



Inflation Targeting: The New Zealand Experience and Some Lessons

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Abstract

Inflation targeting has become a very popular monetary policy regime in many developed and emerging market economies. In this paper we review the New Zealand's inflation targeting experience. New Zealand's experience can be characterised as a move towards flexible inflation targeting. Since inflation targeting was adopted the New Zealand economy has been broadly successful, albeit not without challenges.

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“Inflation targeting is a framework for monetary policy characterised by the public announcement of official quantitative targets (or target ranges) for the inflation rate over one or more time horizons, and by explicit acknowledgement that low, stable inflation is monetary policy’s primary long-run goal. Among other important features of inflation targeting are vigorous efforts to communicate with the public about the plans and objectives of the monetary authorities, and, in many cases, mechanisms that strengthen the central bank’s accountability for attaining those objectives...By imposing a conceptual structure and its inherent discipline on the central bank, but without eliminating all flexibility, inflation targeting combines some of the advantages traditionally ascribed to rules with those ascribed to discretion”

Bernanke, Laubach, Mishkin and Posen (1996)

1 Introduction

With the passage of the Reserve Bank of New Zealand Act in 1989, New Zealand became the first country to formally embark upon inflation targeting.¹ Since that time, many central banks around the world have joined the inflation targeting club, and none has left. There are more than 20 inflation targeting countries and the number is likely to increase.²

The above citation is from Bernanke, Laubach, Mishkin and Posen’s³ widely cited book on inflation targeting. Although implementation differs across countries, the Bernanke *et al* characterisation draws out some key elements common to almost all central banks in the club.

The cornerstone element is the ‘framework’, enshrined in the Reserve Bank of New Zealand Act (1989) in our case. This confers central bank independence in the conduct of policy and recognises that the best contribution monetary policy can make to the economy is to keep inflation low and stable. The target for monetary policy itself is contracted between the Government and the Governor in the Policy Targets Agreement (PTA), and is specified as a CPI inflation target band of 1-3 percent on average over the medium term.

A second key element of inflation targeting is a ‘strategy for communication’ of central bank monetary policy actions. Communication, and in a related sense trans-

¹The Bundesbank had an implicit inflation targeting probably well before New Zealand and the German experience was one to which the Reserve Bank of New Zealand looked at in the early 1980s.

²Battini, Kuttner and Laxton (2005), the latest cross-country work on inflation targeting, report 21 central banks as inflation targeters. Their sample does not include the Central Bank of the Republic of Turkey.

³Bernanke, Ben S; Laubach, Thomas; Mishkin, Frederick S; Posen, Adam S. 1999. ‘Inflation targeting. Lessons from the international experience’, Princeton University Press.

parency, are key ingredients of a successful inflation targeting regime.

However, there is more to inflation targeting than the operational framework and the communication strategies. How one conducts inflation targeting is also important. New Zealand's conduct over time can probably be characterised as a move towards a relatively more flexible inflation targeting approach. This transition has become possible as inflation and inflation expectations have become better anchored, implying monetary policy has more room to look through shocks and transitory blips in the CPI inflation rate (Svensson 2001, Svensson 2002). In other words, as we gained credibility and anchored public's expectations, we became more flexible. This evolving nature of our inflation targeting is also apparent in the more flexible nature of the successive PTAs.

The macroeconomic performance of New Zealand after 15 years or so of inflation targeting has been positive relative to the experiences of the 1970s and 1980s. Growth has been higher and less volatile, while inflation has been low and stable. Although monetary policy itself may have only played a supporting role in the improvement in economic growth, it has of course been instrumental in the inflation outcomes. This experience is common to many other developed and developing nations who are finding inflation targeting a preferable way of approaching monetary policy. The implicit inflation targeting experience of the Republic of Turkey so far is definitely one of them.

Is it surprising that inflation targeting, which is such a young framework, has become this popular? Perhaps not. First of all, it offers a nominal anchor. Second, central banks find inflation targeting a useful discipline in terms of their policy discussions, research and communications. There is also a developing view that countries with an explicit inflation target have more stable inflation expectations and hence long-term interest rates.⁴ For an emerging market economy, as Kuttner (2004) states, 'adopting inflation targeting provides an opportunity for the central bank to clearly define its objectives and delineate its responsibilities *vis á vis* other official policy institutions'. Moreover, Battini *et al* (2005) argue that inflation targeting in emerging economies is associated with lower inflation, lower inflation expectations and no

⁴Gürkaynak, Sack and Swanson (2005).

adverse effect on output.

Is inflation targeting a ‘one size fits all’ kind and a mechanical framework? Certainly not. Different countries have their unique experiences with some differences in their frameworks and operations. However, it seems most inflation targeters have converged towards some form of flexible inflation targeting.

The remainder of this paper is structured as follows. Section 2 discusses the origins of inflation targeting in New Zealand. Section 3 looks at the ‘framework’ for New Zealand inflation targeting, namely the Reserve Bank of New Zealand Act and the Policy Targets Agreements. Section 4 discusses the communication strategy aspect of New Zealand inflation targeting, with specific emphasis on transparency. In Section 5, we discuss some key developments in New Zealand inflation targeting. Section 6 concludes.

2 The New Zealand economy in the last two decades at a glance

To understand the origins of inflation targeting in New Zealand it is useful to look at the historical experience before the implementation of the regime. The institutional model of the Reserve Bank of New Zealand was very close to that of the Bank of England at the time. In addition to providing advice to the Minister of Finance, the legislation required the Bank to have regard for inflation, employment, the exchange rate, the balance of payments and so on. Although New Zealand never experienced hyper inflation, inflation persistently remained around 10-15 per cent for almost two decades, during the 1970s and 1980s. This was also a period where economic growth in New Zealand was also relatively low and volatile, partly a consequence of the difficult commodity-based trading environment.

New Zealand went through some dramatic economic reforms after 1984, aiming at improving longer-term economic performance. The Reserve Bank of New Zealand Act (1989) was part of the wider economic reform process.⁵

The floating of the currency, other financial liberalisations, corporatisation and

⁵For a more detailed analysis of economic reforms in New Zealand see Bollard, Lattimore and Silverstone (1996) and Evans *et al* (1996).

then privatisation of state-owned enterprises, public sector reform, welfare reform, labour market liberalisation and trade liberalisations were among key reforms. These reforms have generally resulted in a more competitive environment in product and labour markets. As figure 1 shows, this institutional change, and the inflation targeting framework with which it has become synonymous, coincided with the achievement of price stability in the early 1990s.

