

Independent Review
of the Operation of Monetary Policy in New Zealand:
Report to the Minister of Finance

Lars E.O. Svensson*
Institute for International Economic Studies, Stockholm University

February 2001

*Email: Lars.Svensson@iies.su.se. Homepage: <http://www.iies.su.se/leosven/>.

Executive summary

In May 2000, the Treasurer/Minister of Finance invited me to review the operation of monetary policy in New Zealand and provided me with the Terms of Reference. In undertaking the review, I have read the wide range of submissions provided to me and have met with a number of submitters and other interested parties. I visited New Zealand for two weeks in November 2000 in order to observe the operations of the Reserve Bank first hand and collect material for the review. I have also had discussions with a number of key people in the area of monetary policy from other countries.

In order to judge whether the operation of monetary policy has been effective, it is important to understand what monetary policy can and cannot do. People typically ask too much of monetary policy—no less in New Zealand than elsewhere. In the long term, monetary policy can only control nominal variables such as inflation and the nominal exchange rate. It is beyond the capacity of any central bank to increase the average level or the growth rate of real variables such as GDP and employment, or to affect the average level of the real exchange rate. At best monetary policy can reduce the variability of these real variables somewhat. An attempt to increase the average level or growth rate of GDP or employment would trigger ever-rising inflation, at increasing cost to the economy in terms of less efficient resource allocation and arbitrary and inequitable redistributions of incomes and assets. For these reasons, an increasing number of countries have specified price stability as the primary goal for monetary policy.

In the short and medium term, monetary policy has effects on both nominal and real variables. However, the complex transmission mechanism of monetary policy, the varying lags and strength of the effects through different channels, unpredictable shocks and inherent uncertainty combine to prevent the use of monetary policy for any fine-tuning. There is considerable agreement among policymakers, academics and researchers in the monetary policy area that so-called flexible inflation targeting is the best monetary policy setup. Then inflation is stabilized around a low inflation target in the medium term rather than at the shortest possible horizon, and a gradual and measured policy response avoids creating unnecessary variability in the real economy. Because of shocks, uncertainty and imperfect control, considerable variability may remain in the real economy, especially for a small, open and less diversified economy like New Zealand. Best-practice central banks which have adopted flexible inflation targeting include the Bank of England and Sveriges Riksbank (the central bank of Sweden). I believe these banks provide a relevant standard of comparison for the operation of monetary policy in New Zealand.

Overall, with regard to the operational framework and how monetary policy is managed in pursuit of the inflation target, I have found that *the period (mid 1997 to March 1999) when the Reserve Bank used a Monetary Conditions Index (MCI) to implement monetary policy represents a significant deviation from best international practice*. This has now been remedied, and *monetary policy in New Zealand is currently entirely consistent with the best international practice of flexible inflation targeting, with a medium-term inflation target that avoids unnecessary variability in output, interest rates and the exchange rate*. Only some marginal improvements, mostly of a technical nature, are recommended.

With regard to the governance and accountability structures, I have found some weaknesses. These have not yet caused any problems because of the qualities of the current Governor, but they could in different circumstances. Therefore, some substantial improvements are recommended.

The summary of the review and the recommendations below is organized according to the terms of reference.

Term of Reference 1: The way in which monetary policy is managed in pursuit of the inflation target

The Reserve Bank made some policy mistakes during the 1990s. It tightened policy too late in 1992/93 and eased policy too late in 1997/98. However, the Reserve Bank has been a pioneer in inflation targeting, without the possibility of learning from previous experience of other central banks. The economy has regularly been subject to new kinds of shocks. Mistakes in retrospect are unavoidable, and they need to be seen in a broader perspective.

The inflation history of New Zealand before the 1990s is dismal. During the 1990s *the Reserve Bank has achieved a remarkable stabilization of inflation at a low level and successfully anchored inflation expectations on the inflation target*. With hindsight, the timing of policy could have been somewhat better. However, *given the circumstances at the time of decisions, aside from the period when the Reserve Bank used the MCI to implement policy, there is no evidence that policy has systematically resulted in unnecessary variability in output, interest rates and the exchange rate*.

During the MCI period, the Bank let exchange rate depreciation result in automatic interest rate increases with little burden of proof that those interest rate increases were warranted and in spite of the MCI being an unreliable indicator of the monetary policy stance. This allowed interest rate increases at the onset of the first drought and the Asian crisis in 1997/98, when a more

thorough analysis of the situation may have suggested differently. This certainly contributed to unnecessary interest rate variability and may have caused some unnecessary output variability. *The MCI period represents a substantial deviation from best-practice inflation targeting.*

During the 1990s, the Bank has lengthened its policy horizon and improved its understanding of the transmission mechanism of monetary policy. The Bank has developed an extremely well-designed decision-making process. Since March 1999, the Bank has abandoned the MCI as an instrument in favour of the Official Cash Rate (OCR). The December 2000 *Monetary Policy Statement* (MPS) is a prime example of flexible inflation targeting. I conclude that *the Reserve Bank's current conduct of monetary policy is entirely consistent with the best international practice of flexible inflation targeting, with a medium-term inflation target that avoids unnecessary variability in output, interest rates and the exchange rate.*

In line with current best practice, the Reserve Bank interprets the PTA as a medium-term point target of 1.5 percent. *I recommend that the current policy target in the PTA should continue to be interpreted as a medium-term point target for 12-monthly increases in the Consumer Price Index (CPI) of 1.5 percent.* At the beginning of the next term of the Governor, the PTA should be marginally modified to include the medium-term point target directly. There is no reason to make other changes in the PTA.

Frequent changes to the PTA can be disruptive to the economy. For this reason, it is desirable that each PTA is maintained for the full five-year duration of the Governor's term and *I recommend that any change to the PTA should be done at the beginning of the new term of the Governor.*

I also recommend some further technical improvements to the Reserve Bank's Forecasting and Policy System (FPS). These are detailed in my report. Although these are not likely to materially affect policy choices, they represent developments that will improve the internal consistency of the FPS and push the frontier of best international practice in inflation targeting further out.

Term of Reference 2: The instruments of monetary policy

There is considerable support for the OCR system in New Zealand and the consensus is that it has worked well. Additional instruments would either be without essential effect (reserve ratios and foreign-exchange interventions) or would be very difficult to implement in practice, create inefficiencies in financial markets, have high supervisory and compliance costs and probably

result in a loss of confidence of international investors and corporations (capital controls and other tax or regulatory interventions). My conclusion is that *the Reserve Bank is currently using the appropriate instrument for the operation of monetary policy.*

Term of Reference 3: The information used by the Reserve Bank in its decision-making

I have had the opportunity to observe directly the information used by the Bank in its decision-making in terms of assessing the current state of the economy, in making forecasts of macroeconomic variables and in general economic analysis. I am convinced that the Bank uses available data in the same way and to the same extent as other best practice central banks. In addition to using available data, the Bank makes a considerable effort in collecting information directly from a large number of businesses and organizations all over New Zealand.

The availability and quality of data relevant for monetary policy are largely in place. However, some improvements are required to bring data quality up to international standards. *I recommend that Statistics New Zealand collect monthly data on the CPI and industrial production.*

I also recommend that the Reserve Bank consider reporting and discussing alternative measures of inflation expectations for the medium and long term more extensively than is currently the case, as part of assessing the long-term credibility of the monetary policy regime. Some of the data, for instance, extensive surveys of inflation expectations of different categories of firms, organizations and households, should be commissioned at arm's-length from the Bank, perhaps from Statistics New Zealand.

Term of Reference 4: The monetary policy decision-making process and accountability structures

This term of reference concerns governance and accountability issues. In New Zealand, responsibility for monetary policy decisions rests with the Governor of the Reserve Bank alone. This is an unusual arrangement internationally; in most countries monetary policy decisions are the responsibility of a committee.

The current arrangement with a single decision-maker works very well. This is to a large extent because of the exceptional qualities of the current Governor, Dr Brash. In spite of the rigorous procedure for appointing the Governor, future Governors may not be of the same

standing. Another Governor may not, to the same extent, encourage open and comprehensive discussion and advice within the Bank and support the Board in its monitoring of the Bank. Another Governor may not cope as well with the pressure, criticism and even abuse that seem to go with the territory, and may, in difficult times and under high pressure, lose confidence and let policy go awry in a number of different ways. The current system relies on the ability to quickly dismiss the Governor on such occasions. However, the lags in the effects of monetary policy, the difficulties in objectively identifying whether outcomes are the result of policy or luck, and the actual mechanics of removing a Governor together imply that removal of a Governor will never be easy and never be quick.

Consequently, I find the current arrangement's dependence on a single person's qualities too risky. For this reason, *I recommend that a formal Monetary Policy Committee (MPC) of the Reserve Bank, responsible for decisions related to monetary policy, be formed.* A suitable time for this would be at the beginning of the next term of the Governor.

The sound design of a committee is essential to overcome the existing risks without creating others. As in the committees of the Bank of England and Sveriges Riksbank, the members of the committee should be experts in monetary policy, macroeconomics or financial markets. Nonexperts would inevitably have reduced ability for independent assessment and less capacity to participate in monetary policy discussions, and effectively become hostage to the experts. Given the careful wording of the objectives set out in the PTA, meeting the PTA is largely a technical activity that requires technical expertise.

In a small country such as New Zealand, there is inevitably a limited supply of highly competent experts without serious conflicts of interest. While a sufficient pool of experts outside the bank may be available for initial appointments, with some turnover in the committee a drop in quality over time is unavoidable. There are also other problems with external experts discussed in my report. Therefore, I propose an internal MPC comprised of the Governor and Reserve Bank staff.

The MPC should have five members, each with one vote: the Governor as chair, the two Deputy Governors and two other senior Bank staff. The Governor and Deputy Governors should be appointed in the same way as now. The two senior staff should be appointed in the same way as the Deputy Governors, by the Board of Directors on the recommendation of the Governor. The terms should be five years and overlapping, so only one member is appointed or reappointed each year. Named votes and non-attributed minutes of the MPC should be published with a short

lag. The MPC should only be responsible for decisions related to monetary policy. In all other respects, the Governor should continue to be the single decision-maker of the Bank.

The proposed MPC essentially institutionalizes a well-tested internal decision-making structure worked out by the Bank. It represents the minimum change and provides the minimum disruption necessary in moving to a formal committee structure. It retains the current coherent decision-making and communication processes better than alternative committee arrangements, especially those with external members. It retains the current accountability to the largest extent possible. Published minutes further improve accountability.

The accountability structure should be further strengthened. The current arrangement whereby the Governor and the two Deputy Governors sit on the Bank's Board is unsatisfactory and provides the potential for a conflict of interest. *I recommend that the Board of Directors only consist of non-executive directors. The chair should be selected by the non-executive directors themselves and not by the Treasurer, to ensure sufficient independence of the Board. The Board of Directors should publish an annual report with an evaluation of the Bank's monetary policy.*

The Bank itself can contribute to the accountability process by raising the profile of monetary policy discussion. *I recommend that the Reserve Bank fund an annual conference on the evaluation of monetary policy in New Zealand.*

The Parliament's Finance and Expenditure Select Committee also has an important role in the accountability structure. However, the Select Committee is typically pushed for time and lacks some of the technical expertise necessary to effectively question the Bank on policy matters. For these reasons, *I recommend that Parliament's Finance and Expenditure Select Committee conduct thorough and detailed hearings of the Governor and other Reserve Bank officials with the help of appointed experts and other assistance.*

Term of Reference 5: The coordination of monetary policy with other elements of the economic policy framework, including prudential policy

New Zealand is a leader in the transparency not only of its monetary policy, but also of its fiscal policy. Monetary and fiscal policy are coordinated by each focusing on medium-term objectives and making policy actions transparent. In this way fiscal actions can take full account of the likely monetary response and vice-versa. Given the transparency and the medium-term orientation of both fiscal and monetary policy and the regular exchange of information that takes place between the Bank and the Treasury, any gains from more explicit coordination between

fiscal and monetary policy are likely to be minor. In particular, they would be overwhelmed by the negative consequences of any reduction in the operational independence of monetary policy. Therefore, *no changes are required in the current coordination of monetary and fiscal policy.*

It is highly desirable that government policies in general are consistent with the price stability goal and that the Government informs the Bank well in advance of policy plans that may have consequences for inflation.

The current prudential-supervision arrangements are fully consistent with the price stability objective, but the profile of prudential policy could be raised. *I recommend that the Reserve Bank summarize its information about the financial system, including a number of macro-prudential indicators of financial stability, in a regular report, modelled on those published by the Bank of England and Sveriges Riksbank.*

Term of Reference 6: The communication of monetary policy

Effective communication is vital to the efficient operation of monetary policy. A high level of transparency is also an important part of the accountability structure of monetary policy. *The Bank's communication of monetary policy decisions to the public and the financial markets is generally exemplary.* This is a conclusion that is widely held and evident in many of the submissions to the review.

The Bank has recently reduced the level of detail reported in its MPS, in order not to give the impression of unrealistic precision. I believe there are far better means of illustrating the uncertainties inevitable in economic projections than in the rounding procedure introduced. *I recommend that the Reserve Bank consider alternative ways of conveying the inherent uncertainty in projections while maintaining transparency.* These can be modelled on those used by the Bank of England and Sveriges Riksbank.

Introduction

Background

In December 1999, the new Government of New Zealand announced that it would undertake a review of the operation of monetary policy, the first since the passing of the Reserve Bank Act in 1989. In May 2000, the Minister of Finance announced the Terms of Reference for the review (see appendix A) and appointed me to conduct it. A secretariat, managed by the New Zealand Treasury, was established to assist the review (see appendix B).

The goal of the review is to ensure that the monetary policy framework and the Reserve Bank's operations within that framework are appropriate to the characteristics of the New Zealand economy and best international practice. According to the Terms of Reference, the goal of price stability for monetary policy set out in the Reserve Bank Act will not be reviewed. Nor is the Government willing to lessen the accountability of the Reserve Bank for inflation outcomes or alter the operational autonomy of the Bank. Hence, these issues will not be subject to this review.

As explained below, this exclusion does not seem to be a limitation: there is overwhelming international support, based on theory, empirical results and practical experience, for the general view that an optimal monetary policy framework is characterized by (1) a goal of price stability, (2) operational independence of the central bank and (3) clear accountability of the central bank for achieving the goal. The monetary policy setup in New Zealand is a prime example of such a framework and has been a model for monetary policy reform in many other countries. This overall monetary policy framework has, for instance, been adopted in the United Kingdom, Sweden and the Economic and Monetary Union (EMU) in Europe.

The Terms of Reference specify that the review will consider:

1. The way in which monetary policy is managed in pursuit of the inflation target. The way the Reserve Bank interprets and applies the inflation target set out in the Policy Targets Agreement with a view to ensuring that this approach to achieving medium-term price stability is consistent with avoiding undesirable instability in output, interest rates and the exchange rate.
2. The instruments of monetary policy. Whether the Reserve Bank has an adequate range of instruments and is using its current instruments effectively in altering monetary conditions in the desired direction.

3. The information used by the Reserve Bank in its decision-making. The range of sources, availability, type and timeliness of data, and the impact of these variables on forecasting and decision-making.
4. The monetary policy decision-making process. Whether the decision-making process and accountability structures promote the best outcomes possible.
5. The coordination of monetary policy with other elements of the economic policy framework, including an evaluation of the relationship between monetary policy operations and other Reserve Bank functions such as prudential oversight of financial institutions.
6. The communication of monetary policy. Whether the Reserve Bank's communication of monetary policy decisions to the public and financial markets is as simple, clear and effective as possible.

The Terms of Reference also specify the process of the review. The reviewer was required to invite interested parties to submit their views on the operation of monetary policy in the areas detailed in these terms of reference, consult further with parties making submissions or other parties where this was useful for the review, obtain any other relevant expertise, and report to the Minister and make such recommendations pertaining to the operation of monetary policy and legislation as is appropriate within the context specified in the Terms of Reference above. The report should be with the Minister by February 28, 2001.

Submissions were invited in early August 2000, with a closing date providing a period of eight weeks for submissions. After the end of the submission period, the submissions were posted on the review website, www.monpolreview.govt.nz. The submissions are listed in appendix C and summarized in appendix D. Among the submitters were the Reserve Bank, which also published several detailed supporting documents on its website (see appendix E), and the Non-Executive Directors Committee of the Reserve Bank. In addition to being essential to the review, several of these submissions are of considerable general interest. Many of the submissions are of a high standard, are very informative on inflation targeting in general and monetary policy in New Zealand in particular, and deserve wide readership and study.

In November, 2000, I visited New Zealand for two weeks and met with the Minister of Finance, Reserve Bank officials, Treasury officials, the non-executive directors of the Reserve Bank, and a number of submitters and other interested parties (see appendix F). In particular,

I spent a substantial amount of time observing key forecasting and decision meetings in the Reserve Bank leading up to the December 2000 *Monetary Policy Statement*.

The people I met with were very helpful, and I benefited from many frank and informative discussions. The Reserve Bank has cooperated wholeheartedly in the review. The Secretariat has assisted me in a professional and efficient way, and the Secretariat and the Reserve Bank have provided all the information I needed. I have also benefited from discussions with a number of key people in the area of monetary policy outside New Zealand (see appendix F). Any errors or deficiencies in this report are solely my own responsibility.¹

Although the submissions cover all the terms of reference, two issues received special attention, namely (1) the way monetary policy has been and is conducted in pursuit of the inflation target, including to what extent monetary policy has avoided unnecessary variability in output, interest rates and the exchange rate, and (2) the governance of the Reserve Bank, especially whether the current arrangement with a single decision-maker or the alternative of a committee is most appropriate. These issues fall under Terms of Reference 1 and 4, respectively. The prominence of these issues was also confirmed in my meetings in New Zealand. Consequently, these issues will be prominent in this report.

Organization of the report

The rest of the Introduction to the report discusses what realistically can be expected from monetary policy. Sections 1–6 deal in order with the Terms of Reference 1–6. Section 7 summarizes my recommendations.

A realistic view of monetary policy

A review of monetary policy should start from a realistic view of what monetary policy can and cannot do. Such a view of monetary policy is also important in a discussion of the appropriate goals for monetary policy and in understanding why an increasing number of countries have selected price stability as the primary goal for monetary policy. It is sometimes suggested that monetary policy is unfairly selected as a scapegoat when other economic policies are to blame. To assess the validity of such suggestions also requires a realistic view of what monetary policy can and cannot do.²

¹ I also thank Annika Andreasson for secretarial and editorial assistance.

² Some of this discussion builds on Svensson [20] and [22].

Let me start from the presumption that the ultimate objective of economic policy is to guarantee and enhance the citizens' welfare. This ultimate objective is often expressed as a number of separate goals which contribute to the citizens' welfare, for instance, efficient resource utilization, full and stable employment, high economic growth, price stability, equitable distribution of wealth and income, regional balance and environmental protection.³

Monetary policy is part of economic policy. At first, one might think that monetary policy should have the same goals as overall economic policy. However, since monetary policy only has sustained or persistent effects on a limited number of variables affecting economic welfare, it is more appropriate that monetary policy is assigned a limited number of goals. Specifying goals for monetary policy that it cannot achieve would, of course, be unproductive and could even be counterproductive. Instead, monetary policy should be assigned goals that it can achieve and that are consistent with the ultimate objective for economic policy. In order to determine which goals are most suitable for monetary policy, one must therefore understand the effects of monetary policy and what monetary policy can achieve.

How monetary policy affects the economy Monetary policy affects real and nominal variables through a number of channels, together referred to as the *transmission mechanism* of monetary policy.⁴ Central banks normally conduct monetary policy by setting a short nominal interest rate, the central bank's *instrument rate* (for instance, the Official Cash Rate (the OCR) in New Zealand). Suppose the central bank lowers the instrument rate. How is the economy affected? In the short term, domestic prices and domestic inflation in industrialized countries are relatively slow to change (or sticky). This means that private-sector inflation expectations for the short term are relatively sticky. This further implies that central banks, by controlling the short nominal interest rate, can also affect the short *real* interest rate: the difference between the short nominal rate and short-term inflation expectations. Via market expectations of future real rates, longer real rates are also affected. Thus, the lowering of the instrument rate normally lowers short and longer real interest rates, which will affect economic activity.

Furthermore, a reduction in the short interest rate normally depreciates the domestic currency and hence decreases the nominal exchange rate.⁵ Since domestic prices are sticky, the real exchange rate (the price of domestic goods and services in terms of foreign goods and services,

³ See Clark [6] for the goals of the economic policy of the current government of New Zealand.

⁴ See Svensson [26] for a more formal discussion.

