
Supporting Paper A3

How similar is monetary policy in New Zealand, Australia and the United States?

Introduction

This brief note examines whether the Reserve Bank responds to short-run fluctuations in economic variables in a similar way to other central banks. There are no definitive answers to this question, but the relatively simple approach used here can help shed a little light on the issue. As other papers in this submission note, New Zealand real interest rates tend to be higher than those in other countries, and our exchange rate is also a little more volatile. It is important to try to understand whether there is anything unusual in the way that we conduct monetary policy that might explain those outcomes. These data do not suggest that there is.

Monetary policy interpreted using Taylor rules

The Taylor rule, first proposed by John Taylor in 1993, has become a popular tool for analysing monetary policy.¹ According to this “rule”, a central bank raises short-term nominal interest rates above some neutral rate when current inflation exceeds the central bank’s inflation target, or when aggregate output exceeds the economy’s non-inflationary supply potential (and vice versa). Interest rates are adjusted gradually, as a way of managing the many uncertainties involved in policy-making.

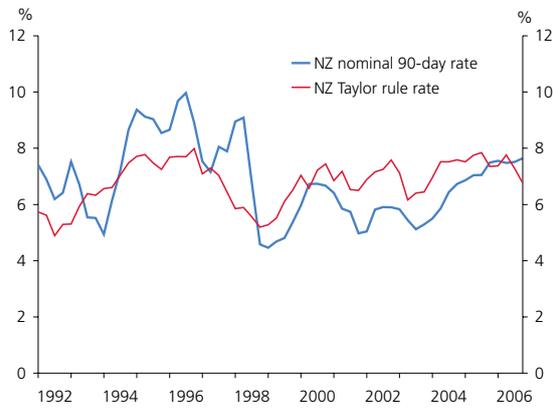
Of course, a Taylor rule is only a crude approximation to how interest rates are set in reality. In addition to considering data on aggregate inflation and output, when setting interest rates central banks typically review a broad variety of data (eg the exchange rate, house prices and measures of confidence), and consider risks that may never come to pass. For these reasons actual interest rates are often quite different from rates implied by Taylor rules. Nevertheless, for the purpose of comparing central banks’ behaviour, Taylor rules are a useful approximation.

We have estimated Taylor rules for New Zealand, Australia, and the United States, respectively. The recommendations of the resulting estimated “rules” are shown, against actual short-term interest rates, in figure 1 (the technical appendix sets out more detail). The rules appear to do a reasonable job of describing actual interest rate movements.² In all three countries, the actual interest rate rarely diverges greatly from the Taylor rule rate. However, in all countries the actual interest rate tended to be above the Taylor rule rate from the mid to late 1990s, and has been below the Taylor rule-implied rate since the late 1990s.

¹ For a non-technical exposition of the Taylor rule, particularly in the New Zealand context, see Plantier L.C. and D Scrimgeour (2002), “The Taylor rule and its relevance to New Zealand monetary policy”, Reserve Bank of New Zealand *Bulletin*, 65 (1).

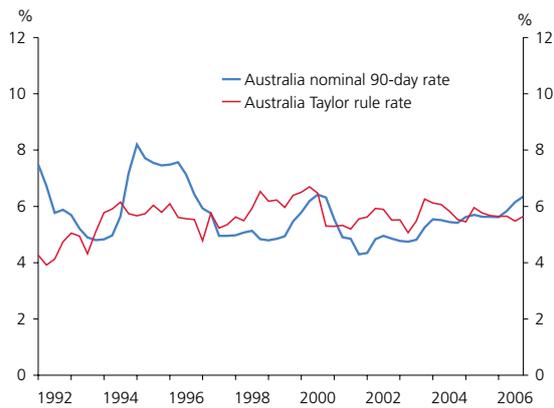
² 90 day bank bill rates are here a proxy for the policy rate. Central banks do not set 90 day rates directly but policy rate adjustments (and expectations of such adjustments) are the main influence on 90 day rates.

