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# Strategic choices in inflation targeting: the New Zealand experience

A presentation by Murray Sherwin, Deputy Governor of the Reserve Bank of New Zealand, to a seminar on inflation targeting hosted by the International Monetary Fund and Central Bank of Brazil, 3-5 May 1999, Rio De Janeiro.

## 1 Introduction

The Reserve Bank of New Zealand is generally regarded as the originator and pioneer of formal inflation targeting as we now understand that term, that is, the conduct of monetary policy within a framework based on an explicit quantitative inflation objective. New Zealand's experience of inflation targeting now stretches back over a decade, and over one full business cycle. It is nice to have that small claim to fame, but we should acknowledge the efforts of Knut Wicksell in the 1890s which inspired the Swedes to adopt a form of inflation targeting in the early 1930s, apparently with positive results.

It has been, naturally, of some interest to watch our fellow central banks take up the concept of inflation targeting and apply it in their own environments over recent years. Indeed, it seems that the interest is growing, as this conference indicates. The past couple of months have brought forth a number of central banks around the world seeking advice and assistance as they explore the concept and its applicability to their own circumstances.

I said that the New Zealand experience with inflation targeting extends over a decade. I should be more precise, because this matter has been a source of confusion in some quarters. The Reserve Bank of New Zealand Act 1989 (RBNZ Act), which established the operational independence of the RBNZ, and which established the single objective of price stability for our monetary policy, came into force in February 1990. The first Policy Targets Agreement (PTA) entered into between the Governor and the Minister of Finance under that legislation, which specifically defined the inflation target, was signed in March 1990.

However, we date the concept and practice of inflation targeting in the sense of adopting an announced, numerical target, from April 1988. Moreover, several years prior to that, in fact from the middle of 1984, the government of the day had made it clear that the achievement of low infla-

tion was a key objective of its economic policy agenda. There should be little surprise, therefore, that a number of academic studies of recent times have found it difficult to identify a clear break in New Zealand's inflation performance from the date our new charter was adopted in 1990. The behavioral change with respect to the formulation and implementation of monetary policy, had taken place several years earlier.

In an operational sense, the reform of monetary policy in the mid-1980s was encapsulated in two key initiatives. The first was to adopt the principle that all of the government's funding requirements should be met directly from private markets, with open tenders of government securities being the primary means by which that was to be, and continues to be, achieved. The second key decision was that, in March of 1985, to move to a clean float of the New Zealand dollar. That has also been sustained since, with no direct foreign exchange market intervention by the Reserve Bank over the subsequent 14 years. With those two decisions we effectively removed the major exogenous influences on the money base. Those decisions also signalled the government's willingness to accept market judgements with respect to the interest rates and the exchange rate consistent with achieving low inflation.

## 2 Inflation targeting in concept

With that said, it is timely to step back a little from the usual rush to engage in debate about specific elements of inflation targeting, such as the definition of the target, or the merits of different institutional structures, and address a few of the higher level characteristics of inflation targeting.

There is perhaps a tendency in some quarters to see inflation targeting as a complex solution, with the complexities arising from the perceived need for:

- a well developed inflation forecasting technology;

- particular forms of institutional structure, often including central bank independence;
- a sound and well developed financial sector; and
- well developed measures of inflation.

In fact, New Zealand scored rather poorly on most of these “prerequisites” when we first began our serious attack on inflation.

First, our forecasting systems were not particularly sophisticated, with our existing econometric model having been essentially rendered redundant by the extensive structural reform that also commenced in New Zealand in the mid 1980s. With no closely defined sense of the relationships between the key monetary variables and the likely path of future inflation, the conduct of monetary policy through that period was necessarily an exercise of fairly crude judgements. It has been only in the past two years that we have recommenced using a formal macroeconomic model in our forecasting and monetary policy formulation – and our analysts still argue about whether the advent of our new model represents a real advance in our forecasting capability.

Secondly, the RBNZ Act did not appear until about 5 years after we had commenced the disinflationary process. Although our original legislative mandate assigned monetary policy to a number of macro objectives, not just low inflation, the Minister of Finance, who under that legislation had the power to instruct the Bank, decided that the priority in the area of monetary policy should be to achieve low inflation. He also accorded the Bank a high degree of de facto operational independence. These were matters of political commitment, rather than formal institutional structure.

Thirdly, New Zealand’s financial sector in the second half of the 1980s was far from sound and stable. Rapid deregulation of the finance sector in the mid-1980s enabled previously restrained institutions to expand their lending very rapidly, and a bubble economy resulted. This bubble collapsed following the October 1987 Wall Street equity market correction, and banks in New Zealand that had lent against equities and property suffered substantial losses, in some cases to such an extent that, in the absence of shareholder recapitalisation, they would have failed. Also, a large near-bank lending institution, and a number of smaller institutions,

did fail and were liquidated. No one could dispute the desirability of a robust financial sector when undertaking the disinflationary process but, in New Zealand, that was not to be the case. Indeed, if anything, the very much more subdued conditions that prevailed in asset markets and in lending behaviour after the bubble collapsed were conducive to achieving disinflation. A number of the emerging market economies that have recently been afflicted by financial crisis are today in a broadly similar – though undoubtedly more acute – position. And just as was the case for us, it is not obvious that delay in aiming for price stability will be their best option.

Finally, our inflation measures were also far from ideal – and in some respects remain so. I will touch on this matter further later on.

In sum, the commencement of inflation targeting in New Zealand boiled down to the following:

- Recognition that inflation was too high, and of the need for a clear inflation objective. Initially this objective was cast in terms of a rate no higher than New Zealand’s trading partners and later in terms of the price stability (0 to 2 percent) objective.
- Political buy-in to those objectives.
- Recognition that if those objectives were to be achieved, monetary policy needed to be singularly focussed on them, and political buy-in to that challenge as well. In economists’ jargon, it was recognised that inflation is ultimately a monetary phenomenon, that the long run Philips curve is vertical, and that to achieve disinflation a period of consistently firm, if not tight, monetary policy would be required.

