Australia and New Zealand Economics Analyst

# Quantifying Recession Risks (Nixon)

- Against the backdrop of rising interest rates and elevated inflation – as well data showing two consecutive quarters of negative GDP growth in the United States – recession risks in Australia and New Zealand are increasingly in focus. In this Analyst we look back at 75 years of data in the Antipodes to identify leading indicators of recessions and quantify the risks over the next year or so.
- Based on probit regression analysis, we find that changes in inflation, equity prices, and the yield curve all provide useful leading indicators of recessions in Australia and New Zealand. Recessions in the US also materially increase the odds of local recessions.
- Overall, while we view the models as a rough guide rather than a strict rule, the analysis points to a ~25% chance of a recession in Australia and 30-35% chance of New Zealand over the next 12 months. While these probabilities support our baseline view that both economies will avoid recession in 2023, we note the risks have risen above 'normal' levels.
- That said, we are mindful of factors not captured by historical analysis, including COVID-related volatility and changes in households' balance sheets over recent years. In particular, the increase in savings over recent years may provide households with a larger 'buffer' to absorb higher inflation and interest rates.

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# Quantifying Recession Risks

Recession risks are increasingly in focus around the world. We expect the Euro Area to enter recession later this year, while we put the odds of a recession in Canada, the US and the UK over the next 12 months at 25%, 30% and 35%, respectively.

Indeed, last week's preliminary data showed the United States recorded two consecutive quarters of negative GDP growth over 1H2022, although our US team noted this does meet the official definition of recession ("a judgmental mix of levels and rates-of-change across several variables, most of which continued to expand in the first half of the year.")

Our base case is that Australia and New Zealand will avoid recession, but we are mindful of downside risks, including recessions induced by some combination of weaker global activity, supply-side inflation and tighter financial conditions.

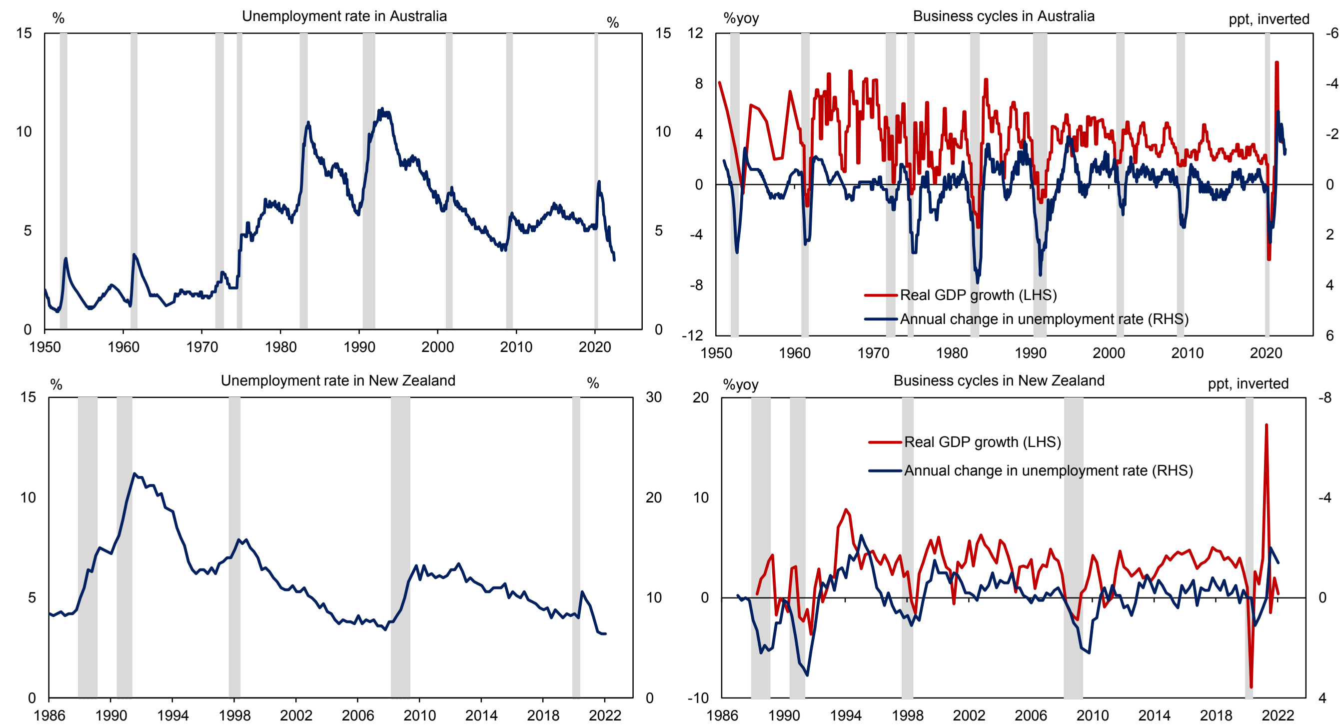
In today's *Analyst* we look back at 75 years of data in both economies to identify leading indicators of recessions and attempt to quantify the risks over the next 12 months.