⁵ In New Zealand, nominal exchange rates are conveniently defined as units of foreign currency per unit of domestic currency, so a fall in the exchange rate corresponds to a depreciation of the New Zealand dollar.

or the price of nontradable goods and services in terms of tradable goods and services) also falls. The fall in the real exchange rate implies that the domestic price of imported and exported final goods increases. Since these goods enter the Consumer Price Index (CPI), this means that CPI inflation increases. This is the so-called *direct exchange rate channel to CPI inflation*. The direct effect on CPI inflation usually occurs within a year, or even quicker.

The fall in short and longer real interest rates mentioned above will stimulate consumption and investment and increase aggregate demand and output in the economy. This is the so-called *real-interest-rate channel to aggregate demand*. The fall in the real exchange rate makes domestically produced goods less expensive relative to foreign goods. This increases demand for export and for import-competing goods, which also adds to aggregate demand. This is the *exchange rate channel to aggregate demand*. The effects through these two channels usually occur in about a year or so.

The monetary policy literature has also discussed a so-called *credit channel to aggregate demand*. It works in the same direction as the pure real-interest-rate effect on aggregate demand. For simplicity, we can therefore include the credit channel in the above real-interest-rate channel to aggregate demand.

The impact of monetary policy on inflation Having traced the transmission channels to aggregate demand, let me discuss the effects on domestic inflation: the rate of change in the prices of the domestically produced goods and services. (Inflation in domestically produced tradable and nontradable final goods and services is the main component of CPI inflation; another substantial component is inflation in imported final goods.) We normally think of current output as determined mainly by aggregate demand in the short and medium term. Potential output is the hypothetical output level that would result in the absence of price stickiness and other frictions. It is largely determined by factors other than monetary policy. The output gap is the difference between current output and potential output. It can be seen as a measure of general excess demand in the economy. The above transmission channels to aggregate demand are hence also channels to the output gap. The increase in aggregate demand and the output gap will then lead to an increase in domestic inflation, because increased production increases the costs of production and because increased demand allows firms to increase prices. The increase in domestic inflation usually occurs within another year or so. This is the *aggregate-demand channel to domestic inflation*.

For a given output-gap level, domestic inflation is also independently affected by production costs, for instance wage costs and costs of imported intermediate inputs, like oil and raw materials. The fall in the exchange rate increases the cost of imported intermediate inputs as well as imported final goods, and the reduced purchasing power of wages may trigger increased wage demands. This can be called the *production-cost channel to domestic inflation*. Finally, price and wage setting are strongly affected by expectations of future inflation, since movements in the expected future price level are the obvious starting point for individual price and wage setting. This is the *expectations channel to domestic inflation*. Any increased inflation expectations that may be generated by the lowering of the instrument rate and the resulting increase in activity will then independently add to the effect on domestic inflation.

Thus, a reduction in the central bank's instrument rate affects the economy through a number of channels with different lags. The exchange rate and short and longer interest rates are usually immediately affected. Within a year or less, there is an effect on CPI inflation, through the direct exchange rate channel. As this first effect is working through, in about a year or so there is an increase in output and the output gap. Through that linkage, within another year or so there is a second effect on CPI inflation. Both effects are in the same direction, namely to increase inflation. However, the lags mentioned are only very rough rules of thumb. In practice, the lags and the strength of the effects through the different channels vary across channels and over time, and the effects are spread out over several quarters. For instance, the lag and the strength of the direct exchange rate effect on CPI inflation depends on the so-called pass-through of exchange rate changes: the degree to which importers pass on exchange rate changes to buyers rather than absorbing them in their profit margins. The pass-through varies considerably depending on the circumstances, for instance, with the perceived persistence of the exchange rate change, the size of the initial profit margins, and the price sensitivity of demand for imports. Furthermore, the economy is subject to a never-ending sequence of shocks and disturbances, directly and indirectly, to inflation and output, including price changes of raw materials, shifts in international capital flows, productivity changes, changes in indirect taxes etc. Many of these shocks are quite difficult to identify, and many occur during the lag between instrument adjustment and effects on output and inflation. Thus, it is worth emphasizing that the central bank's control over inflation, output and other macro variables is quite imperfect.

The Monetary Conditions Index The above discussion of the impact of monetary policy on output and inflation throws light on the so-called Monetary Conditions Index (MCI) that the Reserve Bank has used both as an indicator and as an instrument in implementing monetary policy. The real MCI is constructed by combining the 90-day real interest rate with the real exchange rate (expressed in terms of a trade-weighted index, the TWI), with a weight of 0.5 on the exchange rate. (Using the nominal interest rate and exchange rate results in the nominal MCI.) The MCI is supposed to measure the overall stance of monetary policy: the degree to which monetary policy is deemed to resist either inflationary or deflationary tendencies. However, from the complexity of the transmission mechanism, with different channels, different lags and different strengths of the effects, it is apparent that a simple summary index like the MCI will be unreliable. For instance, the relative effect of interest rate and exchange rate changes on output and inflation varies with the channel, the time horizon, and how persistent these changes are expected to be by households and firms. Thus, there is no reason to believe that the relative weight on the exchange rate, taken to be 0.5 by the Reserve Bank, is stable. In line with this, attempts to estimate the relative weights have resulted in different and very uncertain estimates.⁶ The role of the MCI in Reserve Bank policy will be further discussed below.

The long-term effects of monetary policy We have seen above how the central bank, by lowering its instrument rate, thereby reducing the short real rate and the real exchange rate, can increase aggregate demand and output for a few years. Can the central bank indefinitely maintain a low instrument rate and a low exchange rate and in this way stimulate the economy indefinitely? The answer is definitely no. In the longer term, the central bank must set its instrument rate so that on average the short real rate is equal to the *neutral real rate*. The neutral real rate is the real rate that is consistent with output equal to potential output. It is largely determined by factors other than monetary policy. If the central bank tries to maintain a short real rate below the neutral real rate for too long, aggregate demand outstrips potential output, the economy becomes overheated, and inflation increases to high single-digit, then double-digit

⁶ These points were made in the working-paper version of Svensson [25], presented at a workshop at the Reserve Bank in October 1997, in connection with my visit to the Reserve Bank and Victoria University of Wellington as a Professorial Fellow in Monetary Economics. The paper showed that it might at best be possible to construct an MCI for the impact of monetary policy on output but not for the impact on inflation (because of the complexity of the transmission mechanism). However, that MCI would be a linear combination of the real exchange rate and the *long* real interest rate rather than the short real rate used in the Reserve Bank's MCI.

Stevens [18] provides a broader and more accessible discussion and critique of the use of MCIs.

inflation, and eventually hyper-inflation.⁷ As history has demonstrated several times, a hyper-inflationary situation eventually results in a breakdown of the market system and a severe economic and financial crisis. Thus, sustained stimulation of the real economy through monetary policy is not a feasible option.

In the long term, monetary policy can only control nominal variables such as inflation and the exchange rate. In the long term, monetary policy cannot increase the average level or the growth rate of real variables such as GDP and employment, or affect the average level of the real exchange rate. There is evidence that monetary policy that leads to high and/or variable inflation is harmful to the real economy and to economic growth, by making the market mechanism work less well and by creating unnecessary uncertainty. However, once monetary policy brings inflation down to relatively low and stable levels, monetary policy has no long-term effects on the *average* level and *average* growth rate of real variables. Nevertheless, monetary policy can affect the *variability* of real variables, as further discussed below.

Suitable goals for monetary policy In the long run, output fluctuates around potential output, which is determined by factors other than monetary policy (except that, as already noted, bad and volatile monetary policy may well create a volatile and uncertain economic environment that deters investment and hence growth in potential output). Thus, there is a conspicuous difference between output targets and inflation targets for monetary policy. Whereas a long-run inflation target for monetary policy makes eminent sense and can be achieved, a long-run level or growth target for output does *not* make sense for monetary policy, because it cannot be achieved. Put differently, in contrast to the inflation target, the long-run output target is not subject to monetary policy choice. Instead it is given by potential output, which is largely independent of monetary policy. In the long term, monetary policy can at best provide a stable environment for the real economy. However, the fact that monetary policy has effects on the level of real variables in the short and medium term creates considerable tensions and temptations that need to be faced and handled.

A crucial ingredient in a stable environment for the real economy is a nominal anchor: an anchor for the nominal variables and private-sector expectations of future nominal variables. An increasing number of countries have found that price stability, in the sense of low and stable inflation, provides the best nominal anchor. The reason is that the alternative, higher

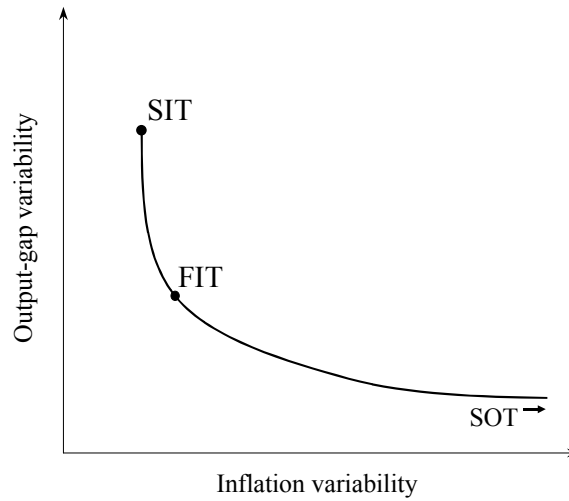
⁷ The mirror image of this is a rapidly increasing rate of growth of the monetary base. In order to maintain the short real interest rate below the neutral rate, the central bank has to inject money into the economy at a rapidly increasing rate. At higher inflation rates, this money-growth channel to inflation becomes dominant.

inflation, has serious negative consequences. In practice, higher inflation always comes with higher variability in inflation. High and variable inflation impairs the capacity of the market mechanisms to achieve efficient resource allocation, and the ensuing uncertainty makes it more difficult for firms, consumers and savers to make the right decisions. It leads to arbitrary and inequitable redistributions of incomes and assets, for instance, a shift away from small savers to professional investors, and from tenants to owners of houses and property. Inflation is effectively theft from small savers and low-income groups. High inflation has no lasting positive effects, and the adverse effects eventually become unbearable. Numerous historical experiences have demonstrated that bringing inflation down from a high level is costly; as a rule, a deep recession with high unemployment is required. Accordingly, it is important to avoid letting inflation take off in the first place. For these reasons, an increasing number of countries have specified price stability as the primary goal for monetary policy.

However, completely disregarding the real consequences of monetary policy in the short and medium term and focusing exclusively on controlling inflation at the shortest possible horizon would have bad consequences. This policy has been called “strict inflation targeting” in the literature. In practice, in an open economy, it would mean relying almost exclusively on the direct exchange rate channel to CPI inflation described above, since it has the shortest lag. For instance, any disturbance to domestic inflation that could arise from a number of different sources would be countered by attempts to move the exchange rate so as to let the domestic price of imported and exported final goods adjust to stabilize CPI inflation. This would require aggressive and volatile policy and lead to considerable volatility in interest rates and the nominal and real exchange rate, which would contribute to increased volatility of output, and surely be detrimental to welfare.

A more moderate policy, called “flexible inflation targeting” in the literature, maintains that the primary goal of monetary policy is to achieve price stability in the form of an inflation target, but it is recognized that some weight should be given to stabilizing the business cycle and, consequently, stabilizing output movements around potential output. In practice, this means taking a somewhat more gradual and more moderate approach to monetary policy, aiming to achieve the inflation target at a somewhat longer horizon (say 2–3 years) than would be technically feasible (perhaps 3–4 quarters). It also means accepting that inflation will, in the short term, deviate, sometimes quite a bit, from the inflation target. This approach also relies more on the aggregate demand channel than the direct exchange rate channel to inflation.

Figure 0.1: The tradeoff between inflation variability and output-gap variability



The tradeoff between inflation variability and output variability The tradeoff between inflation variability and output-gap variability and the choice between strict and flexible inflation targeting have been discussed extensively in the monetary policy literature, for instance, in several papers presented at the Jackson Hole conferences in 1996 and 1999 (Federal Reserve Bank of Kansas City [8] and [9]). The tradeoff is often illustrated as in Figure 0.1, with inflation variability around a given inflation target measured along the horizontal axis and output-gap variability measured along the vertical axis. The intersection of the axes corresponds to zero variability of inflation and the output gap, that is, inflation always equal to the inflation target and the output gap always equal to zero. Because of the complex transmission mechanism of monetary policy, unpredictable shocks, imprecise control and inevitable uncertainty, zero variability is a completely infeasible outcome. Instead, the curve shows the most efficient and feasible combinations of inflation and output-gap variability that monetary policy can achieve. Points above and to the right of the curve correspond to inefficient monetary policy, where either inflation variability or output-gap variability, or both, could be reduced by better monetary policy. Points below and to the left of the curve correspond to outcomes that are infeasible. The point SIT corresponds to strict inflation targeting, when the central bank concentrates on stabilizing inflation without considering the consequences for output-gap variability. It results in the lowest feasible variability of inflation but high variability of the output gap. The point FIT corresponds to flexible inflation targeting, where the central bank puts some weight on stabilizing

output-gap variability. It leads to somewhat increased inflation variability but reduced output-gap variability. The point SOT, to the right outside the figure, corresponds to “strict output-gap targeting”, when the central bank puts all weight on stabilizing the output gap. It would lead to very high inflation variability.

Discussions among policymakers, experts and researchers in the monetary policy area (as reported, for instance, in [8] and [9]) have by now resulted in considerable agreement that flexible inflation targeting is the best compromise for monetary policy. There is also general agreement that inflation-targeting central banks in industrialized countries in practice conduct policy in this way. That is, they aim to stabilize inflation around the inflation target but also to some extent stabilize output around potential output—acknowledging that because of the tradeoff, unpredictable shocks, uncertainty and unavoidably imperfect control there will always remain some variability in both inflation and the output gap. For a small, open and less diversified economy like New Zealand, the remaining variability is likely to be substantial.

However, one important mechanism for improving the tradeoff is by achieving credibility, in the sense of anchoring inflation expectations on the inflation target. Shocks to inflation expectations are historically an important source of variability in inflation and output, since shifts in inflation expectations have independent effects on future inflation (the direct expectations channel to domestic inflation mentioned above). Shifts in inflation expectations also cause additional indirect disturbances to output and inflation by affecting real interest rates and exchange rates. As a result, volatility in inflation expectations shifts the curve in figure 0.1 up and to the right and worsens the variability tradeoff. Conversely, more stable inflation expectations anchored on the inflation target improve the tradeoff, shift the curve down and to the left, and allow inflation variability or output-gap variability (or both) to fall. This is also because inflation expectations anchored on the inflation target create a strong tendency for actual inflation to revert to the inflation target and, everything else equal, mean that monetary policy needs to be less active. Interest rates and output need to move less to counter unfavourable movements in inflation expectations. The economy is to some extent put on autopilot. This situation is every inflation-targeting central banker’s dream. Although central bankers often may seem obsessed with credibility, this obsession is for good reason.

Practical experience shows that credibility has to be earned over time. In most new inflation-targeting regimes, especially when initial inflation is high and a period of disinflation is required, inflation expectations are high and credibility is low. An idea that makes a lot of sense is that, in

a new inflation-targeting regime, the central bank should initially put more weight on reducing and stabilizing inflation and be a less flexible inflation targeter, in order to more quickly achieve credibility. The cost would be more output-gap variability in the beginning of the regime. The benefit would be an improved tradeoff and lower variability of both inflation and the output gap later on, when credibility has improved and the central bank can afford to be a more flexible inflation targeter.

This can be illustrated in terms of figure 0.1 in the following way. Suppose, because of low initial credibility, that the economy initially is at a point northeast of point FIT, with higher variability of both inflation and the output-gap. This initial point would be on an initial tradeoff curve located to the northeast of the curve through points FIT and SIT. Suppose the central bank implements strict inflation targeting. This would correspond to a move northwest along the initial tradeoff curve. If credibility improves, the tradeoff curve would shift to the southwest, to the curve through points FIT and SIT. The economy would then be at point SIT. If the central bank then implements flexible inflation targeting, the economy would move to point FIT. Compared to the initial situation, the economy would benefit from lower variability of both inflation and the output gap.

A separate issue is the desirability and feasibility of independent stabilization of interest rates and the exchange rate. It is certainly possible for the central bank to stabilize either the interest rate or the exchange rate somewhat, at the cost of increased variability of inflation and/or the output gap. Is it desirable for the central bank to do so? Except in situations of financial fragility with concerns about the stability of the payment and financial system, I find it difficult to see good reasons for such stabilization at the cost of increased inflation and output-gap variability. In practice, flexible inflation targeting, with a longer horizon to meet the inflation target and concern for output-gap variability, will normally mean a more gradual approach and a less activist policy and hence reduced interest rate variability. Since interest rate changes lead to exchange rate changes, everything else equal, this also reduces exchange rate variability. Increased credibility and increasingly stable inflation expectations will reduce a major source of shocks to both interest rates and exchange rates. Thus, successful and credible flexible inflation targeting is likely to contribute to less variability of interest rates and exchange rates. However, exchange rates are by nature volatile asset prices and are affected by a number of shocks beyond inflation expectations and interest rate changes. Such shocks will continue to cause unavoidable exchange rate variability.

Summary In the long term, monetary policy can only control nominal variables such as inflation and the nominal exchange rate. It cannot increase the average level or the growth rate of real variables such as GDP and employment, or affect the average level of the real exchange rate. At best it can reduce the variability of real variables somewhat. In the short and medium term, monetary policy has effects on both nominal and real variables. However, the complex transmission mechanism of monetary policy, varying lags and strength of the effects through different channels, unpredictable shocks and inherent uncertainty combine to prevent any fine-tuning. There is general international support for a regime of flexible inflation targeting, where inflation is stabilized around a low inflation target in the medium term (rather than at the shortest possible horizon) and a gradual and measured policy response avoids creating unnecessary variability in the real economy.

1. Term of Reference 1: The way in which monetary policy is managed in pursuit of the inflation target

Term of Reference 1 concerns “[t]he way in which monetary policy is managed in pursuit of the inflation target. The review will examine the way the Reserve Bank interprets and applies the inflation target set out in the Policy Targets Agreement, with a view to ensuring that this approach to achieving medium-term price stability is consistent with avoiding undesirable instability in output, interest rates and the exchange rate”.⁸

I will discuss the current best international practice among inflation-targeting central banks (section 1.1), the Reserve Bank’s historical record and whether policy was appropriate during the 1990s (section 1.2), and how the Reserve Bank currently stands relative to the best international practice (section 1.3). I will also address some of the more general criticisms of the Bank (section 1.4) and some issues concerning the inflation target and the Policy Targets Agreement (PTA) (section 1.5). Some more technical issues are discussed in section 1.6.

1.1. The current best international practice in inflation targeting

As discussed in the Introduction, changes in the central bank’s instrument rate affect inflation and output with a lag, usually about one year for output and about two years for inflation. Monetary policy that aims at controlling inflation is therefore best conducted in a forward-

⁸ Whereas the current PTA refers to “unnecessary” instability in output, interest rates and the exchange rate, the Term of Reference 1 refers to “undesirable” instability. For the purpose of this review, I will treat these words as synonyms.

looking manner. In principle, this is done by constructing conditional forecasts (projections) of future inflation, conditional on the available information about the current state of the economy, the central bank’s view of the transmission mechanism, and alternative levels or paths of the central bank’s instrument rate (the interest rate used as an instrument of monetary policy—the OCR in New Zealand). The current instrument rate is then set so that the corresponding inflation projection is consistent with the inflation target at an appropriate horizon, usually about two years ahead.

Judging whether the inflation projection is consistent with the inflation target requires that the interpretation of the inflation target is clear. As discussed in the Introduction, inflation-targeting central banks interpret their inflation targets as flexible medium-term point targets, aiming at achieving their inflation targets in the medium term, but also putting some weight on stabilizing the output gap. This has been denoted “flexible” inflation targeting as distinct from “strict” inflation targeting. Strict inflation targeting would be the case where a central bank is exclusively concerned about keeping inflation as close to the inflation target as possible, without any concern for other economic variables. This would imply targeting inflation at the shortest possible horizon (perhaps as short as 3–4 quarters) and would require quite aggressive and volatile instrument rate adjustments. Such policy would result in large volatility in output, interest rates and the exchange rate. This is generally deemed undesirable, and instead inflation-targeting central banks prefer a more gradual and moderate approach to inflation targeting so as to avoid such volatility.

