1

MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS
STANDARD REFERENCE MATERIAL 1010a
(ANSI and ISO TEST CHART No. 2)

National Library
of Canada

Bibliothèque nationale
du Canada

Canadian Theses Service

Services des thèses canadiennes

Ottawa, Canada
K1A 0N4

CANADIAN THESES

THÈSES CANADIENNES

NOTICE

The quality of this microfiche is heavily dependent upon the quality of the original thesis submitted for microfilming. Every effort has been made to ensure the highest quality of reproduction possible.

If pages are missing, contact the university which granted the degree.

Some pages may have indistinct print especially if the original pages were typed with a poor typewriter ribbon or if the university sent us an inferior photocopy.

Previously copyrighted materials (journal articles, published tests, etc.) are not filmed.

Reproduction in full or in part of this film is governed by the Canadian Copyright Act, R.S.C. 1970, c. C-30.

THIS DISSERTATION
HAS BEEN MICROFILMED
EXACTLY AS RECEIVED

AVIS

La qualité de cette microfiche dépend grandement de la qualité de la thèse soumise au microfilmage. Nous avons tout fait pour assurer une qualité supérieure de reproduction.

S'il manque des pages, veuillez communiquer avec l'université qui a conféré le grade.

La qualité d'impression de certaines pages peut laisser à désirer, surtout si les pages originales ont été dactylographiées à l'aide d'un ruban usé ou si l'université nous a fait parvenir une photocopie de qualité inférieure.

Les documents qui font déjà l'objet d'un droit d'auteur (articles de revue, examens publiés, etc.) ne sont pas microfilmés.

La reproduction, même partielle, de ce microfilm est soumise à la Loi canadienne sur le droit d'auteur, SRC 1970, c. C-30.

LA THÈSE A ÉTÉ
MICROFILMÉE TELLE QUE
NOUS L'AVONS REÇUE

Canada

MONETARY GRADUALISM IN CANADA (1975-1982)

- AN EVALUATION -

by

José Pedro de Almeida Arroja

—A thesis submitted to—

the Faculty of Graduate Studies and Research

in partial fulfilment of

the requirements for the degree of

Doctor of Philosophy

Department of Economics

Carleton University

Ottawa, Ontario

April 1986

c copyright

1986, José Pedro de Almeida Arroja

Permission has been granted to the National Library of Canada to microfilm this thesis and to lend or sell copies of the film.

The author (copyright owner) has reserved other publication rights, and neither the thesis nor extensive extracts from it may be printed or otherwise reproduced without his/her written permission.

L'autorisation a été accordée à la Bibliothèque nationale du Canada de microfilmer cette thèse et de prêter ou de vendre des exemplaires du film.

L'auteur (titulaire du droit d'auteur) se réserve les autres droits de publication; ni la thèse ni de longs extraits de celle-ci ne doivent être imprimés ou autrement reproduits sans son autorisation écrite.

ISBN 0-315-29859-6

The undersigned hereby recommend to
The Faculty of Graduate Studies and Research
acceptance of the thesis,
"Monetary Gradualism in Canada (1975-1982) - An Evaluation"
submitted by
J. Pedro De Almeida Arroja, Licence, M.A.
in partial fulfilment of the requirements
for the degree of Doctor of Philosophy.

Douglas A. Smith
.....
Chairman, Department of Economics

Ronald G. Rodden
.....
Thesis Supervisor

W. E. D.
.....
External Examiner

Carleton University

May 8, 1986

A B S T R A C T

From 1975 until 1982 Canada lived under an official policy of Monetary Gradualism. This was a policy aimed at restoring price stability through the control and gradual reduction of the growth rate of the money supply (M-1). It was also one of the most orthodox monetarist experiments ever adopted by a Central Bank in the Western World.

By the late seventies evidence was accumulating that the experiment had failed. In the ensuing debate, two positions emerged. On the Neo-keynesian side it was argued that the experiment should never have taken place and the Bank of Canada was urged either (i) to return to the pre-1975 policy of "appropriate credit conditions" or (ii) to gear monetary policy so as to secure a stable value for the Canadian dollar in foreign exchange markets. On the Monetarist side, while support was given to the philosophy underlying Monetary Gradualism, it was argued that (iii) the policy should have been pursued with a lesser degree of gradualism or (iv) with a different definition of money, namely M-2.

This study uses the FOCUS macroeconometric model of the Canadian economy to evaluate the actual monetary experiment and the four alternatives suggested. The policy of Monetary Gradualism is ranked against the four alternative options on the basis of two independent criteria. Under the Output Criterion policy options are ranked according to two key economic indicators, as the rate of unemployment and the rate of real GNP growth, which are made commensurate. Under

the Public Opinion Criterion it is the Canadian public which, by means of a constructed public opinion poll, is called upon to express preferences regarding different courses of policy, with decisions taken according to the level of public concern for economic issues. Both criteria yield the same ranking, with option (i) first, followed by the actual policy experiment and options (ii), (iii) and (iv) in this order.

It is concluded that in an economy such as that of Canada any monetarist experiment is unlikely to reduce significantly the rate of inflation without imposing real costs which are sufficiently high to make the experiment socially intolerable. In this sense, it is argued that although the wisdom involved in the 1975 policy decision to adopt Monetary Gradualism was questionable, the Bank of Canada was nonetheless well advised to ignore the corrective solutions proposed by its monetarist critics.

C O N T E N T S

1. INTRODUCTION.

1

PART I: MONETARY GRADUALISM (1975-1982):

THE POLICY DEBATE.

2. MONETARY GRADUALISM: THE BACKGROUND.

8

2.1. Monetary Gradualism: Historical Overview.

8

2.2. Monetary Gradualism: The Strategy.

15

3. THE POLICY DEBATE (I): THE MONETARIST CRITIQUE.

32

3.1. Introduction.

32

3.2. M-1: The Wrong Monetary Aggregate?

37

3.3. Too Gradual a Gradualism?

45

4. THE POLICY DEBATE (II): THE NEO-KEYNESIAN VIEW.

55

4.1. Inflation: A Structural Phenomenon

55

4.2. An Incomes Policy as a Complement to Monetary Gradualism

57

PART II. EVALUATING MONETARY
GRADUALISM AND THE ALTERNATIVES (1975-1980)

Foreword.	65
5. CRITERIA FOR POLICY EVALUATION	67
5.1. The Output Criterion	68
5.2. The Public Opinion Criterion	71
5.2.1 The Economic Theory of the Canadian Public	73
5.2.2 The Evaluation of Policy According to Public Concern for Economic Issues	81
6. MACROECONOMETRIC SIMULATION ANALYSIS AND POLICY EVALUATION. THE FOCUS MODEL.	83
6.1. The FOCUS Model: An Overview.	83
6.2. Monetary Policy in FOCUS.	89
6.3. The Performance of Monetary Gradualism	92
7. MONETARY POLICY: THE NEO-KEYNESIAN ALTERNATIVES.	99
7.1. The Credit Conditions Policy.	100
7.2. A Pegged Exchange Rate Policy	112
7.3. Policy Evaluation I: The "Credit Conditions" and the "Pegged Exchange Rate Policies" versus Monetary Gradualism	123
7.3.1 The Output Criterion	123
7.3.2 The Public Opinion Criterion	126

8. THE MONETARIST ALTERNATIVES.	134
8.1. A Less Gradualist Policy with M-1	135
8.2. Monetary Gradualism with M-2	144
8.3. Policy Evaluation II: The "Less Gradualist Strategy with M-1" and "Monetary Gradualism with M-2" versus Actual Monetary Gradualism	152
8.3.1 The Output Criterion	152
8.3.2 The Public Opinion Criterion	154
9. SUMMARY AND CONCLUSIONS	161
REFERENCES.	168

1. Introduction.

From November 1975 through November 1982 Canada lived under an official policy of "Monetary Gradualism". This policy, which involved a gradual reduction over time of the rate of growth of the narrowly defined money supply (M-1), was one of the instruments of an anti-inflation policy package - which also included a comprehensive program of wage and price controls - adopted by the Government of Canada in the Fall of 1975 in response to the inflation experience of the early seventies.

The Canadian experiment with Monetary Gradualism has been the subject of considerable debate and little agreement. With time, interest rates and unemployment increased and the standard of living of Canadians deteriorated while the inflation performance of the economy showed no real signs of improvement. As a result, most economic analysts adopted a critical attitude towards the Central Bank for both the adoption of the monetarist experiment and for the way it had been conducted. Even those falling under the label of "Monetarists", who initially provided the intellectual support to the new policy, moved over time to a position of skepticism about the Central Bank policy.

A quantitative evaluation of the experiment with Monetary Gradualism, being an empirical matter, is admittedly a difficult task. Policy evaluation in Economics, which cannot employ controlled experimentation, raises difficulties of its own. Nevertheless, enormous progress has been made in the last decades in attempting to re-create the economic

system under alternative policy scenarios. This has been accomplished through the development of large-scale econometric models and the refinement of the techniques of simulation analysis. Such models and techniques are still the subject of ongoing research and improvement, but, even with imperfections and subject to criticism, they represent the best available tool to evaluate past policy performance.

This study evaluates the Bank of Canada's policy of Monetary Gradualism, as well as the alternative proposals for the conduct of monetary policy which, from 1975 through 1982 were proposed by the business and academic communities. The study uses the "What if?" criterion whereby the actual performance of the Canadian economy is compared with alternative scenarios for monetary policy. For this purpose, FOCUS, a macro-econometric model of the Canadian economy is used (FOCUS, an acronym for Forecasting and User Simulation, is a model developed and maintained by the Institute for Policy Analysis, University of Toronto).

Although the official reign of Monetary Gradualism in Canada lasted until November 1982, it is commonly agreed that by mid-1981 with the Central Bank's actions directed at the protection of the Canadian dollar in foreign exchange markets, control over the rate of growth of the money supply had de facto been abandoned. To avoid possible indeterminacies, the empirical evaluation of the Central Bank's experiment with monetary targeting is restricted to the 5½ year period starting in the 3rd quarter of 1975 and ending in the 4th quarter of 1980.

The question of whether Monetary Gradualism in Canada failed has received conflicting answers. The critics of the experiment have tended, in general, to adopt a historical criterion in their evaluations. They argue that if the inflation scenario after 1975 was not significantly better than in the earlier seventies, despite the new policy, the experiment should be considered a failure. This criterion is less than appropriate. Over each time period there was a host of inflationary forces at work, ranging from OPEC price increases and poor crops to domestic political issues such as the 1971 improvement in an already generous system of unemployment insurance. To evaluate the performance of the post-1975 monetary policy as a tool against inflation using the Canadian inflation record of the early seventies as a norm is to assume implicitly that factors bearing on the Canadian economic, political and social scenes were the same in both periods, and applied with the same intensity. Needless to say, the ceteris paribus assumption cannot be expected to hold under such circumstances.

The only meaningful quantitative evaluation of the monetary policy experiment initiated in 1975 is that which compares the post-1975 actual performance of the Canadian economy with a hypothetical alternative scenario for the same period which differs from the historical scenario only with regard to the monetary policy assumptions. Only then, can one expect the ceteris paribus assumption to be satisfied.

What this "What if?" criterion gains in reliability, relative to the historical criterion, is, on the other hand, lost in terms of

objectivity, for there is no consensus about what constitutes the proper course of monetary policy that determines the hypothetical scenario. One possible solution to this problem, although not the only one available, is to select as the reference scenario that which would have prevailed in the absence of the October 1975 switch to Monetary Gradualism on the part of the Bank of Canada. This is not the only solution because at the time the Central Bank decided to move away from the "appropriate credit conditions" policy to Monetary Gradualism, several policy options were possible, such as controlling the exchange rate or the cost of credit, or to practice Monetary Gradualism more or less gradually or with different definitions of money.

In the debate that accompanied the 1975-1982 experiment of Central Bank policy, a number of alternative policy proposals were offered. These ranged from strategies that had the same rationale as the actual monetary experiment to strategies directed at the control of the exchange rate or the control of the cost of credit. Part II of this study analyzes such alternative policy scenarios for monetary policy against which the 1975-1980 experiment with monetary targeting can be judged.

The evaluation of policy using an econometric model poses a second, more serious problem. Policies have benefits and costs which are often of a heterogeneous nature. Furthermore, different individuals perceive such benefits and costs differently. While the expert has an advantage over the layman in matters of policy evaluation, he cannot claim the right to impose his judgement upon the general citizen. First, because the

estimates on which his judgement is formed are often plagued by considerable uncertainty. Second, and unless the expert succeeds in shaping public opinion, it is the citizenry in general which, through the political marketplace, ultimately rates policy and determines its fate.

Accordingly, two independent criteria are used. In the first, policy evaluation is conducted in terms of two key economic indicators, the rate of inflation and the rate of output, with benefits and costs in terms of such indicators made commensurable and expressed as a percentage of actual GNP. In the second, using a methodology to be described in chapter 5, it is the Canadian public which, by means of a constructed public opinion poll, is called upon to express its preferences regarding different monetary policy proposals; these proposals are then ranked according to the level of concern for economic issues they raise amongst the general public.

The two criteria yield strikingly similar results in terms of the ranking attributed to the five alternative courses of monetary policy which could legitimately be regarded as feasible by the authorities in 1975. Anticipating some of the conclusions, it can be said that, contrary to entrenched beliefs, the actual policy of Monetary Gradualism is by no means the worst policy course that could have been chosen from 1975 through 1982. It ranks second among the five considered and is only surpassed by that policy course which it replaced in 1975, namely the policy of "Appropriate Credit Conditions".

The study is organized as follows. Part I discusses the policy of Monetary Gradualism since its implementation in 1975 until its official termination in 1982, as well as the criticisms and alternatives that were presented by different schools of economic thought in Canada over this period. Part II develops the policy evaluation criteria which is then used to rank Monetary Gradualism against its alternatives, and summarizes the conclusions.

PART I.

MONETARY GRADUALISM (1975-1982):

THE POLICY DEBATE

2. MONETARY GRADUALISM: THE BACKGROUND.

2.1. Monetary Gradualism: Historical Overview.

On September 22, 1975, in a speech delivered at the 46th Annual Meeting of the Canadian Chamber of Commerce, held in Saskatoon, the Governor of the Bank of Canada, Mr. Gerald K. Bouey, announced a major switch in the course of monetary policy, namely the adoption of the Monetarist approach to monetary management. Even today, ten years later, this decision remains one of the most controversial policy events in the post-War history of Canadian economic policy.

The threat of rising inflation to the stability of the social and economic institutions of Industrialized countries had become an issue of concern since the late sixties. The "full-employment" mentality which dominated macroeconomic policy-making since World War II, with low interest rates and considerable monetary expansion, was likely to produce long-term costs. Sooner or later, it was argued, the policies pursued by Governments, on both the fiscal and monetary fronts, would end up in a explosion of prices bringing social inequities, business uncertainties and the potential for social unrest.

Until 1973, the monetarist view of the longer-term inflationary consequences of existing policies had been disregarded in official circles. Then the Organization of Petroleum Exporting Countries (OPEC) was able to quadruple oil prices, with the price of a barrel of oil increasing from \$3 to \$12. Next, inflation in the seven

major industrialized countries (excepting Germany) reached the double digit level.

By 1973, two countries, Italy (10.8%) and Japan (11.7%), were already experiencing a rate of CPI inflation in excess of 10%; these rates doubled in 1974 (Italy: 19.1% Japan: 24.5%). The remaining four countries, namely the United States, the United Kingdom, France and Canada, entered the double digit inflation level in 1974 for the first time in more than 20 years. The world economy was then at the trough of a severe recession.

Chart 2.1. Inflation Rate, Canada (1950-1982)

Source: Statistics Canada, Prices and Price Indexes, and National Income and Expenditure Accounts.

In Canada, the GNE implicit price deflator which, from 1950 to 1969 rose at a moderate annual growth rate of 3%, climbed to .15% in 1974 (Chart 2.1); output growth which averaged 5% from 1960 to 1973 fell to 1% by 1975 (Chart 2.2).

Chart 2.2. Rate of Growth of GNP in constant 1971 dollars, Canada (1950-1982).

Source: Statistics Canada, National Income and Expenditure Accounts.

The rate of unemployment, shown in Chart 2.3, reached an unprecedented plateau of 7% by mid-decade, partly due to the recession and partly, according to findings reported by Cook et al. (1976), as a result of recent improvements in Unemployment Insurance legislation.

Chart. 2.3. Unemployment Rate, Canada (1950-1982)

Source: Statistics Canada, The Labour Force and Historical Labour Force Statistics.

This combination of continuously rising prices and high unemployment which affected the North-American economy in the first half of the decade was thus the result of a combination of social policies and unexpected events, such as the energy crisis and the agricultural price explosion of 1972-73, in an environment characterized by accommodating economic policies, both on the fiscal and monetary fronts (Eckstein, 1978, pp. 139-140).

In Canada this stagflation provided the backdrop for an abrupt and major change in the priorities of macroeconomic policy, away from full-employment towards a concern for stable prices. From then on, at least until the late seventies, inflation became, in official circles, the main enemy. As Governor Bouey noted in his aforementioned Saskatoon address:

"(...) my first proposition (...) is that the protection of the value of money is, of prime importance to the future economic and social welfare of Canada (...).

(...) For more than 20 years almost every country in the Western world has given rapid growth and high employment much higher priority in its policies than the preservation of the value of money. This approach worked well for quite a while, but it will not work well any longer. (...) We now have no option but to contain inflation and inflationary expectations if we are to have any realistic hope of achieving sustained economic growth".

(Bouey, 1975(7), pp.-24-29).

As stagflation became the main concern for policy-makers, the popularity of the monetarist doctrine increased and the attractive simplicity of its solution provided the intellectual support for an anti-inflation policy based on monetary restraint:

"The second proposition is that, whatever else need to be done to bring inflation under control, it is absolutely essential to keep the rate of monetary expansion within reasonable limits".

(Bouey, *ibid.*, p. 24)

In accordance with this declaration of principles, Governor Bouey announced in November 1975 that the annual growth rate of the narrowly defined, seasonally adjusted, money supply (M-1) was being controlled within target bands of 10% and 15%. Furthermore, it was the intention of the Central Bank to revise periodically downwards those target growth bands so as to achieve in the medium term a rate of monetary expansion compatible with sustained real growth and price stability:

"Given that it is not reasonable to expect the rate of price and cost inflation in Canada to decline rapidly (...) it would not seem appropriate for the time being to have an underlying rate of monetary growth below 10 per cent a year, but that, on the other hand, an underlying rate of 15 per cent would be too high.

(...) a sharp reduction in the rate of growth of the money supply (...) would have much less impact on the trend of costs and prices in the short-run than it would have in reducing economic activity and employment. The only feasible approach, therefore, is to slow down the rate of monetary expansion gradually over time".

(Bouey, 1975(b), p. 6).

With this announcement, Governor Bouey officially inaugurated the era of monetary gradualism for Canada and in the judgement of a distinguished analyst the Bank of Canada became the most monetarist of world's Central Banks (Courchene, 1976(b), p. 111).

By 1980, however, after 5 years of monetarism, inflation was back to its 1974-1975 levels, in spite of a comprehensive program of wage and price controls lasting from the Fall of 1975 through 1978. From 1974 to 1978, under monetarism and controls, the rate of inflation was reduced by a mere 2 percentage points, from 10.8% to 8.9%, while the rate of unemployment increased over the same period by more than 3 percentage points, from 5.3% to 8.4%.

Throughout 1981 and 1982, with the upper and lower target bands of M-1 growth set at levels of 4% and 8%, Canada went through the worst recession since the thirties, with record unemployment and inflation combined with a dismal productivity performance. By August 1982 the unemployment rate climbed to 12.2%; the rate of CPI inflation remained persistently at double digit levels during 1981 (12.7%) and the first half of 1982; In August 1981, the level of interest rates, as measured by the Chartered Banks' rate on prime business loans, reached an unprecedented 22.75%; by June 1981, the Canadian dollar was trading in foreign exchange markets at a post War low of less than 80 cents in terms of the U.S. dollar.

On November 29, 1982, in a speech delivered at the Canadian Club in Toronto, Governor Bouey officially terminated the monetarist experiment

blaming several innovations in banking practices which made the control of the money supply (M-1) very difficult:

"Unfortunately, the monetary aggregate to which the Bank of Canada has been paying most attention, currency and demand deposits or M-1, has for some time - more than a year - been a less reliable guide than it was earlier.

(...) It is now clear that there have been major and continuing shifts out of M-1 as a result of changes in banking practices.(...) As a result, the recorded M-1 series is not a useful guide to policy at the present time. In these circumstances I want to make it known that the Bank no longer has a target range for it".

(Bouey, 1982(a), p. 7).

2.2. Monetary Gradualism: The Strategy.

Since the floating of the Canadian dollar in May 1970, monetary management had been geared to the control of the cost and availability of credit, a policy known as the "Credit Conditions" policy. This policy did not involve a strict control of interest rates, nor was it strictly directed at the control of Chartered Bank Reserves. It was rather a mix of the two, whereby the Central Bank set the level of Chartered Bank Reserves with an eye on the resulting level of interest rates.

The fact that nominal rates of interest were kept artificially low by

the "Credit Conditions" policy is reflected in the level of real interest rates. As shown in Chart 2.4, real rates of interest, calculated on the basis of "synthetic" expectations of inflation (Dungan, 1981), averaged a negative 0.2 per cent from the 4th quarter of 1970 through the 2nd quarter of 1975. At the same time, the money supply expanded rapidly (Chart 2.5): from 1971 through 1973 the average growth in both the M-1 and the M-2 money stocks averaged 15%.

Chart 2.4 Nominal and Real Yields on 90-day Finance Company Paper, Canada (1971:I - 1975:II)

Source: FOCUS Data Bank.

In 1975, Governor Bouey acknowledged the Bank's expansionary stance:

"Over a period of two years ending in the second quarter of 1973, a period in which unusually high rates of monetary expansion

occurred around the world, the public's holdings of currency and demand deposits (...) increased at an average rate of no less than 15% per cent a year. By comparison, an average rate of no more than 5% a year would have been high enough to accommodate the growth in production of goods and services in Canada at the long-term trend rate if the price level had remained stable."

(Bovey, 1975(a), p. 27)

Chart 2.5 Growth Rates of M-1 and M-2, relative to 4 Quarters Earlier, Canada (1971:I - 1975:II)

Source: FOCUS Data Bank.

The 1975 switch from the "Credit Conditions" policy to Monetary Gradualism raised three issues which later would become the subject of considerable debate. They are:

- (i) the choice of the monetary aggregate to be controlled;
- (ii) the choice of the control mechanism;
- (iii) the choice of the level for the monetary aggregate - an issue of particular importance during the transition period to the long-term target growth rate of the money supply.

M-1, the narrowly defined money supply, including currency in the hands of the public plus privately held demand deposits at Chartered Banks, was the monetary aggregate chosen to be controlled.

Since the goal of the new policy was to control the rate of growth of nominal income and, ultimately, the rate of inflation, the appropriate definition of money to be controlled would have to be that which in the past had shown the closest relationship with the aggregate level of nominal spending. On the basis of the empirical work conducted at the Bank, that aggregate was M-1 (Bank of Canada, 1975, pp. 15-20).

The selection of M-1, in turn, dictated the control mechanism to be adopted by the Bank. Since the assets included in M-1, unlike those only included in broader definitions of money, do not bear interest, M-1 could be controlled by having the Central Bank influencing the level of short-term interest rates.

Basically, the control mechanism, would operate as follows.

Given the Bank's own estimated demand function for M-1 balances,

$$m = f(Y, i) \quad \text{with } f_Y > 0 \text{ and } f_i < 0 \quad \dots (2.1)$$

where m is the narrowly defined money supply, Y the level of real income and i some short-run rate of interest, equation (2.1) is inverted and solved for i :

$$i = g(Y, m) \quad \text{with } g_Y > 0 \text{ and } g_m < 0 \quad \dots (2.2)$$

Given the Bank's target money supply, $\bar{m}$, the Bank would manipulate i so as to direct the actual path of the money stock, m , towards the target, $\bar{m}$. If, at a given moment the actual money supply was running above target, the Central Bank would act to increase the level of short-term interest rates, and vice-versa. The control of short-term interest rates was largely exerted through the weekly auction of Government of Canada 90-day Treasury Bills. With the actual money supply below the target, the Bank of Canada would bid high, increasing prices and reducing yields; with the actual money stock above the target, the Central Bank would bid low, reducing prices and increasing yields.

This was a rather indirect method of money supply control, but the only one available to the Central Bank at the time of the implementation of Monetary Gradualism.

One could think of the Central Bank controlling the chosen monetary aggregate directly by acting on the supply side of the money market, namely, by manipulating the level of Chartered Banks' Reserves - a method henceforth referred to as Reserve or Base control. Reserve control would operate through the standard credit or money multiplier: given the minimum reserve deposit requirements of Chartered Banks, the Bank of Canada would provide the banking system with a reserve growth compatible with the target growth rate of the money supply. This method would have the advantage of reducing the variance over time of the chosen monetary aggregate, given the more predictable and stable response of the banking system to changes in the reserve base compared with changes in interest rates.

The difference between the effectiveness of the two control mechanisms is illustrated in Fig. 2.1.

Suppose the money supply target is m_0 and money demand is D . Then, under Base Control the Bank generates a monetary base compatible with a money stock m_0 . On the other hand, under an interest rate control mechanism the Bank must first guess what the market-clearing interest rate is at the target money stock m_0 . Assuming perfect foresight, the Bank would then set interest rates at the market-clearing level (i_0 in Fig. 2.1) and would allow the money supply to be determined by demand at that level of interest rates.

Fig. 2.1

Although under both control mechanisms interest rates are the endogenous variable, the interest rate mechanism requires on the part of the Bank perfect information, i.e., a priori knowledge of the level of interest rates that will clear the market at the target money stock. Since such perfect information is generally absent, errors under the interest rate control mechanism are bound to occur whose consequences are to keep the money supply off target. This can be seen by returning to Fig. 2.1.

