Forecasting the NZD/AUD

- **Fair Value for the NZD/AUD is currently just below 0.87, up from 0.82 in the early 1990s.**
- **Fair Value has risen mainly because New Zealand has experienced lower inflation.**
- **The NZD/AUD reasonably stable – the monthly average exchange rate has remained within 10% of Fair Value at all times over the past 15 years.**
- **The NZD/AUD is responds consistently to fundamentals, with the most important being interest rates, inflation, commodity prices, GDP growth, and New Zealand immigration/ emigration. Current accounts, house prices, and financial market volatility do not have a consistent influence.**
- **The NZD/AUD normally exhibits persistence – when it starts moving in one direction, it tends to keep going in that direction.**

We have just completed in-depth research into the New Zealand Dollar / Australian Dollar exchange rate cross (NZD/AUD). The five key findings are summarised in the bullets above. A complete explanation of the model can be found in the accompanying Occasional Paper on our website.[1]

We developed a forecasting model that broke exchange rate movements down into two types – Fair Value exchange rate movements that can be explained by inflation and interest rates, and Deviations from Fair Value, which are all other exchange rate movements. The model works with monthly average exchange rates, and is best at forecasting 2 – 12 months ahead.

Why the NZD/AUD matters

The NZD/AUD exchange rate is important for both Australia and New Zealand. Many companies, including Westpac, operate on both side of the Tasman Sea and are therefore affected by the NZD/AUD. Australia is New Zealand's biggest trading partner (21% of merchandise exports), while New Zealand is Australia's fifth largest trading partner (5% of merchandise exports).

Of course, the NZD/AUD will always be more important to New Zealand, because NZ is five times smaller than Australia. Indeed, the NZD/AUD may be the most important exchange rate for judging whether the New Zealand Dollar is overvalued or undervalued. Australia looms so large on New Zealand's economic landscape that economic developments *in Australia* often affect the NZD/USD exchange rate (as they should). Such "third country effects" make it difficult to study the NZD against any other exchange rate.

As a case in point, the NZD/AUD has been very stable this decade, even as both currencies have varied wildly against the US Dollar. The US Dollar has been moving vis-à-vis the Australasian block. Some people in New Zealand have argued that monetary policy is responsible for the high NZD/USD, but that argument falls apart completely when one considers that the NZD is actually below historical average against the Australian Dollar.

The final reason to be particularly interested in the NZD/AUD is the closeness and integration of the two economies. Goods, services, labour and capital have all flowed freely between Australia and New Zealand for decades, and many regulations have been actively harmonised, making Australasia akin to a mini European Union. There is evidence that the NZD/AUD is more responsive to fundamentals than other currency pairs, possibly due to this integration.

The model's current NZD/AUD forecast

The NZD/AUD recently fell sharply, and is now below Fair Value. We expect the NZD/AUD to fall a little further this year, and to rise a little next year, but to remain below Fair Value over the whole period. The main reason we expect the NZD/AUD to remain below Fair Value is Australia's GDP growth, which is expected to outperform New

[1] http://www.westpac.co.nz/olcontent/olcontent.nsf/Content/Economic+&+Financial+Markets+reports?OpenDocument&refr=Agri

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Zealand's. (Fair Value itself is also expected to fall a little as Australia's interest rates rise by more than New Zealand's.)

Our forecast is at odds with the market consensus, which is that the NZD/AUD will depreciate much further. The key point of difference is Fair Value – our estimate of 0.87 is probably well-above the market consensus view. Our estimate of Fair Value is based on the inflation-adjusted average of the NZD/AUD over the past 15 years, which is 0.85, plus a small consideration for New Zealand's cyclically higher interest rates.

The second reason we doubt the NZD/AUD will fall much further is that New Zealand's commodity prices have been rising quickly and are expected to stay there or rise further, whereas Australia's commodity export prices are probably past their peak.

Figure 1: Fair Value NZD/AUD

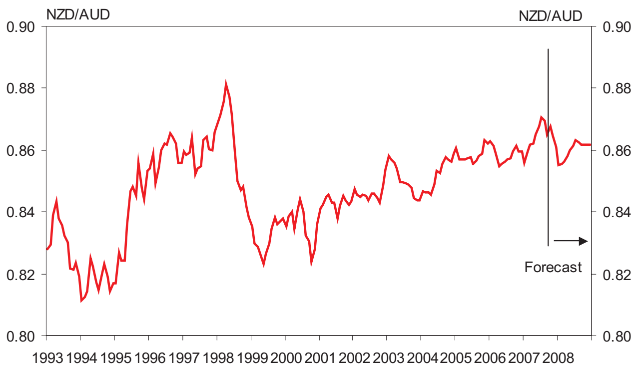
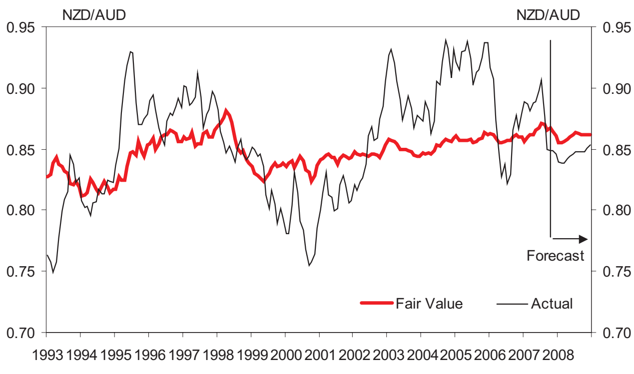


