

UNIVERSITY OF MANITOBA

THE IMPLICATIONS OF THE BANK OF CANADA'S
CHANGE IN POLICY STRATEGY

A THESIS SUBMITTED TO THE FACULTY OF
GRADUATE STUDIES IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE MASTER OF
ARTS DEGREE

LORRAINE SOKOLOV

WINNIPEG, MANITOBA

MAY, 1980

The Implications of the Bank of Canada's Change
in Policy Strategy.

by

Rhoda Lorraine Sokolov.

A thesis submitted to the Faculty of Graduate Studies of
the University of Manitoba in partial fulfillment of the requirements
of the degree of

Master of Arts

© 1980

Permission has been granted to the LIBRARY OF THE UNIVER-
SITY OF MANITOBA to lend or sell copies of this thesis, to
the NATIONAL LIBRARY OF CANADA to microfilm this
thesis and to lend or sell copies of the film, and UNIVERSITY
MICROFILMS to publish an abstract of this thesis.

The author reserves other publication rights, and neither the
thesis nor extensive extracts from it may be printed or other-
wise reproduced without the author's written permission.

CONTENTS

PREFACE.....	1
INTRODUCTION.....	2
I CREDIT MARKET CONDITIONS STRATEGY.....	7
Targets of Policy.....	9
Monetary Policy: Post Float 1970-1974.....	16
Impact of Policy.....	24
Failure of the Credit Market Conditions Strategy...34	
II MONEY SUPPLY STRATEGY.....	50
Theoretical Sources.....	52
Technical Components of Implementation.....	67
III BANK OF CANADA MONEY SUPPLY STRATEGY.....	98
Technical Underpinnings.....	105
Policy Implementation.....	111
Impact of Policy.....	126
Summary and Conclusion.....	142

Preface

In an effort of this nature, one's debts to teachers, colleagues and the profession at large are beyond what can be acknowledged. In some small token, I would like to thank the donors of the more significant benefits without which this thesis would not have been completed in its present form. I would like to express my gratitude for intellectual and material benefits, the latter in the form of a Fellowship grant, received from the University of Manitoba and its Economics Department. In particular, I wish to thank Dr. Brian Scarfe for the initial instruction and aid he gave me prior to his departure for the University of Alberta; and Dr. Norman Cameron, whose comments, criticisms and encouragement formed an integral part of the completion of this thesis. I also wish to thank Dr. Clarence Barber and Dr. John McCallum who agreed to sit upon my Committee.

The sole responsibility for the analysis, conclusions, and any errors is my own.

INTRODUCTION

Monetary policy involves the manipulation of money and credit by the central Bank in order to effect certain macroeconomic results on the economy. The most important of these are: the level of income and employment, the general level of prices, and the foreign exchange value of the currency. Discretionary use of monetary policy allows the particular emphasis placed by the authorities on final policy objectives to determine appropriate monetary and credit conditions. A rules, or money supply target approach to policy, does not. It constrains the use of the money supply as a policy variable to a constant growth rate which approximates real economic growth. Stabilization policies which restrain or stimulate growth in income and employment, therefore, only occur as a result of actual growth in the money supply being above or below the targeted range. Interest rates will reflect the monetary conditions and so therefore will

the exchange rate insofar as the particular rate structure induces capital flows.

When in late 1975 the Bank of Canada expressed its policy stance in terms of a monetary growth target, it implied not only a conceptual shift but a change in emphasis on final policy objectives. The former discretionary framework had allowed exchange rate objectives to dominate the formulation of policy. The official intent of monetary policy in prior years was to stabilize the economy by prompting contra-cyclical changes in credit conditions. However, following the floating of the Canadian dollar and ensuing pressure on it to further appreciate, appropriate credit conditions were determined by endeavors of the authorities to keep the Canadian dollar within close parity to the United States dollar. Policy thereby incurred rapid rates of expansion in all definitions of the money supply. The counterpart to the expansiveness of Canadian monetary policy in the early seventies, in conjunction with other inflationary pressures which emerged internationally, was the increasing incidence of domestic inflation. In consequence, rising Canadian interest rates over 1973 and 1974 reflected the incorporation of an inflationary premium rather than decisive restraint on the part of the monetary authority. Within the inflationary environment

credit market conditions were unreliable indicators for policy direction and as the problems associated with price inflation became more apparent, the Bank of Canada opted for stable monetary expansion in order to secure contra-cyclical changes in credit conditions.