In principle, flexible inflation targeting can be implemented by making projections of both inflation and the output gap and then choosing an instrument rate (or a planned instrument rate path) that results in a good compromise between the speed with which the inflation projection approaches the inflation target and the projected output-gap movements required for this. Some analysis (see, for instance, Batini and Haldane [1] and Svensson [21] and [23]) has pointed out that an almost equivalent way of incorporating flexible inflation targeting is by aiming at the inflation target at a longer horizon. This normally implies conducting policy in a more gradual and measured way, for instance, accepting short-run (“first-round”) deviations of inflation from the target after a shock, and by this measured policy avoiding destabilizing output. While it is not perfectly equivalent, this approach is the one adopted by inflation-targeting countries to date, including New Zealand.⁹

⁹ For an example of the practical handling of these issues, see the clarification of the Executive Board of Sveriges Riksbank [19], as well as the discussion in Heikensten and Vredin [12].

Which central banks in the rest of the world represent the best international practice in inflation targeting? In my view, the Bank of England and Sveriges Riksbank (the central bank of Sweden) are obvious candidates. By now, both central banks have accumulated considerable experience in inflation targeting. They have developed efficient procedures for information collection, analysis and decision-making. They are both very transparent and thus open to scrutiny and evaluation. They have explicitly committed themselves to flexible rather than strict inflation targeting. They have excellent *Inflation Reports* with published forecasts and have provided regular innovations with regard to both techniques and transparency. Both banks publish the minutes and votes of their decision-making bodies (the MPC for the Bank of England, the Executive Board for the Riksbank). Those minutes reveal that the analysis and discussion before the decisions are sophisticated and of very high quality. Most or all members of their decision-making bodies are experts in monetary policy, macroeconomics or financial markets.¹⁰

The Bank of Canada and the Reserve Bank of Australia may also seem to be natural candidates. There is no reason to doubt the competence, judgement and accumulated experience of these banks. However, they have so far chosen to be less transparent than the Bank of England and the Riksbank. They have less informative and detailed reports and motivations of their policy, and they do not publish minutes of their policy discussions. Thus, nonpublic inside information would be required for a more thorough assessment of the quality of their policy-making.

The Federal Reserve System in the US or the Eurosystem in Europe are not suitable for comparison since they operate in very large economies and hence under very different circumstances. Further, the Federal Reserve System is hardly an example of the current best practice in inflation targeting. Although the actual policy has been quite successful, the monetary policy framework lacks a clear objective and suffers from insufficient transparency.¹¹ Neither is the Eurosystem (consisting of the European Central Bank and the 12 national central banks in the EMU) an example of the current best practice in inflation targeting. It has been severely criticized for an ambiguous and asymmetric formulation of its inflation target, an inconsistent

¹⁰ The Bank of England and the Riksbank also seem to have been models for the inflation-targeting frameworks set up by the Czech National Bank in the transition economy of the Czech Republic and Banco Central do Brasil in the developing economy of Brazil.

¹¹ The guiding legislation (the Humphrey-Hawkins Act) arguably lists contradictory goals for the Federal Reserve System, and any move towards a more consistent law about the goals of monetary policy seems stalled. Members of the Federal Open Market Committee (FOMC) are sometimes reported to have different objectives and different perceived models of the economy. Published monetary policy statements are not of the same quality and transparency as those of the inflation-targeting central banks. Several informed observers have suggested that the Federal Reserve System should move to an explicit inflation-targeting regime (Bernanke, Laubach, Mishkin and Posen [2], Bernanke, Laubach and Posen [3] and Cecchetti [5]).

and confusing two-pillar monetary policy strategy, and insufficient transparency by a number of external observers.¹²

Thus, I find that the Bank of England and the Riksbank are suitable for comparison with the Reserve Bank as examples of the current best international practice of inflation targeting, particularly for small economies. Before discussing how the Reserve Bank currently compares, I will examine the Reserve Bank's historical record.

1.2. The historical record

What is the historical record of the Reserve Bank with regard to inflation, output, interest rates and exchange rates? Figure 1.1 shows how real GDP growth and the CPI target measure of inflation have developed from 1991.¹³ Figure 1.2 shows the 90-day nominal interest rate and the Trade-Weighted Index (TWI) of the nominal exchange rate for the same period.

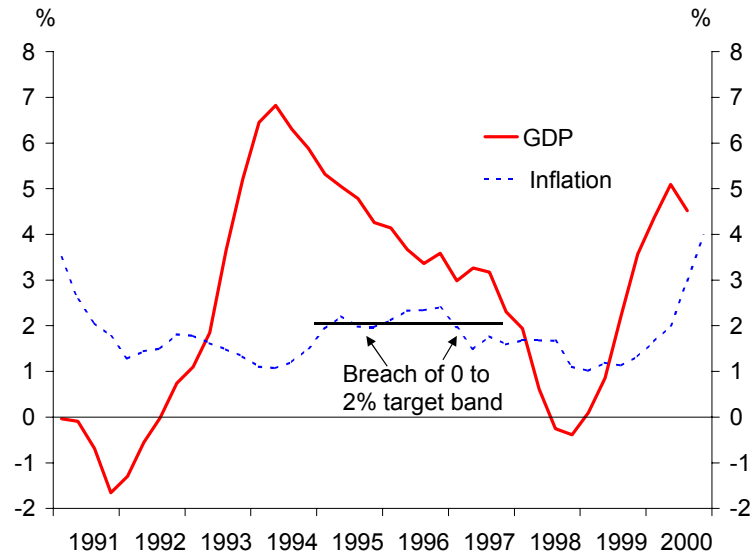
The Policy Targets Agreement (PTA) of December 1992 instructed the Bank to maintain inflation within the target band of 0 to 2 percent (per year). This target band was maintained until the PTA of December 1996, when the band was widened to 0 to 3 percent. Figure 1.1 shows that from the June quarter of 1991 through the September quarter 2000, inflation has consistently remained below 3 percent and typically between 1 and 2.5 percent (in the December quarter 2000, to be further discussed below, inflation reached 4 percent). There were moderate breaches of the target band in the June quarter of 1995 and in all four quarters of 1996. It is apparent that inflation has remained exceptionally stable through this period and monetary policy has successfully anchored inflation on the inflation target. Compared to New Zealand's previous dismal inflation performance, and given the difficulties of controlling inflation that were discussed in the Introduction, this is a remarkable monetary policy achievement.

However, has the Reserve Bank succeeded in "avoiding unnecessary variability in output, interest rates and the exchange rate"? This is a key area of concern raised in a number of submissions and brought out forcefully in a number of the discussions I had in New Zealand in November 2000. Figure 1.1 shows that GDP growth fluctuated between -2 and 7 percent (per year). Figure 1.2 shows that the 90-day interest rate from 1992 has fluctuated between 4.5 and 10 percent. The nominal TWI has fluctuated between 48 and 68. Were the above fluctuations in

¹² See, for example, Gros, Blanchard, Emerson, Mayer, Sinn, St. Paul and Tabellini [11], Favero, Freixas, Persson and Wyplosz [7] and Svensson [24].

¹³ GDP growth is measured as annual average percent change. Inflation is measured as an annual percent change. The target measure of CPI inflation is constructed as a spliced series of the CPI measures targeted by the Reserve Bank at different periods of time. They are the underlying inflation rate, the CPI ex credit services and the current CPI measure.

Figure 1.1: Real GDP growth and CPI target measure of inflation

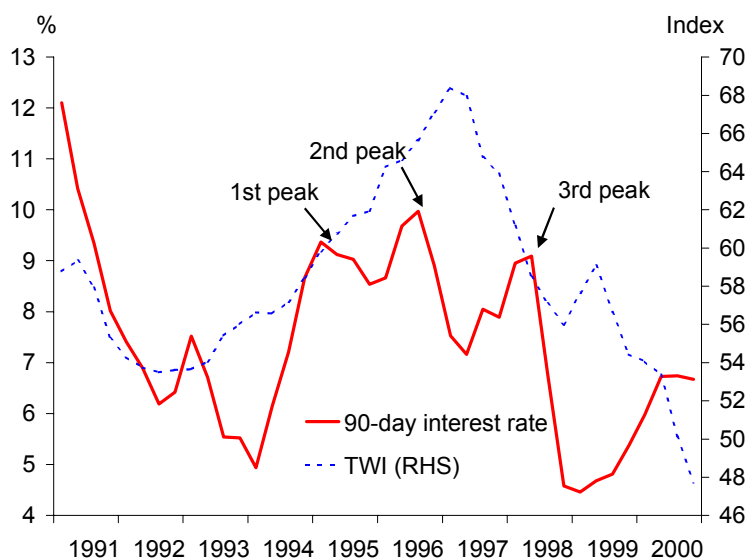


output, interest rates and the exchange rate necessary or unnecessary? To answer these questions is, unsurprisingly, quite difficult. It is not easy to assess what is necessary and unnecessary variability of these variables. Monetary policy is conducted under considerable—sometimes close to overwhelming—uncertainty, given difficulties in interpreting incoming information, assessing the state of the economy and uncertainty about the lags and effects of monetary policy actions on the future development of the economy. With the benefit of hindsight, mistakes are unavoidable and unsurprising. The real issue is whether there were any serious mistakes, given available information at the time of decision.

Figure 1.1 shows that GDP growth increased quickly after the recession in 1991 and early 1992, to reach a peak of almost 7 percent in the first half of 1994. From then on, GDP growth declined steadily into the shallow recession of the end of 1998. The economy was hit by the major negative shocks of the drought in late 1997 and the Asian crisis in early 1998, which surely contributed to the recession. After these shocks, GDP growth picked up again.

What was the stance of monetary policy during the period? Real interest and exchange rates are more relevant for assessing the stance of monetary policy than the nominal rates displayed in Figure 1.2. However, since inflation and short-term inflation expectations have been relatively stable in New Zealand, movements in the nominal interest and exchange rates to a large extent correspond to movements of the real rates. Thus, we can use figure 1.2 as a rough indication of

Figure 1.2: 90-day interest rate and nominal TWI exchange rate



the relative stance of monetary policy during the period. It is apparent that monetary policy was relatively easy in 1992 and 1993, with a relatively low interest rate and a relatively low exchange rate. Policy was tightened substantially in 1994, with a dramatic increase in the interest rate and an accompanying appreciation of the currency. The exchange rate appreciated to a peak in the beginning of 1997, after which it started to depreciate. The interest rate fluctuated around a high level of about 8 to 9 percent into the second quarter of 1998. The combined effect of the interest rate and the exchange rate meant that policy was very tight from 1995 into the first half of 1998. From mid 1998, the interest rate fell quickly to about 4.5 percent at the end of 1998. Since then the 90-day rate has been pushed up to around 6.5 percent at the end of 2000.

With the benefit of hindsight, could policy have been better? Given the rapid increase in the growth of GDP in 1993, it seems that policy was too easy in 1992 and 1993. With tighter policy then, GDP growth would most likely have been more moderate in 1993 and 1994, and the upward pressure on inflation would most likely have been less in 1995 and 1996. Policy could then have been less tight in 1994 and 1995, with lower interest rates and a lower exchange rate, and still have been able to keep inflation within the target band. GDP growth would then have held up better in 1996 and 1997, and the economy might have been less vulnerable to the combined effect of the drought and Asian crisis in late 1997 and early 1998. Such policy might have been able to achieve less variable GDP growth while still keeping inflation within the target

band.

Thus, with the benefit of hindsight, it seems that a better *timing* of policy would have been possible, without *average* policy necessarily having been much different. The fact that inflation has been stabilized effectively, in particular that average inflation has not come in low relative to the target band, indicates that average policy settings have most likely been appropriate.

The Reserve Bank's supporting document "Business Cycle Developments and the Role of Monetary Policy over the 1990s", Reserve Bank [17], presents the Bank's view and interpretation of the historical record of this period. It provides a thorough and detailed account. The document reaches similar conclusions as above, namely that, with the benefit of hindsight, the Bank was "a little slow to recognize the pace of acceleration of the economy in 1992/93, and a little slow to recognize the joint impact of the Asian crisis and the first drought through late 1997 and early 1998".

However, as already emphasized, the relevant question is not whether policy could have been better with hindsight. The relevant question is whether policy decisions could have been better, given the available information about the state of the economy and the transmission mechanism of monetary policy at the time of decisions. In 1992 and 1993, the Bank had little experience of inflation targeting. It was the first central bank in the world to implement such a monetary policy setup, so it could not rely on the experience of other inflation-targeting central banks. Likewise, it had little experience in constructing inflation projections. Furthermore, as discussed in more detail in section 1.3, the Bank had a rather rudimentary view of the transmission mechanism at the time and mostly emphasized the direct exchange rate channel to CPI inflation. Without a broader view of the other channels of the transmission mechanism, especially the aggregate-demand channel to inflation, it is possible that the Bank did not pay sufficient attention to output developments and their consequences for future inflation. Furthermore, I have no information that suggests that a significant number of external commentators and/or other forecasters at the time were criticizing the Bank for underestimating the acceleration of the economy and the corresponding future inflation pressures and, especially, faulting the Bank for not tightening monetary policy. Altogether, I find the Bank's mistake in not tightening policy in 1992 and 1993 understandable and not unreasonable considering the circumstances. It does not indicate any systematic or structural problems in the Bank's conduct of monetary policy.

1.2.1. Policy in 1995 and 1996

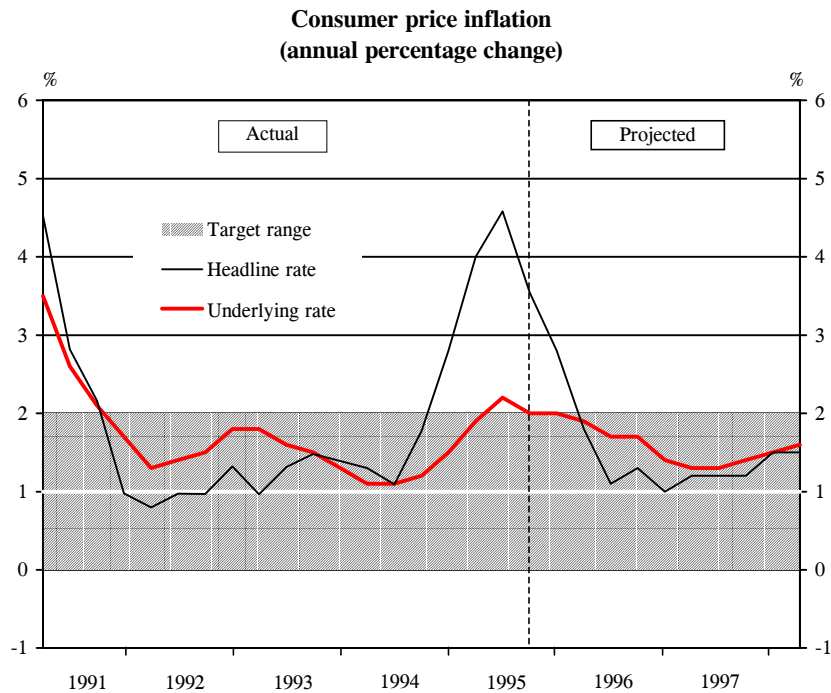
In addition to discussing policy in 1992/93 above and 1997/98 later in this section, I have examined in some detail policy during 1995 and 1996. This period was brought to my attention several times in New Zealand, and it arguably has some importance for the state of the economy when it was hit by the droughts and Asian crisis in 1997 and 1998.

Given that policy had been (in retrospect) too easy in 1992/93 and that the 0–2 percent target was breached in June 1995, was policy appropriate in 1995 and 1996? As seen in figure 1.2, policy was very tight in this period. Short interest rates were around 9 percent. The nominal and real exchange rate appreciated strongly, reaching a peak in early 1997. Inflation (measured as underlying inflation) was slightly above 2 percent. Thus short real interest rates were around 7 percent. As seen in Figure 1.1, GDP growth fell steadily from around 6 percent in 1994 to around 3 percent by the end of 1996. Some informed observers have suggested to me that policy in 1995 and 1996 was significantly tighter than warranted and that this unnecessarily depressed the real economy, made it more vulnerable to the negative shocks in 1997 and 1998, and thus contributed to the 1998 recession.

It deserves to be emphasized, that the issue is not whether the Reserve Bank was a strict inflation targeter in 1995 and 1996, in the sense of targeting inflation at the shortest possible horizon without any concern for variability in output or other variables. In the public lecture I gave at Victoria University of Wellington in November 1997 (Svensson [21]), I examined the Reserve Bank’s policy during this period. I found conclusive evidence that the Reserve Bank was not a strict but a flexible inflation targeter, in the sense of aiming at the inflation target at a longer horizon and avoiding too activist and volatile policy. Instead, the issue is, within the scope of flexible inflation targeting, was policy appropriate or too tight.

In line with the discussion of inflation-forecast targeting in section 1.1, the most relevant metric for assessing policy is with regard to the inflation and output-gap projections. These are detailed in the Reserve Bank’s *Monetary Policy Statements* (MPS). A first question, then, is how good these projections are, especially whether they are biased in any way. The Reserve Bank’s supporting document, “The Projection Process and Accuracy of the RBNZ Projections”, shows that the accuracy of Bank output forecasts is average compared to external ones, whereas the accuracy of the Bank inflation forecasts is better than the external ones. In addition, an internal Bank memo finds that Bank output forecasts have underestimated growth slightly and that Bank inflation forecasts have underestimated inflation somewhat. Thus, any bias of the Bank inflation

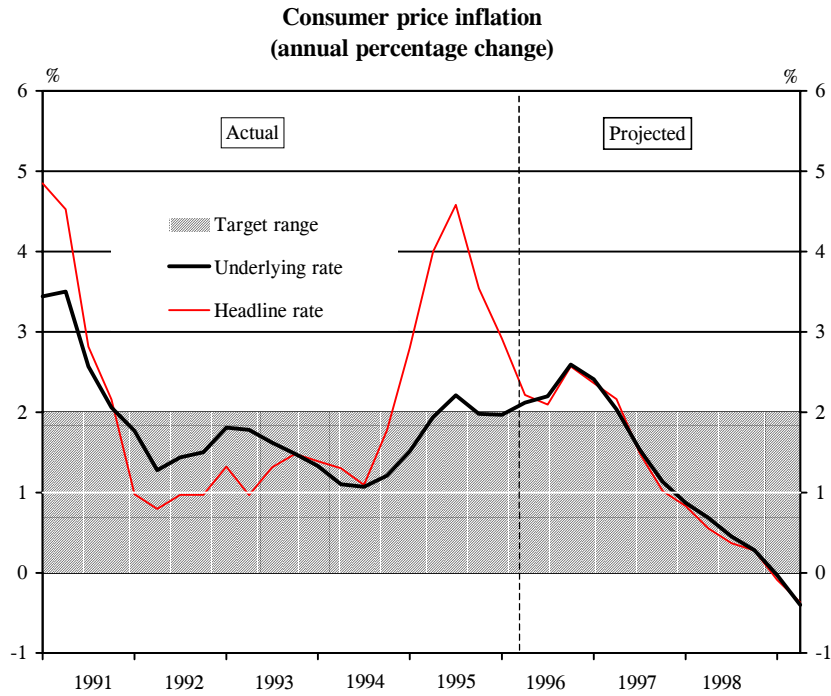
Figure 1.3: Inflation projection, December 1995



forecast would be in the direction of recommending easier policy than was appropriate. Since the issue is whether policy was too tight rather than too easy, this bias is not a problem here.

