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**Centre for the Analysis of National Economic Policy**

**Working Paper Series**

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## 1. INTRODUCTION

During the first half of the 1980s the industrialized world underwent a severe recession and experienced disinflation. This experience raises many questions and contains many lessons concerning the interactions between exchange rates and monetary policy. The purpose of this paper is to discuss some of these lessons and questions from the perspective of a single small open economy. The paper examines the particular case of Canada.<sup>1</sup>

Although the paper touches on many issues, there is one central problem that runs through the discussion. This is the problem that the Bank of Canada faced when trying to disinflate in the face of disturbances such as unusually high real interest rates in the rest of the world, that were putting downward pressure on the Canadian Dollar. If the Bank were to resist the resulting depreciation it would have to follow a more restrictive policy than it wanted. On the other hand if it allowed a substantial depreciation this would jeopardize its anti-inflation programme.

How the Bank should cope with this dilemma was the topic of intense public debate in Canada throughout the period. The Bank's stated policy was to steer a middle course, allowing some of the pressure to come out in depreciation and some in a tighter stance. Thus, among the most important questions raised by the episode were whether such a middle course was indeed appropriate, and whether the Bank succeeded in steering it.

The Bank also invoked the above dilemma as a rationale for giving increasing weight throughout much of the period to the objective of stabilizing the exchange rate, and correspondingly decreasing weight to controlling the rate of monetary expansion. Accordingly, one of the main objects of the paper will be to ask what light the episode sheds on the relative merits of exchange-rate targeting versus monetary targeting.

The paper is organized as follows. Section 2 briefly presents some background history and broadly describes the course of events during the episode. Section 3 describes the Bank's public defense of its policies. Section 4 discusses several issues concerning disinflation, including the issue of what constitutes an optimal timing of disinflation, and in particular whether the Bank's timing was appropriate. Section 5 begins the examination of alternative targeting strategies by pointing out some problems with exchange-rate stabilization illustrated by the episode. It also examines critically the rationale for exchange-rate stabilization offered by the Bank of Canada. Section 6 argues that on the whole the episode gives little reason to doubt the wisdom of monetary targeting, although it does suggest important lessons for the appropriate design of a monetary targeting régime.

## 2. BACKGROUND AND DATA

The Canadian disinflation took place in the aftermath of an unsuccessful experiment with monetary targeting. In 1975 the Bank of Canada announced a policy of "Gradualism", according to which the rate of monetary growth was to be reduced by stages. The targeted aggregate was M-1 (currency plus demand deposits with chartered banks). By and large the Bank showed a strong commitment to Gradualism, and M-1 growth rates, although erratic, had a clear downward trend after 1975. However, the policy had little noticeable effect on the rate of inflation, which was just as high in 1980 as it had been in 1975. (The annual rate of inflation as measured by the GNE price deflator was 10.8 percent in 1975 and 10.6 percent in 1980. As measured by the CPI it was 10.0 percent in both years.)

The failure of Gradualism can reasonably be attributed to two particular circumstances concerning the targeted aggregate M-1<sup>2</sup>. The first is that

because M-1 contains no interest-bearing assets it has a fairly large interest-elasticity of demand. Thus to a large extent the gradual fall in the growth rate of M-1 over the 1975-80 period merely accomodated the substantial rise in nominal interest rates that occurred over that period, an accomodation that represented no change in the underlying rate of monetary expansion.

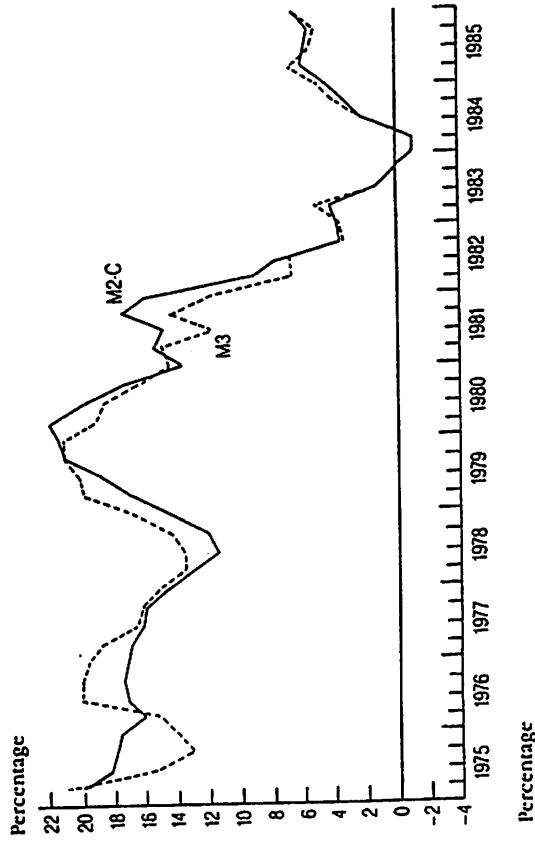
The other circumstance concerning M-1 is that its demand function was subjected to large downward shifts over the 1975-80 period.<sup>3</sup> The shifts took the form of portfolio switches away from the non-interest-bearing checking accounts in M-1, towards the accounts contained in broader definitions of money. The shifts probably had little effect on the demand for broader aggregates.

These circumstances are reflected in Figure 1, which shows that M-1 was the only one of the commonly used aggregates to show a clear deceleration over the 1975-80 period.<sup>4</sup> All others continued to grow at rates in the mid to high teens.