With these elements in place, matters such as the precise measure of inflation to be targeted, the time horizon over which to target it and the like, were of second order importance, albeit with plenty of scope for complication and distraction. In short, the commencement of inflation targeting in New Zealand had a considerable element of the “just do it” philosophy of central banking behind it.

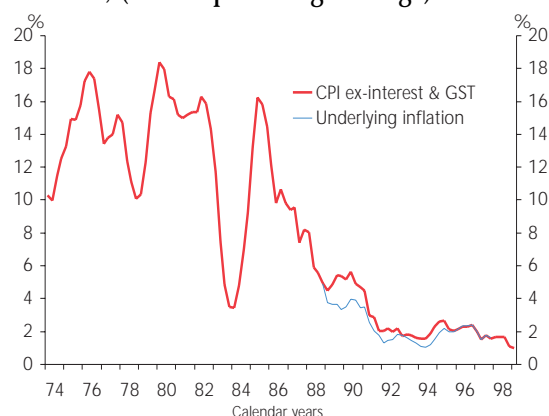
### 3 The New Zealand context

I won't dwell on the background to the New Zealand reforms, other than to say that from about the late 1950s, New Zealand had experienced declining relative standards of living and growing economic imbalances, of which rising and persistent inflation was but one characteristic. Through the 1970s and 1980s, our inflation performance was amongst the worst in the OECD, with CPI outcomes of between 10 and 20 percent per annum becoming persistent. (See figure 1). The period of economic under-performance culminated in a policy and foreign exchange crisis of our own in mid-1984. That crisis marked the beginning of possibly the most comprehensive policy overhaul yet seen in the OECD group.

The comprehensiveness of the New Zealand policy reforms is an important backdrop to any assessment of the effectiveness of our inflation targeting regime. The key point to note is that inflation targeting was not introduced in isolation. Rather, it was introduced in the midst of a process that involved substantial industry deregulation, including in the financial sector; privatization and corporatisation within the SOE sector; tariff and other trade protection (reducing) reforms; sweeping tax reforms; labour market reforms; removal of industry, including of virtually all agricultural, subsidies; the complete removal of all capital controls and the subsequent free float of the exchange rate; and rigorous and comprehensive fiscal reform.<sup>1</sup>

Many of those reforms contributed to the process of breaking down "institutionalized" inflation (eg de facto indexation of wages and prices, a "cost plus" pricing mentality, and a crawling peg exchange rate). However, some reforms conspired to make the disinflation process more difficult. For example, the introduction of GST (a comprehensive VAT-style consumption tax), caused, in the period immediately prior to it taking effect, a surge in consumption expenditure, and afterwards caused a one-off, across-the-board, increase in the prices of consumer goods and services. Also, a move to "user-pays" principles for many government-provided serv-

Figure 1  
CPI ex-interest & GST and underlying inflation, (annual percentage change)



ices, as part of the fiscal reform, caused measured prices to rise, but without any direct offset to prices from the lower income taxes made possible.

### 4 Central bank institutional reform

Much of the public sector reform process in New Zealand drew heavily on the "principal-agent" model. As applied to most government agencies, this model required that the principal (ie the government, as represented by the relevant cabinet minister) and the agent (ie the chief executive of the government department in question) enter into a contract which specifies the "outputs" to be produced by the department, and the nature of the department's accountabilities to the minister. In essence, this is simply a standard business model. It calls for clarity of objectives, clear specification of responsibilities, authorities and performance criteria, and some sense of the consequences of non-performance.

The institutional arrangements into which inflation targeting was fitted – which I will elaborate on in a moment – flowed more-or-less directly from the application of this principal-agent model to the central bank. Of course, the contemporaneous international debate on the influence of central bank independence, and the vertical Phillips curve literature already mentioned were entirely consistent with

<sup>1</sup> See Brash (1996), for a review of the New Zealand reform process

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the notion of making the central bank solely responsible for achieving an inflation objective.

## 5 The actual framework <sup>2</sup>

The RBNZ Act has a number of features that, in the monetary policy area<sup>3</sup> mark it out as different from the charter it replaced.

For monetary policy, the primary objective is established as maintenance of “stability in the general level of prices”. Previously, the Act required that the monetary policy of the government be directed to multiple objectives, including growth, full employment and balance of payments equilibrium as well as price stability.

To give greater specificity to the price stability objective, the Act requires that the Governor and the Treasurer<sup>4</sup> negotiate and agree a Policy Targets Agreement (PTA) – effectively a contract providing the Governor with, to use the jargon of the management consultants, his KPI (Key Performance Indicator). Once the PTA is signed, the Governor is free to implement monetary policy without any further reference or instruction from the Government. The Governor, who is the person in whom all the decision-making authority is vested, can be dismissed for non-performance in relation to the target set down in the PTA.

However, the Act also provides that the Government can unilaterally over-ride the primary objective, and the PTA entered into on the basis of that objective. Such an over-ride is to be effected by a formal, legal and public process. In the event of the over-ride being invoked, a new PTA must be negotiated which specifies clearly the new target. The Act provides that an over-ride can last for no more than one year before being explicitly renewed. This over-ride mechanism acknowledges that the elected Government of the day should be able to depart from the “price stability” objective for a period, without requiring the legislation to go before the full Parliament for amendment, but that any such depart-

ture must be transparent and open to public scrutiny.

The key features of this framework, therefore, are that:

- There is a single objective for monetary policy, that is price stability, which is established as a matter of law.
- The Bank has effective independence to implement monetary policy as it judges necessary to meet its contracted target, without limitations as to technique, except that choices “must have regard to the efficiency and soundness of the financial system”.
- The legislation recognizes that any choices on the trade-offs between monetary policy and other economic policy objectives are the prerogative of the elected government. Mechanisms are provided in the legislation for these choices to be exercised. In this way, the framework is consistent with a Westminster approach to democracy.
- The way in which such tradeoffs are made is a matter of public record and therefore transparent to the community at large.
- Operational independence is accompanied by a clear accountability for monetary policy implementation decisions. The Governor is solely responsible for monetary policy outcomes in terms of the target he agreed when accepting the role. A key mechanism for meeting the accountability standard is a requirement that the Bank publish a detailed *Monetary Policy Statement* at least every six months. A Select Committee of Parliament may review the Bank’s handling of monetary policy following the publication of each *Statement*.
- A committee of non-executive directors of the Board exists with the principal function of monitoring the performance of the Governor in terms of the PTA. That committee has no involvement in monetary policy decisions, but is required to review decisions, and to report its views periodically to the Treasurer. The committee may recommend the dismissal of the Governor should it conclude that his performance under the PTA is inadequate.

