Monetary Policy Transparency,
Public Commentary, and Market Perceptions
about Monetary Policy in Canada

Pierre L. Siklos

(Wilfrid Laurier University)

Abstract

The introduction of inflation targets in Canada in 1991 ostensibly clarified the objectives of monetary policy, namely the pursuit of price stability. In doing so, one of the objectives of the new policy was to ensure that the public would henceforth be able to assess more easily monetary policy performance based on the Bank of Canada's record at achieving low and stable inflation.

An obvious question then is to ascertain whether in fact, as the Governor the Bank stated recently, "… public commentary on monetary policy since 1991 has involved a fairer assessment of the performance of the Bank of Canada." Using information compiled on commentary about the Bank of Canada, and monetary policy in general, collected from the *Globe and Mail* and *Financial Post* national newspapers, we evaluate how favourable or critical such commentaries have been since 1986. In so doing, we examine a sample before inflation control targets were introduced, as well as the period since.

The Bank of Canada also aims to influence expectations and financial market perceptions of its performance. Additional tests, using daily interest rate and exchange rates and monthly inflation and inflation forecast data, are presented which shed light on this question.

Zusammenfassung

Die Einführung von Inflationszielen in Kanada im Jahr 1991 verdeutlichte angeblich das Ziel der Geldpolitik, nämlich Preisstabilität. Mit der neuen Politik sollte unter anderem die Öffentlichkeit fortan den Erfolg der Geldpolitik leichter daran messen können, inwieweit es der Bank von Kanada gelingt, die Inflation stabil auf niedrigem Niveau zu halten.

Deshalb liegt die Frage nahe, ob tatsächlich – wie der Präsident der Zentralbank kürzlich feststellte – „ ... die Erfolge der Bank von Kanada in der öffentlichen Kommentierung der Geldpolitik seit 1991 fairer beurteilt werden." Anhand von Kommentaren in den überregionalen Zeitungen *Globe and Mail* und *Financial Post*, die sich mit der Bank von Kanada sowie der Geldpolitik allgemein befassen, werten wir aus, wie positiv oder kritisch diese Kommentare seit 1986 ausgefallen sind. Dabei untersuchen wir eine Stichprobe aus der Zeit vor Einführung der Inflationsziele sowie aus der Zeit danach.

Die Bank von Kanada versucht auch, die Erwartungen und die Einschätzung ihrer Politik an den Finanzmärkten zu beeinflussen. Ob ihr dies gelingt, wird mit Hilfe von zusätzlichen Tests untersucht, die sich auf tägliche Zinssätze und Wechselkurse sowie monatliche Inflationsdaten und Inflationsprognosedaten stützen.

Table of Contents

List of Tables and Figures

Monetary Policy Transparency, Public Commentary, and Market Perceptions about Monetary Policy in Canada[*]

1 Introduction

The increase in autonomy granted de facto or de jure to central banks in the industrial world is largely a phenomenon of the 1990s. However, it became apparent early on to central bankers themselves that "independence", together with a mandate to achieve some form of price stability, requires that careful thought be given to accountability.[1]

Accountability and transparency were no less important principles in previous decades, at least in theory, as the experience with monetary and exchange rate targeting suggest. What changed was the growing recognition that price stability and central bank autonomy were both desirable elements of central bank operations. Consequently, emphasis shifted toward what central banks do and how they do it. Accountability, however, creates expectations of greater transparency. In the event of a disagreement over monetary policy actions it is clearly in the interests of the central bank to be sufficiently open to ensure that its credibility and reputation are not impaired. Typically, however, discussions about conflicts center around fundamental disagreements over policy between the government and the central bank. These tend to be rare events and ordinarily take place during times of crisis.[2] In contrast, the demand for greater transparency is a reflection of the desire, by financial markets in particular, for more information about central bank operations.[3] However, financial markets' horizon is very short (e.g., tick by tick or daily) while the mandate of

[1] Crow (1994) is an early example, in the Canadian context, of a central banker who emphasized the importance of accountability. John Crow was Governor of The Bank of Canada from 1987 to 1994. Inflation control targets were introduced during the second half of his mandate though he advocated the concept of price stability soon after he became Governor (see Crow (1988)).

[2] At least according to Siklos' (1999b) account of the history of US and Canadian central banking.

[3] A related, but equally important issue, is the democratic accountability of the central bank. That is, openness and transparency enhance the legitimacy of an autonomous central bank. It is, in considerable part, for this reason that the debate about the questions posed in this paper stem from the peculiar status and relations between the European Central Bank and member governments in the European Monetary Union.

central banks with inflation targets relies on data that is available far more infrequently (e.g., weekly, monthly, or even quarterly). A difficulty, not adequately recognized by the relevant literature is that, even in countries with an inflation objective, the central bank is not expected to achieve it at the expense of financial stability. Consequently, central banks do not focus on a single task in practice and they must occasionally make trade-offs between tasks that can come into conflict with each other.[4] How central banks respond to these tensions can influence their credibility and reputation.[5] Therefore, efforts at increasing the transparency of central bank operations can come into conflict with the clarity with which it communicates its policies to the public.

If the principal objective of greater openness or transparency has been to make central banks more accountable, and permit financial markets to more easily assess the performance of the monetary authorities, then one would expect that public commentary about the central bank to reflect the change. An obvious question then is to ascertain whether in fact, as the Governor of the Bank of Canada stated recently, "… with a clearer objective, public commentary on monetary policy since 1991 has involved *fairer* assessments of the performance of the Bank of Canada" (Thiessen (1999), p. 97, emphasis added. Also see Mayes and Razzak (1997) for a similar expression applied to the policy rules for the European Central Bank). While the Governor did not explain what he meant by the subjective term "fair", the comments reflect the importance attached to public commentary and financial market reactions to actions by the Bank of Canada.

Using commentary about the Bank of Canada compiled from the two most widely read and followed Canadian financial publications, an assessment of the Bank's performance since 1986 is conducted. The period covers a sample before and after inflation control targets were introduced. In addition, qualitative and quantitative techniques are used to evaluate changes in the public's perceptions of central bank performance using data at the daily and monthly frequencies.

The rest of the paper is organized as follows. First, a brief review of the impact of accountability and transparency on financial markets reactions in theory and in practice is presented in section 2. Next, efforts by the Bank of Canada to improve communication of their activities and responsibilities are described in section 3. Data used to evaluate

---

4 Since inflation targets are usually expressed in terms of a band with varying horizons, in principle these provide sufficient flexibility for central banks to address other objectives. The problem is that financial markets and the public may interpret flexibility either as minimizing the chances of failure or, alternatively, interpret the objective, namely the mid-point of the bans, as something a central bank pursues in a single-minded fashion.

5 Siklos (1999a) argues that there is an important distinction to be made between the two concepts.

markets' assessments of Bank of Canada policies are described in section 4 prior to a discussion in section 5 of more formal evidence dealing with the impact of greater central bank accountability and transparency. Section 6 concludes.

2 Central Bank Transparency and Accountability in Theory and in Practice

2.1 Institutional Approach

As there is now a voluminous and easily accessible literature on the subject of accountability and transparency in central banking this section will, of necessity, be brief.[6] The relevant research can roughly be divided into two parts. Some studies emphasize the measurement of accountability and transparency via indicators of statutory reporting requirements of central banks. These include: the type of monitoring by legislative or executive authorities, override and other forms of interference in central bank operations, and communications instruments used by central banks to deliver their message and justify their actions. Defined in this fashion, accountable central banks are found to be less independent, where autonomy is determined via indexes of the kind popularized by Cukierman (1992), and used by several others since.[7] However, Briault, Haldane and King (1996) find that more accountable central banks are also more transparent. De Haan, Amtenbrink and Eijffinger (1999) redefine accountability in terms of who is responsible for the ultimate objectives of monetary policy and find a positive association between accountability and central bank independence. In addition, more autonomous central banks are (weakly) less transparent **and** are less responsible for monetary policy outcomes. In other words, central banks with a high reputation need not be as transparent as those with a poorer reputation. The former's actions speak louder than words while, for central banks of lesser repute, they must build credibility. One vehicle used to build reputation is via greater

---

[6] See, inter alia, Cukierman (2000), Briault, Haldane and King (1996), Eijffinger, Hoebrichts and Schaling (1998), de Haan, Amtenbrink and Eijffinger (1999), Walsh (2000), and Siklos (1995, 1997, 1999, 2001).

[7] While criticisms of indexes of central bank independence abound (e.g., Eijffinger and de Haan (1996), Banaian, Burdekin and Willett (1998)) there is little discussion of the sensitivity of such relationships to alternative measures of autonomy.

transparency.[8] Clearly, then, in theory there can be a trade-off between accountability and credibility.

2.2 Loss Function Approach

A second strand of the literature focuses on the implications of accountability and transparency for the choice of central bank objectives. Central banks are assumed to respond to shocks that produce deviations in inflation and output from some notional or explicitly targeted value. The impact of such shocks is captured in the loss function of a central bank which can, in principle, permit assessment of the degree of "conservativeness" of the central bank according to the relative weight placed on inflation or output gap objectives. Several variants on the basic loss function have been proposed, depending upon whether the loss function is linear or quadratic, or according to whether the central bank must make a once and for all decision as opposed to settling on the weights in a dynamic framework. See, inter alia, Cukierman and Meltzer (1986), and Faust and Svensson (1999). Generally, this literature can be said to argue in favor of the position that greater transparency will produce more socially desirable economic outcomes. One practical implication of this result is that central banks ought to publish their forecasts of inflation (also see Tarkka and Mayes 1999, and Geraats 2000). There are, however, a number of considerations that temper the desirability of greater transparency. First, greater openness combined with a relatively low cost of override[9] of central bank monetary policy decisions worsens the expected inflation picture as well as increasing the weight placed on the output stabilization objective (Eijffinger, Hoebrichts and Schaling 1998, 2000). Indeed, in contrast to Garfinkel and Oh (1995), central banks with a credibility problem need to be especially open, while a monetary authority with a great deal of reputation can afford to "whisper". The difficulty with this result is the presumption that central banks with an apparent credibility problem (e.g., New Zealand, Canada) actually do speak louder and more clearly than central banks that enjoy a high reputation. This is a misreading of the activities of the Bundesbank (Siklos and Bohl 2000 and Posen 2000). Even in the case of the US Federal

---

[8] Siklos (1996) likens the distinction between credibility and reputation to the stock-flow distinction in economics. Reputation is a stock, credibility is a flow.Also, see Cukierman and Meltzer (1986a). Consequently, the Bundesbank can afford to be less transparent than, say, the Bank of Italy because it has a built-up stock of reputation. The Bank of Italy, by contrast, needs to generate highly credible and open policies to influence expectations.

[9] The cost of override is assumed to be fixed. It is not immediately clear to me why a shift of responsibility for monetary policy outcomes effectively decreases central bank independence. In most democratic societies governments always, directly or indirectly, bear ultimate responsibility for monetary policies. Part of the problem with this literature is that political economy considerations are ignored. From a more practical perspective, the Canadian experience with the Coyne Affair (Rymes 1994) suggests that shifting the ultimate responsibility to the government is an independence *enhancing* characteristic.

Reserve this view is debatable for while its penchant for secrecy in the past has been widely reported (e.g., Goodfriend 1986) the Fed has, in part due to Congressional oversight, been rather more open than many other central banks.

