Monetary policy challenges in New Zealand: how are we different?

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ABSTRACT

A striking feature of the New Zealand economic picture is the persistently high level of real interest rates compared with elsewhere. We argue that this is because New Zealand has a higher neutral real interest rate, embodying a "New Zealand differential" of up to 200 basis points. While the neutral real rate appears to have declined over the 1990s in step with similar declines elsewhere, the New Zealand differential has persisted. Some possible underlying drivers of this differential are discussed.

Disclaimer: The views expressed in this paper are those of the authors, and do not necessarily reflect those of the Reserve Bank of New Zealand.

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1. Introduction

New Zealand has a bit of a reputation as an innovator in monetary policy. As the first in the world to introduce inflation targeting, it has subsequently seen its model adopted by many of the best regarded central banks in the world, with more countries following suit each year.

Likewise, New Zealand is one of the very few countries to have maintained a policy of extreme non-intervention in exchange markets, with no central bank intervention since the introduction of floating exchange rates in 1985.

These policy steps, along with wide-ranging structural reforms to labour and product markets and public sector management, have in the past been held up as examples of best practices for the rest of the OECD. In more recent years, however, the continued slow trend growth of New Zealand has taken the spotlight as observers have puzzled over why such laudable policy has not delivered better results in one of the areas that really matters, namely achieving stronger growth in average real living standards.

One of the striking features of the New Zealand economy is the persistently high level of real interest rates, which raises the cost of debt financing in New Zealand relative to other countries. To the extent that this is not driven by a higher marginal product of capital in New Zealand, this is an obstacle to investment and thus to growth. The causes of high real interest rates are therefore important to study, and in particular to determine whether these might be connected to monetary policy.

One view is that once inflation has become low and stable, monetary policy on its own is not capable of generating more rapid growth[1], though poorly conducted monetary policy may still harm growth performance by unduly creating or allowing shocks which eventually disturb the real economy[2]. In a standard Barro-Gordon framework, unduly high interest rates will over time lead to inflation falling below target. The inflation track record in New Zealand is nevertheless one of inflation persistently in the upper half of the target band, with occasional breaches of the top of the band.

So what is going on? We are left with an unexplained "New Zealand differential" in real interest rates, and by implication also the neutral real rate. This is one of several unobservable economic variables that we need to understand better. The remainder of this paper is structured as follows. Section 2 documents the higher interest rates in New Zealand versus elsewhere. Section 3 provides alternative measures of the New Zealand differential, as embodied in the (also unobservable) neutral real rate. Section 4 discusses potential underlying drivers of the New Zealand differential. Section 5 concludes.

2. Observables and unobservables

How big is the New Zealand differential and how has it been evolving? Figure 1 below shows average inflation and interest rates in a number of countries 1992-2002. New Zealand is an outlier, with higher interest rate levels than elsewhere, even though inflation performance is broadly in line with the rest.

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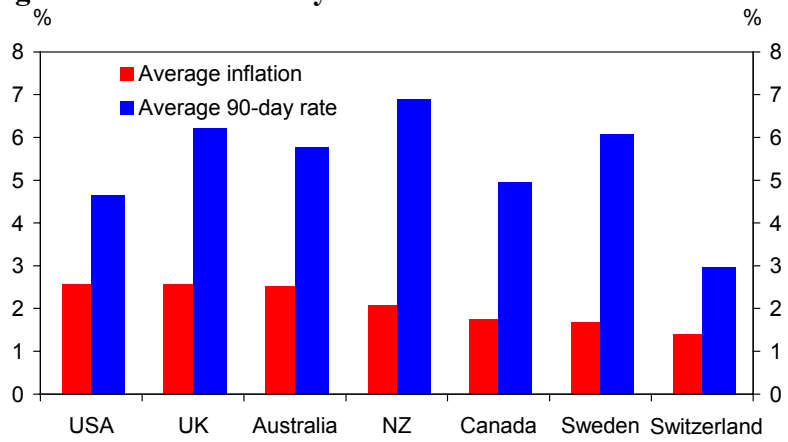
[1] See for example Brook, Karagedikli and Scrimgeour (2002) for a review of the inflation and growth literature.

[2] Such shocks would include excessively sudden large movements in interest rates, or excessive volatility in output. Unnecessary output volatility can result from too much or too little central bank activity: the central bank may not respond enough to offset such shocks that can be offset, or may run overly loose monetary policy which permits imbalances to develop that require more severe adjustment processes later. Likewise, overly tight monetary policy may push an economy into recession or choke off a recovery.

Figure 1. Average inflation and 90-day rates 1992–2002



Can overly tight monetary policy be an explanation for the generally high policy real interest rates in New Zealand? When we observe New Zealand inflation performance relative to target, there is an upward bias which suggests that if anything, monetary policy has been overly loose on average. Inflation has generally been in the upper half of the target band, with occasional breaches of the upper band in 1999 and again in 2001-2.

An alternative hypothesis is that New Zealand simply has a higher neutral real interest rate (NRR) than elsewhere. The neutral real rate can be thought of as the "normal" real interest rate in the economy when inflation is stable, on target and all cyclical influences have been stripped out. If New Zealand is well-integrated into global capital markets, then the difference between the New Zealand neutral real rate and other countries' NRRs should give us some indication of the size of the New Zealand differential.

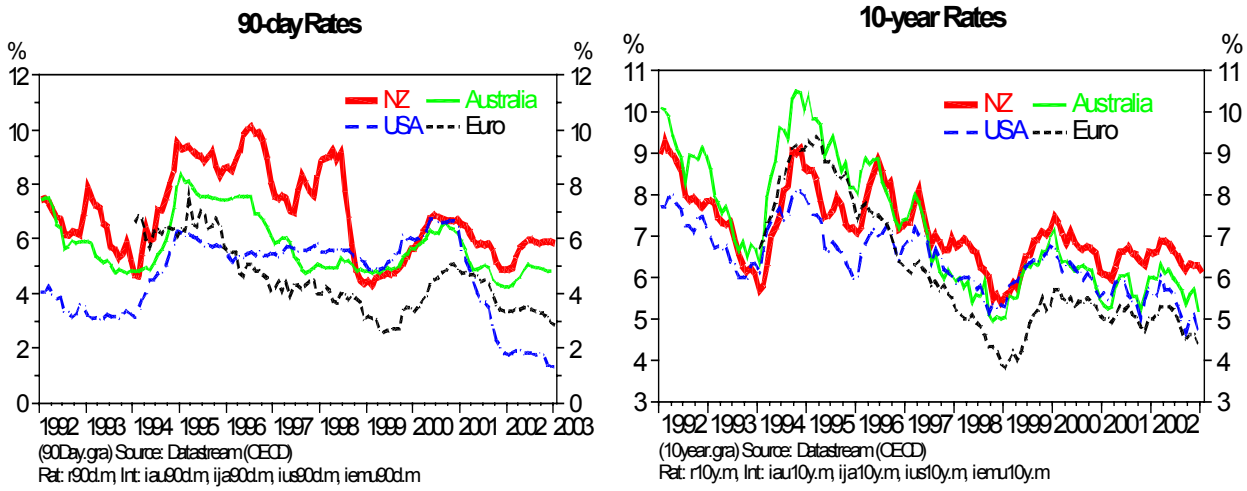
Regardless of its cause and its sub-components, there are two reasons why the size of this differential matters for monetary policy. First, it is an important component of the interest rate level which corresponds to a neutral setting in the economy, i.e. tending neither to stimulate nor hold back domestic activity. Therefore, a positive differential will justify interest rate levels that are higher than overseas, all else equal.