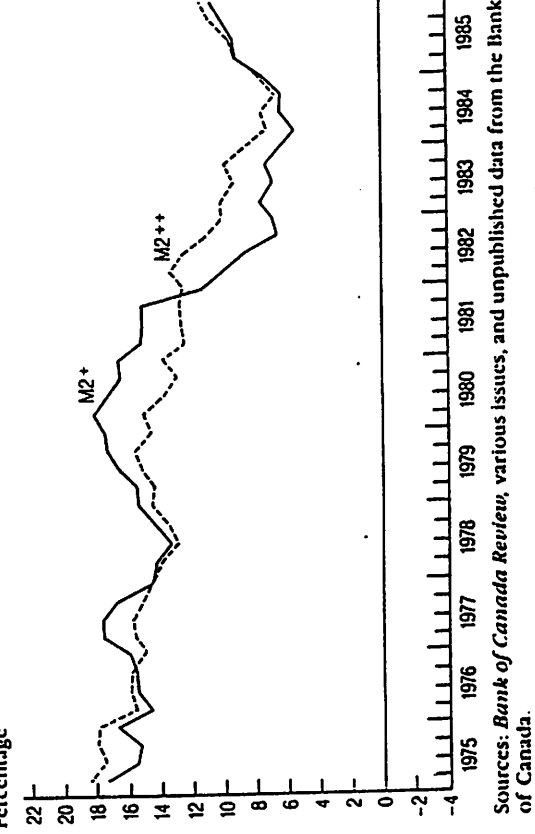
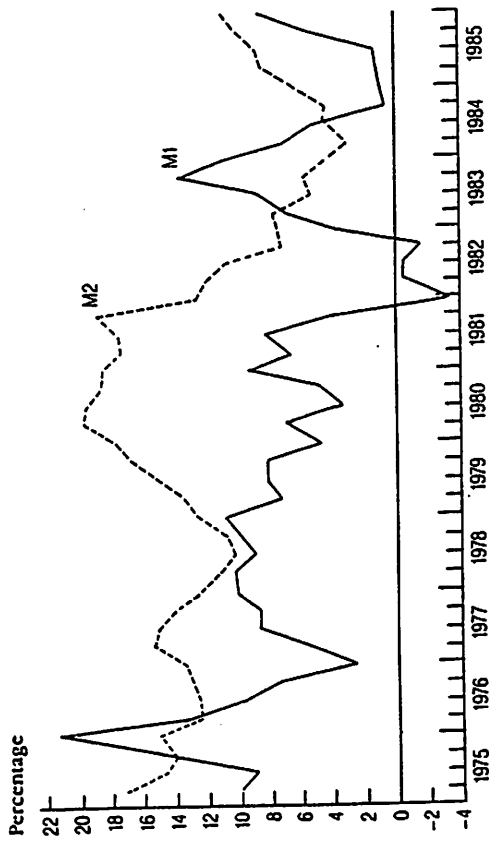
The early part of Gradualism also saw a large depreciation of the Canadian dollar. Figure 2 shows that from late 1976 to late 1978 the dollar fell by more than 20 percent against a trade-weighted average of Group-of-Ten currencies. This depreciation, together with mounting evidence of instability in the M-1 demand function was obviously threatening the effectiveness of Gradualism in reducing inflation.

Beginning in 1978 the Bank responded to these events by beginning to pay less attention to keeping M-1 on target and more to resisting depreciation.<sup>5</sup> As Figure 2 reveals, the fall in the G-10

**Growth Rates of Canadian Monetary Aggregates, 1975-85**



**Growth Rates of Canadian Monetary Aggregates, 1975-85**



Sources: *Bank of Canada Review*, various issues, and unpublished data from the Bank of Canada.

Figure 1

*G-10 Weighted-Average Exchange Rate, 1971-85*  
(1971 = 100)

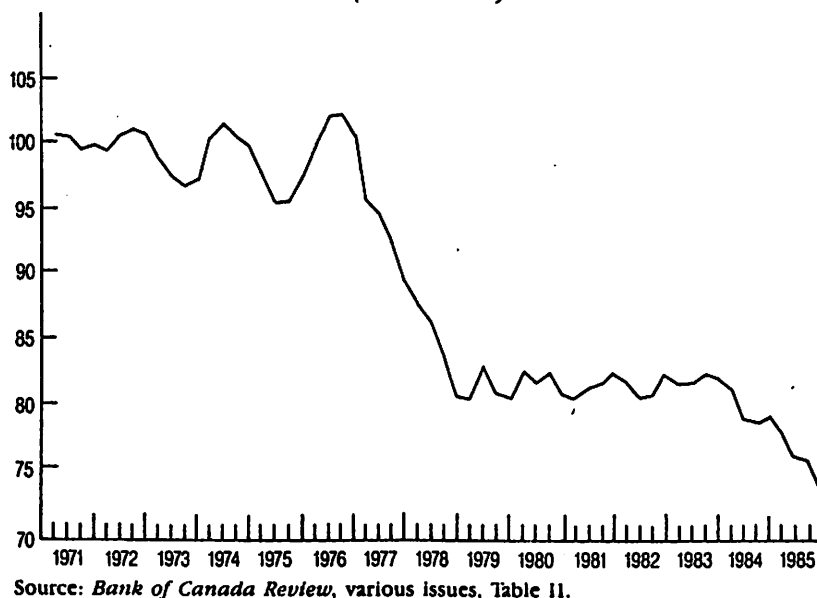


Figure 2

exchange rate was arrested, and the rate was kept within a fairly narrow band, with no tendency to drift, for the next five and a half years.

By the time the 1981-82 recession arrived the Bank had abandoned Gradualism<sup>6</sup>, and was focussing to a large extent on resisting depreciation against the U.S. dollar. In mid 1981, in the face of rising U.S. interest rates, weak export and domestic investment demand, and a relatively high rate of inflation in Canada, the Canadian dollar came under intense speculative pressure. The Bank responded by increasing short-term interest rates 400 points above corresponding U.S. rates, and by the end of 1981 the Canadian



dollar was even higher in relation to the U.S. dollar than at the beginning of the year.

A policy of resisting depreciation this vigorously in response to speculative pressure obviously requires a restrictive monetary policy. Figure 1 shows that the growth rates of all of broad monetary aggregates began a sharp decline in 1981, a decline that continued until the first quarter of 1984. Thus, for example, the growth rate of  $M2^+$  fell from 15.1 percent in the second quarter of 1981 to 6.8 percent by the last quarter of 1982, and continued to fall to 5.5 percent by the first quarter of 1984. This sudden monetary deceleration, coming after several years of uninterrupted high monetary growth, obviously played an important role in bringing on and deepening the 1981-82 recession.<sup>7</sup>

The severity of the 1981-82 recession can be seen from the data on real GNP, employment growth, the rate of unemployment, and capacity utilization (Howitt, 1986, p. 74). By all these measures economic activity declined for six straight quarters from the third quarter of 1981 through the fourth quarter of 1982. Over this period the cumulative fall in real GNP was 6.6 percent, and the fall in employment was 5 percent.