One other important part of the reform process that complemented the new monetary policy regime was the passing of the Fiscal Responsibility Act (1994). The *raison d'être* of this piece of legislation has been to direct government spending and taxation policy within a medium-term planning horizon, while avoiding the volatility associated with short-term attempts to 'pump prime' the economy. In addition, the Fiscal Responsibility Act requires a high degree of transparency for planned fiscal policies of the future.

Taken together, the product and labour market reforms, along with more stable macroeconomic policies, have contributed to the improved underlying performance of the New Zealand economy over the past decade or so, while exogenous factors, such as favourable commodity prices and migration, have driven the current cyclical upturn (Bollard 2005). Following the flat economic performance of the late 1980s and early 1990s, average rates of real economic growth have steadily improved. Growth over the past decade has averaged 3.3 per cent per annum, compared to 1.5 per cent for the preceding decade. In cyclical terms, New Zealand's GDP growth has become less volatile and expansions⁶ have become longer lived - a global phenomenon partly explained by the shift to more stable macroeconomic policy (both monetary and fiscal), better inventory management, lower volatility in investment, and smaller and less frequent shocks (Figure 2).⁷

⁶An expansion here is defined as at least two consecutive quarterly expansion in the level of GDP following a contraction (at least two consecutive quarterly declines).

⁷For an overview on the various explanations for the observed lower output volatility see Kent and Norman (2005), 'Changing nature of Business Cycle', Reserve Bank of Australia. For New Zealand context, Buckle, Haug and Thomson (2001) for an explanation of the fall in volatility in New Zealand output.

Figure 1 Real GDP growth and Inflation in New Zealand

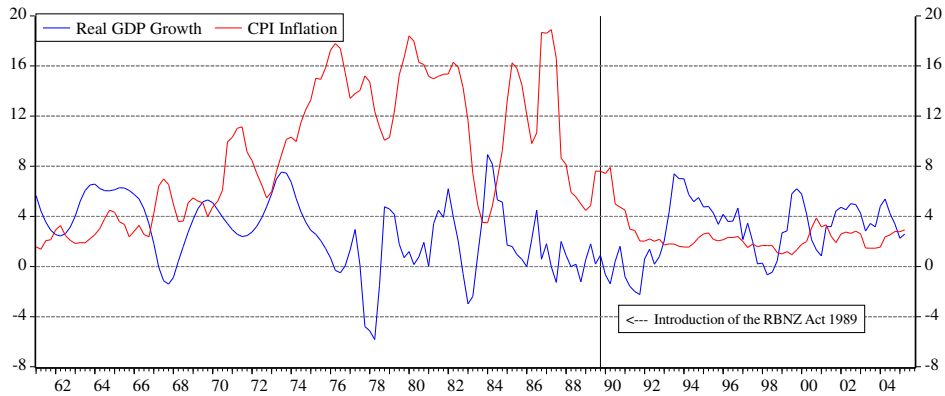
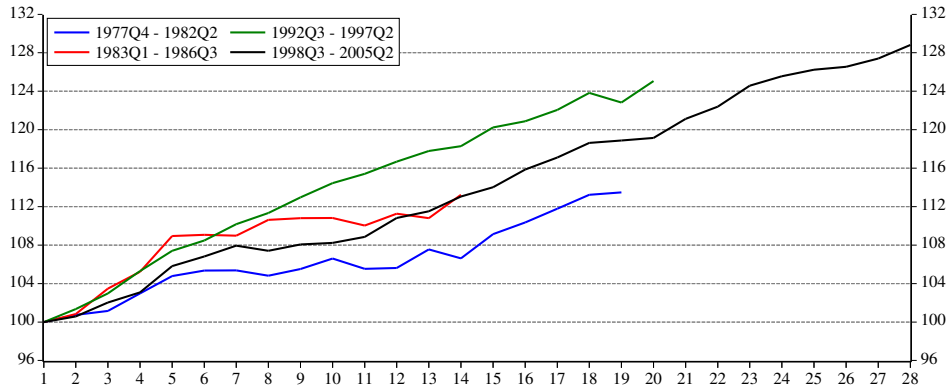


Figure 2 Economic Expansions - trough to peak



3 Core Features of Inflation Targeting in New Zealand

The core features of inflation targeting in New Zealand are contained in the Reserve Bank of New Zealand Act 1989 (the ‘Act’) and the Policy Targets Agreement (PTA, the contract between the Governor and the Minister of Finance).

3.1 Reserve Bank of New Zealand Act (1989)

The Reserve Bank of New Zealand Act(1989) recognises the limitations of monetary policy in achieving multiple objectives, and specifies that the best possible contribution that monetary policy can make to the economy is achieving price stability.⁸ The Act also recognises that central bank independence (operational) is a crucial requirement for the Reserve Bank of New Zealand to achieve and maintain the price stability objective. So the Act provides the Bank with independence once the PTA between the Minister and Governor has been signed. The Governor has no obligation to consult with the Minister, the Treasury, or with the Board of the Reserve Bank, when implementing monetary policy.

The Act also requires the Bank to be transparent in its actions. It forces the exercise of judgement on policy tradeoffs into the public arena, making them transparent to the community at large. The degree of transparency required by the Act is high; specifically it requires:

- the Bank to publish a Monetary Policy Statement at least every six months;
- a Select Committee of Parliament explicitly to review the Bank's Monetary Policy Statements and implicitly to review its handling of monetary policy.

The Act also establishes the Governor's⁹ accountability for decisions on the implementation of monetary policy. The assignment of authority and responsibility to an individual rather than a committee is uncommon amongst inflation targeting central banks. Although New Zealand has a single decision-maker approach, in practice there is an advisory committee which gives advice to the Governor prior to his final decisions. Although this committee (known as the Official Cash Rate Advisory Group, OCRAG) is not required by the Act, in practice the members of the OCRAG give written and detailed advice to the Governor on each policy decision. And the (unattributed) recommendations of this committee are seen by the Board of the Reserve Bank of New Zealand, which oversees the Governor's performance.¹⁰

⁸The Act does not require inflation targeting. It requires targets consistent with section 8 on price stability.