Suppose there is an unexpected shift in the demand for money, say from D to D' . Under the Base control mechanism the money supply will remain on target and the effect is felt on interest rates (i_1 versus i_0). But if interest rate control is used, the same demand shock will leave interest rates unchanged at i_0 (the Bank's best guess regarding the equilibrium rate of interest for the target money stock m_0) while reducing the money supply below its target level (m_1 versus m_0). In other words, under Base control the money supply is left unaffected at the target level and

the decrease in the demand for money is felt in terms of decreasing interest rates; under interest-rate control, interest rates are left unchanged but the money supply falls below target. If the demand for money is highly unstable, the interest rate control mechanism is bound to make the control of the money supply an impossible task. To restore the money supply back to target from its current level m_1 , the Bank needs information on the position of the new demand for money D' . By the time such information is gathered and the money demand equation appropriately adjusted, a new shift in the demand for money might have occurred.

The interest rate mechanism adopted by the Bank had an important bearing in at least two respects in the whole experiment with Monetary Gradualism. First, it led the Bank to announce targets for the money supply not in terms of a single growth figure but in terms of a growth range; in this way, the Bank could cope with small, unanticipated, shifts in the money demand relationship. Second, in the late seventies, the money demand equation became highly unstable with persistent, unpredictable shifts to the left in terms of Fig. 2.1. (Marwah and Chengalath, 1985). As a result, the money supply started to run continuously below the target and finally became uncontrollable. This was the immediate reason that led the Bank to put an end to the experiment of Monetary Gradualism.

Although a Reserve control mechanism would have granted the Bank a higher degree of certainty to money supply management, there were, however, two important reasons preventing the Bank from using such control mechanism. One was of an institutional nature, while the other

had to do with the Bank's chosen monetary aggregate. The institutional obstacle to base control was the result of the fact that, under existing legislation, Chartered Banks' minimum required reserves are calculated against the previous month's average deposit levels, thus making Bank Reserves an endogenous variable which is determined by the public rather than by the Central Bank. The second obstacle had to do with the Bank's choice of M-1. Since minimum reserve requirements by Chartered Banks are held not only against demand deposits (included in M-1) but also against non-demand deposits (excluded from M-1, but included in the broader aggregates M-2 and M-3) and since it is the public which determines the allocation of its financial portfolio between interest bearing and non-interest bearing assets, a given rate of expansion in Chartered Banks' Reserves would be compatible with a multiplicity of growth rates for M-1. It would therefore be the public through its demand for M-2 balances, rather than the Central Bank, that would ultimately determine the money supply M-1.

Beyond the choice of monetary aggregate and control mechanism, the only remaining issue was the level for the target growth rates of the money supply. On several occasions in 1975 and 1976, Governor Bouey expressed the idea that the appropriate long-term growth rate for M-1 - the rate compatible with relative stability in the value of money and long-term real output growth - was somewhat less than 5 per cent a year. At the time of implementation of the new policy, M-1 growth had been often in the double digit range. The question was thus how to effect this transition.

By mid-1975, with inflation in excess of 10 per cent, it was felt that a drastic reduction of money growth would affect output and employment more than prices. Governor Bouey responded to the proponents of a "cold turkey" approach in his 1975 Annual Report:

"The trouble with this prescription is not with the medicine but with the dosage, which would be so great that the patient would suffer excessively while it was working. It would sharply curtail the growth of spending on goods and services in the face of the continuing large increases in production costs already built into the economy, and this would almost certainly result in extremely weak markets, widespread bankruptcies and soaring unemployment" (Bank of Canada, 1975, p. 10).

Already, in November 1975, in a speech to the Saint John Board of Trade (Bouey, 1975(b)), Governor Bouey hinted at a gradualist strategy in the reduction of the growth rate of the money supply with target bands for M-1 growth of 10% and 15%. Although never made official, the 10-15% range rapidly became the public's perception of the "official" range: starting in the third quarter of 1975, anchored on its average level in the previous quarter, M-1, the narrowly defined, seasonally adjusted, money supply, would grow at an average annual rate between 10 and 15%, subject to later revisions.

The Governor's prudence in announcing the first target range and his silence as to when downward revision would occur apparently resulted from his uncertainties about the new policy, rather than a lack of

commitment. As he prudently pointed out in his Saint John's speech:

"In my opinion the main reason that central bankers show considerable reluctance to commit themselves to more specific targets is that, in the present state of knowledge about these matters, there are questions in our minds about how far we can properly rely on any one indicator to get a good reading of the thrust of our policy actions. Until we have had more experience with the problems encountered in trying to adhere to particular monetary growth targets, we feel bound to regard such targets as tentative and subject to revision in the light of developments that may not have been anticipated" (Bouey, 1975(b), p. 6).

The targets turned out to be revised at regular intervals of one year. On August 24, 1976, Governor Bouey announced a reduction to 8-12% of the target range for M-1 to take effect in the second quarter of 1976. In the Bank's press release, the Governor reminded the public that the Central Bank, in its formulation of policy, was not relying exclusively on the trend of M-1 growth, but was also taking into account a variety of economic and financial indicators, including a number of broader monetary indicators (Bank of Canada, 1976(a)). In other words, the Bank was allowing itself discretion to judge the appropriateness of respecting the targets in the case of unexpected developments. The postal strike which temporarily disrupted the payments system in the 4th quarter of 1975 was the first such event, which the Bank accommodated by allowing M-1 to overshoot the target.

Chart 2.6. Target Growth Ranges for M-1

Source: Bank of Canada, 1983, p. 26.

Throughout 1976 and 1977 the money supply was persistently below the lower bound of the target range, despite several successive reductions in short-term interest rates. From November 1976 to May 1977, the Bank Rate declined by a full two percentage points, from 9.5% to 7.5%, without bringing the money supply back within the target bands. On October 7, 1977, the Bank announced that the target growth range for M-1 was being reduced to 7% and 11%, respectively, starting in the 3rd quarter of 1977.

In his 1976 Annual Report, the Governor hinted that a downward shift in the demand for M-1 balances was taking place, as a result of the

facilities made available by the Chartered Banks to large corporate demand deposit holders (through consolidation of balances held across the country) to minimize their average holdings of these deposits. In the 1977 Annual Report he stressed this point to explain the continued undershooting of the target range, though admitting that due to the declining trend in the growth of nominal spending, the M-1 target bands set in 1976 might have been too high.

Starting in the 3rd quarter of 1978, the target growth bands for M-1 were again reduced, this time to 6% and 10%, respectively. Throughout 1978, the Bank managed to keep the money supply within target, despite a major postal strike during the 4th quarter of that year. Several external developments during 1978, notably a new round of major food prices increases, and escalating short-term interest rates in the United States, led the Bank to rationalize successive increases in the Bank rate (from 7.5% by the end of 1977 to 11.25% in early 1979), in terms of the need to protect the external value of the Canadian dollar.

By 1980, with the target growth range for M-1 growth set at 5% and 9% since the 3rd quarter of 1979, the Bank was overreacting to external developments. With short-term interest rates in the United States exceptionally volatile, the Bank decided to absorb this volatility partly through domestic rates of interest and partly through the exchange rate (Chart 2.8). The rise in domestic interest rates led the money supply to undershoot the target by mid-year, while the later reduction in the domestic rates of interest, following the U.S. trend, led the money supply to overshoot the target by year end. However, by

December 31, the money supply was again in the centre of the target range which, since the fourth quarter of 1980, had been lowered to the 4 to 8% range.

Chart 2.8. Exchange Rate and Interest Rates, Canada and United States.
(Source: Bank of Canada, 1981, pp. 11-12).

By mid-1981, with the money supply at the lower limit of the target range, interest rates in the United States were rising, and the Canadian dollar was trading at a record low of 81 cents in terms of the U.S. dollar. The Bank of Canada had two options: to reduce interest rates so as to bring the money supply back within target, thereby accepting a further depreciation of the Canadian dollar; or to increase interest rates, protecting the dollar at the cost of effectively abandoning monetary targeting.

It chose the second alternative: from May to August 1981 the Bank Rate increased by 2 percentage points, from 19% to 21%, a trend reversed in September when U.S. interest rates started to fall. By then, the policy of Monetary Gradualism was terminated de facto with the aim of monetary policy becoming the control of the external value of the Canadian dollar rather than the control of the money supply.

Throughout 1982, short-term interest rates in Canada were about those in the United States, and declined as U.S. rates fell. By mid-1982, with the money supply running below target since the third quarter of 1981, a slight upsurge in U.S. short-term interest rates narrowed the differential and the Canadian dollar fell to 78 cents U.S., a new low relative to the U.S. dollar. The Bank responded by raising interest rates again, and the money stock went farther below the lower bound of the targets range.

In November 1982, Governor Bouey officially ~~terminated~~ the monetarist experiment, and the Bank returned to the adoption of an ambiguous policy

rationale but one which, unlike the pre-1975 policy of "appropriate credit conditions", now involved an obscure control of the money supply and the protection of the Canadian dollar in foreign exchange markets. With the policy switch and the highly ambiguous new policy rationale, the actions of the bank were again eventually removed from public scrutiny.

As Acheson and Chant (1970; 1972; 1973) argued more than a decade ago, the Bank of Canada, being essentially a "bureau", with its over-reliance on prestige and self-preservation, cannot pursue for long a policy characterized by an exceptional degree of overtness and exposure as the policy of Monetary Gradualism effectively was. Maintenance of autonomy and self-preservation of the Bank, they argued, are best achieved by reliance on covert methods of operation which can increase the Bank's immunity to critical investigation. Furthermore, in the absence of precise information regarding the Bank's policy rationale, the potential critic is disarmed and Bank officials are left free to maximize their successes and minimize their failures (Acheson and Chant, 1972).

Monetary Gradualism, with its pre-announced monetary targets and clearly defined policy rationale, offered the public quantitative targets against which the performance of the Bank could objectively be measured. As result, the Bank endured, during the seven years the experiment with Monetary Gradualism lasted, an amount of criticism unknown in its history which seriously threatened the traditional mythology surrounding Central Banks and Central Bankers.

The abandonment of Monetary Gradualism in 1982 and its replacement by a policy which vaguely promised to keep money supply growth under control while at the same time protecting the value of the Canadian dollar, could therefore be interpreted as the return to those nebulous policy goals, typical of the pre-1975 era in Canadian Central Banking, whose interpretation is sufficiently discretionary to be compatible with any actions of policy, thereby effectively enabling the Bank to escape public scrutiny.

3. THE POLICY DEBATE (I): THE MONETARIST CRITIQUE:

3.1. Introduction.

Serious criticisms of the Canadian monetarist experiment began with the publication of "The Monetarist Counter-Revolution" (1979) by Arthur W. Donner and D.D. Peters followed by Clarence Barber and John McCallum's "Unemployment and Inflation - The Canadian Experience" (1980). Thus far, the discussion of the post 1975 monetary policy had mainly concentrated on the technical aspects of monetary control rather than on the assessment of its actual performance.¹

By the Summer of 1980, three different positions on monetary policy could be distinguished.

At the one extreme, a number of authors essentially denied the monetary nature of Canadian inflation, thereby questioning the appropriateness of the whole monetarist experiment (Donner and Peters, 1979, 1981; Barber and McCallum, 1980, 1981). While Donner and Peters emphasized the structural nature of Canadian inflation stressing the supply side effect of rising energy and other commodity prices and high interest rates, Barber and McCallum evolved an explanation which combined "a series of misfortunes on the supply side superimposed on a long-term trend towards

¹. See, for one, T.J. Courchene, P. Fortin, G.R. Sparks and W.R. White, Monetary Policy in Canada: A Symposium, Canadian Journal of Economics, XII, no. 4, November 1979.

higher prices for basic resource goods" (op. cit., 1980, p. 49) with the absence of social consensus in Canada taking the form of an implicit rejection of the prevailing distribution of income (Barber and McCallum, 1982, ch. 1).

The cure for inflation recommended by both pairs of authors was a form of an incomes policy - a Tax-Based Incomes Policy (TIP) for Donner and Peters, Wage and Price Controls, à la Anti-Inflation Board, for Barber and McCallum. They held that Monetary Gradualism provided little gain on the inflation front while imposing a significant loss in terms of output and employment and balance of payments disequilibrium.

At the other extreme was the monetarist view, with some distinguished members of the Department of Economics of the University of Western Ontario the leading interpreters. If, until 1979, T. Courchene had been the most enthusiastic - though critical - supporter of the Canadian monetarist experiment (Courchene, 1976(a), 1976(b), 1977), by the Summer of 1980 his position had changed to one of open criticism:

"(...) I am in sympathy with the proposition that the Bank of Canada policy has been less than adequate. (...) I would recommend that the Bank live up to its commitments of 1975 and implement a meaningful policy of monetary restraint".
(Courchene, 1981(a), p. 248, emphasis added).

This line of criticism, and the associated discredit in which the Bank's policy soon fell in the eyes of such critics, referred mainly to the

several occasions in 1978 and 1979 when the Bank of Canada temporarily gave priority to control of the exchange rate in its conduct of monetary policy.

These episodes of foreign exchange market intervention were nevertheless consistent with the Bank's announced policy for they always left the money supply within the target growth bands and could therefore be regarded as a result of the flexibility that the Bank allowed itself by setting the target rate for M-1 in terms of a range rather than in terms of a single figure. Although range targeting had earlier received the full support of Western Ontario economists (e.g., Courchene, 1977, pp. 66-59; see also Laidler, 1976), the unsequential episodes of foreign exchange market intervention remained their only point of criticism of the Central Bank's policy until 1980 when a second argument was added, namely that the apparent failure of the monetarist experiment in bringing down inflation was due to its having been too gradual. According to this view, a more "cold turkey" approach to monetary policy would have been warranted to ensure the success of the experiment (Wirrick, 1981; You, 1982).

Other analysts took a middle ground in the debate on monetary policy. They recognized the essential monetary nature of inflation, but were skeptical regarding the effectiveness of a pure monetary cure without incurring heavy costs in terms of unemployment. In general they tended to favour a policy mix involving both fiscal and monetary discipline as well as some form of an incomes policy aimed at moderating inflationary expectations and wage demands (Reid, 1976, 1979; Bodkin, 1981, 1982).

Thus, by the end of 1980 the monetarist experiment, which had never won the enthusiasm of the business community, was also losing the intellectual support of the academic community. It became apparent that the only supporter of the actual course of policy was the Bank of Canada itself. Mr. G. E. Freeman, Deputy Governor of the Bank, wrote in the Fall of 1980:

"It is obviously disappointing, therefore, that after having fallen for a time below 8 per cent a year, Canada's inflation rate, as measured by the Consumer Price Index, has since rebounded, and now seems likely to be almost as high again in 1980 as it was in the mid-1970's. It would be easy to jump from this to the conclusion that monetary policy in Canada has been misconceived, and isn't working and won't work as intended and that inflation in Canada is now essentially out of control. In my view, however, no such conclusions are warranted, and I would like to take a minute or two to explain this view".

(Freeman, 1980, p. 8),

and the Deputy Governor then went on to explain the apparent lack of success of the policy in terms of the economic conditions prevailing in the United States.

He concluded:

"I am convinced that, with a continuing policy of moderation in the rate of monetary expansion, our chances are good for

achieving a resumption of moderate growth in spending and economic activity in Canada in 1981 and an improving cost and price outlook as we move into 1982".

(ibid., p. 10).

Economic conditions, however, deteriorated rapidly throughout 1981 and 1982. The inflation rate reached 12% with the U.S. dollar trading at a record 1.24 in terms of the Canadian dollar. With the money supply below the target, interest rates rose to 22.75%, in terms of the Chartered Banks' rate on prime business loans, by August 1981. Skepticism about the effectiveness of the policy of Monetary Gradualism then reached the Bank of Canada. Governor Bouey took the opportunity to make the announcement which amounted to its practical termination:

"What would have happened if, in spite of our own serious inflation problem and balance of payments difficulties, we had tried to keep our short-term interest rates significantly lower by increasing the rate of monetary expansion? One immediate result would have been a sharp fall in the exchange value of the Canadian dollar... [from which]... there would have been no worthwhile benefit.

(...) For the reasons I have outlined, the Bank of Canada has in recent months given a high priority to the exchange rate situation in its monetary policy operations".

(Bouey, 1981(a), pp. 15-16).

3.2. M-1: The Wrong Monetary Aggregate?

One of the monetarist critiques to the Central Bank's policy of Monetary Gradualism was that the Bank was controlling the wrong monetary aggregate.

Prior to the implementation of Monetary Gradualism, it had been argued that from a practical standpoint the choice of the precise monetary aggregate that the Central Bank decides to control is irrelevant, for in the long-run there is a tight correlation between the growth rates of any two measures of money supply.

In his year-to-year evaluation of monetary policy from 1970 to mid-1975, Courchene noted;

"I recognize and share the Bank's concern over the proper definition of the money supply. At the same time I have a suspicion that the Bank is using this definitional quandary to support its position of benign neglect with respect to movements in the money stock. For virtually all of the 1971 to mid-1974 period, for example (...) it would have made little difference which of the alternative aggregates was selected as representing money - little difference in the sense that any definition would point in the direction of extremely expansionary policy (...)"

(Courchene, 1976(a), p. 101)

At about the same time, Laidler wrote:

"(...) there is nothing in the case for adopting a monetary growth rule that hinges critically upon the choice of one specific definition of money rather than another over quite a broad class of alternatives".

(Laidler, 1976, p. 187).

While both authors were virtually indifferent to the precise definition of money that the Central Bank decides to control, they ended up expressing a slight preference for M-2, a broader definition of money which includes M-1 plus other checkable and all notice and personal term deposits.

Laidler put the point as follows:

"There is (...) some risk that if a very narrow definition [of money] was chosen, there might be room for an uncomfortable amount of slippage in the system, and so I would prefer to see the growth rule applied to a rather broad definition of money - one that includes savings deposits at Chartered Banks and checkable deposits at such institutions as Trust Companies, but which excludes large scale non-checkable deposits".

(1976, pp. 186-187).

The same position was advocated by Courchene (1976(a), pp. 102-106) based on empirical work developed by Gillian Clinton (1974) who, by

performing a set of regressions of nominal income on different indicators of monetary policy, found that the coefficient of determination was maximized ($R^2 = 0.72$) when the M-2 money stock was used as the indicator of monetary policy.

This preference for M-2, however, did not stem from any conceptual superiority of M-2 relative to M-1 in terms of embodying the set of assets properly considered to be "money", and, in particular, Courchene's preference for M-2 is founded on a tautology which leads him to identify money with the statistical monetary aggregate that bears the closest relationship with the level of nominal income. On the other hand, Clinton's work, while being an interesting study in economic history showing that from 1953 through 1973 M-2 had been the best predictor (among those chosen by the author) of money income, offers no clues on whether and why that would also be so in the future. Neither could such clues be offered.

The main intellectual error of the monetarist doctrine, and possibly the main source of its modest policy record, is the idea that money is an objective concept i.e., one which independent observers would regard in the same manner, thereby being amenable to objective statistical measurement. This scientific attitude whereby it is assumed that there exists a universal relationship between each individual and the things he regards as appropriate means to make transactions and/or to store wealth, fails to realize that money is essentially a subjective relationship, a relationship between each man and that collection of objects which according to his beliefs or opinions (in the strict sense

of the word) are best fit for the pursuit of given ends (namely, the facilitation of transactions and/or the conservation of wealth).

As an eminently subjective relationship, "money" lies in the eyes of the beholder. Thus, an object, such as a personal cheque, that is regarded as money by one individual, might not be so regarded by a different individual. Also, objects that in the past had been regarded as money, even by the generality of individuals in a given community at some point in time, might cease to be regarded as such at a later time, in the same manner that objects which in the past had not the status of money might gain such status under different times and circumstances. If, in times of prosperity, a large number of assets is in general regarded as money, in times of panic even such data of any modern statistical money stock as demand deposits or legal tender might cease to be actually regarded by the majority as such, at which time new instruments (new money) are adopted or invented which replace the old ones.

An extreme illustration of this phenomenon, whereby what is money is ultimately defined by the public, not by the chief statistician or economist of any Government agency, occurs in any situation of hyperinflation, such as post World War Germany, where even legal tender lost the status of money in the eyes of the public. And, to take more recent illustrations, domestic legal tender is increasingly losing its status of money in various Latin American countries such as Mexico, and being replaced by other instruments, such as the U.S. dollar (Ortiz, 1983).

Similarly, although during the seventies the evidence in Canada was conflicting regarding the utilization of U.S. currency as a substitute for domestic currency (Miles, 1978; Bordo and Choudhri, 1982), the steady depreciation of the Canadian dollar since then, by increasing the return on holdings of foreign currency, might be changing the situation in the same direction.

In general, serious students of the monetary history of the world did not fail to realize the changeable nature of money, how new objects come to be accepted as money while others are deleted, how existing objects are used with increasing efficiency in man's continuous search for more effective means to make transactions and to hold wealth (see, for example, Gilbert, 1968).

If money is thus a subjective relationship between people and the things they regard as appropriate means to make transactions and/or to store wealth, two important conclusions follow.

The first is that this collection of objects which at any given time and place constitute money is determined by the public through the beliefs or opinions people hold about those objects. Although in the short-run, Governments, as issuers of legal tender, might influence the quantity of money (provided people regard legal tender as money and for so long as people regard it as such) in the long-run it is the public, not Governments, which determines the quantity of money.

Second, as a collection of objects whose status as money depends on the beliefs or opinions held by millions of different individuals, one can conceive of no such thing as an objective measure of the stock of money.

The claim by the Bank's critics that the Bank had been using the wrong monetary aggregate is thus unfounded. For if such critics could support their preference for M-2 on the basis of Clinton's misspecified, simple regression models, so could the Bank cite a wealth of more credible empirical evidence to support its actual choice of M-1 (see Bank of Canada, 1975, pp. 15-20; 1981, pp. 29-30; 1982, p. 25; Freeman, 1976; see also White, 1976, 1979; Selody, 1978; and Poloz, 1980).

The debate regarding the appropriate monetary aggregate becomes, thus, meaningless on a priori grounds, for whatever the chosen statistical aggregate, M-1, M-2, M-3, or any other, the only thing that can be said is that it represents an approximation to the total stock of money; furthermore, since in view of its subjective nature the true stock is not known, and cannot be known, by any single individual, there is no sense in which one of such approximations can be claimed as better than any other over a quite broad range of alternatives. Any monetary policy, thus, because it is based on an arbitrary approximation of the true stock of money and because it fails to anticipate those unintended changes in the composition of assets which people regard as money, must necessarily produce results which, if not opposite to the intended ones, must at least deviate from them to an extent that no one can know in advance. This amounts to saying that the evaluation of a monetary policy course, regardless of the statistical definition of money that is

adopted, becomes ultimately an empirical matter whose merits or demerits can only be judged a posteriori.

This inability to predict the outcomes of monetary policy, and the increasing evidence regarding undesired, unintended consequences of monetary action by Governments has recently led some economists to propose the privatization of currency production (Hayek, 1978; Salin, 1984). This proposal has the merit of removing from Governments, as monopolists of the issue of currency, the power to affect in any decisive manner the stock of money and to avoid the unintended and often undesirable consequences that must necessarily follow from any attempts to control it.

When in 1982 the Bank of Canada officially ended control of the money stock M-1, it was the conceptual problem with the definition of money that was at stake. With the high rates of interest (as measured by historical standards) that money supply (M-1) control had produced since 1975, it could be expected that sooner or later the public would find ways to economize on the use of non-interest bearing assets as means to facilitate transactions and/or store wealth. This was clear already in the years 1979 and 1980 with the creation by the Banking system of accounts combining savings and checking privileges and the facilities made available by banks with regard to corporate cash management which shifted the demand function for M-1 in an unidentifiable manner.

Governor Bouey precisely invoked such conceptual difficulties with the definition of money to cancel the experiment of Monetary Gradualism:

"As a result of these innovations, a substantial reduction has taken place in the growth of M-1 relative to that which one would have expected, given movements in total expenditures in the economy and interest rates. In principle, the Bank could have adjusted its M-1 target system to this development in either of two ways: by revising downwards the target range or by broadening the definition of M-1 in order to incorporate the changed forms in which transactions balances are now being held.

Work on the adjustment of the target levels was imposed by the statistical reporting problems mentioned in last year's Report but a more serious problem is that both the process of financial innovation and the response of bank customers have been rapid and continuing. Since neither can be reliably predicted, appropriate ranges for the future growth of M-1 cannot be chosen with any confidence".

(Bank of Canada, 1982, p. 27).

The fact that the changing nature of money, and thus the difficulty of its control via the chosen statistical aggregate, became an insurmountable operational impediment to Monetary Gradualism, and that it was not being used by the Bank as a mere expedient to discard the whole monetarist experiment, is now supported by an increasing amount of empirical evidence. In a recent study, Marwah and Chengalath (1985) use three alternative statistical tests to provide overwhelming evidence of a structural shift in the demand for M-1 balances in the third quarter of 1978, which they attribute to the financial innovations introduced in

the banking system since the mid-seventies. Furthermore, it can be presumed that the effect of some of such innovations (e.g., the consolidation of corporate deposits by banks) on the reliability of existing monetary aggregates was not confined to M-1 but that they affected M-2 as well.

3.3. Too Gradual a Gradualism?

A second criticism of the Central Bank's policy referred to its gradualism.

In 1975, Governor Bouey rationalized his gradualist approach to the reduction of the rate of monetary expansion on the grounds that the alternative "cold turkey" approach would be too disruptive in social and economic terms to be considered. The Governor's case for gradualism was thus based on an adaptive view of inflationary expectations and the need to minimize the real costs of the policy. His argument was presented as follows.

Suppose that the rate of inflation is currently 15% and this also corresponds to the expectations of inflation held by market participants. If the Central Bank sets a rate of monetary expansion compatible with price stability, and wages and other input prices are fixed by contracts in anticipation of a rate of inflation of 15%, interest rates will increase. Inventory accumulation by businesses and then unemployment will be the signs of the slowdown in economic activity induced by the change in monetary policy. With excess supply on both

labour and product markets, inflation will moderate and thus expectations of inflation. This process will persist as long as the rate of inflation exceeds zero. Only when price stability is reached, and expectations have adjusted, will the (real) rate of interest return to its equilibrium level with excess supply in output and labour markets eliminated.

If the Central Bank sets instead a higher rate of monetary growth, say 10%, i.e., if a gradualist approach to the reduction of the rate of growth of the money supply is followed, the adjustment process described above will be less painful.