Second, it is a factor determining the loan servicing capacity of borrowers, and thus the equilibrium level of domestic asset prices, including housing. A permanent downward shift in this differential, or in any other component affecting the neutral real rate (such as the world neutral real rate), would imply a decrease in the rate of return on riskless assets. This would increase the equilibrium amount of debt leveraging in the economy and have a potentially large upward impact on the prices of all assets typically financed by debt.

For this second reason, we need to pay attention not just to the evolution of the New Zealand-specific interest rate differential, but also to any other components of the interest rate that exhibit persistent shifts over time.

Over recent economic cycles, both long and short interest rates in New Zealand have tended to be higher than overseas, including in Australia (Figure 2).

Figure 2. 90-day rates and 10-year rates in New Zealand and elsewhere



The differentials have been larger than one might expect to result from differences in some fundamentals, such as inflation, government debt and expected exchange rate depreciation; subtracting these factors out, we are left with a residual that comprises a country-specific differential.

Hawkesby, Smith and Tether (2000) have calculated and studied precisely this 'New Zealand differential', taking the view that it reflects of the willingness of foreign investors to take a position in New Zealand capital markets. This loosely translates into a market-based risk assessment associated with liquidity, currency volatility and default[3]. This explanation focuses on the role of the foreign investor as the supplier of capital at the margin. An alternative explanation, which shifts the focus to the New Zealand borrower's demand for funds, is that the high real interest rate could reflect a temporary state, while the economy is in transition toward a higher level of debt following financial liberalisation and increased integration into global capital markets. As a constraint is removed to New Zealanders achieving desired capital stocks and levels of indebtedness that previously were unobtainable, borrowing soars and interest rates rise above long run equilibrium levels until stocks have adjusted.

3. Estimating the size of the New Zealand differential

National central banks make operational estimates of the neutral real rate that they believe they face domestically. Operationally, the concept of a neutral monetary policy provides a benchmark level against which an assessment can be made as to whether monetary policy is stimulating or slowing the economy. There are several different approaches to estimating the neutral real rate, as outlined below.

3.1 The averaging method of calculation

Over the business cycle, the interest rate should be broadly neutral. One way to estimate the NRR is therefore to average over a long time period (preferably multiple cycles) and correct

[3] Hawkesby et al solve for a "currency risk premium" as a residual after the effects of liquidity risk, default risk and PPP-based expected changes in the exchange rate have been accounted for. Estimates of this "currency risk premium" are around 200-400 basis points against the US and 100-150 basis points against Australia, with huge confidence intervals. An implication is that if New Zealand were to enter into a currency union with Australia or the United States, the currency risk premium would be eliminated.

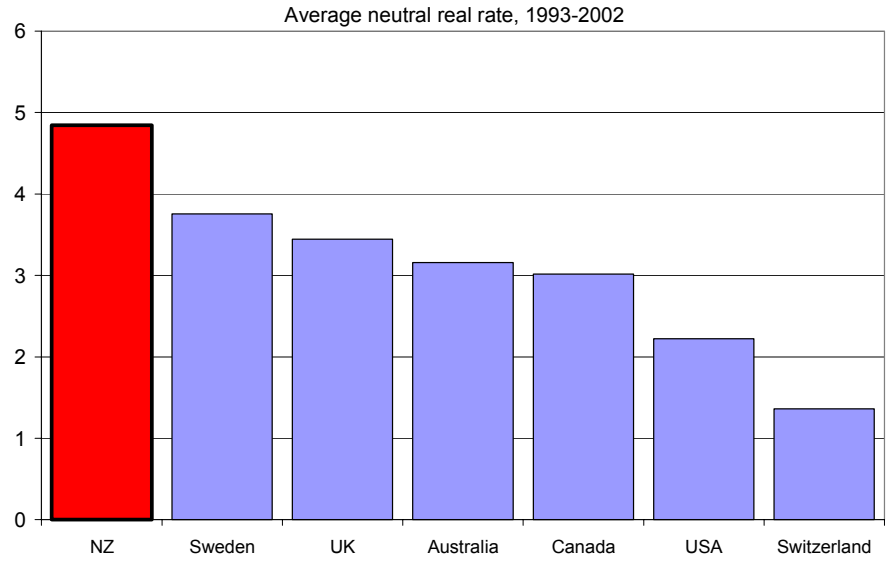
for inflation, which then yields a stable benchmark rate. This approach has been recommended by Blinder (1998), who recommended averaging over 40-50 years.

While this is a robust method given that it encompasses several business cycles, it is not always useful from a policy perspective, for two reasons. First, economies can undergo prolonged periods of transition, with effects lasting over several years. During these periods, the NRR may reliably deviate from the long run average. Second, many countries have only relatively recently integrated well into global capital markets, and this has structurally changed relationships determining the neutral real rate. Perhaps for these reasons, the BIS (2002 p.72) simply calculates 10-year moving averages.

Archibald and Hunter (2001) compute a range of estimates of the NRR for New Zealand by averaging historical real interest rates over the period of stable inflation under the current inflation targeting regime 1992-2000. Deflating nominal 90-day interest rates by several alternative measures of inflation, the estimates of the average NRR over this time period ranged from 4.3 per cent to 5.6 per cent.

Taking a straight average of 90-day rates minus inflation since 1993, New Zealand comes out having neutral rates that are on average 200 basis points higher than the US and 100-150 basis points higher than other inflation targeting developed countries (Figure 3).

Figure 3. Average neutral real rate, 1993-2002



Particular stories can be told about the reasons for high real interest rates in Sweden and the UK. The start date of 1993 was chosen because Sweden and the UK adopted inflation targeting after being pushed out of fixed exchange rate regimes in 1992. Accordingly, Sweden and the UK had very high real interest rates for some time post-1992 as the central banks rebuilt lost credibility and leaned against inflationary pressures of devaluations.

New Zealand may have faced such issues as well, though as discussed in more detail below the surveyed inflation expectations data does not support this. In any case, it seems implausible that such effects would have been much stronger in New Zealand during 1993-4 than in the UK or Sweden. This only goes to strengthen the argument that New Zealand is an outlier with respect to high real interest rates on average.

A potentially serious problem with averaging is that it cannot take into consideration cyclical or structural factors which cause the neutral real rate to vary over time, which may include changes in productivity growth or a process of financial liberalisation/integration. It also assumes a zero trend in the NRR over the relevant time period.