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<sup>2</sup> This section draws heavily on Nicholl and Archer, 1992

<sup>3</sup> Note that the bulk of the Act deals with issues of prudential supervision, not monetary policy.

<sup>4</sup> In December 1996 the new Cabinet position of Treasurer was established and, from that time, it has been the Treasurer who has been the Cabinet Minister responsible for the Reserve Bank.

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## 6 The framework in practice

This institutional framework has been in place for a decade, but has evolved during the course of those years. In part, those developments have reflected shifting circumstances – the task of maintaining price stability is different, and in some senses more difficult, than the task of achieving disinflation. In part, there have been shifts in our thinking about key issues – in particular, our views of the relative roles of interest rates and of the exchange rate in the monetary policy transmission process have shifted. Also our techniques for implementing monetary policy in the financial markets have proved less than satisfactory at times, and have been subject to change.

Also, as we have progressed, public acceptance of the price stability target has grown, and with it inflation expectations appear to have become better anchored. That has allowed us some latitude in policy implementation that was not available at an early stage in the process.

Moreover, circumstances around us have altered – the international environment, in terms of inflation pressures, is not as it was a decade ago. That has an impact both on local inflation expectations, and on the external pressures we face. Finally, we have learned from experience and from mistakes. No doubt, we will continue to learn from both.

Rather than attempt to document all of the various issues we have confronted and shifts we have made over the years, I will outline the arrangements we were working to in 1990, and those we are currently working to. I will then draw out some of the issues and lessons emerging from our experience.

### The 1990 model

As noted, the first PTA under the new Act was signed in March of 1990 (annex 1). At the time, the CPI was running at a little over 5 percent per annum and the economy was in recession. The PTA formally confirmed a target of 0 to 2 percent for the CPI, to be achieved by the year to December 1992. That original PTA also established a number of “caveats”, that is, circumstances where it was envisaged it may not be appropriate to continue to pursue the 0 to 2 percent target. The PTA envisaged renegotiation of the PTA quanti-

tative targets in such circumstances, namely where there was a direct impact on the CPI of one half of one percentage point or more as the result of:

- divergences in the movement of owner occupied house prices (which featured in the CPI regimen) and house rental values (which for owner occupied houses did not), and changes to the interest rates charged on consumer debt, notably housing loans secured by a mortgage;
- significant movements in public sector charges;
- shifts in GST and local government taxes;
- significant movements in export or import prices; and
- crisis situations, such as in the event of a major natural disaster.

In practice, these caveats came to be given effect by the Bank estimating a measure of underlying inflation which was “PTA consistent”. In other words, the underlying inflation measure was derived from the headline CPI measure calculated by the Government Statistician, but with adjustments to take account of the various elements listed above. The underlying inflation measure became our operational target.

While not required by the PTA, the RBNZ opted to publish an indicative trajectory for inflation bridging the gap between the starting point of over 5 percent and the targeted rate of less than 2 percent. Accordingly, we set targets of 3 to 5 percent for 1990 and 1.5 to 3.5 percent for 1991. A change of government in the latter part of 1990 led to an amended PTA being signed which deferred the 0 to 2 percent target by one year<sup>5</sup>. In part, that reflected a concern that the output and employment costs implied by the original trajectory were too high. In part, it reflected a concern that the Gulf War would lead to sharply increased oil prices and make the task of disinflation more difficult<sup>6</sup>. However, in the event, the target was reached early, in late 1991, and we remained within the 0 to 2 percent range for the subsequent 4 years.

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<sup>5</sup> It should be noted that the December 1990 PTA also removed the need for ex ante renegotiation of the targets in the event of a caveatable event arising, and shifted to an arrangement where the Bank was required to give ex post account for how it had responded to such circumstances. The other principal change introduced was the dropping of the distinction between the price, and imputed rental value, of owner occupied houses.

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During the initial phases of formal inflation targeting, we tended to emphasize the importance of not breaching the target. In our public discussion of policy, and in our policy reactions, we tended to treat the inflation target as being “hard-edged”. Indeed, the target was sometimes described as being bounded by “electric fences” – approach if you must, but don’t touch! The hard-edges were not necessarily a conscious part of the original design of the framework. Rather, they emerged once we had got within the target range and came to prominence in the context of an extensive public communications programme aimed at convincing New Zealanders that the Bank was, indeed, serious about its inflation target and intended to remain within it for the long haul.

Another feature of the new regime was a requirement that monetary policy be conducted with a high degree of transparency and accountability. The RBNZ had had a long history of publishing its forecasts and a continuation of that policy seemed entirely natural. The new regime also brought a requirement to publish six-monthly *Monetary Policy Statements*. The early *Statements* tended to concentrate on explaining and interpreting the new framework, and describing our policy reaction function – what indicators we were watching and how we might respond to movements in those indicators. Given that comprehensive forecasts continued to be published separately, the *Monetary Policy Statement* contained little in the way of inflation forecasts, except for fairly general comments on whether the Bank considered that conditions were evolving in a manner consistent with achieving its targets and the risks that could jeopardize such achievement.

Over time, there has been a merging of the *Statements* and our forecasts, with the inflation projections having become a central part of the policy message. The two publications

have been merged into a single *Monetary Policy Statement* form, which is now published quarterly. To use Svensson’s<sup>7</sup> terminology, the inflation forecast has become the intermediate target, and our *Monetary Policy Statements* are structured very much around the forward looking forecast for inflation<sup>8</sup>.

