RODNEY'S RAVINGS take an open-minded and at times irreverent look at topical economic issues. Unlike our pay-to-view services, that are for the eyes of subscribers only, the **RAVINGS** are free and you may forward them to other people. Contact Denise Pilbrow (denise@sra.co.nz) if you want to be added to the distribution list for the **RAVINGS**, or to learn about our insightful pay-to-view services.

RODNEY'S RAVINGS

What really drives the major cycles in the exchange rate

EXECUTIVE SUMMARY

There is a widely held view that the level of NZ interest rates relative to US interest rates is the key driver of the USD/NZD exchange rate. This rule of thumb is rolled out regularly by economists and the media even though it is not well founded. In answering the question about what really drives the major cycles in the exchange rate this report focuses on the USD/NZD and on the NZD TWI (the traded-weighted exchange rate index that measures the performance of the NZD against the USD, AUD, Yen, Sterling and the Euro).

A high interest rate differential is said to attract foreign investors, but in reality the return to the investors/traders from exchange rate movements dwarfs the much talked about interest rate differential. The real game is about parking money in the NZ fixed interest market while the NZD is appreciating, and trying not to get caught holding NZ dollars prior to major depreciations.

As our analysis shows, higher NZ interest rates can result in a higher exchange rate, but they can also lead to a lower exchange rate, while a low interest rate differential can be associated with a high NZD. Overall the fit between the NZ-US interest rate differential and the USD/NZD exchange rate is poor. There is clearly much more to what drives the exchange rate than interest rate differentials.

Our analysis shows that the foreign investors are attracted to NZ when the economy is performing strongly. A strong economy is what drives an appreciating NZD and again it is the appreciating NZD that dominates returns for the foreign investors. Equally, the investors/traders get frightened off if signs of economic weakness emerge because if they hold the NZD during a period of economic weakness they face the risk of large capital losses on their NZD holdings that swamp the interest rate differential.

The analysis of what really drives the exchange rate leads to a counter-intuitive, but well-founded conclusion about what the Reserve Bank (RBNZ) should do if it wants to help the export sector and achieve the "rebalancing" in the economy it desires.

The RBNZ needs to hike the OCR more aggressively to hit the domestic economy. This is also needed to get domestic inflation down from the current rate of 4.1%. A deteriorating domestic economy would frighten the traders off because they would become more concerned about the risk of making capital losses on their NZD holdings than they would be attracted by the higher interest rates. A weaker domestic economy would also help exporters by reducing the pressure they are under from the excruciatingly tight labour market which is pushing up their cost of production relative to their overseas competitors.

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 30 April 2007

Myth busting the link between the interest rate differential and the NZD

There is a widely held view that the level of NZ interest rates relative to US interest rates is the key driver of the NZD/USD exchange rate. This rule of thumb is rolled out regularly by politicians, economists and the media even though it is not well founded. For example:

"Finance Minister Michael Cullen, who has tried to talk the dollar down in the past two years with little success, said yesterday he doubted the exchange rate would fall back to "realistic" levels until the Reserve Bank stopped raising interest rates." (The Press, 17 April 2007)

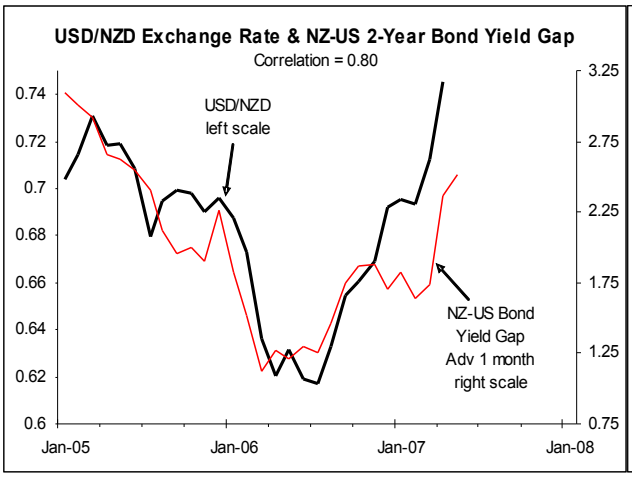
"Longer-term fundamentals - low growth and acute external imbalances - continue to counsel for a medium term downtrend in the NZD. However, NZ's relatively high interest rates are still providing support to the currency in the near term, and should continue to do so over much of 2007." (ASB Business Weekly Economic Report, 20 April 2007)