After 1982 recovery began, but it was disappointingly slow. By the end of 1985 the economy was still operating below full employment. A fairly broad consensus view puts the natural rate of unemployment in the range of 6.5 to 8 percent for this period.<sup>8</sup> By this measure unemployment was still about 3 points above its natural rate in 1985. If one applies Okun's Law - with a (relatively small) coefficient of 2, this suggests that there was still about a 6 percent output gap in 1985. A similar message can be inferred from capacity utilization data, by assuming that 1979 was a year of full employment. Capacity utilization was 79.2 percent in 1985 compared to 84.8

percent in 1979, indicating a 7.1 percent gap. A similar message can also be inferred from real GNP data, assuming further that full-employment output was growing at 3 percent per annum. By this measure there was a 5.6 percent gap in 1985.

Inflation responded to the 1981-82 recession as in a textbook model of disinflation. This can be seen from the various measures reported in Table 1. For approximately the first year of the recession there was no clear response of inflation. However, sometime in mid 1982 inflation began falling very sharply. By 1985 it was 6 to 10 points lower than it had been in 1981. By all three measures of price-inflation all of the decline that occurred from 1981 to 1985 had already taken place by the first quarter of 1983. The decline in wage-inflation was less sudden, but most of it too seems to have occurred in 1982.

Although unemployment remained high and inflation came down from mid-1982 through 1984, nevertheless monetary policy became increasingly restrictive throughout most of that period. Figure 1 shows that monetary growth kept falling until the first quarter of 1984.

The two main measurable channels through which monetary policy works in a small open economy are interest rates and exchange rates. (The extent to which it works through one rather than the other depends upon the time frame involved, the degree of capital mobility, and the nature of exchange-rate expectations.) Simple measures of ex post real interest rates for Canada show that they ran to very high levels in 1981 and remained high through 1984.<sup>9</sup>

Of course these ex post measures are at best simple proxies for the true ex ante cost of borrowing. Furthermore, they reflect global real interest rates as much as domestic monetary policy. A cleaner measure of the effects of monetary restriction can be constructed from data on the real exchange rate.

TABLE 1

Inflation by Quarter, 1981-I to 1985-IV

excluding COLA		Consumer Price Index <sup>a</sup>	GNP Deflator <sup>b</sup>	Industry Selling Price Index <sup>a</sup>	Average Hourly Earnings in Manufacturing <sup>a</sup>	Wages and Salaries per Unit Output <sup>a</sup>	Wage Settlements
1981-	I	15.4	12.5	11.5	14.2	9.0	13.7
	II	13.9	7.3	10.6	12.7	10.6	12.6
	III	9.5	11.4	6.9	12.3	17.6	13.8
	IV	9.7	11.9	4.6	11.5	16.6	13.9
1982-	I	13.2	12.2	7.0	14.8	13.0	12.9
	II	12.4	7.4	7.0	8.2	5.6	12.5
	III	6.3	9.9	3.8	7.2	1.0	10.2
	IV	5.4	9.5	-0.1	8.7	5.6	7.2
1983-	I	5.0	1.1	4.0	8.1 <sup>c</sup>	-3.7	6.7
	II	5.6	4.4	5.7	4.3	2.7	5.8
	III	3.8	6.7	2.4	4.2	1.4	5.7
	IV	3.8	-1.0	2.4	9.3	-3.5	4.1
1984-	I	5.5	3.3	7.9	6.8	-2.6	3.9
	II	3.3	5.5	3.0	2.9	4.6	2.9
	III	2.6	-0.9	1.4	4.4	0.5	3.0
	IV	3.6	2.7	2.7	4.7	4.2	4.5
1985-	I	5.3	5.6	4.8	4.6	3.9	3.8
	II	4.9	3.9	1.4	0.0	2.4	3.4
	III	2.5	1.6	0.6 <sup>d</sup>	4.6	2.4	3.8
	IV	4.8	2.2	4.6	7.8	-0.6	3.5

<sup>a</sup>Annualized rate from end of last quarter to end of current quarter.<sup>b</sup>Seasonally adjusted.<sup>c</sup>Break in series.<sup>d</sup>ISPI replaced by Industrial Product Price Index after 1985-II.Source: Bank of Canada Review

Measured by Canada's GNE deflator relative to foreign export prices Canada experienced a substantial real appreciation over the 1980-85 period relative to all of its 6 most important trading partners, except the United States.<sup>10</sup> Canada's normalized relative unit labor cost rose steadily from 100 in 1980 to almost 120 by the end of 1983, before declining in 1984. A similar message can be read from various other IMF measures of our real exchange rate, all of which show a real appreciation between 1982 and 1984.<sup>11</sup> Likewise, Table 2 shows that Canada's GNE deflator rose fairly steadily relative to the domestic price of traded goods, although in the case of exports part of that rise is undoubtedly attributable to adverse movements in Canada's terms of trade working through world prices for basic commodities and energy.

TABLE 2

Implicit Price Indices of Exports and Imports  
Relative to GNE, Annual, 1980-85

	(1) Exports	(2) Imports	(3) GNE	(4) (1)/(3)	(5) (2)/(3)
1980	278.2	261.3	225.8	1.09	1.16
1981	298.6	289.9	249.7	1.20	1.16
1982	306.6	303.0	275.5	1.11	1.10
1983	306.5	299.3	290.1	1.06	1.03
1984	311.2	316.3	298.2	1.04	1.06
1985	320.9	331.9	307.1	1.04	1.08

Source: Bank of Canada Review

In the first quarter of 1984 the Bank's increasingly restrictive policy was finally relaxed. The growth rates of all the broad monetary aggregates depicted in Figure 1 reached a trough in that quarter and started moving up. The G-10 weighted average exchange rate also showed a sharp depreciation beginning in February 1984. Since the fourth quarter of 1978 quarterly averages of that rate had been kept within a band of 81.5 plus or minus 1.7 percent. After February 1984, it remained permanently below that band.

