	-1.5	4.3	1.2	0.1	0.7	1.5	1.4	0.8	0.7	0.6	0.7	0.5	0.8
Imports	7.7	3.8	1.7	3.7	3.0	0.2	3.3	0.6	1.9	0.5	-1.5	0.3	0.8	0.7	1.0	0.8	0.8	1.0	0.9	1.1
Net Exports (a)	-0.8	0.4	0.5	-0.2	-1.0	0.5	-0.5	-0.5	0.5	0.2	0.3	0.1	0.2	0.2	0.0	0.0	-0.1	-0.1	-0.1	-0.1
Inventories (a)	-0.1	0.1	-0.1	0.0	0.4	-0.7	0.3	0.1	0.1	0.1	-0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Domestic Demand - qtr%					0.7	0.9	0.8	0.8	0.8	0.7	0.3	0.4	0.6	0.5	0.7	0.6	0.6	0.7	0.6	0.7
Dom Demand - ann %	2.9	2.9	2.1	2.5	2.2	2.5	3.5	3.2	3.4	3.2	2.7	2.2	2.0	1.8	2.2	2.4	2.3	2.5	2.5	2.6
Real GDP - qtr %					**0.4**	**0.8**	**0.6**	**0.5**	**1.0**	**0.9**	**0.3**	**0.5**	**0.8**	**0.6**	**0.6**	**0.5**	**0.5**	**0.6**	**0.5**	**0.7**
Real GDP - ann %	2.4	2.9	2.4	2.3	**2.2**	**2.1**	**2.8**	**2.4**	**3.0**	**3.1**	**2.8**	**2.7**	**2.4**	**2.2**	**2.6**	**2.6**	**2.3**	**2.3**	**2.2**	**2.3**
CPI headline - qtr %					0.5	0.2	0.6	0.6	0.4	0.4	0.4	0.4	0.6	0.4	0.4	0.8	0.5	0.6	0.6	0.7
CPI headline - ann %	1.9	1.9	1.9	2.4	2.1	1.9	1.8	1.9	1.9	2.1	1.9	1.6	1.8	1.8	1.8	2.2	2.1	2.3	2.5	2.5
CPI underlying - qtr %					0.5	0.6	0.3	0.5	0.5	0.4	0.3	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6
CPI underlying - ann %	1.9	1.8	1.9	2.3	1.7	1.9	1.9	1.9	2.0	1.8	1.7	1.7	1.7	1.8	1.9	2.1	2.1	2.2	2.3	2.3
Wages (Pvte WPI - qtr %					0.5	0.5	0.5	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
Wages (Pvte WPI - ann %)	1.9	2.1	2.5	2.7	1.8	1.8	1.9	1.9	2.0	2.1	2.1	2.3	2.3	2.4	2.5	2.6	2.6	2.7	2.7	2.8
Unemployment Rate (%)	5.6	5.3	4.8	4.8	5.9	5.6	5.5	5.4	5.5	5.6	5.1	4.9	4.8	4.7	4.8	4.7	4.8	4.7	4.8	4.8
Terms of trade	12.1	-0.1	-0.7	0.0	5.3	-5.9	-0.1	-0.1	3.1	-1.1	0.9	-3.4	-0.8	-1.2	-0.9	0.3	-0.4	0.3	-0.4	0.2
G&S trade balance, $Abn	9.6	18.0	8.7	1.8	6.7	3.3	0.9	-1.2	4.2	3.9	6.6	3.3	3.2	2.6	1.4	1.5	0.9	0.9	0.1	0.0
% of GDP	0.5	1.0	0.4	0.1	1.5	0.7	0.2	-0.3	0.9	0.8	1.4	0.7	0.7	0.5	0.3	0.3	0.2	0.2	0.0	0.0
Current Account (% GDP)	-2.6	-2.5	-3.1	-3.5	-1.6	-2.4	-2.9	-3.4	-2.3	-2.6	-2.2	-2.9	-2.9	-3.1	-3.3	-3.3	-3.4	-3.4	-3.5	-3.5