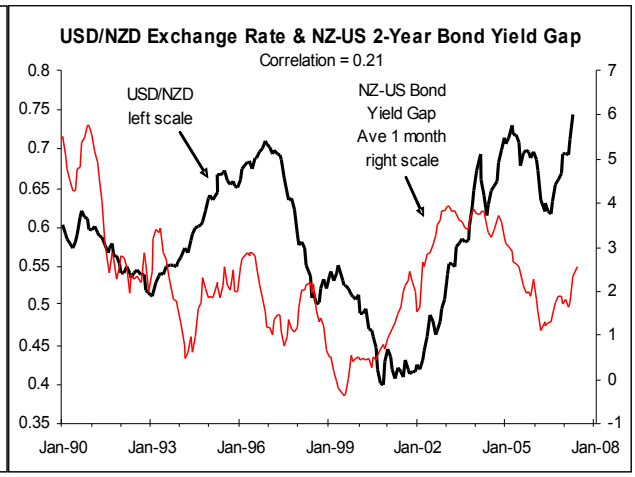
The left chart shows the relationship between the USD/NZD (the black line) and one measure of the NZ-US interest rate differential (the gap between the NZ and the US 2-year bond yields). Overseas investor interest in NZD-denominated 2-year fixed interest securities is a reason for looking at the 2-year interest rate differential in the context of the exchange rate, although the choice of maturities is not overly important.

The best fit between the two lines in the left chart is with the interest rate differential leading the exchange rate by one month, with a high correlation of 0.8 (1.0 being a perfect fit). So the claim that the interest rate differential drives the USD/NZD exchange rate has some empirical support, albeit using a highly selective slice of history starting in January 2005.

Unfortunately for those inclined to fall back on this rule of thumb, when a longer period of history is examined, as is done in the right chart, the relationship breaks down dramatically. Since January 1990 the correlation between the NZ-US 2-year bond yield differential and the USD/NZD exchange rate is a miserly 0.21 (i.e. much closer to a zero relationship than a perfect score of 1.0). The right chart shows that the current interest rate differential is around average, not high, while when the USD/NZD was last extremely high in 1997 the interest rate differential was below average. This is one busted myth.

Our brains are very good at finding patterns and so when people look at the right chart and tilt their heads a bit and squint with one eye they swear they can see a good relationship between the two lines (see the charts on page 5 for the really good relationships). The saying that there are liars, damn liars and statisticians has some truth to it, especially if is applies to statisticians or economists included to test rules of thumb using selected periods of history (i.e. the left chart). However, we have not yet met a correlation that lied where it was calculated over a representative period of history (i.e. the right chart).





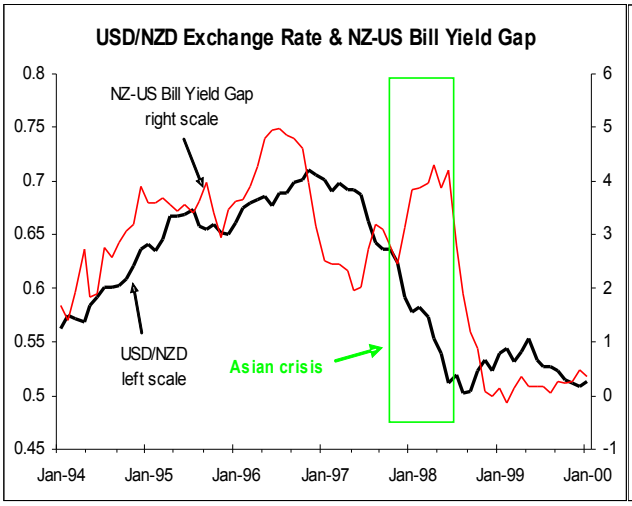
In addition to the general poor fit between the interest rate differential and the USD/NZD in the right chart above, the Asian crisis in 1997 provides a superb case study that further busts the myth about the link between interest rates and the exchange rate.