### The 1999 model

Our current PTA (annex 2) was signed in December of 1997, upon the re-appointment of the Governor for a further term of office. It sets the target at 0 to 3 percent in terms of the All Groups Consumers Price Index excluding Credit Services (CPIX), as published by Statistics New Zealand. The PTA continues to recognize that there can be significant temporary shocks that mask the underlying trend in prices and the Bank is instructed to respond to those disturbances in a manner that prevents general inflationary pressures emerging.

To a greater degree than in preceding PTAs, the current PTA explicitly notes that there will be occasions when inflation outcomes deviate from the targeted range. On those occasions, it requires the Bank to explain in its *Monetary Policy Statements* why such outcomes have occurred and the nature of its monetary policy response.

As compared to the original PTA, the edges of the target band have been softened. Also, we have moved away from routine, quarter by quarter, accounting of the various shocks that come within the ambit of the “caveats.” In other words, we have abandoned our earlier practice of measuring “underlying inflation”, and instead now rely on a more qualitative approach to taking account of “shocks” (whilst recognising that in the event of a major shock, estimation of the magnitude of the direct effect on prices will likely be required).

In practice, as noted, our monetary policy process now revolves around a quarterly cycle, centered on the production of comprehensive economic projections and the subsequent publication of those projections in our quarterly *Statements*<sup>9</sup>.

The projection process identifies, with all the usual constraints, qualifiers and limitations, the monetary conditions

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is the monetary conditions required to deliver that inflation outcome that is forecast (as are the tracks for the key national accounts aggregates and other macro variables of interest).

<sup>9</sup> *Monetary Policy Statements* can be viewed on the RBNZ website, <http://www.rbnz.govt.nz>

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<sup>6</sup> Refer here to the change of target to take account of the Gulf war increase in oil prices.

<sup>7</sup> See Svensson (1997).

<sup>8</sup> Up to March 1997 forecasts, including of inflation, were based on what was, essentially, a “no policy change assumption”. Under this approach the forecast inflation track signified whether a change in monetary policy stance was required. From June 1997, however, the forecasts have been generated on the basis that monetary policy is endogenous; that is, in the forecast, inflation is set to track within the 0 to 3 percent target range, and it

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which we think will be necessary to maintain CPIX inflation at about the mid-point of the 0 to 3 percent target band about six to eight quarters ahead. However, we are also conscious that our starting point is uncertain. Key data series in New Zealand are both slow to arrive and may be subject to revision. So as much as we try to look forward, we know that our attitude to current policy is likely to be heavily conditioned by emerging data on the recent past.

On the back of this analysis, the Bank announces its official cash rate (OCR), the principal instrument of policy. The OCR is additionally reviewed, but without the aid of a fully developed set of projections, approximately midway between each of the quarterly *Monetary Policy Statement* releases, giving us eight possible reset points for the OCR each year.

In reaching decisions on the nature and shape of our projections and on the setting of the OCR, the key deliberative body is a Monetary Policy Committee. This Committee is drawn from our key staff members. However, we explicitly recognize that this is only an advisory committee. As already noted, decision-making authority with respect to the operation of monetary policy rests solely with the Governor.

## 7 The lessons learnt

Bernanke et al (1999) identify a number of key operational issues that arise in the design and implementation of an inflation targeting regime. So, with the benefit of a decade of experience, how do we think about some of those issues?

### Which measure of inflation should be used?

New Zealand opted for the price measure that was most familiar to New Zealanders. We saw the disadvantages of aspects of the construction of the CPI, but did not regard any of the alternative measures of inflation as viable candidates for the task. The key issues centred on the inclusion in the CPI of household interest costs, and the inclusion of some housing-related capital items (the cost of a new "section" or house lot is taken directly into the CPI, as is the construction cost of new houses). In essence, houses are included in the CPI regimen on the same basis as are consumer durable goods, even though houses have a very much longer life

than other consumer durables.

Over the past couple of years, we have been working with Statistics New Zealand on a review of the CPI. We already have an officially published measure which excludes the interest rate component (CPIX), which is now used for the purposes of our target. Also we will soon have alternative measures of inflation that incorporate owner-occupied housing costs by way of an imputed rentals figure, rather than the current "acquisitions" approach.

While the Bank has been anxious to see these developments in the official inflation measures, it is difficult to conclude that we have been significantly disadvantaged through not having these measures earlier. Certainly, our task was made more complicated on occasions, especially with respect to public communication. But we were able to compensate in various ways. Our use, up until December 1997, of an underlying inflation measure was never seriously challenged as lacking in integrity, despite it being calculated by the Reserve Bank. The fact that we were careful to explain, in a fully transparent manner, any deviations between the official CPI measure and underlying inflation was doubtless a major factor here.<sup>10</sup> Our current use of the interest rate exclusive measure of inflation, rather than the headline CPI, has also required a good deal of public explanation. But again that has not given rise to any significant challenge to the integrity of our framework or the integrity of our intentions.

We have devoted some effort to exploring trend measures of inflation.<sup>11</sup> Despite identifying measures such as weighted medians of the CPI components that have attractive characteristics as measures of central tendency, we have not felt tempted to adopt those as our target measures, largely because of the perceived difficulties in gaining public understanding and acceptance. However, the CPIs of many countries carry a higher weighting than in New Zealand for volatile elements such as food. In those cases, the identification of a reliable but more stable measure of trend inflation may be much more important to the successful implementation of inflation targeting.

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<sup>10</sup> Moreover, the underlying inflation measure never included less than 85 percent of the total headline CPI regimen.

<sup>11</sup> See Roger (1995).

## What numerical value should the target have?

The arguments over what is the preferred numerical value for an inflation target are well canvassed in the literature and I certainly have nothing new to say on that subject.

The origins of the original 0 to 2 percent target in New Zealand reflected a generalised ambition to achieve something close to "true" price stability. At the time there was a loose presumption that the measurement bias in our CPI could be of the order of 1 percent.