The inflation projection in the December 1995 MPS showed underlying inflation (the target measure) falling gradually from around 2 percent in the beginning of 1996 towards around 1.5 percent in the beginning of 1997 (see figure 1.3, which is figure 1 in the December 1995 MPS). No output-gap forecast was presented at this time. The text of the MPS reported a projected output growth of around 3 percent in the year to the March quarter of 1997 and around 4 percent in the year to the March quarter of 1998. Since the inflation projection was still in the upper half of the 0–2 percent band (which was the target until the December 1996 PTA) and projected output growth was substantial, the MPS does not seem to indicate too tight policy. In the June 1996 MPS (figure 1.4, which is figure 1 in the June 1996 MPS), underlying inflation was projected to overshoot the target range through 1996, fall back into the target range in the beginning of 1997, and then fall quickly and reach the bottom edge at the end of 1998. Output growth was projected to be 2–2.5 percent in the year to the March quarter of both 1997 and 1998. In the December 1996 MPS, inflation was overshooting the target range at about 2.3

Figure 1.4: Inflation projection, June 1996

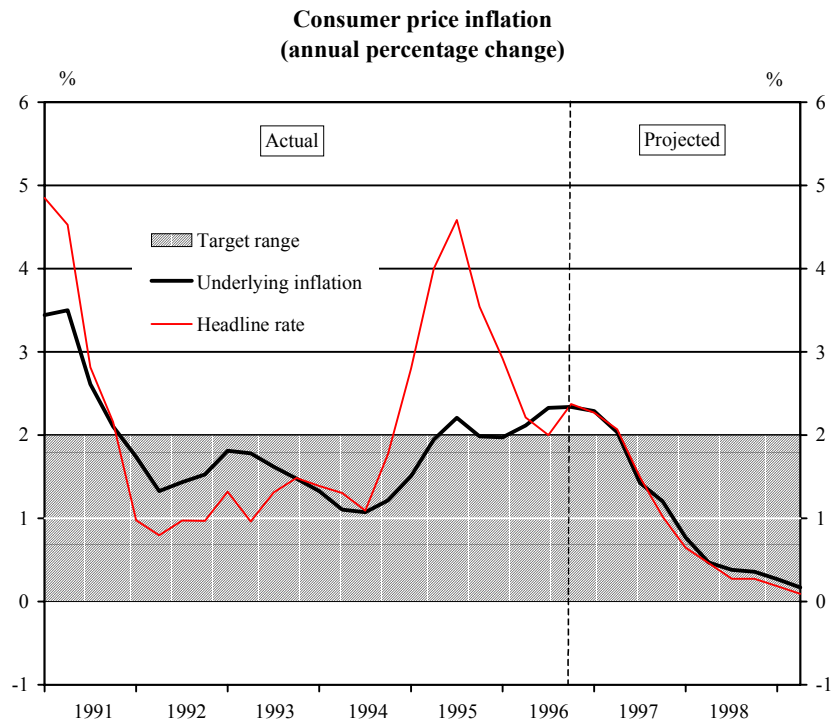


percent and was projected to move inside the target range in the March quarter of 1997 and then fall quickly to the lower half of the target range by late 1997 (figure 1.5, which is figure 1 in the December 1996 MPS). Output growth was projected to be 1.3 percent and 2.6 percent for the year to the March quarter of 1997 and 1998, respectively. Output was expected to grow less than potential output, although no details were provided.

Arguably, these projected quick falls of inflation to the lower half of the target range and modest output-growth projections could be interpreted as indicating overly tight policy. On the other hand, at this time the projections were made under the assumption of an unchanged interest rate and an unchanged exchange rate, which might to some extent exaggerate the fall in the inflation projection compared to an interest rate and exchange rate path corresponding to some realistic future easing. Still, on balance, policy seems to have been on the tight side. (It is worth emphasizing that the December 1996 MPS is extremely well written and clearly lays out the difficult choices facing the Bank.)

This tight policy must, however, be seen in the perspective of the Reserve Bank previously having underestimated the upturn in 1992/93 and the target having been breached in the June

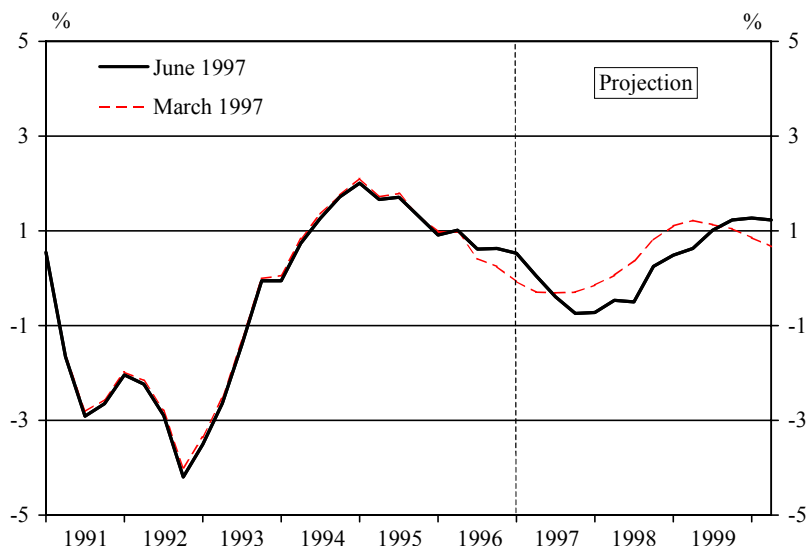
Figure 1.5: Inflation projection, December 1996



quarter of 1995 and then again in 1996. This resulted in letters from the Bank’s non-executive directors to the Treasurer reviewing the performance of the Governor. The non-executive directors stated that it was their “understanding that 0 to 2 percent was always intended to be a target towards which the Bank would be *constantly aiming*, not necessarily a target which could, given the inevitable uncertainties in forecasting and lags in the effectiveness of monetary policy, always be certain of attainment” (the letter is reproduced in the June 1996 MPS). Still, many observers may have interpreted the inflation target as having hard edges that should never be breached, and it is completely understandable if the Governor was quite keen on getting inflation back into the target range.

If policy was indeed too tight in 1995 and 1996, one would have expected that the negative shocks from the first drought in late 1997 and the Asian crisis in early 1998 would have pushed inflation towards the bottom of or even below the old target range of 0–2 percent in 1997 and 1998, and that a sizeable negative output gap would develop. This did not happen; instead inflation remained in the 1–2 percent range, that is, in the upper half of the old target range

Figure 1.6: Output-gap projection, June 1997



(figure 1.1).¹⁴ The June 1997 MPS reports (figure 1.6, figure 5 in the June 97 MPS) that the output gap remained positive, around 1 percent, in 1995 and 1996, and fell to about -0.7 percent in late 1997 and early 1998. Looking at the inflation and output-gap outcome, policy does *not* appear to have been too tight in 1995 and 1996.

To summarize: In an absolute sense, with short real interest rates around 7 percent and with a very high real exchange rate, monetary policy was very tight in 1995 and 1996. Inflation was not much more than one percentage point above the midpoint of the target range, the output gap was perhaps not much more than one percentage point, and there was no indication that inflation was getting out of control. Was it *too* tight and hence, in the short and medium term, unnecessarily depressing the real economy? The inflation projections falling steeply towards the bottom of the target range in the June and December 1996 *Monetary Policy Statements* provide some indication of this. On the other hand, the actual inflation outcome and the (estimated) output gap in 1997 and 1998, in spite of the negative shocks of the droughts and the Asian crisis, were much more moderate, and indicate that policy was probably not too tight. Finally, the tight policy must be seen in the context of the tense atmosphere at the time, with the

¹⁴ Note that, for policy in 1995 and 1996, it is the old target range rather than the new 0–3 target range of the PTA of December 1996 that applies. Even for the MPS of December 1996, strictly, the old target range applies (and is consequently displayed in figure 1.5), since the MPS was finalized on December 5 and the PTA was signed on December 10.

Governor's performance being evaluated because of the breach of the target and a hard-edged interpretation of the target among some observers. Thus, in the end, the evidence is somewhat mixed, although leaning towards the conclusion that, given the circumstances, policy may have been either appropriate or somewhat on the tight side, but not substantially too tight.

However, there is a considerable contrast between the vigorous policy then and the very measured response outlined in the December 2000 MPS, to be discussed below. Whereas there can be different views on whether or not policy was sufficiently flexible in 1995 and 1996, the Reserve Bank is clearly quite flexible now, as we shall see in section 1.3.

1.2.2. Policy in 1997 and 1998

As mentioned above, the Reserve Bank's supporting document admits that the Reserve Bank was "...a little slow to recognize the joint impact of the Asian crisis and the first drought through late 1997 and early 1998". Was the lag in recognizing and reacting reasonable, given the information available at the time? One way to approach this question is to scrutinize the Reserve Bank's *Monetary Policy Statement* of December 1997 for possible bias which might have prevented the Bank from easing earlier. The MPS contains a fair amount of discussion of the Asian crisis and possible repercussions on the New Zealand economy. It projects inflation roughly in the middle of the 0–3 percent target range (see figure 1.7, figure 1 in the December 1997 MPS) and an output gap which is negative through 1998 and then positive in 1999 (see figure 1.8, figure 10 in the December 1997 MPS). Arguably, the negative output gap might have motivated a somewhat more expansive policy path in 1998 and tighter path in 1999. Such a path is, interestingly, discussed as an example of a more aggressive policy in Box 3 of the MPS. It was projected to imply only slightly more inflation in 1999. In retrospect, it would have been wiser to start on that path at the end of 1997.

Something I find missing in this MPS is a thorough discussion of the implication of the Asian crisis for the New Zealand economy. This shock implies a fall in the external demand for New Zealand output and a fall in the New Zealand terms of trade (the relative price of New Zealand exports in terms of world prices). The fall in external demand and the reduced real income of New Zealanders from the terms-of-trade deterioration are both contractionary and disinflationary. The exchange rate depreciation alleviates these contractionary effects somewhat, by improving the competitiveness of exporters and those competing with imports. It also counters the disinflationary effects and may even cause some inflation, but the consequences on domes-

Figure 1.7: Inflation projection, December 1997

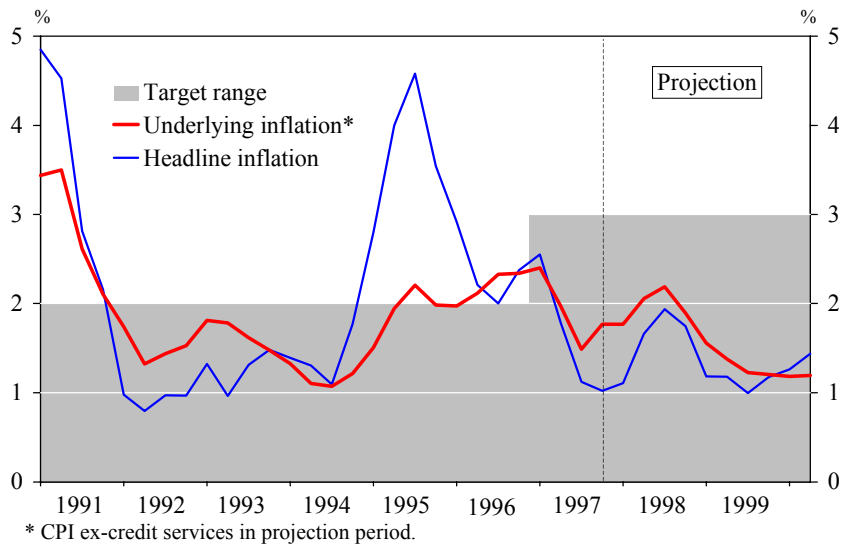
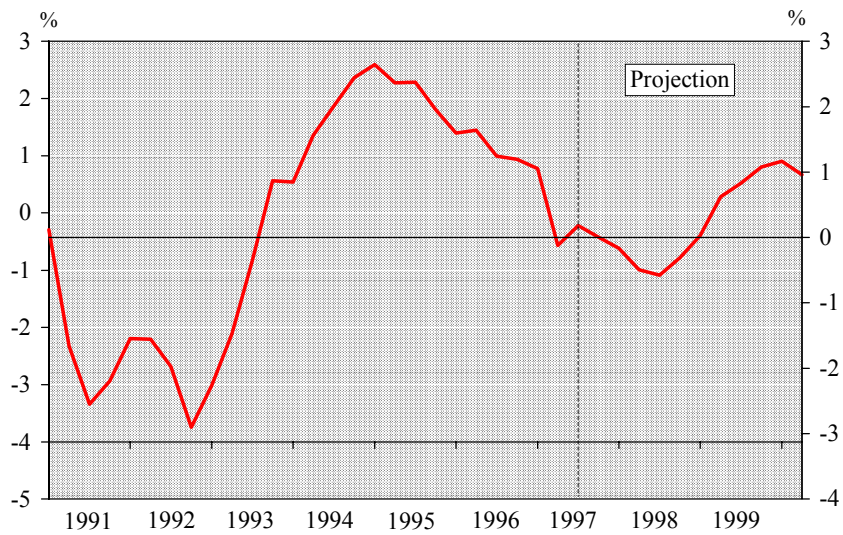


Figure 1.8: Output-gap projection, December 1997



tic inflation may be quite muted due to the terms-of-trade deterioration. The appropriate monetary policy response may very well be a lowering of the interest rate, and a good case can be made for accepting a one-time increase in the price level and “looking through” an inflation peak.¹⁵ The 1996 PTA also listed significant changes in the terms of trade among the caveats allowing deviations from the target.

The experience in 1997 and 1998 is intimately connected with the Reserve Bank’s idiosyncratic use of a Monetary Conditions Index (MCI) in implementing policy. The index was constructed by combining the 90-day interest rate with the TWI exchange rate, with a weight of 0.5 on the exchange rate. The MCI was associated with numerous problems and is further discussed in section 2. As noted in the Introduction and discussed in Stevens [18], the MCI is an unreliable indicator of the impact of monetary policy (see also footnote 6). From June 1997 to March 1999, the Bank used the MCI not only as an indicator but as an instrument for implementing policy. It announced a desired level or path for the MCI with a tight band of ± 50 basis points (± 0.5 percentage point), thereby letting the market choose the combination of interest rates and exchange rates consistent with the index. As mentioned in the Introduction, the idea was that the MCI would adequately summarize the impact of monetary policy on output and inflation. For a given level of the MCI, a fall in the exchange rate then requires a rise in the interest rate. To some extent this explains the peculiar interest rate peak in early 1998, the “third peak” in figure 1.2. Since the exchange rate depreciated quite rapidly, but the Bank only eased policy slightly in terms of the MCI, the interest rate had to rise substantially. Thus, in terms of the interest rate alone, we see a strong tightening of monetary policy at the onset of the first drought and the Asian crisis, when an easing may have been more appropriate.

Of course, the Reserve Bank could have responded by reducing the MCI sufficiently, in order to prevent the interest rate from increasing, but it chose not to. The interest rate was instead allowed to rise automatically. In March 1999, the Reserve Bank abandoned this unusual way of implementing monetary policy and instead moved to a completely conventional implementation, by setting the Official Cash Rate (OCR). If the Bank had been implementing policy by setting an OCR in 1997 and 1998, would it have purposefully increased interest rates so dramatically? In my view, it is probable that an OCR implementation regime would have required a higher burden of proof that such interest rate increases were warranted.

Summing up the 1997 and 1998 record, I believe the Bank may be excused for not anticipating

¹⁵ Stevens [18] contains a discussion of terms-of-trade effects in relation to the MCI.

early enough the severe consequences of the first drought and the Asian crisis. I do not have any information that a substantial number of other forecasters would have predicted differently or criticized the Bank for being overoptimistic. On the other hand, I believe the Bank did not consider the appropriate response to the Asian shock sufficiently well, and the Bank is certainly responsible for too strong and too long an attachment to the MCI and for allowing that attachment to result in substantial interest rate increases with little burden of proof. Although the rapid easing of monetary policy in late 1998 (see figure 1.2) may have muted the consequences for inflation, this episode certainly involved more interest rate volatility than necessary and possibly some unnecessary output volatility, too.

Having said that, it is worth mentioning the oft-repeated analogy that New Zealand is but a small boat in a large and tempestuous sea. New Zealand is a very small and geographically isolated country. The domestic economy is too small to act as any kind of buffer in the event of large external shocks. Economies of scale, market entry costs and a lack of diversification compound the effect of its smallness. Superficial comparisons with Australia are misleading, because of Australia's several times larger and more diversified economy. Even with close to perfect monetary policy, New Zealand will continue to be quite vulnerable to external and internal shocks that create considerable volatility in output and real exchange rates. Larger and more diversified open inflation-targeting economies, like the UK and Sweden, have actually experienced real exchange rate fluctuations of the same magnitude as New Zealand.

1.3. How does the Reserve Bank compare?

This section first summarizes the historical record of the Reserve Bank and then discusses the development of the Bank's monetary policy framework more generally, and to what extent the Bank's policy approach at this point conforms with the PTA's requirement to maintain medium-term price stability while avoiding unnecessary instability in output, interest rates and the exchange rate. After a discussion of the Bank's decision process and my own experience with it, I assess how the Bank currently compares to the current best international practice of inflation targeting, as represented by the Bank of England and Sveriges Riksbank.

The discussion of the Bank's historical monetary policy record in section 1.2 finds that the evidence is somewhat mixed. I conclude that the Bank's mistake in not tightening policy in 1992 and 1993 was reasonable, given the circumstances. Regarding policy in 1995 and 1996, I conclude that, given the circumstances, policy was either appropriate or a bit on the tight side,

but not substantially too tight. For policy in 1997 and 1998, I conclude that, although the Bank may be excused for not anticipating early enough the severe consequences of the first drought and the Asian crisis, the Bank did not analyse sufficiently well the appropriate monetary policy response to the Asian shock. Furthermore, the Bank's too long and too strong attachment to the MCI implied that the exchange rate depreciation was allowed to result in interest rate increases with little burden of proof. Although the rapid easing of monetary policy in late 1998 may have muted the consequences for inflation, this episode certainly involved more interest rate volatility than necessary and possibly some unnecessary output volatility.

Thus, some mistakes have been made in the past, but perfection is an inappropriate benchmark. The Reserve Bank has been a pioneer in inflation targeting, without the possibility of learning from previous experience by other central banks. The economy has regularly been subject to new kinds of shocks. Mistakes in such a situation are to a large extent unavoidable, and they need to be seen in a broader perspective. The inflation history of New Zealand before the 1990s is dismal. During the 1990s the Reserve Bank achieved a remarkable stabilization of inflation at a low level. With hindsight, the timing of policy could have been somewhat better. However, given the circumstances at the time of decisions, aside from the MCI period there is no evidence that policy has systematically resulted in unnecessary variability in output, interest rates and the exchange rate. The period of using the MCI to implement monetary policy is the exception, and it must be seen as a substantial deviation from the best practice of inflation targeting.

The Bank has certainly debated and learned from its historical record over the years, as is evident, for instance, in the thoughtful discussions in its *Briefing* of October 1996 and November 1999 (Reserve Bank [15] and [16]). It has also learned from the problems associated with the MCI implementation, which was eventually abandoned in March 1999 and replaced by the OCR implementation.

As noted in section 1.2 above, the Bank's view of the transmission mechanism of monetary policy was somewhat unsophisticated in the early 1990s and emphasized the direct exchange rate channel and a rather short policy horizon of 2–4 quarters (see the Bank's *Briefing* of October 1996, [15, p. 28–29]). The Bank's view of the transmission mechanism seems to have evolved gradually over the years to emphasize other channels of transmission, especially the aggregate-demand channel. The MPS of December 1995, for instance, contains a box with a brief and preliminary discussion of the concept of potential output, which is so central in modern views

of the transmission mechanism. With the introduction of the Forecasting and Policy System (FPS) in 1997, the Bank has clearly developed a fully-fledged modern view of the transmission mechanism in an open economy, along the lines discussed in the Introduction and in line with best international practice. Arguably, such a view is necessary in order to take full account of output movements and to avoid unnecessary variability in output, interest rates and the exchange rate.

Parallel to these developments, the Bank seems to have lengthened its policy horizon, and taken a more flexible interpretation of the inflation target. Indeed, in its *Briefing* of November 1999, [16, p. 22], the Bank completely subscribes to the idea of flexible inflation targeting:

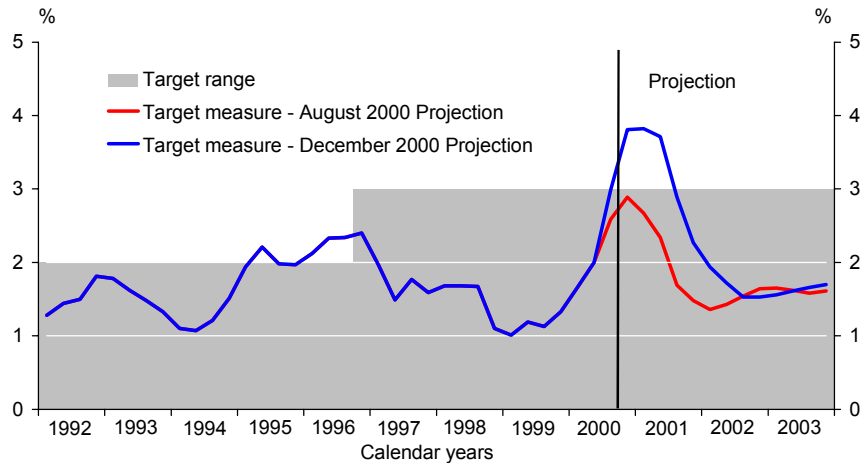
“Our conclusion, on the whole, has been to adopt a more medium-term approach, which attaches more weight to the desirability of stabilising output, interest rates and the exchange rate, while still aiming to keep inflation within the target range.”