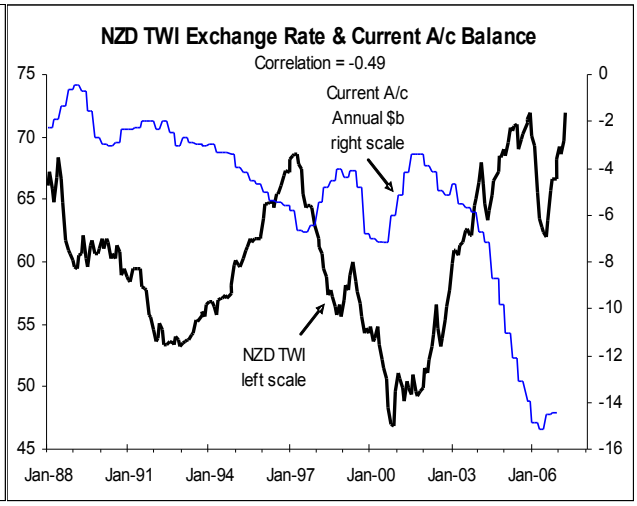
In October 1997 equity markets in Thailand, South Korea, Malaysia and Taiwan started tumbling and what became known as the Asian crisis officially started. The equity market collapses signalled that there were fundamental economic problems in these countries. The direct consequence was that a significant number

of NZ exporters to Asia soon felt the chill winds of the economic crises in these countries. The foreign exchange market reacted quickly and pushed the NZD down, especially relative to the USD (see the area in left chart below highlighted by the green box). The RBNZ was concerned that the falling NZD would push up import prices, so it forced local interest rates up, with NZ short-term interest rates rising dramatically relative to US short-term interest rates (see the red line in the chart). But despite a large increase in the NZ-US interest rate differential in late-1997/early-1998 the NZ dollar did not appreciate against the USD, instead it kept falling.

The RBNZ was the only central bank to respond to this negative external shock by forcing up interest rates. The foreign exchange market reacted by pushing down the NZD in response to the higher interest rates because it could see that the NZ economy was at risk of heading into a recession, made more likely because the summer of 1997/98 delivered one of the worst droughts in many years.

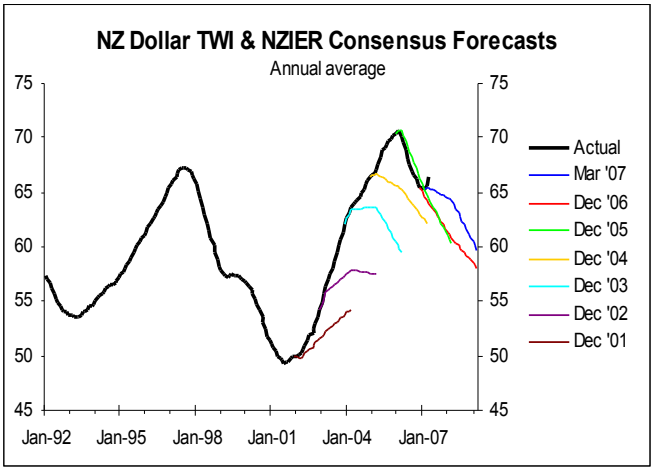
As an aside, the right chart below shows the relationship between NZ's external current account deficit and the level of the NZD as measured on a TWI or trade-weighted basis against the currencies of our major trading partners. If NZ's external deficit deteriorates, as it has dramatically over the last few years, economists generally assume this is reason for a lower NZD. However, as the chart shows, there is more often than not an inverse relationship between the external balance and the exchange rate. The correlation is -0.49 (a negative correlation reflects an inverse relationship, with -1.0 being a perfect inverse relationship). So you will not find us talking about the external deficit in the currency section of our monthly **Interesting Times** report, rather we focus on what really drives the exchange rate.