The shift to a 0 to 3 percent target in December 1996 was essentially politically driven. Don Brash was not seeking such a change himself, despite inflation having slightly exceeded the 2 percent upper limit through the previous year. However, while not seeking that change, there is some reason to believe that the original target suffered to some degree from a public perception that it was too narrow to be fully credible. It is also fair to say that the Bank was, and remains, very comfortable with the extra latitude of the new target. The wider band is more consistent with what we believe we can achieve with a reasonable degree of reliability. It is also more consistent with a growing sense that we can usefully trade off a little additional inflation variability against some increased stability in output and interest rates. This matter is discussed further below.

## What horizons?

The question of the appropriate policy horizon is essentially bound up with the nature of the chosen target and accountability arrangements. With a hard-edged target and rigorous accountability for outcomes relative to target, the incentives on the central bank drive it towards shorter horizons and more active manipulation of the policy instruments.

Our early horizons were around the one year mark. That was broadly consistent with what we felt our forecast capacity to be. It was also consistent with our approach to policy which, at the time, put a good deal of emphasis on the direct price effects of exchange rate movements.

More recently, we have put more weight on interest rates and on the indirect impact of the exchange rate on aggregate demand, and on prices via that indirect channel. We now assume, in the first instance and in the absence of evidence to the contrary, that shifts in the exchange rate reflect and counteract real disturbances to the economy, notably from abroad, and therefore do not require an immediate interest rate response in order for aggregate demand to be kept stable. The corollary is that the direct effect of such exchange rate movements on the prices of imported goods and services is "looked" through, as a relative price shift, rather than as part of the inflation process. In that respect, we have moved in the direction of the Reserve Bank of Australia.

Consistent with that evolving view of the role of the exchange rate, we have lengthened our policy horizon to around six to eight quarters. In doing so, we acknowledge that the longer horizon leads directly to a greater risk that we will miss our target range more often.

We have recently published work which looks directly at the policy horizon and band width questions.<sup>12</sup> Our stylized policy simulation work is summarized in table 1. This suggests that with a band width of +/- 1.5 percent and our now standard 6 to 8 quarter policy horizon, the probability that inflation outcomes will be within the band ranges from 66 percent with the least active policy rule, to 92 percent with the most active policy rule.

**Table 1**  
**Alternative band widths for CPI inflation targeting rules**

Band width	Probability that inflation lies within the band with alternative policy reaction rules			
	<b>A</b> (least active)	<b>B</b>	<b>C</b>	<b>D</b> (most active)
+/- 1%	50%	70%	64%	75%
+/- 1.5%	66%	82%	90%	92%
+/- 2%	80%	93%	97%	98%
+/- 3%	95%	99%	99%	99%

<sup>12</sup> See Drew and Orr (1999).



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In these simulations, the policy reaction is made more active by increasing the size of the interest rate response to a deviation of forecast inflation from the inflation target. For example, policy reaction B, which broadly characterises our present reaction function, requires that if inflation is projected to be one percentage point above the target over a 6 to 8 quarter policy horizon, short-term interest rates will be increased by around 140 basis points. As can be seen from table 1, such an approach can be expected to see inflation remaining within the target range about 82 percent of the time.<sup>13</sup>

With all the usual qualifications that should accompany analysis of that sort, we feel comfortable in concluding that:

- the narrower the target range the more active monetary policy must be;
- more activism implies more variability in interest rates, the exchange rate, and output; and (up to a point) less variability in inflation; and
- lower inflation expectations and a wider target range allow for a longer policy horizon, and less active monetary policy.

### Point target versus range target

The issues arising here are essentially the same as those in the band width/policy horizons debate.

By widening and softening the edges of our bands, we have moved in the direction of an Australian-style "thick point". We feel this option is more readily contemplated now, with inflation expectations better anchored, than was possible at the very early stages of our inflation targeting experience.

Certainly, a disadvantage of the bands approach is a tendency to focus unwarranted attention on very small deviations from the target (2.99 percent inflation equals success; 3.01 percent inflation equals failure). In that sense, the potential credibility gains from hard-edged bands dissipate as time passes and success in achieving and maintaining price stability grows.

The upshot has been a shift of emphasis away from avoiding a breach of the target range at all costs, and toward a firmer focus on having inflation always reverting to somewhere near the mid-point of the target range in the medium term.

### Transparency

Transparency is an integral part of our framework. For the Reserve Bank of New Zealand, the explicit and transparent commitment to price stability has undoubtedly brought focus to our monetary policy task. The target is clear and has a high public profile. The Bank cannot escape difficult monetary policy decisions – indeed, we are obliged to confront them early. As in other countries, we are subject to lobbying and pressures to modify our policy settings to recognize particular regional or sectoral pressures. The policy framework and explicit targets undoubtedly assist in responding to, and where appropriate resisting, those pressures.

Within political circles, the clarity and transparency of the framework appear to have modified the nature of the monetary policy debate. That New Zealand should aim for price stability, or some close approximation of it, has proved difficult to challenge politically. Instead, the political debate has tended to occur around particular aspects of the framework – the specification of the target (eg the band width and midpoint), or the different sectoral impacts of monetary policy – rather than on the desirability of maintaining a firm commitment to price stability. A strength of the arrangements is the separation of the government's commitment to the overall objectives of policy, as encapsulated in the PTA, from the day-to-day implementation of policy. That has tended to focus political commentary on issues surrounding the longer-term objectives of policy and away from shorter-term tactical issues.

For the public at large, the target is very visible, and readily monitored. We have a comprehensive public information and outreach programme that attempts to explain what monetary policy is about and why. The programme encompasses the production of pamphlets, resource material for schools, speeches, articles, interviews and a very active internet site. The aims of that programme lie primarily in influencing inflation expectations, strengthening the credibility of the target and through that, increasing the likelihood

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<sup>13</sup> Note that the estimates are based on four quarter inflation outcomes, which mean that a single disturbance can see inflation outside of the band for four consecutive quarters. Also the probability of inflation falling outside the target range makes no allowance for the PTA events.

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that we will both achieve our target and minimize any social costs in doing so.

An aspect of the transparency which is particularly relevant to financial markets is our practice of publishing detailed projections, including projections of the future monetary conditions judged to be consistent with achieving our inflation target. The published projections are a well-established feature of the New Zealand monetary policy scene. For the most part, we have found the practice helpful in providing a means for communicating our policy stance, and making clearer the various assumptions and judgements underlying our stance.