The move toward monetary ease was recorded in the 1984 Annual Report of the Governor, which indicated that (p. 8): "... the operations of the Bank of Canada were oriented during 1984 to bringing about lower interest rates, so long as the progress we were making in bringing down our inflation rate was not threatened." The move continued through the end of 1985, by which time the G-10 rate had depreciated by about 10 percent from its value of two years earlier, monetary growth rates had risen considerably from the troughs of the first quarter of 1984, and much of the real appreciation of 1980-84 had been reversed. (For example, normalized unit labor costs fell from 119.6 in the fourth quarter of 1983 to 108.5 by the fourth quarter of 1985).

### 3. THE BANK'S RATIONALE - CREDIBILITY AND EXCHANGE RATES

The Bank's public defense of its policies throughout the period ran largely in terms of the need to defend the exchange rate, in order to control inflation. The Bank was concerned that depreciations "affect more than just import prices. Both the prices of domestic goods that compete with imports and goods sold in Canada of a type that can be exported will also go up".<sup>12</sup> Furthermore, it worried that the secondary effect of these price increases could revive the inertial component of inflation: "a large and rapid

compression of the purchasing power of Canadians because of exchange rate depreciation risks a self-defeating resurgence of inflationary demands for compensating increases in wages and salaries".<sup>12</sup>

Beyond this the Bank was directly concerned with its credibility:

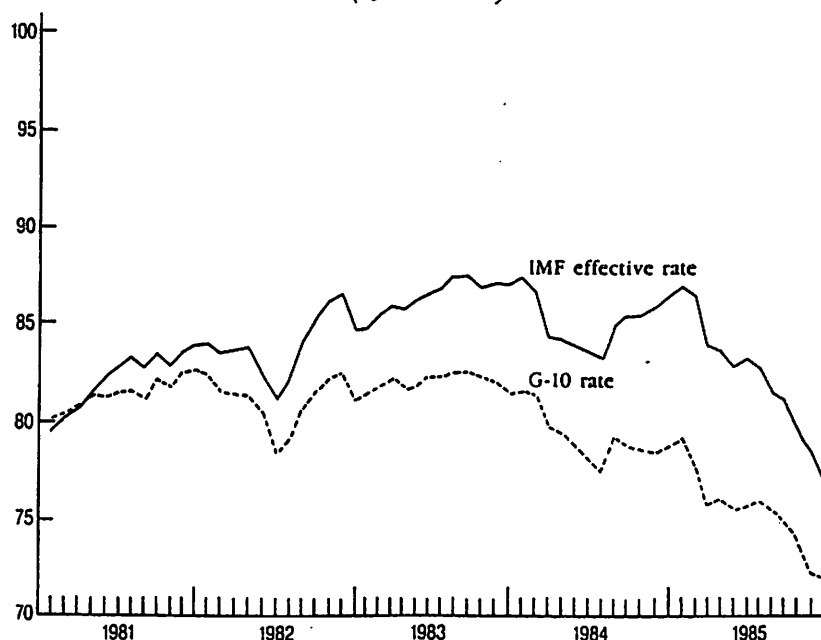
A nation's exchange rate does not float in a vacuum. It can only float and find its level within the context of policies and perceptions of policies. A prescription for [expansionary monetary policy] would bring the Canadian dollar under intense downward pressure once it became evident that there was no policy concern about the Canadian dollar and the impact of any decline on inflation. In a situation where Canadian policy was perceived to be oriented towards repeating the inflationary mistakes of the 1970s, the exchange rate decline would have no evident limit. Interest rates would in fact rise sharply rather than fall as investors sought to get out of assets denominated in a currency that was only headed in a downward direction and as financial markets came to be dominated by the unpleasant prospect of much higher inflation rates.<sup>13</sup>

The Bank was made acutely aware of the precariousness of its credibility by its experience during various exchange-market crises over the period. The Governor's 1984 Annual Report dwelt in particular on the experience of late 1983 and early 1984. Its attempt during that period to ease monetary policy had run into a sharp depreciation of the Canadian dollar beginning in February 1984. The Bank eventually raised the Canadian interest differential sharply in mid-1984, and the crisis came to an end. In the Bank's view this experience showed the immense difficulty of trying to stimulate the economy in a world of fragile credibility. In fact the Bank argued that credibility was such a problem during this crisis that any attempt to lower domestic interest rates would quickly produce such intense speculative pressure as to result in higher rather than lower interest rates.

During the 1980-85 period the Canadian economy was subjected to several significant macroeconomic disturbances. The tightening of U.S. monetary policy associated with the move toward controlling unborrowed reserves in 1979-82, combined with the growing U.S. fiscal deficit and the U.S. investment boom of the early 1980s, brought about a series of increases in U.S. real interest rates. Around the same time, U.S. inflation fell sharply. A collapse of confidence in Canadian government policies toward investment contributed to a sharp decline in Canadian investment demand in 1981. In the face of the world debt crisis Canadian institutional lenders increased their liquidity preference. Canada's terms of trade were affected adversely by the decline in world prices of energy and basic commodities. Any of these disturbances would have resulted in a substantial depreciation of the Canadian dollar if the supply of broadly defined money had been kept on a fixed growth path. To avoid the depreciation, each deflationary shock had to be met by further monetary restriction.

The Bank's explicit policy throughout the period was to react to such disturbances by steering a middle course of letting some of the pressure come out in depreciation and some in higher domestic interest rates.<sup>14</sup> Nevertheless the Canadian dollar showed no tendency to depreciate against the U.S. dollar from mid-1982 until early 1984. Indeed by resisting depreciation against the U.S. dollar to such an extent at a time when the U.S. dollar was appreciating with respect to other currencies, the Bank was not only resisting depreciation, it was turning the pressure to depreciate into a small nominal appreciation. This is hardly noticeable in the G-10 weighted average exchange rate shown below in Figure 3, but it is noticeable in the IMF effective exchange rate for Canada, which assigns less weight to the U.S. dollar than does the G-10 rate.

