INFLATION TARGETING: THE NEW ZEALAND AND CANADIAN CASES

Andreas M. Fischer

Introduction

Canada and New Zealand have recently announced targets of zero inflation. The return to a "nominal anchor with drift" represents a new way of thinking about the objectives of Canadian and New Zealand monetary policy. The targets are bounded by formal agreements between the minister of finance and the central bank, thereby providing monetary policy with a strong commitment to price stability. The change in the (somewhat modified) Consumer Price Index (CPI) was chosen as the yardstick for measuring inflation, with price stability tentatively defined as a rate of CPI inflation between 0 and 2 percent.

While inflation targeting heightens the general awareness as to what the objectives of monetary policy are in Canada and in New Zealand, it is important to identify for whom the targets are intended. Large differences in the time frame of the target path may arise if the targets are designed for purposes of fiscal discipline, financial markets, or the public. At the same time, inflation targeting leaves many operational issues concerning monetary policy open. The issue of targets and instruments raises questions as to how monetary policy should be implemented. This paper draws from the experiences in Canada and New Zealand and examines the benefits and drawbacks of implementing inflation targets.[1]

Cato Journal, Vol. 13, No. 1 (Spring/Summer) 1993.

The author is an economist at the Swiss National Bank. He wishes to thank David Carey, Steve Englander, Ketil Hviding, Maitland MacFarlan, Adrian Orr, and Carl Walsh for helpful comments.

[1]The inflation target debate also has received attention in the United States, the United Kingdom and Australia. In the United States, Congressman Stephen L. Neal introduced a resolution in August 1989, asking the Federal Reserve to adopt a five-year, zero-inflation goal (Neal 1992). It was reintroduced in January 1991 where it was blocked in the House Banking Subcommittee on Domestic Monetary Policy. The chancellor of the Exchequer, Norman Lamont announced on October 8, 1992 inflation targets of

The discussion is organized into four sections. First, the goal of price stability in Canada and New Zealand is defined. Second, alternative rule-based strategies for price stability are compared. Although no rule-based policy dominates the other in an absolute sense, the distinctive feature for inflation targeting is that rules are defined in terms of the final objective rather than an intermediate target. Third, tactics for implementing inflation targets are discussed. Several tradeoffs regarding the target path horizon, operating procedures, and the transparency of monetary conditions are highlighted. Considerations for a feedback rule in Canada and New Zealand are also discussed. Fourth, the recent inflation performances in Canada and New Zealand are reviewed.

The Goal of Price Stability and Institutional Reform

During the last two decades, economic circumstances and developments in economic theory have brought into sharper focus the difficulty of pursuing multiple mandates with the limited tools at a central bank's disposal. In particular, long-run effects of monetary developments on real variables are generally considered to be nonexistent, and attempts to influence real variables may be counter-productive. Consequently, it is thought that monetary policy should focus on the one goal it can control in the long run, the price level.

One way of controlling central bank policy is through legislation. The objectives of the Reserve Bank of New Zealand have changed significantly under the Reserve Bank of New Zealand Act 1989, which became effective on February 1, 1990.[2] The act makes price stability the sole objective of monetary policy.[3] Prior to this, monetary policy had a mandate to promote economic growth, full employment and low inflation. The New Zealand targets equate price stability with zero inflation. However, because of deflationary risks and mathematical and measurement biases in the construction of price indices, the interpretation favored by the Reserve Bank is 0 to 2 percent growth in the CPI. The act, furthermore, constrains successor governments to behave consistently in the long run, facilitating the build-up of the central bank's reputation. While nonbinding policies can

1 to 4 percent. In Australia, the Liberal opposition party has expressed active support for inflation targets as in Canada and New Zealand (see Stutchbury 1991).

[2]The main features of the Reserve Bank of New Zealand Act 1989 are outlined in Stephen Dawes (1992).

[3]Likewise, Canada has sought to make price stability the Bank of Canada's primary goal. Despite failed attempts to revise the preamble of the Bank of Canada Act, price stability is firmly recognized to be the overriding goal of Canadian monetary policy.

be changed at low cost, changing objectives fixed by law, although possible, incurs greater costs because it is more visible to society.

An alternative route for governments to influence central bank behavior is to alter the central bank's incentive structure. Within the context of a principal-agent problem, Carl Walsh (1992), and Torsten Perrson and Guido Tabellini (1992) regard the announcement of targets as a contract between the government and the central bank. The government achieves its objective by altering the incentive structure of the central bank by either enforcing penalties (i.e., dismissal of the governor if the targets are missed) or by making transfer payments (i.e., ego boosting, increased salary, etc.). In this contract framework, the time inconsistency problem as defined in Robert Barro and David Gordon (1983) is resolved. In the next section, several types of target agreements are considered for small open economies.

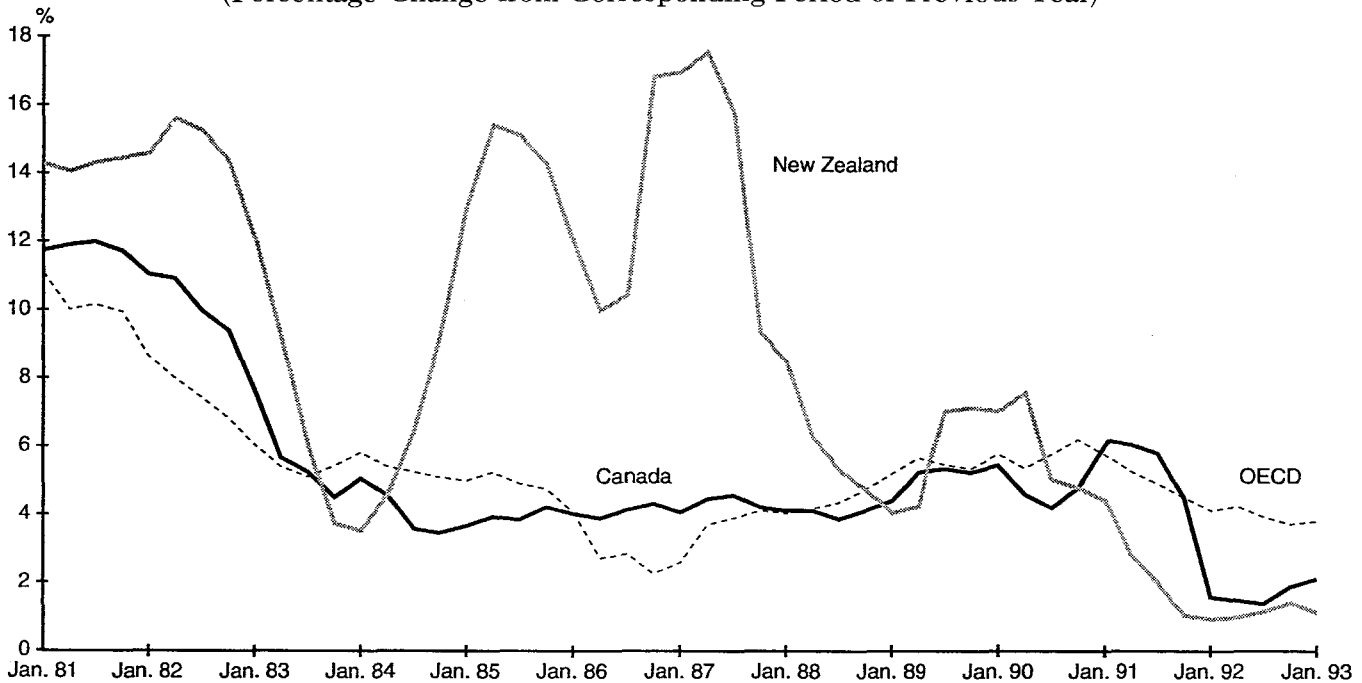
The Strategy: Defining a Nominal Anchor

The abandonment of monetary targeting in the early 1980s left most central banks searching for an alternative nominal target that was not subject to shocks caused by technological innovation or by financial deregulation. While some countries were able to peg their currencies to a low inflation country, Canada and New Zealand adopted a "looking at everything" approach as an operational mechanism (see Freedman 1989, Spencer 1992). During the mid-1980s both countries made progress on the inflation front (see Figure 1), but it was felt that the multiple-indicator framework did not provide economic agents ample information about the seriousness with which the central banks were pursuing price stability. Given this problem, the past record of high inflation and corresponding low credibility in both countries during the 1970s and early 1980s, the respective governments and central banks believed that the private sector needed to be presented with proof of their determination to combat inflation.