The Bank also mentions some steps taken in this direction. They include:

- “The widening of the inflation target range, from 0 to 2 percent to 0 to 3 percent...”
- “A lengthening of the horizon at which policy responses to inflation pressures are directed, from 6 to 12 months to something more like 12 to 24 months. This means that, provided the medium-term inflation outlook is in line with the target, near-term shifts in the price level are more likely to be accepted without policy reaction.”
- “Some de-emphasis of the edges of the target range as hard and precise thresholds...”
- “The shift from an MCI target to a cash interest rate instrument for implementing monetary policy. This change has lessened the need for frequent intervention in the financial markets, and has resulted in more interest rate stability.”

It is worth recalling that during the 1990s the Bank gradually established credibility and anchored inflation expectations on the inflation target. The Bank also accumulated an increased understanding of the transmission mechanism of monetary policy and increased confidence in its ability to fulfil the inflation target. This allows the Bank some more degrees of freedom, and a gradual move towards more flexible and medium-term inflation targeting is to a large extent a natural consequence. In line with the discussion in the Introduction, it is also possible that

Figure 1.9: Inflation projection, December 2000



a shorter horizon and somewhat higher weight on inflation stabilization in the beginning may have contributed to establishing initial credibility.

Is there concrete evidence of the Bank being a flexible inflation targeter? The *Monetary Policy Statement* of December 2000 can certainly be interpreted in such a way. Here, due to the large fall in the exchange rate, the sharp increase in international oil prices, and the increase in indirect taxes on cigarettes, inflation is projected to significantly overshoot the upper edge of the target range for several quarters, before it comes down to the midpoint of the target range (see figure 1.9, figure 1 in the December 2000 MPS). The Reserve Bank is looking through the inflation spike without raising the instrument rate, giving the private sector a chance to absorb the one-time increase in the price level from the fall in the exchange rate, explaining that unless this triggers price and wage increases, no persistent inflation need arise and significant instrument rate increases will be unnecessary. My judgement is that the December 2000 MPS is prime evidence of good flexible inflation targeting that maintains medium-term price stability while avoiding unnecessary variability in the real economy.

1.3.1. The decision-making process

I have had the privilege of observing a number of forecasting and decision meetings at the Reserve Bank, both in October and November 1997 during a visit as a Professorial Fellow in Monetary Economics and in November 2000 in connection with the current review.

The Bank's decision-making process is a regular quarterly cycle that leads up to the release

of the MPS and the announcement of the new OCR setting (a recent speech by the Governor, Brash [4], provides more details). The process leading up to the MPS takes about eight weeks. During each cycle, the Bank collects an enormous amount of data, comprising several thousand series. The Bank monitors and analyses closely almost 100 of these, covering both domestic and international developments.

What is perhaps less well known is that, in the beginning of each cycle, the Bank's economists visit and meet with a large number of businesses and organizations all over New Zealand. This allows the Bank to collect very fresh information that can be used to cross-check the official statistics. It also allows the Bank to collect more informal information about the state of business in all sectors of the economy. This practice keeps the Bank in touch with what is happening all over the economy and New Zealand.

Further into the decision cycle, the data and more informal information are processed and analysed, and the Bank's forecasting team starts preparing the projections. My visit in November 2000 allowed me to participate in some of the most important meetings in the most intensive week of the decision cycle, week five of the eight weeks allocated to the process. In two meetings on Tuesday, the forecasting team presented projections to the internal Monetary Policy Committee (MPC) (the committee that provides advice to the Governor). These projections considered alternative background assumptions, both for the next few quarters and for the next three years. In a meeting on Wednesday, the members of the MPC discussed and scrutinized these projections and the underlying assumptions and data. In another meeting on Thursday between the forecasters and the MPC, the final projections were agreed on. The last meeting of the week, on Friday, was with the OCR Advisory Group, a subgroup of the MPC consisting of the Governor, the two Deputy Governors, the Chief Managers of the Economics Department and the Financial Markets Department, two senior advisors and two managers. The members of this group each provided written advice on the OCR decision to the Governor, which was then discussed and scrutinized, allowing the Governor to make a provisional decision before the final OCR decision at the time of the release of the MPS.

This decision process seems well designed to provide the Governor with the best comprehensive advice for the OCR decision. The discussions in these meetings were very open and covered all relevant aspects, as far as I could see. The broad base of these discussions was further enhanced by the "hawks and doves" exercise that had taken place in the previous week. There, four of the Bank's economists not directly involved in the forecasting process were asked

to provide individually written views along two lines, one corresponding to a more “hawkish” and the other a more “dovish” policy decision. The idea is to open the Bank’s thinking to alternative views and make sure that the Bank’s assessment does not easily fall into a single view.

As during my previous visit in 1997, I was struck by the Reserve Bank being the least hierarchical central bank I have come across. This shows not only in the Governor and senior staff having lunch in the Bank’s cafeteria rather than in a separate executive dining room, which is common in other central banks. More importantly, it shows in the free and informal exchange of views and information between the junior and senior staff, including the Governor, during these meetings and discussions. Competence, information and judgement are rightly judged as more important than formal rank.

My conclusion is that the Reserve Bank, in gathering, processing and analysing information, considering alternative scenarios, constructing projections, and making informed decisions, is second to none and hence compares well with the Bank of England and the Riksbank.

1.4. Some general criticism of the Reserve Bank

In some of the submissions and meetings, I have encountered more general criticism of the Reserve Bank, which does not refer to the precise policy conduct discussed in section 1.2. This section addresses some of this criticism.

1.4.1. The Bank is out of touch with the reality in New Zealand

From what I can observe, this criticism is simply not correct. As noted in the discussion of the Bank’s decision process above, the Bank makes a huge effort in collecting information, data and informal views from a large number of businesses and organizations from all sectors of the economy, for instance by having its economists travelling and talking to people all over New Zealand. I doubt that there is a single business, organization or authority that has better and more detailed knowledge about the state of the New Zealand economy. As far as I can judge, the Bank puts at least as much effort into this as other central banks. However, this activity of the Bank does not seem to be well known in New Zealand. I understand the Bank plans to remedy this by listing the businesses and organizations it has talked to before each MPS.

1.4.2. The Bank is an ivory tower and filled with boffins

I find this an odd criticism and one that is out of touch with the reality of modern monetary policy practice. First, the Bank is not more technical in its way of conducting and reporting monetary policy than the Bank of England and Sveriges Riksbank. It does not have more trained economists than these banks; it has many fewer. (I actually think the Reserve Bank could use a few more economists. Making good monetary policy takes almost the same amount of work if you are a small economy as if you are a large one.)

The Federal Reserve System, although not being an explicit inflation targeter, has been very successful in the last decade in both controlling inflation and stabilizing the economy. Many associate this success (to a large extent rightly, I think) with its Chairman, Alan Greenspan. However, Alan Greenspan is not a layman. He is a trained economist and an extremely skilful forecaster with a deep knowledge about the working of the US economy (and a master in judging potential-output movements). And behind him, at the Board of Governors, he has an excellent staff, with about 175 PhDs, not to speak of the accumulated competence in the 12 Federal Reserve Banks. Indeed, some of the world's leading researchers in the area of monetary policy are economists in the Federal Reserve System.

Second, as discussed further in section 4.1, monetary policy in New Zealand is technical rather than political. In New Zealand, the social and political control over monetary policy enters through the *Reserve Bank Act* and the PTA. The *Act* sets out the overall objective of price stability. The PTA allows the Government, through the Treasurer, to specify in detail how the overall objective of price stability shall be interpreted. Once the PTA is specified and signed, with the target range and the requirement to avoid unnecessary variability in output, interest rates and the exchange rate, getting policy right and fulfilling the PTA is no longer a political but a technical task. This technical task involves collecting, processing and analysing data, developing models of the transmission mechanism, using models and judgement to construct forecasts, interpreting these forecasts and drawing the right policy conclusions. The task also requires a thorough understanding of all parts of the New Zealand economy, good skills in communicating complex monetary policy issues, and an ability to read day-to-day dynamics of the financial markets. This is a very skill-intensive activity that requires bright and well-trained people. As far as I can judge, the Reserve Bank has a staff with the appropriate range of skills.

1.4.3. The Bank is mechanistic, for instance, in its reliance on the output-gap model

There may have been periods when the Bank has behaved in a somewhat mechanistic way. Some would say that the MCI period is an example, when interest rates were allowed to increase automatically when the exchange rate fell. (I am inclined to agree.) However, the Bank has (fortunately) abandoned the MCI implementation and is now using a conventional cash rate. In my experience of the meetings and discussions in the decision-making process discussed above, I did not notice anything mechanistic. Model results were not taken for granted, and a strong effort to always subject them to good economics and sound judgement was made. The Bank consistently makes an effort not to let its thinking fall into a single view, for instance, with the “hawks and doves” exercise mentioned above.

Furthermore, the Bank’s staff is definitely not of one view. There is a healthy difference in views and opinions among the staff, including the senior staff. These views are frequently aired, as far as I can judge, in line with the informal and non-hierarchical atmosphere at the Bank.

Some submitters are skeptical about the so-called output-gap model. However, potential output and the output gap are indispensable tools for good monetary policy. They are prominent in the discussion of the transmission mechanism in the Introduction, and they are prominent in every good central bank these days. Potential output is certainly an abstract and difficult concept, and estimating it is one of the greatest challenges in practical monetary policy. Still, it is essential for understanding the transmission mechanism and determination of inflation. (Actually, from a monetary policy point of view, the whole debate about the role of technology and the New Economy can be seen as a debate about whether a sustained increase in potential-output growth has occurred or not. One reason for the success of Alan Greenspan is his skill in projecting potential-output movements.)

The output gap is of course not the only determinant of inflation. As discussed in the Introduction, and as discussed in the MPSs and in the meetings at the Bank that I attended, inflation is determined by a number of factors and affected by a number of shocks and disturbances. The output gap is one of the more important determinants, but definitely not the only one. The Bank is certainly aware of this. I doubt that anyone in New Zealand understands the intricacies of inflation determination better than the Bank.

Finally, potential output is indispensable for getting the right perspective on output variability. Because monetary policy cannot affect average output in the long term but only the temporary deviations of output from potential output, the relevant variability for monetary pol-

icy is output-*gap* variability, not output variability. Thus, analysis of potential output and the output gap is required in order to best avoid unnecessary variability in output, interest rates and the exchange rate.

1.5. The Policy Targets Agreements

The current Policy Targets Agreement, of December 1999 (see appendix G), states in section 2b that “the policy target shall be 12-monthly increases in the CPI of between 0 and 3 percent”. Section 4a states that the Bank “shall constantly and diligently strive to meet the policy target established by this agreement”. Furthermore, section 4c states that “[i]n pursuing its price stability objective, the Bank shall implement monetary policy in a sustainable, consistent and transparent manner and shall seek to avoid unnecessary instability in output, interest rates and the exchange rate”.

In order to be in line with the best international practice, according to the discussion in the Introduction and in section 1.1 above, the policy target in the current PTA should be interpreted as a medium-term inflation target, consistent with flexible inflation targeting. Should it be interpreted as a target “range of indifference” of 0 to 3 percent, or should it be interpreted as a point target of 1.5 percent, the midpoint of the target range? Since flexible inflation targeting in practice means aiming at the inflation target further into the future, a point target provides a better anchor. There is a big difference between inflation of 0 and 3 percent for two years. There is also a big difference between inflation expectations of 0 and 3 percent for a few years. Thus, there are strong reasons for a point target in order to provide a clear anchor for inflation expectations in the medium term. In line with this, the policy target in the PTA should be interpreted as a point target of 1.5 percent. To be in line with flexible inflation targeting, the target should be interpreted as “soft-edged”, in the sense that the edges 0 and 3 percent do not constitute thresholds for policy adjustments. This seems completely consistent with the Reserve Bank’s current interpretation of the target (see section 1.3).

Ideally, section 2b of the PTA would be modified to read “the policy target shall be 12-monthly increases in the CPI of 1.5 percent over the medium term”. Were this not the interpretation in use and commonly accepted, there would be a pressing need to change the current wording of the PTA. The next time the PTA is modified, it might be useful to take the opportunity to change the wording as suggested. There is no reason for any other change in the PTA

(except for some resulting technical changes where there are references to the target range).¹⁶

Some submitters have suggested that the inflation target should be raised. I am not aware of any strong evidence suggesting that 1.5 percent would not be an appropriate level. An increase in the target level for no good reason might easily be interpreted as lessening the commitment to price stability and be detrimental to the credibility of the monetary policy regime.

The PTA has been changed a number of times. There have been six PTAs since the Reserve Bank Act came into force in early 1990. Frequent adjustment of the PTA is likely to be detrimental to the stability and credibility of the monetary policy regime. As emphasized in the Introduction, credibility in the sense of inflation expectations anchored on the inflation target is essential for stabilizing output, interest rates and the exchange rate. Stability and credibility would seem to be well served if the PTA (in line with the apparent intention of the Reserve Bank Act) were to be interpreted as a five-year agreement between the Governor/Reserve Bank and the Government for the duration of the Governor's term. Thus, there should be one PTA per Governor term, not one PTA per Government, and any modification of the PTA should occur at the beginning of the Governor's term.

1.6. Some more technical comments on the Forecasting and Policy System

This section makes some more technical comments on the Bank's Forecasting and Policy System. Readers less interested in technical detail may prefer to skip the section.

The Reserve Bank combines short-term forecasting with medium-term projections that are constructed utilizing a structural macro model called the Forecasting and Policy System (FPS). This way it integrates data and estimates of the current state of the economy, forecasts and assumptions about external developments and state-of-the-art macroeconomics embodied in the structural macro model. All together, this represents best-practice inflation-forecast targeting.

In some dimensions, the Reserve Bank has an edge over the Bank of England and the Riksbank. First, since mid 1997, the Reserve Bank's projections are conditional on time-varying interest rate paths. In contrast, the Bank of England and Sveriges Riksbank, so far, mainly rely on projections conditional on an unchanged instrument rate (although they also publish projections conditional on market expectations of future interest rates). As discussed by Goodhart

¹⁶ For instance, section 4b could be reformulated as: "It is acknowledged that inflation outcomes may deviate from the target. If inflation outcomes were to deviate more than 1.5 percent from the target, or if 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."

[10] and Kohn [13], this leads to a number of problems and inconsistencies in the projections. A constant instrument rate path is unlikely to materialize, is unlikely to be consistent with private sector expectations, and implies that the projections do not correspond to the most likely outcomes. Second, the Reserve Bank publishes projections for three years ahead, whereas the Bank of England and Sveriges Riksbank so far have published projections two years ahead (the Riksbank have recently added a verbal discussion of the inflation projection for the third year). Since these banks put considerable weight on whether the inflation projection eight quarters out hits the inflation target, it is a bit awkward that the projections end there, since there may be cases where it makes sense to check that they do not diverge from the target further out. I would anticipate that these banks will eventually follow the Reserve Bank's example on these two points.

There are, however, some reasons for further developments and improvements in the FPS. It is worth emphasizing that these developments are quite advanced and would push the frontier of best international practice in inflation targeting further out. Although they are not likely to materially affect policy choices, they represent further refinements that will improve the internal consistency of the FPS.

First, the FPS uses a particular policy reaction function, where the short (90-day) nominal rate relates to the deviation of an equilibrium inflation forecast some six to eight quarters ahead. This reaction function is somewhat problematic and unlikely to be the most appropriate. It has been taken over, uncritically I believe, from the so-called QPM model of the Bank of Canada. It is theoretically problematic, since it cannot be directly related to a reasonable optimality condition (see Svensson [23] and [27]). In practical simulations on different macro models, its performance is inferior and nonrobust (see Levin, Wieland and Williams [14]). Thus, the Reserve Bank should consider alternatives to this reaction function, for instance, those examined in [14].

Second, the Reserve Bank typically presents the MPC with projections for a few alternative scenarios with different assumptions about external developments and responses of the domestic economy. However, for each scenario, only one projection is presented, corresponding to the time-varying interest rate path generated by the reaction function above. Since the decision problem is to *choose* the appropriate instrument rate path for which the inflation and output-gap projections look to achieve the best compromise relative to the inflation target, it makes sense to present the MPC with a menu of projections resulting from alternative interest rate paths for discussion and evaluation. For instance, two additional interest rate paths, corresponding

to tighter and looser policy than the one generated by the basic reaction function, could be considered for each scenario. This makes particular sense, since the interest rate path generated by the basic reaction function so far may not be the best one.

Third, the FPS system lends itself to making output-gap projections more explicit and for these being discussed at the same level as the inflation projection. Such discussion would allow more explicit discussion of the optimal compromise between inflation and output-gap stability, and make more concrete the effort to avoid unnecessary output-gap variability.

Fourth, the projections generated by the FPS lend themselves to more formal evaluation, using loss functions with specified relative weights on inflation and output-gap variability. Thus, the Reserve Bank may want to experiment with such formal evaluation of the projections, in order to find the best interest rate path for any given scenario.

2. Term of Reference 2: The instruments of monetary policy

Term of Reference 2 concerns the instruments of monetary policy. The review will assess “whether the Reserve Bank has an adequate range of instruments and is using its current instruments effectively in altering monetary conditions in the desired direction”.

Instruments are prices and/or quantities that can be controlled by the central bank and are used by the central bank to implement monetary policy. Most central banks implement monetary policy by setting a short interest rate. Practical experience as well as theoretical results support this as the most effective way of implementing monetary policy.

The Reserve Bank’s choice of instrument and implementation of monetary policy have developed over the years, as described in the Reserve Bank’s submission and in more detail in its supporting document, “The Evolution of Monetary Policy Implementation”. From June 1997, the Reserve Bank implemented monetary policy in a quite idiosyncratic way, by announcing a desired level or path for a Monetary Conditions Index (MCI) with a tight band of ± 50 basis points (± 0.5 percentage points).¹⁷ The MCI implementation was associated with a number of problems, as described in several of the submissions provided to me (see also the discussion in the Introduction). This way of implementing monetary policy was abandoned in March 1999. Since then the Reserve Bank has implemented monetary policy by setting the Official Cash Rate, the OCR, in line with conventional wisdom and best international practice. There is considerable support for the OCR regime in the submissions and in the discussions I had there was consensus

¹⁷ For an excellent discussion of the problems with the use of MCIs, see Stevens [18].

that it has worked well. The OCR gives the Reserve Bank an adequate instrument to alter monetary conditions in the desired direction. The Reserve Bank's submission acknowledges "that it would have been helpful to have moved to the Official Cash Rate approach rather earlier than was the case". I agree completely and consider the MCI period a significant departure from best international practice.

In the public debate in New Zealand and in some of the submissions, alternative instruments of monetary policy have been suggested, including reserve ratios, capital controls, other tax or regulatory interventions, and foreign exchange interventions. The main idea is that alternative instruments would be less blunt than the interest rate instrument and might, in the mid 1990s, have allowed policy to mitigate the inflationary pressure originating in the booming nontradables sector, while avoiding the sharp rise in the exchange rate that negatively affected the tradables sector. This has also been debated inside the Bank, and the Bank has carefully considered the advantages and disadvantages of alternative instruments. It has come to the firm conclusion that none of the alternative instruments would have materially eased the cyclical imbalances, and that in many cases any such gains would have had significant costs to the efficient operation of New Zealand's economy and financial markets.

This is, from an international perspective, a quite uncontroversial conclusion. In deregulated and well-functioning financial markets, an increase in banks' reserve requirements results in an increase in the interest rate and has the same effect on the economy. Changes in reserve requirements are thus redundant, and they are rarely used these days. Some countries, including New Zealand, Sweden and the UK have indeed abolished reserve requirements, literally or effectively.

Capital controls, which would introduce a wedge between domestic and foreign interest rates, create inefficiencies, waste resources—by agents finding ways to circumvent the controls and by authorities trying to enforce them—and arbitrarily favour agents who can more easily find ways around the controls. With New Zealand's well developed financial markets, they would be very difficult to implement with any degree of enduring effectiveness, and they would involve substantial supervisory and compliance costs. Administrative credit controls for different sectors of the economy face the same problem. In the rest of the world, as in New Zealand, there has been a strong trend towards deregulation and liberalization of financial markets, for very good reasons. The costs for New Zealand of reversing this trend would be substantial, both in the form of domestic resource costs and inefficiencies and in the form of a loss of credibility with and the confidence of international investors and corporations.

Another potential additional instrument consists of foreign-exchange interventions, meaning sterilized foreign-exchange interventions that do not involve adjustment of the instrument rate. The result of much research and practical experience is that they normally have only small and short-lived effects, and that they may have more substantial effects only when they are interpreted as signals or threats of future interest rate changes. A transparent central bank has better ways of sending such signals, though. There is no evidence that sterilized foreign exchange interventions could have any material effect on exchange rate variability. I see no reason why a transparent inflation-targeter should undertake foreign-exchange interventions.