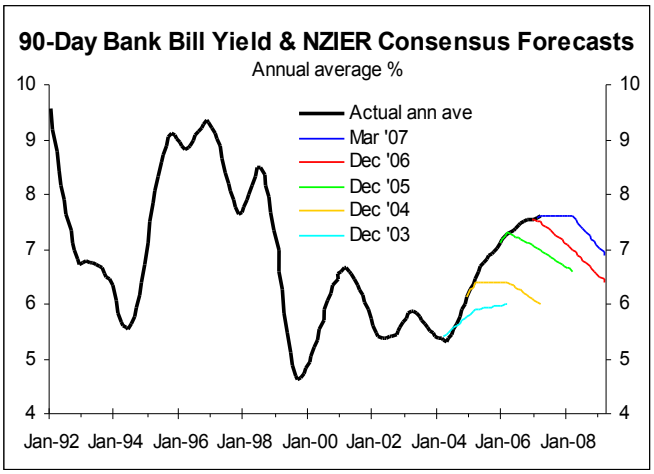
The economists' currency forecasts exhibit latent "mean reverting" tendencies

Once a quarter NZIER surveys the bank economists, the RBNZ, Treasury and themselves. The coloured lines in the chart below reflect the average forecasts of the economists surveyed for the NZD TWI, the dates are when the surveys were conducted (e.g. the light blue line is from the December 2003 survey).



Aside from showing that the economists are not very good at forecasting the exchange rate, the interesting feature of this chart is the tendency for the forecasts to "mean revert". When the NZD TWI is below the historical average, as it was in December 2001, the economists forecasts that it would increase. With the NZD having been above the historical average since late-2003 the economists have kept predicting that it will fall over the next couple of years.

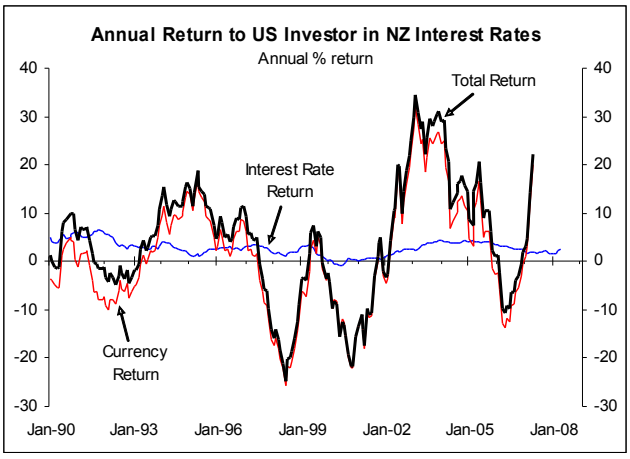
Having a consistent framework for forecasting is meritorious, but when the forecasts rely on "mean reverting" assumptions you would be better off employing monkeys armed with darts.



The "mean reverting" tendencies of the economists are also exhibited in their interest rate forecasts. The coloured lines in the chart are the average forecasts of the economists surveyed by NZIER and again the associated dates reflect when the respective surveys were conducted.

When the 90-day bill yield, the key short-term wholesale interest rate, was below the **recent** historical average of around 6% the economists predicted that it would increase (e.g. December 2003), but once it rose above the **recent** average they kept predicting that it would fall. Interestingly, the economists generally but not always forecast falling interest rates to coincide with a falling NZD.