It was thus the concern with the social and economic costs of the adjustment process to lower inflation that led Governor Bouey to choose a gradualist approach as opposed to an alternative involving an abrupt curtailment in monetary growth (Bank of Canada, 1975, p. 10). In the Governor's view, inflationary expectations already built in the economy would be insensitive to the announcement of an abrupt reduction in the growth rate of the money supply. On this point the Governor was supported by academics of the monetarist persuasion. In his case for gradualism, Laidler, for example, noted:

"There is one implicit assumption in the foregoing argument that is of considerable importance to our description of the process whereby the inflation rate slows down (...) namely that expectations of inflation **only** get revised downwards when

...le actually observe the inflation rate falling".

(Laidler, 1976, p. 203, emphasis added).

The author then suggests that the simple announcement of a tighter policy on the monetary front by the Central Bank could by itself exert some downward pressure on the expectations of inflation (ibid, p. 203). This suggestion is also found in Courchene (1976(b), pp. 71-72; 1977, pp. 100-106). Both authors, therefore, ultimately side with gradualism, thereby accepting a larger weight for past economic conditions on the formation of expectations than that for announcements of policy.

By 1980-81, after 5 years of Monetary Gradualism and modest improvement in the inflation rate, consensus emerged among monetarists that the policy had been too gradual and hesitant and such was the explanation for its apparent failure (Courchene, 1981 (a), p. 245; 1981(b), pp. 238-245; Wirick, 1981). In retrospect, it seems that for short periods of time during 1976, 1977 and 1978; monetary policy was overly expansionary, or gradualism too mild, in the sense that the target growth rates of the money supply were set too high. Short-term real rates of interest averaged 2.6% from the 3rd quarter of 1975 through the fourth quarter of 1976, but became negative in the two first quarters of 1977. From then on until the third quarter of 1978, they were either marginally positive, or significantly negative (see Chart 3.1).

This was due to the considerable slowdown of economic activity during 1976 and 1977 as well as to the downward shift in the demand for M-1 balances occurring at the time, as Governor Bouey explained in his 1977 Annual Report:

"During much of 1976 and the early months of 1977 the growth of the M-1 aggregate in Canada displayed a persistent tendency to fall somewhat short of the per cent a year lower limit of the target range in effect at the time. This was mainly a reflection of the relatively slow growth of money expenditures in the economy from the second quarter of 1976 through to the second quarter of 1977 (...).

Chart 3.1. Real Yield on 90-day finance Company Paper, Canada
(1975:I-1981:II)

There was also some evidence during this period of the tendency noted in the last year's Annual Report for large holders of demand deposit balances to take advantage of facilities made more readily available to them by the chartered banks for

minimizing their average holdings of these deposits".

(Bank of Canada, 1977, p. 23).

As noted earlier, episodes of monetary overexpansion or underexpansion were inherent to the strategy of monetary gradualism for the setting of the target bands for M-1 growth was plagued by considerable uncertainty resulting from incorrect forecasts of output growth and the instability of the M-1 money demand function. These episodes, however, can hardly be interpreted, as the critics have suggested, as a lack of commitment, on the part of the Bank, to the announced policy. Obviously, the issues involved do not concern monetary gradualism in particular, but economic policy in general. Policy decisions are taken in an environment where policy-makers have access to only a small fraction of the total relevant information dispersed by millions of independent economic agents, an environment where such decisions must necessarily produce unintended consequences. In the case of monetary policy, these difficulties are compounded because on the lack of relevant information regarding the policy environment is superimposed the lack of relevant information regarding the policy instrument itself.

It is therefore against this background that the episodes of monetary overexpansion of 1977 and 1978 must be regarded. Judging in retrospect, it seems that the criticisms regarding such episodes, as well as those others relating to the alleged mildness and hesitancy of the Bank in pursuing Monetary Gradualism, as discussed below, represented much less of a credible argument against the Bank's conduct of monetary affairs than an intellectual expedient by which some economists of the

University of Western Ontario found it convenient to dissociate themselves from a policy experiment which had largely failed to deliver what it had promised.

By 1980 all the forces leading to a deceleration of inflation were present in the Canadian economy: interest rates (as measured by the yield on 90-day Finance Company paper) increased from 8.1% in 1975 to 13.8% in 1980; output growth had been declining since 1976 and was virtually zero by 1980; unemployment rose from 6.9% in 1975 to 7.5% in 1980 with a peak of 8.4% in 1978; businesses had been accumulating inventories since 1976 so that by 1979 inventory accumulation amounted to 1.5% of real GNP, a new record. Nevertheless, inflation was back in the double digit range.

The monetarist critique then concentrated its focus on the issue of inflationary expectations and the alleged mildness and hesitancy with which Monetary Gradualism had been pursued. Despite rising unemployment and interest rates and inventory accumulation, it was argued that monetary gradualism had failed to break deeply entrenched inflationary expectations.

In the Summer of 1980 there were a series of papers on the theme "Has Monetarism Failed?" at the Meetings of the Canadian Economics Association. Monetarists went to great lengths to explain first the apparently modest results of the experiment, and second why it should have been less gradual. With the exception of Laidler, they were unanimous in blaming the excessive gradualism of monetary policy.

Courchene argued

"that the Bank [had] in effect **not** been pursuing gradualism with anything like the degree of firmness and determination that [he] would have anticipated on the basis of its 1975 'conversion'".

(1981(a) p. 247; see also 1981(b), pp. 238-245, emphasis added).

While Wirick added

"that the major difficulty, however, is simply that the tactics of gradualism, as utilized by the Bank, are unsound. Restraint has been applied too unevenly and too hesitantly to convince Canadians that inflation can and will be brought under control. As a result, Canadians have continued to hold expectations of high inflation, which have made progress in actually controlling inflation very slow and painful. Only when the Bank implements restraint in a more forceful manner is it likely that expectations will adjust more rapidly permitting an effective reduction in inflation and a rapid return to full employment".

(1981, p. 257, emphasis added).

According to this interpretation, inflation was not strictly a monetary phenomenon, but involved expectations. Monetary restraint was thus a necessary, although not sufficient, condition to reduce inflation. A

second condition was required, namely, monetary restraint had to be announced and conducted with firmness and determination to convince Canadians that inflation could and would be brought under control.

This reinterpretation followed the lines of the "rational expectations" hypothesis. According to this view, if expectations are rational, the real costs of an anti-inflation policy will be nullified by the behaviour of market participants provided such policy be clearly announced and firmly pursued. And if the monetarist position had initially supported the strategy of gradualism, the rational expectations hypothesis enabled it later to criticize the Bank for the adoption of a prudent gradualism. As Jong S. You argued,

"(...) one can make a stronger case for a more aggressive monetary restraint today than was possible in, say, the early seventies, since the public awareness of a close relationship between inflation and monetary growth seems to have improved over the years and consequently a sharp reduction in the rate of monetary growth is likely to have a greater dampening effect on inflationary expectations today, thereby lightening the burden of output adjustment".

(You, 1982, p. 96).

Governor Bouey seemed increasingly sensitive to "rational expectations" proposals. Having previously acknowledged the episodic overexpansions

of the money supply, which he attributed to the inherent difficulties of gradualism, by 1980 he changed his views.

In his 1980 Annual Report, he wrote

"the reason [why Canada has made only limited progress since 1975 in containing inflation] is not that the anti-inflationary financial policies were misconceived but that they were pursued with such gradualism that they did not succeed in dominating the influences that were working in the opposite direction".

(Bank of Canada, 1980, p. 12).

At the same time he began a public campaign, in his policy pronouncements, designed to reassure the Canadian public of his firm determination to hold to whatever monetary restraint was needed to end inflation:

"(...) if you are a central banker (...) you should achieve and maintain firm control over the rate of monetary expansion in your country, you should take great care to ensure that the rate of monetary expansion is not so great as to prevent the rate of inflation in your country from subsiding, and you should ~~master~~ the patience and resolution to proceed in that way for as long as may be necessary".

(Bouey, 1980, pp. 14-15).

In February 1981, with inflation at double digit levels, the Governor announced a reduction in the target range for M-1 growth to 4 and 8%, respectively. The Canadian economy then went through the worst recession ever since the early thirties, while inflation persisted at double digit levels. Throughout 1981 the tight monetary stance could not but accentuate the severity of the recession until it was officially abandoned in the following year. Independently of its empirical performance relative to alternative courses of action (considered in Part II of this study) there is thus a sense in which the Canadian monetarist experiment of 1975-1982 clearly failed, from both a theoretical and a pragmatic point of view. It failed in its pretence to measure the true money stock by means of the statistical aggregate M-1 (although, it should be stressed, no a priori evidence exists that any other of the available statistical monetary aggregates, such as M-2 and M-3, would have done better in this regard) and consequently on its goal of bringing down inflation together with an arbitrarily chosen money supply. If money is what people, rather than policy-makers, determine it to be, any attempt by the latter, even if successful, to control the supply of assets, such as those included in M-1, they believe to be the money stock must necessarily result in outcomes which differ from intended ones. The gradual deterioration of the economic conditions in Canada which started in the late seventies was one of such unintended, undesired results.

4. The Policy Debate (II): The Neo-Keynesian View.

4.1. Inflation: A Structural Phenomenon

The Neo-Keynesian view in the policy debate was put forward, among others, by Donner and Peters (1979, 1981) and Barber and McCallum (1980, 1981, 1982). Although both pairs of authors differ at times on diagnoses and prescriptions, essentially they share a common view of the world and a common philosophy regarding economic policy. Inflation was perceived as a structural phenomenon which was not created nor could it be cured by the use of monetary policy alone.

In Donner and Peters, the main factors contributing to Canada's structural inflation were the higher world oil prices and the gradual policy adopted in the country to bring domestic energy prices up to world levels, plus the high rates of interest which followed from the policy of Monetary Gradualism (op. cit., 1979, p. 41).

Barber and McCallum offer a similar structural explanation for inflation, an inflation largely irresponsive to the stance of monetary (or fiscal) policy:

"The rise in inflation should be ascribed (...) to a series of misfortunes on the supply side superimposed on a long-term trend towards higher prices of basic resource goods".

(op. cit., 1980, p. 49).

Although Barber and McCallum went on to an explanation of inflation stressing the role of "social consensus" (op. cit., 1982, ch. 1), the key characteristic of their studies is that, like Donner and Peters, they reject any monetary interpretation of inflation, and thus the Bank of Canada's experiment with Monetary Gradualism. After asserting that inflation was largely structural and externally imposed, they argued that fiscal and monetary policies should aim at full-employment. In fact, both pairs of authors ultimately held that the first priority of public policy should be the level of unemployment.

In Barber and McCallum (1980), discretionary fiscal and monetary actions are crucial to attaining full-employment. In the case of monetary policy,

"It is essential that monetary authorities conduct policy with the aim of maintaining the exchange rate at a level consistent with a satisfactory competitive position for Canadian industry. Sooner or later this requirement will conflict with the Bank of Canada's money supply targets. When this happens, the money supply targets should be sacrificed, and not the competitive position of the Canadian economy".
(op. cit., 1980, p. 130).

In Donner and Peters, monetary policy plays a much more accommodative role, similar to that it had played in the early seventies:

"Recommendation: Bank of Canada goals should be set more flexibly in terms of interest rates, credit conditions and money supply targets, with short-run priority given to interest rates and credit conditions".

(op. cit., 1979, p. 78).

Although for both pairs of authors full-employment should be the first priority of policy, both were also concerned with inflation, though they assign less weight to the objective of price stability than do monetarists. From a different diagnosis, they end up with a different cure for inflation: some form of incomes policy - a Tax-Based Incomes Policy (TIP) for Donner and Peters; a comprehensive program of wage and price controls for Barber and McCallum.

4.2. An Incomes Policy as a Complement to Monetary Gradualism

If in the ~~Neo-Keynesian~~ view inflation is largely a supply side phenomenon, a policy of monetary restraint is bound not only to fail in dealing with the inflation problem but also to produce along the way significant costs in terms of unemployment. What is needed, according to this view, is a policy that complements monetary restraint and addresses the problem of inflation on the supply side of the market.

Implicit in the policy of Monetary Gradualism was the idea that a gradual reduction in money supply growth would bring continuous moderation of inflationary expectations. Thus, the transition to the "optimal rate of inflation" would be relatively free of pain.

The implementation of Monetary Gradualism in 1975 was accompanied until 1978 by a comprehensive package of controls on wages and profit margins. The merit of the latter policy was its potential to moderate inflationary behaviour and thus help in the transition towards lower rates of monetary growth and inflation (Courchene, 1976 (b); Lipsey, 1977). Wilson and Jump (1979), using the FOCUS model, estimated the cumulative effect of the Anti-Inflation Board in restraining wage levels at 1.1 percentage points by the second quarter of 1977, though Reid (1979) reports an estimated impact of the controls program on wage settlements of 4.5 percentage points and on the expected rate of inflation of at least 2 percentage points. Independent estimates by Auld et al. (1979) suggest that the Anti-Inflation Board may have contributed to a reduction of 3.2 percentage points in average wage settlements during the period of controls.

The case for controls, as a solution to moderating inflationary expectations, and as a quick solution to inflation was revived by Barber and McCallum. In their 1980 study (pp. 126-127) the case for controls was made, although not forcefully. It was only in their 1982 study that a theoretical rationale for a comprehensive program of wage and price controls is presented. For Barber and McCallum, inflation is a problem of "social consensus", or, more appropriately, a problem of "social disconsensus", a concept which refers to the implicit dissatisfaction by different groups in society with regard to the prevailing distribution of income. Using cross-sectional data for 18 different countries over the period 1950-1979, they argue that the degree of "social disconsensus", measured by the rate of strike activity, is a

better predictor of inflation than the rate of monetary growth.

The "social consensus" hypothesis put forward by Barber and McCallum, while having much in common with the view of the world proposed by Galbraith (1967) almost twenty years ago, is nevertheless less convincing. It sees the society as a grand household pursuing a common hierarchy of ends whereby the dissidents, failing to agree to the common ends, should be punished by a coercive program that limits the growth of their incomes. It fails to account for the fact that what characterizes the social order of the market on which a country like Canada still relies is the freedom of each individual or organization to pursue his own ends regardless of those pursued by others. In doing so, individuals and organizations, if placed in a position conferring substantial market power, might adopt a pricing behaviour that is inflationary, thereby generating "negative externalities" in the sense that their actions generate benefits that are fully internalized while the costs are borne by the society at large in the form of higher prices.

In this case, it appears that the appropriate solution to the problem of inflationary behaviour is the taxation of such behaviour. It is in this sense that the relatively new idea of a Tax-based Incomes Policy (TIP), as advocated in Canada by Donner and Peters (1979) and Bodkin (1981) has a strong appeal.

Since the first proposal by Wallich and Weintraub (1971), the idea of a TIP has sponsored a large number of variants. Some have favoured a

penalty TIP; others a reward TIP; some would see the TIP applied to wages only; others to prices only, and still others to both wages and prices; in terms of its coverage, the TIP could be applied only to the largest corporations and/or unions or be perfectly general.

In Canada, Donner and Peters (1979) and Bodkin (1981) have regarded this policy as an important supplement to a comprehensive anti-inflation package including monetary and fiscal discipline (Bodkin, *op. cit.*, pp. 204-206). The role of a TIP policy in this package is to reduce the real costs of an anti-inflationary policy that relies on fiscal and monetary restraint. Regardless of its precise form, the basic idea behind the TIP proposal is that non-inflationary behaviour on the part of private decision-makers is a good which has all the characteristics of a public good, namely, its consumption is neither rival nor exclusive (Musgrave and Musgrave, 1976, pp. 50-53). Thus, one cannot expect self-imposed restraint on the pricing decisions of market participants if they bear the costs of such behaviour while the benefits accrue to society as a whole. For those groups in society with some degree of market power, inflationary behaviour, though justified in terms of their self-interest, is anti-social. Therefore, they should be taxed as "price polluters".

The TIP proposal has been the subject of considerable controversy and little agreement (Weintraub, Weldon and Laidler, 1981; Courchene, 1981 (b); Barber and McCallum, 1982; The Fraser Institute, 1982), with most critics seeing in it a disguised form of wage and price controls.

There is little doubt that a TIP proposal, even in its most comprehensive form, is a more flexible instrument, in allocative terms, than orthodox controls on wages and prices, although, in its comprehensive variant, flexibility is the only advantage of TIP relative to wage and price controls.

The importance of a TIP, thus, remains in its possibility of being applied on a selective basis. The criterion of application, however, should not be the size of the economic unit as such, and large corporations in particular, as sometimes has been advocated, for there is no evidence in Canada that inflationary pricing behaviour is related to corporate size. As of 1980, the most concentrated industrial sectors in Canada were Tobacco, Beer, Motor Vehicles, Aluminium and Iron, with concentration ratios, as measured by the ratio of the largest four firms' shipments to total industry's shipments, ranging from 99.6% for Tobacco to 86.7% for Iron. It cannot be argued that the giants in these industries were the source of the inflation problems in Canada. The prices of beer and tobacco products actually declined in relative terms over the latter decade and most of their nominal price increases were due to increased indirect taxes. Neither the size of say, GM, Ford, Chrysler or American Motors can be blamed for the inflationary experience of the seventies: from 1971 to 1980, the CPI for car purchases rose from 100 to 180, whereas the overall CPI increased from 100 to 210. In the case of aluminium, iron and other basic materials, whose prices are largely established in world markets, the case for the inflationary behaviour of the large corporation, as such, is considerably weakened.

The case for a selective TIP exists in those sectors of the economy which are not subject to the discipline of the market (e.g., the public sector) and those where artificial (i.e., legal) barriers have been erected to shelter particular groups from the forces of competition. Thus a selective TIP would include first the whole of the public sector. This would encompass not only the Government as a vendor of particular goods or services but Crown Corporations as well. This proposal would therefore require a TIP imposed on wages rather than prices. Furthermore, it would have to be applied in the form of a reward TIP rather than a penalty TIP (Bodkin, 1981). Second, it would include all private sector employees who are legally protected from competition (e.g., doctors, lawyers, and most unionized workers where something approaching a closed-shop legislation exists). Third, it would apply to all private sector employees working for firms whose sectors of activity enjoy legal protection from competition (e.g., airline and banking industries, agricultural workers whose employers are members of some Marketing Board, etc.).

It can be said that a proposal which recommends a selective TIP only on those sectors of the economy which are protected by Governments is simply a second best solution, the first best being the removal of established, protected interests. There is indeed little doubt that a competitive environment, coupled with monetary restraint, would be the most appropriate one to ensure price stability. But at a time of unlimited democracy (Hayek, 1976) where Governments have grown weaker and weaker to resist the pressure of organized interest groups to accommodate their particular demands for various forms of economic

protection, the establishment of that competitive social order which would guarantee equal chances for all in a stable environment is probably out of political reach.

It is in this sense that a TIP policy, as outlined above, appears as an improvement over the present state of affairs. Furthermore, its application to the public sector, which has become the single most important inflationary force in Canada in recent years (Bank of Canada, 1984), appears as an urgent necessity.

PART II

EVALUATING MONETARY

GRADUALISM AND THE ALTERNATIVES

(1975-1980)

FOREWORD

Part II is devoted to an evaluation of the 1975-1980 experiment with Monetary Gradualism in Canada. Such an evaluation raises two methodological issues.

First is the choice of an alternative policy scenario against which the original policy is rated. It was felt that the best solution to this problem would be to compare the performance of Monetary Gradualism with the alternative monetary policy proposals that arose out of the debate contemporaneous to the policy.

Following the discussion in PART I there are four discernible money policy scenarios subject to econometric evaluation that resulted from the debate. These are, on the Neo-Keynesian side, Donner and Peter's policy of appropriate credit conditions and Barber and McCallum's exchange rate strategy. On the Monetarist side, they include a "cold turkey" approach to the reduction of the rate of growth of the M-1 money stock, as proposed by Wirick (1981), You (1982) and the Courchene (1981(a); 1981(b)) of the early eighties, and a policy of monetary gradualism involving the control of the broader monetary aggregate M-2, as sponsored by Courchene (1979) of the late seventies and Laidler (1976).

The second methodological issue concerns the choice of a criterion to rank policy alternatives. The solution adopted with regard to this problem is a double one. First, policies are rated on the basis of two

key economic indicators, the rates of inflation and output growth, made commensurate in a manner deemed appropriate; second, a constructed opinion poll is devised whereby Canadians are called upon to express their ratings about the performance of the actual policy of Monetary Gradualism, as well as the four alternative policy proposals considered.

The econometric estimates of the performance of the four alternative policy scenarios are generated by the FOCUS macroeconometric model of the Canadian economy. The econometric analysis extends from the 3rd quarter of 1975 through to the 4th of 1980.

The sequence of the analysis is as follows. Chapter 5 presents the criteria for policy evaluation and Chapter 6 discusses the FOCUS model. Chapters 7 and 8 re-create the economy under the monetary policy proposals advanced by Neo-Keynesians and Monetarists, respectively, and evaluate Monetary Gradualism relative to them. Chapter 9 provides a cross-section evaluation of the different scenarios of policy and summarizes the conclusions.

5. CRITERIA FOR POLICY EVALUATION

Policy choices are ultimately a matter of personal judgement and preferences. This makes it difficult to devise a method that can by some objective criterion rate one policy relative to another.

Policies do have benefits and costs and, given different preferences on the part of individuals, weights attached to them are likely to differ from individual to individual. On the other hand, a system of group preferences can be found only when the individual members of the group have homogeneous preferences and valuations.

Within the Economics profession some agreement exists regarding the use of indicators of aggregate income and output as a proxy for the level of well-being experienced by individuals, on average, within society. Accordingly, section 5.1 develops a criterion of policy evaluation (henceforth referred to as the Output Criterion) based on the homogenization of two indicators of inflation and output in terms of aggregate income.

Judgements derived from criteria as the above, because they are held by one individual or by a small group of individuals, have in general no more than a normative value. Ultimately, it is the stance of public opinion that determines the fate of policies. A positive criterion for policy evaluation (henceforth referred to as the Public Opinion Criterion) is developed in Section 5.2.

5.1 The Output Criterion

Debate concerning macroeconomic policies, centers in general on the performance of policies in terms of indicators of output (employment) and inflation. The evaluation of a particular course of policy relative to an alternative therefore requires a common denominator to measure the costs and benefits on both the inflation and the output dimensions. This can be done by expressing such costs and benefits as a percentage of actual, real GNP.

Okun (1981) estimated that the social costs of economic slack could be approximated by the value of the resulting output loss (op. cit., p. 272). Thus, if a given policy reduces output relative to actual by, say, \$1 billion in a given year, this figure in absolute terms or, expressed as a percentage of actual GNP, can be taken as the approximative cost of that policy.

In order to derive the costs (benefits) of a policy on the inflation front, it is assumed that the relevant stock of money (M) is M-1, the Bank of Canada's chosen definition.

Following Friedman (1969), the optimum quantity of money is that which makes the nominal rate of interest equal to zero. In terms of Fig. 5.1 this corresponds to the quantity determined at the intersection of the M^d schedule and the horizontal axis, where the value of the services provided by money, given by the area below the M^d curve, is maximized.

Starting from a situation involving a nominal rate of interest i_0 and a real M-1 money stock M_0 in Fig. 5.1, a 1 percentage point increase in the rate of inflation increases the cost of holding money from i_0 to $i_0 + 1\%$. The value of the services provided by money, which is foregone as a result of the higher rate of inflation, is given by the shaded area (Feldstein, 1979). This can be approximated by the expression $M \cdot e_i \cdot 1\%$ where M is the real money stock and e_i the interest elasticity of the demand for real balances.

Fig. 5.1.

If the increase in the rate of inflation is seen as permanent, the above welfare loss will grow over time at an annual rate $e_y \cdot y$ where e_y is the income elasticity of demand for real balances and y the annual growth rate of real output.

Considering a time horizon of 35 years for the current generation, it follows that the present discounted cost (benefit) in year t_0 resulting

from a permanent increase (decrease) in the rate of inflation by 1 percentage point in that year is given by the expression

$$M.e_i.1\% \sum_{t=t_0}^{t_0+35} \frac{(1+e_y.y)^{t-t_0}}{(1+r)^{t-t_0}} = M.e_i.1\% \int_{t_0}^{t_0+35} e^{(e_y.y-r)(t-t_0)} dt \dots (5.1)$$

where M is the real money supply in year t_0 and r the real internal rate of return.

In Canada from 1970 to 1982 y averaged 3.1% and the yield on Government of Canada bonds over 10 years 9.76%; with the rate of CPI inflation averaging 8.25% per year, the internal rate of return is taken as $r = (9.76\% - 8.25\%) = 1.51\%$.

Plugging in $e_i = 0.18$, $e_y = 0.73$ (Poloz, 1980), $y = 3.1\%$ and $r = 1.51\%$ into (5.1) one obtains 0.088M or, expressed as a percentage of real GNP, 0.088M/Y.

Over the period under analysis (1975 - 1980) the velocity of M-1 balances averaged 11, so that $0.088M/Y = 0.8\%$. In other words, the present discounted value of the welfare loss (benefit) in year t resulting from a permanent increase (reduction) in that year of the rate of inflation by 1 percentage point is approximately equal to 0.8% of real GNP of that year.

A measure of the costs of a given course of policy relative to some alternative chosen as the reference case can now be derived.

Let P^0 and P^1 be two alternative courses of policy with outcomes Y_t^0, I_t^0 and Y_t^1, I_t^1 in terms of output and inflation, respectively, in year t . Let P^0 stand for the base case policy. Then, a welfare measure of the benefits (costs, if negative) in year t of policy P^1 relative to policy P^0 , expressed as a percentage of Y_t^0 , is

$$W_t^1 = \left(\frac{Y_t^1 - Y_t^0}{Y_t^0} \right) + 0.008 \left[\left(I_t^1 - I_t^0 \right) - \left(I_{t-1}^1 - I_{t-1}^0 \right) \right] \dots (5.2)$$

$$(t = 1, 2, \dots, n; I_0^1 = I_0^0)$$

Welfare indicator (5.2) assumes that the well-being of individuals in society is a function of aggregate output and prices. In its construction, the income velocity of money is assumed constant under both courses of policy and the gains (losses) in inflation performance are perceived as permanent.