3. Term of Reference 3: The information used by the Reserve Bank in its decision-making

Term of Reference 3 concerns the information used by the Reserve Bank in its decision-making. The review will consider “the range of sources, availability, type and timeliness of data, and the impact of these variables on forecasting and decision-making”.

In the time I have spent at the Reserve Bank, I found the Bank to use available data in the same way and to the same extent as other inflation-targeting central banks, in assessing the current state of the economy, in making forecasts of crucial macro variables and in general economic analysis. In addition to using available data, as discussed in section 1.3.1, the Reserve Bank makes a considerable effort in collecting information directly from a large number of businesses and organizations all over New Zealand. Overall, I believe that the information available to the Bank and, in particular, the Bank’s use of it, is well up to standard.

This judgement is endorsed by the Bank. The Reserve Bank’s supporting document concludes that “[although]...we see some areas where additional, well-targeted, resources could yield some useful data improvements, overall, we consider that the data currently available for monetary policy are broadly adequate”.

Nevertheless, some observers have found that New Zealand data is generally less accurate, less complete, and more prone to revisions than in many other countries. Several of the submissions also point to data deficiencies. I find it striking that key data series for monetary policy like the CPI or industrial production are not available at a monthly frequency. These series are particularly useful when it comes to determining turning points in the cycle, a notoriously difficult problem in monetary policy.

Data on inflation expectations is useful both as an input into inflation projections and as a

measure of the credibility of the monetary policy regime. Credibility can be measured by how close private-sector inflation expectations are to the inflation target at different horizons. The Riksbank has commissioned Statistics Sweden to do regular and extensive surveys of short-, medium- and long-term inflation expectations of different agents, businesses and organizations. Summaries of these surveys figure prominently in its *Inflation Reports*. The Reserve Bank might consider collecting and reporting data on medium- and long-term inflation expectations more systematically than it currently does. Since one of its uses is to assess the credibility of the Reserve Bank's policy, in order to ensure sufficient independence, at least some of that data should be collected and published at arm's-length, for instance, by Statistics New Zealand.

4. Term of Reference 4: The monetary policy decision-making process and accountability structures

Term of Reference 4 concerns the monetary policy decision-making process, governance issues and accountability structures. The review will consider "whether the decision-making process and accountability structures promote the best outcomes possible". I was struck by the prominence given to this issue both in submissions and in meetings, especially the choice between a single decision-maker and a committee.

This section discusses (1) the choice between a single decision-maker and a committee for monetary policy decisions and (2) some further accountability issues.

4.1. A single decision-maker or a committee for monetary policy decisions

In New Zealand, responsibility for monetary policy decisions rests with the Governor alone. This is an unusual arrangement; in most other countries, monetary policy decisions are the responsibility of a committee. The main advantages with a single decision-maker are the strong accountability and the coherence in decision-making and communication that it makes possible. Disadvantages include the risk associated with the dependence of monetary policy decisions on the qualities, knowledge and experience of a single individual rather than a group of individuals, and the possible capture of policy by a single line of thinking. Furthermore, in democracies, there is an inherent legitimacy problem in vesting so much power and responsibility in the hands of one person (non-elected too), given the importance of monetary policy. Crucial power in democracies is normally vested in committees. Governments and supreme courts are committees, for instance.

In New Zealand, some of the disadvantages are already addressed within the existing structure. There is a rigorous procedure for appointing the Governor, which mitigates the risks of a bad appointment. The legislation and the PTA specify the operational goals for monetary policy and in this way restrict the Governor's discretion. The Governor's performance is monitored by the Board of Directors of the Reserve Bank, and there is a procedure for removing the Governor if his/her performance is unsatisfactory.

Furthermore, the Governor has instituted an internal Monetary Policy Committee (see section 1.3.1), where information about the economy, forecasts and policy decisions are openly and extensively discussed and where the committee members provide the Governor with comprehensive policy advice. I have been able to observe this MPC in session several times, during visits in October and November 1997 and in November 2000. As far as I can judge, and as discussed in some detail in section 1.3.1, the work of this committee, in quality, openness and comprehension, is at least equivalent to the practice of MPCs in other central banks. Submissions by former Bank staff Grimes, Lang and Mayes, as well as the Westpac submission by several former Bank staff, all comment on the open and contestable nature of discussions at the MPC.¹⁸

Still, on balance, I find that the present New Zealand arrangement carries with it some significant risks. I believe the current arrangement works so well to a large extent due to the personal attributes of the current Governor, Dr Brash. In spite of the rigorous procedure for appointing the Governor, future Governors may not be of the same standing. Another Governor may not, to the same extent, keep the Board as well informed and simplify its monitoring, encourage open and comprehensive discussion within the Bank, or give the same important role to the internal MPC. Another Governor may not cope as well with the pressure, criticism and even abuse that seem to go with the territory. Another Governor may, as discussed in some detail in the submission of ex Deputy Governor RJ Lang, in difficult times and under high pressure lose confidence and let policy go awry in a number of different ways. The current system relies on the ability to quickly dismiss the Governor on such occasions. However, the lags in the effects of monetary policy, the difficulties in objectively identifying whether outcomes are the result of policy or luck, and the actual mechanics of removing a Governor imply that removal of a Governor will never be easy and never be quick. In particular, depending on the circumstances, a dismissal of the Governor might easily be interpreted as a reduced commitment

¹⁸ A strong argument in favor of a committee as a decision-maker rather than a single individual is the so-called information-aggregation argument, that a committee more efficiently aggregates and uses information (see Favero, Freixas, Persson and Wyplosz [7, p. 28–29]). In this context, the MPC of the Reserve Bank can be seen as a way of maintaining efficient information aggregation together with a single decision-maker.

to price stability, which could imply a considerable loss of credibility for the monetary policy regime, making the costs of a dismissal very large.¹⁹

Therefore, if sufficient accountability and coherence in decision-making and communication can still be maintained, a committee arrangement may be preferable. Several alternative committee arrangements are possible, and different central banks have quite different arrangements. Since different arrangements may work quite differently, it is important to select the right kind of committee. A senior central banker told me: “Of all arrangements, the best is the right committee. The worst is the wrong committee.”

One question is whether committee members should be experts in monetary policy or nonexperts. Nonexperts would have the advantage that there is a larger group of possible candidates to choose from and therefore it is easier to find widely respected candidates who would increase the general legitimacy of the committee. However, a lack of expertise in monetary policy means reduced competence for independent assessment and capacity to participate in the high-level discussion required in efficient forward-looking inflation targeting. Nonexperts therefore easily become dominated by committee members with more expertise. There are hence very good reasons to limit appointments to candidates with expertise in monetary policy, macroeconomics or financial economics. In line with this, both the Bank of England and Sveriges Riksbank have no nonexperts on their committees.

This issue is related to whether monetary policy is a political or technical activity. This depends on the circumstances, more precisely on whether the central bank has so-called goal independence or operational independence (the latter is also frequently called instrument-independence). *goal independence* means that the central bank has the power to independently set monetary policy goals or at least interpret stated monetary policy goals with some discretion. This is the case, for instance, if legislation for the central bank does not state any monetary policy goal, or states it in ambiguous terms open to interpretation. Then monetary policy of the central bank inevitably includes a political element.

Operational independence refers to the situation when the central bank’s independence is restricted to conducting monetary policy so as to achieve a clear and well-specified goal that is not set by the bank but by the political authorities, for instance, in legislation or by the Government. The New Zealand monetary policy regime is a prime example of operational independence, since the Reserve Bank’s goal is clearly specified in the PTA. Indeed, the precise

¹⁹ For instance, if the situation of dismissal is one where inflation is above target and the Governor, in attempting to get inflation back towards the target, is considered to pursue a too tight and zealous policy.

formulation of the PTA, with the commonly agreed interpretation of flexible inflation targeting with a medium-term point target that avoids unnecessary variability in output, interest rates and the exchange rate, and the strong accountability structures imply that the political element of monetary policy has been taken out and that monetary policy is a purely technical activity. Then monetary policy is best done by experts. (See also section 1.4.)

This also implies that appointments to an MPC with the purpose of sectoral, political or other special-interest representation would be mistaken. Not only is it unnecessary, but it would bring special-interest conflicts into the committee, cause deadlocks or risk policy serving special interests rather than the country as a whole.

Another issue is whether a committee should include external members, meaning non-executive part-time members without administrative responsibilities in the Bank, or be composed entirely of Bank staff. One potential advantage with external members is that it would address the concern that the Reserve Bank is “out of touch” and not sufficiently open to external and alternative views. This is a point raised by a number of the submitters. However, as discussed in section 1.4, I strongly believe that any perception that the Bank is not currently sufficiently open and informed, either about the state of the economy or about external views, is erroneous. In my experience, as discussed in section 1.3.1, the Bank makes a very strong effort to collect information from and to exchange views with a broad collection of concerned parties in New Zealand. Instead, this perception can be countered by the Bank more explicitly reporting about such information collection and exchange of views and also institutionalizing more formal external contacts. I understand the Bank is planning to list in each MPS the businesses and organizations it has talked to in the preparation of the MPS. Furthermore, and very importantly, if minutes of the MPC are published, this will allow scrutiny of whether important and relevant aspects of monetary policy and its consequences are included or left out. This is also one reason why it is important that minutes record differences of opinion and not only the final outcome.

Another reason for external members might be that they would increase the political legitimacy of the Reserve Bank. However, from the discussion above about operational independence, it follows that monetary policy in New Zealand is a technical activity and not a political one. Hence, there is no need for increased political legitimacy of the Reserve Bank and, given the technical nature of monetary policy, attempts to increase political legitimacy may actually undermine the effective operation of monetary policy.

There are also some quite practical reasons for not including external members. One great

disadvantage is the limited supply of competent experts without serious conflict of interest. This may be a problem even in a country as large as the UK, with a population some 15 times that of New Zealand. For New Zealand this problem may be overwhelming. Even if initial appointments would be good—some have suggested to me that there are a number of suitable candidates—with some turnover a drop over time in quality and competence is unavoidable. Another problem with external members is that there may be a conflict between responsibility to the committee and personal interests. For instance, temptations may arise to take advantage of the increased visibility to raise a personal profile, for instance, by publicizing dissenting views from the rest of the committee, perhaps as a way of furthering one’s future career after a stint on the committee. Finally, having external committee members raises the issue of what amount of resources in terms of staff and assistance is required for the external members to be effective. Experience from the Bank of England shows that this can become a controversial issue. The experience from the Bank of England also points to a tendency for part-time external members to become full-time internal members rather than external ones. Altogether, I believe it would be quite unsuitable for New Zealand to appoint external committee members.

Instead, I find the most suitable committee to be an internal MPC, to a considerable extent codifying the current well worked-out arrangement. Thus, I propose a committee of five members (with three a quorum), consisting of the Governor, the two Deputy Governors, and two nominated senior Reserve Bank staff (for instance, the Chief Managers of the Economics Department and the Financial Markets Department). Each member would have one vote (with the Governor having the casting vote in case of ties). The votes and non-attributed minutes should be published with a two to three week lag, to be available before the next MPC meeting. A meeting every six weeks is appropriate and would fit well with the current decision cycle in the Bank. Whereas the votes should be named to allow individual accountability, minutes should be non-attributed, otherwise the discussion may be less free and open. The experience from both the Bank of England and Sveriges Riksbank, where non-attributed minutes are published, gives no indication that such minutes restrain the discussion. The MPC should only take responsibility for decisions related to monetary policy. In all other areas, the Governor would remain the single decision-maker of the Bank.

Currently, the Governor is appointed for a five-year term of office by the Minister of Finance, on the recommendation of the Bank’s Board of Directors. The Deputy Governors are appointed by the Board on the recommendation of the Governor, also for five-year terms. These proce-

dures for appointments need not be changed. Other senior staff are currently appointed by the Governor, typically for five-year terms. To ensure sufficient independence of the two senior staff who are members of the MPC, they should also be appointed by the Board, on the recommendation of the Governor. The conditions for removal should be unchanged for the Governor and the Deputy Governors, and changed to be the same as the Deputy Governors for the two senior staff. Political independence of the MPC is best served with the Board (and not the Treasurer) appointing the MPC members other than the Governor. A suitable time for introduction of the new MPC would be at the end of the current term of the Governor.

The proposed size of the committee (five members) has the advantage of allowing overlapping five-year mandates, where only one member is appointed or reappointed each year. This allows for desirable continuity in the MPC composition. Furthermore, the size of five implies that the Governor's casting vote will probably rarely be used.

There are several advantages with the proposed arrangement. It essentially institutionalizes a well-tested internal decision-making structure that the Bank already has worked out. It represents the minimum change necessary in moving to a formal committee structure and thus should result in the minimum disruption to the current structure. It would retain the current coherent decision-making and communication processes better than would alternative committee arrangements, especially those with external members. It would retain the current accountability to the largest extent possible.

Accountability will continue to be based on Board monitoring and scrutiny. In addition, published non-attributed minutes and voting records will allow enhanced accountability. Realistically, as is effectively the case today, the sanction for unsatisfactory performance will be explicit verbal criticism and the threat of no reappointment, rather than removal from office, although removal from office will still be a technical possibility. (Some further improvements in the accountability structure are proposed in section 4.2.)

An internal committee would make the decision-making arrangements and the decisions themselves much less sensitive to the personal qualities of the Governor and should also work well with differing Governors. While retaining a strong role for the Governor as an executive of the Bank and in recommending other MPC members to the Board for appointments, it leaves the Governor with the choice of being a leader or mainly a chair with regard to monetary policy decisions. The proposed arrangement does not disrupt the current internal incentive structure in the Bank. If the Chief Managers of the Economics Department and the Financial Markets

Department are selected for membership on the MPC, it would elevate their position to some extent relative to the current setup, which should make them somewhat more attractive relative to other similar positions outside the Bank. This may, rightly, recognize the crucial work for monetary policy that is being done in these two departments, and should also make it easier to attract and retain competent candidates.²⁰

Given the importance of inflation projections in inflation-targeting, one potential problem in an MPC is disagreement about the published inflation projection, as discussed in Goodhart [10] and Kohn [13]. The Bank of England MPC has stated that their published inflation projections should be understood as the MPC's "best collective judgement", although there are a number of problems with the precise meaning of this, as Kohn notes. The Riksbank's Executive Board instead states that their published inflation projections represent the "the majority view". In line with this, occasionally a minority of the Executive Board has dissented and in the minutes explained how their preferred projection differs from the majority's. As far as I can judge, the Riksbank's approach has worked quite well. One clear advantage is that the published projections naturally are the ones that policy will be based on.

Another possibility when there are disagreements about the projections, suggested by Goodhart [10], is that the projections are the Governor's. This would be similar to the situation currently in the Reserve Bank's MPC (except that under a committee structure, policy need not necessarily be the Governor's if he/she is in the minority). The other MPC members could then, if they prefer, in the minutes record any difference with the Governor's projection. A serious drawback with this arrangement is that the published projection need not be the one policy is based on. The problem may appear to be somewhat compounded for the Reserve Bank relative to the Bank of England and the Riksbank, in that the projections use a time-varying interest rate path rather than a constant interest rate path (at least until the Bank of England and the Riksbank choose to follow the Reserve Bank's lead and abandon their constant-interest rate assumption, see section 1.6). In principle, though, both the interest rate path and the inflation projections could reflect either a majority view or the Governor's view. I see no reason why the MPC could not efficiently resolve these issues.²¹

²⁰ Another alternative would be to create an Executive Board, say of four to six full-time executive directors with administrative responsibilities in the Reserve Bank, similar to the six-member Executive Board at the Riksbank. The Executive Board would then be responsible both for monetary policy and for managing the Reserve Bank. Such an arrangement may create a rather top-heavy, hierarchical and bureaucratic management structure in a small central bank such as the Reserve Bank. It effectively introduces a new layer above the Chief Managers and dilutes the position of the Deputy Governors. It is therefore likely to have negative motivational effects on some of the staff. It would also make accountability for the management of the Bank more diffuse. It has quite a few drawbacks compared to the alternative of an internal MPC responsible for monetary policy only.

²¹ A projection is always associated with uncertainty. Ways of conveying the appropriate uncertainty are

If an internal MPC is the best decision-making arrangement for the Reserve Bank, what is the second best? In spite of my considerable misgivings about the supply and other problems with external members, I believe an MPC with external experts is the second-best committee arrangement. Such a committee should still have five members, with three internal (the Governor and two Deputy Governors) and two external. It retains the advantage of being comprised of experts, and the external experts can potentially challenge the internal ones. A third best committee arrangement would be a similar five-member MPC but with one or two of the external members being nonexpert (the more nonexperts the worse; a nonexpert would essentially be a hostage to the experts). A fourth best for the small Reserve Bank would be the top-heavy Swedish arrangement with an Executive Board (see footnote 20). I find these third and fourth best committee arrangements significantly inferior to the first and second best.

Where do I put the arrangement with the single decision-maker in this ranking? Provided the Governor is an expert, I put it at rank 2.5, below the second best committee with external experts but well above the third best committee with external nonexperts. I put it below the two top committees because of the risk involved with a single person, but above the two bottom committees because of the strong accountability and coherence in decision-making and communication. (If the Governor were to be a nonexpert, I would rank the single decision-maker last.)

4.2. Accountability structures

The Board of Directors of the Reserve Bank comprises the Governor (as chair), the Deputy Governor(s) (up to two) and between four and seven non-executive directors. Thus the Board comprises a majority of non-executive directors. The non-executive directors form the Non-executive Directors' Committee (NEDC). The Board of Directors has a key role in the process for choosing the Governor, appointing the Deputy Governors and in monitoring the performance of the Bank. These roles are delegated to the NEDC, in order to avoid the obvious conflict of interest caused by the Governor being the chair of the Board and the Deputy Governor(s) being members of the Board.

Several submissions, including that of the NEDC, recommend that one of the non-executive directors be chair of the Board instead of the Governor. The NEDC's submission recommends that the Governor and Deputy Governor(s) remain members of the Board. However, a board of

therefore an integral part of the projection. This is further discussed in section 6.

non-executive directors can always ask the Governor and Deputy Governors to attend meetings to provide information and participate in discussions. Therefore, the simplest and cleanest arrangement seems to be a Board of Directors consisting of non-executive directors only. If a compromise is sought, one possibility is that the Governor becomes a non-voting member of the Board. The independence of the Board seems best served if the non-executive directors select the chair among themselves, rather than the chair being selected by the Treasurer.

The Board's monitoring of monetary policy is currently an internal process, described in some detail in the NEDC submission. For instance, the Board discusses and scrutinizes each *Monetary Policy Statement* and makes a formal decision on whether or not the MPS in question meets the statutory requirements. A number of submissions put forward suggestions for improving the Bank's public accountability. The accountability structure would be strengthened if the Board produced and published a report with its evaluation of the Bank's policy, either as a separate annual report by the Board or as part of the Bank's *Annual Report*. Given that only a minority of the Board members may have extensive expertise in monetary policy issues, the Board may want to appoint a panel of experts to assist it in its evaluation of monetary policy.

General public discussion and debate about monetary policy among journalists, experts and interested parties is a most important part of the accountability structure. Inflation targeting, with an explicit goal for monetary policy and regular and transparent *Monetary Policy Statements* with published forecasts and detailed motivations for policy decisions, provide ideal circumstances for a thorough public monitoring of monetary policy. The clear logic of the framework allows criticism and discussion to be quite pointed and, for instance, to specify whether the criticism refers to the PTA, to the Bank's inflation projections (including the assessment of the current state of the economy), or to the policy conclusions from a given inflation projection. Unfortunately, in many cases the public discussion and debate provide rather inefficient monitoring of monetary policy, because it is dominated by special interests, is often biased towards easy monetary policy, and has a quite short time horizon.

One way to raise the level of the monetary policy discussion and to provide more effective public monitoring may be a regular annual conference for the evaluation of monetary policy, funded by the Reserve Bank but organized by an independent committee. Such a conference may contain a presentation of an annual review of the operation of monetary policy by an expert panel, a presentation of the Bank/Board's annual report(s), presentations of other papers by invited experts, speeches and comments by Reserve Bank officials and independent experts from

within and outside New Zealand, and opportunities for general discussion and debate.²²

The Finance and Expenditure Select Committee of the New Zealand Parliament also has a role in monitoring monetary policy. The Governor and other senior Bank staff appear before the Committee at open meetings occurring after the release of the MPS and the *Annual Report*. However, there are often serious constraints on the preparation time available for the Committee, and a range of experience and monetary policy expertise amongst members, which may act to reduce the effectiveness of the monitoring function. Unfortunately, in many countries it is not unusual for such committees to use hearings with central-bank officials for scoring political points rather than for more penetrating scrutiny. One possibility for more effective monitoring is for such committees to appoint panels of experts to assist them. In the UK, the Select Committees of both Houses utilize the help of expert panels in preparing for the hearings with Bank of England officials. In Europe, the Committee on Economic and Monetary Affairs of the European Parliament appoints a panel of experts to assist it in the hearings with the President and other Executive Board Members of the European Central Bank. Provided sufficient resources are designated for this purpose, the Select Committee of the New Zealand Parliament could appoint a panel of experts for assistance with hearings of the Governor and other Reserve Bank officials. This may allow greater depth in the hearings and give more clout to the Committee's monitoring.