Taken at face value as estimates of the present NRR, the number for New Zealand seems implausibly high. With expected inflation currently running at about 2.5 per cent, the average neutral real rate number suggests that monetary policy would continue to impart stimulus to the economy at nominal levels of around 7 per cent. Consequently, it has become generally accepted that neutral real rates in New Zealand have declined over the course of the 1990s to a lower level at present, perhaps reflecting such factors as post financial liberalisation convergence to overseas levels or gradual gains in central bank credibility over time. Plausible NRR estimates need to be able to reflect this trend decline.

3.2. The real interest rate gap

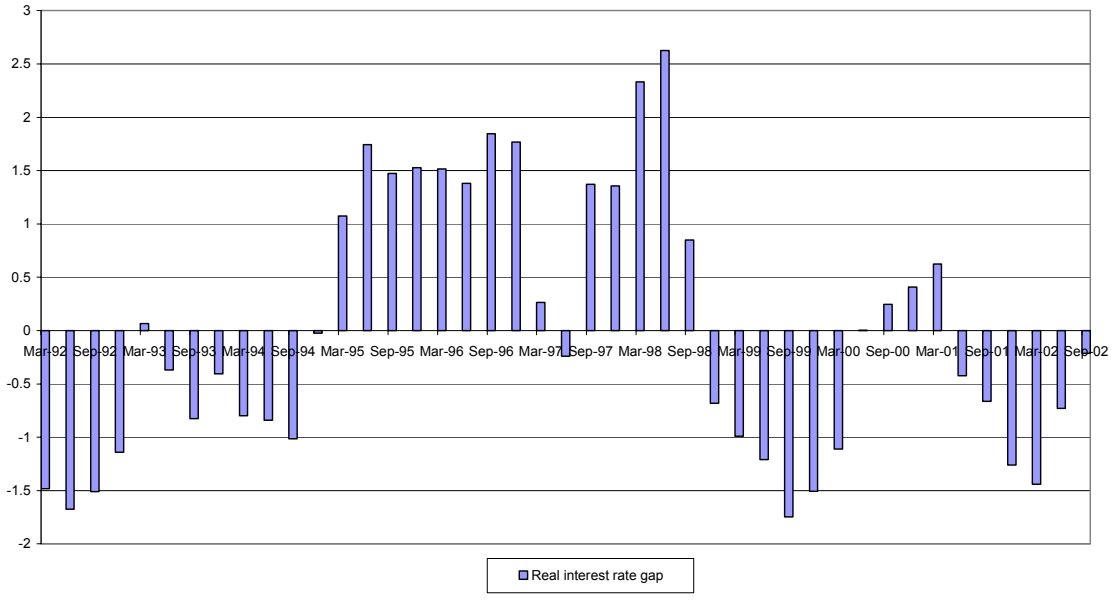
Besides the averaging approach, it is also possible to back out a NRR estimate from an alternative method of detecting monetary policy deviations from neutral settings. This involves considering the extent to which the slope of the yield curve differs from "normal", with a steeper-than-normal yield curve indicating expansionary monetary policy. The idea is that over the business cycle, monetary policy settings must on average be neutral if inflation is stable. Likewise, short and long interest rates move procyclically, but short rates move by more than long rates. Then, over the business cycle, the yield spread will revert to its mean. This analysis abstracts from level considerations of the interest rate, and instead gives an alternative measure of whether monetary policy is tight or loose.

Doing this for New Zealand, we derive an indicator for when monetary policy has differed from neutral. Figure 4 plots the real interest rate gap series, computed as

$$(1) \qquad rirgap_t = r_t - R_t - \left(\bar{r} - \bar{R}\right)$$

where R is the 10-year interest rate and r is the 90-day rate.

Figure 4. The New Zealand real interest rate gap 1992-2002



Once a baseline yield curve slope has been established and a real interest rate gap computed, a neutral real rate (NRR) can be backed out of the analysis. This is done in equation 2, by subtracting the real interest rate gap from the 90-day rates to get the short term neutral nominal rate, then subtracting out expected inflation one year ahead.

$$\begin{aligned} NRR &= r_t - rirgap_t - \pi^e \\ &= R_t - \left(\overline{R} - \overline{r}\right) - \pi^e \end{aligned} \tag{2}$$

Thus, the level of the short term neutral real interest rate is determined from the nominal 10-year interest rate, minus a constant representing the sum of the average yield spread and expected inflation.

We treat inflation expectations as roughly constant, and believe the term premium to be mean-reverting. To illustrate more clearly the implications of these assumptions, we can write out long interest rates generically as the weighted average of expected future short rates:

$$R_t = (1-\rho)\sum \rho_t^i r_{t+i} + \alpha_t \tag{3}$$

where, as before, R_t is the long term nominal interest rate, r_t is the short term nominal interest rate, and α_t is the term premium. Nominal short rates in each future time period are conventionally understood to be real interest rates plus inflation:

$$r_{t+i} = \phi_{t+i} + \pi_{t+i}^e \tag{4}$$

where the ϕ_{t+i} represents real interest rates. Substituting equation (4) into (3) gives the following:

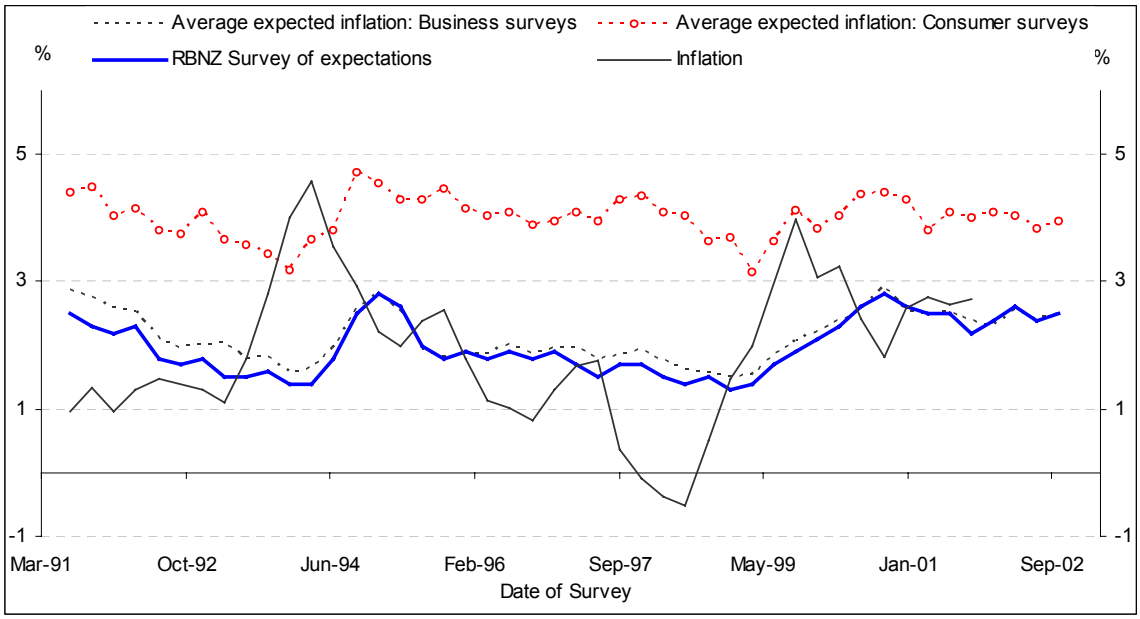
$$R_t = (1-\rho)\sum \rho^i \phi_{t+i} + (1-\rho)\sum \rho^i \left(\pi_{t+i}^e\right) + \alpha_t \tag{5}$$

The long term nominal interest rate is now written as a combination of three terms: long term real interest rates as the weighted average of short real rates in the future, an inflation expectations component, and the term premium.