5.2 The Public Opinion Criterion

Since January 1980 Decima Research Limited has been conducting public opinion polls where respondents are asked:

"What is the most important problem facing Canada today - in other words, the one that concerns you the most?"

The answers to this question are then grouped into five mutually exclusive categories, namely:

- Economic Issues
- National Unity
- Energy Issues
- Government/Taxes
- Other

The category "Economic Issues" includes answers expressing primary concern with problems of inflation, unemployment, interest rates, and the general economic condition of the country. Under "National Unity" are grouped respondents who express priority concern for such issues as the separation of Quebec, native people, East-West conflicts within the Canadian Federation, etc.

"Energy Issues" includes concerns about fuel shortages, energy conservation and substitution, and energy dependency on foreign suppliers.

The category "Government/Taxes" includes institutional concerns, e.g., the views of the public about Parliament, politicians and the bureaucracy, and the level and structure of taxation. The category "Other" is a residual one.⁽¹⁾

(1) For a detailed account of the type and variety of concerns grouped under each heading, see Decima Research Limited and Public Affairs International (1983, pp. 187-190).

Table 5.1 shows for the period 1981:I - 1984:IV the proportion of Canadians whose primary concern was with Economic Issues.

Specific Economic issues are grouped under the headings of "Inflation", "Unemployment", "Interest Rates" and "Economy General". The latter is a residual category where the respondents whose answers could not fit any of the other 3 categories of economic issues are grouped. Among concerns most often expressed under "Economy General" are the external value of the dollar, the levels of public spending and deficit and the standard of living of Canadians.

5.2.1 The "Economic Theory" of the Canadian Public

A positive interpretation of the relationships underlying the attitudes of Canadians regarding the state of the economy can be derived from the data presented in Table 5.1.

The choice of a particular economic issue by Canadians as that having the top priority is assumed to depend on the level of the corresponding economic indicator as well as on the levels of other indicators among which such choice is made.

Percentage of Respondents*

Date	Economic Issues	Specific Economic Issues			
		Inflation	Unemployment	Interest Rates	Economy General
March 1981	57	28	14	2	13
June 1981	64	36	10	7	11
Sept. 1981	68	30	7	14	17
Dec. 1981	70	23	12	13	22
March 1982	72	21	23	9	19
June 1982	79	20	27	13	19
Sept. 1982	79	17	40	9	13
Dec. 1982	73	12	46	3	12
March 1983	70	11	48	2	9
June 1983	70	10	49	2	9
Sept. 1983	66	10	47	1	8
Dec. 1983	62	9	43	3	7
March 1984	65	7	46	3	9
June 1984	71	6	52	4	9
Sept. 1984	73	7	53	2	11
Dec. 1984	66	7	50	1	8

* What is the most important problem facing Canada today - in other words the one that concerns you personally the most?

Table 5,1

Source: Decima Research Ltd. and Public Affairs International Ltd., Quarterly Report - Public Affairs Trends, Toronto, various issues.

A model of public opinion concern for specific economic issues can thus be postulated as follows:

$$\begin{aligned}
 CI_t &= a_i + a_{ii} I_t + a_{iu} U_t + a_{ir} R_t + a_{ig} G_t + u_{it} \\
 CU_t &= a_u + a_{ui} I_t + a_{uu} U_t + a_{ur} R_t + a_{ug} G_t + u_{ut} \\
 CR_t &= a_r + a_{ri} I_t + a_{ru} U_t + a_{rr} R_t + a_{rg} G_t + u_{rt} \\
 CG_t &= a_g + a_{gi} I_t + a_{gu} U_t + a_{gr} R_t + a_{gg} G_t + u_{gt} \\
 CE_t &= CI_t + CU_t + CR_t + CG_t
 \end{aligned}
 \dots (5.3)$$

where CI_t , CU_t , CR_t , CG_t and CE_t are the proportions of total respondents stating top concern with Inflation, Unemployment, Interest Rates, Economy-General and Economic Issues, respectively; I is the actual rate of inflation measured by the rate of growth of the GNE implicit price deflator; U is the actual rate of unemployment and R the nominal yield on 1-3 year Government of Canada bonds; G is an index for "Economy-General" as described below. The a 's are structural parameters and the u 's are residual errors assumed to possess standard statistical properties; t is a time subscript.

The index for the general state of the economy is defined as

$$G_t = 0.4 (\bar{y} - y_t) + 0.4 d_t + 0.2 e_t \dots (5.4)$$

where y_t is the rate of growth of real GNP and $\bar{y}$ the corresponding trend rate (1950-1980: $\bar{y} = 4.6$ percent); d_t stands for the Federal Budget deficit expressed as a percentage of GNP and e_t is the rate of depreciation of the Canadian dollar. The term $(\bar{y} - y_t)$ is a proxy for the "standard of living" of Canadians while the weights are chosen so as

to reflect as closely as possible the frequency with which respondents mentioned the concerns grouped under the heading "Economy-General" in Decima polls.

To avoid misspecification of model (5.3), the intensity of factors which determine the concern of Canadians for non-economic issues (e.g., National Unity, Energy Issues, and Government) must either be given explicit consideration or otherwise assumed constant.

The first solution, while increasing the explanatory power of the model, would involve an attempt to quantify human sentiments (e.g., the sentiments of nationality held by Canadians, their fears of energy shortages and foreign dependency, or their political philosophies regarding the proper role of Government in Society) which are, by their very nature, not amenable to cardinal measurements.

The second solution, in turn, would involve the choice of a sample period characterized by the absence of national, energy and institutional crises, where the factors determining the concern of Canadians for such issues could be assumed constant and subsumed in the constant terms of equations (5.3).

The latter solution was adopted. Although Decima poll results are available starting in the 1st quarter of 1980, the whole year of 1980 was excluded in view of the above considerations. This was the year of the Quebec referendum on sovereignty-association; of the fall of the

short-lived Clark conservative government as well as the aftermath of the last major oil crisis of 1978-79.

The period 1981-1984, in turn, saw none of such events and was accordingly chosen for estimation purposes. The estimates of model (5.3) to the quarterly data 1981:I - 1984:IV are presented in Table 5.2

Dependent Variable	Independent Variables						St. Error of Regression	F	DW
	Constant	I_t	U_t	R_t	G_t	R^2			
CI_t	-13.60	0.80 (0.32)	-0.46 (1.10)	2.65 (0.95)	-1.99 (0.80)	0.86	3.98	24.07	1.56
CU_t	48.22	-1.21 (0.53)	2.91 (1.83)	-3.09 (1.57)	1.77 (1.33)	0.88	6.58	28.77	1.67
CR_t	-23.13	0.00 (0.18)	0.59 (0.62)	1.56 (0.54)	-0.37 (0.45)	0.81	2.25	17.26	1.72
CG_t	-4.33	-0.28 (0.21)	0.21 (0.73)	0.86 (0.40)	0.59 (0.53)	0.74	2.63	11.41	1.97

Table 5.2

Notes: (1) Estimations by Ordinary Least Squares.

(2) In brackets are standard errors of estimates.

Since the above estimations reflect an amalgamation of individual views and concerns held by Canadians about economic issues, no a priori expectations could be formed regarding the sign and size of the regression coefficients, except for the elements of the main diagonal. The latter, as expected, are all positive although two of them do not pass a 5% significance test. Of the remaining coefficients, seven do

not pass a 5% significance test, reflecting a tenuous dependency (not excluding the possibility of no dependency at all) of the relevant endogenous variables on the corresponding exogenous variables. Given the lack of a priori insight into the size of the coefficients of the model, it was decided to accept the maximum likelihood estimates of non-statistically significant coefficients, rather than setting them arbitrarily at zero, although the latter solution would have made little difference in terms of the results obtained with the model in subsequent chapters.

It is in the analysis of the elements off the main diagonal of the matrix of regression coefficient that the "economic theory" held by the Canadian public is revealed. There is first an interesting view held by Canadians regarding the relationship between inflation and interest rates. An increase in interest rates increases the concern for inflation. This is consistent with a Keynesian, supply side-view of the causes of inflation à la Donner and Peters. But as for the effects of inflation on interest rates Canadians see apparently no relationships. It can be said that either this represents an extremely short-run, myopic view of the effects of inflation, or else Canadians are ignorant of the Fisher equation.

The interpretation of the regression results involving unemployment and inflation seems to indicate that Canadians believe in a trade-off between inflation and unemployment represented by a downward sloping Phillips curve. An increase in inflation reduces the concern for unemployment (possibly because lower unemployment is expected as a result) while an increase in unemployment apparently leads Canadians to

expect less inflation and be less concerned with this issue.

The belief in the Phillips curve trade-off between inflation and unemployment is supported by the analysis of the effects of the index of general economic conditions, G_t , on the concern for inflation and unemployment issues. A decrease in the growth rate of real GNP relative to trend, via variable G_t , increases the concern for unemployment while reducing that for inflation. It seems, thus, that in terms of their acceptance of the view that unemployment and inflation are inversely related, Canadians are no less Keynesian than in terms of their interpretation of inflation as a supply side phenomenon.

Canadians seem to have a double criterion to evaluate the relationship between unemployment and interest rates. On a priori grounds an increase in interest rates leads Canadians to worry less about unemployment. They seem apparently unable to establish the more sophisticated demand-side links that lead from higher interest rates to higher unemployment. Rather, they are able only to capture the immediate supply-side link, between higher interest rates and higher inflation and then, apparently using the Phillips curve argument, to conclude that higher inflation leads to lower unemployment.

However, when the unemployment rate increases, Canadians seem to be more concerned about interest rates.⁽¹⁾ This seems to reflect an a

(1) This statement must be taken with caution as the relevant regression coefficient ($a_{ru} = 0.59$) is not statistically significant.

posteriori explanation for increasing unemployment in terms of the level of interest rates, which is in contradiction with a priori beliefs.

The concern of Canadians for the "Economy-General" is possibly as much, the result of a "state of mind" involving expectations of the course of economic events as it is the result of a set of observable economic indicators. This accounts for the moderate statistical performance of the equation explaining that variable. That "state of mind", if appropriately proxied by variable G_t , increases the concern of Canadians for unemployment and reduces that for inflation.

Over the period of time used to estimate the model, a recurrent issue has been at the centre of public debate, namely, the size of the Federal Budget deficit. If, as assumed in the construction of variable G_t , the size of the budget deficit enters in the formation of that state of mind that leads Canadians to express a concern for the general economic conditions of the country⁽¹⁾ an important proposition follows in terms of the body of "economic theory" held by the public. This is that Canadians do not believe in the "Crowding-out" effect of deficit financing - a belief which, although relating to an empirical question, again reveals their Keynesian bias. An increase in the federal budget deficit by 1 percentage point adds no more than 0.1 ± 0.4 percent of

(1) One of the typical answers of those who express concern for "Economy-General" in Decima Polls is:

"I think that the country [Government?] may be going broke".

(See Decima Research Ltd. and Public Affairs International Ltd., op. cit.).

Canadians to express a concern for interest rates.⁽¹⁾ The increased concern for unemployment that results from higher deficits might then be explained either by the expectations of higher levels of taxation or from the feeling, borrowed from household economics, that the country "may be going broke".

5.2.2 The Evaluation of Policy According to Public Concern for Economic Issues

Model (5.2) can be used to develop a criterion of policy choice according to the level of concern shown by the public for economic issues.

Let P^0 and P^1 be two alternative courses of policy. Let the outcomes of P^0 and P^1 in terms of inflation, unemployment, interest rates and general economic conditions in period t be represented by the vectors

$$P_t^0 = \begin{bmatrix} I_t^0 \\ U_t^0 \\ R_t^0 \\ G_t^0 \end{bmatrix} \quad \text{and} \quad P_t^1 = \begin{bmatrix} I_t^1 \\ U_t^1 \\ R_t^1 \\ G_t^1 \end{bmatrix} \quad \dots(5.5)$$

respectively.

Define the vectors

$$\overline{P}_t^0 = \begin{bmatrix} 1 \\ P_t^0 \end{bmatrix} ; \quad \overline{P}_t^1 = \begin{bmatrix} 1 \\ P_t^1 \end{bmatrix} \quad \dots(5.6)$$

(1) Confidence level: 95%.

Then, policy p^1 is said to be preferred to policy p^0 in period t if

$$CE_t^1 = IAP_t^1 < CE_t^0 = IAP_t^0 \quad \dots(5.7)$$

where I is a unitary vector of order 1×4 and A the 4×5 matrix of coefficients of model (5.3).

If policy regimes p^0 , p^1 are compared over a time interval $(1;n)$, then (5.7) can be replaced by

$$\overline{CE}^1 = \frac{\sum_{t=1}^n IAP_t^1}{n} < \overline{CE}^0 = \frac{\sum_{t=1}^n IAP_t^0}{n} \quad \dots(5.7A)$$

Criterion (5.7), thus, amounts to choosing policy p^1 as being preferred to policy p^0 in period t if, had an opinion poll been conducted in period t among the general public, the proportion of respondents expressing primary concern for economic issues under p^1 (CE_t^1) is less than that under p^0 (CE_t^0).

6. Macroeconometric Simulation Analysis and Policy Evaluation. The FOCUS Model

6.1. The FOCUS Model: An Overview.

In order to evaluate the performance of the policy of Monetary Gradualism relative to its feasible alternatives, in terms of both the Output and Public Opinion criteria developed in the previous chapter, the FOCUS Macroeconometric model of the Canadian economy is used.

The FOCUS model is a direct descendant of the now retired Quarterly Forecasting Model (QFM) of the Canadian economy, developed and maintained by the Institute for Policy Analysis, University of Toronto. Unlike its predecessor which was designed for short-term forecasting, FOCUS is essentially a policy-analysis and simulation model.¹

In its 1981E version - the one used in this study - FOCUS is a large-scale macroeconometric model involving more than 600 variables, of which more than 350 are endogenous. It is a quarterly model although its solutions can be annualized. Most of the behavioural equations in FOCUS are estimated using the Ordinary Least-Squares technique, with estimation periods which range from the early fifties to the late seventies. Price equations, however, only use data prior to mid-1975, thus avoiding structural shifts introduced by the wage and price controls experiment of 1975-1978.

1. This and the following sections draw on the work by Jump and Dungan (1982) and Jump (1982).

Like other macroeconometric models, the demand side of the economy is largely disaggregated. The first block of equations, models the demand for goods and services - following the traditional disaggregation used in the National Accounts - as Personal Consumption, Business Fixed Investment, Government Expenditures on Goods and Services and Foreign Trade. A second block of equations describes the money market, with equations modelling the demand for, and the supply of various financial assets and the determination of key rates of interest.

The supply side in FOCUS comprises the two remaining blocks of equations. The first of these includes the aggregate production function and the derived demand for labour, as well as the equations determining employment, wage rates, output and prices.

The last block of equations models the supply side of the labour market. This block includes the equations determining labour force participation rates for six age/sex categories as well as other definitional relationships. The overall labour force is computed from a weighted average of participation rates, with weights being given by the appropriate source populations.

There are at least four distinctive features in FOCUS which are not generally shared by other Canadian macro-models. First, FOCUS uses a "synthetic" approach to model expectations of inflation (Dungan, 1981).

Unlike the traditional, distributed-lag approach where expectations of inflation are assumed to depend on past rates of price inflation, the "synthetic" approach sees expected prices as being determined by a broader set of economic indicators such as money supply growth, exchange

and unemployment rates, foreign inflation, in addition to present and past inflation rates.

The key price expectations variable in FOCUS is the expected annual rate of CPI inflation 90 days in the future. Although other price expectations variables are considered in the model, such as the expected rates of CPI inflation one year and two years in the future, these are derived from the expected rate of inflation one quarter in the future through a distributed lag approach.

The FOCUS in equation for the key price expectations variable is developed by regressing the difference between the actual rate of CPI inflation with a lead of one quarter and the current CPI inflation rate on various series, typically expressed as the difference between the current log ratio and an eight-quarter moving average. The equation shows expected inflation as being inversely related to the rate of unemployment and positively related to the rates of growth of M-1, real GNP, the U.S. CPI and the price of foreign exchange. Expectations are, however, regressive, in the sense that an upward surge in CPI inflation relative to the average of the past eight quarters, ceteris paribus, yields expectations of a lower inflation rate in the next quarter.

The expectations of inflation variables play a critical role in the model, particularly through their influence in the determination of nominal wage settlements and real rates of interest. Real rates of interest are calculated as the difference between nominal interest rates and the expected rate of inflation. Nominal interest rates, in turn,

are determined in order to clear money markets in a manner which depends on the specification of Bank of Canada policy, as described below.

Second, FOCUS model builders were able to model international capital flows and the Balance of Payments in a way which enables the exchange rate to be determined as a market clearing price. This is a considerable achievement, given the difficulties of exchange rate modelling.

Third, FOCUS contains an integrated description of the supply side of the economy. The private sector is seen as consisting of a number of equal-sized plants, each operating under a Cobb-Douglas technology displaying decreasing returns to scale. Factor demand equations are derived from the common production function, so that the capital to labour ratio used in production is sensitive to relative factor prices: a rise in wages relative to the rental price of machinery and equipment will induce a substitution of capital for labour. When relative prices are stable, both variable factors of production are complementary to capital structures. Assuming a perfectly competitive environment, when the profit rate is high, the number of "plants" in the economy expands as does investment in non-residential structures.

Parameter estimates and equation specification in FOCUS are continuously revised in light of new developments as more data becomes available or following revisions of the existing data base.

Being essentially a short to medium-term policy simulation model, the normative criterion guiding FOCUS model builders is the policy-analytic capabilities of the model. In the words of one of FOCUS model builders,

"If there has been a trade off to be made between an equation with good structural-analytical properties and an equation which has poorer structural properties but which would be more desirable from a forecasting standpoint, we have chosen the first".

(Wilson, 1981, p. 19)

In periods of rapid structural changes, policy induced or other, as the post World War period has been, adherence to the above criterion sometimes implies sacrificing the statistical properties of the model.

This can be illustrated with the following example. Suppose a change in one or more structural coefficients has occurred. This might result, say, from the introduction of new financial arrangements or institutions; or from the imposition of a program of wage and/or price controls by Governments, economy-wide or in a specific sector; or from the imposition of quotas in a specific import sector; or from policy changes involving levers of policy too specific (e.g., a change in the sales tax imposed on a particular good or class of goods in Ontario; a change in the child exemption for income tax purposes, etc.) to be detailed in a macro model like FOCUS; and so on ad infinitum.⁽¹⁾

It might then be a long time before new statistical information becomes available to enable re-estimation of the affected coefficients and equations. In such cases, affected equations are initially add-factored with add-factors representing "on the side" estimates of the impact of

(1) See Wilson, op. cit., pp. 25-28.

the structural or policy changes on the relevant endogenous variables.

Later, as new information becomes available, preliminary, adjusted estimates of affected coefficients are made and introduced into the model. Such adjusted estimates are continuously updated with the release of still more information and this process is continued until sufficient information is available (which might require several years) to permit a complete re-estimation of the affected equation. The same procedure is adopted with regard to revisions in equation specification.

FOCUS is thus a model undergoing perennial change. This means that the "residuals" in FOCUS no longer resemble a well-behaved error structure with standard statistical properties. Rather, they are subsumed in the add factors, which capture not only statistical residuals proper but also the effects on the relevant endogenous variables of changes in coefficients and equation specification operated by the process described above.

The method adopted in the construction of FOCUS, thus, while making the model particularly suited for policy-analysis precludes its evaluation in terms of its historical-tracking properties, i.e., in terms of the comparison between a model solution that excludes the add factors, and the actual historical record. For only by accident would the model track appropriately the past, particularly the distant past - neither is it designed to do so.

The policy-analytical capabilities of FOCUS ultimately determined its choice for the purposes of this study. Although FOCUS is also a fore-

2 OF/DE 2

MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS
STANDARD REFERENCE MATERIAL 1010a
(ANSI and ISO TEST CHART No. 2)

casting model, an arrangement between the Institute for Policy Analysis (IPA) and Data Resources Inc. (DRI) has freed FOCUS model builders from the constraints imposed by the need to forecast. Under this arrangement, IPA can draw upon the forecasts, both short-term and long-term, that DRI prepares on a regular basis. The FOCUS model is "tuned" to replicate the chosen DRI forecast. This forecast then becomes the base case upon which IPA's ex-ante policy-analysis work is undertaken. FOCUS model builders can therefore afford the luxury of choosing equations with good policy analytical properties even though these equations might involve serious forecasting difficulties (Wilson, op. cit., pp. 20-21).

6.2. Monetary Policy in FOCUS.

The main channel by which financial variables affect real quantities and prices in the FOCUS model is via real rates of interest, which are influenced by monetary policy.

The key real rate of interest in FOCUS is the rate on 90-day Finance Company Paper (90FCP). This rate is determined in the model through a liquidity-preference approach that equates the supply and the demand for money. Other interest rates are derived from 90FCP through "term structure" relationships. Real rates of interest are related to nominal rates through "synthetic" price expectations 90 days, 1 year and 2 years into the future, which are calculated on the basis of reduced-form forecasting equations for prices.

FOCUS distinguishes between the two most commonly used definitions of money, M-1 and M-2, and allows the user to select any of several

different monetary policy regimes. How the model functions under these regimes is described below:

- (i) The Bank of Canada may be deemed to set target growth rates for the narrowly defined, nominal money supply, M-1. In this case, the model determines the real rate of interest, $90FCP$, which equates demand and supply of M-1. The broadly defined money-supply (M-2) and the level of Chartered Bank Reserves (CB Reserves) are determined endogenously by the respective demand equations for these aggregates.
- (ii) If the Central Bank decides to control M-2, the roles of M-1 and M-2 are reversed relative to (i) above: the real interest rate, $90FCP$, is now determined so as to equate the supply and the demand for M-2 balances, with M-1 and CB Reserves being determined by their respective demand equations.
- (iii) When the Central Bank controls CB Reserves, the money supply becomes endogenous, and $90FCP$ equates the exogenously determined supply of reserves with the Chartered Banks' demands for required reserves (derived from deposit liabilities).
- (iv) The Bank may set targets for the real rate of interest, $90FCP$. In this case, M-1 and M-2 are endogenously determined so as to satisfy the demand for money at the target real rate of interest.
- (v) Alternatively, the Bank may set targets for the short-run nominal rate of interest. In this event, the money supply is determined

so as to equate the demand for money at the target interest rate. The real rate of interest 90FCP is then computed as the difference between the target nominal rate and the expected rate of inflation 90 days into the future.

(vi) Instead of setting targets for the narrowly defined, nominal money supply, as in (i) above, the Central Bank may be considered to set targets for the real money supply M-1. The real money supply is defined in terms of nominal M-1 deflated by the GNE implicit price deflator, and the real rate of interest is then determined so as to equate the controlled real money supply with the endogenously determined demand for real balances. In this case, M-2 and CB Reserves are determined by their respective demands.

(vii) Finally, if the Bank of Canada controls the exchange rate, the user of FOCUS specifies the maximum allowable changes in official foreign reserves, so that actual changes above that maximum are zero. In this case, the short-term nominal rate of interest is endogenously determined so as to clear the foreign exchange market at the target exchange rate.

It is interesting to note the properties displayed by FOCUS under each of the above monetary regimes. Theoretically, one of the functions that might be ascribed to monetary policy is to cushion the real sector of the economy from exogenous shocks or disturbances (i.e., unintended shifts in the IS schedule). In terms of standard textbook economics, this is better accomplished the more interest-inelastic, or steeper is the LM curve. If this is the criterion for ranking alternative monetary

policy regimes, then, option (ii), in which the Bank of Canada is assumed to control the broadly defined money supply, M-2, ranks first. This policy option produces a steeper LM schedule than any other of the alternatives. Next, comes option (iii), in which the Bank of Canada is assumed to control Chartered Bank Reserves, followed by option (i) (or (vi) when the narrowly defined money supply, M-1, is controlled. Options (iv) or (vii) peg the real rate of interest or the exchange rate, respectively, and produce a horizontal LM curve and thus no insulation at all; in terms of intended policy actions these options grant fiscal policy its maximum effectiveness.

Finally, control of the nominal rate of interest, option (v), produces a downward sloping LM curve, as exogenous shocks are amplified by the "accommodating" behaviour of monetary authorities.

6.3 The Performance of Monetary Gradualism

For the purposes of policy comparison and evaluation, the policy of Monetary Gradualism is taken as the reference policy.

Table 6.1 presents the outcomes of this policy, in annualized form, from

1975 through 1980⁽¹⁾. In brackets are FOCUS annualized add factors for the corresponding model equations. Those add factors are non-zero in the case of behavioural (B) equations and zero in the case where the economic indicator is given through an identity (I).

As noted earlier, although the policy of Monetary Gradualism was officially terminated only in November 1982, evidence strongly suggests that it was de facto abandoned by mid-1981 when emphasis in the conduct of monetary affairs switched from money supply control to the support of the Canadian dollar in foreign exchange markets. Accordingly, the period of analysis is restricted to 1975-1980.

Section A of the Table presents the actual values of GNP, in constant 1971 prices, and its components, as Personal Consumption, Business Fixed

(1). An attempt was made to replace the deterministic nature of the results presented in Table 6.1 as well as those of the simulations reported in subsequent chapters by a more realistic, stochastic one, using a Bootstrap method (Efron, 1982). The technique involved the following steps:

- (i) for each endogenous variable and each quarter in the simulation period (1975:III-1980:IV) an add factor is randomly selected from the actual distribution of 22 add factors for that variable over the time span of the simulation;
- (ii) the model is subsequently simulated with actual add factors for each endogenous variable replaced by the outcomes of the random process described in (i)
- (iii) steps (i) and (ii) are repeated 100 times so as to generate a probability distribution for each endogenous variable in each quarter of the simulation period.

The heteroscedasticity displayed by add factors turned out to be more severe than anticipated with more than 90% of Bootstrap simulations producing time paths for the endogenous variables whose internal variability was judged unacceptable. The experiment was, accordingly, abandoned.