Cukierman (2000) demonstrates that a fully transparent central bank – namely one that communicates its inflation outlook prior to the private sector's formation of such expectations – is a socially inferior solution when it actually assign a positive weight to a goal other than an inflation objective.[10] Under these conditions, inflation and output are more volatile than in the limited transparency case (where inflation forecasts cannot influence private sector expectations). As a consequence nominal interest rate variability can also be higher. However, Cukierman's results are based on the notion that the central bank's forecasts are unbiased, an unlikely event, especially if central banks do not possess substantially better information than private sector forecasters.[11] Moreover, the impact of a central bank forecast cannot be divorced from the credibility and reputational issues discussed earlier. Surely, the impact of a central bank generated inflation forecast would be influenced by the track record of such forecasts as well as by the details of the modelling procedure used to generate such forecasts. In addition, as many central bankers will point out, any staff forecast represents but one input into a decision to change the instrument of monetary policy. To suggest that private sector forecasts can be wholly influenced by a central bank's forecast, or that central banks are unable to generate an independent inflation forecast for fear of departing from the private sector consensus, is to argue that implementing monetary policy is based on a very narrow information set. Finally, it would appear difficult to disassociate a central bank's loss function with the policy framework under which it operates. Consequently, as Walsh (2000) has shown, greater transparency and inflation targeting are compatible but, by implication, it becomes more difficult to verify central bank performance when the objectives of the central bank are less perfectly clear, even if its operations are transparent.. In a sense then, the debate between Buiter (1999) and Issing (1999) misses the point. What matters is not so much whether certain characteristics of accountability and transparency are present, such as the publication of inflation forecasts or minutes of committee meetings. Rather a clear understanding of the division of responsibilities over the outcome of policy actions as between government and

---

[10] This result is not sensitive to the information content of such forecasts. The latter point has often been made to argue that the release of inflation forecasts can undermine a central bank's reputation (e.g., Issing 1999).

[11] All that is required in Cukierman's approach is that a central bank's forecast is informative to the private sector in some fashion (perhaps because of better modelling procedures or estimation techniques and not necessarily because of better or more data).

the central bank is also necessary, as is the quality of communication by the central bank.[12] The latter is especially important and will be largely influenced by corporate governance issues, a consideration generally neglected in the literature (see, however, Siklos (1997, 2001)).

While the loss function approach is a sensible one it cannot deal with a dilemma that central banks must confront, especially ones with a clear mandate to achieve a form of price stability. The need to focus on an objective for which its actions produce results that are only apparent with long and variable lags can conflict with the volume of information that affects financial markets on an hourly or daily basis. Hence, a central bank that refuses to respond to every wiggle in the movement of financial asset prices may not be seen to be open, or even transparent, while a central bank that responds in some fashion too frequently may be open and transparent but suffer from tunnel vision in the conduct of monetary policy. The loss function approach is not helpful in this context (see, however, Siklos 1999) because it focuses on low frequency variables in the central bank's menu of objectives while under emphasizing or ignoring entirely high frequency movements in asset prices the monetary authority is also keenly interested in.

2.3 Conflicting Tasks

One can examine slightly more formally the difficulty faced a central bank with a time horizon that is longer than that of financial markets. In what follows I will assume that the central bank has two tasks. One is to provide financial markets with sufficient information, at high frequency, to reduce uncertainty about the stance of monetary policy in the face of unexpected shocks.[13] This can be accomplished via efforts at increasing the transparency (and clarity) of its operations. The central bank's other main task is to deliver inflation within a publicly announced inflation target band objective. One reason for favoring a target band over a point target for inflation is that some deviations from a stated objective might be acceptable. The difficulty is in communicating to financial markets in particular which departures from, say, the mid-point of an inflation target band are acceptable versus ones that portend a possible future breach of the band.

In the traditional principal-agent problem, the agent – here the central bank – is assumed to have one task (e.g., the control of inflation). However, if the agent has multiple tasks, then

---

[12] The emphasis on clarity, a measure of the quality of communication, is also highlighted by Winckler (1999) whose research I became aware of after writing this paper.

[13] Alternatively, this can be viewed as the maintenance of financial stability, a point emphasized by Blinder (1999).

the problem arises as to how to allocate a fixed amount of effort on each task. Because of this constraint, too much effort aimed, say, at calming financial markets can crowd-out signals suggesting that inflation within the target band remains the central bank's top priority. The reason is that the central bank can confuse markets by speaking out too often (or not clearly) about whether the inflation target has been temporarily suspended in favour, say, of an exchange rate target. An important reason is that transparency need not be positively related to clarity.

More formally, if δi represents the output on task i, *e* the agent's effort, then the principal (here society) would then maximize the "aggregate" output conditional on the agent's effort. In other words, we can write society's objective function as

$$\Psi(e) = E[F(\delta_1, \delta_2)/e]$$

where $F(\delta 1, \delta 2)$ is the function describing "output" (i.e., the conduct of monetary policy) in terms of transparency ($\delta 1$) and the inflation target ($\delta 2$) inputs. $\Psi(e)$ is the function the principal wishes to maximize.

For a central bank under strict inflation targeting, one can suppose that $\delta 2$ is measured with little or no error. The same is not true of transparency since it can conflict with clarity. Therefore, write

$$\delta_1 = e_1 + \varepsilon_1$$

and

$$\delta_2 = e_2$$

where effort at achieving transparency is measured with error ($\varepsilon 1$), while the effort at achieving the inflation target is assumed to be measurable without error. Since $\sigma^2 \varepsilon 1 > 0$, it is natural for incentives to be oriented toward achieving the inflation target both because it is easier to evaluate as well as due to the fact that such objectives tend to be jointly agreed to by the government and the central bank. Clearly, the fact that transparency is a relatively

"noisier" output does not imply than society wishes the central bank to neglect this task entirely. However, society has to "balance" incentives to achieve some optimal combination of the two outputs. A further complication arises when changes in one output conflict with "production" of the other, an especially relevant consideration in weighing the costs and benefits of more transparency in an inflation targeting environment. The relevant industrial organization literature (e.g., see Dewatripont, Jewitt and Tirole 2000) suggests that, in the present context, greater effort be placed on improving the measurement of central bank transparency. Alternatively, central banks should be provided with incentives to increase the clarity of their actions. One such device is the release of statements at fixed intervals, whether or not discount rate actions are taken.

There are a couple of potential caveats to the foregoing assessment. First, transparency is treated as an objective in its own right on a par with attaining the inflation objective. It could be argued instead that transparency is part of an overall strategy to achieve a stated inflation goal. While this is a reasonable view it presupposes that transparency and clarity go hand in hand. This is almost certainly not the case.

3 The Evolution of Transparency and Accountability at the Bank of Canada

3.1 An Early Attempt at Accountability and Transparency

For reasons stated earlier, it is common to trace the accountability-transparency debate to the de facto or de jure granting of autonomy to several central banks beginning in the 1980s, with the movement gathering momentum in the 1990s (Siklos 2001). However, in a significant sense, the Bank of Canada's history, in particular, suggests a much earlier confrontation that brought to a head the role of accountability and transparency.

The Coyne Affair of 1959-60, spurred by a disagreement over how tight monetary policy should be, revealed an apparent flaw in the *interpretation* of the statutory relationship between the Bank of Canada and the federal government. The original Bank of Canada Act (1936) gave the Governor the right to veto any decision by its Board or Executive Committee. In such circumstances, the Governor had to inform the Minister of Finance in writing and the cabinet would then either support or contradict the Governor's veto.[14]

---

[14] Muirhead (1999, p. 168-9) argues that the veto power stems from the fact that, originally, the Bank of Canada's shares would be publicly owned and the government had no control over who the directors might be.

Although the Minister of Finance at the time of the creation of the Bank of Canada recognized that elected officials were ultimately responsible for monetary policy ("There cannot be two sovereigns in a single state." (Muirhead 1999, p. 169)) the point seemed to be ignored or misunderstood by the Conservative government at the time James Coyne was Governor of the Bank of Canada. It is also possible that lawmakers felt that conflicts were a remote possibility (Watts 1993, pp. 20-1).

But such a conflict did take place (see Rymes 1994).[15] The outcome was the Rasminsky directive of "dual responsibility" – named after Coyne's successor, Louis Rasminsky, who had been a deputy governor at the time of Coyne's mandate. It was agreed that while the Bank has responsibility over monetary policy, the government – specifically, the minister of finance – has the power to override it by issuing a directive. Such a directive has never been published. Moreover, Rasminsky expressed the opinion that, if a directive were ever issued, the governor would be duty-bound to resign.

Presumably, any such directive requires the finance minister to outline areas of conflict and the reasons behind the move to force the central bank to adopt a policy it disagrees with. Such an approach necessitates therefore a level of transparency about government views concerning the appropriate stance of monetary policy and it may find such a requirement undesirable. In contrast, an inflation target also requires that efforts at transparency be undertaken but this time by the central bank.

It took six years for the directive to be enshrined in the *Bank of Canada Act* (where it remains today as section 14 of the Bank of Canada Act of 1967). The addition of this clause, however, probably made the Bank more, not *less*, independent (Rymes 1994)[16]. Significantly, the requirement that the Governor resign in such cases was *not* included the act. Even so, Cukierman (1992, appendix 19A) records no change in the degree of independence assigned to the Bank of Canada since he views *some* executive branch authority over monetary policy matters as always equivalent to a lack of independence. By contrast, a public-choice analysis of the Coyne Affair would lead to a different conclusion. The political costs of a public conflict with the central bank over a matter of policy might

---

[15] Following a policy conflict with Bank of Canada Governor James Coyne, the government of the day, headed by Prime Minister John Diefenbaker, asked Coyne to resign. When he refused to do so, the government introduced legislation to declare his position vacant. The House of Commons passed the bill, but the Senate did not. Feeling vindicated, Coyne then resigned.

[16] Interestingly, a similar arrangement can be found in the Netherlands Bank Act of 1946 (article 26; see Aufricht (1967, vol. II, p. 471)). Whether Rasminsky was somehow inspired by the Dutch legislation is not known.

outweigh any perceived benefits from a government's simply taking direct responsibility for the consequences of a policy. [17]

Crucially, however, the Bank did not become more accountable, as ultimate responsibility for monetary policy continued to rest with the federal government. Moreover, unlike the German experience, the Canadian tradition did not translate into accountability to the public at large for delivering good monetary policy. Yet, it could be argued that, since the division of responsibilities between the ultimate objectives of monetary policy and day-to-day monetary policy actions were clarified, Bank of Canada operations became clearer, if not more transparent.[18]

3.2 Accountability and Transparency in the 1990s

In 1988, then Governor John Crow set out his vision of the mission of the Bank of Canada, namely to provide price stability (Crow 1988). Price stability has never been formally defined – although decisions to do so in 1995 and 1998 were deferred to 2001 – but, subsequently, he and then Minister of Finance Michael Wilson agreed to inflation control targets as part of the 1991 federal budget. The Bank interpreted this as signaling that a greater degree of public accountability would be expected and that Bank of Canada operations would also need to become more transparent, though the latter requirement was never stated in the budget. Curiously, the need for greater accountability and transparency seem to have originated with the Bank of Canada, not from the government or Parliament (Crow 1994). No changes in legislation were introduced following the Manley Report (Canada 1992) which essentially concluded that "if it ain't broke, don't fix it." Nevertheless, efforts to increase accountability and transparency were apparent from a series changes in the operations of the Bank of Canada, in addition to the adoption of an inflation targeting policy[19].