Why the importance of interest rate differentials is massively overstated



The blue line in the adjacent chart shows the annual return a large financial institution could have gained from borrowing money in the US for one year and investing it in NZ for one year. In the last few years the NZ yield has at times been twice the US yield, which to some seemed like easy money.

To gain this return the investors are exposed to fluctuations in the USD/NZD exchange rate. In good years a US-based investor could gain 30% from the exchange movement in addition to the interest rate premium, but in a bad year the investor could lose 20% of the capital value of their investment, which swamped the return from the interest rate differential.

The black line in the chart above shows the total annual return to a US-based investor or trader, including the benefit of NZ's interest rate premium (the blue line) and the impact of exchange rate movements (the red line). The chart makes abundantly clear that the return to the investors/traders from exchange rate movements dwarf the much talked about interest rate differential.

The real game is about parking money in the NZ fixed interest market while the NZD is appreciating, and trying not to get caught holding NZ dollars prior to major depreciations. So the interest rate differential between NZ and the US is not only poor at explaining the major cycles in the USD/NZD exchange rate, the differential is swamped by movements in the exchange rate itself in determining the returns made by US-based investors. So what does drive the major cycles in the exchange rate?

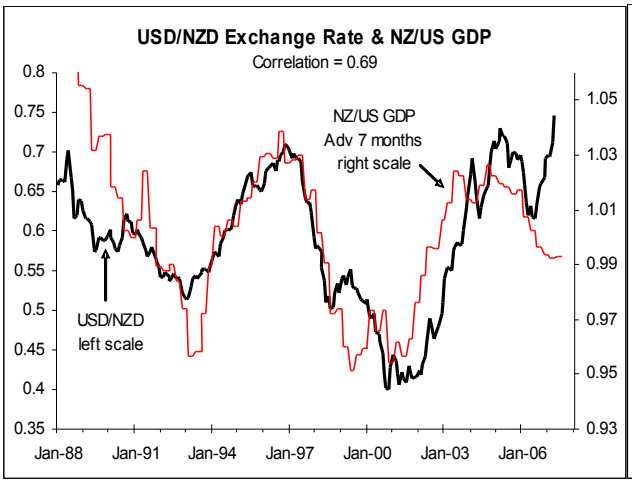
Now for what really drives the major cycles in the exchange rate

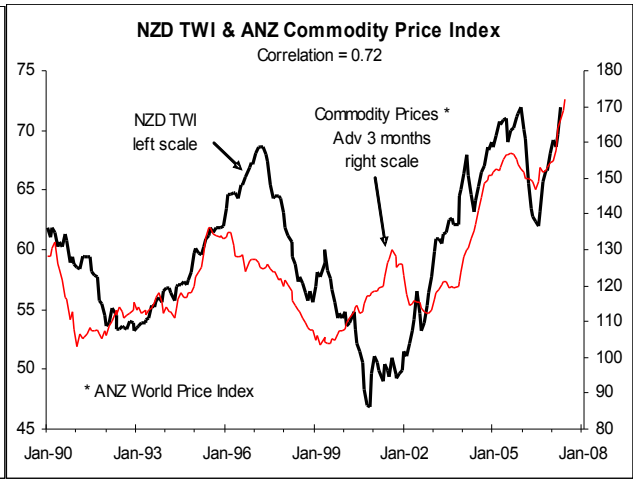
The big financial institutions and traders do dominate exchange rate movements. The magnitude of the funds they have available to invest in, or withdraw from NZ swamps the currency flows associated with exports and imports. So what turns the investors and traders on and off NZ?