Table 6.1 The Performance of Monetary Gradualism (1975-1980)

(Control Solution)

	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>
<u>A. Aggregate Demand and Output</u> (constant 1971 \$million)						
Personal Consumption (I)	70,645 (-)	75,250 (-)	77,415 (-)	79,550 (-)	81,136 (-)	81,955 (-)
Business Fixed Investment (I)	22,534 (-)	23,536 (-)	23,314 (-)	23,481 (-)	25,168 (-)	26,273 (-)
Inventory Investment (I)	-268 (-)	966 (-)	60 (-)	232 (-)	1,872 (-)	-762 (-)
Government Expenditures on Goods and Services (I)	25,542 (-)	25,571 (-)	26,273 (-)	26,564 (-)	26,474 (-)	26,342 (-)
Exports Goods and Services (I)	23,993 (-)	26,225 (-)	28,046 (-)	30,929 (-)	31,766 (-)	32,087 (-)
Imports Goods and Services (I)	29,683 (-)	32,166 (-)	32,844 (-)	34,344 (-)	36,420 (-)	36,615 (-)
GNP (I)	113,005 (-)	119,249 (-)	121,761 (-)	126,281 (-)	130,115 (-)	130,160 (-)

B. Prices and Wages
(growth rates, %)

CPI (I)	10.8 (-)	7.6 (-)	8.0 (-)	8.9 (-)	9.1 (-)	10.2 (-)
GNE Price Deflator (I)	10.8 (-)	9.5 (-)	7.1 (-)	6.4 (-)	10.3 (-)	10.7 (-)
Wages and Salaries, Private Sector (B)	13.1 (-)	12.3 (-)	7.5 (-)	4.7 (-)	8.0 (-)	8.6 (-)

C. Employment

Employment (1,000 persons)		9,284	9,482	9,649	9,971	10,368	10,657
(I)		(-)	(-)	(-)	(-)	(-)	(-)
Unemployment Rate (%)		6.8	7.1	8.1	8.4	7.5	7.5
(I)		(-)	(-)	(-)	(-)	(-)	(-)

D. Government Surplus or Deficit
(\$ million)

Federal		-3,805	-3,390	-7,302	-10,654	-9,214	-10,697
(I)		(-)	(-)	(-)	(-)	(-)	(-)
All levels		-4,049	-3,221	-5,005	-6,954	-4,691	-5,983
(I)		(-)	(-)	(-)	(-)	(-)	(-)

E. Incomes and Savings
(1971 \$million, unless otherwise indicated)

Wages and Other Labour Income		67,357	72,476	73,941	74,083	75,844	77,000
(I)		(-)	(-)	(-)	(-)	(-)	(-)
Corporation Profits before taxes		14,196	13,418	12,993	14,612	18,240	17,642
(I)		(-)	(-)	(-)	(-)	(-)	(-)
Personal Disposable Income		80,851	85,186	87,242	90,933	92,807	93,863
(I)		(-)	(-)	(-)	(-)	(-)	(-)
Net National Income at factor cost		93,710	99,736	100,080	101,926	107,411	108,279
(I)		(-)	(-)	(-)	(-)	(-)	(-)
Personal Savings Rate		10.9	10.0	9.7	10.8	10.3	10.1
(I)		(-)	(-)	(-)	(-)	(-)	(-)

F. Financial
(%, unless otherwise indicated)

Nom. Yield 90-day Finance Co. Paper		8.1	9.2	7.3	9.1	12.2	13.8
(B)		(0.5)	(-0.5)	(0.1)	(0.9)	(1.0)	(1.8)
Real Yield 90-day Finance Co. Paper		-0.9	2.7	-1.0	0.4	2.4	4.4
(I)		(-)	(-)	(-)	(-)	(-)	(-)

Nom. Yield 1-3 years Gov. Canada Bonds (I)	7.6 (-)	8.0 (-)	7.4 (-)	8.9 (-)	10.8 (-)	12.6 (-)
Real Yield 1-3 years Gov. Canada Bonds (B)	-1.9 (0.3)	1.8 (0.2)	-0.8 (0.4)	0.2 (0.9)	1.3 (0.0)	3.3 (-0.6)
Money Supply (M-1, \$million) (B)	16,978 (341)	18,194 (370)	19,883 (-201)	21,717 (719)	23,158 (880)	24,661 (1,856)
Money Supply (M-2, \$million) (B)	63,214 (-238)	74,152 (240)	85,343 (-171)	95,464 (4,351)	113,195 (9,244)	131,220 (13,030)
Chartered Bank Reserves (\$ million) (B)	3,628 (40)	4,050 (1)	4,563 (-52)	5,234 (-95)	5,872 (-131)	6,495 (-98)

G. Balance of Payments
(\$ million, unless otherwise indicated)

Balance on Current Account (I)	-4,757 (-)	-3,842 (-)	-4,301 (-)	-4,935 (-)	-4,986 (-)	-1,904 (-)
Balance on Long-Term Capital Flows (I)	3,395 (-)	7,923 (-)	4,265 (-)	3,361 (-)	2,838 (-)	1,374 (-)
Balance on Short-Term Capital Flows (B)	417 (542)	-3,558 (748)	-1,385 (636)	-1,726 (328)	3,745 (-536)	-968 (-120)
Exchange Rate (Can. cents/US\$) (B)	102 (-5)	99 (-8)	106 (-6)	114 (-2)	117 (20)	117 (2)

H. Other Economic Indicators

Capacity Utilization Rate (%) (B)	81.4 (-2.2)	82.6 (-0.3)	81.0 (-0.9)	83.3 (-)	84.4 (-1.3)	79.6 (-1.8)
Terms of Trade (index) (I)	110 (-)	112 (-)	107 (-)	103 (-)	107 (-)	107 (-)
New Passenger Car Sales (thous.) (B)	250 (-4)	234 (-33)	249 (-16)	248 (-43)	250 (-77)	235 (-98)
Housing Starts (thous.) (I)	225 (-)	274 (-)	244 (-)	233 (-)	198 (-)	159 (-)

Investment, Government Expenditure on Goods and Services and the foreign trade balance.

In section B, three indicators for price and wage inflation are presented, namely, the growth rates of the Consumer Price Index (CPI), the GNE implicit price deflator and Wages and Salaries in the private sector. Section C displays the values of two key labour market statistics, the level of employment and unemployment rate.

Section D reflects the stance of budgetary policy through the Federal and overall budget balances.

The aggregate, functional distribution of income is presented in section E which also includes other income aggregates, such as Personal Income, Personal Disposable Income and Net National Income. The Personal Savings Rate, or the ratio between Personal Savings and Personal Income after taxes, closes this section.

The crucial indicators of monetary policy, the level of money supply (M-1 and M-2), Chartered Bank Reserves and short-term and long-term interest rates (real and nominal) are presented in section F.

Section G displays the Balance of Payments components, and the exchange rate of the U.S. dollar in terms of the Canadian dollar.

Finally, in section H, other economic indicators are listed such as the aggregate capacity utilization rate, an index of the terms of trade for

Canada⁽¹⁾ and the rest of the world, and two leading indicators of aggregate demand, the number of housing starts and new passenger car sales.

(1) The terms of trade are defined as the ratio between the implicit price deflator for Canadian exports and the implicit price deflator for Canadian imports.

7. Monetary Policy (1975-1980): The Neo-Keynesian Alternatives.

The Neo-Keynesian critique to the Central Bank's experiment with Monetary Gradualism made alternative proposals for the conduct of money policy.

Donner and Peters argued for a less restrictive policy on the monetary front, one taking into account the cost and availability of credit. Their proposal is to return to the pre-1975 policy of "appropriate credit conditions", while Barber and McCallum suggested monetary policy be geared to control of the exchange rate in order to achieve a satisfactory competitive position for the Canadian economy in international markets.

This chapter considers these two proposals in turn. In section 7.1. FOCUS is simulated to re-create the Canadian economic scenario from mid 1975 through the end of 1980 under the "credit conditions policy".

Section 7.2. considers an exchange rate strategy for monetary policy. In the absence of precise guidelines on the part of the proponents of this strategy, FOCUS is simulated over the period mid 1975-1980 under the assumption that the exchange rate is fixed at its average level since the floating of the dollar in May 1970 until mid-1975, namely US\$1.

In section 7.3. both policies are evaluated vis-à-vis Monetary Gradualism using both the "Output Criterion" and the "Public Opinion Criterion" developed in Chapter 5.

7.1. The Credit Conditions Policy.

The policy of "appropriate credit conditions" had the Central Bank monitoring the level of Chartered Bank Reserves with the aim of achieving discretionary targets in terms of the level of nominal rates of interest.

From 1971 through mid-1975, the level of chartered Bank Reserves increased at an average annual rate of 16.3%. Between 1971 and 1973, growth in Bank Reserves was virtually kept constant at rates oscillating between 16% and 17%, and the decline of the growth rate in 1974 (13%) was compensated in the first three quarters of 1975 by an above average growth rate of 20% on an annual basis. With the adoption of Monetary Gradualism, growth in Bank Reserves declined to 12.5% on average from 1975:III to 1980:IV, with annual rates in the range 11%-13% except in 1978 (14.7%) and 1980 (16.6%).

In order to simulate the performance of the Canadian economy under the credit conditions policy, it is assumed that Chartered Bank Reserves would have grown at the trend rate of 16.3% per annum from 1975:III through 1980:IV. By the 4th quarter of 1980, this assumption amounts to an increase of 17.5% in the level of this aggregate, relative to actual.

The Simulation Results, in an annualized form, are presented in Table 7.1.

Chart 7.1. Chartered Bank Reserves (Canada, 1971:I-1980:IV), actual and simulated.

Table 7.1. The "Credit Conditions" Policy
(Chartered Bank Reserves controlled at an annual growth rate of
16.3%, simulated minus actual)

	1975	1976	1977	1978	1979	1980
<u>A. Aggregate Demand and Output</u>						
(constant 1971 \$million)						
Personal Consumption.....	1	28	189	520	1009	1626
Business Fixed Investment....	12	190	766	1590	2096	2506
Inventory Investment.....	0	25	135	262	314	291
Governm. Expend. Goods and Services.....	0	0	0	0	0	0
Exports Goods and Services...	6	43	138	302	365	530
Imports Goods and Services...	0	40	240	522	635	506
GNP.....	19	246	989	2151	3148	4446
<u>B. Prices and Wages</u>						
(growth rates, %)						
CPI.....	0.04	0.39	1.00	1.85	1.93	2.87
GNE Price Deflator.....	0.04	0.35	0.98	1.74	2.18	3.31
Wages and Salaries, Private Sector.....	0.02	0.26	0.78	1.61	2.31	3.18
<u>C. Employment</u>						
Employment (1,000 persons)...	1	12	61	145	226	328
Unemployment Rate (%).....	-0.01	-0.07	-0.36	-0.84	-1.25	-1.77
<u>D. Government Surplus or Deficit</u>						
(\$million)						
Federal.....	23	262	526	457	448	723
All levels.....	29	300	999	2057	3172	4964

E. Incomes and Savings

(1971 \$million, unless otherwise indicated)

Wages and Other Labour Income	-32	-24	191	642	1457	2381
Corporation Profits before taxes.....	31	290	846	1510	1913	2540
Personal Income.....	-37	-20	200	601	1500	2440
Personal Disposable Income...	-7	-30	115	429	1161	1884
Net National Income at factor cost.....	-14	246	1056	2131	3334	5084
Personal Savings Rate (%)....	-0.01	-0.01	0.06	0.03	0.18	0.27

F. Financial

(% , unless otherwise indicated)

Nom. Yield 90-day Finance Co. Paper.....	-0.07	-0.63	-0.92	-0.81	-1.01	-1.07
Real Yield 90-day Finance Co. Paper.....	-0.22	-1.21	-1.56	-2.45	-3.25	-3.46
Nom. Yield 1-3 years Gov. Canada Bonds.....	0.01	-0.28	-1.16	-1.25	-1.25	-1.76
Real Yield 1-3 years Gov. Canada Bonds.....	-0.16	-1.06	-1.82	-2.74	-3.53	-4.17
Money Supply (M-1, \$million).....	61	537	1071	1521	2475	3480
Money Supply (M-2, \$million).....	235	2412	5296	8237	15248	23830

G. Balance of Payments

(\$million, unless otherwise indicated)

Balance on Current Account...	-2	-94	-458	-1164	-1573	-1039
Balance on Long-Term Capital Flows.....	-5	-81	-760	-2018	-3230	-4498
Balance on Short-Term Capital Flows.....	6	175	1218	3182	4803	5537
Exchange Rate (Can. cents/US\$)	0	1	3	6	10	15

H. Other Economic Indicators

Capacity Utilization Rate (%)	0.00	0.00	0.01	0.01	0.01	0.01
Terms of Trade (index).....	0	0	0	-1	-1	-1
New Passenger Car Sales (thous.).....	0	1	6	13	19	25
Housing Starts (thous.).....	0	2	8	14	21	34

Chart 7.2. Rate of Growth of M-1, relative to 4 quarters earlier (1975: I-1980: IV), actual and simulated.

Source: FOCUS

The "credit conditions" policy would have expanded the money supply which, in terms of the M-1 aggregate, would have been above actual by some 14% by 1980. The rate of growth of M-1, shown in chart 7.2, would have followed the actual pattern with the same sharp decline starting in the first quarter of 1980. This happened simultaneously with the widespread use of new facilities offered by the banking system. Deposit accounts combining savings and checking privileges reduced the M-1 money multiplier from 3.6 in 1979 to 3.1 in 1980 while the daily consolidation by Banks of demand deposits held across the country by large corporations contributed to a reduction in the M-2 money multiplier.

	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>
M-1	4.5	3.7	3.7	3.6	3.1
M-2	20.1	18.4	20.1	22.0	20.9

Table 7.2. Money Multipliers, 1976-1980 (change in Money Stock divided by change in Chartered Bank Reserves).

Under the "Credit Conditions" policy, both real and nominal rates of interest, particularly the former, would have been considerably lower, contributing later in the decade to a significant depreciation of the Canadian dollar to levels below 70 cents U.S.

The lower rates of interest and the decline in the external value of the Canadian dollar would have added to all the components of aggregate demand, specially business fixed investment which, by 1980 would have been some 10% above actual. However, the higher level of aggregate demand would not have prevented the 1976-1977 and 1979-1980 downturns in the aggregate level of production, as shown in Chart 7.3.

With natural rates of unemployment of 5 to 6% (Dungan and Wilson, 1981), full-employment could have been reached by mid-1979 and maintained throughout 1980 (Chart 7.4).

Chart 7.3. Rate of Growth of real GNP, relative to 4 quarters earlier (1975:I-1980:IV), actual and simulated.

Chart 7.4. Unemployment Rate (1975:I - 1980:IV), actual and simulated.

Inflation (CPI) would have followed its actual path, although at a higher level. The expansionary monetary stance implicit in the "credit conditions" policy would have dictated rates of inflation some 2-3 percentage points higher than actual by 1979-1980. The same pattern would have been observed in terms of the broader GNE implicit price deflator (GNEpd). In terms of both indicators, the inflation rate would have returned to double digit levels in 1978, reaching 13-14% by 1980.

Chart 7.5. Rate of CPI inflation, relative to 4 quarters earlier (1975: I-1980:IV)

Table 7.3. shows the elasticities of the price level and the level of employment with respect to three monetary indicators, M-1, M-2 and the level of Chartered Bank Reserves (CB Reserves) under the "Credit Conditions" policy. The price level is measured by the GNE implicit price deflator.

	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>
<u>Price Level</u>					
M-1	0.10	0.23	0.42	0.46	0.57
M-2	0.10	0.20	0.34	0.37	0.44
CB Reserves	0.10	0.19	0.38	0.42	0.46
<u>Employment</u>					
M-1	0.04	0.12	0.21	0.20	0.22
M-2	0.04	0.10	0.17	0.16	0.17
CB Reserves	0.04	0.10	0.19	0.19	0.18

Table 7.3 Price and Employment Elasticities with respect to Key Monetary Aggregates, "Credit Conditions" Policy (1976-80).

These estimates suggest that the process by which inflation propagates itself in the economy following changes in domestic money policy is considerably slow. After 5 years of a sustained increase in any measure of the money supply (brought about by an appropriate increase in Chartered Bank Reserves) the price level changes by half the accumulated percentage change in the money stock.

Milton Friedman has suggested on repeated occasions that a 1% increase in the money supply, ceteris paribus, will take about 1½ years to be translated into a 1% increase in the price level. In Canada, according to the estimates provided in Table 7.3., the transmission of higher rates of monetary growth into higher rates of inflation appears to be not only slower but also to operate only indirectly and partially.

The difference can be explained by the size and openness of the Canadian Economy vis-à-vis the United States. In a small open economy such as Canada, any monetary stimulus is transmitted directly to aggregate demand only in part. Depending on the degree of capital mobility, the reduction in domestic interest rates induces the substitution of domestic for foreign sources of financing which, per se, has no direct effect on domestic aggregate demand. The impact of an expansion of the money supply on prices is thus delayed, and produced only via the indirect effect of the ensuing depreciation of the Canadian dollar on aggregate demand and supply.

As shown in Table 7.4., the ability of financial capital to flow in and out of Canada according to interest rate differentials, relative to the United States, is non-trivial. With the implementation of Monetary Gradualism in 1975 Canadian interest rates increased substantially relative to U.S. rates, and so did the inflows of capital into Canada.

The high sensitivity of portfolio investment decisions in Canada to interest rate differentials, adjusted for expected changes in exchange rates, has been recently documented by Marwah (1984). Both "flow" and

(1) Year	(2) 90-days Canadian Prime Corporate Paper Rate	(3) 90-days U.S. Commercial Paper Rate	(4) Differential (2)-(3)	(5) Net New Issues of Canadian Securities Abroad (\$ billion)
1970	7.34	8.11	-0.77	0.6
71	4.51	5.17	-0.66	0.4
72	5.10	4.83	0.27	1.1
73	7.45	8.55	-1.10	0.6
74	10.51	10.33	0.18	1.8
75	7.94	6.26	1.68	4.2
76	9.17	5.31	3.86	8.1
77	7.47	5.75	1.72	5.1
78	8.83	8.32	0.51	5.4
79	12.07	11.44	0.63	3.2
80	13.15	13.03	0.12	3.0
81	18.33	15.89	2.44	10.9
82	14.15	12.12	2.03	12.0
83	9.45	9.20	0.25	5.7
84	11.19	10.37	0.82	4.8

Table 7.4

Source: Department of Finance, Economic Review, April 1985

"stock" decisions of portfolio seem to respond significantly to both the level and changes in the level of yield differentials between Canadian and foreign securities.

The same sensitivity of capital flows to interest rate differentials is displayed in the simulation results of the "Credit Conditions" policy, whose lower rates of interest are associated with a large reduction in net new issues of Canadian securities abroad, as shown in Table 7.5.

<u>Year</u>	<u>Change in Net New Issues of Canadian Securities Abroad (\$ million)</u>
1976	-17.6
1977	-549.3
1978	-1,763.9
1979	-2,959.9
1980	-4,134.5

Table 7.5 Change in Net New Issues of Canadian Securities Abroad
(Simulated, "Credit Conditions" Policy)

~~Thus, to the extent that Canadian business and Governments can rely on~~
U.S. credit markets as substitutes for domestic credit markets, the ability of Canada to influence the domestic price level is impaired. Progress in reducing inflation is slow and depends on circumstances (e.g., the extent to which economic agents regard Canadian and U.S. securities as substitutes; the sensitivity of domestic aggregate demand and supply to changes in the exchange rate, etc.) which are beyond the control of the Central Bank.

7.2. A Pegged Exchange Rate Policy

The return to a policy of fixed exchange rates vis-à-vis the United States has been forcefully argued in Canada by Clarence Barber and John McCallum (1982). They seem to draw on the Swiss example whose economic performance over the seventies they attribute to the efforts of Swiss authorities to keep the value of the Swiss franc constant relative to the German mark.

In an economy of the size and openness of Canada, a fixed exchange rate policy with the U.S. severely affects the already small degree of independence in matters of economic policy that is left to domestic authorities, while at the same time putting an inordinate amount of faith on the ability of U.S. authorities to conduct sensibly their own economic affairs.

It was a policy of fixed value of the C\$ in terms of the U.S. currency which in the late sixties largely imported in Canada the inflation brought about by U.S. inflationary policies on both the fiscal and monetary fronts.

A pegged exchange rate policy, if it is to be directed at the improvement of the competitive position of Canadian industry, as suggested by its advocates, raises the question of the determination of the value at which the exchange rate should be set. Ideally, under such policy, the value of the dollar should be set at its equilibrium level, i.e., that level where deficits and surpluses of the Balance of Payments

average out over the long-run. But while past experience can provide some insight into what the equilibrium exchange rate would have been under those past, known circumstances, this information, while relevant from the point of view of the economic historian, is of limited use to the policy-maker, who must look at the future course of economic phenomena in a changing environment.

It is one of the merits of the market as a communications system to provide through the price mechanism information which, being widely dispersed among millions of economic agents operating in a network of highly complex relationships, cannot be known in advance to any single individual. Thus, a policy that fixes the exchange rate necessarily does so in an arbitrary fashion and ultimately is bound to err on either the low or the high side, and errors of this nature are bound to work ultimately against the long-run interests of Canadian industry. An undervaluation of the dollar because it is likely to create inflationary pressures on both the demand side and the supply side, thereby impairing the competitive position of the Canadian economy, while at the same time conferring an advantage to the exporting sector of the economy at the expense of the non-exporting sector which can hardly be justified on any principles of justice. An overvaluation is undesirable because it deprives Canadian business of sales that would otherwise be forthcoming, with the non-exporting sector benefiting at the expense of the exporting sector.

To design an exchange rate policy that can meaningfully be compared with Monetary Gradualism, one has to place oneself in the position of the

policy-maker who in the 3rd quarter of 1975 had to decide on the "appropriate" level of the exchange rate. Lacking any insight into future developments of the economy, he would have to rely on the limited relevant information provided by recent past experience.

From the floating of the dollar in May 1970 until mid-1975 the Canadian dollar fluctuated between 97 and 102 cents U.S., averaging U.S. \$1.00. In 1975 alone the Canadian dollar fluctuated around U.S. \$1.00 closing the year at approximately U.S. \$0.99. It seems therefore sensible that if an exchange rate had to be chosen to fix the value of the Canadian currency in terms of its U.S. counterpart that would have been around the parity value.

In the policy simulation reported in Table 7.4., the Bank of Canada is assumed to intervene in foreign exchange markets so as to keep the external value of the Canadian dollar at parity with the U.S. dollar. However, foreign exchange market intervention by the Bank is assumed to be sterilized so as to leave Chartered Bank Reserves at their control, actual levels.

Table 7.6. An Exchange Rate Strategy
 (External value of C\$ assumed at parity with U.S. \$ from 1975:III
 through 1980:IV, Chartered Bank Reserves
 Controlled at historical levels; simulated minus actual)

	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>
<u>A. Aggregate Demand and Output</u>						
(constant 1971 \$million)						
Personal Consumption.....	4	-72	51	-189	-1117	-1747
Business Fixed Investment....	-28	6	-115	-526	-899	-527
Inventory Investment.....	-14	6	-30	-197	-392	-153
Governm. Expend. Goods and Services.....	0	0	0	0	0	0
Exports Goods and Services...	-42	6	-232	-1111	-1325	-469
Imports Goods and Services...	28	-72	173	124	-571	-689
GNP.....	-110	19	-502	-2147	-3163	-2213
<u>B. Prices and Wages</u>						
(growth rates, %)						
CPI.....	-0.40	0.51	-1.91	-4.62	-4.29	-1.45
GNE Price Deflator.....	-0.26	0.15	-0.96	-4.13	-5.61	-3.10
Wages and Salaries, Private Sector.....	-0.17	0.06	-0.82	-2.84	-4.92	-3.86
<u>C. Employment</u>						
Employment (1,000 persons)...	-6	-7	-19	-167	-350	-347
Unemployment Rate (%).....	0.04	0.04	0.11	0.97	1.99	1.91
<u>D. Government Surplus or Deficit</u>						
(\$million)						
Federal.....	-160	87	-295	-468	929	2966
All levels.....	-193	139	-973	-3795	-5794	-4134

E. Incomes and Savings

(1971 \$million, unless otherwise indicated)

Wages and Other Labour Income	-192	-190	-1203	-6401	-15617	-22700
Corporation Profits before taxes.....	305	225	-1405	-5659	-8024	-4635
Personal Income.....	-348	-185	-2040	-9853	-22234	-30960
Personal Disposable Income...	104	-249	544	932	-860	-2613
Net National Income at factor cost.....	-489	-148	-2548	-13187	-27382	-34022
Personal Savings Rate (%)....	0.11	-0.16	0.50	1.20	0.73	-0.09

F. Financial

(% , unless otherwise indicated)

Nom. Yield 90-day Finance Co. Paper.....	-0.07	-0.03	-0.31	-1.55	-3.04	-3.62
Real Yield 90-day Finance Co. Paper.....	0.27	-0.32	1.50	1.77	0.87	-0.87
Nom. Yield 1-3 years Gov. Canada Bonds.....	-0.08	-0.03	-0.39	-1.28	-2.49	-3.29
Real Yield 1-3 years Gov. Canada Bonds.....	0.25	-0.31	1.35	1.92	1.37	-0.52
Money Supply (M-1, \$million).....	-1	8	-6	54	217	.332
Money Supply (M-2, \$million).....	-64	15	-354	-1468	-2751	-3329

G. Balance of Payments

(\$million, unless otherwise indicated)

Balance on Current Account...	104	-230	662	327	-274	-276
Balance on Long-Term Capital Flows.....	-67	-102	-317	-1780	-4234	-6760
Balance on Short-Term Capital Flows.....	-565	1001	-3170	-3222	672	3301

H. Other Economic Indicators

Capacity Utilization Rate (%)	-0.01	0.01	-0.06	-0.14	-0.17	-0.17
Terms of Trade (index).....	0.00	0.00	-0.01	-0.02	-0.02	0.00
New Passenger Car Sales (thous.).....	0	-2	7	-12	-31	-24
Housing Starts (thous.).....	1	0	3	10	12	3

As shown in Chart 7.6. posterior developments would have made the parity value of the exchange rate a gross overvaluation of the value of the Canadian dollar. Starting in the third quarter of 1976, with the election of the Parti Québécois in Québec, the emergence of economic nationalism under the Trudeau Administration and the decline in productivity growth, the Canadian dollar gradually depreciated relative to the U.S. currency, a trend that has been continued in the eighties.

Chart 7.6. Exchange Rate (1971:I - 1980:IV), actual and simulated.