But there are downsides. In circumstances where monetary conditions are projected to change at some point in the future, financial markets will tend to bring forward such changes by adjusting interest rates and exchange rates early. That may help to smooth the adjustment path. But to the extent that projections are subject to change as the emerging data turns out different from that expected, the projections have the potential to contribute additional “noise” to financial markets. Similarly, there is a risk that major, or frequent, shifts in projections can undermine, rather than enhance, public confidence in the central bank and the conduct of monetary policy.

Despite those risks, however, we feel that the practice of publishing projections has been a net positive for us in assisting the conduct of monetary policy. On balance, we think it preferable that markets should be fully informed of how we are reading the data and shaping our view. That brings an external discipline to bear on how we do in fact shape our view, as well as useful feedback from those in the markets who closely scrutinise our projections.

## Accountability

As noted at the outset, the New Zealand monetary policy framework to a large degree grew out of the application of the principal-agent model being applied generally throughout the New Zealand public sector. Clear specification of objectives and accountabilities is integral to that model.

The New Zealand inflation targeting model apparently goes further than others in terms of there being an explicit inflation targets contract between the Governor and the cabinet

minister responsible for the Bank. In the early days of inflation targeting in New Zealand, the Policy Targets Agreement, with its explicit specification of quantified inflation targets, seemed to be a source of some bemusement to some observers, perhaps as much because it linked the possibility of the Governor being dismissed to inadequate performance under the inflation contract. In this regard, it should be noted that the ground for dismissal is inadequate performance under the contract, and thus that the reasons for and context surrounding a breach of the inflation target matter are critical factors to be taken into account when a breach of the inflation target occurs. Nonetheless, there can be little doubt that the link does reinforce the institutional incentives towards the achievement of price stability and, probably, the public's willingness to accept that the inflation target will be met.

But, as always, there is another side to the argument. While it can be argued that the accountability provisions assist in building the public credibility of the target, that will not be true if the sanctions turn out to lack credibility. This could occur if the framework required sanctions to be applied in circumstances where, to most observers, that would make no sense, or in circumstances where there is no carry through when sanctions manifestly should be applied. It should also be acknowledged that in a complex world, simple accountabilities may, on occasion, lead to perverse outcomes. Particular dilemmas can emerge where the central bank faces choices between short and longer-term performance relative to its target. In short, accountability provisions clearly are important, but they must be designed, and handled, with a good measure of skill and care by those required to judge performance.

Finally, an unusual aspect of the New Zealand framework is its assignment of decision-making authority and responsibility solely to the Governor. The purpose of this aspect of the framework was quite clear. It was intended to eliminate any ambiguity about where responsibility for the conduct of monetary policy rests, and in that way to sharpen the incentives for delivery of price stability. There seems little doubt that it has had that effect.

## 8 Implementation structures

I noted earlier that New Zealand's techniques for giving effect to monetary policy in the financial markets have proved less than satisfactory on occasions.

Up until recently, monetary policy was implemented mostly by making statements to the financial markets, importantly by way of our quarterly *Monetary Policy Statements*, and also in a more ad hoc manner between those Statements when monetary conditions departed from those the Bank was seeking.

This style of policy implementation was the product of an historical attachment to a quantity-based implementation structure. Formally, the monetary policy instrument was the quantity of "settlement cash" made available to the banking system. However, over the years, it became apparent that the relationship between the quantity of settlement cash available to the banking system and prevailing monetary conditions – in terms of the interest rates and exchange rates prevailing in the market – was very elastic. That is, a wide range of interest and exchange rate levels seemed to be capable of co-existing with a given settlement cash quantity. For this reason, the settlement cash target ceased to be an effective policy instrument, or a reliable policy signal.

As already mentioned, in the early stages of our formal inflation targeting regime, a key variable that shaped our view of inflation prospects was the exchange rate, owing to the direct price effects from exchange rate changes. From this view emerged an approach to policy implementation based on adjustable exchange rate comfort zones: if the exchange rate moved by more than judged consistent with inflation staying inside the target range, then policy action – generally in the form of a statement to the financial markets – was taken. At times this approach was supplemented by references to the slope of the yield curve and, more recently, we used announced target zones for a monetary conditions index (MCI).

It was also apparent – particularly from June 1997 when the MCI target zone framework was adopted – that the implementation structure we were employing was encouraging an unhelpful degree of volatility in short-term interest rates and, and in doing so, complicating the task of communicat-

ing our desired policy stance. Accordingly, in March 1999 the quantity-based implementation structure was abandoned in favour of a fairly conventional structure built around fixing the overnight inter-bank cash rate.

I won't dwell on those arrangements largely because they are not central to the issue of inflation targeting. But it is worth noting in passing that there are important considerations embodied in the choice of an implementation structure which can ease or complicate the conduct of monetary policy. The risk of a poorly-specified implementation structure is that it will distract unhelpfully from the longer-term objectives of policy.

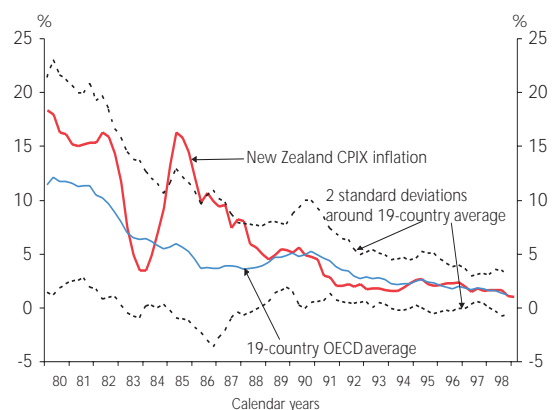
## 9 Assessment of the New Zealand experience

So how do we assess the New Zealand experience?

The easy part of the assessment comes from looking at our inflation performance.