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

Exchange Rate Forecasts

	14-Jan	Apr-19	Jul-19	Oct-19	Jan-20
Majors					
AUD/USD	0.7208	0.71	0.70	0.73	0.75
NZD/USD	0.6825	0.68	0.67	0.69	0.70
USD/JPY	108.24	113	113	110	108
EUR/USD	1.1474	1.17	1.18	1.20	1.23
GBP/USD	1.2856	1.35	1.40	1.43	1.45
USD/CHF	0.9831	0.98	0.98	0.99	0.97
USD/CAD	1.3261	1.31	1.31	1.27	1.27
USD/CNY	6.7439	7.10	7.20	7.20	7.15
Australian Cross Rates					
AUD/NZD	1.0561	1.04	1.04	1.06	1.07
AUD/JPY	78.0	80	79	80	81
AUD/EUR	0.6282	0.61	0.59	0.61	0.61
AUD/GBP	0.5607	0.53	0.50	0.51	0.52
AUD/CNY	4.8610	5.04	5.04	5.26	5.36
AUD/CAD	0.9559	0.93	0.92	0.93	0.95
AUD/CHF	0.7086	0.70	0.69	0.72	0.73

Interest Rate Forecasts

	14-Jan	Apr-19	Jul-19	Oct-19	Jan-20
Australia Rates					
RBA Cash rate	1.50	1.50	1.50	1.50	1.50
3 month bill rate	2.06	1.95	1.90	1.90	1.90
3 Year Swap Rate	1.90	1.85	1.85	1.95	2.05
10 Year Swap Rate	2.54	2.60	2.60	2.70	2.80
Offshore Policy Rates					
US Fed funds	2.50	2.75	3.00	3.25	3.25
ECB deposit rate	-0.40	-0.40	-0.40	-0.20	0.00
BoE repo rate	0.75	0.75	1.00	1.00	1.25
BoJ excess reserves rate	-0.10	-0.10	-0.10	-0.10	-0.10
RBNZ OCR	1.75	1.75	1.75	1.75	2.00
China 1yr lending rate	4.35	4.35	4.35	4.35	4.35
China Reserve Ratio	14.5	16.0	16.0	16.0	16.0
10-year Benchmark Bond Yields					
Australia	2.29	2.70	2.75	2.75	2.70
United States	2.70	3.20	3.35	3.35	3.25
New Zealand	2.31	2.85	3.10	3.20	3.30

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	2.4	2.9	2.4	2.3	3.4
US	2.9	1.6	2.2	2.9	2.3	1.6	2.6
Eurozone	2.0	1.9	2.5	1.9	1.7	1.6	1.5
UK	2.3	1.8	1.7	1.3	1.7	1.5	2.4
Japan	1.4	1.0	1.7	0.8	1.2	0.9	0.8
China	6.9	6.7	6.9	6.6	6.3	6.0	9.2
India	8.2	7.1	6.7	7.4	7.1	7.2	6.6
New Zealand	3.5	4.0	2.8	2.8	2.8	2.6	3.0
World	3.5	3.3	3.7	3.7	3.6	3.5	3.5
MTP Top 5	4.1	3.8	4.2	4.0	3.8	3.4	5.0

Commodity prices ($US)

	14-Jan	Mar-19	Jun-19	Sep-19	Dec-19
Brent oil	60.4	85	80	77	78
Gold	1293	1276	1297	1305	1318
Iron ore	72.6	63	60	61	62
Hard coking coal	195	180	175	160	165
Thermal coal	98	105	103	101	100
Copper	5921	6350	6500	6600	6700
Aust LNG (*)	15.7	14.3	14.6	13.4	13.0

(*) Implied Australian LNG export prices.

Under review

CONTACT DETAILS

Market Economics

David de Garis
Director, Economics
+61 3 8641 3045
david.degaris@nab.com.au

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

FX Strategy

Tapas Strickland
Markets Strategist
+44 207 710 1532
tapas.strickland@eu.nabgroup.com
tapas.strickland@nab.com.au

Markets Research

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

Group Economics

Alan Oster
Chief Economist
+61 3 8634 2927
alan_oster@national.com.au