From the 3rd quarter of 1976 through the 3rd quarter of 1978 the Canadian dollar depreciated in terms of the U.S. dollar by more than 20%. In the simulated scenario, the attempt to hold the Canadian dollar at parity with the U.S. dollar over this period would have deteriorated the trade balance so as to accentuate the 1977-78 downturn in the level of economic activity (Chart 7.7).

Chart 7.7. Rate of Growth of real GNP (1975:I - 1980:IV), actual and simulated.

The rate of unemployment, virtually coincident with history up to the 3rd quarter of 1977, would have reached the double digit level in 1978 and stayed 2 percentage points above actual until 1980 (Chart 7.8.).

Chart 7.8. Unemployment Rate (1975:I - 1980:IV), actual and simulated.

- In the simulated scenario of policy, the overvaluation of the external value of the Canadian dollar by about 20% between 1976 and 1978 would have appreciably reduced inflation (Chart 7.9.) but with the removal of the downward pressure on the dollar by 1979-1980 inflation would have returned to its actual path.

Chart 7.9. Rate of CPI Inflation (1975:I - 1980:IV), actual and simulated.

The reduction in the inflation rate achieved in the simulated policy scenario by the effort to resist the depreciation of the Canadian dollar over the period 1976-1978 supports the earlier contention that an articulate anti-inflation policy in Canada, using money policy, goes beyond the requirement of control of the money supply. It involves the need to protect the external value of the Canadian dollar in foreign exchange markets as a first priority even if such protection proves to be incompatible with announced money supply targets; this means that the

most effective strategy to fight inflation in Canada appears to be one that not only controls money supply growth per se but also controls money supply growth at a level compatible with a stable or increasing value of the Canadian dollar in foreign exchange markets.

The high import content of Canadian production costs renders them particularly vulnerable to a depreciation of the domestic currency. In terms of the dynamic version of the familiar Aggregate Demand (AD)/Aggregate Supply (AS) diagram of Fig. 7.1. this means that a policy of gradual reduction of the money supply, which shifts AD to AD', but which allows the Canadian dollar to depreciate, increasing domestic production costs (shift of AS to AS'), is bound to have little, if any,

Fig. 7.1

effect on inflation (point P_1 versus point P)(¹). What is required then is to abandon the monetary target implicit in the aggregate demand schedule AD' and to protect the external value of the Canadian dollar thus returning the aggregate supply schedule to position AS . Certainly this will imply a somewhat tighter monetary stance, represented by demand schedule AD'' . The resulting equilibrium (point P_2) will be associated with a lower rate of inflation than that which would result from a setting of money policy that excludes consideration for the external value of the Canadian dollar.

Thus, if the Bank of Canada interprets its mandate as one primarily oriented towards assuring stability of the value of money - an interpretation that under Governor Bouey has been the dominant philosophy of the Bank - an anti-inflation monetary policy must include an active defence of the value of the dollar in foreign exchange markets as a binding constraint.(²) Needless to say, the magnitude of the real costs implicit in such a policy might be non-trivial, depending upon the

(1) This explains why Monetary Gradualism could achieve no more than a moderate improvement, by historical standards, in the inflation performance of the country from 1975 through 1981.

(2) The abandonment of monetary targeting under the policy of Monetary Gradualism in mid-1981 and the immediate switch by the Bank of Canada to an active protection of the foreign exchange value of the Canadian dollar suggests that the Bank ultimately came to accept this view.

elasticities of aggregate demand and supply as well as on the multiplicity of factors which determine the level of exchange rates. Among these, the economic nationalism that emerged in Canada in the mid-seventies might have proved one of the most serious obstacles to the policy of Monetary Gradualism. As the dollar depreciated, despite the tight stance of monetary policy, inflationary pressures subsided on the supply side, and as the Bank of Canada moved to support the dollar in order to cope with such pressures, it could not but add to the slowdown in the level of economic activity which culminated in the recession of 1981-82, precisely at a time when the Bank had been particularly active in foreign exchange markets following a major outburst of economic nationalism in Canada: the National Energy Program.

7.3. Policy Evaluation I: The "Credit Conditions" and the "Pegged Exchange Rate" Policies versus Monetary Gradualism

This section draws on the policy evaluation criteria developed in Chapter 5 to rate the performance of the actual policy of Monetary Gradualism against its Neo-Keynesian alternatives, as considered above.

7.3.1 The Output Criterion

Using the policy of Monetary Gradualism as the reference case, the benefits (+) and costs (-) of the "Credit Conditions" and the "Pegged Exchange Rate" policies, in terms of output and inflation are presented

in Table 7.7⁽¹⁾. Benefits of policy refer to increased output or reduced inflation, relative to actual; costs of policy are symmetrically defined. Both benefits and costs are rendered commensurate and expressed as a percent of actual, real GNP. The column of net benefits corresponds to the welfare indicator (5.2).

The "Credit Conditions" (CC) policy would have outperformed the policy of Monetary Gradualism (MG), with net benefits gradually improving over time. From 1975:III through 1980:IV the CC policy would have generated, relative to MG, quarterly benefits, resulting from increased output, amounting on average to 0.38 percent of actual GNP; costs, deriving from higher inflation, would amount only to 0.13 percent on average, for an average quarterly net benefit of 0.25 percent of actual GNP.

On a year-by-year basis, only in 1975 and 1976 would the CC policy, with a modest increase in employment, have performed less satisfactorily than MG. From 1977 through 1980, the increase in output and employment under the CC policy more than offsets its higher rates of inflation, yielding positive net benefits relative to MG.

The "Pegged Exchange Rate" (PEG) policy would have had an overall performance below that of MG, with an average quarterly net score of

(1) Values of the quarterly economic indicators underlying calculations presented in Table 7 are listed in the Appendix to this chapter.

	CREDIT CONDITIONS POLICY			PEGGED EXCHANGE RATE POLICY		
	Output	Inflation	Net	Output	Inflation	Net
1975 III	0.00	0.00	0.00	-0.17	0.48	0.31
IV	0.04	-0.08	-0.04	-0.03	-0.16	-0.19
Total 1975	0.04	-0.08	-0.04	-0.20	0.32	0.12
1976 I	-0.02	0.16	0.14	0.01	-0.08	-0.07
II	0.07	-0.48	-0.41	0.02	-0.16	-0.14
III	0.05	0.08	0.13	0.00	0.64	0.64
IV	0.11	-0.16	-0.05	-0.01	0.24	0.23
Total 1976	0.21	-0.40	-0.19	0.02	0.64	0.66
1977 I	0.10	-0.16	-0.06	-0.07	0.32	0.25
II	0.21	-0.08	0.13	-0.06	0.40	0.34
III	0.23	-0.32	-0.09	-0.08	0.56	0.48
IV	0.27	0.16	0.43	-0.20	0.72	0.52
Total 1977	0.81	-0.40	0.41	-0.41	2.00	1.59
1978 I	0.35	-0.48	-0.13	-0.26	0.56	0.30
II	0.45	0.00	0.45	-0.39	0.80	0.41
III	0.39	0.08	0.47	-0.46	0.64	0.18
IV	0.51	-0.32	0.19	-0.59	0.56	-0.03
Total 1978	1.70	-0.72	0.98	-1.70	2.56	0.86
1979 I	0.47	-1.04	-0.57	-0.62	-1.12	-1.74
II	0.67	0.72	1.39	-0.57	1.52	0.95
III	0.67	-0.32	0.35	-0.64	-0.08	-0.72
IV	0.62	0.40	1.02	-0.61	-0.56	-1.17
Total 1979	2.43	-0.24	2.19	-2.44	-0.24	-2.68
1980 I	0.82	0.16	0.98	-0.55	-0.72	-1.27
II	0.67	-0.64	0.03	-0.49	-0.40	-0.89
III	0.85	-0.08	0.77	-0.36	-0.96	-1.32
IV	0.89	-0.48	0.41	-0.30	-0.24	-0.54
Total 1980	3.23	-1.04	2.19	-1.70	-2.32	-4.02
Mean 1975:III- 1980:IV	0.38	-0.13	0.25	-0.29	0.13	-0.16

Table 7.7. Benefits (+) and costs (-) of the "Credit Conditions" and "Pegged Exchange Rate" policies relative to Monetary Gradualism, expressed as a % of actual, real GNP.

-0.16 percent. In the early years of 1976-78 the overvaluation of the Canadian dollar would have significantly reduced inflation. But such overvaluation would have resulted in depressed levels of output and employment whose effects would have been felt in 1979 and 1980 in such a manner as to more than offset earlier benefits of this policy relative to Monetary Gradualism.

7.3.2. The Public Opinion Criterion

If quarterly opinion polls had been conducted under the three scenarios of policy being compared, asking Canadians what is the issue concerning them personally the most, the results would have been as shown in Table 7.8.

These estimates are derived from the quarterly outcomes under the three scenarios of policy presented in Appendix at the end of this chapter and the estimates provided in Table 5.2 of Chapter 5. $\hat{C}I$, $\hat{C}U$, $\hat{C}R$ and $\hat{C}G$ are the proportions of Canadians expressing concern for inflation, unemployment, interest rates and economy-general, respectively and $\hat{C}E = \hat{C}I + \hat{C}U + \hat{C}R + \hat{C}G$ the proportion of Canadians expressing concern for economic issues.

The rating of policies on the basis of the estimated proportion of Canadians citing economic issues as their main concern turns out to be the same as under the "Output Criterion". The CC policy is the preferred policy with a 52% proportion of respondents over the period 1975:III - 1980:IV, followed by Monetary Gradualism (55%) and the PER policy (57%).

		MONETARY GRADUALISM					CREDIT CONDITIONS POLICY					PEGGED EXCH. RATE POLICY				
		CI	CU	CR	CG	CE	CI	CU	CR	CG	CE	CI	CU	CR	CG	CE
1975	III	10	34	--	9	53	10	33	--	8	51	8	36	--	8	52
	IV	9	35	--	8	52	8	34	--	8	50	10	35	--	8	53
Mean 1975		10	34	--	9	53	9	34		8	51	9	36		8	53
1976	I	9	34	--	9	52	8	35	--	8	51	8	35	--	9	52
	II	8	35	--	9	52	9	34	--	7	50	7	36	--	9	52
	III	6	38	--	8	52	5	39	--	8	52	7	38	--	9	54
	IV	3	43	--	8	54	2	43	--	7	52	8	37	--	9	54
Mean 1976		7	38	--	8	53	6	38	--	8	52	7	37	--	9	52
1977	I	4	43	--	7	54	2	44	--	7	53	3	44	--	6	53
	II	3	45	--	7	55	1	46	--	7	54	3	45	--	6	54
	III	3	45	--	7	55	--	47	--	7	54	2	47	--	7	56
	IV	--	48	--	8	56	--	51	--	6	57	--	52	--	6	58
Mean 1977		3	45	--	7	55	1	47	--	7	55	2	47	--	6	55
1978	I	2	46	--	9	57	1	45	--	8	57	--	52	--	7	59
	II	3	46	--	9	58	--	47	--	8	55	--	54	--	6	60
	III	1	46	--	10	57	--	46	--	8	54	--	54	--	6	63
	IV	8	38	--	10	56	6	38	--	10	54	--	55	--	6	61
Mean 1978		3	44	--	10	57	2	44	--	9	55	--	55	--	6	61
1979	I	8	37	--	10	55	5	35	--	9	49	2	51	--	6	59
	II	13	30	--	10	53	12	28	--	11	51	2	50	--	7	59
	III	16	26	1	11	54	11	23	--	11	45	4	47	--	7	58
	IV	20	22	2	12	56	19	20	--	11	50	5	46	--	8	59
Mean 1979		14	29	1	11	55	12	27	--	10	49	3	49	--	7	59
1980	I	27	14	6	13	60	26	10	3	14	53	15	35	2	10	52
	II	16	29	--	10	55	18	27	--	10	55	3	49	--	7	59
	III	23	20	3	12	58	21	17	--	11	49	11	38	--	9	58
	IV	21	21	3	12	57	19	18	--	11	48	9	40	--	9	58
Mean 1980		22	21	3	12	58	21	18	1	12	51	9	41	1	9	59
Mean 1975:III-1980:IV		10	35	1	9	55	8	34	--	10	52	5	44	--	8	57

Table 7.8. Public Concern with Economic Issues under the Policies of "Monetary Gradualism", "Credit Conditions" and "Pegged Exchange Rate".

Since the outcomes of the different policies are virtually identical in the early quarters of the period of comparison, the preference of the public for the CC policy over the alternatives is mild in 1975 and 1976. In 1977 public concern for economic issues would have been the same (55%) under the three different scenarios. Starting in 1978 the advantage of the CC policy in terms of public esteem over the alternatives grows over time so that by 1979 and 1980 the percentage of respondents expressing concern for economic issues under this policy course is appreciably lower than under the alternatives.

The margin of error in Decima Research polls is 2 percentage points on either side of the reported point estimates with a confidence level of 95%. Thus, the level of public esteem for the CC policy relative to MG is significantly different from zero in 1979 and 1980 and relative to the PEG policy in 1978, 1979 and 1980. On the other hand, Monetary Gradualism outperforms the Pegged Exchange Rate Policy by a margin which is significantly different from zero in the years 1978 and 1979.

In terms of specific economic issues, inflation appears to be a concern with low priority to Canadians under the three scenarios of policy. Even under Monetary Gradualism, a policy whose design and implementation reflected the concern of authorities for the problems of inflation in the mid-seventies, no more than 10% of the general public until 1979 seemed to be highly preoccupied with this issue.

The PER policy which would have achieved the lowest rate of inflation on average over the period under analysis, ranks first in terms of the

inflation issue. The CC policy, although producing higher rates of inflation than MG, outperforms the latter in terms of concern for inflation. This is so because under CC interest rates are lower than under MG and the "economic theory" held by the public is such that interest rates are viewed as a main determinant of inflation.

Unemployment would have been seen as the most important economic issue under the three scenarios of policy, with CC being the preferred policy in terms of this issue. The high unemployment rates generated under PER would have made this policy highly unpopular, particularly in 1978 and 1979 with virtually half of Canadians expressing concern with unemployment.

Interest rates would have received scarce attention from the public under the three policies, while Economy-General would have received approximately the same level of concern.

In terms of both criteria, thus, the "Credit Conditions" policy outranks "Monetary Gradualism", with the "Pegged Exchange Rate" policy being the least preferred.

Appendix. Key quarterly economic indicators under the actual policy of Monetary Gradualism and the simulated "Credit Conditions" and "Pegged Exchange Rate" policy scenarios.

Variable Definition:

- Y= GNP in millions of 1971 dollars, annual rate.
- I= Inflation rate (based on the GNE implicit price deflator).
- U= Unemployment rate.
- R= Nominal yield on 1-3 years Government of Canada bonds.
- y= Rate of growth of GNP in millions of 1971 dollars, relative to 4 quarters earlier.
- d= Federal Budget Deficit as a percent of GNP.
- e= Rate of depreciation of the C\$ vis-à-vis the US\$, relative to 4 quarters earlier.
- G= Indicator of Economy-General as defined in the text.

MONETARY GRADUALISM

	Y (\$million)	I (%)	U (%)	R (%)	y (%)	d (%)	e (%)	G (%)
1975 III	113,495	9.7	7.0	8.7	1.8	3.2	0.9	2.2
IV	114,667	10.2	7.1	8.1	2.8	2.4	-1.3	1.8
Mean 1975	114,081	10.0	7.1	8.4	2.3	2.8	-0.2	2.0
1976 I	118,123	9.8	6.8	8.5	5.8	1.5	-2.3	2.5
II	119,750	10.7	7.0	8.3	6.7	1.5	-1.6	3.0
III	119,294	8.9	7.2	8.1	5.1	1.7	-0.2	2.7
IV	119,822	8.7	7.5	7.1	4.5	2.4	1.5	3.1
Mean 1976	119,247	9.5	7.1	8.0	5.5	1.8	-0.7	2.8
1977 I	120,626	8.1	7.9	7.4	2.1	2.6	3.8	2.6
II	121,289	7.1	8.2	7.3	1.3	3.4	2.1	2.3
III	121,766	7.0	8.4	7.4	2.1	3.4	1.7	2.5
IV	123,371	6.1	8.4	7.5	3.0	4.6	3.0	3.6
Mean 1977	121,763	7.1	8.2	7.4	2.1	3.5	2.7	2.8
1978 I	124,359	6.3	8.5	8.3	3.1	5.8	1.0	3.8
II	125,526	6.0	8.5	8.6	3.5	4.5	2.3	3.7
III	127,389	6.3	8.2	8.8	4.6	7.5	1.5	5.1
IV	127,856	6.7	7.9	10.1	3.6	4.0	3.0	3.6
Mean 1978	126,283	6.3	8.3	9.0	4.5	5.5	2.0	4.1
1979 I	129,125	6.3	7.6	10.1	3.8	3.9	0.7	3.2
II	129,094	10.3	7.1	9.8	2.8	3.8	-2.4	2.2
III	130,732	10.9	7.3	11.2	2.6	3.3	0.8	2.5
IV	131,504	11.9	7.5	12.2	2.9	3.2	-0.8	2.3
Mean 1979	130,114	9.9	7.4	10.8	3.0	3.6	-0.4	2.6
1980 I	130,332	11.7	7.5	14.3	0.9	3.2	-0.9	1.5
II	128,988	10.5	7.7	10.5	0.0	4.2	0.5	1.8
III	129,126	10.5	7.5	12.7	-1.1	4.3	-0.9	1.1
IV	132,132	9.8	7.4	12.9	0.4	3.1	2.1	1.8
Mean 1980	130,145	10.6	7.5	12.6	0.1	3.7	0.2	1.6
Mean 1975:III- 1980:IV-	124,471	8.8	7.6	8.5	3.0	3.5	-0.7	2.7

Table 7.A.

Source: FOCUS data bank.

CREDIT CONDITIONS POLICY

	Y (\$million)	I (%)	U (%)	R (%)	y (%)	d (%)	e (%)	G (%)
1975 III	113,495	9.7	7.0	8.7	1.8	2.6	0.9	1.9
IV	114,742	10.3	7.1	8.2	2.8	2.3	-1.0	1.8
Mean 1975	114,119	10.0	7.1	8.5	2.3	2.5	0.0	1.9
1976 I	118,042	9.7	6.8	8.3	5.7	1.6	-2.8	2.4
II	120,093	11.2	7.0	8.7	7.0	1.3	-0.1	3.3
III	119,510	9.3	7.1	7.5	5.3	1.6	-0.5	2.7
IV	120,334	9.3	7.3	6.6	4.9	2.1	2.2	3.2
Mean 1976	119,495	9.9	7.1	7.8	5.7	1.7	-0.3	2.9
1977 I	121,093	8.9	7.7	6.6	2.6	2.3	3.2	2.6
II	122,321	8.0	7.6	6.5	1.9	3.1	3.9	2.8
III	122,883	8.3	7.8	6.1	2.8	3.0	2.0	2.7
IV	124,703	7.2	7.9	5.7	3.6	4.2	3.0	3.7
Mean 1977	122,750	8.1	7.8	6.2	2.7	3.2	3.0	3.0
1978 I	126,094	8.0	7.7	7.6	4.1	5.4	1.7	4.1
II	127,806	7.7	7.7	7.1	4.5	4.0	4.0	4.2
III	129,370	7.9	7.6	6.8	5.3	3.9	-0.1	3.7
IV	130,456	8.7	7.2	9.2	4.6	3.7	4.6	4.2
Mean 1978	128,432	8.1	7.6	7.7	4.6	4.3	2.6	4.1
1979 I	131,529	9.6	6.8	8.4	4.3	3.6	-1.8	2.8
II	132,528	12.7	6.3	9.6	3.7	3.3	3.0	3.4
III	134,240	13.7	5.8	10.0	3.7	2.7	2.8	3.1
IV	134,755	14.2	6.0	10.4	3.3	2.8	-2.3	2.0
Mean 1979	133,263	12.6	6.2	9.6	3.8	3.1	0.4	2.8
1980 I	134,573	15.8	5.9	13.0	2.3	2.6	1.5	2.3
II	133,467	13.4	6.0	8.7	0.7	3.6	3.2	2.4
III	133,563	13.5	5.7	10.9	-0.5	3.7	-1.6	1.0
IV	136,820	13.2	5.5	10.8	1.5	2.4	2.0	1.0
Mean 1980	134,606	14.0	5.8	10.9	1.0	3.1	1.3	1.9
Mean 1975: I - 1980: IV	126,474	10.5	6.9	8.4	3.4	3.0	1.3	2.8

Table 7.B.

Source: FOCUS simulation.

PEGGED EXCHANGE RATE POLICY

	Y (\$million)	I (%)	U (%)	R (%)	y (%)	d (%)	e (%)	G (%)
1975 III	113,120	9.1	7.1	8.1	1.5	3.0	0.0	1.8
IV	114,601	9.8	7.2	8.4	2.7	2.5	0.0	2.1
Mean 1975	113,861	9.5	7.2	8.3	2.1	2.8	0.0	2.0
1976 I	118,191	9.5	6.9	8.9	5.9	1.5	0.0	3.0
II	119,816	10.6	7.1	8.4	6.8	1.4	0.0	3.3
III	119,295	9.6	7.3	8.1	5.5	1.6	0.0	2.8
IV	119,767	9.1	7.5	8.6	4.5	2.3	0.0	2.7
Mean 1976	119,267	9.7	7.2	8.5	5.7	1.7	0.0	3.0
1977 I	120,293	8.1	7.9	6.7	1.8	2.7	0.0	1.8
II	121,023	6.6	8.0	7.1	1.0	3.5	0.0	1.8
III	121,347	5.8	8.3	7.3	1.7	3.6	0.0	2.1
IV	122,376	4.0	8.7	7.0	2.2	4.9	0.0	2.8
Mean 1977	121,260	6.1	8.2	7.0	1.7	3.7	0.0	2.1
1978 I	123,055	3.5	8.9	7.8	2.3	6.1	0.0	3.4
II	123,588	2.2	9.3	7.5	2.1	5.0	0.0	2.8
III	125,046	1.7	9.6	7.3	3.0	4.9	0.0	3.2
IV	124,843	1.4	9.6	7.9	2.0	4.6	0.0	2.6
Mean 1978	124,133	2.2	9.4	7.6	2.4	5.2	0.0	3.0
1979 I	125,927	2.4	9.6	7.9	2.3	1.4	0.0	1.5
II	126,174	4.5	9.5	7.9	2.1	3.8	0.0	2.4
III	127,397	5.2	9.3	8.3	1.9	3.3	0.0	2.1
IV	128,308	6.9	9.5	8.3	2.8	3.2	0.0	2.4
Mean 1979	126,952	4.8	9.5	8.1	2.3	2.9	0.0	2.1
1980 I	127,494	7.6	9.6	11.2	1.2	2.6	0.0	1.5
II	126,437	6.9	9.8	7.0	0.2	3.6	0.0	1.5
III	127,336	8.1	9.3	9.6	0.0	3.8	0.0	1.5
IV	130,520	7.7	9.1	9.2	1.7	2.5	0.0	1.7
Mean 1980	127,947	7.6	9.5	9.3	0.8	3.1	0.0	1.6
Mean 1975:III- 1980:IV	122,998	6.4	9.3	8.1	2.2	3.3	0.0	2.3

Table 7.C.

Source: FOCUS simulation.

8. The Monetarist Alternatives

Monetarist criticism of the Bank of Canada's experiment with Monetary Gradualism made two points. First, several authors argued that the experiment had been too gradual in implementation and a more abrupt approach to the reduction in the growth rate of the money supply was appropriate.

Second, there was the question of the appropriate monetary aggregate to be controlled. Based on their preferences for a reserve control mechanism, Laidler and Courchene were the main advocates of Monetary Gradualism based on the broader definition of money, M-2.

This chapter attempts to shed light on the empirical validity of the above arguments. Would the Canadian economy over the period 1975-1980 have performed significantly better had a less gradualist strategy with M-1, or a gradualist strategy involving the control of M-2 been adopted in 1975?

Section 8.1. deals with a less gradualist approach to the reduction in the growth rate of M-1 than that implemented by the Bank of Canada. Section 8.2. discusses the FOCUS model estimates of the key economic variables over the period 1975:III - 1980:IV under a gradualist approach to monetary policy, but one involving the control of the broadly defined money supply, M-2. Section 8.3 evaluates both courses of policy relative to Monetary Gradualism.

8.1. A Less Gradualist Policy with M-1

How "cold turkey" should have been the approach to the reduction in the growth rate of the money supply in order to be successful is a point that the advocates of such an approach have never made clear.

The first target range for M-1 growth announced by the Bank of Canada in November 1975 was 10-15% per annum based on the average level of this aggregate over the second quarter of 1975. Up to the end of 1980, the target range was revised downwards no less than four times, namely in August 1976, October 1977, September 1978 and December 1979, as shown in table 8.1. The last revision occurred in February, 1981, bringing the target range to 4-8%.

<u>Announcement</u>	<u>Target Range(%)</u>	<u>Implementation</u>	<u>Base</u>
Nov. 1975	10 - 15	1975:III	1975:II
Aug. 26, 1976	8 - 12	1976:II	March, 1976
Oct. 7, 1977	7 - 11	1977:III	June, 1977
Sep. 11, 1978	6 - 10	1978:III	June, 1978
Dec. 28, 1979	5 - 9	1979:III	1979:II
Feb. 13, 1981	4 - 8	1980:IV	Sept., 1980

Table 8.1. Actual target ranges for seasonally adjusted M-1 growth.

Taking the median values of the different target ranges as indicators of the stance of policy, table 8.1. suggests that the actual degree of gradualism basically involved a reduction of 1 percentage point per year

in the growth rate of the seasonally adjusted, narrowly defined money supply. The only exception to this general rule occurred in the first revision of the target band, in March 1976, whose centre, relative to the previous one, declined by 2.5 percentage points.