## History Suggests ~13% Chance of Recession in Any Given Year

Exhibit 1 shows quarterly data on GDP and unemployment in Australia since 1950, with more limited New Zealand data going back to 1986. We define the shaded 'recessions' as periods where the unemployment rate increased by more than 1ppt and GDP growth slowed by more than 3ppts over a period of 12 months.

Across Australia's full sample, the median rise in the unemployment rate during recessions is 2.5ppts, while median trough in annual GDP growth is -0.7%yoy (~4ppts below potential growth).

**Exhibit 1: History suggests Australia and New Zealand have a ~13% chance of entering a recession in any given year**




Source: Goldman Sachs Global Investment Research, ABS, Haver Analytics, RBA

While most of these episodes also satisfy the rule-of-thumb definition of two quarters of negative GDP growth, we also include some episodes that don't satisfy this definition.

For example, Australia only recorded one quarter of negative GDP growth during the 2000/01 and 2008/09 downturns, but we classify both as recessionary episodes given unemployment rose sharply (>100bps) within 12 months and a wide range of economic indicators deteriorated. In both episodes, the RBA also pivoted from hiking rates to cutting rates.

For New Zealand, we also don't define the Canterbury earthquake as a recession despite two quarters of negative GDP growth in 2H2010, given unemployment and other economic indicators remained stable during the period.

Looking over our sample of data, Australia has experienced 9 recessions since 1950, while New Zealand has experienced 5 recessions since 1986 – implying that both economies have a roughly 13% probability of being in a recession in any given year.

## Current Economic Conditions Pointing to 20-30% Odds of Recession

That said, this ~13% chance of a recession estimate is an 'unconditional' probability. That is, it tells us the odds of a recession regardless of any other information.