---

[17] .It is interesting to note that several central banks in the industrial world struggled at approximately the same time with the issue of the appropriate division of responsibility and accountability over short-run monetary policy decisions. Although notions of central bank autonomy were well understood at the time, the "technology" allowing the assignment of a quantifiable measure of central bank performance was not yet sufficiently developed.

[18] Indeed, it was during Rasminsky's tenure that the Bank of Canada *Review* was introduced, providing articles about monetary policy, descriptions of the Bank's research capabilities, speeches and press releases.

[19] Again, these events were not unique to Canada. At about the same time, several members of the US Congress attempted to reform the US Federal Reserve via the Federal Reserve Accountability Act of 1993. It failed to pass into law in large part because the Fed succeeded in painting the reforms as reducing the Fed's autonomy vis-à-vis the Congress and the Executive.

(1) In 1995, the Bank's Annual Report was revamped to include discussion of how it carried out its responsibilities;

(2) Also in 1995, the Bank introduced the Monetary Policy Report (MPR) intended to reflect "… the framework used by the Bank in its conduct of monetary policy." (Bank of Canada 1995);[20]

(3) In 2000, the Bank adopted fixed dates for announcing changes to the Bank rate (www.bankofcanada.ca/fixed-dates/index.htm).

The primary focus of the report centers around inflation developments and outlook as well as a statement about how the inflation control targets are to be achieved. Hence, the MPR can, in fact, be likened an inflation report. The report is from the Governing Council, which consists of the Governor and the Deputy-Governors. The Council is a creation of the Bank and is not, as such, sanctioned by Statute. The report is issued twice a year with a quarterly update of the semi-annual MPR introduced in 2000.

In mid 1994, a significant change took place in the Bank's operating procedure when it announced a target range or band for the overnight interest rate. Beginning in October 1996 (October 28), the Bank further decided to target the mid-point of the overnight band. Previously, it had targeted the upper edge of the band.

Finally, in 1995 (12 April), the Bank announced new foreign exchange intervention guidelines. Foreign exchange intervention practices would become more public but greater exchange rate variability would also be tolerated prior to triggering intervention (Murray, Zelmer and McManus 1996). In July 1998, the Bank further announced that foreign exchange interventions would henceforth be immediately announced on its website while in September 1998, the Bank abandoned rules-based interventions (Beattie and Fillion (1999)).[21]

Table 1 provides a chronology of these changes. Figure 1 plots the inflation rate in the overall CPI, core inflation, and the inflation control targets. Figure 2 plots the overnight rate band as well as the actual overnight rate. Between April 1994 and May 1999 there were 41 changes in the operating band (Muller and Zelmer 1999, Table 2).

---

[20] The Bank of Canada has since 1971 published speeches, articles about monetary policy and a wide variety of macroeconomic and financial data in the Bank of Canada *Review*, published quarterly. In 1999 the data section was removed and the *Bank of Canada Banking and Financial Statistics* publication introduced and published on a monthly basis.

[21] Since the policy was insituted, the Bank intervened only once, on September 21, 2000, as a G7 measure to support the euro. The Bank's web site merely announced the intervention but provided no details.

Not all procedural and other changes undertaken either by the government or the Bank of Canada may be said to have been positive from the standpoint of accountability and transparency. First, there has been no change in the Bank of Canada Act of 1967 to reflect the relatively greater emphasis on price stability. The importance of statutory independence and precision in objectives is, of course, a hotly debated question (e.g., see Cukierman (1992), Bernanke et al. (1999), Siklos (2001)). Second, the federal government deferred to 2001 a decision, originally scheduled for 1995, to define price stability.[22] It is unclear how significant such a deferral is in part because the inflation control targets were in fact extended in 1998. The issue of how to define price stability seems to have attracted more attention in academic circles where disagreements abound about, for example, whether zero inflation is too low while a survey of central banks with inflation targets suggests that some kind of consensus has been reached (e.g., see Bank of Canada 1999, Mayes and Chapple 1995).[23]

Third, despite arguments in favor of the release of central bank inflation forecasts, and their apparent spread especially among inflation targeting central banks (e.g., see Siklos 1999), the Bank of Canada has, so far, chosen not to follow this route (see Muller and Zelmer (1999)). The reasons include a concern that the time horizon of interest to the central bank and financial markets are not in general the same. As noted earlier, the Bank's mandate for price stability should not be influenced by day-to-day or even month-to-month gyrations in financial markets. Indeed, there is the danger that financial market developments may make the Bank too myopic (Siklos 1999). It is likely, however, that financial market participants are aware of this problem and should be able to place any forecast in the proper context, especially if the Bank is transparent about how such forecasts are generated and communicated.

Second, a forecast represents the staff's view of the future inflation outlook, so its publication might give such views predominance over those of the Governing Council, thereby confusing markets. I return to this issue below.

Third, the Bank worries that views about monetary conditions represent implicit views about future exchange rates. However, the risks of such an interpretation are dependent on its ability to communicate its views about the determinants of the exchange rate and its

---

[22] "It was also agreed that a decision will be made by 1998 on a target range for the CPI that would be consistent with price stability." (Bank of Canada 1995, p. 3).

[23] Needless to say there is a large literature about the costs and benefits of low or zero inflation that space limitations prevent one from quoting from in great detail. Perhaps the most public of articles dealing with the controversy was by Paul Krugman, published in *The Economist* (7 September 1996).

own intervention practices. Here the issue of conditional versus unconditional forecasts becomes relevant. The former poses an especially tricky communications problem for a central bank. It has to defend the assumptions on which the forecasts are originally made and, in the event these conditions are wrong, why it might be led to set policy based on a different set of assumptions after the fact (also see Tarkka and Mayes 1999). Presumably, in the Canadian context, any expression of expected or forecasted monetary conditions must be conditional on no intervention and on a policy of no "particular level for the exchange rate"(www.bank-banque-canada.ca/english/backgrounders/bg-e2.htm).[24]

Unfortunately, however, the Bank, in an attempt to be open with financial markets in particular, may have inadvertently made matters worse via the publication and publicity given to the monetary conditions index (MCI).

The MCI is a linear combination of an interest rate and an exchange rate pioneered by the Bank of Canada (e.g., see Bank of Canada (1998)). The appeal of the MCI is understandable since, in a small open economy, relative changes in these two variables can signal not only future inflation but provide an indication of the current stance of monetary policy. There are a number of difficulties with the uses and interpretation of the MCI that cannot be discussed here (e.g., see Siklos 2001a, Eika, Ericsson and Nymoen (1996)).However, there are at least two negative side-effects of the MCI, as far as transparency of central bank operations is concerned. First, as pointed out earlier, because the (nominal) MCI can be evaluated on a daily basis there is the danger that financial markets might expect the Bank of Canada to react to every "wiggle" in the index. The Bank of Canada has, of course, strenuously denied this possibility (e.g., Freedman (1995), and Bank of Canada (1995)) but some observers were convinced that, for a time at least, the Bank of Canada targeted the MCI. The MCI is perhaps an illustration of the dangers of being too transparent or of enhancing transparency at the expense of clarity. Simple indicators may be useful for policy discussions at the highest levels of decision-making at the central bank, but they raise the possibility that markets will place too great a weight on their day-to-day movements.[25] This is all the more so because it is the *only* high frequency indicator of the overall stance of monetary policy, unless one is willing to resort to stock market index movements, also available at very high frequency. It is, therefore, ironic that the Bank, concerned about a dissonance between the time horizon applicable to monetary policy versus the one relevant for many financial market decisions, would resort to

---

[24] Indeed, central banks that do publish forecasts are at pains to point out that these are conditional on unchanged interest rates or exchange rates. Therefore, any forecast is but a point within an interval whose width is determined in part by uncertainty about future economic shocks.

[25] The Bank of Canada's November 1996 Monetary Policy Report, in describing the MCI, stated: "…, for convenience, the Bank focuses on the nominal MCI because it can be updated daily" (p. 21).

publicizing the MCI but not to publishing an inflation forecast. Furthermore, the Bank worries that an inflation forecast might signal the Bank's expectation of the future exchange rate. However, the MCI is not helpful in this connection since its information content is dependent on the base period used. In other words, the ease or tightness of policy, as interpreted by the Bank, is largely a function of the values of the components of the index at a reference date chosen by the Governing Council but which is not clearly communicated to the public, as shown in Table 2. Indeed, the Table appears to suggest a considerable de-emphasis on the MCI since 1998. In a sense then, the Bank is too transparent by publicizing the index but not transparent enough about the interpretation of changes in the index. In other words, transparency has been sacrificed at the expense of clarity. As discussed in Siklos (2001a), the Reserve Bank of New Zealand took the additional step of stating a desired level of monetary conditions. The RBNZ eventually backed away from emphasis on the MCI when markets became confused about how the RBNZ would react to changes in the MCI relative to some changing target.[26] Figure 3 plots the daily MCI for the period June-December 1998, the year of the Asian and Russian financial crises. The strong downward movement in the MCI signalled, at least relative to June 1, a significant easing of monetary conditions. Markets clearly viewed monetary policy as easing significantly (see section 5 below) and the Bank eventually raised the target for the overnight rate by a full percentage point on August 27th. The Bank's press release claimed that monetary easing was "excessive" (www.bank-banque-canada.ca/english/press/pr98.6/htm) but did not provide a benchmark against which markets could assess the degree of ease or tightness. As can be seen from Figure 3, the MCI resumed its downward trend and the overnight target was reduced twice (by .25% each time) driven by similar actions taken by the US Fed and renewed "confidence in Canadian financial markets" (www.bank-banque-canada.ca/english/press/pr.98-11.htm). No reference to monetary conditions as such were made which continued to ease relative to the chosen reference date.

Returning to the communication of discount rate changes, part of the difficulty is that, having adopted a target for the overnight band, the Bank of Canada, until late 2000, chose to issue a press release only when the target was changed and not to "speak" when the overnight rate was left unchanged. In contrast, the Fed (and, as we shall see, the Bank of England) have for some time issued statements or minutes of their regular meetings. As pointed out by Laidler (2000), this approach may confuse markets "…because a decision *not* to change interest rates is sometimes just as important as one to do so, and needs just as much public explanation."(op.cit., p.2, italics in original) In addition, the Bank of Canada's

---

[26] The RBNZ faced an additional difficulty in that it used "open mouth" opeartions to influence interest rates (see Guthrie and Wright 2000) but did not target them directly as in Canada.

approach may have inadvertently dawn attention to the exchange rate and to decisions of the US Federal Reserve. Table 3 lists the dates of the meetings and actions of the Federal Reserve Open Market Committee (FOMC) since 1997. Of the 14 discount rate changes, half of them mirror decisions taken by the Fed a day or so earlier. This has given the impression to some observers that Canada does not effectively have an independent monetary policy. The criticism is a bit unfair since the FOMC has itself only recently begun to issue an official press release in the event the federal funds rate is left unchanged. However, as the Table notes, minutes of the meetings have been released for as time though not in a timely fashion. Second, the apparent common movements in US and Canadian discount rates took place at a time when the two countries' aggregate growth cycles were coincident.