In order to simulate how the Canadian economy would have performed over the period 1975:III-1980:IV under a less gradualist approach to monetary deceleration, the following assumptions are made:

- (i) For each target range announced by the Bank of Canada, its centre is taken and reduced by $(2.5 + 1/2(n - 1))$ percentage points, where n is the cardinal of the n th target range actually announced by the Central Bank ($n=1, 2, \dots, 6$). This assumption amounts to an increase in the rate of deceleration of $M-1$ by 0.5 percentage points at the time of each revision in the target range, as well as an initial target range median of 10% compared to the actual 12.5%.
- (ii) Assumption (i) generates a new series of target range centres for the growth of seasonally adjusted $M-1$. In the simulation experiment the Bank of Canada is assumed to control the money supply at rates equal to the new target range centres, as shown in table 8.2.
- (iii) The implementation of the new series of target ranges or, for that purpose, of their median values, is assumed to occur at the same time as their actual counterparts.

<u>Implementation</u>	<u>Centre of Actual Target Range (%)</u>	<u>Centre of Simulation Target Range (%)</u>
1975:III	12.5	10.0
1976:II	10.0	7.0
1977:III	9.0	5.5
1978:III	8.0	4.0
1979:III	7.0	2.5
1980:IV	6.0	1.0

Table 8.2. Actual and Simulated Target Range Centres for M-1 (seasonally adjusted) growth.

With the above assumptions, FOCUS is simulated for the 22 quarters 1975:III - 1980:IV.

The simulation results are presented in Table 8.3. The first insight derived from the such estimates is that the less gradualist approach with M-1 would have produced, as expected, a substantial increase in rates of interest which, by 1980, would have been, in real terms, some 4 percentage points higher than the rates actually experienced (Chart 8.1).

Table 8.3. A Less Gradualist Strategy with M-1
(M-1 growth controlled under lower target ranges,
simulated minus actual)

	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>
<u>A. Aggregate Demand and Output</u>						
	(constant 1971 \$million)					
Personal Consumption.....	-1	-32	-187	-497	-978	-1770
Business Fixed Investment....	-17	-214	-719	-1339	-2044	-2694
Inventory Investment.....	-1	-21	-141	-234	-341	-352
Governm. Expend. Goods and Services.....	0	0	0	0	0	0
Exports Goods and Services...	-5	-81	-142	-397	-503	-818
Imports Goods and Services...	-3	-24	-215	-387	-538	-414
GNP.....	-22	-324	-975	-2080	-3330	-5220
<u>B. Prices and Wages</u>						
	(growth rates, %)					
CPI.....	-0.06	-0.45	-0.85	-1.82	-2.45	-3.71
GNE Price Deflator.....	-0.05	-0.37	-0.88	-1.66	-2.68	-4.12
Wages and Salaries, Private Sector.....	-0.03	-0.31	-0.17	-1.58	-2.45	-3.67
<u>C. Employment</u>						
Employment (1,000 persons)...	-1	-13	-62	-138	-239	-392
Unemployment Rate (%).....	0.01	0.08	0.37	0.80	1.35	2.16
<u>D. Government Surplus or Deficit</u>						
	(\$million)					
Federal.....	-29	-322	-651	-519	-503	-698
All levels.....	-30	-379	-910	-1883	-3340	-5591

E. Incomes and Savings

(1971 \$million, unless otherwise indicated)

Wages and Other Labour Income	23	38	-157	-540	-1203	-2186
Corporation Profits before taxes.....	-34	-360	-732	-1418	-2213	-3234
Personal Income.....	29	21	-84	-436	-1083	-2136
Personal Disposable Income...	10	41	-118	-395	-991	-1791
Net National Income at factor cost.....	-2	-289	-966	-2011	-3530	-5875
Personal Savings Rate (%)....	0.01	0.02	-0.08	-0.02	-0.12	-0.12

F. Financial

(%, unless otherwise indicated)

Nom. Yield 90-day Finance Co. Paper.....	0.09	0.79	0.74	1.08	1.69	1.38
Real Yield 90-day Finance Co. Paper.....	0.21	2.00	0.87	2.81	3.77	4.91
Nom. Yield 1-3 years Gov. Canada Bonds.....	0.01	0.14	1.45	1.14	2.05	2.10
Real Yield 1-3 years Gov. Canada Bonds.....	0.17	1.59	1.45	2.92	4.36	5.50
Money Supply (M-2, \$million).....	-285	-2807	-4297	-8418	-16224	-23961
Chartered Bank Reserves (\$million).....	-14	-126	-250	-425	-801	-1143

G. Balance of Payments

(\$million, unless otherwise indicated)

Balance on Current Account...	7	86	412	788	1166	394
Balance on Long-Term Capital Flows.....	5	123	838	2015	3786	5621
Balance on Short-Term Capital Flows.....	-12	-209	-1250	-2803	-4952	-6014
Exchange Rate (Can. cents/US\$)	0	-1	-3	-6	-11	-17

H. Other Economic Indicators

Capacity Utilization Rate (%)	0.00	0.00	-0.01	-0.01	-0.01	-0.02
Terms of Trade (index).....	0	0	1	1	1	2
New Passenger Car Sales (thous.).....	0	-1	-6	-12	-20	-31
Housing Starts (thous.).....	0	-2	-9	-14	-28	-44

Chart 8.1. Nominal Yield on 90-day Finance Company Paper (1975:I - 1980:IV), actual and simulated.

Higher rates of interest of this magnitude would have attenuated, though not prevented, the severe depreciation of the Canadian dollar during 1976-1978 (Chart 8.2). This, coupled with the effect of the tighter monetary stance on aggregate demand would have moderated inflation to an average of 7% between 1978 and 1980, although with considerably higher quarterly variance (Chart 8.3).

Chart 8.2. Exchange Rate (1975:1 - 1980:IV), actual and simulated.

Chart 8.3. Rate of CPI Inflation relative to 4 quarters earlier (1975:1 - 1980:IV), actual and simulated.

The gains in inflation, however, would still be slow to appear, because the tighter domestic credit conditions would be partly offset by large long-term capital inflows resulting from the positive interest differential in favour of Canada (the large short-term capital outflows being due in the FOCUS simulation to speculative decisions regarding the expected appreciation of the Canadian dollar, and to the fact that a significant amount of long-term foreign borrowing is usually temporarily held abroad in the form of short-term instruments).

As shown in Table 8.4., for each one percent sustained reduction in the money supply relative to actual, the price level would have been reduced by only 0.59 percentage points by 1980 while the level of employment would have been affected by 0.25%.

	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>
Price level	0.11	0.28	0.37	0.43	0.59
Employment	0.04	0.15	0.19	0.19	0.25

Table 8.4. Price and Employment Elasticities with respect to M-1 ("A Less Gradualist Strategy with M-1"), 1976-1980.

As a result, the rate of unemployment would have increased steadily and reached double digit levels by 1980 (Chart 8.4), at a time when the actual rate of unemployment was a moderate 7%.

Chart 8.4. Unemployment Rate (1975:I - 1980:IV), actual and simulated.

Needless to say these results hinge on the assumption that the behaviour of economic agents, as captured by the structural coefficients of FOCUS, are insensitive to the new, stricter policy of monetary control embodied in the "cold turkey" approach. Although, due to its empirical nature, this is a matter where opinions diverge, experience tends to suggest "on the basis of consideration of scores upon scores of economic relationships, that continuity and stability of coefficients are more prevalent characteristics than change" (Klein, 1982, p. 12)

The estimates thus point in the direction that a relatively tighter monetary policy, although moderating inflation, would have aggravated the real costs produced by the actual experiment of Monetary

Gradualism. In particular, they argue against the view of those who held that the disappointing results of Monetary Gradualism on both the inflation and output fronts, had to do with its alleged mildness.

8.2. Monetary Gradualism with M-2

In this section, the performance of the Canadian economy from 1975:III to 1980:IV is assessed, assuming that the Central Bank controls the M-2 monetary aggregate, leaving M-1 to be endogenously determined.

In the simulated scenario, the broadly defined, seasonally adjusted money supply, M-2, is assumed to grow at annual rates equal to the median values of the target ranges actually announced for M-1 over the 5½ year period. The timing of implementation of the new target growth rates, and their bases, is the same as those actually adopted for M-1. In other words, this scenario differs from history only in that:

- (i) the monetary aggregate being controlled is M-2, rather than M-1.
- (ii) M-2 is controlled at rates equal to the centres of the target ranges actually adopted for M-1. In terms of table 8.1., this means that the initial target growth rate for M-2 is 12.5%, implemented in the 3rd quarter of 1975. This target rate is then reduced to 10% in the 2nd quarter of 1976, and successively so to 9% (1977:III), 8% (1978:III), 7% (1979:III) and 6% (1980:IV).

Chart 8.5. Rate of Growth of M-2, not seasonally adjusted, relative to 4 quarters earlier (1975:I-1980:IV), actual and simulated.

The degree of gradualism assumed with respect to the reduction in the growth rate of M-2 is thus the same as that actually adopted by the Bank of Canada in the historical experiment with M-1.

As a result of these assumptions, the growth rate of the non-seasonally adjusted money supply, M-2, declines smoothly, as shown in chart 8.5., from 17.5% in the second quarter of 1975 to 6.5% in the fourth quarter of 1980.

The simulation results are presented in table 8.5.

Table 8.5. Monetary Gradualism with M-2
(M-2 growth controlled at centre of target ranges actually
adopted for M-1, simulated minus actual)

	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>
<u>A. Aggregate Demand and Output</u>						
(constant 1971 \$million)						
Personal Consumption.....	-4	-76	-392	-900	-1628	-2819
Business Fixed Investment....	-43	-490	-1347	-2121	-2854	-4008
Inventory Investment.....	-6	-78	-250	-375	-479	-506
Governm. Expend. Goods and Services.....	0	0	0	0	0	0
Exports Goods and Services...	-11	-113	-370	-732	-880	-1349
Imports Goods and Services...	-5	-107	-370	-554	-615	-597
GNP.....	-59	-649	-1989	-3575	-5225	-8086

<u>B. Prices and Wages</u>						
(growth rates, %)						
CPI.....	-0.12	-1.00	-1.84	-2.68	-3.61	-5.45
GNE Price Deflator.....	-1.10	-0.88	-1.74	-2.56	-3.99	-6.32
Wages and Salaries, Private Sector.....	-0.07	-0.67	-1.58	-2.50	-3.75	-5.41

<u>C. Employment</u>						
Employment (1,000 persons)...	-2	-35	-122	-239	-373	-602
Unemployment Rate (%).....	0.02	0.22	0.74	1.40	2.12	3.35

<u>D. Government Surplus or Deficit</u>						
(\$million)						
Federal.....	-64	-655	-898	-530	-500	-843
All levels.....	-76	-734	-1799	-2917	-4888	-8167

E. Incomes and Savings

(1971 \$million, unless otherwise indicated)

Wages and Other Labour Income	39	72	-310	-1051	-2051	-3576
Corporation Profits before taxes.....	-75	-665	-1633	-2255	-3216	-4834
Personal Income.....	49	115	-221	-857	-1930	-3516
Personal Disposable Income...	15	83	-257	-789	-1615	-2895
Net National Income at factor cost.....	-23	-564	-1862	-3429	-5539	-9411
Personal Savings Rate (%)....	0.01	0.05	-0.09	-0.05	-0.14	-0.24

F. Financial

(%, unless otherwise indicated)

Nom. Yield 90-day Finance Co. Paper.....	0.22	1.16	1.64	1.20	2.33	1.89
Real Yield 90-day Finance Co. Paper.....	0.44	2.25	3.30	3.97	5.61	6.60
Nom. Yield 1-3 years Gov. Canada Bonds.....	0.05	0.72	1.96	1.93	2.53	3.30
Real Yield 1-3 years Gov. Canada Bonds.....	0.36	2.13	3.63	4.40	6.31	7.84
Money Supply (M-1, \$million,	-169	-985	-1825	-2268	-4072	-5329
Chartered Bank Reserves (\$million).....	-34	-233	-476	-600	-1160	-1697

G. Balance of Payments

(\$million, unless otherwise indicated)

Balance on Current Account...	23	271	737	1138	1370	141
Balance on Long-Term Capital Flows.....	14	278	1622	3588	5373	7737
Balance on Short-Term Capital Flows.....	-38	-548	-2358	-4725	-6743	-7878
Exchange Rate (Can. cents/US\$)	0	-2	-6	-11	-17	-25

H. Other Economic Indicators

Capacity Utilization Rate (%)	0.00	-0.01	-0.02	-0.02	-0.02	-0.03
Terms of Trade (index).....	0	1	1	2	2	3
New Passenger Car Sales (thous.).....	0	-3	-11	-20	-30	-47
Housing Starts (thous.).....	-1	-6	-15	-22	-39	-84

The same degree of gradualism applied, alternatively, to monetary aggregates which differ in terms of their interest elasticities of demand, does produce higher rates of interest in the case where the monetary aggregate being controlled is the less interest elastic. As shown in Chart 8.6, M-2 control would have produced rates of interest substantially higher than those actually experienced.

Chart 8.6. Nominal Yield on 90-day Finance Company Paper (1975:I - 1980:IV), actual and simulated.

As a result, the depreciation of the Canadian dollar in 1976-1978 would have been largely prevented, and an appreciation would have occurred in 1979-80.

Chart 8.7. Exchange rate (1975:I-1980:IV), actual and simulated.

The combination of money supply control with a non-depreciating dollar would have produced important gains on the inflation front (Chart 8.8.), but the transmission process would still be persistently slow and only partial, as shown in Chart 8.8 and Table 8.6, which displays price and employment elasticities with respect to the M-2 monetary aggregate.

Chart 8.8. Rate of CPI Inflation, relative to 4 quarters earlier (1975:I-1980:IV), actual and simulated.

	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>
Price level	0.30	0.33	0.45	0.44	0.54
Employment	0.07	0.12	0.19	0.18	0.21

Table 8.6. Price level and Employment Elasticities with respect to M-2 ("Monetary Gradualism with M-2"), 1976-1980.

The significant gains brought about by this policy in terms of inflation would have been mirrored on the real side by steadily rising unemployment (Chart 8.9.), with rates of unemployment in the range of 10%-12% from 1978 through 1980.

Chart 8.9. Rate of Unemployment (1975:I-1980:IV), actual and simulated.

As with the less Gradualist Strategy with M-1, these estimates suggest the inability of monetary policy to effect, per se, a return to price stability without costs in terms of output and employment which are high enough to be in all probability socially intolerable.

8.3. Policy Evaluation II: "The Less Gradualist Strategy with M-1" and "Monetary Gradualism with M-2" versus actual Monetary Gradualism

8.3.1. The Output Criterion

Using actual Monetary Gradualism as the base case, the benefits and costs of the policies involving a less gradualist approach to the control of M-1 (LGM1) and Monetary Gradualism with M-2 (MGM2) are shown in Table 8.7.⁽¹⁾

In terms of the Output Criterion, both the LGM1 and MGM2 policies would have performed less satisfactorily than the actual experiment with Monetary Gradualism, with average quarterly net scores of -0.27 and -0.40, respectively.

Only in 1975 and 1976 when both policies reduce inflation without any immediately visible output costs do they outperform Monetary Gradualism. However, over time their costs exceed benefits. By 1980 net costs of the LGM1 strategy would have amounted to 2.26 percent of actual GNP and those of the MGM2 policy to 2.96 percent. These results point once more to the comparatively high output costs of relying exclusively on monetary instruments to address the problem of inflation in Canada..

(1) Quarterly economic indicators underlying the values presented in Table 8.7. are shown in Appendix to this chapter.

	THE LESS GRADUALIST STRATEGY WITH M-1			MONETARY GRADUALISM WITH M-2		
	Output	Inflation	Net	Output	Inflation	Net
1975 III	-0.01	0.08	0.07	-0.01	0.16	0.15
IV	-0.03	0.00	-0.03	-0.05	0.00	-0.05
Total 1975	-0.04	0.08	0.04	-0.06	0.16	0.10
1976 I	-0.01	0.00	-0.01	-0.06	0.16	0.10
II	-0.04	0.08	0.04	-0.13	0.40	0.27
III	-0.05	0.00	-0.05	-0.15	0.00	-0.15
IV	-0.18	0.56	0.38	-0.21	0.32	0.09
Total 1976	-0.28	0.64	0.09	0.55	0.88	0.08
1977 I	-0.09	-0.24	-0.33	-0.28	0.16	-0.12
II	-0.19	0.32	0.13	-0.39	0.08	-0.31
III	-0.25	0.08	-0.17	-0.44	0.08	-0.36
IV	-0.28	-0.32	-0.60	-0.52	0.32	-0.20
Total 1977	-0.81	-0.16	-0.97	-1.63	0.64	-0.99
1978 I	-0.33	0.64	0.31	-0.60	0.08	-0.52
II	-0.47	0.08	-0.39	-0.76	0.32	-0.44
III	-0.36	-0.16	-0.52	-0.64	-0.24	-0.88
IV	-0.50	0.56	0.06	-0.84	0.64	-0.20
Total 1978	-1.66	1.12	-0.54	-2.84	0.80	-2.04
1979 I	-0.47	-1.84	-2.31	-0.74	-2.08	-2.82
II	-0.69	1.92	1.23	-1.08	2.64	1.56
III	-0.79	0.96	0.17	-1.26	1.44	0.18
IV	-0.61	-0.96	-1.57	-0.94	-1.28	-2.22
Total 1979	-2.56	0.08	-2.48	-4.02	0.72	-3.30
1980 I	-0.89	1.36	0.47	-1.35	2.24	0.89
II	-1.13	-0.24	-1.37	-1.97	0.48	-1.49
III	-0.96	-0.48	-1.44	-1.46	-0.88	-2.34
IV	-1.04	1.12	0.08	-1.62	1.60	-0.02
Total 1980	-4.02	1.76	-2.26	-6.40	3.44	-2.96
Mean 1975:III- 1980:IV	-0.43	0.16	-0.27	-0.70	0.30	-0.40

Table 8.7. Benefits (+) and costs (-) of the "Less Gradualist Strategy with M-1" and "Monetary Gradualism with M-2" relative to actual Monetary Gradualism, expressed as a % of actual, real GNP.

8.3.2. The Public Opinion Criterion

The rating by public opinion of the three courses of policy, measured by the proportion of respondents expressing concern for economic issues, is shown in Table 8.8.⁽¹⁾

With 55% of respondents on average from 1975:III through 1980:IV expressing concern for economic issues, the actual experiment with Monetary Gradualism would have outperformed its monetarist alternatives, the LGM1 strategy ranking second (59%) and the MGM2 policy being the least preferred (63%).

The difference in public esteem between Monetary Gradualism and LGM1 is statistically significant in 1979 and 1980 and that between Monetary Gradualism and MGM2 as early as 1977. On the other hand, LGM1 seems to perform appreciably better than MGM2, although the differences in public esteem are statistically significant only in 1979 and 1980.

In terms of the inflation issue, MG would have been the preferred policy, not because of a better inflation performance, but because of higher rates of interest associated with the alternative courses of policy, which are seen by the public as being inflationary.

(1) Figures are derived from Tables 8.A. and 8.B. in Appendix and Table 5.2. in Chapter 5.

	MONETARY GRADUALISM					THE LESS GRADUALIST STRATEGY WITH M-1					MONETARY GRADUALISM WITH M-2				
	$\hat{C}I$	$\hat{C}U$	$\hat{C}R$	$\hat{C}G$	$\hat{C}E$	$\hat{C}I$	$\hat{C}U$	$\hat{C}R$	$\hat{C}G$	$\hat{C}E$	$\hat{C}I$	$\hat{C}U$	$\hat{C}R$	$\hat{C}G$	$\hat{C}E$
1975 III	10	34	--	9	53	10	34	--	8	52	10	34	--	8	52
IV	9	35	--	8	52	10	34	--	8	52	10	34	--	8	52
Mean 1975	10	34	--	9	53	10	34	--	8	52	10	34	--	8	52
1976 I	9	34	--	9	52	9	34	--	9	52	9	34	--	9	52
II	8	35	--	9	52	8	35	--	9	52	10	34	--	8	52
III	6	38	--	8	52	8	37	--	8	53	9	36	--	9	54
IV	3	43	--	8	54	3	43	--	7	53	5	41	--	8	54
Mean 1976	7	38	--	8	53	7	37	--	8	53	8	36	--	9	53
1977 I	4	43	--	7	54	7	39	--	9	55	7	41	--	8	56
II	3	45	--	7	55	4	44	--	7	55	7	42	--	8	57
III	3	45	--	7	55	5	44	--	8	57	7	43	--	9	59
IV	--	48	--	8	56	5	44	--	10	59	5	46	--	9	60
Mean 1977	3	45	--	7	55	5	43	--	9	57	7	43	--	9	59
1978 I	2	46	--	9	57	3	47	--	9	59	6	45	1	10	62
II	3	46	--	9	58	5	40	--	8	53	7	45	--	9	61
III	1	46	--	10	57	6	44	2	11	63	7	44	4	11	66
IV	8	38	--	10	56	10	40	2	10	62	9	42	3	10	64
Mean 1978	3	44	--	10	57	6	43	1	10	60	7	44	2	10	63
1979 I	8	37	--	10	55	13	34	4	12	63	13	36	6	13	68
II	13	30	--	10	53	16	32	1	10	59	14	37	--	9	60
III	16	26	1	11	54	19	28	3	11	61	18	31	3	10	63
IV	20	22	2	12	56	24	20	10	16	70	26	21	14	17	78
Mean 1979	14	29	1	11	55	18	29	5	12	64	18	32	6	12	68
1980 I	27	14	6	13	60	27	19	10	15	71	29	21	11	14	75
II	16	29	--	10	55	17	34	2	9	62	20	35	3	9	67
III	23	20	3	12	58	26	22	10	14	72	28	22	15	17	82
IV	21	21	3	12	57	13	27	9	13	62	26	28	11	13	78
Mean 1980	22	21	3	12	58	21	26	8	13	67	26	27	10	13	76
Mean 1975:III 1980:IV	10	35	1	9	55	11	35	3	10	59	13	36	4	10	63

Table 8.8. Public Concern with Economic Issues under "Monetary Gradualism", the "Less Gradualist Strategy with M-1" and "Monetary Gradualism with M-2".

Unemployment would raise the largest concern under the MGM2 policy, while the MG and LGM1 policies would have received equal scores on this issue.

Interest rates, a matter of comparatively little concern for Canadians under MG would have been of greater concern under both LGM1 and MGM2. Economy-general would have received approximately the same level of concern under the three policy courses.

On a year-by-year basis, actual MG would have outperformed both LGM1 and MGM2 in all years but 1975 and 1976.

The ranking of policies under the Public Opinion Criterion is similar to that provided by the Output Criterion, both on an overall basis and on a year-by-year basis. Thus, from 1977 through 1980 MG ranks first, followed by LGM1 and MGM2, respectively, this being also the overall ranking. In 1975 and 1976 both LGM1 and MGM2 perform better than MG under both criteria, although marginally so.

The comparison between the three monetary experiments once again suggests that only at a great cost in terms of employment and output can monetary policy alone be effective in reducing inflation. But neither do the real costs seem to be worth the benefits nor is such a drastic monetary strategy popular in a country mostly concerned with employment rather than inflation.

These findings discredit the claims of those who argued that Monetary Gradualism had been too mild. It seems rather that it went to the limit, which, in terms of monetary tightness and consequent high rates of interest, was socially tolerable. If since 1978, as interest rates started to rise and entered the double digit level, public pressure and criticism on the Bank of Canada mounted to reach a climax in the Spring of 1981, it seems hardly feasible that the Bank could have gone farther without major social disruption. It is important to note in this connection that, if major adverse economic shocks can be accepted by the population because they are seen as resulting from impersonal processes and/or because they are beyond the control of domestic authorities, the situation is different with domestically engineered policies for which responsibility can be readily assigned. In this case, public support is a binding constraint. If, in this respect, Monetary Gradualism seems to have reached the tolerable limit, it can be concluded that its monetarist alternatives would have been impracticable.

Appendix: Key quarterly economic indicators under the "Less Gradualist Strategy with M-1" and "Monetary Gradualism with M-2" policy scenarios.

Variable definition

Y= GNP in millions of 1971 dollars, annual rates.

I= Inflation rate (based on GNE implicit price deflator).

U= Unemployment rate.

R= Nominal yield on 1-3 years Government of Canada bonds.

y= Rate of growth of GNP in millions of 1971 dollars, relative to 4 quarters earlier.

d= Federal Budget Deficit as a percent of GNP.

e= Rate of depreciation of the C\$ vis-à-vis the US\$, relative to 4 quarters earlier.

G= Indicator of Economy-General as defined in the text.

THE LESS GRADUALIST STRATEGY WITH 'M-1

	Y (\$million)	I (%)	U (%)	R (%)	y (%)	d (%)	e (%)	G (%)
1975 III	113,468	9.6	7.0	8.7	1.8	2.7	0.8	2.0
IV	114,609	10.1	7.1	8.2	2.7	2.4	-1.5	1.7
Mean 1975	114,039	9.9	7.1	8.5	2.3	2.6	-0.4	1.9
1976 I	118,078	9.7	6.8	8.7	-5.6	1.5	-1.0	2.6
II	119,601	10.5	7.0	8.3	6.6	1.6	-1.9	2.9
III	119,067	8.7	7.3	8.3	4.9	1.8	-2.5	2.7
IV	118,953	7.8	7.6	7.2	3.8	2.8	-1.0	2.4
Mean 1976	118,925	9.2	7.2	8.1	5.2	1.9	-1.6	2.5
1977 I	120,200	7.5	8.1	9.4	1.8	2.8	6.2	3.1
II	120,395	6.1	8.3	8.0	0.7	3.8	1.3	2.1
III	120,546	5.9	8.7	8.3	1.2	3.8	0.5	2.1
IV	122,007	5.4	9.0	9.7	2.6	5.0	2.8	3.6
Mean 1977	120,787	6.2	8.5	8.9	1.6	3.9	2.7	2.7
1978 I	122,710	4.8	9.0	8.9	2.1	6.2	0.6	3.4
II	123,209	4.4	9.2	9.3	2.3	5.0	-1.9	2.5
III	125,570	4.9	9.3	10.8	4.2	4.6	3.7	4.3
IV	125,311	4.6	9.2	11.2	2.7	4.5	0.8	3.0
Mean 1978	124,200	4.7	9.2	10.1	2.8	5.1	0.8	3.0
1979 I	126,708	6.5	8.9	12.4	3.3	4.0	3.7	3.7
II	125,542	7.7	8.6	11.0	1.9	4.4	-8.2	0.9
III	126,596	7.1	8.6	12.3	0.8	4.1	-5.4	0.9
IV	128,294	9.3	8.9	15.9	2.4	3.5	7.4	3.8
Mean 1979	126,785	7.7	8.8	12.9	2.1	4.0	-0.6	2.3
1980 I	125,751	7.4	9.3	16.4	-0.1	3.8	3.3	2.1
II	123,145	6.5	9.9	11.4	-1.4	5.2	-7.4	0.0
III	124,210	7.1	9.8	15.9	-1.9	5.1	2.7	1.8
IV	126,652	5.0	9.9	15.2	-1.3	3.9	3.5	1.7
Mean 1980	124,940	6.5	9.7	14.7	-1.2	4.5	0.5	1.4
Mean 1975 III- 1980:IV	122,301	7.1	8.5	10.7	2.1	3.8	0.3	2.4

Table 8.A.