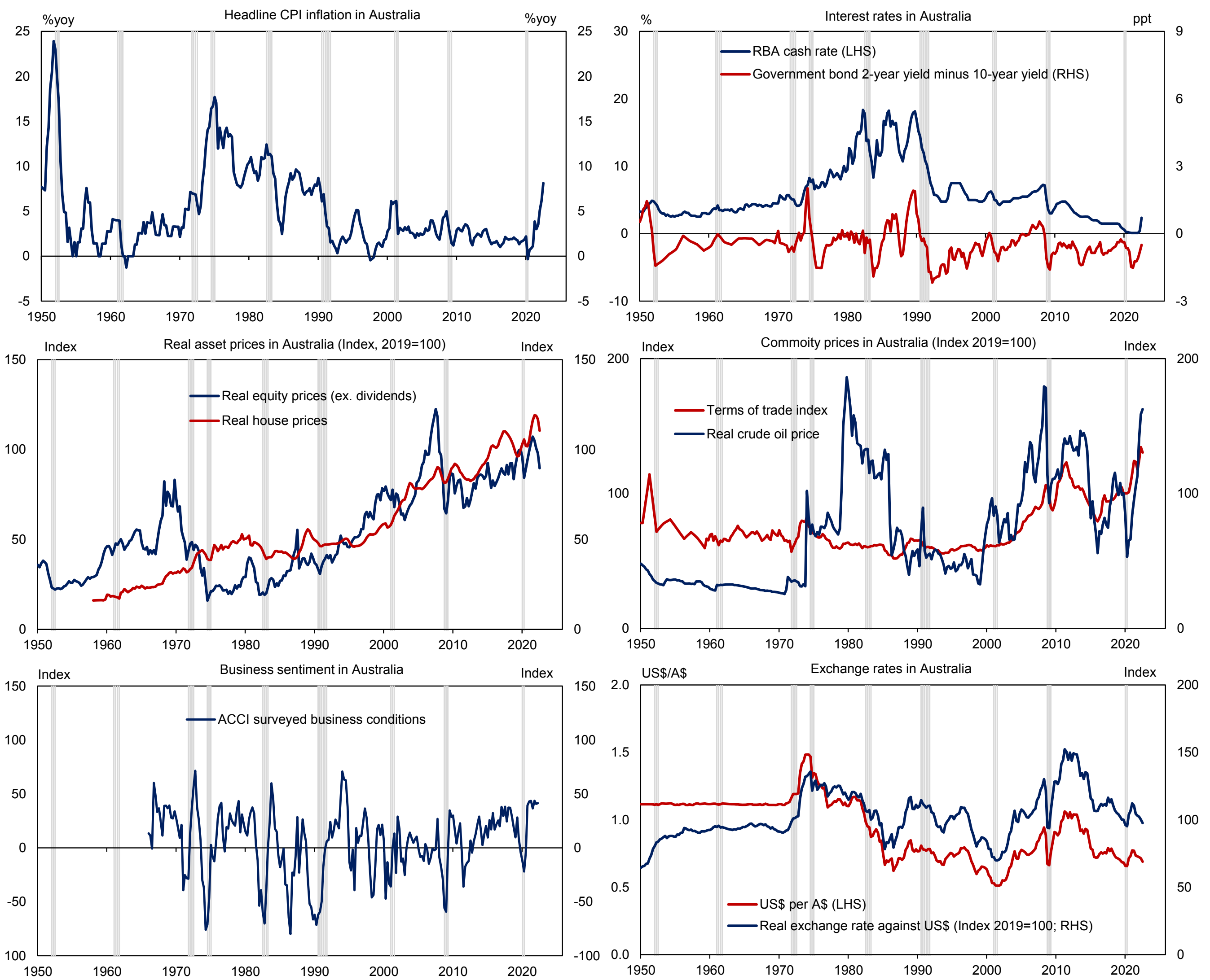
We can also estimate a time-varying probability of recession based on changes in observable economic variables, such as interest rates, inflation and asset prices. This approach has been used widely in academic research and previous GS analysis (for example here, here, and here).

While there is debate about which variables are the best 'leading indicators' of recessions, it is common for models to include the spread between short-term and long-term government bond yields – which typically 'inverts' ahead of recessions – as well as changes in oil prices, credit spreads and central bank policy rates.

Based on local data availability, we consider the following variables for models for Australia and New Zealand: the spread between 2-year and 10-year government bond yields, the overnight cash rate, real CPI inflation, real equity prices, real house prices, crude oil prices, the terms of trade, surveyed business conditions and the exchange rate against the US dollar.

Exhibit 2 shows these variables in Australia on a quarterly basis between 1950 and 2022, with data for 3Q2022 based on forecasts or daily data over the quarter to date. The shorter sample for New Zealand is shown in the Appendix.

**Exhibit 2: Recessions tend to be preceded by a rise in oil prices, inflation and short-term interest rates, as well as a decline in equity prices**




Source: Goldman Sachs Global Investment Research, RBA, ABS, Haver Analytics

Following previous literature, we estimate a probit regression model where 1=

recession over the next 12 months and 0= no recession over the next 12 months.[1] Given Australia and New Zealand have broadly similar economies, and New Zealand's sample is limited by data availability, we estimate the model using panel data across both economies.

At a high level, we find that a higher 2-10-year yield spread, an acceleration in CPI inflation and a decline in real equity prices all tend to be consistent leading indicators of recessions in Australia and New Zealand.