Figure 1
Actual interest rates versus rates implied by a Taylor rule
New Zealand: Nominal 90-day bank bill rate versus Taylor rule rates



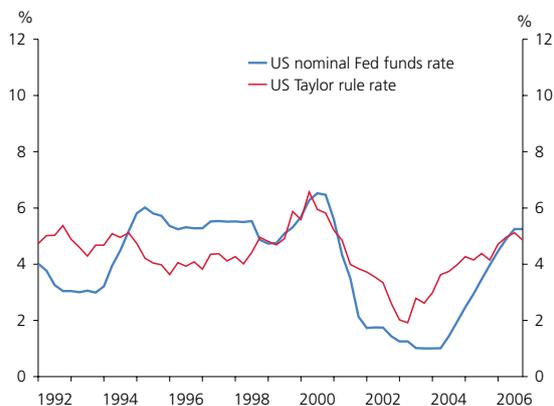
Source: RBNZ, RBNZ estimates.

Australia: Nominal 90-day bank bill rate versus Taylor rule rates



Source: Datastream, RBNZ estimates.

United States: Nominal 90-day bank bill rate versus Taylor rule rates



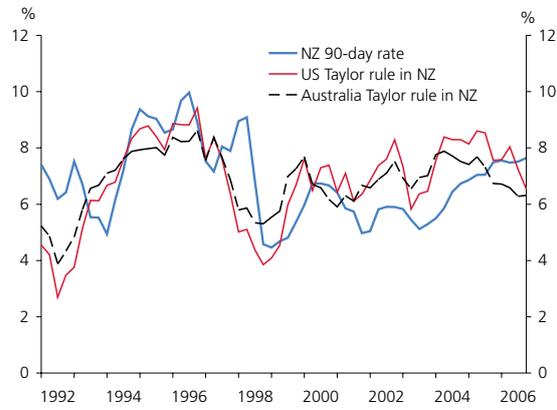
Source: Datastream, RBNZ estimates.

To see whether the differences between the three estimated “rules” are economically material, figure 2 on p. 68 shows how monetary policy in New Zealand would have looked if it had been set according to the Taylor rule estimates of the Reserve Bank of Australia or the Federal Reserve. The idea is to gauge how United States and Australian policy-makers might have responded if they were operating monetary policy in New Zealand, faced the shocks we faced, our inflation target, and our estimate of the neutral real interest rate for New Zealand. The exercise is inevitably a somewhat crude approximation, but we believe it can be usefully illustrative.

On the whole, the Reserve Bank of New Zealand’s actual policy rate is not very different from the interest rates implied by the Taylor “rules” estimated for the Reserve Bank of Australia and the Federal Reserve. Indeed, from the late 1990s until very recently, actual New Zealand interest rates have tended to be a little below what the Australian and United States Taylor rules might have suggested for New Zealand. These differences are not large, and these Taylor rules are only rough proxies for how the Reserve Bank of Australia or the Federal Reserve might have managed policy. However, note that the Taylor rule estimate for New Zealand itself has also tended to produce recommended interest rates above our actual policy rate since the late 1990s.

Overall, the results suggest that the Federal Reserve and the Reserve Bank of Australia would not have acted very differently if they had been facing the shocks and pressures New Zealand has faced this decade. There is certainly nothing to suggest that if we had applied the United States or Australian approaches, at least as estimated here, that would have led to lower interest rates in New Zealand this decade than we have actually experienced.

Figure 2
Actual interest rates versus rates implied by a US and Australian Taylor rule



Source: RBNZ, RBNZ estimates.

Summary

The results of this very simple exercise suggest that interest rates would not have been very different in New Zealand if the Reserve Bank had responded in exactly the same way to changes in inflation and output as the Reserve Bank of Australia and the US Federal Reserve are estimated to have done. Differences between interest rate settings in New Zealand and countries with similar price stability objectives seem to be largely a function of differences in the economic conditions and inflation pressures each country faces. They do not seem to reflect any fundamental differences in the way the various central banks respond.