*Weighted-Average Exchange Rates, 1981-85*  
(1971 = 100)



Sources: *Bank of Canada Review*, various issues, Table I1 (for G-10 rate); *International Financial Statistics* (International Monetary Fund), various issues (for IMF effective rate).

Figure 3

#### 4. DISINFLATION

An interesting aspect of this episode concerns the timing of disinflation. As Buiter and Miller (1984) have pointed out, disinflation in a small open economy should proceed particularly rapidly at first because of the direct effects on the price level of the real appreciation accompanying monetary restraint, but particularly slowly after that because of the real depreciation that returns the real exchange rate to its long-run equilibrium value. This effect is evident in the sudden fall of inflation in Canada over the 1982-83 period, while the Canadian dollar underwent a substantial real appreciation, and the subsequent halt to that fall after 1983, when the real appreciation began to reverse itself.



This timing aspect is less noticeable in the measures of wage-inflation reported in Table 1. But this too is consistent with the Buiter-Miller effect, since domestic wages are less directly affected by exchange-rate movements than are domestic price indices.

Another aspect of disinflation illustrated by this episode is the "reentry" problem.<sup>15</sup> Specifically, a disinflation that reduces monetary expansion immediately to a rate consistent with zero inflation in the long run and keeps it there permanently will ultimately raise the whole time path of the real demand for money by reducing nominal interest rates. But unless prices are instantaneously flexible it will have the initial effect of reducing the real supply of money below its former path. The resulting gap between the actual and long-run-equilibrium quantities of real money balances will thus continue to grow for as long as inflation remains positive. Ultimately, deflation will be needed to close the gap.

Rather than endure deflation a sensible policy would attempt to close the gap with a burst of monetary growth. This appears to have been the policy of the Federal Reserve in the United States in late 1982. Figure 1 shows a similar burst around that time in Canadian M-1, but not in any of the less interest-sensitive broad aggregates. Instead, deceleration of the broad aggregates continued for another year and a half before reentry was attempted.

The reentry problem raises the important question of the optimal timing of disinflation. Specifically, if a sudden reduction in monetary growth to a rate consistent with zero inflation in the long run would optimally call for a subsequent temporary reversal, wouldn't it be better to avoid the reversal by smoothing the monetary deceleration over time? That was the original intention of Gradualism, as the name implies.

One of the unfortunate aspects of Gradualism and the subsequent Canadian disinflation was the lack of guidance from economic theory on this timing issue. In the late 60s and early 70s some theoretical work was done on the optimal exploitation of the intertemporal tradeoff between inflation and unemployment, but that work was based upon the idea that the inertia of inflation was attributable entirely to expectations. And with the rational expectations revolution just starting there was still a lot to be learned about the subtle strategic interaction between policy and expectations. About the only advice that economists could offer at the time was: when in doubt, go slowly.<sup>16</sup>

Even now there are many unanswered questions concerning inflation-inertia and the formation of expectations, and these questions are pivotal for determining the optimal strategy for disinflation. Nevertheless, there seems a general presumption that it is optimal to bring inflation down with a "soft landing". (See, for example, Howitt, 1987) That is, as inflation starts to come down, the marginal benefit from reducing inflation ought to diminish, whereas with output and employment now depressed the marginal cost of reducing inflation will be higher than at the outset; thus the policy-maker ought to reduce the disinflationary pressure as the target of zero inflation is approached.

These considerations raise the question of whether the Bank of Canada followed an optimal policy during the 1982-84 period. For as we have seen, inflation came down sharply during that period, while by all measures the Bank's policy became increasingly restrictive. It could perhaps be argued that over much of that period real output grew very rapidly in any event, and hence that an increasingly tight monetary policy was appropriate. The problem with this argument is the disappointingly slow pace of recovery in 1984. In

any case that was not the argument of the Bank of Canada. Instead, the Bank continued to defend its policies in terms of the above-mentioned dilemma; it argued that it had to pursue an increasingly tight monetary policy to avoid an inflationary depreciation relative to the U.S. dollar.

Now on the face of it the Bank's argument appears deficient. That is, if the optimal reaction to a contractionary shock like a rise in foreign real interest rates is, as the Bank has argued, to steer a middle course allowing some depreciation, then the shock should result in an even greater real depreciation than would exist along the no-shock soft-landing path.

One possible justification for the increasingly restrictive policy pursued by the Bank might be that over this period the Bank's reputation was tied to the Canadian-U.S. dollar exchange rate. With the U.S. dollar rising relative to most of the rest of the currencies of the world the Bank had to accept a real appreciation for Canada with respect to the rest of the world or else allow such a large depreciation relative to the U.S. dollar that people would begin to lose confidence in the Bank's resistance to inflation.

There is some plausibility in this defense, in that public attention to the value of the Canadian dollar does seem to be restricted largely to its value in terms of the U.S. dollar. Even though it may seem irrational for professional speculators to focus on that particular exchange rate when gauging the Bank's intentions rather than focussing on a more meaningful weighted-average rate, the multiplicity of reputational equilibria in rational-expectations models [see, for example, Rogoff, 1986] suggests that it could well be rational for people to form expectations this way, and for the Bank therefore to resist depreciation against the U.S. dollar at a time when, expectational effects aside, it would prefer a depreciation.<sup>17</sup>

But the problem with this line of argument is that it raises the question of why the Bank ever tied its reputation to the U.S.-Canadian exchange rate in the first place. One of the roles of a Central Bank in a world of uncertain currency values is to act as a focal point for peoples' expectations, to coordinate their beliefs by stating its intentions unequivocally. In effect a strong central bank is in a position to select among the many potential reputational equilibria by making such announcements. Under Gradualism the Bank tried to use this power to select an equilibrium in which its reputation was tied to M-1 growth targets. When this policy failed and it started shifting towards an equilibrium in which its reputation was tied to the exchange rate, the U.S. dollar had already undergone large fluctuations on world markets. The Bank could see from this that the best exchange rate to tie its reputation to would be a weighted-average rate rather than the idiosyncratic bilateral rate with the U.S. dollar. Why then did it not publicly emphasize the importance of such a weighted average, and de-emphasize the Canadian-U.S. dollar rate, instead of waiting until September 1984 before even publishing data on a weighted-average rate?<sup>18</sup>

##### 5. DOUBTS CONCERNING EXCHANGE-RATE STABILIZATION

The difficulty of finding an appropriate definition of money is a well-known drawback of monetary targeting. One lesson to be drawn from the Canadian episode is that an analogous drawback faces a policy of exchange-rate stabilization. The attempt by the Bank of Canada to resist depreciation relative to the U.S. dollar resulted in an almost fixed value for the trade-weighted G-10 average exchange rate, and an appreciation as measured by the IMF effective rate. I have already argued that stabilizing the Canadian-U.S.

dollar exchange rate made little sense when the U.S. dollar was undergoing large fluctuations relative to the rest of the currencies of the world, but this leaves open the question of which exchange rate should be the target of an exchange-rate stabilization policy.