**Figure 2**  
Annual inflation rates: New Zealand and selected OECD countries

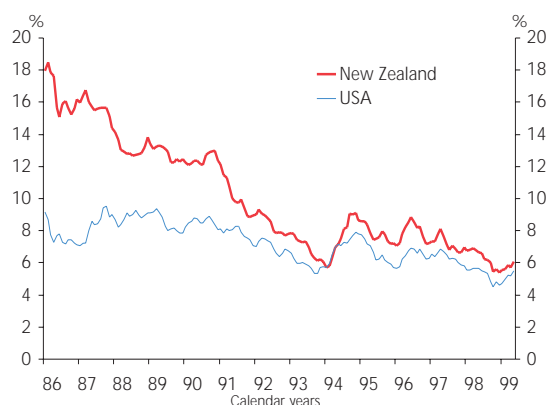
Source: *Statistics New Zealand, International Financial Statistics, RBNZ calculation.*



Inflation outcomes were consistent with the assigned target from 1991 to mid-1995, although some overshooting occurred through 1995-1996 before the target was adjusted. Perhaps a more relevant measure of success is the New Zealand inflation performance relative to others. (See figure 2). On that basis, we can see that New Zealand has moved from being one of the OECD's worst performers with respect to inflation, to be clearly in the middle of the pack. In terms of the objectives set for monetary policy under the 1989 Act,

that can only be described as a successful performance. The sharp decline in the risk premium implicit in our bond yields provides tangible and convincing endorsement of that view. (See figure 3).

**Figure 3**  
**Ten year bond rates: USA and NZ**



Judging how much of that improved performance can be ascribed to the particular inflation targeting regime we adopted is a much harder task. We could place high weights on the shifts in political priorities, the sweeping reforms that have occurred elsewhere in New Zealand's macro and micro policies, and the shift in our trading partners' inflationary behaviour. It could be argued, for instance, that the shift in political attitudes towards inflation was, ultimately, the only change that really mattered. We could also reasonably argue that the key changes came with the decisions to float the exchange rate and commit to market funding of the government's fiscal deficits.

To accept just those arguments, however, would miss some important points. Certainly, the political will to adopt a price stability target was an essential prerequisite to any serious attack on institutionalized inflation. But what the inflation targeting regime has done is to give the initial political commitment a degree of durability that transcends the influence of the particular set of politicians in power in 1989 when the RBNZ Act was passed into law. We have shifted the incentives from an acceptance of inflation arising from the usual time-inconsistent influences towards a more robust resistance to any future re-emergence of inflationary tendencies.

There are, of course, other dimensions that can be considered in assessing the success of our regime. It would be nice to be able to demonstrate conclusively that inflation targeting has allowed us to reduce the costs of disinflating below what might have been achieved by other methods. We have no such proof. But that begs the question of what alternative routes might have been available to us. In a sense, we stumbled into inflation targeting because, at the time, the alternatives, for example, money aggregate targeting, did not seem viable.

Perhaps as good economists, we should simply rely on a market test to assess whether inflation targeting is successful. The evidence, in terms of countries adopting the framework, looks reasonably convincing.

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## Appendix 1

### Reserve Bank of New Zealand Policy Targets Agreement

In terms of section 9 of the Reserve Bank of New Zealand Act 1989 (the Act), the Minister of Finance (the Minister) and the Governor of the Reserve Bank of New Zealand (the Governor) agree as follows:

#### 1. Inflation Targets

Consistent with section 8 of the Act, the Reserve Bank should formulate and implement monetary policy with the intention of achieving price stability by the year ending December 1992. An annual inflation rate in the range of 0 to 2 per cent will be taken to represent the achievement of price stability. The inflation rate should be kept within that range for the remainder of the Governor's current term of office, which ends on 31 August 1993, and conditions at that date should be consistent with the maintenance of sustained price stability thereafter. In pursuing this target, and subject to the caveats below, the Bank's implementation of monetary policy should be designed to achieve a steady reduction in the annual rate of inflation (exclusive of the direct impact of the July 1989 GST increase) throughout the period to December 1992. Each policy statement released by the Bank under section 15 of the Act should contain a projected path for inflation over the following five years.

#### 2. Measurement of Inflation

Section 8 of the Act requires the Bank to direct monetary policy towards the stabilisation of the "general level of prices". In pursuing this objective, the Bank will monitor price movements as measured by a range of price indices. However, it is considered that the primary measure of prices used to calculate the inflation rate for the purpose of these targets should relate to the prices of goods and services currently consumed by households. Unfortunately, the All Groups Consumers Price Index (CPI) is not an entirely suitable measure of these prices since it also incorporates prices and servicing costs of investment-related expenditures, notably in the housing field. The New Zealand CPI is unusual amongst OECD consumer price indices in including components for

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both the purchase price of dwellings and the cost of mortgage finance. For this reason, while the CPI will, for practical purposes, be the measure of inflation used in setting the targets, the Bank is to prepare an alternative measure of consumer prices based on an internationally comparable approach, so as to provide a basis for assessing the impact of investment-related housing costs on the CPI. In particular, the Bank's adjusted index will replace the current expenditure based measure of housing costs in the CPI with a measure based on imputed housing rentals. The Bank shall publish this index on a quarterly basis and is to ensure that the calculation of the index is verifiable by reputable external sources.

### 3. Variations to Targets

A. If an Order-In-Council comes into force under section 12 of the Act, the policy targets in this document cease to have effect and must be replaced by new targets within 30 days of the making of the order in accordance with section 12(7) of the Act.

B. These targets may also be varied at any time by agreement between the Governor and the Minister in accordance with the provisions of section 9(4) of the Act. The following specific instances will trigger a renegotiation of these targets in accordance with these provisions:

(i) The Bank shall notify the Minister if, in 1992 or 1993, there is, or is likely to be, a divergence of at least one half of one percentage point between the annual inflation rate of the CPI and of the Bank's internationally comparable measure of consumer prices. Within 30 days of this notification, the Governor may choose to renegotiate new policy targets so as to take account of the effect of the deficiencies in the construction of the CPI.