The adoption of a monetary target strategy implied that exchange rate priorities would no longer determine the direction of monetary policy in Canada. Interest rates would reflect domestic economic conditions and could be expected to move in a direction opposite to rates in the United States should there arise dissimilar levels of economic activity in the two countries. Monetary policy, therefore, would be entirely devoted to the domestic situation and independent of balance of payments considerations which had permeated previous policy.

This thesis attempts to evaluate the extent to which this, in fact, did occur. It, therefore, examines how policy reflected the particular weights placed on final objectives within the two alternative approaches to Canadian monetary policy subsequent to the floating of the dollar in 1970. It concludes that in the latter period exchange rate objectives were temporarily subordinated. Until 1978, policy was in strict accord with the intent of

the new strategy. Monetary targets were determined by the objective of controlling inflation and policy was directed to the achievement of targets. This required Canadian interest rates to move in opposite directions from rates in the United States from 1975 through 1977, with the result that the Canadian dollar initially appreciated and then depreciated in terms of the United States dollar. The extent of depreciation over 1977 ultimately resulted in import costs being the largest contributing factor to price inflation in Canada. The Bank therefore reinstated the exchange rate as a dominant objective of Canadian monetary policy and in so doing implied the limitations on Canada conducting an entirely independent monetary policy for long.

Chapter one describes the previous discretionary approach to policy: Section I, the conceptual framework; Sections II and III, the implementation of policy from 1970 to 1975; Section IV, the specific failure of that strategy. Chapter two summarizes selected theoretical literature on implementing a monetary target strategy. Chapter three examines the Bank of Canada's specific adaptation of a monetary target strategy: Section I, the technical underpinning; Sections II and III, the implementation and impact of policy from 1975 through 1978; Section IV, the consistency between policy intent

and performance.

Bank pronouncements in the Annual Reports and statistical data published in the Monthly Reviews essentially are the means used to analyse and interpret the intent, implementation and impact of policy in the two periods.

CHAPTER ONE

CREDIT MARKET CONDITIONS STRATEGY

The Bank of Canada's adoption in late 1975 of a monetary growth target signified, at least, an acknowledgement of some relationship between inflation and excessive monetary expansion and, at most, an indictment of the former credit market approach to policy implementation.

A credit market conditions approach to monetary policy presumes that changes in credit conditions influence the spending decisions of consumers and investors and thereby output, employment and prices. Furthermore, a differential between domestic and international credit conditions can be expected to affect capital flows and therefore exert upward or downward pressure on the exchange rate. The behavior of final policy targets therefore engenders discretionary action by the central Bank to impact upon domestic credit conditions. Methods in implementing policy may directly affect: the cash reserve positions of the chartered banks; the level and structure of interest rates; or the availability of credit. More control over the money supply is implied when policy relies on cash reserve management and more control over interest rates with use of the other methods. Appropriate credit conditions and

the methods in implementing such conditions are thereby determined by the central Bank's particular emphasis on final targets.