Note that there is a significant difference between involving external experts in MPCs and in annual evaluations of monetary policy. In the former case, the involvement implies continuous access to market-sensitive information, which creates serious conflicts of interest for many potential experts. In the latter case, the involvement means looking back (often as far as two to three years, given the lags in monetary policy discussed in the Introduction) at old information which is no longer market-sensitive. Hence, there is much less conflict of interest, if any at all. Consequently, the supply of suitable people is significantly larger.

5. Term of Reference 5: The coordination of monetary policy with other elements of the economic policy framework, including prudential policy

Term of Reference 5 concerns “the coordination of monetary policy with other elements of the economic policy framework, including an evaluation of the relationship between monetary policy operations and other Reserve Bank functions such as prudential oversight of financial

²² The Reserve Bank is currently running an annual scientific workshop on various topics in connection with the Professorial Fellowship in Monetary Policy. The new conference proposed here would instead be devoted explicitly to monetary policy evaluation.

institutions”.

Monetary policy and fiscal policy in New Zealand are coordinated by placing each within a decision framework focusing each on medium-term objectives and making those objectives and related actions transparent. In this way, fiscal actions can take full account of the likely monetary policy response, and vice versa. The alternative approach to coordination, namely to make fiscal and monetary policy decisions jointly, is not feasible, given the operational independence of the Bank.

The *Fiscal Responsibility Act* seems to give New Zealand an edge in fiscal policy effectiveness relative to other countries, in that conducting fiscal policy this way becomes more transparent and medium-term oriented. Given the transparency and medium-term orientation of both fiscal and monetary policy in New Zealand and the regular exchange of information that takes place between the Bank and the Treasury, any gains from more explicit coordination between fiscal and monetary policy are likely to be minor. In particular, they would be overwhelmed by the negative consequences of abandoning the operational independence of monetary policy.

Government policies in a number of other areas, for instance, labour relations and tariff policy, have implications for inflation and sometimes make monetary policy more difficult. It is desirable that government policies are consistent with the price stability goal, and it is important that the Government informs the Bank well in advance on policy plans that may have consequences for inflation.

With regard to prudential policy, the Bank is obliged to “[h]ave regard to the efficiency and soundness of the financial system” (*Reserve Bank Act* 10(a)). The Bank’s prudential supervision is based on disclosure and market discipline, self discipline by registered banks, and regulator discipline focused on compliance with a limited number of restrictions. This is fully consistent with its price stability objective. Price stability provides the best environment for the financial system to remain sound, and a sound and efficient financial system makes price stability easier to achieve.

It is sometimes suggested that selective prudential instruments, such as selective credit controls, could occasionally be applied for monetary policy purposes, for instance, by dampening activity in some overheated sectors. As discussed in section 2, with well developed financial markets, such attempts are highly likely to be ineffective, cause distortions in the financial system and create unfairness due to the different capacity of agents to circumvent the controls. As in other industrialized countries, such attempts do not belong to modern monetary policy.

Sveriges Riksbank and the Bank of England have started to issue regular *Financial Stability Reports* complementing their regular *Inflation Reports* and containing summary indicators and analysis of the state of the financial system, thus providing early-warning indicators of problems in the financial system. The Reserve Bank reports information on the state of the financial system mainly in an annual article in the *Reserve Bank Bulletin*. It would be entirely consistent with the principle of disclosure and the high standard of transparency if the Reserve Bank were to summarize its information about the financial system (including a number of macro-prudential indicators) in a regular report, called for instance the *Financial Stability Statement* or the *Prudential Policy Statement*, to complement the *Monetary Policy Statement*. A suitable frequency may be twice a year. Such a regular report may also raise the visibility and relative importance of the prudential policy part of the Bank and counter any tendency for it to be overshadowed by the monetary policy part.

In times of financial crisis, there may sometimes be a conflict between price stability and financial stability. A typical conflict situation is when the appropriate monetary policy calls for a monetary policy tightening, but such a tightening might further damage already weak balance sheets in the financial sector and possibly trigger a collapse of the financial and payment system. Such a situation would, however, typically arise in a situation with already high or rapidly rising inflation. With the Reserve Bank having successfully stabilized inflation and anchored inflation expectations on the inflation target, such a situation seems quite unlikely. A financial crisis would probably instead be associated with a fall in inflation below the target, in which case both financial stability and price stability would call for a monetary easing. Thus, a conflict between financial stability and price stability seems less likely in New Zealand.

6. Term of Reference 6: The communication of monetary policy

Term of Reference 6 concerns the communication of monetary policy. “The Reserve Bank’s communication of monetary policy decisions will be reviewed to ensure that these decisions are explained to the public and financial markets in the simplest, clearest and most effective way possible.”

Modern inflation targeting is characterized by close attention to communication of monetary policy. Effective communication is vital to the efficient operation of monetary policy. It is essential to minimize surprises, and therefore costs, that may sometimes be associated with the implementation of monetary policy. A high level of transparency is also an important part of

the accountability structure of monetary policy.

The Reserve Bank’s communication of monetary policy decisions to the public and to the financial markets is generally exemplary. This is also the conclusion of many submissions. Since the Reserve Bank Act came into force in 1990, the Reserve Bank has been at the forefront in the development of openness and transparency in central banking and served as a role model for other inflation-targeting central banks. Some of the other inflation-targeting central banks have eventually caught up and reached similar levels of transparency to the Reserve Bank.

The Reserve Bank manages its communication of monetary policy in several ways. It issues quarterly *Monetary Policy Statements*, where the Bank states the new OCR, the rationale for that decision and how the Bank sees the economy and inflation in the period ahead, with the help of three-year projections of the crucial macro variables. Between the MPSs, the Bank makes an additional OCR announcement. The Bank has an elaborate procedure, including a “lock-up” before the announcement, to make sure that journalists have time to study and digest the MPS and thereby allow more accurate and balanced reporting. At the release of the MPS, there is also a press conference with the Governor. In addition, the Governor and other Reserve Bank officials give numerous speeches at meetings and functions all over New Zealand, both off-the-record and on-the-record. Day-to-day, the Reserve Bank attempts to be open to the news media for information and interviews.

In addition to the MPS, the Bank publishes a quarterly *Bulletin*, a Working Paper Series with research papers, and occasional conference volumes. Before elections, the Reserve Bank publishes a *Briefing on the Reserve Bank*. These are particularly well written, with very good and honest discussions of the Reserve Bank’s policy and experiences. The Bank also publishes educational material on monetary policy and central banking.

Several other inflation-targeting central banks now publish minutes from their MPC meetings. These are useful, for instance, as a check that discussions and arguments in the MPC are relevant, balanced and of appropriate quality. The Reserve Bank does not publish such minutes, on the grounds that the current MPC’s role is purely advisory, that the MPS provides a full picture of the reasoning behind particular OCR decisions, and that making minutes public would “restrict the free and often robust discussion that takes place in that forum” (quoted from the Reserve Bank’s supporting document, “Communication of Monetary Policy Decisions”). However, the minutes published by, for instance, the Bank of England and Sveriges Riksbank are non-attributed and (unavoidably) edited, and there is no indication that such minutes restrain

the discussion. In my recommendation for a formal internal MPC (see section 4.1), I recommend the publishing of such non-attributed minutes, as well as named voting records . One reason for having minutes is that they provide better information on the differences of opinion and the various arguments than a polished final product like the MPS.

The projections published in the MPS are a crucial part of the Reserve Bank’s monetary policy decision process. For several reasons, the Reserve Bank’s published projections have stood out among those published by other inflation-targeting central banks. They are published for a longer horizon: three years rather than the usual two. They have since mid 1997 used a time-varying interest rate path, rather than the common constant interest rate path. They have also been more detailed, with quarterly numeric paths for a number of variables. I believe all those distinctions are good and give the Reserve Bank an edge relative to other inflation-targeting central banks. As discussed in section 1.6, the longer horizon and the time-varying interest rate path have strong advantages over the alternatives. I also believe the detailed projections have advantages, in that the observer can better scrutinize the internal consistency of the Bank’s projections. As reported in the Reserve Bank’s supporting document “Publication of Projections”, the precision of the Bank’s projections is best among all external forecasters for inflation and average for output (although there is little difference in the precision between forecasters for output).

However, a major risk with publishing detailed projections is that less sophisticated observers may interpret the *detail* in the projections as indicating *precision*. As every forecaster and central banker knows, projections and forecasts of future inflation and other macro variables are inherently uncertain and imprecise. To the extent that details in published central-bank projections are erroneously interpreted as indicating precision in forecasts, outcomes of future inflation and other macro variables that unavoidably deviate from previous projections may receive undue emphasis, be interpreted as indicating a lack of central-bank competence, and therefore be detrimental to credibility.

For these reasons, it is important for central banks that publish projections to emphasize both the conditional nature of the projections (their dependence on particular assumptions about the state of the economy, the interest rate path, international scenarios, etc.) and the inherent uncertainty in any projection. Inflation-targeting central banks have developed different ways to convey the uncertainty, from verbal discussion and simple numerical ranges to more sophisticated constructions by the Bank of England and Sveriges Riksbank of confidence intervals and fan

charts.

The Reserve Bank has previously emphasized the uncertainty of the projections in verbal discussions of these projections. In the MPS released in December 2000, the number of tables was reduced and some format changes were announced and implemented. Quarterly GDP projections will no longer appear, all projected numbers will be rounded to the nearest half percent and expressed as fractions (except the first two quarters' CPI inflation projections) and the MCI will no longer appear.

However, rounding to the nearest half percent is a very unsophisticated way of conveying uncertainty. Rounding to the nearest half percent conveys an implicit interval ($\pm\frac{1}{4}$), the size of which has nothing to do with the actual uncertainty. More importantly, rounding moves the centre of that interval, which may be quite misleading. For instance, an increase in 10 basis points to an interest rate of 6.7 percent to 6.8 percent results in a five times larger jump of the rounded number, from $6\frac{1}{2}$ percent to 7 percent. Clearly, such rounded numbers will sometimes be misleading. Reporting intervals, or constructing more sophisticated confidence intervals and fan charts, is a much better way of conveying uncertainty and more consistent with the high level of analysis and transparency at the RBNZ. I find the rounding practice a surprising deviation from the Reserve Bank's laudable transparency record.

Intervals or fan charts indicating the uncertainty in projections should be seen as an integral part of the projections. Therefore, whether the forecast is owned by the majority of the MPC or the Governor there is a need to determine whether the intervals/fan charts are those of the majority or the Governor's (see section 4.1).

7. Recommendations

This section summarizes the recommendations related to the operation of monetary policy and legislation that I find appropriate within the context of the Terms of Reference for the review. With regard to the operational framework, I have found that monetary policy in New Zealand is currently consistent with the best international practice of inflation targeting: flexible inflation targeting with a medium-term inflation target, which is consistent with avoiding unnecessary variability in output, interest rates and the exchange rate. Only some marginal improvements are suggested, mostly of a technical nature. With regard to the governance and accountability structures, I have found some weaknesses. These have not yet caused any problems because of the qualities of the current Governor, but they could in different circumstances and therefore should

be addressed. The recommendations for improvements fall out of the discussion in sections 1–6 above. They have been ordered in four groups, concerning (1) the Policy Targets Agreement (PTA), (2) governance and accountability issues, (3) data issues, and (4) some issues for the Reserve Bank, most of which are technical.

The Policy Targets Agreement

1. The current formulation of the policy target in the PTA, including the clause “to avoid unnecessary instability in output, interest rates and the exchange rate”, should continue to be interpreted as a medium-term point target for 12-monthly increases in the Consumer Price Index (CPI) of 1.5 percent, the midpoint of the target range of 0 to 3 percent. The target should also continue to be interpreted as “soft-edged”, in the sense that the edges 0 and 3 percent do not indicate any hard and precise thresholds for policy responses. This is consistent with the best international practice of flexible inflation targeting and with avoiding unnecessary instability in output, interest rates and the exchange rate. It is also entirely consistent with the Reserve Bank’s current interpretation of the PTA.

At the beginning of the next term of the Governor, section 2b should be modified to read “...the policy target shall be 12-monthly increases in the CPI of 1.5 percent over the medium term”. There is no reason to make any other changes to the PTA.²³

2. To maintain stability and credibility of the monetary policy regime, it is desirable that each PTA is maintained for the full five-year duration of the Governor’s term. At the formation of a new government, the existing PTA should normally be left in place. Any change to the PTA should be done at the beginning of a new term for the Governor.

Governance and accountability issues

1. A formal Monetary Policy Committee of the Reserve Bank, responsible for monetary policy decisions, should be formed. A suitable time for this is at the beginning of the next term of the Governor. The committee should have five members, each with one vote: the Governor as chair (with the casting vote), the two Deputy Governors, and two other senior Bank

²³ Some technical changes where there are references to the target range are required, though. For instance, section 4b could be reformulated as: “It is acknowledged that inflation outcomes may deviate from the target. If inflation outcomes would deviate more than 1.5 percent from the target, or if 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.”

staff. The Governor and the Deputy Governors should be appointed in the same way as now. The two senior staff should be appointed in the same way as the Deputy Governors, that is, by the Board of Directors on the Governor's recommendation. The members of the committee should have overlapping five-year terms, so only one member is appointed or reappointed each year. Named votes and non-attributed minutes of the MPC should be published with a lag of about two weeks. The MPC should only be responsible for decisions related to monetary policy. In all other respects, the Governor should continue to be the single decision-maker of the Bank.

2. The Board of Directors should only consist of non-executive directors. To ensure sufficient independence of the Board, the chair of the Board should be selected by the non-executive directors among themselves and not by the Treasurer.
3. The accountability structure should be strengthened in several ways. The Board of Directors should publish an annual report with an evaluation of the Bank's monetary policy. This report could be separate or part of the Bank's *Annual Report*. The Board may appoint a panel of experts for its assistance.
4. The Reserve Bank should fund an annual conference for the evaluation of monetary policy in New Zealand. The conference should be organized by an independent committee. At the conference, the Board's and the Bank's annual reports, as well as reports by invited experts from within and outside New Zealand, should be presented and discussed by experts, Reserve Bank officials, interested parties and journalists.
5. Parliament's Finance and Expenditure Select Committee should, with the help of appointed experts and other assistance, conduct thorough and detailed hearings of the Governor and other Reserve Bank officials. This may require additional resources for the Committee. These arrangements could be modelled on those undertaken by the UK Parliament and the European Parliament.

Data issues

1. The availability and quality of data relevant for monetary policy are largely in place. However, some improvements are required to bring data quality up to international standards. In particular, Statistics New Zealand should collect monthly data on the Consumer Price Index and industrial production.

Issues for the Reserve Bank

1. The Reserve Bank may want to consider some further developments of its Forecasting and Policy System (FPS). Alternative interest rate reaction functions and alternative interest rate paths could be used and presented systematically to the MPC to provide a larger menu of policy choices for discussion and consideration. Although these are not likely to materially affect policy choices, they represent developments that will improve the internal consistency of the FPS.
2. The Reserve Bank should consider reporting and discussing alternative measures of inflation expectations for the medium and long term more extensively than is currently the case, as part of assessing long-term credibility of the monetary policy regime. Some of the data, for instance, extensive surveys of inflation expectations of different categories of firms, organizations and households, may be commissioned at arm's-length from the Bank, perhaps from Statistics New Zealand.
3. The Reserve Bank should summarize its information about the financial system, including a number of macro-prudential indicators of financial stability, in a regular report, modelled on those published by the Bank of England and Sveriges Riksbank (the central bank of Sweden).
4. The Reserve Bank should consider alternative ways of conveying the inherent uncertainty in projections while maintaining transparency, for instance, modelled on those used by the Bank of England and Sveriges Riksbank.

Appendix

A. Terms of Reference for the Review of the Operation of Monetary Policy

Background

Ten years have passed since the Reserve Bank of New Zealand Act 1989 ("the Act") came into force on 1 February 1990. Having come through a period of transition to sustained price stability, it is now appropriate to review the way in which New Zealand's monetary policy is conducted and its effectiveness in contributing to broader social and economic objectives.

Goal

The goal of the review is to ensure that the monetary policy framework and the Reserve Bank's operations within that framework are appropriate to the characteristics of the New Zealand economy and best international practice.

Context

The goal for monetary policy is set out in Section 8 of the Reserve Bank Act:

The primary function of the Bank is to formulate and implement monetary policy directed to the economic objective of achieving and maintaining stability in the general level of prices.

Through the maintenance of medium-term price stability, monetary policy contributes to the Government's broader economic objectives. Accordingly, this section of the Act will not be reviewed, nor is the Government willing to lessen the accountability of the Reserve Bank for inflation outcomes or alter the operational autonomy of the Bank.

Terms of Reference

The review will consider:

1. The way in which monetary policy is managed in pursuit of the inflation target. The review will examine the way the Reserve Bank interprets and applies the inflation target set out in the Policy Targets Agreement, with a view to ensuring that this approach to achieving medium-term price stability is consistent with avoiding undesirable instability in output, interest rates and the exchange rate.
2. The instruments of monetary policy. The review will assess whether the Reserve Bank has an adequate range of instruments and is using its current instruments effectively in altering monetary conditions in the desired direction.
3. The information used by the Reserve Bank in its decision-making. The review will consider the range of sources, availability, type and timeliness of data, and the impact of these variables on forecasting and decision-making.
4. The monetary policy decision-making process. The review will consider whether the decision-making process and accountability structures promote the best outcomes possible.

5. The coordination of monetary policy with other elements of the economic policy framework, including an evaluation of the relationship between monetary policy operations and other Reserve Bank functions such as prudential oversight of financial institutions.
6. The communication of monetary policy. The Reserve Bank's communication of monetary policy decisions will be reviewed to ensure that these decisions are explained to the public and financial markets in the simplest, clearest and most effective way possible.

The reviewer may, where appropriate, seek to identify lessons for the future from the last decade's experience with the framework and the Reserve Bank's conduct of monetary policy over that period.

Process

The reviewer will:

1. Invite interested parties to submit their views on the operation of monetary policy in the areas detailed in these terms of reference. The reviewer is not required to consult further with parties making submissions or other parties but will consult where it is useful to the review.
2. Obtain such other relevant expertise, including external research services, as is desirable to assist in the examination of issues covered in the report.
3. Report to the Minister of Finance and make such recommendations pertaining to the operation of monetary policy and legislation as is appropriate within the context specified above.

Reporting Date

The review report shall be with the Minister by 28 February 2001.

B. Secretariat

A secretariat has been established to assist the reviewer. The secretariat is managed by the New Zealand Treasury. It is responsible for collating the submissions and providing the reviewer with the administrative and research support needed to conduct the review. The members are:

Struan Little, Chief Analyst, NZ Treasury
Brendon Riches, Analyst, NZ Treasury
Michael Reddell, Chief Manager, RBNZ
Alison Edwards, Administrative Assistant, NZ Treasury

C. Submissions

These submissions comment on the Terms of Reference released on May 9, 2000. Submissions were invited by the Secretariat on August 5, 2000, and closed on September 29, 2000. They are available on the website www.monopolreview.govt.nz.

1. John Zohrab, Portfin.com (NZ) Limited

2. W.J.C. Royds
3. R.J. Lang
4. Annie and Paul
5. Paul Dalziel
6. Arthur Grimes, Institute of Policy Studies
7. J.C. Wilson
8. Economics New Zealand Limited
9. Pierre L. Siklos
10. Deutsche Bank AG
11. Roger J. Bowden
12. Linda Wannan-Edgar
13. New Zealand Council of Trade Unions
14. Non-Executive Directors Committee of the RBNZ
15. Lowell Manning
16. Paul M. Dickie
17. Heather Marion Smith, New Zealand Democrats
18. Business and Economic Research Limited
19. New Zealand Funds Management
20. UBS Warburg New Zealand Limited
21. Howard Scott
22. Employers and Manufacturers Association (Northern)
23. New Zealand Manufacturers Federation Inc.
24. Reserve Bank of New Zealand
25. Sir Frank Holmes
26. Westpac Institutional Bank
27. R.W. England
28. Alec Milne
29. David Mayes
30. P.A. (Phil) Verry, Verry Consulting

D. Summary of Submissions

A total of 30 submissions has been received. The submissions are listed in appendix C. The content of the submissions is summarized below according to the terms of reference. The summary has been prepared by the Secretariat.