Figure 2: Forecast of NZD/AUD



How we did it

1. **Fair Value Model.** The estimate of Fair Value was based on the relationship between the exchange rate, interest rates, and inflation, according to two well-known economic theories, Uncovered Interest Parity and Purchasing Power Parity.[2] Fair Value has risen from 0.82 in the early 1990s to 0.87 today because New Zealand has experienced lower inflation. If recent inflation averages continue – 2.8% in Australia and 2.6% in New Zealand – Fair Value will continue to grind higher by 2% per decade.[3]

   The month-to-month variation in Fair Value is due to interest rates. Interest rates were especially important in 1998, when a sharp decline in NZ interest rates saw Fair Value fall by nearly 4 cents (about half of the total depreciation in the NZD/AUD that year). More recently, NZ's relatively higher interest rates have pushed the NZD/AUD Fair Value about 1 cent higher than it would otherwise be.

2. **Deviations from Fair Value.** Having isolated Fair Value, we then investigated whether Deviations from Fair Value were responsive to other economic fundamentals. We searched among a range of variables that could reasonably affect the exchange rate, and found that the most important were:

   - **Relative commodity prices** – if one country experiences an increase in it's commodity export prices of 10%, its exchange rate tends to rise by 1.3% against the other country.

   - **Relative growth rates** – if one country's growth rate accelerates by 1 percentage point, its exchange rate would appreciate by 0.5%. The exchange rate responds in the month the data is announced, not in the months in which the growth occurred. The impact is short-lived.

   - **NZ immigration** – if an extra 10,000 migrants were to arrive in New Zealand, the NZD/AUD would rise by 2% in the first year, and would still be 0.5% higher after two years. Australian migration patterns did not affect the exchange rate for two reasons – first, immigration in Australia varies far less than immigration in NZ; and second, most of the variation in immigration is actually between Australia and New Zealand, rather than to or from other countries. In other words, Australian and New Zealand immigration statistics mirror each other to some extent.

How good is the model?

Exchange rate forecasting is difficult. So difficult, in fact, that the benchmark for a useful model is one that can systematically outperform a "random walk forecast" (a naïve forecast that the future exchange rate will always be equal to today's exchange rate). Even this low benchmark is rarely exceeded when exchange rate

[2] 1% inflation in NZ = 1% lower Fair Value. 1% higher 2-year interest rate in NZ = 2% higher Fair Value.

[3] The gradual upward drift in the NZD/AUD is no loss of competitiveness for New Zealand exporters, and nor is it any disadvantage for Australian consumers – it is a simple inflation adjustment.

models are put through rigorous tests. Our model does indeed outperform a random walk in tough "out-of-sample" tests, so it can be considered useful.

The standard error for a one-month ahead forecasts is 1.3%, and for 6 month ahead forecasts the standard error is 3.3%. The model correctly picks the *direction* of the next month's move 61% of the time, and picks the correct direction over six months 76% of the time. The model will not be excellent at picking the exact timing of a turning point in the NZD/AUD. It will be most useful for identifying undervaluation and overvaluation, and for picking the direction over the next six months.

Figure 3: Predicted versus actual exchange rate

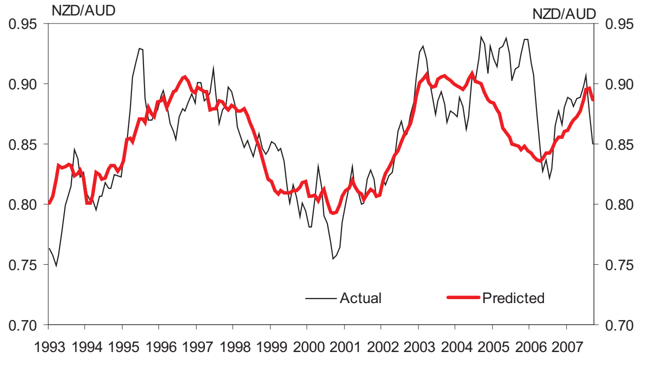
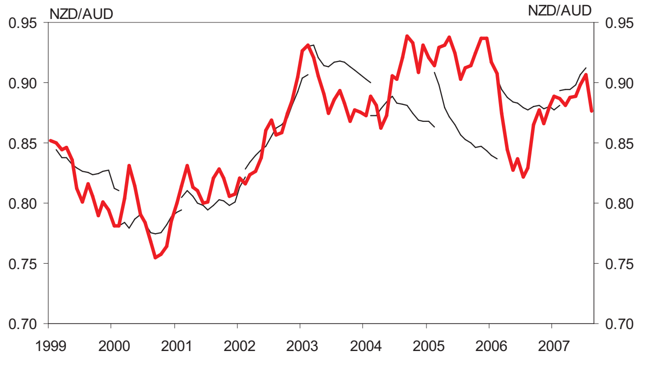


Figure 4: Out-of-sample forecasting performance



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