I. TARGETS OF POLICY

Final Targets: Financial Stability; Economic Stabilization; External Balance

The Bank of Canada's submission to the Porter Commission, in the mid sixties stated the final policy objectives of the Bank of Canada to be in accord with those of national economic policy, namely,

"...sustained economic growth at high levels of employment and efficiency, internal price stability, and the maintenance of a sound external position...."1

That these did not always require the same direction and degree of policy was implicit in former Governor Louis Rasminsky's observation:

"...to the extent that there is difficulty in attaining all of these goals at the same time there is some difference of opinion as to the respective weight that should be attached to them."2

The Bank of Canada's apparent perception of final objectives and the respective weight designated them in policy formulation has been detailed in a study by Pierre Fortin of the 1962 - 1973 period.³ Fortin's sources were the Bank's Annual Reports, monthly reviews and official statements. His conclusion concurred with a widely accepted view that - among the Bank's proximate final targets of financial stability, economic

stabilization and external balance - the external balance objective dominated the formulation of policy during the period in question.

Fortin suggested the Bank maintained stability and efficiency in financial markets consistent with other final objectives. The tendency was therefore to accommodate shifts in the excess demand for credit in order to stabilize interest rates at levels consistent with the internal and external situation. This fostered an accommodating approach to cash reserve management, rationalized defensive operations to avoid abrupt changes in credit market conditions of an inappropriate nature, and prescribed financing government borrowing requirements in a manner non-disruptive to the market.⁴

The Bank's economic stabilization objective was perceived to be the intertemporal maximization of employment prospects at minimum inflation and evolved from the Bank's aims regarding full employment and price stability.⁵ These were not considered mutually exclusive goals but rather employment secured by inflationary policies was thought to be at the cost of future employment. There is no consistent agreement on a target figure for the full-employment unemployment rate and commitment to a zero degree of inflation was

qualified subsequent to 1965 with the advent of inflation in the United States. From that time, the Bank began to stress the limitations of Canadian anti-inflationary policies and suggest:

"...objectives in this country should be to do as well as the United States and perhaps a little better."6

According to Fortin, the economic indicators used by the Bank to reflect the necessity of stabilization measures - in tighter or easier credit conditions - were measures of capacity utilization and of cost and price inflation. In addition, projections were made for the future impact on the economy of such factors as fiscal policy, exports, and foreign prices. However time lags between enactment and impact of policy in addition to the usual uncertainties regarding forecasts generally decreed that monetary policy for stabilization purposes be gradualist in its approach.⁷

The objective of external balance was defined under Governor Rasminsky as: a progressive reduction in the current account deficit of the Canadian balance of international payments; the maintenance of a stable exchange rate at an appropriate level; a level of foreign

exchange reserves which could absorb the short-run fluctuation in the flows of international receipts and payments; and the adequate financing of the current account deficit by net capital imports, with the inflow of short term capital playing only a modest role.⁸ In Forton's view, however, with the current account position more a datum than a controllable variable and an official or self-imposed commitment to exchange rate parity - the Bank's objective in external balance was essentially to establish a relative structure of Canadian interest rates conducive to attracting a net inflow of capital sufficient to maintain the proper balance between demand and supply forces in the foreign exchange market. In addition there was a tendency to depart from the usual "gradualist" guideline in monetary policy if exchange rate conditions required it.⁹

Intermediate Targets: Cost and Availability
Of Credit

The intermediate objectives of the Bank of Canada's credit market approach to policy were "appropriate credit conditions" - as reflected in cost and availability of credit. Credit conditions referred to:

"...the whole range of terms and conditions affecting borrowing and lending and the purchase and sale of financial assets: the level and structure of securities, prices

and yields, institutional lending and deposit rates, and the various requirements (over and above the payment of a certain rate of interest) which lenders require of borrowers as a condition of making funds available...'"10

The indicators used by the Bank of Canada to reflect credit conditions were nominal interest rates and chartered bank liquidity - as indicated by either the Canadian Liquid Asset or Free Liquid Asset Ratios.¹¹