⁹The PTA is not an employment contract, it is rather a set of objectives that the Governor has to achieve.

¹⁰This group (OCRAG) also includes the Bank's two part-time external monetary policy advisers, who provide outsiders' perspectives to mitigate the risk of narrow information source.

The Act also sets out key mechanisms for achieving the desired accountability, specifically:

- the establishment of a majority of non-executive directors on the Bank's Board and a requirement that they review the performance of the Governor in relation to the PTA;
- the reporting of (Board) views to the Minister recommending the Governor's dismissal for inadequate performance in relation to the PTA.¹¹

3.2 Policy Targets Agreement (PTA)

The Act requires the Governor of the Bank and the Minister of Finance to sign a contract known as the Policy Targets Agreement (PTA). The section 9 of the Act requires that the PTA sets out specific price stability targets and that the agreement, or any changes to it, must be made public. A new PTA must be negotiated every time a Governor is appointed or re-appointed, but it does not have to be re-negotiated when a new Minister of Finance is appointed. The PTA can only be changed by agreement between the Governor and the Minister of Finance. Thus, neither side can impose unilateral changes.

The first PTA was signed in 1990, and the six successive PTAs have continued to operationalise the objective of price stability in terms of stabilising consumer price inflation within a specified target band. This inflation targeting framework provides an 'anchor' for changes in the general price level, and to the extent that it delivers the intended outcomes, for expectations of future price changes. Section 2 of the most recent PTA signed in 2002 stipulates that the Bank's inflation target shall be inflation outcomes between 1 and 3 percent on average, over the medium term.

Svensson argues that the New Zealand regime moved towards more flexible inflation targeting over the years. This evolution of New Zealand's inflation targeting regime is reflected in the various changes to successive PTAs since the first was signed in March 1990.¹² Let us go through the major changes in the Policy Targets Agreements:

¹¹The Act sets out the process for dismissal of a non-performing Governor. However, it also sets out protections for the Governor from unjustified dismissal.

¹²See RBNZ (2000b) for a fuller discussion of successive PTAs.

Table 1: A Summary of evolution of the PTA

March 1990	Initially, the government and Reserve Bank agreed to a phased move towards the initial inflation target of 0-2 per cent, with the original target date being December 1992
December 1990	The target date was extended to December 1993
December 1996	The target band was widened to 0-3 per cent in December 1996 to enable a somewhat greater degree of inflation variability.
December 1999	A clause 4(c) was included requiring the Reserve Bank to have regard for ‘unnecessary volatility’ in interest rates, output and the exchange rate, in the course of conducting monetary policy.
September 2002	The lower bound of the inflation target was raised to 1 per cent, on the grounds that at extremely low or negative rates of inflation, the volatility trade-off probably worsens. In addition clause 2(b), specifying the inflation target, was amended from ‘12-monthly increases in the CPI’ to keeping future CPI inflation outcomes within the target band ‘on average over the medium term’. This change made explicit the medium-term focus for price stability, further enhancing monetary policy flexibility. Clause 4(c) was retained with modified wording, as clause 4(b).

Table 1 summarises the main points of each PTA. In early versions of the PTA, it contained specific provisions enabling the Bank to disregard temporary inflation deviations from target when these were caused by ‘exceptional events’, such as changes in government charges or sharp movements in commodity prices such as oil. In the 2002 version, Clause 3 simply makes it clear that with the target focussed on medium-term outcomes, individual observations of inflation outside the 1-3 per cent target range are not in themselves reasons for monetary policy action. The PTA also recognises a symmetric inflation target: inflation can be too low as well as too high, hence the exclusion of zero from the current target.¹³ The target has changed from 0-2 per cent to start with in 1990 to the 1-3 per cent range in 2002.

New Zealand’s choice of inflation measure is the headline Consumer Price Inflation. Some central banks look at some core measures of inflation by excluding certain volatile items such as petrol and energy prices. This way, they focus on underlying inflation rather than short-term contributors of inflation volatility. The PTA directs the Reserve

¹³See Brook, Karagedikli and Scrimgeour (2002) for a review of the literature on alternative inflation targets.

Bank of New Zealand to focus on the headline CPI on average over the medium-term. This medium-term focus allows the Bank to look through any short term volatility in inflation caused by oil prices, energy prices or any other one-off short-term variation. Therefore, with the medium-term focus, the difference between the headline and a core measure diminishes substantially.

The inclusion of clause 4(b) in the recent PTAs is an explicit recognition that unnecessary volatility in output, interest rates and the exchange rate is detrimental to economic welfare, and may have adverse consequences for economic growth.¹⁴ Smoother output cycles may be beneficial for trend growth, since output volatility amplifies the cost of recessions, while unsustainable expansions generate inflation with attendant consequences for welfare and growth. Similarly, large swings in interest rates are probably unhelpful for businesses and households from a longer term planning point of view. Uncertainty regarding the cost of borrowing may cause investment decisions to be deferred, or worse still, for decisions to be taken that are later regretted.

The aspects of the New Zealand framework we discussed above, were influenced by a mix of economic theory of the time and the practical solutions to the problems associated with earlier institutional arrangements. For example, the Act incorporates flavours from the time consistency literature, which was one line of theory that influenced the thinking of the Bank at the time.¹⁵ Reddell (1999) notes that the Bank's view was influenced by the central bank independence literature.

The Act and the PTA framework can also be viewed in the context of the broader public sector reforms that occurred in the late 1980s. An underlying philosophy guiding these reforms was the need to establish clear, achievable policy objectives, while assigning appropriate responsibilities and the necessary delegated authority. It is argued that 'the Reserve Bank of New Zealand was just one of a number of state agencies undergoing reform in the late 1980s, and the guiding principles for those reforms came from developments in the corporate governance literature.'¹⁶ The fact the New Zealand approach links tenure of the Governor of the Bank to the performance

¹⁴For a discussion on the relationship between clause 4(b) of the PTA and the primary goal of price stability see Hunt (2004).

¹⁵Grimes (2005) notes that the time consistency insights were reflected in the Reserve Bank of New Zealand Act (1989).

¹⁶Sherwin (2000).

of the Governor can be characterised as an explicit ‘incentive contract’ (Persson and Tabellini 1993, Walsh 1995). Overall the New Zealand framework was a compromise between different strands of thought.