As mentioned, we assume that inflation is well-anchored. This is perhaps an ambitious claim to make, especially for the early part of the sample. It would be reasonable to expect some slowness in adjustment of inflation expectations to reflect a "new order" of inflation targeting. Available expectations surveys are nevertheless suggestive of a surprising amount of stability (see figure 5), unlike what has normally been experienced in other countries[4]. For this reason, it is important to remain open-minded about the matter, and aware of the price stability assumption.

[4] David Gruen has observed that in Australia, following a step down in trend inflation rates from around 8 per cent in the 1980s to 2-3 in the 1990s, it took inflation expectations (either bond market derived or survey-based) quite a long time to come down, lagging by several years the decline in actual inflation.

Figure 5. Surveyed inflation expectations in New Zealand.



With stable inflation expectations, the long rate can be written as

$$R_t = (1-\rho)\sum \rho^i \phi_{t+i} + \overline{\pi} + \alpha_t \tag{6}$$

Now we can rewrite equation (2) as

$$NRR_t = (1-\rho)\sum \rho^i \phi_{t+i} + \alpha_t - \overline{\alpha} \tag{7}$$

Equation (7) makes explicit that under stable inflation expectations, the neutral real rate is a forward-looking weighted average of expected future short real rates plus the deviation of the (cyclical) term premium from its mean. At any time t, the cyclical fluctuation in ϕ should be counterbalanced by the cyclical fluctuation in α.

Figure 6 below plots equation (2), using RBNZ-surveyed 1 year ahead inflation expectations (which are quite stable over the period), and the result is a broadly downward trending neutral real rate estimate, which is currently somewhere just below 4 per cent after declining by an estimated 200 basis points since 1992. The series itself is noisy, mostly due to the volatility of the 10-year rate, so two filtered trends of the series are included.

The first filter is a simple Hodrick-Prescott filter of the underlying series from equation (2).

The second is a Kalman filter based estimate, derived by allowing both the neutral real rate and the equilibrium yield curve spread to fluctuate. Specifically, the signal equations are

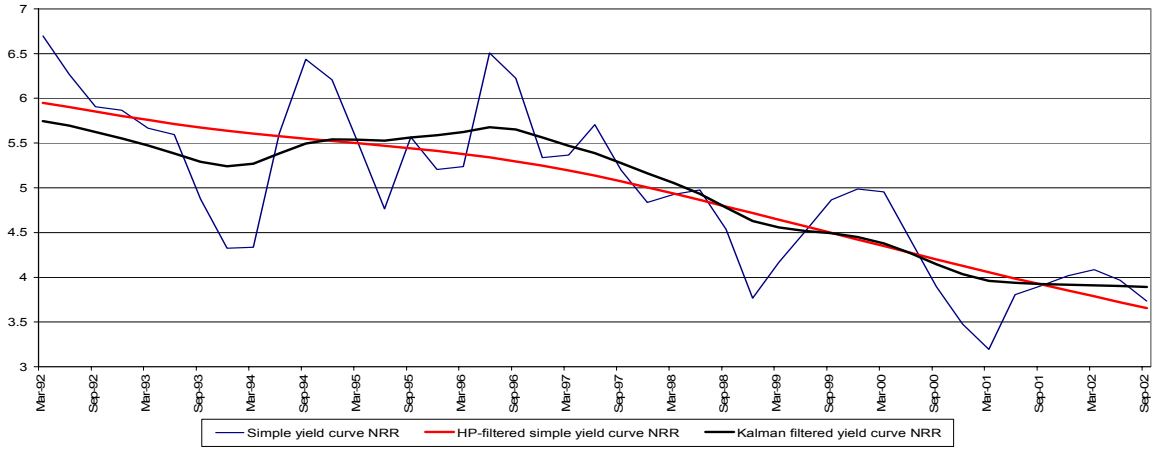
$$\begin{aligned} r_t &= r_t^* + \pi_t^e + e_{1,t} \\ R_t &= r_t^* + \alpha_t + \pi_t^e + e_{2,t} \end{aligned} \tag{8}$$

and the state equations are given by

$$\begin{aligned} r_t^* &= r_{t-1}^* + \varepsilon_{1,t} \\ \alpha_t &= \delta_0 + \delta_1 \alpha_{t-1} + \varepsilon_{2,t} \end{aligned} \tag{9}$$

where r* is the NRR and α is the term premium or yield curve spread. It is interesting to allow for cyclical fluctuations to the yield curve spread, as well as possible productivity-related shifts associated with "new economy" effects. Fixing the equilibrium yield curve spread did not change the profiles of the curves by much, however, since the yield curve spread appeared to be mean-reverting for this period. For this reason, the two estimates are in fact very similar.

Figure 6. Real interest rate gap estimates of the neutral real rate



The same analysis can be done for a number of other countries, for comparison.[5] Instead of inflation expectations, however, we used actual CPI inflation in equation (2) for all countries except for New Zealand. Figure 7 presents Kalman filtered estimates of the neutral real rate for New Zealand, the United Kingdom, Australia, Canada, the United States and Switzerland. From the figure, it seems that the neutral real rate has fallen in a large number of countries, though notably not in the United States.