This section considers alternative rule-based strategies for implementing the goal of price stability and argues why Canada and New Zealand chose the path of inflation targeting. Although George Alogoskoufis (1989) has shown formally that neither nominal income, nor exchange-rate targeting is sufficient to minimize the welfare costs of aggregate fluctuations and no strategy necessarily dominates the other, there may be distinct advantages in following a strategy of inflation targeting for some small open economies that have undergone an intensive program of financial deregulation.

FIGURE 1

CONSUMER PRICE INDEX
(Percentage Change from Corresponding Period of Previous Year)



SOURCE: CANSIM-Statistics Canada.

The Constant Money Growth Rule

Milton Friedman's (1960) argument for the constant money growth rule rather than an active feedback rule is that there are long and variable lags in monetary policy. Consequently, activist policy that responds to current events may effect prices at an inappropriate time. Uncertainty about the lag coefficients implies that active use of monetary policy adds variability to income. Active monetary policy may still be used cautiously to reduce the variability of output, but the gains are uncertain. Moreover, if the coefficients vary over time, it is even less likely that policymakers will have the necessary information to make activist policy optimal. A nonactivist policy may even be optimal if an activist policy adds uncertainty to the system independent of the particular policy being followed.

In recent years it has become clear that there are two problems with the constant money growth rule. First, technical progress in the payments industry and its random occurrence makes it difficult to know how much money growth will lead to zero inflation on average. Second, financial innovation has made narrow money subject to large portfolio shifts, making it an unreliable indicator of inflation. Charles Freedman (1983) cites this as the chief reason why Canada formally abandoned M1 targeting in 1982. Although targeting a broader monetary aggregate may internalize portfolio shifts, broad money is not itself a controllable instrument but is instead a variable that the monetary authorities can manipulate only indirectly. Hence, Friedman's rule is not fully operational. Moreover, monetary targeting is not a viable strategy in Canada and New Zealand because the short-run relationship with nominal output is found to be far from stable.[4]

Targeting Exchange Rates

An alternative rule is to target a nominal exchange rate to a low inflation country. In a certain sense exchange rate targeting, as under the Exchange Rate Mechanism (ERM) is an indirect form of inflation targeting, whereby credibility is gained from the targeted country. This approach is viable for a small country that suffers from a lack of self discipline and is willing to give up its monetary independence. The strategy of exchange rate targeting is easy to monitor since the

[4]In particular, it is difficult to infer whether the observed changes in the monetary aggregates are a reaction to past changes in nominal output or whether they are likely to lead to future nominal output changes. Alfred Wong and Authur Grimes (1992) provide a survey of the major empirical findings for New Zealand money demand and Kevin Clinton (1992) for Canadian money demand.

target and the instrument are analogous, making the stance of the policy transparent.

The recent experiences of the Scandinavian countries suggest that picking a currency and targeting it may not be simple. In deciding whether to fix the exchange rate or to opt for a floating currency, small open countries must consider the type of shocks that they are subject to. For example, the periodic shocks in world prices of raw materials relative to those of manufactured goods would provide a strong argument for a small raw materials producer not to tie its currency to that of a large manufacturing country. Indeed, one of the adjustment mechanisms for the small raw materials producer is via the movements in the real exchange rate and, therefore, fixing or constraining the nominal exchange rate may hamper adjustments in such circumstances. Thus, in order for a country to benefit from pegging its currency to a low inflation country or optimal currency zone, the two countries must be subject to similar trade shocks. The fact that New Zealand suffers from terms of trade shocks that are independent from many other countries creates difficulties in choosing an exchange target.[5]

Furthermore, evidence from the ERM shows that those countries that entered the ERM with high inflation rates have experienced significantly increased unemployment. Hence either inflation expectations have not responded to the greater credibility of the disinflation policy, or labor market institutions and rigidities have prevented lowered expectations from translating into lower inflation. Thomas Egebo and Steve Englander (1992) note that in some ERM countries, such as the United Kingdom and Italy, there is little evidence of a downward shift in inflation expectations in labor and product markets after 1987, suggesting that there is no strong basis for concluding that adhering to the ERM bands alters the tradeoff between inflation and unemployment.

Inflation Targeting

The previously discussed rule-based strategies suffer from a common problem. The target is not the ultimate goal of the policy in question. Although intermediate targets such as exchange rates may influence expectations quickly, because they are easily observable, the precise relationship between these intermediate targets and the final objective is not clear. On the other hand, a multi-period target

[5]Although Canada may have an obvious choice in pegging its currency to the U.S. dollar, since its southern neighbor is its principal trading partner, previous experiments with exchange rate targeting have not resulted in low inflation.

path for inflation forces the central bank to choose a monetary policy such that inflation falls in line with the target path. The next paragraphs outline the rationale for inflation targeting.

A primary motive for inflation targeting is to lower rapidly inflation expectations. The quicker individuals and businesses factor lower inflation into their pricing decisions, the faster nominal wages and prices will adjust downwards and thereby minimize the output losses from tight monetary policy. The speed at which expectations adjust depends on the public's faith in the central bank's ability to carry out the policy, conflicting short-run objectives, institutional rigidities in labor and product markets, and numerous other factors. Credible inflation targets over several years lay out a clear future path for inflation to which wage negotiations can refer over the disinflationary cycle. Understanding the motivations of policymakers and the nature of the announcements is important for altering the expectations of individuals and businesses. In defining the target path, policymakers need to strike a balance between promising a noticeable downward path for inflation in order to demonstrate their commitment, while ensuring at the same time that the target band appears achievable and sustainable.

A second case for the announcement of inflation targets is to constrain future government spending and improve the coordination between fiscal and monetary policy.[6] Formal agreements concerning inflation targets between the central government and the monetary authorities impose implicit limits on the future growth of central government spending. Inflation targets are intended to make budgetary spending allowances consistent with the projected inflation path as laid out in the targets agreement. In addition, a sustainable policy of zero inflation limits the government's inflation tax revenue and its ability to accommodate rising fiscal imbalances. Therefore larger government deficits can only be financed by future tax increases, putting politicians under greater pressure to answer calls as to how such resources are to be furnished.

A third important advantage is that inflation targets offer alternative strategies for removing the inflation bias, which have not been fully analyzed in the time inconsistency literature. Walsh (1992), and Perrson and Tabellini (1992) regard agreements on inflation targets as a contract between the government and the central bank. The introduction of transfer payments to the central bank limits the discretionary

[6]Inflation targets are also intended to limit government spending on the local level (see Robson 1991). In many OECD countries, program spending on the local, state, and provincial level has outpaced government spending in recent years.

options for monetary policy and thereby enhances the institutional credibility of the central bank. Walsh (1993) suggests that inflation contracts are easier to monitor and enforce then if the contract were defined in terms of an intermediate target such as money. A related consideration is that the announcement of inflation targets enhances the government's accountability. Over time, voters should retrospectively be able to make an unambiguous assessment of the monetary authorities' performance on inflation.