The way in which monetary policy is managed in pursuit of the inflation target. The review will examine the way the Reserve Bank interprets and applies the inflation target set out in the Policy Targets Agreement, with a view to ensuring that this approach to achieving medium-term price stability is consistent with avoiding undesirable instability in output, interest rates and the exchange rate.

Eighteen submissions consider that some change to the interpretation of price stability could be beneficial. Of these, a number comment that attempts to hold inflation continuously in a low and narrow range may not be the best way to maximize medium-term growth and employment. In particular, it is felt that the current approach might contribute to exaggerated exchange rate cycles and dull incentives to invest in the tradeables sector of the economy.

In general the submissions consider that moving to a more explicit medium-term focus on inflation would enable the Bank to be more flexible in its approach and better enable the exchange rate to act as a buffer for the economy, leading to less volatility in output. In addition,

it is felt that a greater focus on inflation arising from the non-tradeables sector would reduce some of the pressure on the tradeables sector, providing greater incentives for investment in the sector.

Lang, Grimes, ENZ, the CTU and ManFed all argue that the PTA should explicitly define a medium-term approach. The medium-term could be defined either as an inflation average over the business cycle or over the Governor's five-year term. Deutsche Bank advocate raising the mid-point of the target to somewhere between 2 and 2.5 percent—a level they see as more in line with international practice.

Berl contend that no change to the PTA is necessary but that rather than targeting a mid-point of 1.5 percent the Bank should allow inflation to vary more over the cycle than it has done in the past. They believe that this could be achieved with a change in the Bank's attitude and behaviour.

Mayes notes that changes to the PTA have tended to occur quite frequently, reducing its role as a force for stability and raising the public profile of the price stability goal in public debate. He argues that there would be considerable advantages to the system as a whole if the form of the PTA can be accepted as something that does not have to be changed under normal circumstances.

The Reserve Bank and Westpac argue that the exchange rate experience over the 1990s was not uncommon—the US, UK and Japan all experienced similar cycles. The Reserve Bank also argues that it has not created unnecessary instability in the past and believe that it has moved quickly when it saw such threats emerging. The Reserve Bank stresses that unnecessary instability is always subservient to the goal of price stability.

Lang comments that the current PTA, together with its accountability focus, provides an incentive for the Bank to be activist and conservative in its policy management. This is echoed in submissions made by the CTU, EMA and ManFed.

Verry also suggests changes to the PTA, including objectives of attaining current account balance, maintaining an exchange rate that will stimulate exports and setting a target rate of GNP growth per capita. He also suggests a number of refinements to the Reserve Bank's inflation target.

The potential for recent changes to the PTA to muddy the clarity of decision-making and the accountability of the Governor is commented on by UBS, the Reserve Bank and the NEDC.

Overall eight of 19 submissions commenting on this term of reference advocated investigating further the potential benefits from a more explicit medium-term approach in the PTA.

The instruments of monetary policy. The review will assess whether the Reserve Bank has an adequate range of instruments and is using its current instruments effectively in altering monetary conditions in the desired direction.

Most submissions are supportive of the use of the OCR to implement desired changes in monetary policy. It is unanimously seen as an improvement over the MCI. In terms of the MCI, Westpac argue that it is important for the review to consider the reasons why the MCI was adopted, rather than its effects, and how the Bank has responded to the experience.

A number of respondents believe the Reserve Bank could use a greater range of instruments, although they are not always clear about what additional tools should be used. ENZ, England and Holmes question whether exchange rate intervention might be useful in some circumstances. Holmes asks whether there is anything to be learned from the Australian approach, which appears to have been both beneficial and profitable. Holmes also asks whether controls on credit and minimum reserve ratios, such as those envisioned for the ECB, could usefully stabilize money and credit conditions.

Dickie and Holmes argue that the “channelling” approach used to set the OCR differs from

the international norm of open-market operations. They both argue that an open-market operations approach could have beneficial effects for the liquidity of short-term capital markets.

Verry considers that use of the interest rate instrument to contain inflation acts to push up the exchange rate excessively and results in wealth transfers offshore. He proposes a new instrument, an interest-linked savings scheme. Under this scheme the Reserve Bank would determine an international benchmark interest rate. To reduce inflationary pressures, the Reserve Bank would impose a surcharge on borrowers above the benchmark rate. A funds management unit would hold and invest the surcharge for a defined period (15 years). After this time the surcharge, plus a share of the investment dividends, would be returned to borrowers. The Reserve Bank could return some of the surcharge to the borrowers early if it wished to increase demand, or could affect the exchange rate by varying the proportion of investment undertaken offshore.

The information used by the Reserve Bank in its decision-making. The review will consider the range of sources, availability, type and timeliness of data, and the impact of these variables on forecasting and decision-making.

Most respondents acknowledge that there is room for more, better quality and more timely data to be made available, but note that such expenditure is subject to diminishing returns. However, it is felt that prioritizing and targeting expenditure on particular areas could be beneficial. Particular areas for improvement mentioned are GDP, development of a real disposable income index, measures of capacity utilization and information related to measuring the output gap.

The CTU, ManFed, Royds, EMA and Berl express concerns that the output-gap model employed by the Bank to assess inflationary pressure may not accurately reflect price transmission mechanisms in the economy. In particular it is felt that the output-gap model may not adequately reflect the effect of increased openness on the economy. They are also concerned about the quality of inputs to the model, its ability to accurately reflect the state of the economy and the effect this has on incentives for investment in the traded-goods sector.

ENZ and Holmes ask the review to consider what role (if any) asset prices should play in setting monetary policy.

The monetary policy decision-making process. The review will consider whether the decision-making process and accountability structures promote the best outcomes possible.

This issue attracted considerable attention with 19 of the 30 submissions choosing to comment. Submissions are evenly divided about whether a committee should be given formal responsibility for monetary policy decisions or whether the Governor should retain his position. Of those favouring the status quo four respondents suggested that an advisory committee would improve decision-making.

Those in favour of a committee (Lang, Berl, NZ Funds, Siklos, CTU, Dickie, EMA, ManFed and Mayes) see the main advantages of a committee as:

- Better decision-making resulting from broader experience and vision;
- Better ability to cope with criticism and pressure;
- Less uncertainty and disruption upon a change of Governor;
- Greater credibility with the public and financial markets; and
- Increased understanding of Bank decisions through publication of minutes.

The limited availability of people with the necessary skills and experience without potential conflicts of interest is seen as the major impediment to the ability to operate a high-calibre committee.

The advantages of the present system are seen by Grimes, ENZ, Deutsche Bank, Bowden, NEDC, UBS and Westpac as:

- Strong individual accountability, which is appropriate for the responsibility given to the Bank;
- Preserving credibility—a move to a committee could be associated with a perception of being more accommodating to inflation;
- Clarity of policy and of the communication of policy;
- Clear and efficient management of the Bank; and
- In practice, alternative structures may not be too different from current Bank practice.

The NEDC contend that the present legislation has been carefully designed to ensure that the potential weaknesses of a single decision-maker are addressed in the appointment and ongoing monitoring process. They express reservations about the formation of an internal committee with the power to constrain the Governor's decision-making. They argue that issues of the Governor's performance are for the Board, not the Governor's subordinates, to resolve.

Bowden, Deutsche Bank, Westpac and UBS suggest that an advisory committee would provide many of the advantages offered by a committee while preserving those advantages associated with individual responsibility. The submissions offer differing views on how an advisory committee might operate in practice.

Deutsche Bank and Westpac believe that a committee of experts would be a useful means to increase the ex-post accountability of the Bank. The committee could provide expert advice to the Board, or to FEC. Lang and Royds also comment on the need to enhance the ex post accountability of the Bank. In contrast, Bowden and UBS suggest that decisions be presented to an advisory committee before being formally announced.

The Reserve Bank does not make a recommendation on this aspect of governance. However, it does make the point that an important determinant of the most appropriate decision-making model is the extent of discretion available. Under an inflation-targeting framework, discretion is limited to the choice of instruments and when to use them; there is no discretion about the purpose that the tools are to be used for.

The Reserve Bank, Lang, Westpac and the NEDC consider the appointment of the Governor as chair of the Board of Directors to be inconsistent. A non-executive chair of the Board, appointed by the non-executive directors, is recommended.

Annie and Paul and Royds suggest that a Governor's term should be limited to one four- or five-year period.

The coordination of monetary policy with other elements of the economic policy framework, including an evaluation of the relationship between monetary policy operations and other Reserve Bank functions such as prudential oversight of financial institutions.

UBS, Scott, EMA, ManFed, Holmes, England, Westpac and the NEDC submissions all suggest that there is a need for more focus to be put on the role of structural and fiscal policy in reducing inflationary pressure. A number of these submissions believe that the Bank needs to take a more active role in identifying and analysing means of mitigating inflationary pressures in the economy. Bowden and the CTU suggest that a forum for exploring issues of coordination be established.

Submissions from ENZ and Holmes endorse the Bank's current approach to prudential supervision. The Reserve Bank and Westpac note that in practice there is little scope for conflicts

of interest between monetary policy and prudential supervision to cause concern. In their view such overlap as exists potentially provides useful information in understanding the economy.

The communication of monetary policy. The Reserve Bank's communication of monetary policy decisions will be reviewed to ensure that these decisions are explained to the public and financial markets in the simplest, clearest and most effective way possible.

Most submissions commenting on this area considered the Bank's communications to be effective and appropriate.

Siklos, Deutsche Bank and NZ Funds Management note that there is a trade-off between transparency and clarity. These submissions draw attention to the potential for confusion and uncertainty to be generated through the publication of the assumed outlook for policy variables (interest rates and the exchange rate). They note the potential for misunderstanding, bias and frequent revisions to occur. They suggest that it would be appropriate for the review to consider the costs and benefits of publishing these variables.

The Reserve Bank also notes that there may be some misunderstanding of the role of the Bank's *Monetary Policy Statements*.

A number of suggestions for improved information flows are made. These include the publication of a summary of the Bank's business talks and publication of the factors underlying the interim cash-rate review.

Other relevant information

Manning and Smith make submissions that are difficult to classify under the terms of reference. They advocate interest-free payments by the Government for public infrastructure projects undertaken by the Government or local authorities. Manning argues that the inflation-targeting framework is inadequate—it is based on invalid measures of inflation and GDP. Manning also proposes a tax on all financial transactions, including foreign exchange, to stop financial speculation.

Zohrab argues that the tax system should provide for taxes to be paid in any currency on the grounds that this would assist New Zealand business competing overseas and that there is no good reason to insist on payment in New Zealand dollars.

E. Reserve Bank Supporting Documents

The Reserve Bank has made a submission to the Independent Review of the Operation of Monetary Policy. While the submission is intended to stand alone as a statement of the Bank's views on the operation of monetary policy, it refers to a number of supporting documents. The supporting documents are loosely grouped below according to the term of reference that they address (the numbering of the documents has been added by the reviewer). They are available on the Reserve Bank's website, www.rbnz.govt.nz.

Main submission

Independent review of monetary policy: submission by the Reserve Bank of New Zealand

Term of Reference 1

- 1.1 The evolution of Policy Targets Agreements
- 1.2 The evolution of monetary policy implementation
- 1.3 Inflation targeting in principle and practice
- 1.4 Output volatility in New Zealand
- 1.5 Business cycle developments and the role of monetary policy over the 1990s
- 1.6 Monetary policy in an uncertain world

Term of Reference 2

2.1 Alternative monetary policy instruments

Term of Reference 3

3.1 Data challenges in the monetary policy process

Term of Reference 4

4.1 The monetary policy decision-making process

4.2 The projection process and accuracy of the RBNZ projections

Term of Reference 5

5.1 Fiscal and monetary coordination

5.2 Prudential policy and monetary policy

Term of Reference 6

6.1 Communication of monetary policy decisions

6.2 Publication of projections

F. List of meetings/discussions

Michael Cullen - Treasurer/Minister of Finance

Peter Harris - Economic Adviser to Minister of Finance

Reserve Bank officials

Don Brash - Governor

Murray Sherwin - Deputy Governor

Rod Carr - Deputy Governor

David Archer - Chief Manager, Economics Department

Michael Reddell - Chief Manager, Financial Markets Department

Bruce White - Senior Advisor

Aaron Drew - Manager, Macroeconomic Modelling

John McDermott - Manager, Forecasting

Treasury officials

Allan Bollard - Secretary to the Treasury

Iain Rennie - Deputy Secretary to the Treasury, Budget Macroeconomic Branch

Michele Lloyd - Manager, Macro Policy Section, Budget Macroeconomic Branch

Struan Little - Chief Analyst, Macro Policy Section, Budget Macroeconomic Branch

Brendon Riches - Analyst, Macro Policy Section, Budget Macroeconomic Branch

Non-Executive Directors, Reserve Bank

Bill Wilson - Chairman

Ruth Richardson

Viv Hall

Alison Paterson

Submitters, others

Peter Conway - Council of Trade Unions
Peter Crawford - Manufacturer's Federation of New Zealand
Ian Ewing - Deputy Government Statistician
Paul Dalziel - University of Canterbury
Ted Evans - Secretary, Australian Treasury
Arthur Grimes - Institute of Policy Studies
Viv Hall - Victoria University of Wellington
Murray Horn - ANZ Bank, ex Secretary to the Treasury
Dick Lang - ex Deputy Governor, RBNZ
Ganesh Nana - BERL (Business and Economic Research Limited)
Adrian Orr - Westpac Trust
Ulf Schoefisch - Deutsche Bank
Petrus Simons - Integrated Economic Services

Discussions outside New Zealand

Charles Bean - Bank of England
Mervyn King - Bank of England
Alasdair Scott - Bank of England, ex RBNZ
Donald Kohn - Federal Reserve Board
Torsten Persson - Institute for International Economic Studies
Charles Goodhart - London School of Economics
Guy Debelle - Reserve Bank of Australia
Malcolm Edey - Reserve Bank of Australia
David Gruen - Reserve Bank of Australia
Glenn Stevens - Reserve Bank of Australia
Jenny Wilkinson - Reserve Bank of Australia
Urban Bäckström - Sveriges Riksbank
Claes Berg - Sveriges Riksbank
Lars Heikensten - Sveriges Riksbank
Anders Vredin - Sveriges Riksbank

G. Policy Targets Agreement, December 1999

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, expiring on 31 August 2003. It replaces that signed on 15 December 1997.

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 (CPI), as published by Statistics New Zealand.
- b) For the purpose of this agreement, the policy target shall be 12-monthly increases in the CPI of between 0 and 3 percent.²⁴

3. Unusual events

- a) There is a range of events that can have a significant temporary impact on inflation as measured by the CPI, 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 occasions, 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) In pursuing its price stability objective, the Bank shall implement monetary policy in a sustainable, consistent and transparent manner and shall seek to avoid unnecessary instability in output, interest rates and the exchange rate.
- d) The Bank shall be fully accountable for its judgements and actions in implementing monetary policy.

Hon Michael Cullen
Treasurer

Donald T Brash
Governor
Reserve Bank of New Zealand

Dated at Wellington, this 16th day of December 1999

²⁴ Statistics New Zealand introduced a revised CPI regime from the September quarter, 1999. Until the June quarter 2000, 12-monthly increases in the CPI will be calculated by comparing the new CPI series with the old CPI series adjusted by removing the impact of changes in interest rates and section prices. This adjustment is calculated by Statistics New Zealand. (Refer to the RBNZ's November 1999 Monetary Policy Statement, page 8, for details.)

References

- [1] Batini, Nicoletta, and Andrew Haldane (1999), “Forward-Looking Rules for Monetary Policy”, in Taylor [28].
- [2] Bernanke, Ben S., Thomas Laubach, Frederic S. Mishkin, and Adam S. Posen (1998), *Inflation Targeting: Lessons from the International Experience*, Princeton University Press, Princeton.
- [3] Bernanke, Ben S., Frederic S. Mishkin, and Adam S. Posen, “What Happens When Greenspan Is Gone?” *Wall Street Journal*, January 5, 2000.
- [4] Brash, Donald T. (2000), “Making Monetary Policy: A Look Behind the Curtains”, speech in Christchurch, January 26, 2000, Reserve Bank of New Zealand.
- [5] Cecchetti, Stephen G. (2000), “Preparing for Life after Greenspan”, *Financial Times*, January 6, 2000.
- [6] Clark, Helen (1999), “Speech from the Throne: Opening of Parliament”, speech in Parliament, December 21, 1999.
- [7] Favero, Carlo, Xavier Freixas, Torsten Persson and Charles Wyplosz (2000), “One Money, Many Countries”, *Monitoring the European Central Bank 2*, CEPR, London.
- [8] Federal Reserve Bank of Kansas City (1996), *Achieving Price Stability*, A Symposium Sponsored by the Federal Reserve Bank of Kansas City, Kansas City.
- [9] Federal Reserve Bank of Kansas City (1999), *New Challenges for Monetary Policy*, A Symposium Sponsored by the Federal Reserve Bank of Kansas City, Kansas City.
- [10] Goodhart, Charles A.E. (2000), “The Inflation Forecast”, Working Paper.
- [11] Gros, Daniel, Oliver Blanchard, Michael Emerson, Thomas Mayer, Hans Werner Sinn, Gilles St. Paul and Guido Tabellini (1998), “Macroeconomic Policy in the First Year of Euroland”, First Annual Report on the European Economy of the CEPS Macroeconomic Policy Group, Centre for European Policy Studies, Brussels.
- [12] Heikensten, Lars, and Anders Vredin (1998), “Inflation Targeting and Swedish Monetary Policy—Experience and Problems”, *Sveriges Riksbank Quarterly Review* 4/1998, 5–33.
- [13] Kohn, Donald L. (2000), “Report to the Non-Executive Directors of the Court of the Bank of England on Monetary Policy Process and the Work of Monetary Analysis”, Bank of England.
- [14] Levin, Andrew, Volker Wieland and John C. Williams (2001), “The Performance of Forecast-Based Policy Rules”, Working Paper, Federal Reserve Board.
- [15] Reserve Bank of New Zealand (1996), *Briefing on the Reserve Bank of New Zealand*, October 1996.
- [16] Reserve Bank of New Zealand (1999), *Briefing on the Reserve Bank of New Zealand*, November 1999.

- [17] Reserve Bank of New Zealand (2000), “Business Cycle Developments and the Role of Monetary Policy over the 1990s”, Supporting Document to the Submission to the Independent Review of the Operation of Monetary Policy.
- [18] Stevens, Glenn R. (1998), “Pitfalls in the Use of Monetary Conditions Indexes”, *Reserve Bank of Australia Bulletin*, August 1998, 34–43.
- [19] Sveriges Riksbank (1999), “The Riksbank’s Inflation Target—Clarification and Evaluation”, Statement by the Executive Board, June 13, 1999.
- [20] Svensson, Lars E.O. (1997a), “Exchange Rate Target or Inflation Target for Norway?” in Christiansen, Anne Berit, and Jan Fredrik Qvigstad, eds, *Choosing a Monetary Policy Target*, Scandinavian University Press, Oslo, 120–137.
- [21] Svensson, Lars E.O. (1997b), “Inflation Targeting in an Open Economy: Strict or Flexible Inflation Targeting?” Public Lecture held at Victoria University of Wellington, New Zealand, November, 1997. *Victoria Economic Commentaries* 15-1 (March 1998).
- [22] Svensson, Lars E.O. (1999a), “How Should Monetary Policy Be Conducted in an Era of Price Stability?” in Federal Reserve Bank of Kansas City [9].
- [23] Svensson, Lars E.O. (1999b), “Inflation Targeting as a Monetary Policy Rule”, *Journal of Monetary Economics* 43, 607-654.
- [24] Svensson, Lars E.O. (2000a), “The First Year of the Eurosystem: Inflation Targeting or Not?” *American Economic Review: Papers and Proceedings* 90, 95-99.
- [25] Svensson, Lars E.O. (2000b), “Open-Economy Inflation Targeting”, *Journal of International Economics* 50 (2000), 155-183.
- [26] Svensson, Lars E.O. (2000c), “The Zero Bound in an Open-Economy: A Foolproof Way of Escaping from a Liquidity Trap”, NBER Working Paper No. 7957.
- [27] Svensson, Lars E.O. (2001), “What Is Wrong with Taylor Rules? Using Judgement in Monetary Policy”, in preparation.
- [28] Taylor, John B., ed. (1999), *Monetary Policy Rules*, Chicago University Press.