4 Transparency and Communication

The degree of transparency differs across the inflation targeting central banks. Some argue that transparency is a virtue but ‘like all virtues it can go too far.’¹⁷

As the Svensson Report to the Minister of Finance on New Zealand monetary policy (2001) states, effective communication is vital to the efficient operation of monetary policy. Moreover, the report argues that a high level of transparency is also an important part of the accountability structure of monetary policy.

Communication is a key aspect of the New Zealand regime. Although the Act does not specify how the Bank should communicate with the public in great detail, the Reserve Bank of New Zealand has been very transparent and innovative in its communications.

In New Zealand, a great weight has been placed on transparency throughout the design of the framework, and even within the practical implementation of monetary policy. Transparency is used as a device to moderate incentive problems that might arise from areas where discretion is allowed; as a key part of the accountability mechanism; and to assist in aligning expectations with policy intent. However, we may be regarded as less transparent in terms of the decision-making process: we do not publish the minutes of the OCRAG meetings, for example. However, those minutes, as well as all the documents that go into our decision-making process, are monitored by the Board. Therefore, there is transparency in that sense as well. Moreover, the committee is only advisory and the Governor is the ultimate decision maker and the Governor’s decisions are published.

Within the formal structure, there are important areas where the exercise of discretion can substantially alter the direction and intent of policy. And in terms of the Policy Targets Agreement, the Bank can choose not to offset inflation disturbances that will take inflation outside the target range.

¹⁷Mishkin (2004).

How can one be sure that these ‘loopholes’ do not re-open incentive problems for both politicians and central bankers? At each point where a loophole is opened, there is also the statutory or contractual requirement to advertise publicly, using a prescribed procedure, what is being done and why. While not foolproof, this approach at least makes it more difficult for the relevant actors to claim consistency of their actions with medium-term price stability when in reality there is no such thing.

In the context of forward-looking inflation targeting, laying out one’s intentions quite naturally devolves into publishing inflation forecasts. In this regard, the Reserve Bank of New Zealand is very transparent and we have for some time been publishing detailed inflation forecasts in the same document, in which policy decisions are described. Until 1997 those forecasts were of the standard form: projected inflation based on an assumption of no policy change. Observers could easily relate policy decisions to the forecasts in terms of direction, but not in terms of magnitude.¹⁸

Since 1997, the Reserve Bank of New Zealand has been publishing projected tracks for interest rates and exchange rates consistent with achieving our inflation target, i.e. implicitly forecasting our policy response to our forecasts. The extent of inflationary or disinflationary pressure that we believe will be present over the period ahead can be read directly from the extent to which the policy instruments are projected to adjust. Through this device, we provide a numeric representation of the extent of our policy bias, not only over the period until the next decision point, but also over the next two years or so.

The obvious advantage of being so explicit in our forecasting, and in the connection of policy actions to those forecasts, is that the economic agents can learn to anticipate our policy interests. To a significant extent, market prices adjust automatically on the arrival of new information that is relevant for inflation pressures. There are two other advantages worth noting. First, the reasoning behind policy adjustments is easier for observers to see, helping remove residual doubts as to the motivations underlying policy actions. Second, without inflation projections, pre-emptive policy actions would be harder to justify.

¹⁸This comment is more true of the period 1995-97 period than earlier. Prior to that period, the Bank placed heavily emphasis on the exchange rate pass-through directly into prices of tradeable goods, with the assumed pass-through coefficient well known to observers.

The degree of development of local markets and the local media is an important factor in communication. The New Zealand experience suggests that such development definitely improves the Bank's ability to communicate. The approach the Reserve Bank of New Zealand adopts is a 'guiding the markets towards where we want them to be' approach. There are obvious dangers of simply following the market.