3.3 Implications for Financial Markets and Inflation

Presumably, the benefits of openness, transparency, and accountability increase the awareness of financial markets and the public about the aims and limitations of monetary policy. As a result, one would expect these developments to *increase* the credibility of central bank actions. While the economics profession continues to grapple with how to quantify precisely the notion of credibility, there exist a variety of indicators at our disposal which are highly suggestive of credible policies. They include private sector expectations of inflation, direct explanations and briefings to "experts" who then express their views to the media, and the media's interpretation of the aims and consequences of central bank decisions. It is less clear, however, how greater openness and transparency might affect financial markets. Since such a move indicates that the *volume* of information provided by a central bank increases one might expect, other things being equal, *more* volatility in financial asset movements. Greater transparency ought to signal *fewer* central bank surprises so that central bank monetary policy decisions should not, as such, contribute to greater asset price volatility. We can, however, predict that more openness and transparency should contribute to *less* uncertainty in financial markets.

Muller and Zelmer (1999), and Haldane (1997) propose a simple test of transparency in central banking by examining the response of daily interest rate changes across the term structure conditional on several determinants. These include: changes in the exchange rate and changes in central bank interest rates. Perfect transparency requires that changes in interest rates not be affected by central bank decisions (i.e., there are no central bank "surprises"). Both Muller and Zelmer (1999) and Haldane (1997) find that such surprises do matter but that their quantitative importance declines with the term to maturity. Haldane also finds, however, that surprises along the yield curve largely disappear following the adoption of inflation targets.

Turning to inflation, more precise objectives for monetary policy, combined with mechanisms to communicate how these objectives are to be met, would be expected to contribute to lowering expectations of inflation or, rather, maintaining them within the stipulated target range. It is also conceivable that if future inflation developments, as interpreted by the central bank, are credible and are communicated effectively, these should influence private sector forecasts of inflation. Nevertheless, central bank transparency, if it is high, can also reinforce existing expectations not alter them.

Finally, it is unclear how Governor Thiessen's remarks about openness and transparency contributing to a *fairer* assessment should be interpreted. While the Governor no doubt hopes that public assessments are more favorable, a fairer assessment can also mean that the Bank's views are communicated more clearly and disagreements or unfavorable reviews of any decisions are at least aired in a more objective fashion. Clearly, this aspect of openness and transparency is extremely difficult to measure. In this connection, it is unfortunate that the diversity of views about current and future economic prospects in general, and the inflation outlook in particular, is not communicated to the public as is the case with the UK's Monetary Policy Committee (MPC). If it is assumed that a convergence of sorts, among academics and central bankers, has emerged about the desirability of low and stable inflation rates, an airing of differences in views within the policy making committee of a central bank ought to contribute not only to enhancing transparency but to increasing the accountability of the members of the Governing Council. The absence of such information suggests that consensus about future monetary policy actions always exists while, in reality, such a condition may only emerge from time to time. It is possible, of course, that publication of different views may increase uncertainty but it is more likely that such uncertainty is reduced because it is almost always the case that disagreements among MPC members, for example, are expressed in finely balanced terms. Moreover, financial markets especially are able to make their own assessments of the appropriateness of various views. Of course, settling these issues is an empirical question to which section 5 is devoted to.

An important roadblock to the release of the diversity of views within the Council is the fact that the Governor is statutorily responsible for the day to day implementation of monetary policy. In a sense then, statutory considerations, emphasized by Cukierman (1992), and many others since, plays an indirect role in explaining the degree of accountability that can be expected by a central bank.

4 Data

Inflation in the CPI at the monthly frequency from CANSIM (Statistics Canada) is used along with inflation for a group of comparable countries. Since the adoption of inflation targeting is a fairly recent phenomenon cross-country comparisons can be useful because of differences in the response, among industrial countries especially, to the need for greater openness and accountability in central bank actions. Data from Australia, Sweden, New Zealand, Spain, the UK, all of which formally target inflation, as well as data from Austria, Germany, the Netherlands, Switzerland, and the US, are used. The latter group of countries has an exemplary record of inflation over the last few decades but have not formally targeted inflation. Yet, they are all viewed as implicitly following an inflation objective. Arguably, their attitude toward transparency, for the most part, differs from the approach taken in most inflation targeting countries.

Private sector forecasts of inflation are also used and were obtained from The Economist's Poll of Forecasters and, in the case of New Zealand, from the New Zealand Institute of Economic Research (see Siklos 1999 for the details).

Daily interest rate data were obtained from the Bank of Canada (also see Siklos 1999a for the details).[27] Additional data were taken from Rogers and Siklos (2000) who use the implied volatility in options prices, a forward looking measure of volatility, and the kurtosis from the distribution of options on foreign currency futures, a forward looking measure of uncertainty. Although such indicators are proving to be increasingly popular measures of volatility and uncertainty, they are not without problems (e.g., see Melick (1999)).

Finally, assessments of Bank of Canada policy were obtained from articles in two national Canadian dailies, namely the *Financial Post* and the *Globe and Mail*. Details of the compilation and classification of these articles are contained in a separate appendix. Tables 1 and 3, as well as Table A3 of the Appendix, contain information about events data from the Bank of Canada, the Bank of England, and the US Federal Reserve.

---

[27] We use the three month eurorate although Muller and Zelmer (1999), for example, use the 90 dy Bankers' acceptance rate. The two yields follow each other extremely closely and none of the inferences were affected by the choice of the eurorate.

5 Empirical Results

5.1 High Frequency Evidence

We begin our analysis of the possible impact of measures to increase the transparency of central bank operations by examining the evolution of financial market uncertainty. As noted earlier, an increase in transparency ought to reduce uncertainty about central bank monetary policy actions, conditional on the clarity of the communication of information by the central bank. Table 4 considers four key financial market indicators available at the daily frequency. They are: the overnight interest rate; the slope of the yield curve, defined as the spread between long-term and short-term yields; the forward exchange premium; and, finally, the US-Canada interest rate differential. These are all indicators keenly followed by the central bank and financial markets.

A measure of uncertainty is kurtosis. Kurtosis measures the peakedness or flatness of the distribution of a time series or the likelihood of extreme outcomes and can, therefore, also be interpreted as a measure of uncertainty. A change in kurtosis reflects changes in market perceptions of future values of the series of interest. As is well known, financial asset prices tend to be "fat-tailed" and are "highly peaked" relative to the normal distribution (e.g., see Mills (1999, chapter 5)) which has a value of 3. Excess kurtosis is then defined as an estimate that is less than 3.

Examining the results for the overnight interest rate, we notice that while kurtosis is near normal for the full IT sample, the likelihood of extreme outcomes is smaller (i.e., the distribution is more highly peaked) around the release of MPRs. Since these are all measures associated with greater transparency there is some evidence that these did in fact reduce uncertainty about interest rate developments. Notice, however, that uncertainty is relatively higher around changes in the target band and is especially high when "large" changes in the overnight rate, defined as 50 basis points or higher, were made. Interestingly, there appears to be an asymmetry of sorts between positive and negative changes in interest rates and their impact on uncertainty. Hence, positive changes are associated with more uncertainty than are negative changes. Finally, we also see that uncertainty is generally higher relative to most types of changes in the overnight rate when the overnight rate is unchanged and there is no statement from the central bank. This suggests the need for regular releases of information even when the central rate is not altered.

Turning to the other indicators considered in Table 4, they are all consistent with excess kurtosis. Nevertheless, there are some interesting differences across the cases considered.

For example, if we assume that inflation expectations are constant at very high frequencies, then positive changes in interest rates should signal a tightening of monetary policy while the reverse is true for falling overnight rates. Uncertainty about the future stance of monetary policy, as reflected in the yield curve, is lowest around increases in the overnight rate and around changes in the overnight band. There appears to be little impact on uncertainty around the time MPRs are released. Therefore, since the release of MPRs does not signal any increase in uncertainty while decisions taken to change the overnight rate band actually reduce uncertainty these results can also be viewed as a little bit of evidence that transparency has beneficial effects.

Similarly, the period since inflation targets were unchanged, that is since 1995, and around the release of MPRs, result in the least amount of uncertainty about anticipated future exchange rate developments.[28] The same result is essentially found for the US-Canada short-term interest rate differential though it is again interesting to note that positive changes in the overnight rate are associated with a considerably flatter distribution of US-Canada short-term interest rate differentials and, as a consequence, more uncertainty.

Evidence based on foreign currency options reveals that changes in the overnight band and, in particular, reductions in the target overnight rate, reduce average implied volatility relative to that found in the full inflation targeting sample. The publication of MPRs, positive changes in the overnight band, especially "large" changes in the overnight rate, increase average implied volatility relative to the full inflation targeting sample.

Uncertainty, as measured by the options data, has fallen on average since inflation targets were unchanged. However, MPRs and increases in the overnight band all contributed to increase market uncertainty relative to the full inflation targeting sample. Interestingly, however, if we exclude the Asian crisis period uncertainty is reduced when "large" changes were made in the target overnight rate.

Turning to UK evidence, shown in Table 5, we find that, as in the Canadian case, changes in the repo rate are generally associated with lower uncertainty among framework market participants, as measured by financial indicators. Of more interest, however, is the finding that while market uncertainty increases at the time of the release of MPC minutes uncertainty is generally lower when the committee is split than when a unanimous decision is taken. Therefore, MPC meetings as such are less important than the information content of such meetings, as proxied by committee voting patterns. Further, there is also less

---

[28] While targets have been unchanged since 1995, inflation in Canada was already at target by 1992. See Figure 1.

uncertainty in the repo rate when it is unchanged as well as in the UK-German interest rate differential relative to small and large changes in the repo rate.

Two important caveats to the interpretation of the foregoing results are in order. First, the estimates of kurtosis are, with the exception of when options data are used, unconditional and it is certainly possible that over time other factors may explain the rise or fall in uncertainty though these considerations are not likely to be crucial given the small window size used, at least for many of the calculations shown. Second, changes in the overnight target band and the repo rate tend to be clustered in time, as are split and unanimous committee decisions (see Table A3, appendix for the UK, and Muller and Zelmer (1999) for Canada). These considerations may also indirectly influence market sentiment about monetary policy uncertainty.

Table 6 evaluates kurtosis around the time items about Bank of Canada policy in the Financial Post (FP) or the Globe and Mail (GM), as well as the impact of Bank of Canada announcements on financial market uncertainty. In addition, a distinction is made between favorable (i.e., agreeing with Bank of Canada actions) and unfavorable comments about the Bank of Canada. Finally, calculations were performed over two samples, namely 1986 (or 1990 depending on data availability)-98 and 1995-98. The former sample represents roughly the period when the Bank of Canada announced its intention to control inflation, followed by the formal announcement of inflation targets in the 1991 budget. The latter sample coincides approximately with the period of greater transparency in Bank of Canada operations.

In general, Bank of Canada statements reduce uncertainty in the period since transparency was enhanced, except in the level of overnight interest rates. Furthermore, there tends to be little differential impact between favorable or unfavorable news on uncertainty. Moreover, in the case of GM,, items about the Bank of Canada have reduced market uncertainty since 1995, regardless of whether the item is favorable or unfavorable about the Bank of Canada. Results are much more mixed in the case of FP news items. It is also quite clear that items around the time the Bank of Canada changes the overnight target band produces less uncertainty. All things considered, results such as these may be interpreted as broadly consistent with the Governor's interpretation that public commentary of Bank of Canada policies have been fairer in recent years, assuming that "fairness" can be interpreted in terms of uncertainty. This is true despite the fact that, as reported in Table 7(A), one can reject the null hypothesis that favorable comments are as likely as unfavorable comments, at least when the source of the news items is from the GM, while the commentary is more likely to be equally divided when originating from the FP. Indeed, Table 7(B) reveals no non-random pattern in favorable or unfavorable comments about the Bank of Canada in

any of the post-inflation target samples considered. Therefore, it is conceivable that the impact of reporting about Bank of Canada policies on financial market uncertainty is not primarily due to some type of bias in reporting but may, in fact, reflect better communication through increased transparency in the central bank decision-making process.

