
Does a stitch in time save nine?

In December 2000, the Reserve Bank issued a discussion paper entitled "Interest rate smoothing in New Zealand and other dollar bloc countries," written by Aaron Drew and L Christopher Plantier. The key points made in this paper are summarised in the following note.

1 Introduction

Interpreting the meaning of the PTA's comment "*the Bank shall seek to avoid unnecessary instability in output, interest rates and the exchange rate*" is not straightforward. One of the questions is what kind of instability or volatility is of concern. Is it short run (week to week, month to month) or medium run (over the cycle) variability that matters most? This note discusses how short run interest rate volatility relates to the medium run variability of output, inflation, and the exchange rate over the cycle.

A straw poll would probably produce support for the notion that the size and frequency of Official Cash Rate (OCR) adjustments is the kind of volatility that the PTA attempts to address. For example, substantial changes in the OCR in a short space of time may be seen by some as being inconsistent with the PTA. On the other hand, the Bank has noted publicly that sometimes a rapid adjustment of interest rates is needed in order to prevent the kind of instability that the PTA addresses.

In fact, we can identify instances in our history where, if we had had sufficient foresight to move earlier and/or faster, we would probably have reduced the amplitude of the subsequent cycle in output, interest rates, and exchange rate. There may thus be a trade-off between short run variability of interest rates and medium run variability in the economy - hence the title of this note.

We examine this trade-off question from the following perspective: if the Bank identifies a need to change the OCR in order to keep future inflation on track, should it adjust the OCR fully in one hit, or should it smooth the adjustment?

Interest rate smoothing is a feature of central banking globally. However, if there is a trade-off of the type suggested, such smoothing risks policy "getting behind the curve" and creating medium run instability - which we take to be the main concern of the PTA. This concern reflects that monetary policy can not manage the quarter-to-quarter

path of any variable that is not directly under the Bank's control.

But, if most central banks seem to be smoothing, what might the reasons be? There are many possible explanations, but we list only four here, the last of which we explore more closely later in this note. The first is that some types of uncertainty, especially about how the economy works, make it optimal (in volatility-dampening terms) to hedge one's policy bets. The second is bureaucratic inertia. The third is that short run volatility of interest rates is costly for the economy, and outweighs any resulting increase in medium run instability. And the fourth is that interest rate smoothing might have the *opposite* trade-off to the one already suggested. In fact, a recent visitor to the Bank, Professor Michael Woodford of Princeton University, has promoted this interesting proposition. It is this issue that we now look at in more detail.

2 The competing trade-offs

The 'stitch in time saves nine' proposition is a straightforward one. Given the inflation target, a projected deviation of inflation from target will call for an interest rate response, via the OCR, that is timely - vis-à-vis the lags - and of sufficient magnitude to return inflation to target. (This is not to say that uncertainties do not exist in how the economy will evolve and even where the economy currently stands, but for the sake of this discussion we assume that we know these things with certainty.) If the interest rate response is delayed or of insufficient magnitude, the resulting real interest rates will either be adding unnecessary stimulus to an inflationary situation, or contraction to a deflationary situation. In the end, the inflation deviation (and business cycle variability) will get larger, as will the required corrective action.

But Woodford and others make a distinction between policy interest rates - typically overnight interest rates like the OCR

- and the rates that matter for people's decisions, which tend to be longer-term rates. Longer-term rates reflect financial market expectations of where short-term rates will be in the future. Woodford argues that such rates may be more affected by smoothing OCR revisions, as smoothing gives financial markets more certainty about the persistence and direction of short-term interest rate levels. Hence, smoothing OCR revisions can produce as early, and as large or larger, changes in the longer-term interest rates that matter. With such early and large changes in these longer-term rates, the amplitude of the economic cycle might be dampened.

At its heart, the Woodford proposition has the same inter-relationship between monetary policy and economic outcomes as the 'stitch in time' proposition. If there is delay or undue moderation in moving the interest rates *that matter* for people's decisions, an emerging inflation or deflation problem can be worsened. The policy prescriptions, however, differ. Under the 'stitch in time saves nine' proposition, the OCR would be adjusted relatively quickly. Under Woodford's proposition, the OCR adjustment would be relatively more gradual, but the Bank would need to make a credible promise to financial markets to keep moving OCR adjustments in the same direction in order to ensure that longer-term interest rates are also affected.