Technical Appendix

This appendix sets out the detailed results for the estimated Taylor rules referred to in the paper.

Table 1
Estimated monetary policy rule: New Zealand, Australia, United States

Sample: 1992Q1 - 2006Q4	New Zealand	Australia	United States
Neutral nominal interest rate (i^*)	6.68 (0.49)	5.70 (0.43)	3.92 (0.95)
Response to inflation (b_π)	0.68 (0.61)	0.08 (0.24)	0.97 (1.11)
Response to output (b_y)	0.41 (0.33)	0.69 (0.83)	0.92 (1.08)
Coefficient on last period's interest rate (λ)	0.67 (0.20)	0.77 (0.22)	0.80 (0.23)
Adjusted R ²	0.81	0.87	0.97

Note: standard errors are in parentheses.

We estimate the following system:

$$i_t^R = i^* + b_\pi (\pi_t - \pi_t^T) + b_y (y_t - y_t^*)$$

$$i_t = (1 - \lambda) i_t^R + \lambda i_{t-1} + v_t$$

$$v_t = \rho v_{t-1} + \varepsilon_t$$

Where:

i_t is the actual interest rate,

i_t^R is the interest rate the Taylor rule would call for in the absence of interest smoothing.

i^* is the nominal interest rate consistent with stable inflation (the "neutral rate"),

π_t is inflation,

π_t^T is the inflation target,

y_t is output,

y_t^* is the level of output consistent with stable inflation.

The coefficient b_π determines the response to inflation, while b_y measures the response to output. Higher values of λ indicate higher degrees of interest smoothing, while higher values of ρ reflect a higher degree of serial correlation in the error term v_t .

The first row of table 1 estimates the "neutral nominal interest rate" for the three countries. The neutral nominal interest rate can be thought of as the interest rate that would prevail if inflation was at the target rate and aggregate demand was around the economy's supply potential and, hence, there was no pressure on resources. At that point, monetary policy needs to be neither contractionary nor expansionary.

Note that the neutral rate for New Zealand is estimated to be a little higher than the Australian rate and much higher

than the rate estimated in the United States. This indicates that on average interest rates will be higher in New Zealand than the other two countries, even if pressures on resources were the same across all three countries. Possible reasons for this are discussed in supporting paper A4. Note too, that the neutral nominal interest rate for New Zealand has been estimated over the whole period. During that time, the inflation target has been raised twice, suggesting that if the real neutral rate was constant over the full period, the neutral nominal rate would be higher than average now,

and would have been lower than average in the first half of the 1990s.

As an alternative to estimating Taylor rule relationships, Kam, Liu, and Lees (2007) estimate a model of New Zealand, Australia, and Canada over the period 1990 to 2005. In their framework, each central bank optimally chooses how much weight to assign to the stabilisation of inflation and output, as well as how much to smooth interest rates, conditional on the estimated structure and shocks in these economies.³ The central banks' optimisation problem implies an interest rate rule which is similar in spirit to the Taylor rules, but has the advantage that the coefficients in the model have a more rigorous structural interpretation.

The results of this approach suggest that the Reserve Bank of New Zealand, the Reserve Bank of Australia, and the Bank of Canada have displayed relatively similar preferences about which of the economic variables is most important to stabilise. All three central banks place a higher weight on minimising deviations of annual inflation from the inflation target relative to the weight placed on output deviations from potential output levels. In absolute terms, however, the results suggest that the Reserve Bank of Australia may have placed a slightly higher weight on output stabilisation than the Bank of Canada and the Reserve Bank of New Zealand did.

³ Kam, T, P Liu and K Lees (2007) "Uncovering the hitlist for small open economy inflation targeters: a structural Bayesian analysis", Reserve Bank of New Zealand *Discussion Paper*, forthcoming.