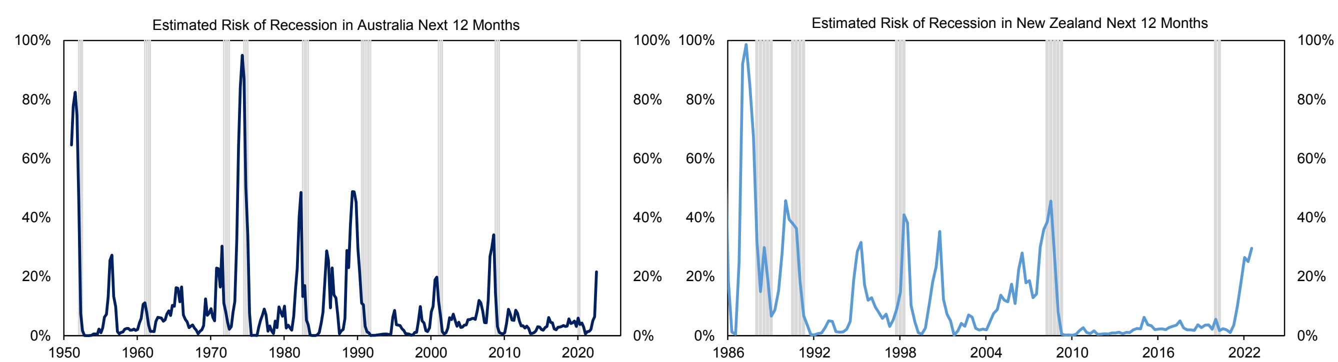
Rising policy rates and oil prices also appear to raise the odds of a recession, although their close correlation with headline inflation mean they don't provide much additional predictive power.

While the results are somewhat dependent on the precise model specification, we find that changes in real house prices, the terms of trade, the exchange rate and business surveys don't tend to be consistent leading indicators of recessions – at least after controlling for other variables. That said, all these variables tend to decline once a recession begins.

Exhibit 3 shows the results of our preferred specification, which is based on the level of the 2-10-year yield spread, the annual change in the rate of CPI inflation and the annual change in real equity prices. The results are broadly similar if we use changes in oil prices and the overnight policy rate instead of CPI inflation.

According to the baseline model, the probability of recession increases by around 8ppts for each 1ppt increase in the 2-10-year bond spread, 2ppts for each 1ppt acceleration in annual CPI inflation and 1ppt for each 10% decline in real equity prices.

**Exhibit 3: Models based on current indicators are pointing to a 20-30% chance of recession over the next year**




Source: Goldman Sachs Global Investment Research

As of 3Q2022, the model is indicating that Australia has a 22% chance of entering a recession over the next 12 months, while New Zealand has a 30% chance. These odds have risen from very low levels in 2021 (<10%) but remain below the levels seen prior the recessions in the 1980s and 2008/9. That said, in Australia they are somewhat above the levels prior to the recessions in the early 2000s and 1960s.

[1] We exclude the 1H2020 recession from the model estimation given it reflected lockdowns in both economies rather than traditional cyclical factors.

From a medium-term perspective, if we assume the odds a recession returns to a 'normal' level of 10-15% over 2H2023 and 2024 as inflation eases and equity prices stabilise, the cumulative probability of recession over the next two years would be around 30-35% in Australia and 40% in New Zealand.