Tactics for Implementing Inflation Targets

Introducing a program of inflation targeting involves various aspects: explaining the policy to the public, defining the target horizon, and choosing the operational instrument. This section reviews the tradeoffs for implementing inflation targets in Canada and New Zealand.

Contracting the Targets Agreement in Canada and New Zealand

Inflation targets in Canada and New Zealand are specified under a contract between the governor of the central bank and the minister of finance. Contracts raise many issues concerning the degree of precision about what monetary policy can or cannot be expected to do over a specified period of time. The challenge in negotiating the contract is to create a set of incentives and sanctions that encourages the central bank to achieve low rates of inflation over the medium term by conducting monetary policy in a consistent and predictable manner.

The Reserve Bank of New Zealand Act, which was passed by Parliament on December 15, 1989, made price stability the primary goal for monetary policy in New Zealand. The act mandates the governor and the minister of finance to agree on a definition of price stability and to announce this publicly in the Policy Target Agreement (PTA). The first agreement specified that monetary policy would be directed toward achieving a year-over-year inflation rate of 0 to 2 percent by December 1992 and maintaining of price stability thereafter. Partly out of concern that adjustment costs were too high, the new government elected in October 1990, deferred the target by one year (Nichols 1991). In February 1991, the Reserve Bank announced interim targets of 2.5 to 4.5 percent by December 1991, 1.5 to 3.5 percent by December 1992, and 0 to 2 percent by December 1993.[7] Similarly, agreements between the Bank of Canada and the

[7]See the "Appendix" in the *Reserve Bank Bulletin* of New Zealand (1990).

Department of Finance announced inflation targets in February 1991 according to which the CPI was to fall to 3 percent by December 1992, 2.5 percent by mid-1994, and 2 percent by the end of 1995.[8]

Although inflation targeting is often thought of as a price rule, the targeting strategy in Canada and New Zealand is one of zero inflation and not of price level targeting. The terms price stability and zero inflation are often used interchangeably, however they imply two different policy objectives. Zero inflation is a price rule with drift, which ignores past changes in the price level whereas price stability does not (see Gavin and Stockman 1990; Lebow, Roberts, and Stockman 1992).

Apart from the fact that the target paths were announced at the same time and that the rate of inflation stood at about 6 percent in both countries at the time of the announcement, there are key differences in the Canadian and New Zealand target agreements. First, the shorter time frame suggests that the New Zealand strategy places more weight on achieving credibility at the risk of having an unbalanced policy mix between monetary and fiscal policy. The longer time frame of the Canadian targets gives the Bank of Canada greater flexibility to average out the price shocks.

The time frame of the target path for inflation raises alternative issues of credibility and dynamics. Olivier Blanchard (1985) has argued for a gradualist approach rather than drastic disinflationary measures. If a government imposes drastic disinflationary measures, it is possible that the public may fail to adjust prices and wages accordingly such that the resulting recession would be too deep, and thus politically unsustainable. Consequently, opposing parties favoring expansionary measures are likely to replace the current policymakers. In contrast, Ulrich Lachler (1988) argues for rapid disinflation. Given that some contraction in economic activity is inevitable, it would be preferable that the policymakers' desire to disinflate be tested early, during the initial stages of the targets program. This would provide a more immediate signal to the market that the government is prepared and politically able to stand by its commitment despite the possibility of an unpopular recession.

A second difference in the target path is that the Canadian agreement is subject to cancellation in the event of a political crisis, whereas the New Zealand strategy offers a greater degree of permanence and consistency under the Reserve Bank Act. Although the Canadian agreement gives the Bank of Canada considerable autonomy under the inflation target agreement, the New Zealand agreement is embedded in the Reserve Bank Act which guarantees a

[8]See "Background Note on the Targets," *Bank of Canada Review* (1991).

high degree of central bank independence regardless of the type of monetary policy pursued.

A third notable difference is that the New Zealand strategy offers greater accountability. In New Zealand, the governor may be dismissed for missing the target. The Governor of the Reserve Bank also has to clarify the Bank's past and future actions on a timely basis every six months. These biannual reports provide the public valuable information regarding the Reserve Bank's assessment of the real and nominal economy and its view of inflation expectations. Moreover, the PTA states that should a temporary deviation occur the Reserve Bank must detail its response in an attempt to ensure that the effects of such shocks are transitory. The Bank of Canada is not mandated to specify the policies by which it intends to achieve its inflation targets, state the reasons for adopting these policies, nor provide an outlook for monetary policy over the next five years on a regular basis as is the case in New Zealand.

Credibility Management under Inflation Targeting

Disinflation becomes difficult to achieve when the public lacks confidence in the central bank's ability and willingness to carry out a newly announced policy. As mentioned earlier, central bank contracts as defined in Walsh (1992) and Perrson and Tabellini (1992) may resolve the time-inconsistency dilemma faced by central banks. However, other credibility problems may arise, forcing the government and the central bank to introduce additional measures.

First, a credibility problem may stem from incompatible programs. The public may recognize that the policy of inflation targeting is not compatible with other government policies that are being pursued simultaneously and that may undermine the central bank's ability to successfully carry out its policy. For instance, a disinflationary program that does not include measures to limit the public sector deficit is inconsistent and will therefore lack credibility with the public. Thus, announcing publicly a target path for inflation serves to alter the scope of future government spending and improves the coordination between fiscal and monetary policy.[9]

Canada and New Zealand announced fiscal consolidation targets at the same time that inflation targets were announced. Canada envisioned a balanced budget by 1996 and New Zealand by 1994. But these efforts to improve policy coordination have stalled due to the

[9]Lachler (1988) has argued that credibility problems may arise independently of whether the adopted policy mix is consistent or not from the unfavorable dynamic adjustment pattern associated with stabilization programs based on non-floating exchange rates in small open economies.

adverse impact on government finances of weaker-than-expected economic activity over the past years. The self-imposed measures of fiscal discipline were delayed by one year in Canada and budget targets were abandoned in New Zealand. This slippage in policy coordination has resulted in a policy imbalance, placing a greater burden on monetary policy.

A second credibility problem is that of incomplete or asymmetric information: private agents may not be able to assess the seriousness or speed at which the central bank is attempting to disinflate. This type of credibility problem differs from the time inconsistency case whereby the public perceives too well the policymaker's underlying intentions. Imperfect information prevails in countries where monetary policy tends to change frequently, hence creating confusion about the objectives of monetary policy. An announced target path for inflation with specified dates informs the public regarding the speed of the disinflation process.

A third form of credibility problem results from uncertainty regarding the predictability of inflation targets. Even if the program of inflation targets is well formulated and time consistent, in the sense that the monetary authorities do not have any incentive to deviate from the announced policy, exogenous shocks may occur, disrupting policy. The public is aware that the monetary authority is unable to precommit its actions in response to each state of the environment and that the relationship between inflation shocks and the authority's instruments is not precise. Thus inflation targets may introduce escape clauses that act as a contingent mechanism to eliminate the predictability problem. In order to avoid problems of time inconsistency it becomes important for the rule-based policy to explicitly outline in advance which shocks monetary policy will and will not accommodate.

The Canadian and New Zealand targets state that not all inflationary shocks are to be offset. The inflation strategy in Canada allows for adjustments to the targets when there are changes in indirect tax rates that lead to abrupt effects on inflation, whereas New Zealand allows for temporary deviations from targets in the event of increases in indirect taxes, terms of trade shocks, and natural disasters. Special circumstances are outlined regarding the precise nature of the supply shock, yet threshold levels (warranting intervention) pertaining to the size of the shock are not defined. This raises the issue of target specification, i.e., the option of having a wider band and/or a long-run specification (for example average inflation over a multi-year period). These options could allow supply shocks to be addressed within the boundaries set by the inflation target, rather than being

treated as exceptions. Such a procedure avoids the problem of defining threshold levels for intervention regarding particular shocks or making arbitrary decisions about whether a real or nominal shock has occurred.