The main argument in favor of a simple trade-weighted average like the G-10 rate is the simplicity of its construction. However, there are reasons for doubting whether the readily available trade proportions are appropriate weights. In particular, the 82 percent weight assigned to the U.S. dollar by Canada's G-10 rate is almost certainly too large, and hence the constancy of the G-10 rate over the 1980-84 period while the U.S. dollar rose dramatically relative to other currencies indicates a true appreciation of the Canadian dollar.

These reasons are twofold. First, a simple average like the G-10 rate that focuses on a country's major trading partners will give a biased measure of the currency's value when one or more of those major trading partners' currencies is behaving very differently from those of the excluded countries. Second, and more fundamentally, an ideal weighted average should assign weights that reflect not just the proportions of trade but also the degree to which each country competes in world markets with the given country. On both of these counts the G-10 rate assigns too much weight to the U.S. dollar.

More specifically, the ideal weighted-average exchange rate to use for addressing the question of the effects of currency depreciation on the Canadian price level is one that assigns weights to different currencies in proportion to the effect that a unilateral depreciation of the Canadian dollar against that currency would have on the Canadian price level. By this criterion, even if 82 percent of Canada's trade was done with the United

States, this would still be too great a weight to assign to the U.S. dollar, because a unilateral depreciation of the Canadian dollar relative to the U.S. dollar would imply an appreciation of the US dollar with respect to the rest of the world. And that appreciation would likely result in a substantial decrease in the U.S. dollar price of the goods that the United States trades, a decrease that would offset to a large extent the effects of Canada's unilateral depreciation on the Canadian dollar price of imports from the United States.

The only available weighted-average exchange rate for Canada that takes these third-party effects into account is the IMF effective exchange rate. For this reason I think it gives the best indication of what was happening to the value of the Canadian dollar over the 1980-85 period. But it too is a highly imperfect measure. For one thing its weights are proportional to the effect of bilateral depreciation not on the Canadian price level but on the Canadian balance of payments. Thus, it is not ideal for all purposes. But more fundamentally its weights are highly subjective, since the effects to which they are proportional are model-specific.<sup>19</sup>

Another familiar drawback of exchange-rate stabilization illustrated by this episode is that it tends to destabilize the rate of monetary expansion, and hence the price-level and the level of economic activity, except in the case where a large proportion of the variability in aggregate demand is attributable to money-demand disturbances. This is especially true when the rest of the world is following unstable policies. From late 1978 until 1981, exchange-rate stabilization in Canada failed to halt the inflationary growth in broadly defined money. From 1982 through 1984 it resulted in an increasingly restrictive monetary policy under circumstances where a relaxation would have been appropriate. That relaxation finally began to

occur in the first quarter of 1984, the same quarter in which the G-10 exchange rate was finally allowed to show a depreciation.

The main argument in favour of exchange-rate stabilization is the one stressed by the Bank - that avoiding depreciation helps the monetary authority to avoid the direct effects of depreciation on inflation and to control the expectations of inflation. As for the first part of this argument, the Canadian experiences from 1978-81 illustrates the obvious truth that stabilizing the exchange rate without controlling the rate of growth of money is no way to avoid inflation.

Furthermore, the direct effects of depreciation on inflation are not so devastating as the Bank's rhetoric sometimes makes them appear. In particular, the effects of a once-over depreciation on the rate of inflation are only temporary. The Bank often invokes the prospect of a wage-price spiral triggered by depreciation, but for this to be a serious problem domestic wage-adjustment must be dominated by real-wage resistance with a strong price-wage feedback, whereas there is strong evidence (Sachs, 1979; Fortin and Newton, 1982) that wage-adjustment in Canada is dominated instead by relative-wage resistance with a strong wage-wage feedback.

One study published by the Bank of Canada (O'Reilly et al, 1982) shows the average results of using six different econometric models of the Canadian economy to simulate the effects on inflation of a once-over 10 percent depreciation caused by monetary expansion. The result was a 3 percent inflation in the first year and a 1.3 percent inflation in each of the next two years. This is a significant effect on the price-level but it gives no indication of runaway inflation. Furthermore, the effects in question represent not just the direct effects of the depreciation but also the effects of the monetary expansion that provoked the depreciation.

As for the second part of the Bank's argument -- that depreciation can affect inflation via peoples' expectations -- this argument involves strategic considerations that are hard to analyze because of the multiplicity of reputational equilibria. Furthermore, the Bank reported plenty of direct evidence, from the exchange-market crises over the period, of the sensitivity of peoples' exchange-rate-expectations to perceptions of Bank policy. Thus this argument for exchange-rate stabilization cannot be dismissed lightly. There are, nevertheless, reasons for doubting the empirical significance of these expectational effects, especially in the Canadian context.

First, one would not expect a depreciation to affect peoples' perceptions of the Bank's intentions unless the depreciation were greater than what people had expected on the basis of their original perceptions. If the depreciation occurred in response to a disturbance that is common knowledge, then unless the monetary authority has tied its reputation to a rigid defense of the exchange rate, people would regard a moderate depreciation as a sensible response, not as a signal that they had misjudged policy.

Second, there are good reasons for doubting the empirical significance of the effect on the actual rate of inflation of any increase in expected inflation. For example, to the extent that wages respond to inflation, Riddell and Smith (1982) have concluded that most of the response takes the form of an ex post adjustment rather than ex ante anticipation.