(ii) Any decrease or increase in GST, or any material change in other indirect taxes, will automatically lead to a renegotiation of these targets where the change is expected to impact directly on the 1992 or 1993 annual inflation rate. In general, a material change in indirect taxes will be interpreted as one which has a positive or negative impact on the price level of at least one half of a percentage point within a one year period. It is intended that the targets will

be renegotiated on the basis of allowing the direct effect of the change to impact on the price level, with no accommodation of second round effects. Following a GST change, or following what the Bank estimates to be a material change in other indirect taxes, the Bank shall inform the Minister in writing of its estimate of the direct effect of the change on the price level. If necessary, new policy targets shall be set within 30 days of this estimate being received by the Minister.

(iii) A significant change in the terms of trade arising from an increase or decrease in either export prices or import prices will trigger a renegotiation of the policy targets, where the Bank indicates to the Minister in writing that it estimates the change will have a significant direct impact on the 1992 or 1993 annual inflation rate. In informing the Minister that a significant change has occurred, the Bank should provide an estimate of the direct price effects of the terms of trade change on the price level. Following the provision of this estimate, new policy targets shall be set within 30 days. The intention of this provision is to enable some or all of the direct price effect of a significant terms of trade change (whether positive or negative) to be accommodated but it is not intended to accommodate any second round influences. Thus it is intended that any terms of trade change will have, at most, only a transitory effect on the inflation rate.

(iv) In the case where some other crisis situation, such as a natural disaster or a major disease-induced fall in livestock numbers, is expected to have a significant impact on the price level, the same procedures should be followed as in the case of a terms of trade change.

C. It is intended that section 9(4) of the Act will not be utilised to alter the policy targets in response to any domestically sourced inflationary shock other than the particular cases already considered. In particular, increases in wages or profit margins that are inconsistent with these targets will not be accommodated by the Bank and will not give grounds for automatic renegotiation of the policy targets.

### 4. Implementation

Sections 10 and 14 of the Act set out certain considerations that the Bank must take into account when implementing

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monetary policy; provided, in accordance with section 13 of the Act, that these considerations do not limit the Bank's obligation to meet its monetary policy objectives. Within this context, considerations that the Bank should take into account when formulating and implementing monetary policy shall include the following:

A. The Bank must take into account the effects of its actions on the efficiency and soundness of the financial system. Where it considers that its actions may have a materially adverse effect on the efficiency or soundness of the system, it must inform the Minister. Following the provision of this advice to the Minister, the Governor and the Minister may review whether the existing policy targets remain appropriate, and may fix new policy targets in accordance with section 9(4) of the Act.

B. Where the Bank considers that the actions of any other party (including the Government) may have an adverse effect on the achievement of the policy targets, or may increase the economic or social costs of achieving the policy targets, or may prejudice the efficiency or soundness of the financial system, the Bank shall consult with that party in an attempt to change that party's actions as necessary to reach the desired policy outcomes at minimum cost.

C. The policy targets are established on the basis of the current institutional structure of the financial sector, particularly in relation to the settlements process within the banking sector. If the Bank considers that the institutional structure has changed or is likely to change in a manner which will prejudice the Bank's ability to implement monetary policy, it shall inform the Minister. If the institutional changes continue to hamper the implementation of policy, the Minister and the Governor may set new policy targets in accordance with section 9(4) of the Act.

Signed on Friday, 2 March 1990, by the Minister of Finance, the Hon. David Caygill, and the Governor of the Reserve Bank of New Zealand, Dr Donald T. Brash.

**Minister of Finance**

**Governor**

## Appendix 2

### Policy Targets Agreement

This agreement between the Treasurer and the Governor of the Reserve Bank of New Zealand (the Bank) is made under sections 9 (1) and 9(4) of the Reserve Bank of New Zealand Act 1989 (the Act), and shall apply for the balance of the Governor's present term and for his next five year term, expiring on 31 August 2003. It replaces that signed on 10 December 1996.

In terms of section 9 of the Act, the Treasurer and the Governor agree as follows:

#### 1. Price stability

Consistent with section 8 of the Act and with the provisions of this agreement, the Bank shall formulate and implement monetary policy with the intention of maintaining a stable general level of prices, so that monetary policy can make its maximum contribution to sustainable economic growth, employment and development opportunities within the New Zealand economy.

#### 2. Policy target

a) In pursuing the objective of a stable general level of prices, the Bank shall monitor prices as measured by a range of price indices. The price stability target will be defined in terms of the All Groups Consumers Price Index excluding Credit Services (CPIX), as published by Statistics New Zealand.

b) For the purpose of this agreement, the policy target shall be 12-monthly increases in the CPIX of between 0 and 3 per cent.

c) Notwithstanding clause 2(a), the Treasurer and the Governor may agree to use an alternative index of consumer price inflation following the implementation of the changes to the calculation of consumer prices proposed by the Government Statistician to take effect during 1999.

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### 3. Unusual events

a) There is a range of events that can have a significant temporary impact on inflation as measured by the CPIX, and mask the underlying trend in prices which is the proper focus of monetary policy. These events may even lead to inflation outcomes outside the target range. Such disturbances include, for example, shifts in the aggregate price level as a result of exceptional movements in the prices of commodities traded in world markets, changes in indirect taxes, significant government policy changes that directly affect prices, or a natural disaster affecting a major part of the economy.

b) When disturbances of the kind described in clause 3 (a) arise, the Bank shall react in a manner which prevents general inflationary pressures emerging.

### 4. Implementation and accountability

a) The Bank shall constantly and diligently strive to meet the policy target established by this agreement.

b) It is acknowledged that, on occasions, there will be inflation outcomes outside the target range. On those oc-

casions, or when such occasions are projected, the Bank shall explain in Policy Statements made under section 15 of the Act why such outcomes have occurred, or are projected to occur, and what measures it has taken, or proposes to take, to ensure that inflation comes back within that range.

c) The Bank shall implement monetary policy in a sustainable, consistent and transparent manner.

d) The Bank shall be fully accountable for its judgements and actions in implementing monetary policy.

**Hon Winston Peters**

**Treasurer**

**Donald T Brash**

**Governor**

**Reserve Bank of New Zealand**

DATED at Wellington, this day of December 1997