Years ago Prime Minister Lange labelled the foreign exchange traders "reef fish", which was not only amusing but also accurate. In the same way reef fish like hot tropical waters, the big traders like hot economies. When the NZ economy is hot it will normally not only have high interest rates, but the rates are likely to stay high for a protracted period. An economy is much like a super-tanker in that once it gets a head of steam up it keeps charging ahead for much longer than the economists are willing to forecast or able to comprehend. However, when NZ economic growth starts to look shaky the reef fish are quick to seek warmer waters elsewhere, which results in the NZD falling, especially against the USD but generally also against most currencies. It is a classic case of the early reef fish making massive currency gains and escaping large currency losses, while the Johnny-come-last reef fish gets fried.

The evidence of this behaviour is provided in the charts below. The top left chart shows a pretty good general relationship between the USD/NZD exchange rate (the black line and left scale) and NZ relative to US economic activity or GDP (the red line). The best fit, with a correlation of 0.69 (again 1.0 is a perfect fit), is with NZ/US GDP leading the major cycles in the exchange rate by seven months on average. This chart explains why the NZ dollar fell against the US dollar in the first half of last year, but does not explain the recent strength of the USD/NZD. However, there are a number of key indicators that drive the traders' views on whether the NZ economy will be hot, tepid or cold, and all need to be considered, including the impact of changes in the interest rate differential.

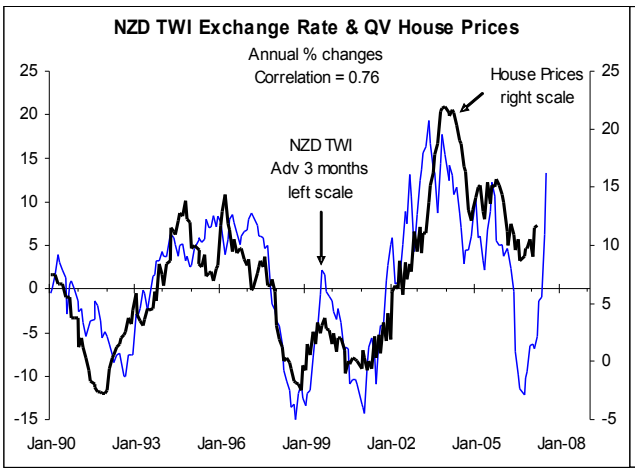
Movements in international commodity prices relevant to NZ will shape the traders' views on NZ economic prospects (see the top right chart). The black line this time is the NZ dollar on a trade-weighted or TWI basis, while the red line is ANZ's measure of NZ export prices in world price or foreign currency terms. The best fit, with a correlation of 0.72, is with commodity prices leading the NZD by three months. The behaviour of commodity prices goes some way to explaining why the NZD fell last year and why it has rebounded strongly since mid last year.

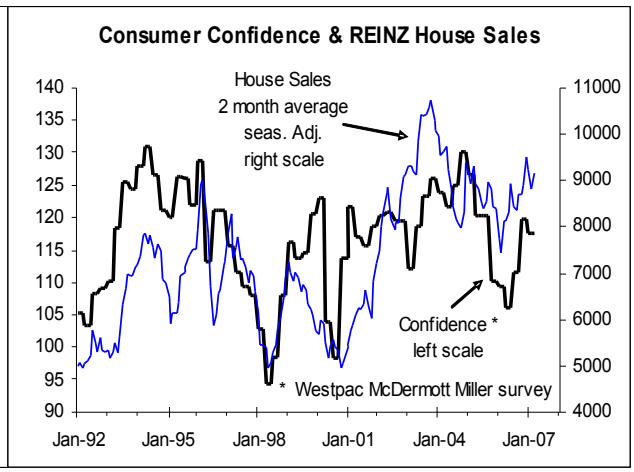




Each month the traders see ample data on the NZ housing market (e.g. house sales, two lots of house prices - REINZ and QV - and building consents). Consequently, the strength of the housing market plays an important part in shaping their perspective on the strength of the NZ economy.