Source: FOCUS simulation.

MONETARY GRADUALISM WITH M-2

	Y (\$million)	I (%)	U (%)	R (%)	y (%)	d (%)	e (%)	G (%)
1975 III	113,383	9.5	7.1	8.7	1.7	2.7	0.4	1.8
IV	114,544	10.0	7.2	8.4	2.7	2.4	-1.3	1.8
Mean 1975	113,964	9.8	7.2	8.6	2.2	1.3	-0.5	1.8
1976 I	117,858	9.4	6.9	8.8	5.5	1.7	-2.7	2.3
II	119,156	9.8	7.2	8.6	6.2	1.9	-2.8	1.9
III	118,569	8.0	7.5	9.3	4.6	2.1	-0.7	2.5
IV	118,813	7.4	7.8	8.3	3.7	2.9	0.9	2.8
Mean 1976	118,599	8.7	7.4	8.8	5.0	2.2	-1.3	2.4
1977 I	119,252	6.6	8.4	9.0	1.2	3.1	3.5	2.4
II	119,408	5.5	8.6	9.0	0.2	4.2	0.2	1.8
III	119,617	5.3	9.0	9.5	0.9	4.0	1.0	2.2
IV	120,815	4.0	9.4	9.9	1.7	5.3	2.4	3.3
Mean 1977	119,773	5.4	8.9	9.4	1.0	4.2	1.8	2.4
1978 I	121,393	4.1	9.6	10.4	1.8	6.4	0.7	3.4
II	121,714	3.4	9.8	10.1	1.9	5.2	-3.4	2.2
III	124,143	4.0	9.9	11.6	3.8	4.8	4.4	4.3
IV	123,571	3.6	9.9	11.4	2.3	4.7	-0.2	2.8
Mean 1978	122,705	3.8	9.8	10.9	2.5	5.3	0.4	3.2
1979 I	125,319	5.8	9.6	13.0	3.3	4.2	5.5	4.1
II	123,493	6.5	9.6	10.3	1.5	4.6	-11.0	0.3
III	124,174	5.3	9.5	12.3	0.0	4.4	-7.7	0.2
IV	126,571	7.9	9.8	17.8	2.4	5.7	12.0	4.8
Mean 1979	124,889	6.4	9.6	13.4	1.8	4.2	-0.3	2.4
1980 I	123,298	4.9	10.3	16.7	-1.6	4.1	-4.1	0.2
II	119,741	4.3	11.0	12.2	-3.0	5.8	-13.0	-1.5
III	121,639	5.4	11.0	18.3	-2.0	5.5	7.4	2.9
IV	123,616	2.7	11.3	16.4	-2.3	4.3	-2.1	-0.4
Mean 1980	122,074	4.3	10.9	15.9	-2.2	4.9	-3.0	0.5
Mean 1975 III- 1980:IV	120,913	6.1	9.1	11.4	1.7	3.9	-0.5	2.1

Table 8.B.

Source: FOCUS simulation.

9. Summary and Conclusions

This study reviewed the main arguments in the policy debate arising out of the adoption of Monetary Gradualism by the Bank of Canada in 1975.

It compared the performance of the Canadian economy under different monetary policy regimes corresponding to the major proposals for the conduct of money policy offered during the debate.

Authors associated with the monetarist school explained the apparent failure of the Bank of Canada's monetary experiment against inflation on the grounds that the Central Bank had chosen the wrong monetary aggregate and that policy had been too hesitantly pursued. On the Neo-keynesian side, disbelief in the effectiveness of a pure monetary cure to inflation, and concern about the real costs of the policy led several authors to call for fiscal activism with monetary policy playing the role of supporting instrument in the attainment of full employment.

Using the FOCUS macroeconomic model of the Canadian economy, we recreated for the 5½ year period from the 3rd quarter of 1975 through the 4th quarter of 1980, four scenarios differing in terms of their monetary policy assumptions, namely

- (i) a credit conditions policy, similar to that adopted from mid-1970 through mid-1975 by the Bank of Canada; -

(ii) an exchange rate strategy, whereby the Canadian dollar was pegged at parity to the U.S. dollar;

(iii) a strategy of monetary gradualism similar to that actually adopted by the Central Bank in mid-1975, but involving a lower degree of gradualism; and

(iv) a strategy of monetary gradualism, but one involving the control of the broader monetary aggregate, M-2.

Strategy (i) was suggested and proposed in some circles of the Neo-Keynesian world, namely in Donner and Peters (1979). Barber and McCallum (1980, 1982), within a package involving a multiplicity of fiscal measures, proposed that monetary policy should be geared towards the control of the exchange rate.

The key monetarist critiques to Monetary Gradualism are embodied in strategies (iii) and (iv). Courchene (1976(a), 1979) and Laidler (1976) argued on several occasions in favour of M-2 control. The argument that Monetary Gradualism had been too gradual is also found in Courchene (1981(b)), but is carried to an extreme by Jong. S. You (1982).

The actual experiment with Monetary Gradualism and the four suggested alternatives were rated according to two different criteria. Under the Output Criterion the benefits and costs of a policy regime were measured in terms of two key indicators of output and inflation, made commensurate and expressed as a percent of actual, real GNP. Under the

Public Opinion Criterion a simulated public opinion poll was conducted, whereby the general public is called upon to express its concern for economic issues under each policy regime.

The results in summary form are presented in Table 9.1.

Both evaluation criteria yield exactly the same conclusions. Thus, the "Credit Conditions" policy ranks first. The actual policy of Monetary Gradualism is second, and the Exchange Rate strategy third. The Monetarist alternatives, namely the Less Gradualist Strategy with M-1 and Monetary Gradualism with M-2 are fourth and fifth, respectively.

Of the four alternatives suggested in the literature to the actual experiment with monetary targeting, only its historical predecessor - the policy of appropriate credit conditions - would have performed better over the 5½ year period under analysis.

When viewed through FOCUS, Canadian monetary policy, both expansionary and contractionary, seems to affect output more than prices, at least within the medium term horizon considered in this study. In this sense, it can neither be considered the main inflationary force operating in the economy nor the most effective weapon, at least when used alone, against inflation. As suggested by the estimates presented in chapter 7, Monetary Gradualism achieved in 5½ years, relative to the Credit Conditions policy, a bare 3 percentage points reduction in the rate of inflation at the cost of an additional 2 percentage point increase in the rate of unemployment, roughly the equivalent of 330 thousand

MEAN SCORES (1975-1980)

YEAR	OUTPUT CRITERION (Net Benefits (+) or Costs (-) as a % of actual, real GNP)					PUBLIC OPINION CRITERION (% of respondents expressing concern for Economic Issues)				
	MG	CC	PER	LGM1	MGM2	MG	CC	PER	LGM1	MGM2
1975 (1)	0.00	-0.04	+0.12	+0.04	+0.10	53	51	53	52	52
1976	0.00	-0.19	+0.66	+0.36	+0.33	53	52	53	53	53
1977	0.00	+0.41	+1.59	-0.97	-0.99	55	55	55	57	59
1978	0.00	+0.98	+0.86	-0.54	-2.04	57	55	61	60	63
1979	0.00	+2.10	-2.68	-2.48	-3.30	55	49	59	64	68
1980	0.00	+2.19	-4.02	-2.26	-2.96	58	51	59	67	76
MEAN (1975- 1980)	0.00	+1.01	-0.64	-1.07	-1.62	55	52	57	59	63
RANK	2	1	3	4	5	2	1	3	4	5

Table 9.1. Ranking of Monetary Gradualism and Alternatives, Output and Public Opinion Criteria.

NOTES: (1) Includes 3rd and 4th quarters only.

- MG: Monetary Gradualism
- CC: Credit Conditions Policy
- PER: Pegged Exchange Rate Policy
- LGM1: Less Gradualist Strategy with M-1
- MGM2: Monetary Gradualism with M-2

man-years unemployed. According to our estimates under the Credit Conditions policy, an average of 52% of the general public over the period 1975:III - 1980:IV would have expressed concern for economic issues. Under Monetary Gradualism it would have been 55%. Since the outcomes of both policies in terms of the key economic indicators would have been similar in the early part of the period under analysis, it is in the latter part of such period that the differences in public esteem for both policy courses become pronounced. Thus in 1979, only 49% of respondents would have expressed concern for economic issues under the Credit Conditions policy relative to 55% under Monetary Gradualism. In 1980 the figures are 51% and 58% respectively. In each of those two years, the Credit Conditions policy would have yielded a net benefit of 2.19% of actual, real GNP relative to Monetary Gradualism.

The policy of exchange rate control by the Central Bank would have been moderately costly and unpopular, relative to the actual experiment with monetary targeting. On average over the period 1975:III - 1980:IV net annual costs would have been 0.64 percent of actual real GNP, and 57% of Canadians would have expressed concern for economic issues under this strategy.

A less gradual strategy using M-1, or an equally gradual strategy involving the control of M-2, would have been costlier and less popular versions of the actual monetarist experiment with M-1.

Although both of these alternatives to the actual experiment with monetary control represent more effective strategies to reduce

inflation, their costs are inordinately high. In 1979 and 1980 net costs of each of such strategies would have amounted to about 3 percent of actual, real GNP. Furthermore, in a population Keynesian by education or belief, where inflation is an issue of moderate concern and employment the absolute priority, those strategies would have been highly unpopular and hardly feasible from a political stand point. Thus, by 1980, the "Less Gradualist Strategy with M-1" would have raised concern with economic issues among 67% of Canadians and the strategy of "Monetary Gradualism with M-2" would have concerned 76% of Canadians. This compares with a moderate 58% under Monetary Gradualism and 51% under the "Credit Conditions" policy.

Attainment of the goal of price stability in Canada goes beyond the requirement of controlling the money supply, however defined, at a growth rate deemed appropriate. It cannot be separated from the insertion of the country in highly integrated international financial markets, where foreign credit can readily be used as a substitute for domestic credit, particularly at the level of the medium and large corporations and Governments.

Furthermore, it was argued that, given the traditional external exposure of the Canadian economy and its reliance on foreign trade, especially with the United States, a steady value of the Canadian dollar is a sine qua non for price stability. A steady dollar, on the other hand, cannot be achieved by monetary policy alone, at least over the long-run. Eventually, as recent, independent evidence suggests, it is the fundamental economic factors, such as GNP growth, domestic and foreign

interest rates, capital flows, expectations, etc., which must determine the destiny of the Canadian dollar over the longer term (Marwah and Palsson, 1986, p. 47).

As a general pattern, economic policies in Canada since the mid-seventies have been indifferent to such market fundamentals, with the rise of economic nationalism over the last ten years being foremost among them.

In this environment, with continuous downward pressure on the Canadian dollar, there is no monetary policy course which can per se bring about price stability without significant costs in terms of output and employment. Governor Bouey and his policy of Monetary Gradualism were from the outset faced with this dilemma. But given the adverse environmental conditions under which the policy operated, it can be said that although Governor Bouey might have made a mistake when in 1975 he abandoned the policy of "Appropriate Credit Conditions" for "Monetary Gradualism", he deserves nonetheless credit for ignoring the recommendations of his monetarist critics.

REFERENCES:

Acheson, K. and J. Chant (1970), "Bureaucratic Theory and the Choice of Central Bank Goals", Journal of Money, Credit and Banking, 1972, pp. 637-55.

----- (1972), "The Choice of Monetary Instruments and the Theory of Bureaucracy", Public Choice, Spring 1972.

----- (1973), "Mythology and Central Banking", Kyklos 2, pp. 362-79.

Auld, D.A.L., L.N. Christofides, R. Swidinsky and D.A. Milton (1979), "The Impact of the Anti-Inflation Board on Negotiated Wage Settlements", Canadian Journal of Economics, XII, -no. 2., pp. 195-212.

Bank of Canada (1975, 1976, 1977, 1978, 1979, 1980, 1981, 1982, 1984), "Annual Report of the Governor to the Minister of Finance and Statement of Accounts for the Year".

----- (1976(a)) "Record of Press Releases", in Bank of Canada Review, September 1976.

Barber, Clarence and J.C.P. McCallum (1980), Unemployment and Inflation - The Canadian Experience, James Lorimer & Co. and The Canadian Institute for Economic Policy, Toronto.

----- (1981), "The Failure of Monetarism in Theory and Policy",
Canadian Public Policy, VII Supplement, April 1981, pp. 221-232.

----- (1982), Controlling Inflation, Learning from Experience in
Canada, Europe and Japan, James Lorimer & Co. and The Canadian Institute
for Economic Policy, Toronto.

Bodkin, Ronald G. (1981), "The Challenge of Inflation and Unemployment
in Canada during the 1980s: Would a Tax-Based Incomes Policy Help?",
Canadian Public Policy, VII Supplement, April 1981, pp. 204-214.

----- (1982) "Is Tax-Based Incomes Policy an Answer? - A Rejoinder",
Canadian Public Policy, VIII, no. 1, Winter 1982, pp. 95-102.

Bordo, M.D. and E.U. Choudhri (1982), "Currency Substitution and the
Demand for Money - Some Evidence for Canada," Journal of Money, Credit
and Banking, vol. 14, no. 1, February 1982, pp. 48-57.

Bouey, Gerald K. (1975(a)), "Remarks to the 46th Annual Meeting of the
Canadian Chamber of Commerce, Saskatoon, September 22, 1975", reprinted
in Bank of Canada Review, October 1975, pp. 23-29.

----- (1975(b)), "Remarks by G.K. Bouey, Governor of the Bank of
Canada, Saint-John, N.B., 26 November 1975", reprinted in Bank of Canada
Review, December 1975, pp. 3-10.

----- (1980), "Remarks by G.K. Bouey, Governor of the Bank of Canada to the Empire Club of Canada, Toronto, 13 November 1980", reprinted in Bank of Canada Review, November 1980, pp. 3-14.

----- (1981(a)), "Remarks by G.K. Bouey, Governor of the Bank of Canada, Calgary, Alberta, 23 September 1981", reprinted in Bank of Canada Review, October 1981, pp. 13-19.

----- (1981(b)), "Remarks by G.K. Bouey, Governor of the Bank of Canada, to The Montreal Chamber of Commerce, 1 December 1981", reprinted in Bank of Canada Review, December 1981, pp. 3-9.

----- (1982(a)), "Recovering From Inflation, Notes for Remarks by G.K. Bouey, Governor of the Bank of Canada, to The Canadian Club, Toronto, Ontario, 29 November 1982", reprinted in Bank of Canada Review, December 1982, pp. 3-9.

----- (1982(b)), "Statement Before the Standing Committee on National Finance, December 8, 1982", reprinted in Bank of Canada Review, December 1982, pp. 11-14.

Carr, Jack (1976), "Wage and Price Controls: Panacea for Inflation or Prescription for Disaster?" in Michael Walker (ed.), The Illusion of Wage and Price Controls, The Fraser Institute, pp. 5-53.

Clinton, Gillian (1974), "Selecting a Monetary Indicator: The Canadian Evidence", Department of Economics, Carleton University, Ottawa.

Cook, P., C.D. Hodgins, G. Jump and C. Szabo, Economic Impact of Selected Government Programs Directed Toward the Labour Market, Economic Council of Canada, Ottawa.

Courchene, Thomas J. (1976(a)), Money, Inflation and the Bank of Canada, An Analysis of Monetary Policy from 1970 to Early 1975, C.D. Howe Research Institute, Montreal.

----- (1976(b)), Monetarism and Controls: The Inflation Fighters, C.D. Howe Research Institute, Montreal.

----- (1977), The Strategy of Gradualism, An Analysis of Bank of Canada Policy from Mid-1975 to Mid-1977, C.D. Howe Research Institute, Montreal.

----- (1979), "On Defining and Controlling Money", Canadian Journal of Economics, XII:4, November 1979, pp. 604-615.

----- (1981(a)) "The Attack on Monetarism: Muddled and Misdirected?", Canadian Public Policy, VII Supplement, April 1981, pp. 239-248.

----- (1981(b)), Money, Inflation and the Bank of Canada, vol. II, An Analysis of Monetary Gradualism, 1975-80, C.D. Howe Research Institute, Montreal.

----- (1983), No Place to Stand? Abandoning Monetary Targets: An Evaluation, C.D. Howe Research Institute, Montreal.

Decima Research Ltd. and Public Affairs International (1983), Quarterly Report - Public Affairs Trends, Toronto.

Donner, Arthur and D.D. Peter (1979), The Monetarist Counter-Revolution, A Critique of Canadian Monetary Policy 1975-1979, James Lorimer and Co. and The Canadian Institute for Economic Policy, Toronto.

----- (1981), "Monetarism: A Costly Experiment", Canadian Public Policy, VII Supplément, April 1981.

Dungan, D. Peter (1981), "Consistent or Rational Expectations in a Macro-Econometric Model of Canada," Working Paper No. 8118, Institute for Policy Analysis, University of Toronto.

Dungan, D. Peter and T.A. Wilson (1981), Potential GNP: Performance and Prospects, Institute for Policy Analysis Report Series, Toronto.

Eckstein, Otto (1978), The Great Recession with a Postscript on Stagflation, Data Resources Series, Vol. 3, North Holland, N. York.

Effron, B. (1982), The Bootstrap and Other Resampling Plans, SIAM, Philadelphia.

Feldstein, Martin (1979), "The Welfare Cost of Permanent Inflation and Optimal Short-Run Economic Policy", Journal of Political Economy, vol. 87, no. 41, 1979, pp. 749-768.

Fraser Institute, The (1982), Tax-Based Incomes Policies, A Cure for Inflation?, Vancouver.

Freeman, G.E. (1976), "Remarks by G.E. Freeman, Deputy Governor of the Bank of Canada, to the Banking Symposium sponsored by The Canadian Council of Financial Analysts and The Association of Canadian Bank Analysts, Toronto, 23 November 1976", reprinted in Bank of Canada Review, December 1976, pp. 3-9.

----- (1980), Inflation and Canada's Monetary Policy - Notes for a Lecture, Centre for Continuing Education, University of British Columbia, Vancouver, October 29, 1980.

Friedman, Benjamin M. (1979), "Optimal Expectations and the Extreme Information Assumptions of Rational Expectations Macromodels", Journal of Monetary Economics, 5, 1979, pp. 23-41.

Friedman, Milton (1969), "The Optimum Quantity of Money", in The Optimum Quantity of Money and Other Essays, Aldine Pub. Co., Chicago, pp. 1-50.

Galbraith, John Kenneth (1967), The New Industrial State, 3rd edition, New American Library, New York.

----- (1981), "The Conservative Onslaught", in Beyond the Monetarists - Post-keynesian Alternatives to Rampant Inflation, Low Growth and High Unemployment, D. Crane (ed.), James Lorimer & Co. and The Canadian Institute for Economic Policy, Toronto.

Gilbart, J.W. (1968), The History, Principles and Practice of Banking, Greenwood Press, New York.

Hayek, F. (1974), The Pretence of Knowledge, Nobel Memorial Lecture, Stockholm, 11 December 1974, reprinted in "New Studies in Philosophy, Politics, Economics and the History of Ideas", Chicago, 1985, pp. 23-34.

----- (1976), Whither Democracy?, Institute of Public Affairs, Sidney, reprinted in "New Studies", op. cit., pp. 152-162.

----- (1978), Denationalisation of Money, Institute of Economic Affairs, London.

Institute for Policy Analysis (1982), "FOCUS-Quarterly Forecasting and User Simulation Model of the Canadian Economy (version 81E)", University of Toronto, Toronto.

Jump, Gregory V. (1982), "Overview of Monetary Policy in the FOCUS Model", in "FOCUS - Quarterly Forecasting and User Simulation Model of the Canadian Economy (version 81E)", Institute for Policy Analysis, University of Toronto.

----- and D. Peter Dungan, "The FOCUS Model: An Overview" in "FOCUS - Quarterly Forecasting and User Simulation Model of the Canadian Economy (version 81E)", Institute for Policy Analysis, University of Toronto.

Klein, Lawrence R. (1982), "The Present Debate about Macroeconomics and Econometric Model Specification", The Institute of Economics, Academia Sinica, Taiwan.

Laidler, David (1976), "An Alternative to Wage and Price Controls", in M. Walker (ed.), The Illusion of Wage and Price Controls, The Fraser Institute, Vancouver, pp. 179-210.

----- (1981), "Monetarism: An Interpretation and an Assessment", The Economic Journal, 91, March 1981, pp. 1-28.

Lipsey, Richard G. (1977), "Wage-Price Controls: How To Do a Lot of Harm While Trying To Do a Little Good", in M. Walker (ed.), Which Way Ahead? Canada After Wage and Price Controls, The Fraser Institute, Vancouver, pp. 23-53.

Marwah, Kanta (1984), "A Prototype Model of the Foreign Exchange Market of Canada - Forecasting Capital Flows and Exchange Rates", Economic Modelling, April 1985, pp. 93-124.

----- and G. Chengalath (1985), In a Renewed Search of Stabilities in the Money Demand Function for Canada: 1955-82, Carleton Economic Papers, 1985.

----- and H.P. Palsson (1986), "Direct Interventions, Interest Rate Shocks and Monetary Disturbances in the Canadian Foreign Exchange Market: A Simulation Study", paper presented at the International Conference on Economic Modelling in the OECD Economies, London School of Economics, London, England, March 24-27, 1986.

McCallum, John (1983), "Policy Beyond Platitudes", Policy Options, November 1983, pp. 6-10.

Miles, M. (1978), "Currency Substitution, Flexible Exchange Rates and Monetary Independence", American Economic Review, 68, pp. 428-436.

Musgrave, Richard A. and P.B. Musgrave (1976), Public Finance in Theory and Practice, 2nd edition, McGraw-Hill Book Co., N. York.

Okun, Arthur M. (1981), Prices and Quantities, A Macroeconomic Analysis, The Brookings Institution, Washington, D.C.

Ortiz, Guillermo (1983), "Currency Substitution in Mexico - The Dollarization Problem", Journal of Money, Credit and Banking, Vol. 15, No. 2, pp. 174-185.

Parkin, Michael (1981), "Watch Out for Falling Inflation", The Canadian Business Review, Autumn 1981, pp. 18-23.

Poloz, Stephen (1980), "Simultaneity and the Demand for Money in Canada", Canadian Journal of Economics, XIII, no. 3, August 1980, pp. 413-425.

Reid, Frank (1976), "Canadian Wage and Price Controls", Canadian Public Policy, II:1, Winter 1976, pp. 103-113.

----- (1979), "The Effects of Controls on The Rate of Wage Change in Canada", Canadian Journal of Economics, XII, no. 2, May 1979, pp. 215-227.

----- (1980), "Unemployment and Inflation: An Assessment of Canadian Macroeconomic Policy", Canadian Public Policy, VI:2, Spring 1980, pp. 283-299.

Rymes, T.K. (1979), "Money, Efficiency and Knowledge", Canadian Journal of Economics, XII, no. 4, November 1979, pp. 575-589.

Salin, Pascal (1984), Currency Competition and Monetary Union, Martinus Nijhoff Pub., The Hague.

Sargent, Thomas J. and Neil Wallace (1975), "Rational Expectations, The Optimal Monetary Instrument, and The Optimal Money Supply Rule", Journal of Political Economy, vol. 83, no. 2, 1975, pp. 241-254.

----- (1976), "Rational Expectations and the Theory of Economic Policy", Journal of Monetary Economics, 2 (1976), pp. 169-183).

Schuettinger, Robert L. (1976), "The Historical Record: A Survey of Wage and Price Controls Over Fifty Centuries", in M. Walker (ed.), The Illusion of Wage and Price Controls, The Fraser Institute, Vancouver, pp. 59-97.

Selody, Jack (1978), "On the Definition of Money: Some Canadian Evidence", Canadian Journal of Economics, XI, no. 3, August 1978, pp. 594-602.

Von Mises, L. (1950), Human Action - A Treatise on Economics, Yale University Press, Chicago.

Walker, Michael (ed.) (1976), The Illusion of Wage and Price Controls, The Fraser Institute, Vancouver.

Wallich, Henry C. and Sidney Weintraub (1971), "A Tax-Based Incomes Policy", Journal of Economic Issues, June, 5:2, pp. 1-19.

Weintraub, Sidney, J. Weldon and D. Laidler (1981), "A Prices and Incomes Policy" in D. Crane (ed.), Beyond the Monetarists, James Lorimer & Co. and The Canadian Institute for Economic Policy, Toronto, pp. 67-89.

White, William R. (1976), "The Demand for Money in Canada and the Control of Monetary Aggregates: Evidence from Monthly Data", Bank of Canada Staff Research Studies 12.

----- (1979), "Alternative Monetary Targets and Control Instruments in Canada: Criteria for Choice", Canadian Journal of Economics, XII, no. 4, pp. 590-604.

Wilson, Thomas A. (1981), Forecasting versus Policy Analysis and the Art of Economic Forecasting, Economic Policy Review, IPA, Toronto, pp. 13-30.

----- and G.V. Jump (1979), "The Influence of the Anti-Inflation Program on Aggregate Wages and Prices: A Simulation Analysis", Institute for Policy Analysis, University of Toronto.

Wirick, Ronald G. (1981), "The Battle Against Inflation: The Bank of Canada and its Critics", Canadian Public Policy VII Supplement, April 1981, pp. 249-259.

You, Jong S. (1982), "Is Tax-Based Incomes Policy an Answer?", Canadian Public Policy, VIII:1, Winter 1982, pp. 249-59.

END

FIN

6 04 87