

# MONETARY AGGREGATES AND MONETARY POLICY IN THE TWENTY-FIRST CENTURY: DISCUSSION

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Frank Morris and the Boston Fed played an important role over the years in the discussion of possible targets for monetary policy. From the perspective of other central banks, the three conferences that the Boston Fed organized on the topic of “Controlling Monetary Aggregates” were extremely useful. They brought together key participants in the ongoing debate on the appropriate role of monetary aggregates in the formulation and implementation of monetary policy. Frank was also interested in the potential role of credit aggregates, following Benjamin Friedman’s work on that subject. And Frank and the Boston Fed had a long-standing interest in Canadian monetary policy and economic and financial developments, which was always appreciated at the Bank of Canada. Thus, I thought that it would be interesting to present the Canadian experience with targeting as a counterpoint to William Poole’s presentation on the U.S. experience. In some ways they are similar, while in others they differ appreciably.

By way of introduction, I would note that the evolution over time of the conduct of monetary policy by central banks has been a function of the interactions among the performance of the economy, developments in macroeconomic and monetary theory, and the success or failure of the prevailing policy approach in achieving the central bank’s objectives. For example, the notion of an exploitable trade-off between inflation and unemployment was discredited by economic developments in the 1970s, buttressed by the analysis of Milton Friedman, Edmund Phelps, and others in the late 1960s. And the same experience of high rates of inflation

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made clear the importance of having a nominal anchor as the centerpiece of monetary policy and having an explicit objective in terms of that nominal anchor. The main candidates for nominal anchor have been a monetary aggregate, the exchange rate, and the rate of inflation.<sup>1</sup> During the past quarter century, Canada used a monetary aggregate target as its nominal anchor for seven years and an inflation target for ten years and had no explicit target for about eight years.

## THE CANADIAN EXPERIENCE WITH MONETARY AGGREGATE TARGETS

The Bank of Canada's experience with the use of money growth as the intermediate target of monetary policy began in the fall of 1975, when a quantitative target was first announced for the rate of growth of M1, a narrow monetary aggregate that was composed of currency and the demand deposits at banks of both the household and business sectors. In Canada as elsewhere, the main factor giving rise to the change in strategy by the central bank was the outbreak and persistence of high rates of inflation. At the same time, the large academic literature on the role of money in causing inflation gave a degree of comfort to central banks embarking on this new approach to the conduct of policy.

The Bank of Canada was aiming at a gradual decline of the target rate of growth for M1 and it expected that the rate of inflation would slow in response. (See Figure 1.) The choice of gradualism as the basis of the policy was based on the view that a sharp deceleration of M1 and inflation would be too costly in terms of lost output and cumulative unemployment. On a technical level, the Bank was able to avoid base drift, the subject of so much criticism in the United States, by choosing not to reduce the target rate of growth of M1 at a preannounced time (such as the fourth quarter of each year) but at a time when M1 was near the center of the target band.<sup>2</sup> In practice, the rebasing of M1, which thus involved little or no base drift, took place on average about every thirteen months.<sup>3</sup> In 1977, in its third targeting exercise, the Bank introduced a  $\pm 1$  percent band parallel to the target path, in order to avoid the communications difficulties with a target fan that became so apparent in the United States. Like almost all central banks, the Bank of Canada adjusted short-term interest rates in order to achieve its monetary target. Use of the

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<sup>1</sup> Nominal spending also received considerable attention in the economics literature but has never been adopted as a formal target by any central bank.

<sup>2</sup> On occasion, the new base was selected at a time when M1 was at a level different from the center of the previous band, in order to reflect shifts in the demand for M1 arising from financial innovations.

<sup>3</sup> Surprisingly from today's perspective, the Bank never made clear the rationale for the fact that retargeting and rebasing took place at times that were not fixed in advance.

**Figure 1**  
**Target Growth Ranges for M1, Canada**



Source: Bank of Canada.

monetary base as an instrument was never considered feasible in the Canadian institutional environment.

Initially, the use of the money target seemed to result in favourable outcomes, with inflation falling appreciably (Figure 2).<sup>4</sup> However, the rate of inflation picked up in the latter part of the decade and especially in 1980, despite a declining rate of growth of M1, and Canada was able to achieve the desired disinflation only by instituting very tight policies in the 1979-82 period, similar to those followed by the United States. The monetary targets were effectively no longer playing the central role in policy for a good part of this later period, and they were formally withdrawn in the fall of 1982.

## FACTORS CONTRIBUTING TO THE WITHDRAWAL OF THE M1 TARGET

There were two main sources of difficulty with M1 as an intermediate target.<sup>5</sup> The first was the bouts of financial innovation that periodically

<sup>4</sup> Price and wage controls were also in place from 1976 through 1978, which makes it more difficult to evaluate the success of the targets over the period.