As with the earlier evidence some caveats are in order. First, the number of observations is relatively small, as is clear from the tests conducted in Table 7. Second, news items dealing with the Bank of Canada cover a myriad of subjects which were not controlled for and are occasionally written by the same author which could impart a type of selection bias effect (see Table A1, appendix). Hence, the results are, at best, suggestive of the beneficial impact of transparency.

5.2 Conditional Interest Rate Changes

Conditional estimates of the impact of transparency on interest rate changes are provided in Table 8. They are based on specification outlined in Muller and Zelmer (1999) and Haldane (1997), although a few wrinkles are added owing to the availability of a richer set of public and central bank announcement data.

$$\Delta Spread_t = a_0 + B(L)\Delta Spread_t + a_1\Delta OB_t + a_2\Delta OB_t * BOC_t + a_3 MPR_t + a_4 NEWS_t + a_5\Delta FX_{t-1} + a_6\Delta FFR_t$$

where *Spread* is the US-Canada interest rate spread (at the 3 month and 10 year terms), *ΔOB* are the changes in the overnight operating bands, BOC are Bank of Canada statements in the form of a dummy variable set to 1 on the day of the announcement or press release and 0 otherwise, MPR is a similarly defined dummy for the release of monetary policy reports, NEWS is a vector of variables for news announcements about Bank of Canada policies in the press, ΔFX is the first log difference in the CAD/US exchange rate, and ΔFFR is the change in the US Fed funds rate. Coefficients a_1 to a_4 are of greatest interest as they capture the impact of various "surprises" on interest rate spreads.

Table 8 reveals that changes in the operating band (OB) raise the US-Canada interest rate differential at both the short and long end of the maturity structure, though the coefficient is relatively larger at the short-end, consistent with the findings of Haldane and Muller and Zelmer. Notice, however, that if we interact the impact of changes in the OB with Bank of Canada statements and press releases, any impact on the spread disappears at the 3 month frequency. This is not the case at the 10 year term where the interaction term actually has an effect that is statistically different from zero and negative. Hence, transparency, as

defined here, has contributed to lowering the spread at the long end of the term structure, that is, precisely for the term that is most likely to reflect changes in inflationary expectations. In addition, there is (weak) evidence that the release of the MPR also appears to reduce the US-CAN interest rate spread. However, the beneficial impact form this transparency measure is more than offset form the increase in the spread due to news reports about Bank of Canada policies in the Financial Post.

5.3 Transparency and Inflation Expectations

Although the beneficial effects of transparency may be easily detected reflected in high frequency data central banks no doubt also keenly hope that improvements in the manner in which policies are communicated impact private sector expectations of inflation, the primary goal of monetary policy.

Using monthly data, I first investigate whether the release of inflation reports influences private sector forecasts of inflation and whether there are any noticeable differences between countries which formally target inflation versus other major central banks with historically strong inflation records.

Two sets of regressions were estimated in a panel setting. The first asks whether private sector inflation forecasts are influenced by the previous forecast as well as by the publication of an inflation report and the existence of inflation targets. For comparison, a second regression examines the persistence properties of inflation via the estimation of an AR(1) model of inflation.[29] Two panels are considered: a group of 12 countries, six of which do not formally target inflation but are considered to have exemplary inflation records. They are: US, Germany, Switzerland,[30] Austria, the Netherlands, and Japan. The remaining countries formally target inflation and the same models are re-estimated for this separate group of countries. They are: Australia, Canada, Sweden, New Zealand, Spain, and the UK.

The results in Table 9 reveal that inflation reports, largely in place among the inflation targeting group of countries by the mid 1990s, significantly reduced inflation forecasts since 1995. In contrast, the adoption of inflation targets themselves, a feature in place since the early 1990s in most of the relevant countries samples, also has a negative impact on forecasts of inflation. While it is difficult to allocate the relative contribution of inflation

---

[29] For a theoretical and empirical justification of these models see Siklos (1999) and Burdekin and Siklos (1999).

[30] Beginning in 2000, Switzerland became an inflation targeting country.

targets, an indication of increased accountability, as opposed to the publication of an inflation report, a proxy for enhanced transparency, panel estimates for the group of inflation targeting countries suggest that transparency played a significant role. Finally, the results reveal that while inflation persistence fell in all 12 countries during the sample considered, as measured by the coefficient on lagged inflation, the impact was relatively larger for the inflation targeting countries. The results confirm, in a panel setting, similar results obtained for individual inflation targeting countries (Siklos 1999). Both increased accountability and transparency can explain these results. In particular, the drop in persistence can be interpreted as the outcome of attempts by central banks to be more forward-looking, that is, effectively target a forecast for inflation, rather than being backward-looking as was perhaps previously the case.

A further test of the impact of changes in central bank policies on inflation may be obtained by asking two related questions. First, are private sector forecasts efficient and unbiased? Second, does the adoption of inflation targets and the publication of inflation reports have any impact on forecast efficiency and unbiasedness? Table 9 provides some suggestive answers. The basic form of the regressions can be summarized as follows:

$$\pi_t - E[\pi_t | I_{t-1}] = \alpha + \beta(L) X_{t-1} + (\delta - 1) E[\pi_t | I_{t-1}] + \upsilon_t$$

where π_t is the CPI inflation rate, $E[\pi_t | I_{t-1}]$ is the inflation forecast conditional on information at time t-1, X_{t-1} is a vector of observables describing economic activity of time t-1, and $\beta(L)$ is a distributed lag function. X_{t-1} is assumed to be made up of two variables, namely output growth and the interest rate. Both are likely determinants of inflation in the short-run.[31]

If inflation targeting increases accountability, transparency, or both, these can serve to reduce forecast erros. Indeed, the results in Table 10 reveal this to be the case. It is also noteworthy that the result fails to hold prior to 1995 (results not shown). This result is consistent with the view that inflation targeting reduces forecast errors beyond their possible impact on credibility since, by 1995, inflation targets had been in place for a few years and were largely unchanged following transitional targets in the early years (see Siklos 1999 for the details). Also, the publication of inflation reports does not impact on

---

[31] Output is measured via the growth rate in real GDP which is available only at the quarterly frequency so the data were transformed to monthly via a cubic spline. All data are from IFS, except for Germany and Japan where data were taken from the OECD. A short-term market interest rate was used for all countries. They are: money market rate (Austria), treasury bills (Australia), treasury bill rate (Canada), call money rate (Germany, Japan, Netherlands, Spain), bank bills (New Zealand), treasury discount notes (Sweden), eurodeposit rate (Switzerland), 3 month with bank loans (UK), fed funds rate (US).

forecast errors. There are two possible explanations for this result. First, any impact from MPRs may be quickly dissipated and may, therefore, not show up at the monthly frequency. Alternatively, inflation reports may, over time, have proven not to contain a "surprise" element, thereby contributing to the stability of short-term inflation expectations.

Indeed, in the Canadian case alone, an impulse response function measuring the impact of the release of MPRs on inflation forecast errors (see Figure 4), shows no "statistically" significant impact over 10 months. Further, on the positive side, inflation forecasts add significantly to the regression's explanatory power though the null that $\alpha = 0$ (or $\alpha-1 = 1$) is rejected. On the negative side, $\alpha = 1$ and $\beta(L)=0$ are hypotheses that are both easily rejected so that inflation forecasts are neither efficient nor unbiased.

A couple of features about the panel estimates should be discussed at this stage. First, all variables in Tables 9 and 10 are in first differences thus eliminating the constant term in the regressions. This is due to Nickell's' (1981) result that estimators in levels are biased and the bias is especially serious when the time dimension is small. Second, it should also be noted that an F-test easily rejects the fixed effects in favor of the results shown in the Tables.

6 Conclusions

This paper has investigated the role played by measures to increase the transparency and accountability of monetary policy actions in Canada. Contrary to the existing literature, it was argued that the impact of these developments is best measured via its effects on financial market uncertainty that necessitates reliance on high frequency data. This is a reflection of the fact that, even under inflation targeting, central banks have other, sometimes competing or conflicting objectives, such as the maintenance of financial stability.

Additional tests were also presented to illustrate the beneficial impact of monetary policy transparency on public commentary about Bank of Canada policies. Also, the impact of inflation targeting, as a proxy for accountability, and the publication of an inflation report, a measure of transparency, on private sector forecasts of inflation was also considered. Beneficial effects from both were found, although one needs to be cautious about estimates based on monthly data. While more transparency and accountability are desirable features of central bank operations, clarity in communicating the policy stance is also important. The Canadian experience is instructive in this respect since it illustrates the dangers of

providing confusing information to financial markets with implications for other central banks. Occasionally then, providing too much information can be as damaging as providing no information at all.

References

Aufricht, H. (1967), *Central Banking Legislation* (Washington, DC: International Monetary Fund).

Banaian, K., R.C.K. Burdekin, and T.D. Willett (1998), "Reconsidering the Principal Components of Central Bank Independence: The More the Merrier?" *Public Choice* 97: 1-12.

Bank of Canada (1998), *Monetary Policy Report*, November.

Bank of Canada (1997), *Price Stability, Inflation Targets and Monetary Policy*, Proceedings of a Conference held at the Bank of Canada, Ottawa.

Bank of Canada (1995), *Monetary Policy Report*, May.

Beattie, N. and J-F. Fillion (1999), "An Intraday Analysis of the Effectiveness of Foreign Exchange Intervention", Bank of Canada working paper 99-4 , February.

Bernanke, B.S., T. Laubach, F.S. Mishkin and A.S. Poser (1999), *Inflation Targeting* (Princeton, NJ: Princeton University Press).

Blinder, A.S. (1999), "Critical Issues for Modern Major Central Bankers", paper presented at the ECB/CFS Conference "Monetary Policy-Making Under Uncertainty", 3-4 December, Frankfurt.

Briault, C., A. Haldane and M. King (1996), "Independence and Accountability", Bank of England working paper no. 49, April.

Buiter, W. (1999), "Alice in Euroland", *Journal of Common Market Studies*, 37 (June): 181-209.

Crow, J. (1994), "Central Banks: Independence, Mandates and Accountability", Ottawa: Bank of Canada, mimeographed.

Crow, J. (1998), "The Work of Canadian Monetary Policy", Eric Hanson Memorial Lecture reprinted in *Bank of Canada Review*, February.

Cukierman, A. (2000), "Accountability, Credibility, Transparency and Stabilization Policy in the Eurosystem", unpublished, Tel-Aviv University, January.

Cukierman, A. (1992), *Central Bank Strategy, Credibility, and Independence* (Cambridge, Mass: The MIT Press).

Cukierman, A. and A.H. Meltzer (1986), "A Theory of Ambiguity, Credibility and Inflation Under Discretion and Asymmetric Information", *Econometrica* 54 (September): 1099-1128.

Cukierman, A. and A.H. Meltzer (1986a), "The Credibility of Monetary Announcements", in M.J.M Neuman (ed.), *Monetary Policy and Uncertainty* (Nomos Verlagsgesellschaft, Baden-Baden), pp. 39-67.

de Haan, J., F. Amtenbrink, and S. Eijffinger (1999), "Accountability of Central Banks: Aspects and Quantificiation", *Banca Nazionale del Lavoro Quarterly Review*.