5 Developments in New Zealand Inflation Targeting

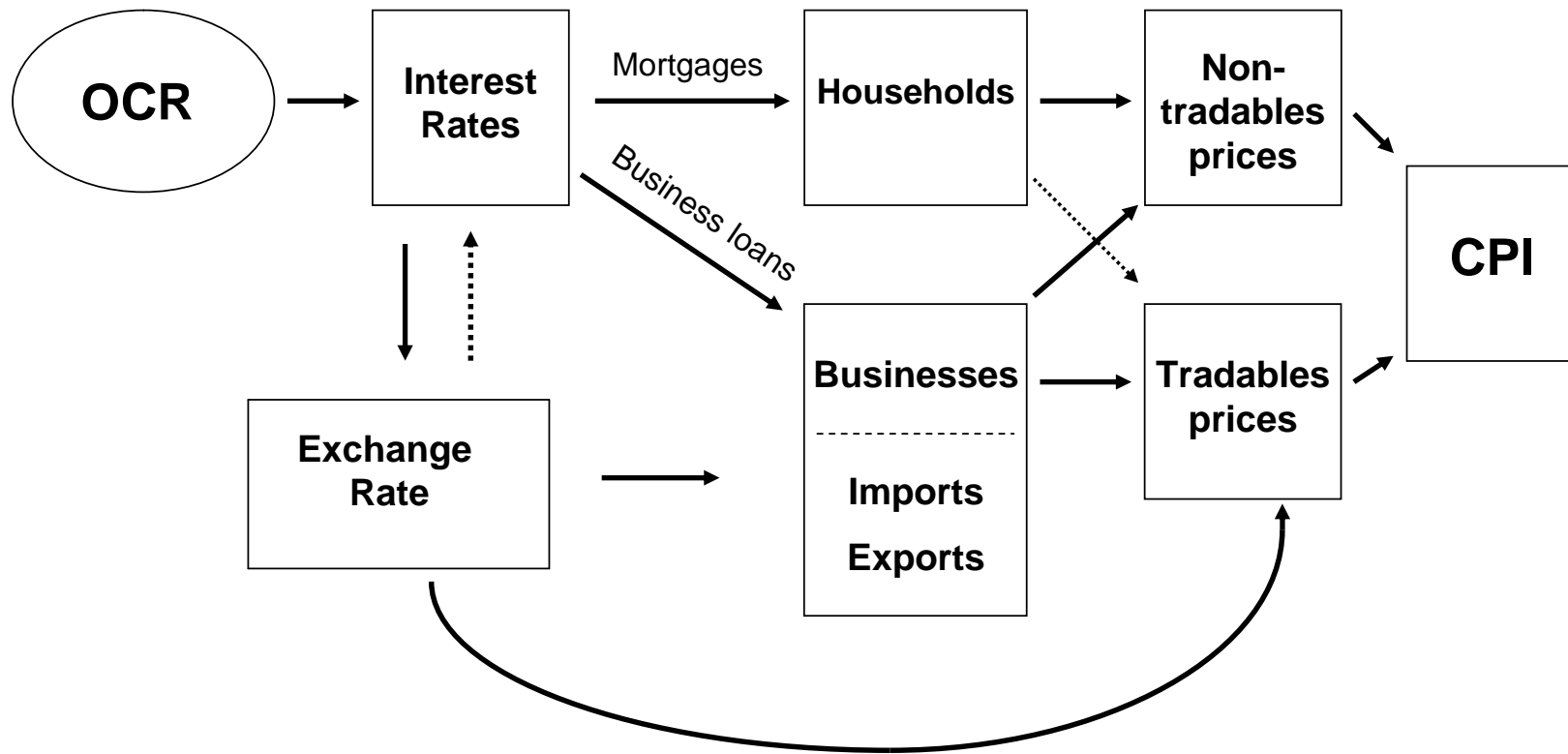
5.1 Flexible inflation targeting

It is useful to put the effects of policy into two boxes: direct and indirect effects. The direct effect (on prices) and the indirect effect (on activity and then prices) are engineered by the central bank via its monetary policy instrument - the official cash rate (OCR) in the case of New Zealand. The OCR can affect the short term interest rates as well as the exchange rate, though the effect on the latter is subject to greater uncertainty. Changes in the real interest rate affect the intertemporal price of borrowing and spending, while changes in the real exchange rate affect the relative cost of buying another country's output. The lag from the real interest rate and exchange rate channel to aggregate demand is typically around a year, with a further lag to domestic inflation. For a small open economy there is also a more direct nominal exchange rate channel to inflation, since import prices enter the domestic CPI basket. This channel works faster than the aggregate demand-to-inflation channel, although it is dependent on the extent and speed of pass-through from the exchange rate to the domestic price of imports.¹⁹

Figure 3 shows a simple textbook version of the transmission mechanism for a small open economy. One way to think about the monetary policy transmission mechanism and associated inflation pressures is via the price pressures induced by the intensity of resource use in an economy. There are many ways of measuring resource pressures in an economy, and the output gap concept is probably the most popular one among inflation targeting central banks. The difficulty in estimating the output gap and

¹⁹Over time however, this channel has become more muted (Hampton (2001)). This may reflect a change in behaviour of firms as they have tended to absorb exchange rate related changes in costs in margins, rather than risk market share by changing prices. This in turn reflects recognition that exchange rate fluctuations are temporary, and inflation expectations are now perhaps better anchored.

Figure 3: A simple monetary transmission mechanism



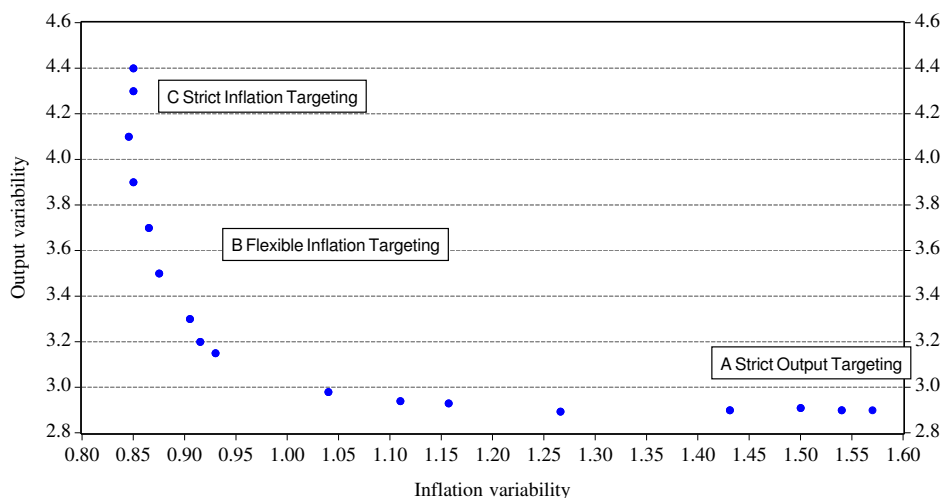
related uncertainty also highlights²⁰ what a technical job monetary policy and inflation targeting is. When the pressure on resources is higher than normal, in other words the output gap is positive, prices tend to rise.

The essence of a flexible inflation targeting approach to monetary policy rests on the decision a central bank must make on how to appropriately respond to inflationary pressures. This choice is mediated by the nature of the trade-offs involved between price stability objective and the variability of output, interest rates and the exchange rate. Consider firstly the lags inherent in the monetary policy transmission mechanism described above. Our research show that monetary policy affects inflation with increasing power up to six to eight quarters. If we wanted to control inflation, say, within a six month time frame, this would require very large changes in our policy instrument, the Official Cash Rate (OCR). Given the magnitude of the interest rate change required to offset any inflationary pressures, the real economy would have to undergo abrupt adjustment. In the extreme, policy could induce a recession which would then require the policy rate to be lowered if the impending fall in inflation were to be similarly managed within a six month time frame. This ‘instrument instability’ associated with a lag mismatch would involve considerable variability in real GDP growth. It would also involve considerable variability in the exchange rate (to the extent the short term interest rates affect the exchange rate), and indeed, the short horizon would implicitly rely on the direct exchange rate channel to inflation outlined earlier, given the quicker pass-through from the exchange rate to inflation. So, one element of a flexible approach to inflation targeting is to match up the policy horizon to the instrument lag.

Another characteristic of flexibility is shaping the policy response to match the nature of the macroeconomic disturbance. Consider a temporary oil price shock, perhaps like the global economy is currently experiencing. We could respond to this negative supply shock to the economy by responding aggressively to the increase in headline inflation. Aided by the direct exchange rate channel, inflation would return to target quite quickly. Alternatively, we could adopt a more cautious approach and

²⁰Various papers by Orphanides and others have highlighted the problems associated with estimating the output gap, especially in real time. See Orphanides (2001), Orphanides and van Norden (2002, 2005).