<sup>5</sup> See Thiessen (1983) and Freedman (1983) for a detailed discussion.

**Figure 2**  
**Consumer Price Index, Canada**



Source: Bank of Canada.

caused large shifts in the demand for the targeted monetary aggregate. In Canada, new types of financial arrangements offered to businesses, which enabled them to minimize their holdings of demand deposits, and new types of deposits offered by financial institutions that combined checking and savings attributes and were not included in M1, resulted in a decline in the demand for M1 balances in the early 1980s on the order of about 15 percent. These innovations were the primary factor leading to the withdrawal of M1 as the target of policy in 1982. As then-Governor Bouey put it, "We did not abandon M1, M1 abandoned us."<sup>6</sup>

And contrary to the view held by many economists at the time, that financial innovations were typically a result of deregulation, the Canadian innovations had been totally unrelated to deregulation, since Canada had removed interest rate controls more than a decade earlier. The Canadian experience was thus a harbinger of the future experience in many other countries in which innovative actions by financial institutions resulted in the relationship between money and nominal spending or inflation becoming unstable. This was the key factor in the move away from monetary targeting in virtually all countries.

But a second factor, less well-known but almost as important, contributed to the lack of success of monetary aggregate targeting in Canada. The monetary aggregate M1 had a relatively high elasticity of

<sup>6</sup> Canada, House of Commons (1983).

demand with respect to interest rates.<sup>7</sup> Thus, a rise in M1 that resulted from a demand-induced increase in the rate of inflation would call for only a relatively small increase in the rate of interest to bring M1 back to its target. Such a small rise in interest rates might not be sufficient to slow down spending and inflation pressures very much.<sup>8</sup> A demand shock could persist and inflation pressures build up to a considerable extent without much offsetting pressure from the interest rate increase needed to keep M1 on target.<sup>9</sup> Thus, even with M1 at its target path, a long time period might be required before the inflation pressures were reversed. And raising interest rates by an amount that would be sufficient to offset aggregate demand shocks over a shorter period would involve counter-cyclical movements in M1, which would make M1 very difficult to use as an intermediate target and would be very difficult to explain.

## THE ATTEMPT TO IDENTIFY ALTERNATIVE TARGETS

In the period after the M1 target was withdrawn, considerable effort was made to find an alternative monetary aggregate to serve as a intermediate target, all to no avail. No aggregate could be found that was sufficiently stable to bear the weight of being a formal target. This did not mean, however, that the monetary aggregates were ignored. Developments in the growth of various narrow and broad monetary aggregates (and, to a much lesser extent, credit aggregates) were examined for leading information with respect to movements in output, spending, and inflation. In their role as information variables, monetary aggregates served as a cross-check on the forecasts provided by the Bank staff using their traditional macroeconomic models. For example, if the monetary aggregates were growing rapidly or accelerating at a time when the staff were projecting a low rate of inflation, questions were posed as to what the aggregates were telling us. Were we in the middle of another bout of financial innovation, or was this a signal that inflation would be picking up in the future? If no financial innovation could be identified, rapid growth in the aggregates forced a reconsideration of the projection of low inflation. As I will describe shortly, the role of the aggregates has recently been upgraded a notch in terms of their contribution to the projection exercise.

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<sup>7</sup> Empirically, the interest rate elasticity in the demand for money equations increased as these equations were reestimated over time during the targeting period.

<sup>8</sup> Indeed, real interest rates could be unchanged or even fall if the rise in nominal interest rates needed to bring M1 back to target was sufficiently small.

<sup>9</sup> This problem bears some resemblance to the concern expressed in the context of Taylor rules that the nominal interest rate response to a change in the rate of inflation needs to be sufficiently large to bring about the desired responses in the real interest rate, aggregate demand, and inflation.

During most of the 1980s, the Bank pursued an eclectic strategy, focused on ensuring that the rate of inflation, which had stabilized at about 4 percent following the period of disinflation in the early 1980s, remained at a low level. However, as the economy began to press against capacity in the latter part of the decade, inflation pressures began to reemerge. Moreover, the sharp rise in oil prices in mid 1990 and the introduction of the Goods and Services Tax in January 1991 raised concerns of a repeat of the inflationary episodes of the 1970s. The possibility of explicit targets for inflation control came under consideration as a way of preventing a new outbreak of inflation and as a way of facilitating the movement of inflation to levels closer to the longer-term goal of price stability.<sup>10</sup>

In February 1991 the Bank of Canada and the Government of Canada jointly announced targets for the rate of inflation, declining from 3 percent by the end of 1992 to 2 percent by the end of 1995. A range of  $\pm 1$  percent was established around the target for CPI inflation, which was defined in terms of the twelve-month growth rate. Subsequently, the 1 to 3 percent target range for the end of 1995 was extended twice more, with the current agreement calling for the Bank and the government to decide upon a long-term target consistent with price stability by the end of 2001.<sup>11</sup> For most of the period, the core measure of inflation used by the Bank as its operational target (CPI excluding food and energy prices and the effects of changes in indirect taxes) has remained within the target range (Figure 3).