Available policy instruments are those which impact on the total amount of chartered bank reserves - open market operations, shifts of government deposits, and foreign currency assets - and others which regulate the availability of credit - the variable secondary reserve ratio and moral suasion. Open market purchases of government securities by the Bank of Canada increase reserves and sales decrease reserves. Government deposits at the chartered banks are normally used to neutralize the impact of government spending but if not offset by the Bank of Canada can be used to increase or decrease chartered bank reserves. Changes in foreign exchange can impact on reserves to the extent they become government deposits. The secondary reserve ratio is used to release or impound bank liquidity and moral suasion, to direct credit to or from certain sectors. The Bank Rate is largely used to signal changes in rates that have already

taken place or the intent of policy. It is tied only very loosely to interest rates in setting the rate at which chartered banks or recognized money dealers can borrow from the central bank. Chartered bank borrowing is minimal and the dealers may borrow at $1/4$ of 1% above the average treasury bill rate at the latest weekly tender, subject to a minimum rate of the Bank Rate minus $3/4$ of 1% and a maximum of the Bank Rate plus $1/2$ of 1%.

Instruments which do not impact on securities markets and thereby directly on interest rates are: transfers of government deposits, foreign currency swaps with the Exchange Fund Account, changes in the secondary reserve ratio and moral suasion.

Operative Dynamic

From his particular study, Pierre Fortin concluded the Bank of Canada's modus operandi during the sixties and early seventies to have evolved from an interest rate rule wherein: the interest rate level suitable to the current economic situation was actively established; the desired interest rate level was defended against any change in the market which would tend to push it off target; external considerations had the greatest weight in determining the desired interest rate

level.¹² Thomas Courchene's analysis of Canadian Monetary Policy over the 1970 - 1975 period essentially agreed with this view.¹³ Courchene concluded that Bank policy, subsequent to the floating of the Canadian dollar in May 1970, was unduly expansionary in order to avert further exchange rate appreciation.

Operations by the Bank of Canada, from 1970 to 1975 would seem to indicate that monetary policy was directed to ensure interest rates conducive to external considerations while chartered bank liquidity was controlled for internal considerations. Bank operations were largely designated to the quick realignment of Canadian interest rates with those of the United States, in order to avert international capital movements with destabilizing effects on the exchange rate. This was reinforced in the chartered banking system by moral suasion in addition to induced liquidity, initially, and illiquidity subsequently. Both nominal interest rates and chartered bank liquidity thereby reflected credit conditions engendered by the objective of maintaining the Canadian dollar within close parity to that of the U.S.

II. MONETARY POLICY: POST FLOAT 1970 - 1974

In the years 1970 and 1971 the Bank's internal and external final targets both required expansionary monetary policy. Subsequently, the external target of maintaining the exchange rate necessitated expansionary policies whereas the internal situation prescribed restraint. The precise timing of change in the internal situation is open to controversy. The Bank noted it in 1973.

The unpegging of the Canadian dollar in June 1970 coincided with a strong recessionary period in Canada and the rest of the world. The dollar rapidly appreciated from the fixed parity of \$.925 to the \$.97 - \$.99 range in U. S. dollars and there was obviously very real limits to which it could be allowed to further appreciate. Awareness of this and policy intentions were explicit in the Bank of Canada's 1970 Annual Report:

"The exchange rate is a very important price in a country that trades with the outside world on the scale that Canada does: changes in it have important effects on the level and nature of economic activity in Canada, particularly on the position of industries that export and that compete with imports. It is not therefore possible to ignore it, even when it floats. Public financial management must continue to be concerned that the exchange rate broadly suitable to the development of Canada's international trade and compatible with the

desired structure of our balance of payments, in particular the size of the balance on current accounts. It is therefore still necessary to seek a mix of fiscal and monetary policy which encourages levels of interest rates in Canada that are consistent with the exchange rates staying within the suitable range."14

As a consequence of recovery in domestic and international demand, real G.N.P. rose from 2.5% growth rate in 1970 to 5.8% in 1971, to 6% in 1972, to just under 7% in 1973. In 1974, a downturn in international demand not only preceded the economic slowdown in Canada, but was more severe.