Third, the sensitivity that the Bank has reported of exchange-rate expectations may reflect not a credibility problem that calls for the Bank to defend its reputation but a tenability problem that the Bank should yield to. That is, given the substantial real appreciation that continued from 1980 through 1984 it is reasonable to suppose that people believed the Canadian dollar was overvalued throughout the period, and that eventually the Bank



would decide it had to allow a real depreciation to occur via the nominal exchange rate. If the Bank was eventually going to go for a soft landing in its disinflation programme, then that would have been a rational expectation. And since that nominal depreciation did eventually occur in 1984-85, it would also have been a correct expectation.

Under the circumstances the expected rate of depreciation would be a weighted average of the depreciation that would occur if the Bank continued its increasingly restrictive policy and what would occur if the Bank were finally to relax. Any hint that the Bank was going to take an easier stance would result in people attaching more weight to the latter possibility - hence in an increase in the expected rate of depreciation. Under this interpretation the sensitivity of expectations to actual depreciation did not come from people being skeptical of the Bank's resolve to resist inflation, but from people believing that a rational disinflation policy was going to require a substantial depreciation to occur sooner or later. This interpretation is made more plausible by the fact that the Bank of Canada had already shown a remarkable immunity to pressure for an easier policy in 1981-82 when there were large public outcries against 20 percent and higher interest rates in the midst of the worst recession in post-war history.

A closely related reason for exchange-rate stabilization is the avoidance of dynamic instability and excess volatility in the exchange rate resulting from speculative bubbles, overshooting, and unstable expectations. This reason too has frequently been invoked by Bank of Canada officials (see, for example, Thiessen, 1982). However, it does not present a persuasive case for controlling the exchange rate to such an extent that monetary growth gets out of control. A central bank with credibility can eliminate rational

speculative bubbles with a policy that requires it to intervene only when a bubble is well underway.<sup>20</sup> The threat that such intervention will take place should be enough to stop the bubble from forming in the first place.

Overshooting may be a problem in some theoretical models but there is no a priori case that the costs of letting the exchange rate overshoot its equilibrium value exceed the costs of taking the monetary actions required to avoid overshooting. (In particular, the above analysis argues that the price-level effects of overshooting are not as serious a social problem as the Bank of Canada has claimed). In any event the econometric evidence of Meese and Rogoff (1983) and Backus (1984) suggests that overshooting is not empirically significant.

As for the possibility that exchange-rate expectations could show dynamic instability, through band-wagon effects and extrapolative expectations, the Bank has claimed support for this view by reference to the recurrent exchange-market crises of the 1980s. However, the apparent readiness of speculators to bet on further depreciation at any sign of weakness in the Canadian dollar does not necessarily imply instability of expectations. It could simply reflect the tenability problem discussed above. As the exchange rate comes down this might encourage the view that it will continue to fall, not forever, but to a value that would be more appropriate given Canada's external situation.

Alternatively this eager speculative activity could reflect a basic flaw in the Bank of Canada's approach to exchange-rate stabilization. Specifically, the Bank has refused to acknowledge any definite target value for the exchange rate.<sup>21</sup> Instead it has announced its intention to dampen what appear to be temporary fluctuations and to make long-run movements more

gradual. The problem with this approach is that when the exchange rate begins to depreciate, if speculators believe that this reflects a long-run movement that the Bank is trying to slow down then they are given a strong inducement to bet on further depreciation, and hence to profit from the Bank's unwillingness to allow rapid adjustment. These speculative inducements would not exist if the Bank foresook active stabilization of the exchange rate, or if it adopted a definite, publicly announced target value for the exchange rate. By attempting to stabilize the rate without announcing its intentions the Bank has fallen between the stools and encouraged speculators to profit at its own expense.

#### 6. MONETARY TARGETING

The Canadian experience with Gradualism, like the U.S. experience with control of unborrowed reserves in 1979-82, and like similar experiences in other industrialized countries, has caused a widespread reconsideration of the wisdom of monetary targeting. However, the Canadian experience of the 1980s can be interpreted as offering considerable support for such a strategy. It also suggests some important lessons for how to operate a régime of monetary control.

The case for monetary targeting rests on the stability of the long-run relationship between monetary growth and inflation, and of the short-run relationship between monetary deceleration and economic downturns. The Canadian experience of the 1970s and 80s, far from casting doubt on those relationships, offers further evidence of their continued validity. The rate of inflation stayed high for as long as broadly defined money continued to

grow at double-digit rates, and fell sharply shortly after the monetary deceleration of 1981-84 was initiated. Likewise, the monetary deceleration was, once more, accompanied by a severe recession.

Of course the relationship between narrowly defined money (M-1) and other economic variables did break down over the period. Clearly a sensible régime of monetary control would not attempt to control M-1. But a casual glance at Figure 1 above reveals that M-1 is the only aggregate to have experienced such a breakdown. A skeptic might interpret this as another manifestation of Goodhart's Law; that instability would occur within any controlled aggregate.<sup>22</sup> But before thus invoking the "Lucas critique" to rule out a priori a broad class of policies, the reader would do well to ask what policy recommendation, no matter how carefully based on econometric evidence, would be immune to such skepticism. A less radical reaction to M-1 instability would be to draw the lesson that a sensible régime of monetary control should not make the mistake that the Bank of Canada made of focussing exclusively on a single aggregate, and of letting the public know as much. Surely when all but one monetary aggregate indicate that policy is not sufficiently restrictive to accomplish the objective of reducing inflation, as was the case throughout Gradualism, the Bank should not focus all its efforts on the exceptional aggregate. This bit of common sense could have prevented the Bank from allowing its intentions to be frustrated for several years by shifts in the demand function for M-1.