Figure 4 The trade-off between output and inflation variability



look through the shock, or not respond as aggressively. This would have a smaller negative effect on output, with less instability in interest rates and the exchange rate. The cost however, would be higher short-term inflation. The key policy judgement would rest on a view as to how temporary the supply-side shock might be, and any implications for inflationary expectations.

This variability trade-off can be illustrated by a stylised ‘Taylor curve’ as in figure 4, which represents the set of variance-minimising combinations of inflation and output that are technically feasible.²¹ This particular curve is taken from Drew and Orr (1999) based on stochastic simulations using the Bank’s forecasting model (FPS). A ‘strict’ approach to inflation targeting would accept a large output variance in return for minimal deviation of inflation from target - point C for example - where ‘more active’ means increasing the interest rate response to deviations of inflation from target. A central bank that placed more weight on stabilising economic growth would be prepared to accept greater inflation variability, and hence be less active - e.g., point A. Flexible inflation targeting therefore represents a compromise between two possible extremes - point B represents the standard policy rule in FPS embodying flexible inflation targeting.

Because credibility is very important for the success of an inflation targeting cen-

²¹See Taylor (1979) for the original statement of this trade-off.

tral bank, the beginning of many inflation targeting regimes may be characterised as relatively strict inflation targeting, while over time they move towards a flexible inflation targeting regime. Over time, central banks have faced a more favourable trade-off between inflation and output variability. One possible explanation for this shift includes a better understanding of the lags involved in monetary policy and a better match between these lags and the policy target horizon. Central banks go through learning as well. The learning process enables them to better forecast especially as inflation becomes more predictable. Monetary policy has also become less of a shock to the economy itself, as central banks have taken on board lessons from the 1970s. Inflation expectations have become anchored at a low level following disinflation policies of central banks around the world. Finally, the ongoing globalisation process in the world economy has ensured intense product market competition, keeping a lid on many prices and promoting labour market flexibility.

In summary, the PTA clarifies what the pursuit of the price stability goal means in practice. Section 2 requires the Reserve Bank to maintain a low and stable inflation environment, while clause 4(b) instructs us to do this in a way that minimises any adverse impact on the variability of output, interest rates and the exchange rate to the extent that we can. In this regard, the Bank has one clear policy objective that is defined in the Act. There are, however, different paths to price stability. The PTA requires the Bank to choose monetary policy paths that do not exacerbate the inevitable volatility that already exists in the economy. This is the essence of flexible inflation targeting.

5.2 Open economy aspect, the exchange rate

For a small open economy, large fluctuations in the relative value of the currency put pressure on a key sector of the economy. This is particularly important for New Zealand, where the export sector represents about 35 per cent of GDP. So a natural question to ask is whether we should be trying to explicitly stabilise the exchange rate? This issue is worth considering in some detail as it often arises as a particular concern in small open economy inflation targeting countries like New Zealand and Turkey.

Overall, the literature tends to find that the Reserve Bank of New Zealand has

not directly responded to exchange rate movements (Lubik and Schorfheide (2005) and Lubik 2005). The literature also tends to find that there is little to be gained in terms of improving the inflation-real economy variance trade-off from an explicit response to exchange rate movements, over and above the response that will result from standard flexible inflation targeting. Exchange rates are rather volatile assets by nature and attempting to reduce this volatility substantially could increase volatility in other objectives.²² This question has also been specifically looked at within the Reserve Bank recently.²³ West (2003) examined what would happen if interest rates were used to attempt to stabilise the exchange rate in a model of the New Zealand economy. He found that reducing quarter-to-quarter exchange rate variance would result in greater output, interest rate and inflation variance.

West's results have been supported by Reserve Bank research using the Bank's forecasting and policy system (FPS) model, and a variety of assumptions about exchange rate determination. Hampton *et al* (2003) finds greater costs to the real economy of achieving exchange rate stabilisation than West. West suggests that his estimate of costs involved in these trade-offs are probably on the low side, as the results assume that the central bank fully understands the exchange rate and that interest rate changes affect the exchange rate in a reliable manner. While this is a conventional assumption in the theoretical literature, in practice the empirical link between monetary policy and exchange rates is complicated by a number of other influences over and beyond interest rate changes and inflation expectations. In other words, it would probably be extremely difficult for the Bank to precisely control the exchange rate using interest rates within the confines of an inflation targeting regime.²⁴ And even if it were possible, attempting to move policy in this direction would lead to significant rises in inflation and output variability.²⁵ New Zealand's own experience with a Monetary Conditions Index has certainly caused the Reserve Bank of New Zealand to be cautious in its responses to the exchange rate.

²²See Dennis (2001) for an overview. Standard inflation targeting in this sense implies some weight on output gap along with inflation deviations from target.

²³See Hampton, Hargreaves and Twaddle (2003) and West (2003).

²⁴Foreign exchange intervention offers an alternative means of influencing the exchange rate. The Bank has recently been given the capacity to intervene in the FX market when the exchange rate is unjustified by economic fundamentals. Such interventions however, must be consistent with achieving price stability. See Eckhold and Hunt (2005) for an overview of the new policy.

²⁵Leitemo and Söderström (2001) show, given uncertainty about what determines the exchange rate, it may be better to not explicitly respond to exchange rate movements.

An added complication to the exchange rate these days is the increasing issuance of New Zealand dollar-denominated offshore bonds (Uridashi and Eurokiwi). A large issuance of Eurokiwis (or Uridashi bonds) at times when the New Zealand dollar exchange rate is already high, may accentuate the peaks in the exchange rate cycle. The capital inflow can be expected to put downward pressure on interest rates, upward pressure on the New Zealand dollar, and therefore shift monetary restraint away from the interest rate channel toward the exchange rate channel (Drage, Munro and Sleeman 2005).

In practice, tradables and non-tradables inflation rates can be quite divergent, even though the average consumer price inflation rate is well within the target. This largely reflects the powerful influence of exchange rate on tradables inflation. Such divergent inflation rates across the economy may not be particularly desirable. It is an important policy question to address the implications of two divergent inflation rates if these are not seen as sustainable relative price trends. This is particularly so if the divergence is due to a persistently mis-aligned local currency. It is an important question, whether this divergence in the two inflation rates will always be there in many countries. At this stage we are not sure if this is a generalised problem or not. If it becomes one, then surely this is a challenge for other central banks.