## THE CURRENT ROLE OF THE MONETARY AGGREGATES

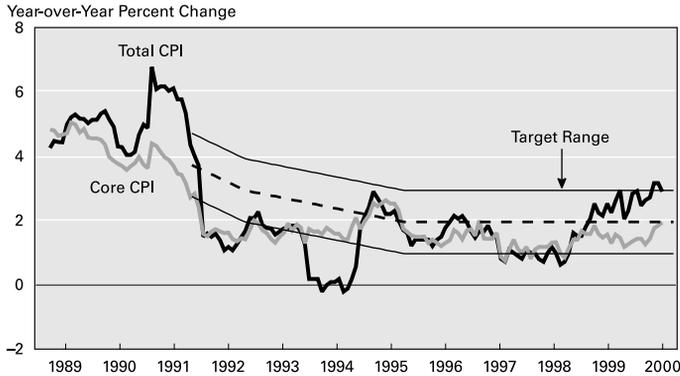
As I noted earlier, money has always played a useful role as a cross-check on the staff projection, with the information contained in the aggregates treated as one of the potential risks to the projection. Recently, however, the Bank has formalized the role of the aggregates in terms of the way that the information contained in the aggregates is assessed and compared with the staff projections of output and inflation. In the meeting at which alternative scenarios around the base-case staff economic projection are presented and discussed, a formal and independent presentation is now also made of the output and inflation forecasts derived from the movements of the financial aggregates. It is important to note in this context that the forecasts based on the monetary aggregates contain a significant element of judgment. Those responsible for interpreting the monetary aggregates have been asked, not simply to give a

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<sup>10</sup> The goal of price stability had been emphasized in Crow (1988).

<sup>11</sup> For a detailed discussion of the Canadian experience, see Thiessen (1998-99) or Freedman (2001).

**Figure 3**  
**Consumer Price Index and**  
**Inflation-Control Target Range, Canada**



Source: Bank of Canada.

mechanical forecast, but to use their analysis of the recent behavior of the aggregates and the information they have on financial innovations affecting the aggregates to come to a considered judgment as to their best estimates of future inflation and output growth. After all, with a considerable number of aggregates and a variety of equations linking those aggregates to output growth and inflation, the number of aggregate-based forecasts of the path of output and inflation over time could be large. The challenge to the staff is to derive their best forecast on the basis of the multiple forecasts. The weight put on the aggregate-based forecasts over time will depend on the success they have in predicting output growth and inflation.

## ACADEMIC RESEARCH ON TARGETING

It is of interest to compare the situation in 1975, when Canada introduced the M1 targets, and that in 1991, when the inflation-control targets were introduced. In the former case, a massive amount of academic research had been done on the links between money growth and spending and inflation and hence on the potential usefulness of monetary aggregates as the target of policy. Of course, a lot of work had to be done within the Bank: estimation of empirical demand for money equations, decisions on band versus fan and the width of the band, decisions on how to treat by-gones and how to judge whether the error in

money demand signaled a demand shock or a financial innovation. Nonetheless, the fact that the policy had a strong basis in academic research was very comforting and was very helpful in pointing out the direction to go in policy design.

Contrast this with 1991 and the introduction of the inflation-control targets. While a number of articles had compared the advantages and disadvantages of various targets for monetary policy, such as monetary aggregates, the rate of exchange, nominal spending, and inflation or prices, the typical conclusion was that the rate of inflation would not be an especially good target. In part, this conclusion followed from the potential volatility of output and financial variables (including the possibility of instrument instability) in a setup in which policy targeted on the *current* rate of inflation. The less than satisfactory outcomes were even more pronounced in the face of supply shocks. The essential point that was missing in this literature (including earlier work that had been done in the Bank of Canada, which was dismissive of inflation targeting) was that, because of lags, the appropriate target for policy is not current inflation but the projection of inflation a year or two ahead. And once one focused on forecast inflation several quarters out as the target, the disadvantages of inflation targeting discussed in the literature simply disappeared.