Now the Bank is not entirely to blame for having focussed exclusively on M-1. Although there were critics (for example, Courchene, 1976) who from the beginning of Gradualism were urging it to focus on a broader aggregate, it was generally accepted by most advocates of monetary targeting that the Bank

should pick a single aggregate and stick to it. The alternative, followed for many years by the U.S. Federal Reserve Board, of announcing multiple targets, was generally believed to offer too easy an escape from accountability by providing multiple rationalizations. In this sense the Bank was doing exactly what its monetarist critics had been urging it to do. The experience with M-1 suggests, however, that multiple rationalizations might be a smaller problem than ignoring information. It suggests a more flexible approach to monetary control that aims to keep most of the aggregates within a target range, most of the time.

Of course the cost of this more flexible approach to monetary targeting would be a loss of credibility. But the experience under study suggests that this would be a small cost. The failure of the Bank of Canada to influence inflation by its announcements throughout Gradualism suggests that credibility is not as important as early proponents of monetary targeting believed. Also, as long as the Bank is firmly and publicly committed to a non-inflationary policy, and nothing in this experience suggests otherwise, there is little to be gained by further tying the Bank's hand in order to increase that commitment.

Furthermore, this experience suggests that a sensible régime of monetary control should be flexible in two other senses. First, the "reentry" problem clearly calls for an exception to a constant, non-inflationary rate of monetary expansion, during the transition to a lower rate. There are undoubtedly other cases where exceptions ought to be made. Second, although there are reasons for doubting that exchange-rate instability is as serious a problem as the Bank has argued, there are also reasons for doubting that a policy of benign neglect would be free from unstable or excessively volatile exchange rates. The arguments that the Bank has adduced, together with the

accumulating evidence of inefficiency in foreign exchange markets, suggests that monetary policy should pay at least some attention to the exchange rate. At a minimum, vigorous intervention at rare occasions when speculative forces seem to be running strongly counter to the fundamentals ought to be undertaken. Furthermore, since this occasional intervention to "punish" speculators can reduce the frequency of speculative bubbles only if it is anticipated by foreign-exchange speculators, this is one aspect of monetary policy that the Bank should go to great lengths to announce clearly.

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FOOTNOTES

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<sup>1</sup>The paper draws on the more detailed analysis of Howitt (1986).

<sup>2</sup>Several other authors have assigned a crucial role to these two circumstances in accounting for the failure of Gradualism. See, for example, Wirick (1980).

<sup>3</sup>Estimates of the size of these shifts have been provided by Poloz (1984). In contrast to the U.S. experience, the shifts were not associated with any change in financial regulation. Exactly what did cause them is the subject of much disagreement. Courchene (1977, p. 104) argued that some of them were induced by the Bank of Canada's exclusive focus on M-1 under Gradualism. Specifically, he argued that Canadian chartered banks encouraged their customers to switch out of the non-interest-bearing accounts included in the definition of M-1, so as to allow bank assets to continue to grow at rates in excess of the Bank of Canada's target growth rates for M-1. According to this interpretation the shifts were another example of Goodhart's Law - that the attempt to control any monetary aggregate will destabilize the demand for it. In opposition to this interpretation, Freedman (1983) attributes the shifts partly to exogenous technological progress in the provision of deposit-related banking services and partly to effects of high nominal interest rates that are hard to capture in money-demand equations that were estimated over a period most of which was before the rise in interest rates.

<sup>4</sup>The aggregates in Figure 1 are constructed according to the following definitions:

- M1 : Currency in the Hands of the Public plus Demand Deposits at Chartered Banks
- M2 : M1 plus Notice Deposits plus Personal Term Deposits
- M2+ : M2 plus Deposits at Trust and Mortgage Loan Companies (TMLs) plus Deposits and Shares at Credit Unions and Caisses Populaires (CUCPs)
- M2++ : M2+ plus Canada Savings Bonds (CSBs)
- M2-C : Currency in the Hands of the Public plus all Privately Held Canadian Dollar Deposits at Chartered Banks
- M3 : M2-C plus Foreign Currency Deposits at Chartered Banks booked in Canada by Canadian residents
- M3+ : M3 plus TML Deposits plus CUCP Deposits and Shares
- M3++ : M3+ plus CSBs plus Treasury Bills and Short-Term Paper Net of Holdings of Chartered Banks and Their Mortgage Subsidiaries.

<sup>5</sup>See Courchene (1981) for details of this change in emphasis.

<sup>6</sup>Governor Bouey's Per Jacobssen Lecture (1982a) made it clear that the Bank had been guided for some time by considerations other than M-1 targets. The official announcement that targets had been abandoned was made by Bouey (1982c) in November of 1982.

<sup>7</sup>An extended discussion of that recession is contained in Howitt (1986, Ch. 4).

<sup>8</sup>See, for example, the discussion in the Report of the Royal Commission (1985, pp. 284-5).

<sup>9</sup>See Howitt (1986, p. 79).

<sup>10</sup>See Howitt (1986, p. 70).

<sup>11</sup>International Financial Statistics (May, 1986), p. 66.

<sup>12</sup>Bouey (1985, p. 23)

<sup>13</sup>Bouey (1984, 6).

<sup>14</sup> See, for example, Bouey (1982b, p. 6), or Bank of Canada (1984, 8-9).

<sup>15</sup> The "reentry" problem is the focus of Scarfe's (1983) analysis of Canadian monetary policy in the early 1980s.

<sup>16</sup> A thoughtful statement of the economic argument for gradualism as of 1982 is contained in Laidler (1982).

<sup>17</sup> The fact that the Canadian dollar has had a long historical tendency to revert to par with the U.S. dollar also makes the exclusive focus of speculative attention on the Canadian - U.S. dollar rate appear more rational than it would otherwise appear. That is, it is possible to see the experiment with Gradualism as just a brief departure from a long-established equilibrium in which both the Bank and private agents have conditioned their actions and expectations on the Canadian - U.S. dollar rate.

<sup>18</sup> The G-10 rate time series was first published in the Bank of Canada Review, September 1984.

<sup>19</sup> The details of the MERM model from which the weights are calculated are described by Artus and McGuirk (1981).

<sup>20</sup> Obstfeld and Rogoff (1983) give the detailed analysis underlying the analogous argument with respect to price-level bubbles in a closed economy.

<sup>21</sup> See, for example, Bank of Canada (1983, p. 8).

<sup>22</sup> See, for example the argument of Courchene (1977) referred to in footnote 3 above.

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