While it is very difficult for a central bank to engineer an optimal ‘desired’ mix of monetary policy conditions through a single instrument, the Bank is open to the idea there maybe supplementary instruments that can help cool domestic demand when it appears overheated relative to the traded sector and *vice-versa*. This is a active area of investigation at the Reserve Bank of New Zealand currently.²⁶

5.3 Housing market

In New Zealand, the housing market plays a significant role in our transmission mechanism: home ownership rate is rather high, around 65-70 per cent and most home owners have a mortgage. When there is a surge in house prices we observe a persistent increase in consumption from households. Moreover, some small businesses

²⁶Although it is too early to make judgements, to the extent the New Zealand experience becomes more global, interest in supplementary instruments on top of a conventional interest rate tool may increase.

may also be financing their investments with housing equity withdrawals. As a result, we observe a clear link in New Zealand between housing market activity, broader economic activity and domestic inflation.

Of course the issue of asset price bubbles and whether central banks should respond to them is a major issue among academics and central bankers. Not only from the inflation perspective, but from a financial stability perspective too and this issue is still being discussed among academics and central bankers.

As figure 1 illustrates, the improvement in both the level and variability of inflation outcomes has been dramatic. This improvement primarily stems from a change in the conduct of monetary policy associated with the introduction of inflation targeting. The specific mechanism however, is the interplay between institutional credibility and the inflation expectations of private economic agents as discussed earlier. Moreover, this relationship is one we do not take for granted, since any flexibility we have in conducting policy we owe to well-anchored expectations.

There are other possible factors that have also contributed to New Zealand's low and stable inflation environment, over and above the role of inflation expectations. These include the more muted response of prices to exchange rate fluctuations; lower imported inflation (the China effect); structural change increasing the degree of product market competition; and a weakening of the traditional wage-cost dynamic in the inflation process (Hodgetts 2005).²⁷

6 Conclusions

It is fair to say that the origin of inflation targeting in New Zealand can be attributed to two forces: the influences of economic theory on policy makers and the realisation of the experiences of the policies of the 1970s and the 1980s.

Above, we mentioned the features of New Zealand's inflation targeting approach. These features are closely bound into the legislative structure of the Reserve Bank of New Zealand Act (1989). New Zealand's experience with inflation targeting has been broadly successful, albeit not without its challenges. However, much has changed from

²⁷These explanations are not mutually exclusive, since lower pass through and a breakdown in wage-push inflation may be themselves a consequence of lower inflation expectations.

the start of the inflation targeting in terms of how we manage policy: the Bank has become relatively more flexible. Our inflation target has been changed from 0-2 per cent range to 1-3 per cent range, acknowledging the risks of deflation and other problems associated with zero inflation. We have also become more focused on medium-term inflation as opposed to annual inflation outturns.

The New Zealand economy has performed well relative to its pre-reform period. In addition to low inflation, the New Zealand economy has also achieved high and stable growth and a low unemployment rate.

What lessons can we take from all this, in terms of the benefits of inflation targeting? It is difficult and probably unfair to relate all of this performance to inflation targeting. The literature on the effects of inflation targeting on growth is not that convincing. However, it is probably fair to say that New Zealand's growth performance reaffirms the now conventional view that a low and stable inflation environment is conducive to improved growth outcomes. Although the cross-country studies are inconclusive in their results, in terms of the effects of inflation targeting on economic performance, no study has found deteriorating effects from inflation targeting. Most find improvements in economic performance, but, fail to find statistically significant improvements.²⁸

The form of inflation targeting pioneered by the Reserve Bank of New Zealand has been adopted by many countries over the years. Although there are many differences in the way different countries operationalise inflation targeting, there are two major points on which New Zealand continues to differ.

The first is the New Zealand's decision-making process where the Governor is the sole decision maker. However, although the Governor is the final single decision maker, there is an advisory committee that gives written advice to the Governor and the Board monitors this advice and the Governor's decisions. Even though this advisory committee is not required by the Act, it has long been the practice at the Bank.

The second difference is the high degree of transparency. In particular in publishing its forward endogenous interest rate track, the Reserve Bank of New Zealand can be characterised as one of the most transparent central banks among inflation targeters.

²⁸Ball and Sheridan (2003), Levin, Natalucci and Piger (2004), Battini, Kuttner and Laxton (2005) are some of them, among others.

Despite these differences, the New Zealand experience can probably provide the following conclusions or warnings to those countries that have recently begun inflation targeting:

- Inflation targeting is not a mechanistic way of operating the monetary policy. Within itself, it can be very flexible. However, inflation targeting is not over-predictive nor is it over-precise;
- New Zealand's experience shows that monetary policy implementation can be much assisted by other policies such as fiscal and structural policies;
- A central bank cannot target more than inflation. We do think about other instruments, but a single instrument to control the single variable inflation is still the key;
- Central bank independence is crucial and comes with a great degree of accountability;
- Inflation targeting can provide a robust and enduring framework, but one that [adapts and] evolves over time. There is a large degree of learning involved;
- Monetary policy will not work without credibility and credibility can only be gained by achieving low and stable inflation.

The nature of the evolving inflation targeting regime and the learning that has accompanied it suggests that a flexible approach to the pursuit of price stability is desirable in a welfare sense. A central bank that has concern for the volatility of the real economy will produce superior outcomes in terms of the various trade-offs that monetary policy confronts. That said, this flexibility is itself predicated on well-anchored inflation expectations, so the extent to which this flexibility can be exploited by the policymaker is limited.