When the Bank set out the framework for the targets in 1991, a number of issues had to be addressed: the definition of the inflation measure, the use of a core measure (excluding food and energy prices) as an operational target, the width of the range, how to respond to movements outside the range (hard-edged versus soft-edged targets), how to deal with supply shocks (including, notably, indirect tax changes), the speed of disinflation, the need to communicate the notion that the Bank would respond to changes in the measured rate of inflation when they reflected a change in the underlying trend of inflation but not when they reflected temporary movements, and ways of providing accountability for success or failure in achieving the goal. In a number of these areas, the New Zealand experience and presentation were helpful. But little in the academic research proved useful in developing the detailed framework for policy. That said, the earlier literature on nominal income targeting was helpful in providing some of the models used in thinking about inflation targeting, as well as providing valuable insight into some of the issues that required consideration, for example dealing with supply shocks.<sup>12</sup>

Fortunately, with the spread of inflation targets, there has been a

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<sup>12</sup> See Duguay and Longworth (1998) for a discussion of the way in which the Bank of Canada staff used nominal income targets as the anchor in the staff economic projections in the 1987-90 period.

sharp increase in academic interest and very useful research on inflation targeting since the mid 1990s. I would note in particular the work of Lars Svensson, who has written a series of insightful articles on such matters as the way that the inflation forecast functions as an intermediate target for policy and the question of price level versus rate of inflation as the appropriate target for policy. A number of assessments of the international experience to date with inflation targeting have also been made.<sup>13</sup> In addition, a number of conferences have been held on inflation targets, many of them sponsored by central banks and international organizations.

While Canada was the second country to introduce inflation targets, following New Zealand, a number of industrialized countries followed suit in the early to mid 1990s, including the United Kingdom, Sweden, Finland, Australia, and Israel. The countries that have chosen to use inflation targets had three key characteristics in common: a history of relatively high rates of inflation, floating exchange rates (either voluntary or forced), and monetary aggregates without sufficient stability to serve as intermediate targets. Since neither the exchange rate nor a monetary aggregate was available to serve as a nominal anchor, these countries decided to focus on the longer-term goal of policy, a low rate of inflation, as the anchor for the system. And, unlike countries with a history of relatively low inflation, their own history and lack of credibility meant that they were unable to rely upon a simple qualitative commitment to low inflation. Instead, they announced an explicit quantitative target for either the downward path to very low inflation or the maintenance of very low inflation.

## THE SUCCESS OF INFLATION TARGETING

What has been the overall experience of countries with inflation targets? First, those with targets moved from being in the relatively high-inflation group of countries to being in the low-inflation group, and they achieved this in a fairly short time. Second, as these countries achieved their announced goals over time, financial markets adjusted their longer-term inflation expectations and built these expectations into longer-term interest rates. And the risk premiums that compensate investors for inflation uncertainty declined or vanished. Moreover, participants in product and labor markets adjusted their expectations of future rates of inflation downward as the inflation targets were achieved. At the same time, inflation expectations became partly linked to the target and were less sensitive to movements of inflation away from the target.

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<sup>13</sup> For a useful survey, see Bernanke et al. (1999).

Third, despite these adjustments, one cannot find improvements in the sacrifice ratio in the data of the countries with inflation targets. Fourth, the targets have been extremely helpful in explaining central bank actions (and, sometimes, inactions) to the financial markets and the public. Moreover, the central banks with inflation targets have become much more transparent, issuing inflation reports or monetary policy reports to explain their framework for the conduct of policy and the rationale for their policy actions. Fifth, the forecast of inflation has effectively become the intermediate target of policy in countries with inflation targets, and the framework for the analysis of new economic information has shifted to its effect on inflation one to two years into the future; in other words, the framework has become more forward-looking. Sixth, according to the staff at a number of central banks with inflation targets, the quality of monetary policy discussions within the central bank has been significantly improved by the introduction of explicit targets.

With the success of inflation targets in containing inflation in industrial countries, a number of emerging-market economies have either adopted or are considering adopting inflation targets as the centerpiece of their monetary policy framework. Included in this group are Brazil, Chile, Mexico, South Africa, South Korea, Thailand, and Indonesia.

The experience thus far shows that inflation targets provide an effective nominal anchor for monetary policy, and that they can make an important contribution to the reduction of inflation and then to its maintenance at a low level. In particular, for countries lacking credibility, inflation targets are very helpful in bringing down and holding down the rate of inflation. However, this does not mean that inflation targets are necessary for achieving and maintaining low inflation. Indeed, a number of countries in which the central bank has credibility, such as the United States and Germany, have posted good inflation records without them. But, it can be argued, even for such countries, inflation targets could make a useful contribution to the conduct of monetary policy.

I would conclude by reiterating the need for a central bank to have a nominal anchor in conducting monetary policy. This does not mean that the central bank is indifferent to the real economy. Indeed, in the case of an inflation-targeting central bank, the horizon that it chooses to return inflation to its target following a shock takes into account output volatility as well as the volatility of inflation around its target. It is nonetheless the case that the best contribution that monetary policy can make to a well-functioning economy is to achieve and maintain low inflation or price stability. Whether it does this by focusing on an intermediate target variable or on the low inflation goal variable will depend on which approach gives the better economic outcome. And, based on the Canadian experience, targeting a low rate of inflation is clearly better than targeting a monetary aggregate.

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