Defining Inflation and the Target Path

The type of targeted price basket has important implications regarding the choice of the instruments to be used by the monetary authority. The argument for focusing on a narrow group of prices such as the price of gold or an exchange rate is that they are relatively easy to target and monitor. For example, if the price rule is based on the exchange rate, then the choice of the price basket and the instrument are analogous. A fixed exchange rate, however, does not necessarily result in zero inflation over a broad basket of goods prices, and places the burden of adjustment primarily on the export sector. Although, stabilizing a broad index is preferable in order to attain the desired adjustment in prices in general, a basket index raises alternative questions regarding the definition of zero inflation.

Canadian and New Zealand inflation targets are expressed in terms of the CPI, and price stability is defined as an inflation rate of 2 percent, or less. Although the alternative measure, the GNP price deflator is broader in coverage, it is subject to large and frequent revisions over long periods of time, making it less appropriate to serve as a basis for targeting inflation. The CPI makes tracking inflation easier because it is published on a regular basis, without long delays, and is rarely revised. Differences between the CPI and alternative measures of inflation should be at least consistent or identifiable in the long run.

The difference between the theoretical concept of the cost-of-living index and the calculated CPI can generate four types of biases: the substitution bias, the new-goods bias, the outlet substitution bias, and the quality bias.[10] Pierre Fortin (1990) estimates that the Canadian CPI is subject to an upward bias of an estimated magnitude of perhaps 0.5 to 1 percent per year if the effects of the substitution and new-goods biases are added up. David Rae, Michele Lloyd, and Andrew Fung (1992) find that the total of the four types of biases amounts to approximately 0.5 percent in New Zealand. Although this figure is below those typically quoted for other countries, they argue that the bias is negligible and the Reserve Bank could target 0.5 percent annual inflation if it had the ability to be this precise.

[10]A good discussion of the issues concerning the various CPI biases can be found in Fortin (1990).

The fact that Canadian and New Zealand inflation targets are set in terms of a 1 percent plus or minus band reflects the reality that policy changes cannot be calibrated so as to achieve an exact rate of increase in prices.[11] As a practical matter, even though Canadian and New Zealand targets are set in terms of total CPI, policy actions are based on a modified index. The Bank of Canada bases its policy actions on a CPI excluding food and energy prices. Because the two CPI components are often volatile with respect to total CPI, it is inappropriate for monetary policy to try to offset their short-run fluctuations (see Figure 2). Alternatively, New Zealand has opted to use a CPI modified to exclude house-purchase and mortgage costs.[12]

Price Lags and Inflation Forecasts

Monetary authorities do not have absolute control over the price level, because the lag between changes in monetary conditions and inflation is long and uncertain. Operationally, the lagged adjustment of prices presents several difficulties for inflation targeting. First, monetary policy seems to operate more slowly on prices than on real GNP. Inflation targeting could cause significant fluctuations in real GNP in trying to stabilize inflation, particularly if the dynamic behavior of prices is unknown. For instance, John Taylor (1985) finds a weak negative tradeoff between the variance of prices and the variance of real output for several countries. Table 1 shows that among several OECD countries, two low inflation countries, Germany and Switzerland, have a higher variance in output than in inflation.

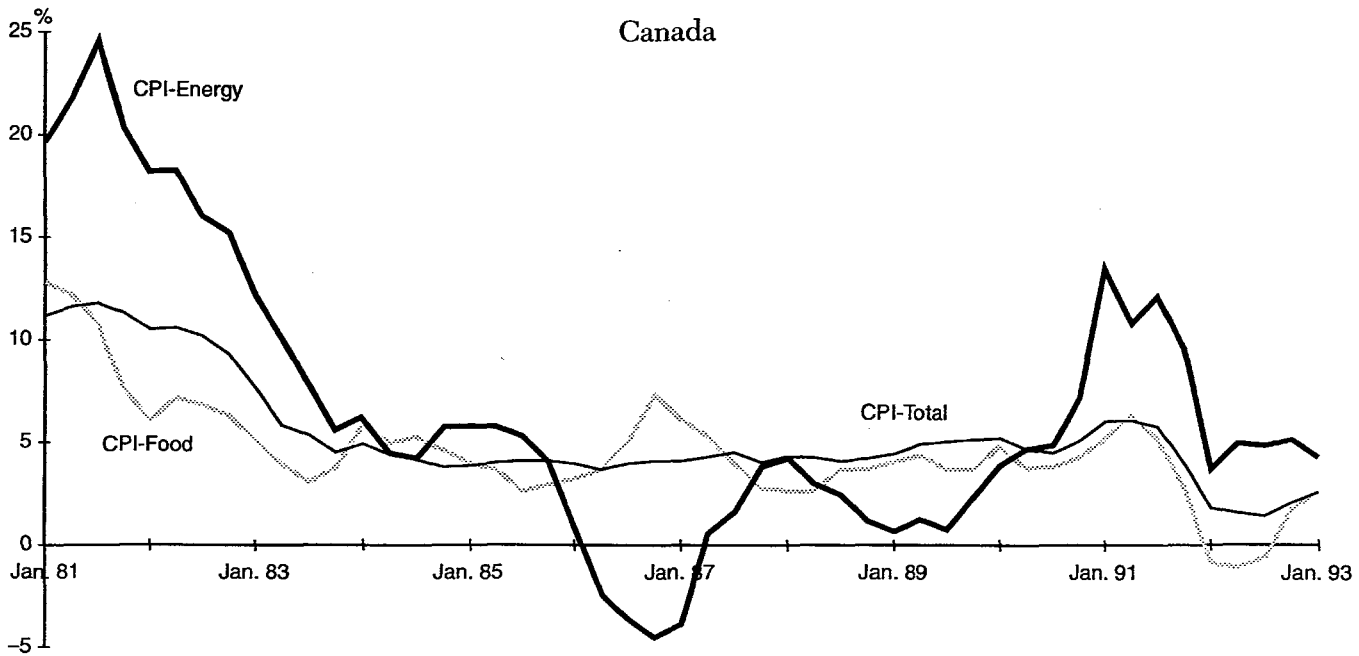
A second potential problem is that the sluggish behavior of prices forces monetary policy to react to inflation forecasts, not to current inflation. Traditionally, the central bank's checklist of inflation indicators includes the exchange rate, the level and structure of interest rates, the wage rate, the output gap, and monetary aggregates, although the Reserve Bank of New Zealand tends to place less weight on the last indicator than does the Bank of Canada. However, the reliance on forecasts based on key indicators makes policymaking arbitrary. Although economists have become increasingly sceptical about the ability to forecast the future path of the economy, the size of the forecast errors may depend on the policy regime. For example,

[11]Canadian and New Zealand targets are regarded as midpoints of a target band of plus or minus 1 percent. Midpoints of the range are the objective of monetary policy in both countries, rather than the upper or lower band.