References

- Ball, L. and N. Sheridan (2003) “*Does Inflation Targeting Matter?*” IMF Working Paper, 03/129.
- Battini, N., Kuttner, K.N. and D. Laxton (2005) “*Does Inflation targeting Work in Emerging Economies*”, World Economic Outlook, September, IMF.
- Bernanke, B., Laubach, T., Mishkin, F., and A Posen (1999) “*Inflation targeting. Lessons from the international experience*”. Princeton University Press.
- Bollard, A. (2005) “*New Zealand’s potential growth rate*”, address to the Canterbury Employer’s Chamber of Commerce, Christchurch, 28 January.
- Brook, A-M., Karagedikli, Ö. and D. Scrimgeour (2002) “*Assessing alternative inflation targets: growth effects and other costs and benefits*” Policy Targets Agreement: Reserve Bank Briefing Note and Related Papers, (Wellington, RBNZ), pp. 22-50.
- Bollard, A., Lattimore, R. and B. Silverstone (1996) “*A study of Economic Reform: The Case of New Zealand*”, North Holland.
- Buckle, R., Haugh, D. and P. Thomson (2001) “*Calm after the Storm?: Supply-side contributions to New Zealand’s GDP Volatility decline*” Treasury Working Paper 01/33.
- Cecchetti, S., Flores-Lagunes, A. and S. Krause (2005) “*Assessing the Sources of Change in the Volatility of Real Growth*” paper presented at the RBA conference, The Changing Nature of the Business Cycle, 11-12 July.
- Dennis, R. (2001) “*Monetary Policy and Exchange Rates in Small Open Economies*” FRBSF Economic Letter, 16.

Drage, D., Munro, A. and C. Sleeman (2005) “*An update on Eurokiwi and Uridashi bonds*”, Reserve Bank of New Zealand Bulletin, 68(3), pp. 28-38.

Drew, A., and A. Orr (1999) “*The Reserve Bank’s role in the recent business cycle: actions and evolutions*” Reserve Bank of New Zealand Bulletin, 62(1), pp. 5-24.

Eckhold, K. and C. Hunt (2005) “*The Reserve Bank’s new foreign exchange intervention policy*” Reserve Bank of New Zealand Bulletin, 68(1), pp. 12-22.

Evans, L., Grimes, A., Wilkinson, B. and D. Teece (1996) “*Economic Reform in New Zealand 1984-95: the pursuit of economic efficiency*” Journal of Economic Literature, 34(4), pp. 1856-1902.

Grimes, A. (2005) “*Acceptance speech to NZIER award*”, www.motu.org.nz/pdf/AG_05_NZIER_Address_Abridged.pdf

Gürkaynak, R.S., Sack, B. and E.T. Swanwon (2005) “*The Sensitivity of Long-term Interest Rates to Economic News: Evidence and Implications for Macroeconomic Models*”, American Economic Review, 95(1), pp. 425 - 437.

Hampton, T. (2001) “*How much do import price shocks matter for consumer prices?*” Reserve Bank of New Zealand Discussion Paper 01/06.

Hampton, T., Hargreaves, D. and J. Twaddle (2003) “*The scope for other stabilisation objectives within an inflation targeting regime: some stochastic simulation experiments*” Reserve Bank of New Zealand Internal Memo.

Hodgetts, B. (2005) “*Changes in the inflation process in New Zealand*”, paper for the BIS Central Bank Economist’s meeting on the evolving inflation process, 27-28 October.

Hunt, C. (2004) “*Interpreting clause 4(b) of the Policy Targets Agreement: avoiding unnecessary instability in output, interest rates and the exchange rate*” Reserve Bank of New Zealand Bulletin, 67(2), pp. 5-20.

Kent, C., K. Smith and J. Holdaway (2005) “*Declining Output Volatility: what Role for Structural Change*” paper presented at the RBA conference, The Changing Nature of the Business Cycle, 11-12 July.

Kuttner, K.N., (2004) “*A Snapshot of Inflation Targeting in its Adolescence*”, in Kent, C. and S. Guttman (eds) Future of Inflation Targeting, Reserve Bank of Australia

Leitemo, K. and U. Söderström (2001) “*Simple monetary policy rules and exchange rate uncertainty*”, Sveriges Riksbank Working Paper No 122.

Levin, A., Natalucci, F. and J. Piger (2004) “*The Macroeconomic Effects of Inflation Targeting*”, Federal Reserve Bank of St. Louis Review, Vol. 86, No. 4, pp. 51-80.

Lubik, T. (forthcoming) “*A Simple, Structural and Empirical Model of the Antipodean Transmission Mechanism*”, New Zealand Economic Papers.

Lubik, T. and F. Schorfheide (forthcoming) “*Do Central Banks Respond to Exchange Rate Movements: A Structural Investigation*”, Journal of Monetary Policy.

Mishkin, F. (2004) “*Can Central Bank Transparency Go Too Far?*”, in Kent, C. and S Guttman (eds) Future of Inflation Targeting, Reserve Bank of Australia.

Orphanides, A. (2001) “*Monetary policy rules based on real time data*”, American Economic Review, 91, pp. 964-985.

Orphanides, A. and S. van Norden (2002) “ *The unreliability of output gap estimates in real time,* ” Review of Economics and Statistics, 84, pp.569-583.

Orphanides, A. and S. van Norden (2005) “ *The reliability of inflation forecasts based on output gap estimates in real time*”, Journal of Money, Credit and Banking, 37(3), pp. 585-596.

Persson, T. and G. Tabellini (1993) “*Designing Institutions for Monetary Stability*”, Carnegie-Rochester Conference Series on Public Policy 39, pp. 53-84.

RBNZ (2000b) “*The evolution of Policy Targets Agreements*” Independent Review of the Operation of Monetary Policy: Reserve Bank and Non-Executive Director’s Submissions, pp. 18-28.

RBNZ (2000a) “*Output volatility in New Zealand*” Independent Review of Monetary Policy - supporting papers.

Reddell, M. (1999) “*Origins and early development of the inflation target*”, Reserve Bank of New Zealand Bulletin, Vol. 62 (3), pp. 63-71.

Sherwin, M., (2000) “*Practical Experiences on Inflation Targeting*”, address to the Bank of Thailand Symposium, Bangkok, 20 October.

Svensson (2002) “*Monetary Policy and Real Stabilization,*” paper presented at the “Rethinking Stabilisation Policy” Federal Reserve Bank of Kansas City Conference, Jackson Hole, Wyoming.

Svensson, L (2001) “*Independent Review of the Operation of Monetary Policy in New Zealand: Report to the Minister of Finance*”, Wellington.

Taylor, J. (1979) “*Estimation and Control of a Macroeconomic Model with Rational Expectations*” Econometrica, 47(5), pp. 1267-86.

Walsh, C. (1995) "*Optimal Contracts for Central Bankers*", American Economic Review (85), march, pp. 150-167.

West, K. (2003) "*Monetary policy and the volatility of real exchange rates in New Zealand*" Reserve Bank of New Zealand Discussion Paper 03/10.