Dewatripont, M., I. Jewett, and J. Tirole (2000), "Multitask Agency Problems: Focus and Task Clustering", *European Economic Review* 44 (May): 869-77.

Eijffinger, S., M. Hoebrichts, and E. Schaling (1998), "A Theory of Central Bank Accountability", September, CentER, Tilburg University.

_____ (2000), "Why Money Talks and Wealth Whispers: Monetary Uncertainty and Monetary Mystique", *Journal of Money, Credit and Banking* 32 (May),: 211-35.

Eijffinger, S. and de Haan (1996), "The Political Economy of Central Bank Independence", Special Papers in International Economics, no. 19, May, Princeton University.

Eika, K., N.R. Ericsson, and R. Nymoen (1996), "Hazards in Implementing a Monetary Conditions Index", *Oxford Bulletin of Economics and Statistics* 58 (November): 765-90.

Faust, J., and L.E.O. Svensson (1999), "Transparency and Credibility: Monetary Policy with Unobservable Goals", International Finance Discussion Papers no. 605, March, *International Economic Review* (forthcoming).

Freedman, C. (1995), "The Role of Monetary Conditions and the Monetary Conditions Index in Canada", *Bank of Canada Review* (Autumn): 53-9.

Garfinkel, M.R., and S. Oh (1995), "When and How Much to Talk: Credibility and Flexibility in Monetary Policy with Private Information", *Journal of Monetary Economics* 35 (April): 317-40.

Geraats, P.M. (2000), "Why Adopt Transparency? The Publication of Central Bank Forecasts", working paper, University of California, Berkeley, July.

Goodfriend, M. (1986), "Monetary Mystique: Secrecy and Central Banking", *Journal of Monetary Economics*, 17: 63-92.

Issing, O. (1996), "The Eurosystem: Transparent and Accountable or 'Willem in Euroland'", *Journal of Common Market Studies*, 37 (September): 503-19.

Laidler, D.E.W. (2000), "Picking Up the Beat: Why the Bank of Canada Should Move to a Fixed Schedule for Monetary Policy Announcements", *C.D. Howe Institute Backgrounder*, 7 September.

Mayes, D.G., and B. Chapple (1995), "The Costs and Benefits of Disinflation: A Critique of the Sacrifice Ratio", *Reserve Bank Bulletin* 58 (March): 9-21.

Mayes, D.G. and W. Razzak (1998), "Transparency and Accountability: Empirical Models and Policy Making at the Reserve Bank of New Zealand", *Economic Modelling,* 15, 377-94.

Mills, T.C. (1999), *The Econometric Modelling of Financial Time Series*, Second Edition (Cambridge: Cambridge University Press).

Muirhead, B. (1999), *Against the Odds: The Public Life and Times of Louis Rasminsky* (Toronto: University of Toronto Press).

Muller, P., and M. Zelmer (1999), "Greater Transparency in Monetary Policy: Impact on Financial Markets", Bank of Canada Technical Report no. 86.

Murray, J., M. Zelmer, and D. McManus (1997), "The Effect of Intervention on Canadian Dollar Volatility", in *Exchange Rates and Monetary Policy*, Proceedings of a Conference held at the Bank of Canada, October 1996, pp. 311-56.

Nickell, S. (1981), "Biases in Dynamic Models with Fixed Effects", *Econometrica,* 49: 1399-1416.

Posen, A.S. (2000), "Lessons from the Bundesbank on the Occasion of its Early Retirement", in L. Mahadeva and G. Sterne (eds.), *Monetary Policy Frameworks in a Global Context* (London: Routledge), pp. 393-420.

Rogers, J. and P.L. Siklos (2000), "Foreign Exchange Intervention in Two Small Open Economies: The Canadian and Australian Experiences", working paper, Wilfrid Laurier University.

Rymes, T.K. (1994), "On the Coyne-Rasminsky Directive and Responsibility for Monetary Policy", in P.L. Siklos (ed.) *Varieties of Monetary Reforms: Lessons and Experiences on the Road to Monetary Union* (Boston: Kluwer), pp. 351-66.

Siklos, P.L. (2001), *The Changing Face of Central Banking: Evolutionary Trends Since World War II* (Cambridge: Cambridge University Press, forthcoming).

_____ (2001a), "Is the MCI a Useful Signal of Monetary Policy Conditions? An Empirical Investigation", *International Finance*, forthcoming.

_____ (1999), "Inflation-Target Design: Changing Inflation Performance and Persistence in Industrial Countries", *Review of the Federal Reserve Bank of St. Louis,* 81 (March/April): 47-58.

_____ (1999a), "Pitfalls and Opportunities for the Conduct of Monetary Policy in a World of High-Frequency Data", in *Information in Financial Asset Prices* (Ottawa: Bank of Canada), pp. 331-369.

_____ (1997), "Charting a Future for the Bank of Canada: Inflation Targets and the Balance between Autonomy and Accountability", in *Where We Go From Here*, ed. by D.E.W. Laidler (Toronto: C.D. Howe Institute), pp. 101-84.

_____ (1996), "The Connection Between Exchange Rate Regimes and Credibility: An International Perspective", in *Exchange Rates and Monetary Policy*, (Ottawa: Bank of Canada), pp. 73-121.

_____ and M.T. Bohl (2000), "Do Words Speak Louder than Actions? The Conduct of Monetary Policy at the Bundesbank", working paper, Wilfrid Laurier University.

Tarkka, J. and D.G. Mayes (1999), "The Value of Publishing Official Central Bank Forecast", Bank of Finland Discussion Paper 22/99, December.

Thiessen, G. (1999), "Accountability and Transparency in Canada's Monetary Policy", speech given to the Metropolitan Halifax Chamber of Commerce, 27 January www.bank-banque-canada.ca/english/speeches/

Walsh, C. (2000), "Accountability, Transparency and Inflation Targeting", unpublished, University of California, Santa Cruz, June.

Watts, G.S. (1993), *The Bank of Canada: Origins and Early History*, a collection ed. by T.K. Rymes (Ottawa: Carleton University Press).

Winkler, B. (2000), "What Kind of Transparency? On the Need for Clarity in Monetary Policy-Making", working paper 26, European Central Bank, Frankfurt.

Table 1:   Chronology of Changes in The Bank of Canada's Accountability and Transparency, 1988-99

Dates	Nature of Change/Announcement
January 8, 1988	Governor Crow's Hanson Memorial Lecture advocating the Goal of Price Stability
February 6, 1991	Announcement of Inflation Control Targets in the federal government's budget speech
May 3, 1995 November 8, 1995 May 8, 1996 November 14, 1996 May 15, 1997 November 19, 1997 May 13, 1998 November 16, 1998 May 19, 1999 November 17, 1999	Monetary Policy (Inflation) Reports
April 15, 1994 October 28, 1996	Band and Target for Overnight Interest Rates Mid-Point of band targeted by the Bank
April 12, 1995	New foreign exchange market intervention guidelines announced
July 1998	Foreign exchange market interventions to be announced on the web site
September 2000	Fixed dates for announcing changes to the Bank rate

Sources: Siklos (1997, 1999), Murray, Zelmer and McManus (1996), Muller and Zelmer (1999), and www.bankofcanada.ca.

Table 2: **Commentary on the Monetary Conditions Index in the Bank of Canada's Monetary Policy Report**

Issue of MPR	Benchmark Information/Bias
May 1995	Second half 94/tighter
November 1995	No benchmark/tighter
May 1996	No benchmark/easing
November 1996	No benchmark/no bias
May 1997	No benchmark/neutral
November 1997	First half of 1997/no bias
May 1998	1997/tighter
November 1998	May 1998/easing
May 1999	No benchmark/no bias
November 1999	No benchmark/no bias

Source: Bank of Canada, *Monetary Policy Report* (various issues).

Table 3: Changes in the Federal Reserve Funds Rate and the Bank of Canada Target Overnight Rate, 1997-2000

Date (dd/mm)	Size of fed funds rate change (no change if left blank)	Size of Bank of Canada target overnight rate change (no change if left blank)
2000		
27-28/8		
17/5		**+.5**
16/5	**+.5**	
22/3		**+.25**
21/3	**+.25**	
3/2		**+.25**
1-2/2	**+.25**	
1999(*)		
17/11		**+.25**
16/11	**+.25**	
5/10		
24/8	+.25	
29-30/6	+.25	
18/5		
4/5		-.25
31/3		-.25
30/3		
2-3/2		
1998		
22/12		
18/11		**-.25**
17/11	**-.25**	
16/10		**-.25**
15/10(**)	**-.25**	
29/9		-.25
27/8		+1.0
18/8		
30/6-1/7		
19/5		
31/3		
3-4/2		
30/1		+.5
1997		
16/12		
12/12		+.5
12/11		
1/10		+.25
30/8		
19/8		
12/7		
26/6		+.25
20/5		
25/3	+.25	
4-5/2		

Sources: Board of Governors and Bank of Canada. (*) After March, statements were issued by the FOMC after the fed funds rate was left unchanged. Prior to this date, only minutes were released. (**) Fed funds rate change at an extraordinary meeting. Fed funds rate changes that appear to be matched by the Bank of Canada are in bold characters.

Table 4: Kurtosis in Daily Financial Asset Prices, Canada

Samples	Over-night Interest Rate	Slope of Yield Curve	Forward Exchange Spread	US-Canada Short-Term Interest Rate Differen-tial[3]	IV	Kurt
IT	3.08	1.79	2.13	2.61	8.84	7.81
Since 1st MPR	3.25	1.73	2.27	2.29	9.15	8.57
IT excl. Asian crisis	2.88	1.60	2.06	2.46	8.45	7.64
Since 1st MPR excl. Asian crisis	3.15	1.77	2.16	2.16	8.30	8.33
Unchanged IT band	3.25	1.79	2.64	2.60	9.06	8.46
Unchanged O/N rate	1.89	2.73	1.87	1.93	7.98	6.86
Around MPRs	3.34	1.72	2.56	2.64	8.92	7.35
Around Changes in O/N bands	2.25	1.81	2.19	2.26	8.74	6.56
Positive O/N band changes	1.92	2.00	1.78	1.84	8.80	7.55
Negative O/N band changes	2.40	1.61	2.46	2.62	8.74	6.63
"Large" positive O/N band changes	1.70	1.67	1.92	2.03	9.36	7.72

Notes: IT (inflation target) = 27 Feb. 1991 – 18 Feb. 2000; Since 1st MPR = 3 May 1995 – 18 Feb. 2000; IT excl. Asian Crisis = IT excluding 1 June 1998 – 31 December 1998; Since 1st MPR (Monetary Policy Report) excluding Asian crisis = Since 1st MPR less Asian crisis dates' Unchanged IT band = 18 Jan. 1995 – 18 Feb. 2000 (unchanged inflation target bands). See Table 1 for date of release of MPR.1.
1.   Ten year yield on government bonds less 3 month eurorate yield.
2.   3 month forward premium (+)/discount (-) on US dollars in Canada.
3.   3 month eurorate US yield less 3 month eurorate Canadian yield.
IV   = implied volatilties derived from options on foreign currency futures,
Kurt = kurtosis derived from the distribution of options on foreign currency futures.