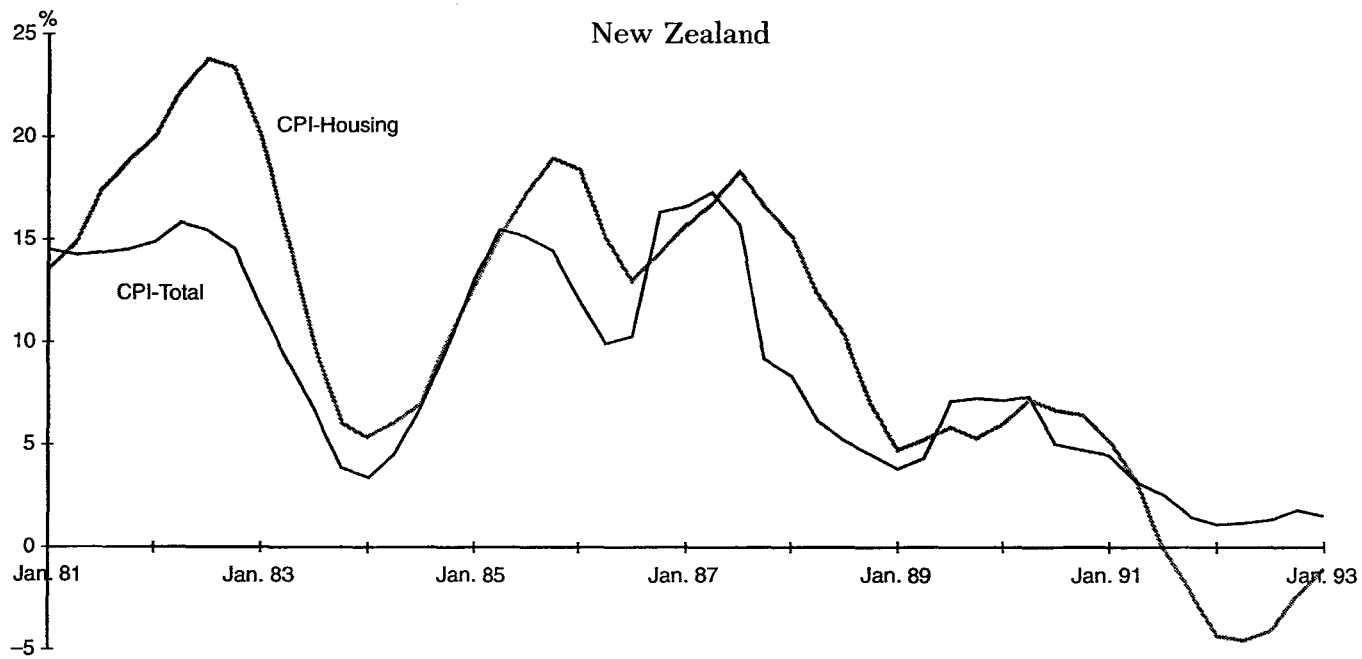
[12]The housing sector is not fully excluded because imputed rents are still included. Following the Iraqi invasion of Kuwait, the Reserve Bank announced that oil would also be removed from the targeted index.

FIGURE 2

CANADA AND NEW ZEALAND INFLATION PERFORMANCE
(Percentage Change Over Four Quarters)



SOURCE: OECD, Main Economic Indicators



SOURCE: OECD, Main Economic Indicators

TABLE 1

GDP GROWTH AND INFLATION, 1960–91
(Average Annual Growth and Variance)

	GDP Volume		Consumption Deflator	
	Growth	Variance	Growth	Variance
United States	2.9	5.3	4.9	6.2
Japan	6.3	12.2	5.3	16.8
Germany	3.1	4.7	3.5	3.3
France	3.6	3.6	6.6	13.7
Italy	3.8	6.0	9.3	37.1
United Kingdom	2.3	4.6	7.7	26.5
Canada	4.0	6.3	5.2	8.8
Australia	3.7	5.7	7.0	17.6
New Zealand	2.2	17.5	8.5	30.7
Belgium	3.4	4.6	4.8	8.8
Switzerland	2.6	7.1	4.2	5.2
Denmark	2.8	7.1	7.1	10.2
Spain	4.5	9.1	9.9	28.0
Greece	4.5	14.0	11.4	62.6
Ireland	4.1	5.3	8.5	36.8
Iceland	4.5	17.7	24.9	357.4
Norway	3.7	3.5	6.6	7.9
Sweden	2.7	4.1	7.4	10.8

SOURCE: OECD, National Accounts.

Allan Meltzer (1987) claims that discretionary policy actions increase uncertainty and the size of the forecast errors.

Instruments, Targets, and Operational Rules

A policy rule that pegs an intermediate target serves as an operational guide for a two-stage process. The policymaker first chooses a time path for some target variable that promises to lead to desirable outcomes for the goal variables. Then in the second stage, policy efforts are focused on an attempt to achieve the designated path for the target variable. For example, the monetary authority may select a target path for the money stock, in the belief that this path will lead to a desirable combination of inflation and output realization.

Whether inflation targeting also follows a two-stage process depends on the dynamics of the optimal control process. Simple examples of an operational rule are given by Barro (1986), Bennett McCallum (1989), and Daniel Lebow, John Roberts, and David

Stockton (1992). Barro and McCallum envision an inflation targeting regime that involves a feedback relationship where an inflation rate above target for a specified length of time triggers lower growth of the monetary base, and vice versa for an inflation rate below target. The objective could involve a moving path of prices that allows for non-zero inflation over time. However, after an initial disinflation phase, the simplicity of the rule, as well as prevention of discretionary adjustments to the level of prices, argues for specifying the target as a constant price level.

In practice, whether such simple operational rules exist for inflation targeting is doubtful. The experiences in New Zealand and Canada argue against simple feedback rules for inflation. Grimes and Wong (1992) argue that the Reserve Bank of New Zealand forecasts inflation pressures arising from all sources other than the exchange rate and determines a path for the exchange rate range that is consistent with price stability. The tolerance band for the exchange rate may vary over time according to price deviations from the target path. In this case, the exchange rate acts as a nominal anchor but not in the strict sense of an intermediate target as under a fixed or a pegged exchange rate rule.[13] In Canada adjustments to inflationary pressures have taken place in either the foreign exchange market or in short-term interest rates.[14] Since the announcement of the inflation targets, the Bank of Canada has not introduced any new operational changes and continues to follow a checklist approach of leading indicators.

Preliminary Evidence of Inflation Targeting in Canada and New Zealand

The main measures for assessing the success of monetary policy are the actual path of inflation, the way in which inflationary expectations are changing, and market confidence that a consistent and predictable approach is being maintained. Given that a large contribution to the Canadian and New Zealand disinflation process arose from the widening output gap, the gains from the inflation targeting strategy remain difficult to assess. In the following discussion I shall not evaluate the adjustment costs of the recent disinflation.[15]

[13]The Swedish experience of price level targeting during the 1930s operated primarily through the exchange rate (see Jonung 1979, Black and Gavin 1990).

[14]For an outline of recent Canadian monetary policy, see OECD (1992) *Country Survey, Canada.*

[15]The permanent and transitory costs from the previous Canadian disinflations are examined in Fortin (1991) and Barry Cozier and Gordon Wilkinson (1990). Jack Selody (1990) provides an overview of the empirical findings for Canada.

However, the rapid fall in price expectations since 1991 is in stark contrast to the persistent gap that existed previously between actual and expected inflation. Nevertheless, the next few years will provide a clearer test of the credibility effects of inflation targeting, especially as economic activity revives.

Undershooting the Intermediate Targets

The eagerness to lower inflation means that central banks have to tighten monetary policy, but to avoid undershooting they have to ease substantially before hitting the intermediate target. The recent Canadian and New Zealand experience of actual inflation and inflation targets reveals that they have or are likely to undershoot their intermediate targets, despite easing before hand.[16] New Zealand undershot its 1991 and 1992 intermediate targets. In Canada CPI inflation, amounting to 2.1 percent in December 1992, was at the low end of the first target range of 2 to 4 percent. Apart from Australia and Iceland, Table 2 reveals that the disinflation process in Canada and New Zealand has been the quickest among the OECD countries over the 1990–92 period.