## Recession Odds Rise Above 50% if US Enters Recession

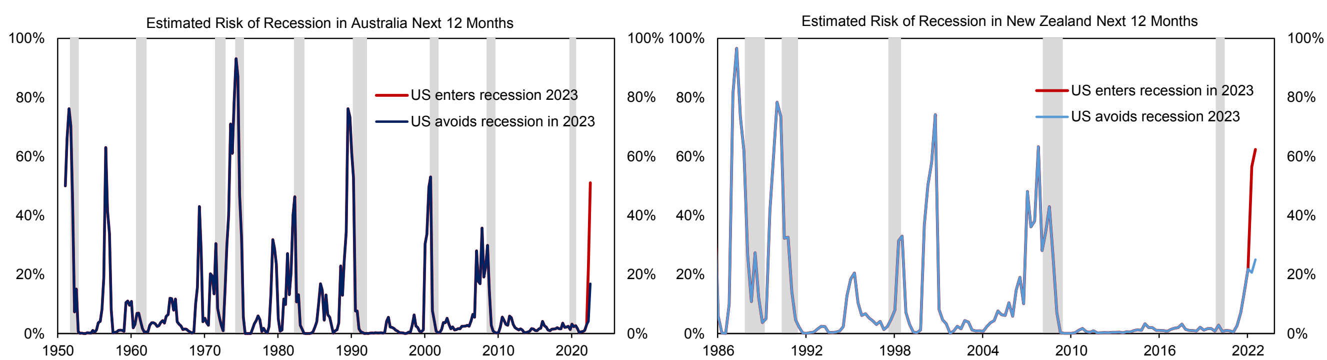
While the model captures global factors indirectly, it's also true that recessions in Australia and New Zealand tend to be correlated with global recessions – particular recessions in the United States.

To capture this dynamic, we can augment our model to include a historical US recession variable (1= US enters recession in next 12 months, 0=US avoids recession next 12 months).[2]

Adding this variable improves the fit of the model and suggest that – all else constant – a recession in the US increases the odds of a recession in Australia and New Zealand by around 35ppts.

Of course, we don't know for sure whether the US will be in recession over the next 12 months, but we can estimate the model based on the two different scenarios. Exhibit 4 shows the results for both Australia and New Zealand, with the red line based on the scenario of a US recession over the next 12 months.

**Exhibit 4: While not our base case, a US recession would raises the odds of recessions in Australia and New Zealand to 50-60%**




Source: Goldman Sachs Global Investment Research

The model suggests that if the US avoids a recession over the next 12 months, Australia and New Zealand have a 17% and 25% probability, respectively, of entering a recession. However, if the US does enter a recession, the model suggests Australia and New Zealand have a 51% and 62% probability, respectively, of entering a recession over the next 12 months.

Combining these probabilities with our US team's view that there is a 30% chance of a recession in the US over the next 12 months, the augmented model implies that

[2] Our US recession variable is based on the NBER midpoint dating method. Similar to our own dating method, the NBER's definition of a US recession requires "a significant decline in economic activity that is spread across the economy and lasts more than a few months" rather two consecutive quarters of GDP growth.

Australia has a 27% chance of recession (0.3*0.51+0.7*0.17), while New Zealand has a 36% chance of recession (0.3*0.62+0.7*0.25).

### Bottom Line: Risks Elevated, But Recession Not Baseline View

Overall, while we view the models as a guide rather than a strict rule, we draw a few conclusions.

Firstly, recession risk in Australia and New Zealand has risen markedly over the past few quarters to be above the long-run historical probability of ~13% in any given year. Higher inflation, lower equity prices and a more hawkish outlook for near-term rates have been the key drivers of this shift.

Secondly, the risk of a recession over the next year in Australia appears somewhat lower than New Zealand, but risks are still well below 50% in both economies.

Thirdly, history suggests that a recession in the US would materially raise the probability recessions in Australia and New Zealand, with risks likely rising to 50-60% in both economies.

Taken as a whole, Australia looks to be facing a ~25% chance of recession over the next 12 months (similar to our assessment of Canada), while New Zealand is facing a 30-35% risk (similar to our assessment of the US and UK).

Of course, we are mindful of risks not captured by this sort of historical analysis, including COVID-related volatility and changes in households' balance sheets over recent years. For example, the increase in savings over recent years may provide households with a larger 'buffer' to absorb higher inflation and interest rates. The shift in Australia and New Zealand's exports towards China over the past few decades may have also lowered the sensitivity of both economies to recessions in the US and Europe.