Table 5: Kurtosis in Daily Financial Asset Prices, UK

	3 month euro Rate	Slope of Yield Curve	Forward Exchange Spread	UK-German Short-Term Interest Rate Differential
IT	2.21	2.18	3.85	1.90
Around MPC meetings	1.47	1.84	1.58	1.61
Around .50 changes in repo	1.09	1.96	1.67	1.27
Around .25 changes in repo	1.41	2.17	1.55	2.63
Around positive repo changes	2.24	2.32	1.69	2.69
Around negative repo changes	2.50	2.29	1.47	1.43
Around "close" votes or ties	3.01	2.77	3.01	2.34
Around unchanged repo rate	1.54	1.71	1.37	2.17
Around unanimous decisions	2.26	2.85	1.82	3.17

Notes: see Table 5. The IT period is from 10/8/92 – 18/2/2000.

Table 6: Kurtosis in Daily Financial Asset Prices: The Impact of Press Reports, 1986-1998

News type/ Samples		**Overnight** Interest Rates	Changes in the Overnight Target Band	Slope of Yield Curve	Forward Change Spread	US-Canada Short-Term Interest Rate **Differential**
FP	**86-98**	2.30	16.06	2.41	2.60	2.48
	95-98	2.42	12.08	1.70	2.90	2.25
FP+,-	**86-98**	2.35	22.50	2.56	3.80	3.68
	95-98	2.59	22.30	1.87	2.48	2.59
FP-	**86-98**	2.38	16.53	2.42	2.66	2.53
	95-98	2.55	14.96	1.83	2.55	2.26
GM	**90-98**	5.84	17.28	9.34	2.79	3.05
	95-98	3.36	16.41	2.88	3.17	3.13
GM+,-	**90-98**	1.92	12.86	3.91	2.37	2.51
	95-98	2.83	12.55	2.83	2.60	2.60
GM-	**90-98**	4.34	14.74	3.91	2.41	2.63
	95-98	3.11	13.96	2.51	2.94	2.93
BOC	**91-99**	5.58	33.03	2.09	2.21	2.32
Statements	**95-99**	2.61	33.03	2.42	2.60	2.58

Note: See notes to Table 3. FP = Financial Post, GM = Globe and Mail. + means commentsfavorable about the Bank of Canada; - means unfavorable comments about the Bank of Canada. 86-98, 95-98, 90-98, 95-98 refer to samples. Jan. 1995 is the arbitrary date used to delineate the period of greater openness and transparency. BOC statements refers to speeches and statements of The Bank of Canada, as recorded on the Bank's web site. In the case of FP, GM and BOC statements the event window is one day. In the other cases the event window is 3 days. Event window size of up to 3 days made little difference to the results.

Table 7:   Non-Parametric Tests of Public Commentary on Bank of Canada Policy

(A) HO: Favorable Comments are as Likely as Unfavorable Comments

Sample		Favorable	Unfavorable	Total	Test Statistic
			Source: *Financial Post*		
1986-90	obs	5	7	12	
	exp	6	6	12	0.33
1991-98	obs	12	28	40	
	exp	20	20	40	6.4[*]
1995-98	obs	7	14	21	
	exp	10.5	10.5	21	2.33
			Source: *Globe and Mail*		
1991-98	obs	17	29	46	
	exp	23	23	46	3.13[+]
1995-98	obs	13	23	36	
	exp	18	18	36	2.78[+]

(B) Number of runs of Favorable and Unfavorable Comments

	Observed	Expected
Source: *Financial Post*		
Full	29	30.5
Post-Inflation Targeting	22	23
Post-Monetary Policy Report	11	12
Source: *Globe and Mail*		
Full	29	30.5
Post-Inflation Targeting	27	28.5
Post-Monetary Policy Report	21	20.5

* signifies rejection of the Null at 5% (+, 10%) level of significance.

Table 8: **Interest Rate Spread and the Impact of Monetary Policy "Surprises",**
1994-99

Independent Variables	3 month US-Canada Spread	3 month US-Canada Spread	10 year US-Canada Spread
Constant	.005(.003)	.004(.003)	.002(.002)
Spread(-1)	**-.238(.041)**	**-.231(.042)**	**-.038(.016)**
Spread(-2)	**-.006(.035)**	**-.060(.035)**	-.011(.023)
Spread(-3)	.029(.055)	.030(.055)	-.023(.016)
ΔOB	**-.201(.049)**	**-.209(.050)**	**-.161(.046)**
Asia Crisis	-.004(.007)	-.004(.007)	-.004(.004)
GM	-.006(.016)		.004(.006)
GM(-1)	-.021(.014)		-.006(005)
FP	-.008(.024)		**.034(.012)**
FP(-1)	.010(.025)		-.013(.011)
BOC	-.002(.013)	-.004(.011)	-.003(.009)
MPR	.010(.018)	.016(.015)	**.020(.012)**
MPR(-1)	.001(.015)	-.008(.013)	**-.030(.013)**
ΔFX(-1)	**-.069(.016)**	**-.060(.015)**	**-.010(.00)**
ΔFFR	.003(.012)	.001(.012)	-.008(.006)
ΔOB*BOC	**.240(.106)**	**.233(.101)**	**-.130(.057)**
Summary Statstics			
Sample (Obs.)	4/18/94-5/31/99 (1168)	4/18/94-12/27/99 (1303)	4/18/94-5/21/99 (1097)
R^2adj	.09	.09	.060
DW	2.12	2.12	2.02

Notes: The dependent variable is the change in either the 3 month or 10 year the US-Canada spread. GM, FP are the NEWS dummies from the Globe and Mail and the Financial Post. All other variables are defined in the text. Coefficients statistically significant at least at the 10% level are in bold. Newey-West robust standard errors in parenthesis.

Table 9: Pooled Cross-Section Time Series Estimates: Monthly Data, 1988-99

Independent Variables	Twelve Countries					Inflation Targeting Countries			
	Inflation Forecast ($\pi^f t$)			Realized Inflation (πt)		Inflation Forecast ($\pi^f t$)		Realized Inflation (πt)	
	88-99	90-99	95-99	85-99	90-99	90-99	95-99	85-99	90-99
$\pi^f t\text{-}1$	.03 (.02)	.04 (.02)	-.02 (.03)	--	--	.04 (.03)	.02 (.05)	--	--
$\pi t\text{-}1$	--	--	--	.39 (.03)[+]	.31 (.04)[+]	--	--	.56 (.05)[+]	.48 (.07)[+]
Inflation									
Report	--	-.02 (.02)	-.04 (.02)[*]	--	--	-.05 (.01)[+]	-.05 (.02)[+]	-.01 (.01)	-.01 (.01)
IT dummy	--	-.03 (.01)[@]	-.01 (.02)	--	--	--	--	--	--
Log likelihood	-57.85	-20.61	142.89	-571.21	-365.53	-193.10	-10.45	-336.83	-143.94
SSR	127.10	120.36	35.66	286.31	195.56	95.48	24.83	149.80	91.78

Notes: @ signifies statistically significant at the 5% level (* at the 10% level, + at the 1% level).

Data is monthly (see text).

Inflation Report is a dummy variable set to 1 in the month the report is released.

All estimates are obtained with GLS (using cross-section weights) and standard errors are corrected.

The 11 countries in the sample are: Australia, Canada, Sweden, USA, Germany, Switzerland, New Zelanad, Spain, UK, Austria, Netherlands, Japan.

The inflation targeting countries are: Australia, Canada, Sweden, New Zealand, Spain, UK.

Table 10: The Determinants of Inflation Forecast Errors

Independent Variables	Dependent Variable: Forecast Errors Samples		
	94-99	95-99	95-99
GDP growth (-2)	.01 (.03)	.02 (.04)	.03 (.04)
Interest rate (-1)	.13 (.03)[+]	.10 (.04)[+]	.11 (.04)[+]
Inflation Forecast	-.87 (.04)[+]	-.87 (.05)[+]	-.87 (.05)[+]
Inflation Target	--	-.03 (.02)*	--
Inflation Report	--	--	-.01 (.03)
Adj. R^2	.36	.36	.36
F-statistic	198.59	112.29	110.85

Note: See Table 7 for estimation details. Data are monthly. Corrected standard errors are in parenthesis. Panel consists of 12 countries (cross sections) for a total of 708 observations (588 when the sample is 95-99).

Table A1: Articles About the Bank of Canada in the *Globe and Mail*, 1990-1998

Year	Total	Pro	Contra	No Opinion	Topic
1990	6	1	3	2	Inflation
		(1 Pro & 1 No Opinion by same author)			Monetary policy
					Interest rates (2)
					CB independence &
					accountability operations
1991	9	0	0	9	Accountability (2)
		(3 No Opinion by same author)			BOC Act
					Inflation Target (3)
					Monetary policy (2)
					BOC mandate
1992	4	0	1	3	Inflation
					Monetary policy
					Exchange rate
					Interest rates
1993	11	3	3	5	Inflation target (3)
		(3 No Opinion by same author)			Interest rates
					Governor (4)
					CB independence
					Monetary policy
					Exchange rate
1994	8	1	2	5	Operations
		(1 Contra & 1 No Opinion by one author)			Monetary policy
		(3 No Opinion by another author)			Inflation (2)
		(1 Pro & 1 Contra by a third author)			Openness
					Operations (2)
					Exchange rate
1995	14	0	5	9	Monetary policy (4)
		(1 Contra & 1 No Opinion by same author)			MPR
					Currency policy
					Interest rates (4)
					Operations (3)
					CB independence
1996	5	0	1	4	Governor
					Monetary policy
					Operations (3)
1997	13	6	3	4	Interest rates (6)
		(1 Pro & 2 Contras by same author)			Monetary policy (4)
		(4 Pro, 1 Contra & 3 No Opinion by another author)			Exchange rate (3)
1998	30	7	14	9	Exchange rate (17)
		(4 Pro, 2 Contra & 5 No Opinion by one author)			Inflation
		(6 Contra & 2 No Opinion by another author)			Interest rate (7)
		(1 Pro, 2 Contra & 2 No Opinion by third author)			Monetary policy (2)
		(2 Pro & 2 Contra by a fourth author)			Openness & transparency
					Currency policy

Note: See note to previous Table. Topic "currency policy" refers to questions relating to the possible replacement of the Canadian dollar

Table A2: Articles about the Bank of Canada in the *Financial Post*, 1986-1999

| Year	Total	Pro	Contra	No Opinion	Topic
1986	2	0	1	1	Central bank reform Monetary policy
1987	9				
1988	7	3	3	1	Exchange rate (2) CB independence (2) Interest rates Political influence on CB
1989	2	0	1	1	Fiscal-monetary coordination (2)
1990	4	2	2	0	Inflation (3) Monetary policy
1991	7	0	6	1	Operations Inflation targets (2) CB independence (3) Accountability
1992	3	0	2	1	Exchange rate (2) Accountability
1993	5	2	3 (1 Pro & 1 Contra by same author)	0	Monetary policy (2) Operations Governor (2)
1994	7	3	3 (1 Contra & 2 Pro by same author) (1 Contra & 1 Indifferent by another author)	1	Inflation target (3) Governor Monetary policy (2) Openness
1995	7	4	2	1	Operations (3) Monetary policy Interest rates Openness & transparency MCI
1996	2	1	1	0	Interest rates Operations
1997	9	0	6 (2 Contra by same author) (4 Contra & 2 No Opinion by another author)	3	Exchange rates (4) Interest rates (4) Monetary policy
1998	10	2	5 (1 Pro & 4 Contra by same author)	3	Exchange rate Interest rate (2) Inflation target Monetary policy (2) Operations (3) MCI
1999 (to May)	1	1	0	0	Openness & transparency

Note: Topic definition chosen on the basis of title and principal content of articles dealing with the Bank of Canada. Topic "operations" refers to appointment (other than of the Governor), salary, or purely organizational issues.