One interpretation attributed to undershooting behavior is the weaker than anticipated economic activity: a sluggish world economy and a stronger than expected exchange rate. An alternative interpretation of the undershooting behavior is the asymmetric risk involved in missing the intermediate targets under a policy that does not have absolute control over the targeted variable. If inflation acts as a scorecard for central bank behavior and reputation building equates to hitting the intermediate targets, then there is a tendency for central banks to err on the downside. In this case the targets embed a strong disinflationary bias. Furthermore, the need to meet the inflation targets together with a sceptical private sector can also instill adaptive behavior. Private decisionmakers need to see low inflation numbers before they are willing to alter their expectations. Recognizing this, the central bank is eager to bring CPI inflation down rapidly at the introductory stages of inflation targeting in the hope that credibility is gained quickly and expectations are altered.

[16]In New Zealand, the September 1991 easing of monetary policy was the clearest example of an explicit policy response to an improved inflation outlook. A reassessment of the Reserve Bank's inflation forecasts encouraged the Reserve Bank to ease monetary conditions in order to prevent inflation in 1992 from undershooting the 1.5 to 3.5 percent indicative range, knowing that the 1991 outcome was already beyond influence. See "Monetary Policy Statement," *Reserve Bank of New Zealand* (February 1992).

Empirical evidence of asymmetric behavior can be found in Canadian financial markets. During the initial phase of inflation targeting, financial markets expected the Bank of Canada to offset positive inflation surprises (see OECD *Country Survey, Canada* 1992, Annex II; and Fischer 1993). Interest rates reacted strongly when monthly CPI announcements were higher than expected. However, the opposite case of lower than anticipated CPI inflation produced no change in Canadian asset prices.

Survey Data

Longer-term inflation expectations have declined in New Zealand and Canada. In New Zealand, the Reserve Bank's survey of businesses' two-year ahead inflation expectations are within the target range—averaging 2 percent for the end of 1993—implying some evidence of credibility. The survey results plotted in Figure 3 are supported by the behavior of nominal wage increases of only 1 percent in the first two quarters of 1992, coinciding with the current CPI inflation.

The Canadian survey data compiled by the Conference Board suggests that short-term expectations concerning inflation have fallen considerably. The decline in the expectations series plotted in Figure 3 is consistent with the sharp deceleration in prices. While these survey results may indicate a gain in near-term credibility there is no evidence of credibility effects in the labor market that might reduce the short-term costs of disinflation. The wage response to changes in employment conditions has remained in line with the previous two recessions. Nominal wage increases in the first two quarters of 1992 continued to increase by over 3.5 percent with an unemployment rate of over 11 percent—a level which is 4 percentage points higher than before the recession.

Labor Contracts

The duration of new labor contracts negotiated after the targets announcement is another indicator of labor market confidence in the targeting strategy. Reduced uncertainty about future changes in prices,—one of the rewards of low inflation—should result in longer-term contracts and thereby increased productivity (i.e., less days lost from work stoppages and contract negotiations). Figure 4 reveals that lower Canadian inflation has not translated into a shift towards longer term contracts. Rather the opposite has occurred, the percentage of new one-year contracts increased sharply after the introduction of the Goods and Services Tax in 1991.

The New Zealand experience suggests that low inflation together with institutional reform may increase the duration of employment

TABLE 2

CONSUMER PRICES
(Percentage Changes from Previous Period, not Seasonally Adjusted)

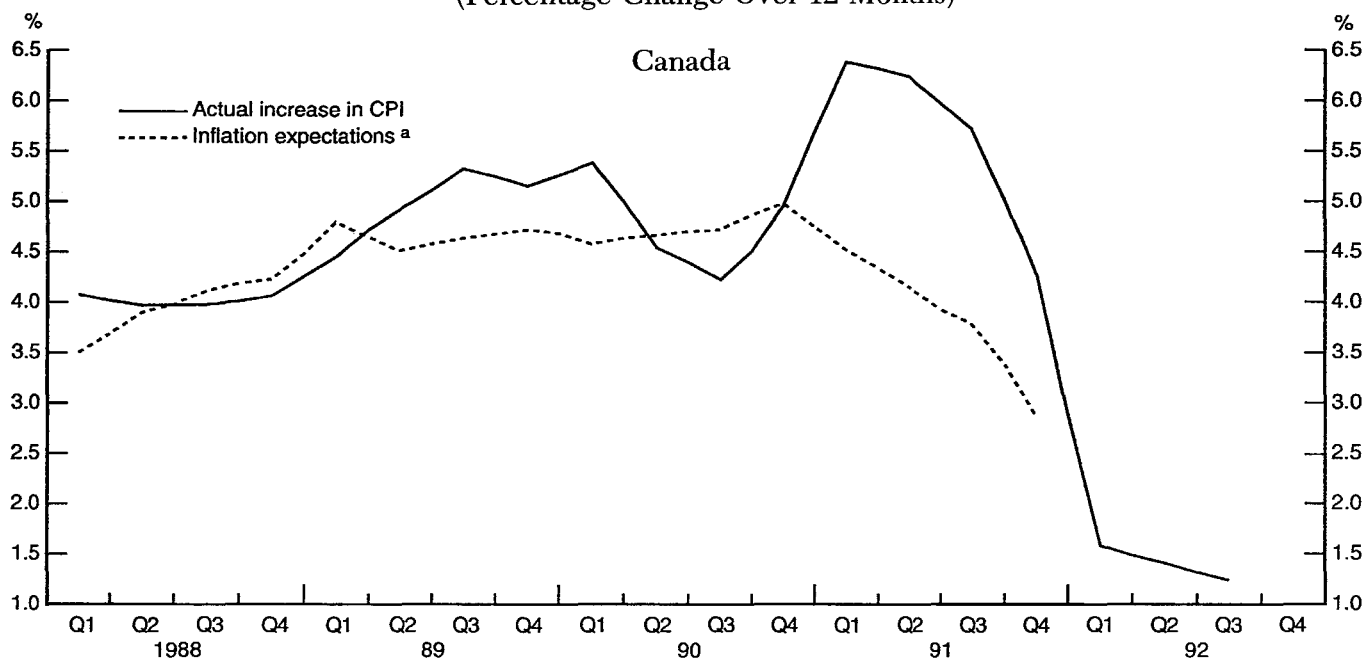
	Year End Annual Rates						At Actual Rate
	1970–79	1979–88	1989	1990	1991	1992	12 Months to Latest Month Available (May 1993)
	Average						
United States	7.6	5.1	4.6	6.1	3.1	2.9	3.2
Japan	9.1	2.3	2.6	3.8	3.6	1.2	0.9
Germany	5.1	2.8	2.8	2.7	3.5	3.7	4.2
France	9.6	7.3	3.0	2.8	4.2	2.0	2.0
Italy[a]	14.0	10.9	6.5	6.3	6.0	5.1	4.5
United Kingdom	13.4	6.9	6.6	6.1	6.4	2.6	1.3
Canada	8.3	6.3	5.2	5.0	3.8	2.1	1.8
Austria	6.3	3.7	2.9	3.5	3.1	4.2	3.7
Belgium	7.6	4.8	3.6	3.4	2.8	2.4	2.7
Denmark	9.8	6.6	4.8	2.7	2.4	1.5	1.0
Finland	11.4	7.2	6.6	4.9	3.9	2.1	2.6
Greece	14.1	19.1	14.8	22.9	18.0	15.0	16.4
Iceland	33.2	38.0	25.2	7.2	7.5	1.5	0.9
Ireland[b, c]	13.4	9.1	4.6	3.1	3.2	2.3	3.6