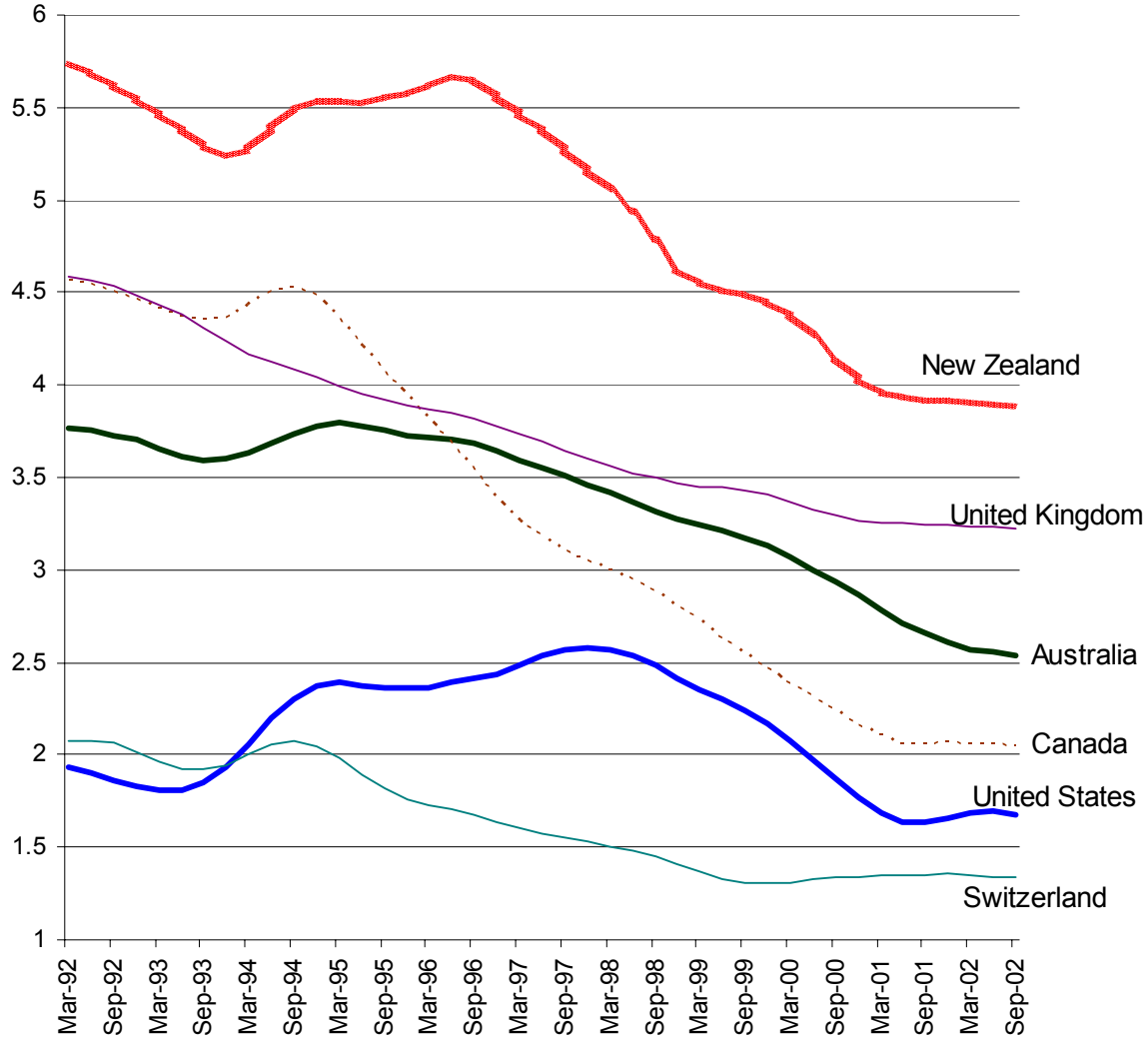
The reasons for the downward trend overseas may be related to increased credibility worldwide of policies and frameworks designed to secure price stability, or may reflect other fundamentals, but are in any case exogenous to New Zealand.

In the world economy, the world NRR is determined by supply and demand for funds overall. If the world NRR falls, then New Zealand's NRR must eventually fall, since the marginal supplier of capital to the New Zealand economy is a global investor who is assessing the risk-return ratios of substitutable assets across the world. In other words, foreigners' willingness to let New Zealanders borrow funds is largely determined by their opportunity cost, what expected returns are in other markets around the world.

The lack of a downward trend in the United States NRR, along with an upward bulge during the second half of the 1990s, seems to match quite well a large number of alternative retrospective estimates of the NRR as presented in fig. 4, p. 54 of Orphanides and Williams (2003). Several plausible stories can be constructed around the evolution of the other neutral real rates, but this is clearly an area where more analysis and empirical testing is needed.

[5] All of the yield curve spreads exhibited stationarity over the time period 1992-2002. This finding itself is somewhat remarkable, and may be due to the fact that the economies included were broadly at the same phase of the business cycle in 1992 and in 2002, even though several had desynchronised interest rate cycles during the period in between. The unit root tests suggest the presence of non-stationarities in the yield gap series for several countries if the sample period extends back into the 1980s.

Figure 7. Yield spread based estimates of NRRs



Once again, the New Zealand differential over the United States seems to be on the order of 200 basis points, and the differential over other inflation targeting countries somewhere around 50-150 basis points.

Robustness considerations

There are three shortcomings with the yield curve approach to assessing monetary policy settings. First, there is a circularity in the derivation of the benchmark, in that the Reserve Bank looks to financial markets for guidance into what constitutes neutral monetary policy settings, while financial market players act depending in part on their expectations of what the central bank is going to do in the future with policy rates[6]. While the approach above interprets the term structure of interest rates as indicative of current policy tightness, the term structure can in principle also be interpreted as an indication of market expectations as to future monetary policy decisions.

[6] Normally long rates should reflect the unwinding of temporary imbalances in the economy over the time horizon, productivity developments, the evolution of yields on alternative investment opportunities, etc, though it is in theory possible that the effect on long rates of all of these factors can be swamped by second-guessing of what monetary policy authorities are likely to do.

The relationship between policy rates and real economy variables can of course be explicitly modelled. Neiss and Nelson (2003) get around the problem by constructing a neutral real interest rate[7] out of a calibrated model for the UK economy, and comparing this to policy interest rates. This approach nevertheless relies on the correct specification of the model, and in particular how well it distinguishes persistent shocks from transitory blips. An intermediate approach is that adopted by Plantier and Scrimgeour (2002), who use a Kalman filter to back out the New Zealand neutral real rate from a Taylor rule fitted to New Zealand policy interest rates 1990-2002. The 90-day rate was used as a signal of the development of the neutral real rate, which yielded a declining NRR. As is a problem with most filters, however, there was considerable endpoint uncertainty, and the final estimates of the NRR in the post-September 11 world were unrealistically low. Yet another approach is that of Laubach and Williams, who use a Kalman filter to jointly estimate the NRR, the natural rate of output and the trend growth rate. This is an appealing approach, since it relates the NRR directly to real economy variables such as productivity, but it also leads to considerable real-time uncertainty.

A second shortcoming with the yield curve slope approach above is that the spread between long rates and policy rates is assumed to be mean-reverting. This appears to be the case for New Zealand and several other industrialised countries during the 1990s[8], but if the sample period is changed even by a few years, several of the series appear to be nonstationary. This could be an indication that structural changes have permanently affected the yield curve; on the other hand, it may also indicate that the sample does not start and end at the same point in a business cycle, and cyclical fluctuations are throwing off the stationarity tests. Careful thought has to be put into what reasons may exist for the spread between long and short rates to change, other than deviations of policy rates from neutral settings.

An obvious candidate is changing inflation expectations. Bomfim (2001) gets around this criticism for the US by looking at yields on indexed bonds, though data limitations of this approach are severe even in the case of the US and prohibitive for many countries. In some cases, including in our analysis for New Zealand, the real interest rate gap measure also assumes a stable relationship between public and private sector risk. The 10-year rate is derived from government securities, whereas the 90-day rate reflects predominantly private sector borrowing. To the extent that the creditworthiness of the public sector changes relative to the private sector, the indicator will be biased.