Table A3: Chronology of Bank of England's Monetary Policy Committee, 1997-99

| Date (day/month) of MPC Meeting	Date and Decision on repo rate	MPC vote
1999		
8-9/12		6-3 no change
3-4/11	4th: +.25	8-1 increase
6-7/10		Unanimous
7-8/9	8th: +.25	7-2 increase
4-5/8		Unanimous
7-8/7		Unanimous
9-10/6	10th: -.25	8-1 reduce (1 for larger)
5-6/5		5-4 no change (CLOSE)
7-8/4	8th: -.25	8-1 reduce (1 for larger)
2-3/3		8-1 no change
3-4/2	5th: -.50	8-1 reduce (1 for larger)
6-7/1	7th: -.25	7-2 reduce (1 no change; 1 reduce)
1998		
9-10/12	10th: -.50	8-1 reduce (1 for larger)
4-5/11	5th: -.50	8-1 reduce (1 for larger)
7-8/10	8th: -.25	7-2 reduce (1 for larger)
9-10/9		7-2 no change
5-6/8		7-2 no change
8-9/7		Unanimous
3-9/6	4th: +.25	8-1 increase
6-7/5		6-3 no change
8-9/4		5-3 no change (CLOSE)
4-5/3		Tie broken by Gov. (CLOSE)
4-5/2		Tie broken by Gov. (CLOSE)
7-8/1		5-3 no change (CLOSE)
1997		
3-4/12		Unanimous
5-6/11	6th: +.25	Unanimous
8-9/10		Unanimous
10-11/9		Unanimous
6-7/8	7th: +.25	Unanimous
9-10/7	10th: +.25	Unanimous
5-6/6	6th: +.25	Unanimous

Source: *Inflation Report*, Bank of England (various issues).

Figure 1 – Inflation and the Inflation Control Targets in Canada, 1991-99

Canada's Inflation Target and Inflation Record, 1991Q2-1999Q4
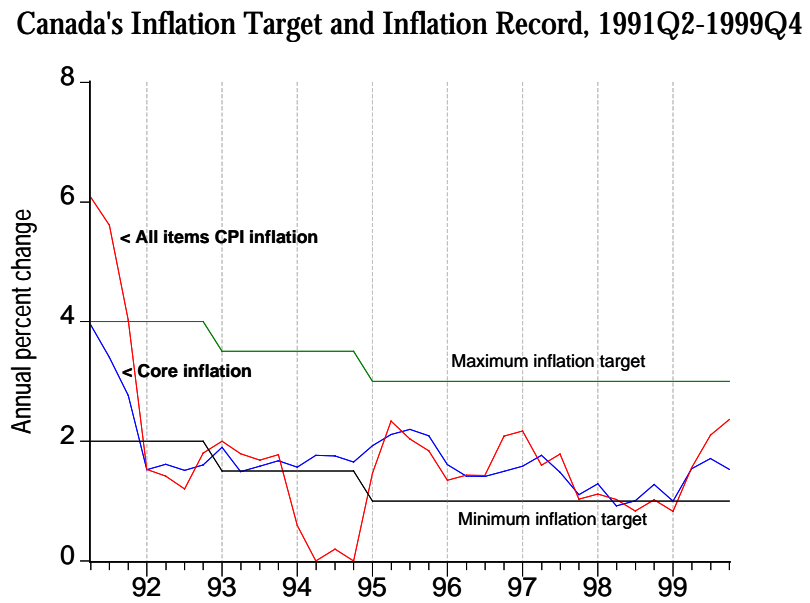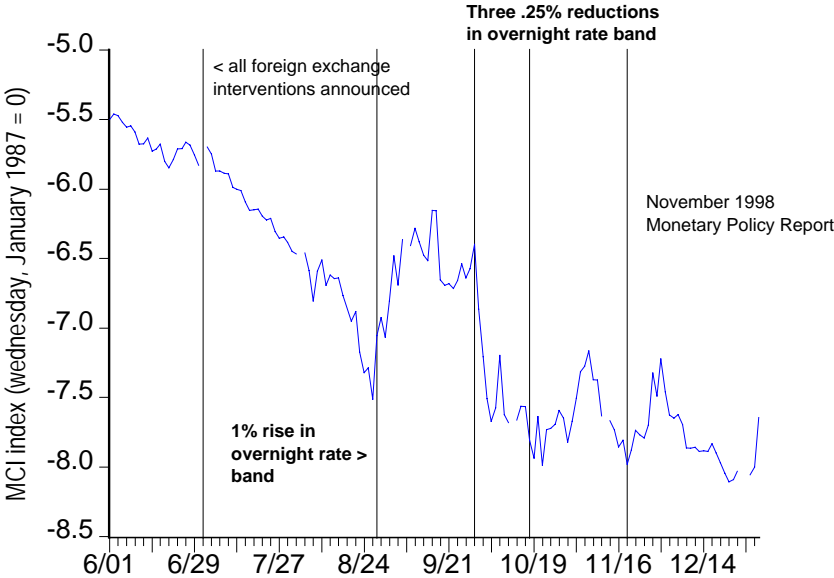

Source: Bank of Canada Monetary Policy Reports (various), and CANSIM.

**Figure 2 – The Overnight Rate Band and the Overnight Rate in Canada, 1994-99**

Overnight Interest Rates and the Target Bands
4 April 1994 - 31 December 1999
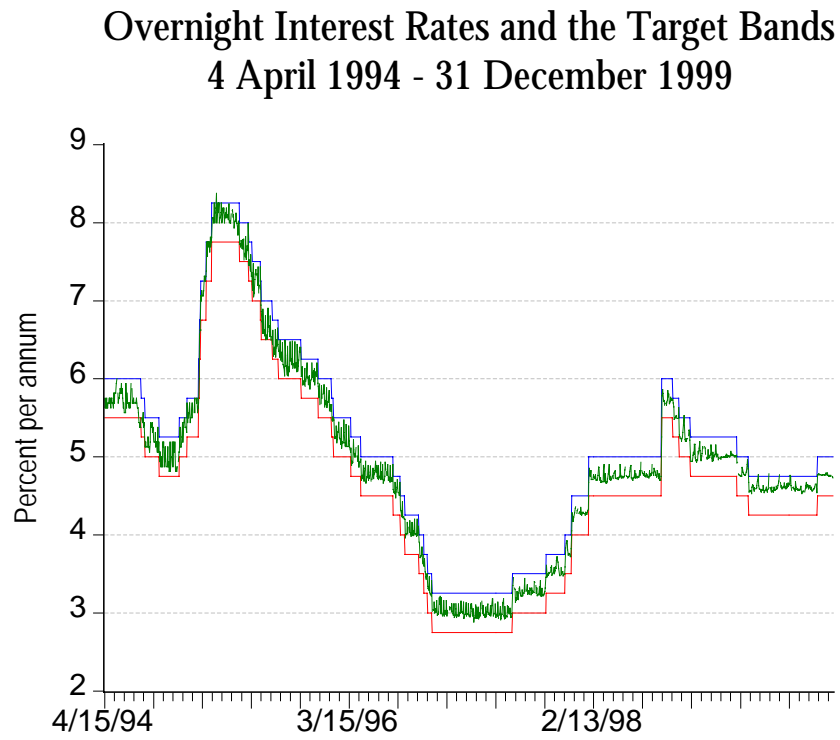
Source: Bank of Canada.

Figure 3 – The Monetary Conditions Index in Canada, June-December 1998

Source: Bank of Canada.

Figure 4 - Impulse Response Function for the Impact of the Monetary Policy Report on Private Sector Forecast Errors, Canada, 1995-99

Response of forecast errors to MPRs
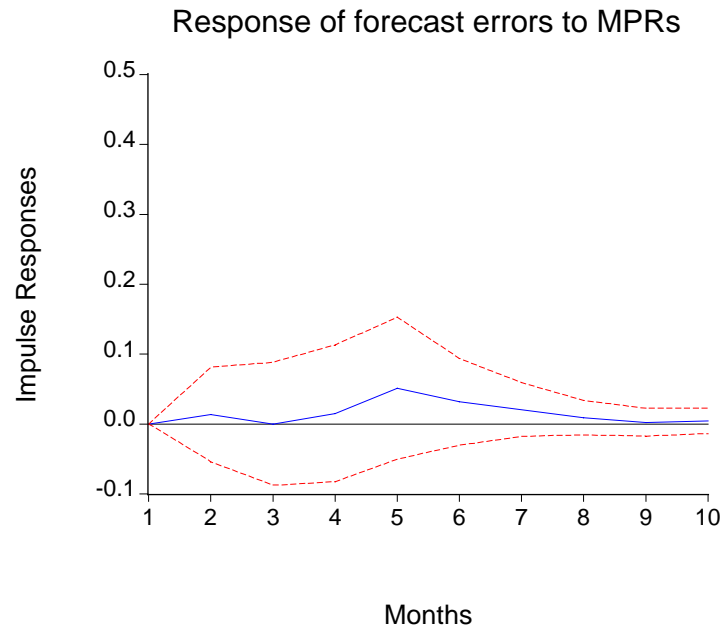
The following papers have so far been published:

January	1999	Die Geldmenge und ihre bilanziellen Gegenposten: Ein Vergleich zwischen wichtigen Ländern der Europäischen Währungsunion *	Dimut Lang
February	1999	Die Kapitalmarktzinsen in Deutschland und den USA: Wie eng ist der Zinsverbund? Eine Anwendung der multivariaten Kointegrationsanalyse *	Manfred Kremer
April	1999	Zur Diskussion über den Verbraucher-preisindex als Inflationsindikator – Beiträge zu einem Workshop in der Deutschen Bundesbank *	
July	1999	Monitoring Fiscal Adjustments in the European Union and EMU	Rolf Strauch
October	1999	Cyber money as a medium of exchange	Gabriele Kabelac
December	1999	Implicit Government Guarantees and Bank Herding Behavior	Rasmus Rüffer
December	1999	Implications of the new sesonal adjustment method Census X-12-ARIMA for current economic analysis in Germany	Robert Kirchner
February	2000	How Safe Was the „Safe Haven"? Financial Market Liquidity during the 1998 Turbulences	Christian Upper

*   Available in German only.

May	2000	The determinants of the euro-dollar exchange rate – Synthetic fundamentals and a non-existing currency	Jörg Clostermann Bernd Schnatz
July	2000	Concepts to Calculate Equilibrium Exchange Rates: An Overview	Ronald MacDonald
August	2000	Kerninflationsraten: Ein Methoden-vergleich auf der Basis westdeutscher Daten *	Bettina Landau
September	2000	Exploring the Role of Uncertainty for Corporate Investment Decisions in Germany	Ulf von Kalckreuth
November	2000	Central Bank Accountability and Transparency: Theory and Some Evidence	Sylvester C.W. Eijffinger Marco M. Hoeberichts
November	2000	Welfare Effects of Public Information	Stephen Morris Hyung Song Shin
November	2000	Monetary Policy Transparency, Public Commentary, and Market Perceptions about Monetary Policy in Canada	Pierre L. Siklos
November	2000	The Relationship between the Federal Funds Rate and the Fed's Funds Rate Target: Is it Open Market or Open Mouth Operations?	Daniel L. Thornton

*   Available in German only.