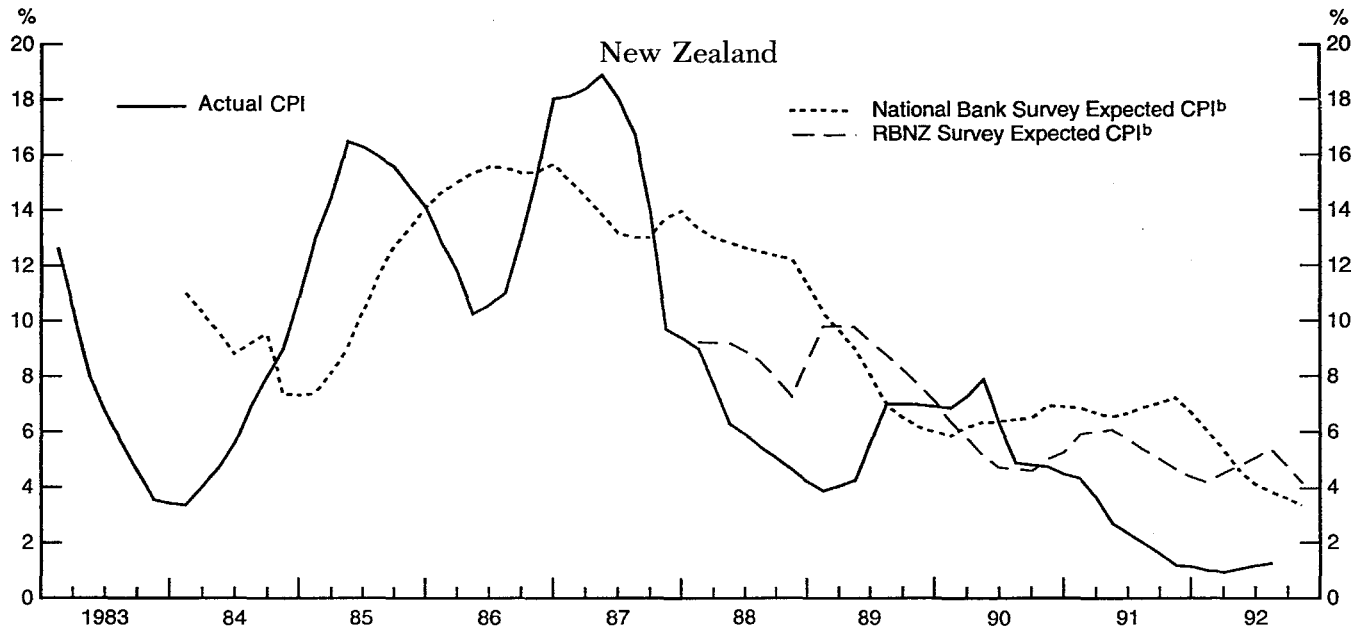
Luxembourg	6.7	4.8	3.4	3.7	3.1	2.9	3.5
Netherlands	7.4	2.9	1.3	2.6	4.9	2.6	2.3
Norway	7.9	8.6	4.2	4.4	2.9	2.2	2.5
Portugal[b]	19.6	17.4	11.6	13.7	9.2	8.4	5.7
Spain	15.6	10.1	6.8	6.5	5.5	5.4	4.6
Sweden	9.0	7.8	6.6	10.9	7.9	1.8	4.8
Switzerland	4.9	3.2	4.9	5.3	5.2	3.4	3.6
Turkey[d]	27.3	47.3	64.3	60.4	71.1	66.0	65.0
Australia[c]	10.7	8.3	7.8	6.6	1.5	1.3	1.2
New Zealand[c]	12.3	11.8	6.7	5.0	0.9	0.8	1.0

[a]Index for households and salary earners.
[b]Excluding rent.
[c]Since consumer prices are available only on a quarterly basis, the figures shown for the rates of change over 12 and 6 months are calculated as the rate of change over 4 and 2 quarters respectively to the last quarter available. The monthly rate is calculated as the change between the two most recent quarterly indices, expressed at a monthly rate and centered at the mid-month of the quarter.
[d]1970–1981: Istanbul index (154 items); from 1982, Turkish index.
SOURCE: OECD, National Accounts.

FIGURE 3

ACTUAL AND EXPECTED INFLATION PERFORMANCE:
CANADA AND NEW ZEALAND
(Percentage Change Over 12 Months)

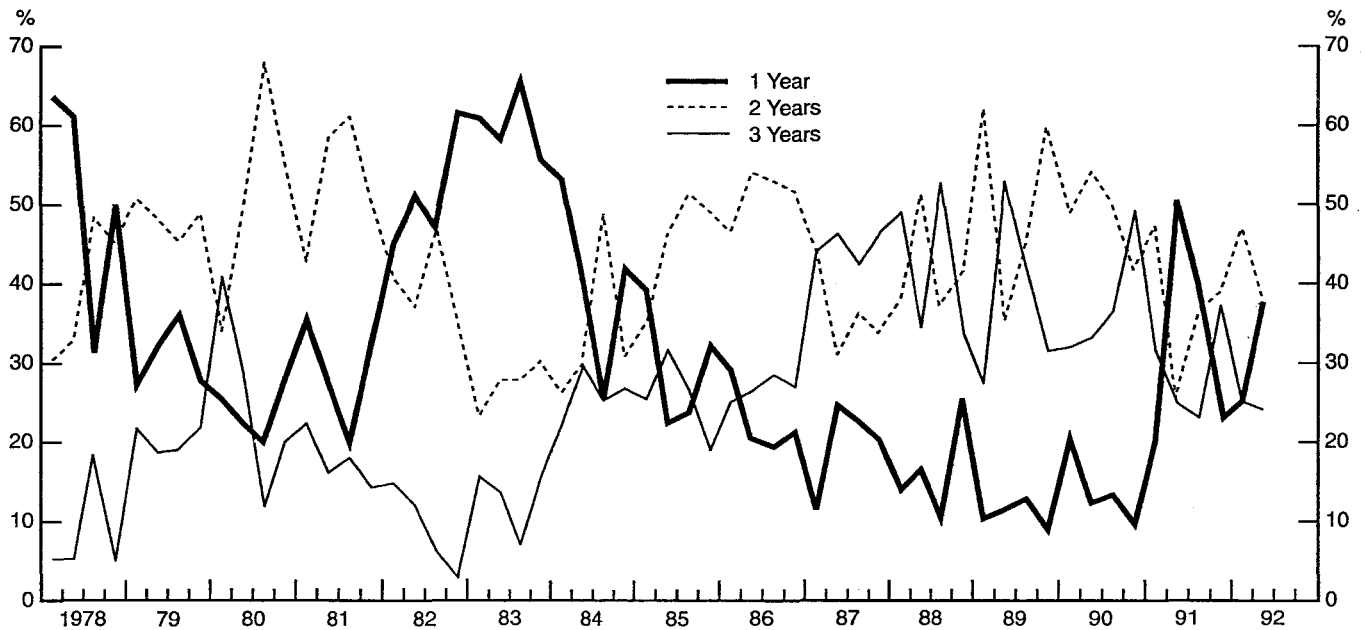




[a]Expected price increased in the next six months at an annual rate.
[b]Survey of inflation expectations of households 12 months ahead.
SOURCES: Conference Board of Canada; Reserve Bank of New Zealand.

FIGURE 4

SETTLEMENTS BY DURATION OF AGREEMENTS
(As a Percentage of Total)



SOURCE: CANSIM-Statistics Canada.

contracts. Prior to 1991, the only duration for any fixed-term contract was one year. However, the combined effects of lower inflation and the Employment Contracts Act, introduced in 1991, have increased the percentage of long-term contracts. In 1991, 41 percent of employees covered by collective contracts had contract terms of more than one year.