The third shortcoming concerns the extent to which the long rates in New Zealand are driven by factors outside of New Zealand, and associated noise. To the extent that long rates overseas exhibit cyclical fluctuations, and this moves around the slope of the New Zealand yield curve, the reliability of a yield curve based indicator of monetary policy stance will be diminished[9]. Gürkaynak, Sack and Swanson (2003) have documented an excess sensitivity of US long term interest rates to surprises in macroeconomic data releases and monetary policy releases, from which the authors infer that expectations of the long run inflation rate are affected. Similar effects are not present in inflation-indexed debt or in the UK, where

[7] Neiss and Nelson term this the "natural" rate of interest

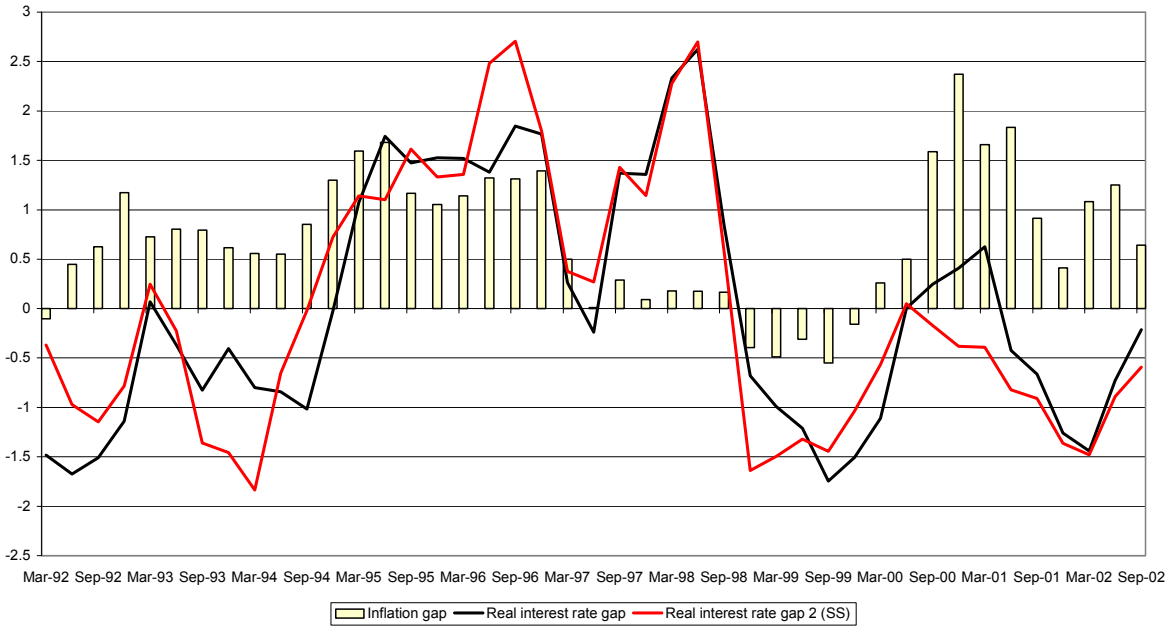
[8] Siklos (2000) found a unit root in the series for the time period 1985-1997, but that time period included the high inflation years of the late 80s and the disinflationary period 89-91. ADF tests reject the null hypothesis of a unit root for the period 1992-2002, but the period is uncomfortably short for this test to be truly reliable. In addition, policy mistakes during the MCI period distort the series and thus reduce the reliability of unit root tests even further. The best that can really be said is that in a plot of the series, it looks like it might reasonably be mean-reverting.

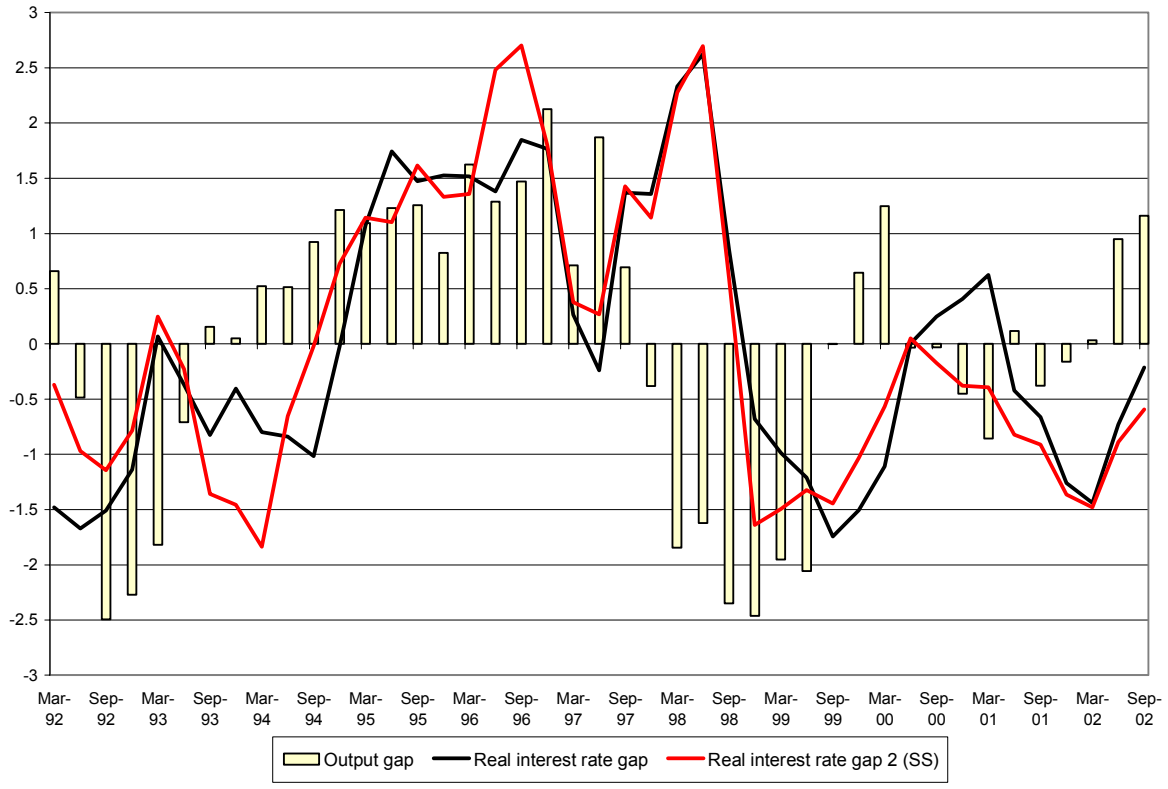
[9] For example, to the extent that yields on 10-year bonds move cyclically, a recession in the US and Europe coinciding with a boom in New Zealand (as at present) may bias the NZ real interest rate gap in the direction of suggesting that monetary policy settings are tighter than they actually are, if long rates in New Zealand are driven by overseas rates to be artificially lower at the margin.

inflation targeting seems to have anchored expectations since 1997. If inflation expectations are equally well anchored in New Zealand, then long debt here would also not exhibit excess sensitivity to domestic surprises. Nevertheless, surprises reflected in noisy US long rates may carry over into New Zealand long rates.