There was strong upward pressure on the Canadian dollar during much of the 1970-1974 period. This was due to strong trade accounts in 1970 and 1971 as well as international currency imbalances resulting from the large deficit position of the United States balance of payments. Further pressure on the Canadian currency was exerted by the OPEC oil price increases of late 1973, in that Canada was initially perceived to be essentially self-sufficient in petroleum.

Policy Implementation

There are two ways in which a central bank can effect a particular exchange rate - by intervening in the

foreign exchange market and in directing monetary policy to ensure appropriate domestic interest rate levels relative to the rest of the world. Given an exchange rate commitment to near parity with the United States dollar, upward pressure on the Canadian dollar subsequent to its float in May 1970 decreed extensive purchases of foreign exchange and expansionary monetary policy. Coincident with the unpegging of the Canadian dollar, the Bank Rate was decreased to 7% and therefore indicated the intent of policy. It was further lowered in successive stages to 4 3/4% at the end of 1971 and remained at that level until the first quarter of 1973. There also ensued large acquisitions of foreign exchange. As the Governor of the Bank of Canada stated in the 1971 Annual Report:

"It was the case in 1970 and to a lesser extent in 1971 that the surplus on current account implied the need for an offsetting net export of capital, or an increase in exchange reserves, or a rise in the level of the Canadian dollar in the exchange market. In the event, the accommodation to our changed external situation included all three elements. The value of the Canadian dollar rose and we added to our foreign reserves, but a large part of the adjustment was accomplished by a shift in our international capital movement....the adjustment in our international capital account was assisted by the relatively easy credit conditions encouraged by Bank of Canada policies."16

TABLE I

BANK OF CANADA Net Purchased from (+) or net sales to (-) investment dealers and banks (MILLIONS)

	Treasury Bonds ⁽¹⁾				Over 10 years	Bankers' Acceptances ⁽²⁾	Sub-total of bills and bonds and bankers' acceptances
	Bills	3 years	3-5	5-10			
1970	+ 246	- 17	- 43	- 9	+ 21		+198
1971	+ 653	+ 76	+100	- 17	+ 75		+887
1972	+ 337	+ 444	+ 61	- 1	+ 39		+880
1973	+129	+ 542	-133	- 43	+ 10		+504
1974	+421.5	+ 80.4	- 79.9	+ 7.3+	2.9	+103.1	+535.3

(1) Classified by years to maturity at time of transactions.

(2) Includes maturing bankers' acceptances

SOURCE: APPENDIX TABLE III: BANK OF CANADA ANNUAL REPORTS: 1970, 1971, 1972, 1973, 1974,

TABLE II

GOVERNMENT OF CANADA		Canadian Dollar Financing requirement met by:							
Net financing requirement		Reduction or increase (-) in Canadian dollar cash balances	Increase in holdings of Canadian Dollar securities outside Government accounts						
Excluding foreign exchange financing	Including foreign exchange financing		Total	Banking System		General Public			
			Bank of Canada	Chartered Banks	Canada Savings Bonds	Marketable securities			
342	1,907	- 85	1,992	183	1,510	714	-415	1970	
1,479	2,162	- 823	2,985	572	721	2,519	-827	1971	
1,309	1,430	- 127	1,557	586	- 192	1,195	- 32	1972	
740	15	69	- 54	572	159	-384	-401	1973	
1,550	1,826	-2,359	4,185	1,014	831	2,444	-104	1974	

SOURCE: BANK OF CANADA REVIEW, May 1976, Table 2

In fact, in order to avert further exchange rate appreciation Bank policies maintained interest rates relative to U. S. rates which lowered the cost of credit appreciably and encouraged easy credit conditions during the entire period. Other than limiting the availability of liquid assets to chartered banks in the form of

Treasury Bills and Government securities, policy did not indicate restraint despite statements of such in 1973 and 1974. The Bank was a net purchaser of securities in the market in all years; the rate of net purchase increased some 400 percent in 1971. Financing operations undertaken for the government sourced the major proportion of debt with the chartered banks in 1970 and the general public in 1971 and 1972. The latter entirely represented holdings in Canada Savings Bonds. After a decline in 1973, C.S.B. holdings again represented the major source of funds in 1974. Chartered bank liquidity as reflected in the ratios of Canadian Liquid Assets and Free Liquid Assets rose in 1970 and 1971 and declined substantially thereafter.