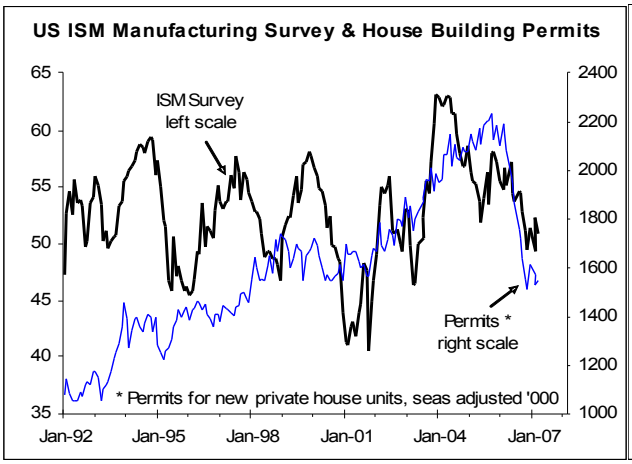
The left chart below shows that the annual % change in the NZD TWI is pretty well correlated with NZ annual house price inflation, with the best fit being with the currency leading house price inflation by three months. This three month lead reflects the traders being forward-looking with respect to house price inflation, which makes sense because changes in the level of house sales (blue line, right chart) lead house price inflation by three months. In the context of the left chart, the fall in the NZD last year was premature and the continued above average level of annual house price inflation meant a rebound in the currency was possible. Equally, the fall in both house sales and consumer confidence last year and the subsequent rebound (right chart) explain the recent mini-cycle in the exchange rate.

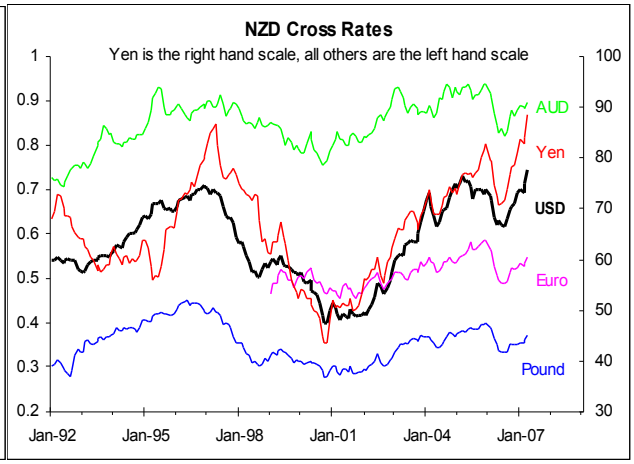




The state of leading indicators for the US economy also need to be taken into account in explaining the behaviour of the USD/NZD exchange rate, which we do in our **Interesting Times** reports with the aid of charts like the left one below which shows two key indictors of the US economy. The recent weakness in a number of US leading indicators has played a part in the strength of the NZD or, more accurately, in the weakness of the USD.

While we have focused on the USD/NZD and the NZD TWI, the right chart below shows that the NZD rises and falls against the USD at about the same time it rises and falls against other currencies, although the magnitude of the movements differs, largely related to developments in the relevant economies. However, in general NZ-specific developments will play the major part in whether the NZD appreciates or depreciations against other currencies in general.





Hopefully it has become abundantly clear that multiple factors are responsible for the behaviour of the exchange rate. While interest rate differentials play a part, the charts show that other factors, especially those relevant to the strength of the NZ economy, are much more important than interest rate differentials. Subscribers to our monthly **Interesting Times** report will be both kept abreast of developments in the relevant factors that drive the exchange rate and be privy to our views on the outlook for the exchange rate.

Finally, interest rates and the state of the economy are directly linked. The real irony for the devotees of the interest rate differential-exchange rate rule of thumb is that the best way for the RBNZ to help the export sector is to whack up interest rates and hurt the domestic economy, which would send the currency traders or reef fish packing. While exporters would be exposed to higher interest costs, higher interest rates is the fastest route to getting the currency down and, in time, to help alleviate exporters from the undesirable impact of the excruciatingly tight labour market.

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