The upshot of all of these shortcomings is that the plausibility of the real interest rate gap as an indicator has to be assessed very critically. Figures 8a and 8b compare two estimates of the New Zealand real interest rate gap with inflation deviations from target and with estimates of the output gap, respectively.

Figures 8a and 8b.





The first estimate (real interest rate gap) corresponds to equation 1 above, the second (real

interest rate gap 2 SS) is a Kalman filtered estimate which allows for some movement in the "average" yield curve over time, as explained in equations 8 and 9, but the two estimates do not differ by very much.

From figure 8a, we observe that periods identified with expansionary monetary policy were followed by inflation above target, whereas the main period of contractionary monetary policy in the mid-1990s was followed by inflation close to or below target. Nevertheless, on balance over the period, monetary policy appears to have responded appropriately to inflation pressure as signalled by this indicator (Liu 2003).

From figure 8b, we find a largely contemporaneous correlation between the output gap and the real interest rate gap, apart from the 1997-98 MCI period anomaly (and perhaps the most recent period post-September 11). Given the noisiness of the output gap numbers for New Zealand, and the practice of smoothing interest rates, the relationship is remarkably tight. This is similar to an even closer relationship between the real interest rate gap and the output gap for the US during the Greenspan era, as documented by Christensen (2002).

The series is given some additional credibility given the systematic relationship between the real interest rate gap and measures linked to the real economy. Moreover, since the interest rate gap is the difference between two readily observable nominal numbers with no measurement error, it is a welcome reference indicator for use in real time policymaking.

4. Reasons for the New Zealand differential

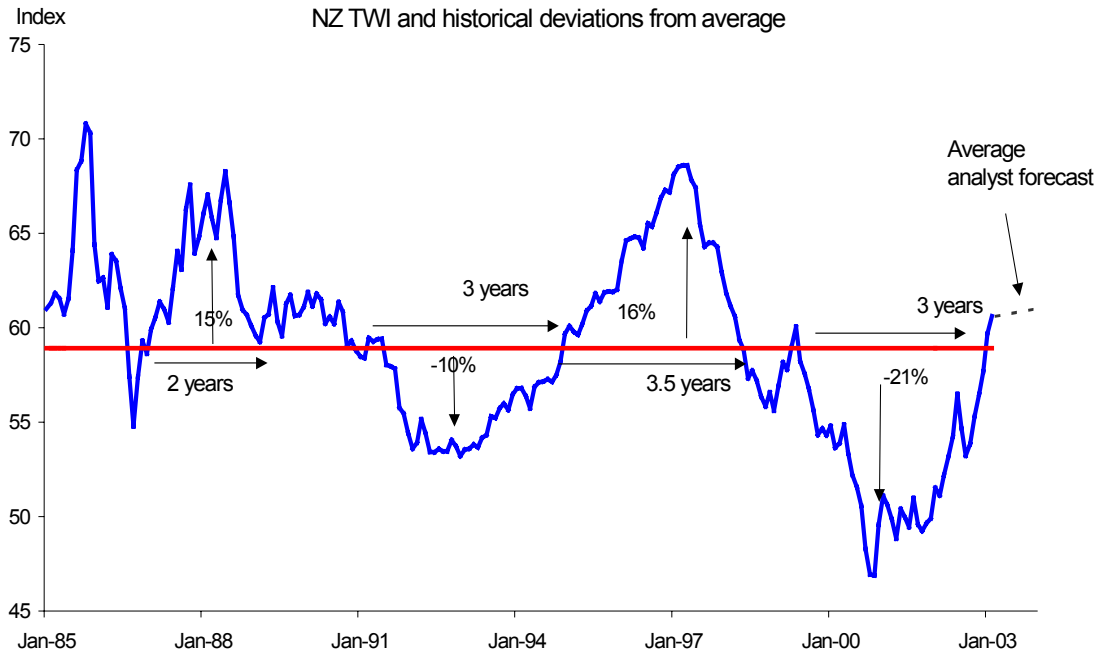
But the question remains: why is the NRR so much higher in New Zealand? For all of the reasons mentioned above, the size of the New Zealand differential is important. If it exhibits a tendency to grow or shrink, or if policy initiatives can affect its size, this is important for policymakers to know.

A framework for thinking about this is a supply-demand relationship of international capital, where the marginal investor is a foreign investor and the marginal borrower is a New Zealander. Thus, the supply of credit at the margin will depend on a range of risk considerations and expected returns elsewhere; the demand for credit by the New Zealand borrower will be determined both by expected rates of return to investments and by intertemporal consumption/saving preferences.

4.1. Large exchange rate cycles.

One potential explanation for foreign investors' reluctance to supply capital to New Zealand without being paid a premium would be regular large deviations of the exchange rate from levels considered broadly neutral. New Zealand has pursued a policy of strict non-intervention in exchange rate markets since the exchange rate was floated in 1985, and the exchange rate variability has also been substantial (Figure 9). Would intervention aimed at smoothing the peaks and troughs have helped to reduce the New Zealand interest rate differential?

Figure 9. The New Zealand trade weighted index 1985-2003



It is unclear whether attempts to intervene would have had any lasting effect on the cycles. Large cycles in New Zealand have not been obviously different from those experienced in other countries where some form of intermittent intervention in foreign exchange markets has been the norm (Figures 10a and 10b). Exchange rate cycles and their management is nevertheless an area that is worth studying more closely.