In 1970, the Bank of Canada's stated policy to reserves was that of restraint in July, easement in August and restraint from mid November to the end of the year.¹⁷ The chartered banks were allowed to fund the major portion of increased government financial requirements. The banks were a ready market for such securities in that the secondary reserve requirements has been raised in mid May and the quiescent state of the economy did not engender large private demands for credit. Marketable securities to the general public would have entailed higher interest rates than the Bank wished to incur.¹⁸ In addition, moral suasion was exerted to

limit interest rates paid by the banks on large Canadian dollar deposits.¹⁹

In early February, 1971, the Bank resumed a stated accommodative approach to chartered bank reserves until the second quarter when interest rates in the United States moved upward. In August, U. S. policies caused a reversal in the upward trend there whereupon the Bank of Canada again stated an accommodative stance. ²⁰ Reliance on chartered bank financing of Government requirements was largely replaced by a Canada Savings Bond issue to the general public. This enabled a sharp reduction in Treasury Bill issues beginning in November.²¹ Restriction in the availability of liquid assets to chartered banks followed upon revival of economic activity and the resumption of strong private credit demands. The banks' requirements for liquid assets to support their increased acquisitions of less liquid assets thereby ensured a captive market for future Treasury Bill issues of low yields. Upward pressure on interest rates incurred by the reduction in chartered bank holdings of liquid assets was moderated by large purchases of securities by the Bank of Canada.²² In addition, the secondary reserve ratio was lowered to 8.5% effective December 1971 and 8% effective January 1972.

The Bank of Canada continued actively in the market until well into the summer of 1972, in order to moderate rises in Canadian short term rates that exceeded U. S. levels. ²³ The combination of low liquid asset ratios and strong credit demands had provoked the chartered banks to bid up rates paid on large short term deposits in order to satisfy credit demands. The Bank ultimately had to resort to control by moral suasion in the Winnipeg Agreement of June 12 which limited rates paid on these deposits. The Bank also increased its net holdings of foreign currency assets by \$191 million. These largely reflected swap transactions with the Exchange Fund Account and were used in the management of chartered bank reserves.²⁴

As interest rates in the United States turned upward in 1973, the Bank Rate in Canada was raised five times during the year to 7 1/4%. The stated intention of the Bank's management of chartered bank cash reserves was to moderate the upward movement of rates rather than stop it.²⁵ The Bank was active in the securities market throughout the year buying short and medium term issues. In addition, swap transactions with the Exchange Fund Account were again used to provide for the large increases in the amount of notes in circulation and in the required cash reserves of the chartered banks.²⁶

In 1974, the Bank Rate was raised from 7 1/4% to 8 1/4% on April 15, to 8 3/4% on May 13 and 9 1/4% on July 24. It remained at that level until November 18 when it was reduced to 8 1/4%.²⁷ Canadian interest rates followed the lead in

U. S. rates. The Bank purchased both short and medium term Government of Canada Bonds in order to moderate rapidly rising rates in March and early April and sold bonds in October and November to temper the excessive downward movement in rates.²⁸ The stated aim of cash management policy was "...to offer resistance to the strong credit demands and to moderate the rate of monetary growth."²⁹ Neither was accomplished.