Conclusion

Inflation targets are defined in terms of the final objective of monetary policy rather than in terms of targets for instruments such as the money stock or nominal GNP. Although survey data highlight that inflation targeting has brought some credibility to the central banks of Canada and New Zealand, the ill-fated attempts to impose fiscal targets along with the undershooting of the intermediate targets, reveal that such a strategy may suffer from credibility problems stemming from inconsistent programs. The experiences in Canada and New Zealand reveal that the announcement of such targets has the primary purpose of providing a standard of accountability for public officials.

Canada and New Zealand have shown that their central banks are committed to the target strategy and that low inflation was achieved quickly. Overall, however, it is too early to determine the success of the policy of inflation targeting. First, one must wait and see how the two economies will react to the new environment of zero inflation, despite considerable costs of high unemployment during the disinflation phase. Moreover, once 0 to 2 percent CPI inflation has been achieved, the next step calls for ensuring that price stability will be maintained. This second phase of locking in and sustaining low inflation will be more difficult. Second, the global slowdown in economic activity and the unanticipated slow response to aggregate domestic demand helped Canada and New Zealand considerably on the inflation front. Thus, it is difficult to determine whether inflation targeting was successful at a time when most countries experienced little or no inflationary pressures. The real test of the policy comes when either central bank is faced with an independent domestic price shock.

References

Alogoskoufis, G.S. (1989) "Monetary, Nominal Income and Exchange Rate Targets in a Small Open Economy." *European Economic Review* 33: 687–705.

"Background Note on the Targets." (1991) *Bank of Canada Review* (March): 9–21.

Barro, R. (1986) "Recent Developments in the Theory of Rules versus Discretion." *Economic Journal* (Suppl.) 96: 23–37.

Barro, R.J., and Gordon, D. (1983) "Rules, Discretion and Reputation in a Model of Monetary Policy." *Journal of Monetary Economics* 12: 101–21.

Black, S., and Gavin, W.T. (1990) "Price Stability and the Swedish Monetary Experiment." Federal Reserve Bank of Cleveland. *Economic Commentary.*

Blanchard, O.J. (1985) "Credibility, Disinflation and Gradualism." *Economics Letters* 17: 211–17.

Clinton, K. (1992) "Recent Developments in the Canadian Monetary Aggregates." *Bank of Canada Review* (January): 3–16.

Cozier, B., and Wilkinson, G. (1990) "How Large are the Costs of Disinflation in Canada?" Working Paper 90–6, Bank of Canada.

Crow, J.W. (1988) "The Work of Canadian Monetary Policy." Eric J. Hanson Memorial Lecture. *Bank of Canada Review* (January): 3–17.

Dawes, S. (1992) "The Reserve Bank of New Zealand Act." In Hutcheson, J.; Bowman, F.; and Stewart, S. (eds.) *Monetary Policy and the New Zealand Financial System,* 3rd. ed., 41–62. Reserve Bank of New Zealand. Wellington, New Zealand.

Egebo, T., and Englander, A.S. (1992) "Institutional Commitments and Policy Credibility: A Critical Survey and Empirical Evidence from the ERM." *OECD Economic Studies* 18 (Spring): 45–84.

Fischer, A.M. (1993) "Canadian CPI Announcements over the Disinflationary Cycle: Evidence from the Foreign Exchange Rate Market." *Applied Economics* 25: 1045–51.

Fortin, P. (1990) "Do We Measure Inflation Correctly." In Lipsey, R.G. (ed.) *The Goal of Price Stability,* 109–30. Policy Study 8. Toronto, Canada: C.D. Howe Institute.

Fortin, P. (1991) "The Phillips Curve, Macroeconomic Policy, and Welfare of Canadians." *Canadian Journal of Economics* 24 (4): 774–803.

Freedman, C. (1983) "Financial Innovation in Canada: Causes and Consequences." *American Economic Review, Papers and Proceedings* 74: 101–6.

Freedman, C. (1989) "Monetary Policy in the 1990s: Lessons and Challenges." Paper presented at the Monetary Policy Issues in the 1990s Symposium Sponsored by the Federal Reserve Bank of Kansas City, 1989.

Friedman, M. (1960) *A Program for Monetary Stability.* New York: Fordham University Press.

Gavin, W.T., and Stockman, A.C. (1991) "Why a Rule for Stable Prices may Dominate a Rule for Zero Inflation." Federal Reserve Bank of Cleveland *Economic Review* 24(1): 2–8.

Grimes, A., and Wong, J. (1992) "The Role of the Exchange Rate in New Zealand Monetary Policy." Mimeo, Reserve Bank of New Zealand.

Jonung, L. (1979) "Knut Wicksell's Norm of Price Stabilization and Swedish Monetary Policy in the 1930's." *Journal of Monetary Economics* 5(4): 459–96.

Lachler, U. (1988) "Credibility and the Dynamics of Disinflation in Open Economies: A Note on the Southern Cone Experiments." *Journal of Development Economics* 28: 285–307.

Lebow, D.E.; Roberts, J.M.; and Stockton, D.J. (1992) "Economic Performance under Price Stability." Economic Activity Section Working Paper

No. 125, Board of Governors of the Federal Reserve System, Washington, D.C.

McCallum, B.T. (1989) "Targets, Indicators, and Instruments of Monetary Policy." NBER Working Paper No. 3047, Cambridge, Mass.

Meltzer, A.H. (1987) "Limits of Short-run Stabilization Policy, Presidential Address to the Western Economic Association, July 3, 1986." *Economic Inquiry* 25: 1–14.

Neal, S.L. (1992) "The Case for Zero Inflation." *Cato Journal* 12 (1): 179–83.

Nichols, P. (1991) "An Announced Downward Path." Speech given at the H.C. Coombs Centre for Financial Studies, Kirribilli, Sydney, 28 October 1991.

Perrson, T., and Tabellini, G. (1992) "Designing Institutions for Monetary Stability." Paper presented at the Carnegie-Rochester Conference, Pittsburgh, 20–22 November 1992.

OECD (1992) *Country Survey, Canada.*

Rae, D.; Lloyd, M.; and Fung, A. (1992) "Defining Price Stability: What Should We Aim For?" Economic Department, Reserve Bank of New Zealand.

Reserve Bank of New Zealand (1990) "Appendix." *Reserve Bank Bulletin,* April 1990.

Reserve Bank of New Zealand (1992) "Monetary Policy Statement." February 1992.

Robson, W.B.P. (1991) *"Aiming Low: Canada's New Inflation Targets." Commentary.* 31. Toronto, Canada: C. D. Howe Institute.

Selody, J. (1990) "The Goal of Price Stability." Technical Report No. 54, Bank of Canada.

Spencer, G. (1992) "Monetary Policy: The New Zealand Experience 1985–1990." In Hutcheson, J.; Bowman, F.; and Stewart, S. (eds.) *Monetary Policy and the New Zealand Financial System,* 3rd. ed., 113–32.

Stutchbury, M. (1992) "A Zero Inflation Target for Australia?" *Financial Review,* 30 October 1992: 15.

Taylor, J.B. (1988) "Output and Price Stability: An International Comparison." *Journal of Economics Dynamics and Control* 2: 109–32.

Walsh, C.E. (1992) "Optimal Contracts for Central Bankers," Mimeo, University of California at Santa Cruz.

Walsh, C.E. (1993) "When Should Central Banker Be Fired?" Mimeo, University of California at Santa Cruz.

Wong, A., and Grimes, A. (1992) "The New Zealand Monetary Aggregates." In Hutcheson, J.; Bowman, F.; and Stewart, S. (eds.) *Monetary Policy and the New Zealand Financial System,* 3rd. ed., 79–90.

No Postage
Necessary
if Mailed
in the
United States

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 13690 WASHINGTON, D.C. 20024

Postage will be paid by addressee

the CATO JOURNAL

1000 Massachusetts Avenue NW
Washington, DC 20001