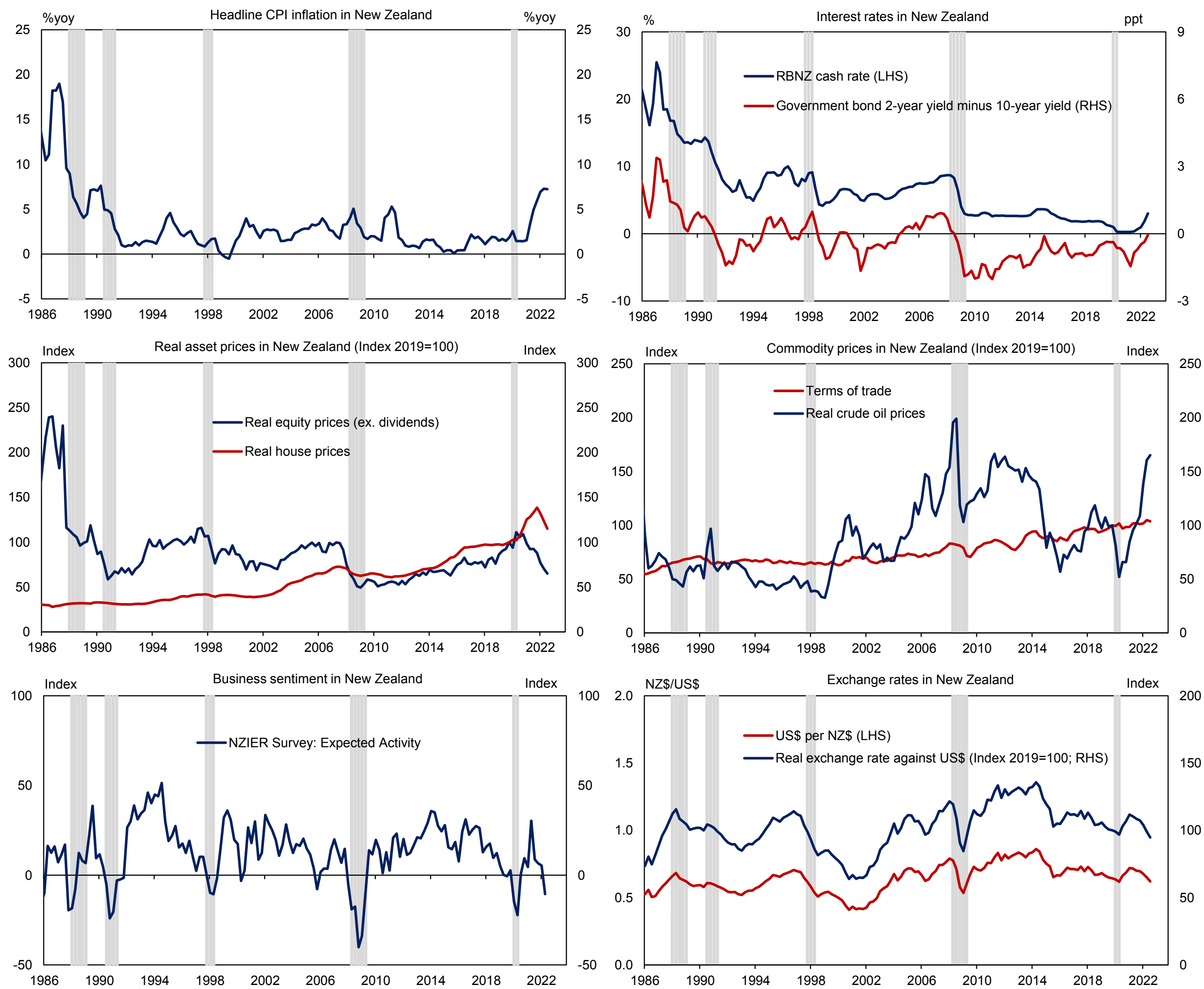
That said, we are also mindful of risks in the other direction. For example, housing wealth as a share of GDP in both Australia and New Zealand is also now much higher compared to prior decades, potentially making both economies more sensitive to a downturn in house prices compared to prior episodes.

**William Nixon**

## Appendix

Exhibit 5 shows historical data for New Zealand. As with Australia, data for 3Q2022 are based on forecasts or daily data over the quarter to date.

**Exhibit 5: New Zealand has had five recessions since 1986 according to our classification**




Source: Goldman Sachs Global Investment Research, RBNZ, Haver Analytics, StatsNZ

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