Figure 10a. Episodes of real exchange rate appreciation

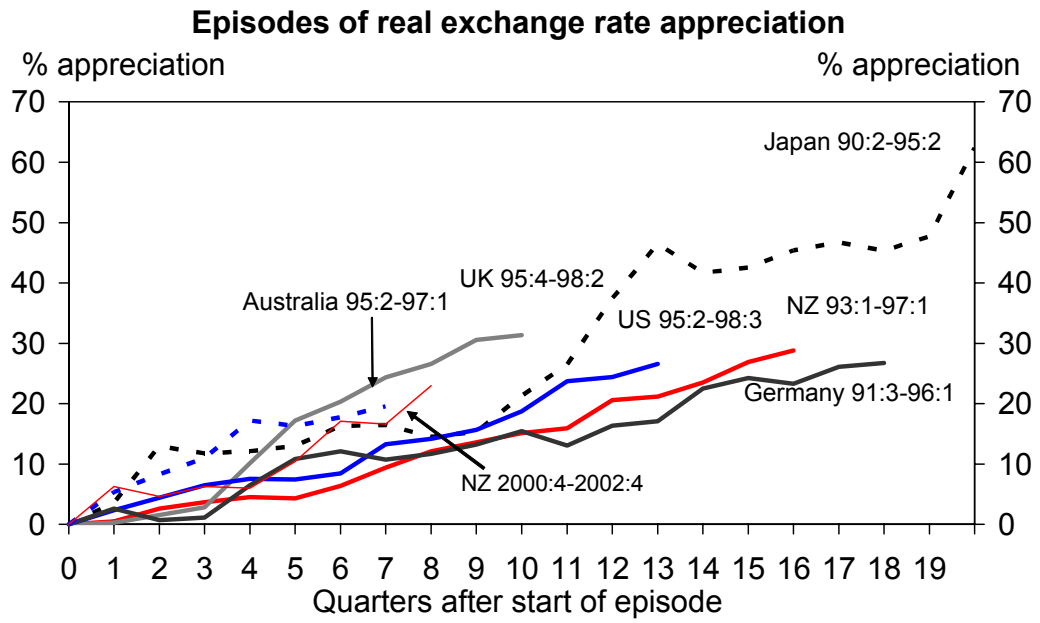
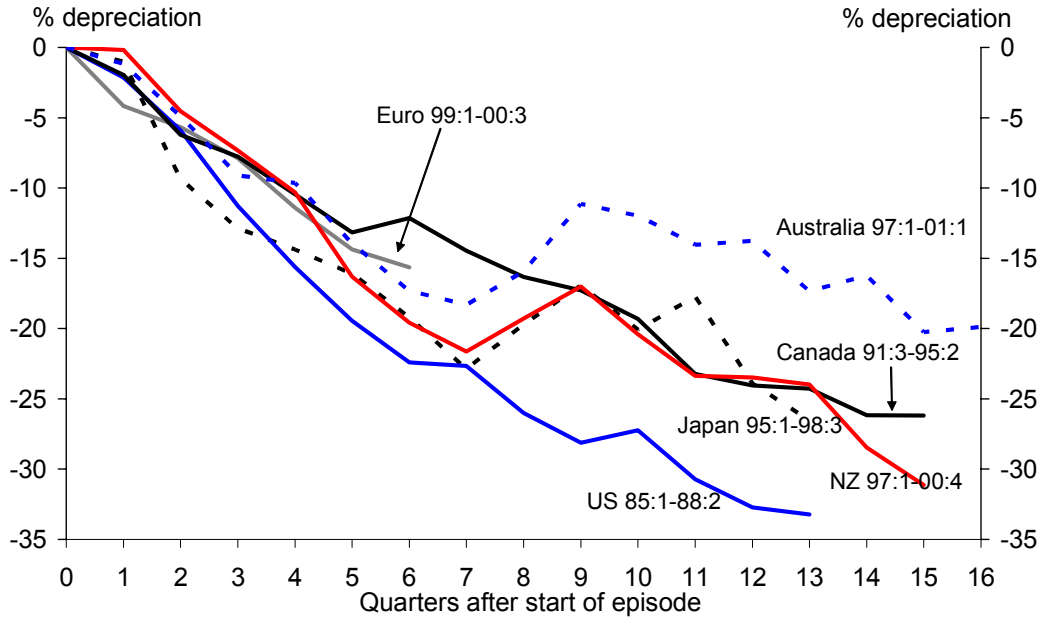


Figure 10b. Episodes of real exchange rate depreciation



4.2. Productivity

As regards the demand for funds by New Zealanders, all else equal, a higher rate of productivity growth should raise returns to capital in a Wicksellian framework, and thus result in a higher level of interest rate corresponding to a "neutral" monetary policy setting. For the US, productivity growth in the second half of the 1990s has been documented, and this coincides with a rise in the estimated neutral real rate using a number of different measures, including our own.

Efficient monetary policy should in principle take this into account. While productivity growth seems unlikely to be the underlying explanation for the high New Zealand neutral real rate, it has a bearing on the dynamics of the NRR and clearly should be understood better.

4.2. New Zealanders' appetite for borrowing

It is also possible that New Zealanders have a greater preference for building up debt and shifting forward consumption than is the case in other countries. This may be related to demographics and fiscal stance, and is in any case a fruitful area for further research.

4.3. Other drivers of NZ neutral real interest rates

Plantier (2003) makes use of panel data on several OECD countries to estimate how much of the decline in the New Zealand NRR can be accounted for by international factors common to several countries (e.g. lower net public debt in OECD countries), country-specific factors (e.g. differences in net public debt, current account, net foreign assets, and inflation variability), and fixed country effects. The results suggest that while some of the decline in real rates can be explained by international and country specific factors, a large amount of the fall relates to some other factor, such as increased capital market integration or increased transparency in fiscal policy.

5. Summary and Conclusions

The New Zealand economy has been characterised by persistently higher real interest rates than what we observe in most other OECD countries. At the same time, productivity does not appear to have grown faster than elsewhere, and the PPP-corrected income per capita of New Zealanders has declined relative to countries with lower real rates.

Since monetary policy is involved with setting short term interest rates, one might ask whether the explanation for the high real rates might involve persistently tight monetary policy. The Reserve Bank of New Zealand has a formal target range for nominal inflation, and has over the past decade adjusted interest rates in order to maintain inflation within this target band. Since higher real interest rates bring inflation down, an overly tight monetary policy should be revealed by looking at the inflation track record of the Bank.

The stance of monetary policy has rarely been so tight that inflation has declined below the mid-point of the target band, and on average inflation has been considerably closer to the top of the band than the bottom. It is still possible that monetary policy was tight if the Bank needed to lean against expectations of inflation accelerating in the future. Some evidence against this is presented in the form of surveys of expected inflation. Every available survey suggests that future inflation expectations were not much higher before the mid-1990s than more recently. We therefore investigate an alternative explanation to real interest rates being high in New Zealand.

In particular, we look more closely at the neutral real interest rate (NRR), which we interpret as the "normal" real interest rate in the economy when inflation is stable, on target and all cyclical influences have been stripped out. If New Zealand is well-integrated into global capital markets, then the difference between the New Zealand neutral real rate and other countries' NRRs should give us some indication of the size of the New Zealand differential. This differential then needs to be analysed more carefully to find explanations for why real interest rates are higher in New Zealand.

Measuring the NRR is not straightforward, as it is both unobservable and time-varying. We derive an estimate based on the slope of the yield curve, and test the plausibility of this estimate against its relationship to inflation and output gap developments. We use the same method to derive neutral real rate series for a number of other countries, and to benchmark these estimates against others available in the literature.

The resulting evidence suggests some intriguing findings. First, the neutral real interest rates of most countries seem to have declined during the 1990s, gradually converging toward the NRR in the United States. Second, the NRR in New Zealand seems to persistently be substantially higher than the NRRs for all other countries examined, and while it has been declining, it does so roughly in parallel with other countries so that the NRR differential does not really appear to be closing with any other country besides the United States.

We have not examined the NRR differential in further detail. Several hypotheses can be put forward to explain this, including New Zealanders' appetite for borrowing, fiscal stance, demographics, and more. Further research is needed before these and others can be rules out or given additional credibility.

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