3 Which way does the trade-off go?

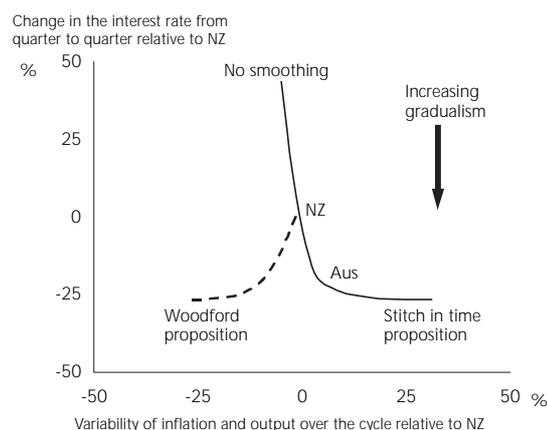
The competing propositions reflect the fact that there is considerable uncertainty over how smoothing OCR revisions may affect the economy over the cycle. Nevertheless, it is possible to arrive at an estimate of the potential risks surrounding gradual policy adjustments by using the Bank's macroeconomic model. The construction of the model embodies the 'stitch in time saves nine' proposition. Smoothing short-term interest rates in the model increases inflation and output variability over the cycle.

Figure 1 below shows stylised model-generated trade-offs involved in adopting more gradual policy approaches. On the vertical axis the quarter-to-quarter change in the 90-day interest rate is shown, while the horizontal axis shows inflation and output variability over the cycle.

This graphs helps stress the idea that in order to get less quarter-to-quarter interest rate variability, the Bank may have to accept more variability in output and inflation variability over the cycle. Note that the slope of this line is initially rather steep, indicating little cost to gradualism, but changes unfavourably the more gradual the policy approach becomes.

Alternatively, if by being gradual the Bank is able to affect longer-term interest rates as Woodford suggests, and hence better manage the business cycle, the slope of the trade-off in figure 1 may be wrong. Instead, it may well swing to the left instead of to the right as shown by the dotted path in figure 1. In this case, output and inflation variability over the cycle would actually be smaller, with smaller short-term interest rate adjustments.

Figure 1
The possible costs of gradualism



4 Adopting a more gradual policy approach in New Zealand

The Reserve Bank of Australia (RBA) is sometimes regarded as being more gradual in its interest rate adjustments than the Reserve Bank of New Zealand (RBNZ). In fact, some empirical evidence based on history prior to the adoption of the OCR shows that the RBNZ does appear to smooth its quarter-to-quarter change in the 90-day interest rate less than the RBA. Using a technique that allows for cross country differences in real interest rates, output gaps, and inflation, the RBA looks to be located at the point labelled 'Aus' in figure 1. This compares to the RBNZ's approximate location

at the point labelled 'NZ'. Note that this is an estimate of historical behaviour only, and may well overstate the differences in smoothing between the RBNZ and the RBA going forward, given our recent adoption of the OCR implementation regime.

The RBNZ's location is clearly preferable to the 'no-smoothing' policy approach, where there are substantially higher quarter to quarter interest rate changes (around 50 per cent higher) without any material reduction in inflation and output variability. However, by moving to the 'RBA approach' short-term interest rate variability could possibly be reduced further.

This begs the question whether the gains from reduced short-term interest rate variability would be more than lost through increased variability in inflation and output over the cycle.

The answer to this question depends on a number of factors. First and foremost, the most important pre-condition that must be in place for the purported benefits of gradualism to arise is that the Bank have a good track record in maintaining price stability. Without a good track record, gradualism may be interpreted by agents in the economy as the Bank being 'soft' on inflation. That would no doubt damage the Bank's ability to influence inflation expectations and actual inflation. However, after more than a decade of inflation targeting in New Zealand, one would hope the Bank would not suffer this problem should it move to a more gradual policy approach.

Secondly, the trade-off varies with the importance of longer-term interest rates for economic agents and the ability of the Bank to affect these long-term rates. Unlike the United States, many debt contracts in New Zealand still key off the 90-day bank bill rate, and short-term rates remain very relevant for firms and households.

Also, longer-term rates in New Zealand appear to be closely linked to United States and Australian long-term rates, so there is a question about the extent to which the Bank could determine these rates even if they were important. On the other hand, if the Bank did adjust the OCR more gradually, it is possible that longer-term rates may become less dependent on foreign long rates as they become better anchored by New Zealand monetary policy.

5 Conclusion

As the Bank can control overnight interest rates via the OCR, it has the ability to affect short-term interest rates. If the Bank adopts a more gradual policy approach, on the margin, average quarter-to-quarter interest rate variability would decline. The effect of this increased gradualism is uncertain. However, it is at least arguable that any associated increase in the variability of inflation and output might be relatively small.