III. IMPACT OF POLICY

Intermediate Targets

TABLE III

SELECTED CANADIAN AND UNITED STATES INTEREST RATES

YEAR/QUARTER (END OF PERIOD)	CANADA						UNITED STATES					
	BANK RATE	TREASURY BILL	90-DAY PAPER RATE	GOVERNMENT OF CANADA BOND YIELDS		CORPORATE BOND RATE	BANK'S 90 DAY DEPOSITS RATE	CHARTERED PRIME RATE	TREASURY BILL RATE	GOVT. BOND RATE 3-5	90 DAY PAPER RATE	CORPORATE BOND RATE
				3-5	10 YEAR+							
ANNUAL												
1970	6.00	4.40	5.58	5.42	6.99	8.83	5.80	7.50	4.96	5.93	6.12	7.75
1971	4.75	3.21	4.32	5.09	6.56	8.24	4.62	6.00	3.02	5.20	4.48	7.38
1972	4.75	3.65	5.15	6.00	7.12	8.15	5.13	6.00	5.25	6.12	5.65	7.25
1973	7.25	6.35	10.25	7.25	7.70	8.81	8.50	9.50	7.65	6.86	9.60	7.87
1974	8.75	7.12	10.25	6.96	8.77	10.72	9.75	11.00	7.34	7.19	9.60	9.24
QUARTERLY												
1970:1	8.00	7.00	7.09	7.32	7.93	9.24	7.50	8.50	6.45	7.01	6.73	8.01
2	7.00	5.94	7.31	7.07	8.09	9.24	7.00	8.50	6.83	7.88	8.74	8.67
3	6.50	5.39	6.68	7.12	7.88	9.19	6.50	8.00	5.98	7.08	7.48	8.35
4	6.00	4.40	5.58	5.42	6.99	8.83	5.80	7.50	4.96	5.93	6.12	7.75
1971:1	5.25	3.16	3.53	5.19	6.76	8.37	3.31	6.50	3.60	4.81	4.36	7.42
2	5.25	3.37	3.98	6.02	7.30	8.57	4.31	6.50	5.22	6.75	5.78	7.83
3	5.25	4.06	4.99	5.63	6.97	8.32	5.09	6.50	4.80	5.94	5.78	7.62
4	4.75	3.21	4.32	5.09	6.56	8.24	4.62	6.00	3.82	5.28	4.48	7.38
1972:1	4.75	3.57	5.51	6.29	7.24	8.24	5.67	6.00	3.94	5.96	4.48	7.36
2	4.75	3.50	5.16	6.68	7.45	8.34	5.17	6.00	4.24	5.84	5.00	7.37
3	4.75	3.62	5.01	6.56	7.46	8.46	5.25	6.00	4.76	6.13	5.26	7.37
4	4.75	3.65	5.15	6.00	7.12	8.15	5.13	6.00	5.25	6.12	5.65	7.25
1973:1	4.75	4.79	5.24	6.50	7.30	8.22	5.13	6.00	6.44	6.75	7.22	7.49
2	6.25	5.48	7.40	7.19	7.74	8.40	6.87	7.75	7.47	6.87	8.55	7.51
3	7.25	6.50	8.92	7.25	7.72	8.62	8.50	8.00	7.57	6.89	10.14	7.84
4	7.25	6.35	10.25	7.25	7.70	8.81	8.50	9.50	7.65	6.86	9.60	7.87
1974:1	7.25	6.51	9.20	7.59	8.19	9.26	8.50	9.50	8.59	7.61	9.60	8.22
2	8.75	8.75	11.70	9.22	9.46	10.45	9.75	11.00	8.11	8.28	12.13	8.80
3	9.25	8.94	11.04	8.89	9.67	10.99	9.75	11.50	6.58	8.18	10.93	9.52
4	8.75	7.12	10.25	6.96	8.77	10.72	9.75	11.00	7.34	7.19	9.60	9.24

SOURCE: Bank of Canada Reviews, February 1975, May 1976, Table 20.

Initially, Bank policy substantially reduced the cost of credit and actively encouraged its availability. From late 1971, however, liquid assets made available to the chartered banks were sharply curtailed. Policy therefore constrained liquid asset ratios and implied the intent of discouraging growth in chartered bank loans while maintaining the low cost of credit. As indicated in the above table, nominal short term interest rates

followed the direction of U. S. rates, generally at a slightly lower level. The differential widened in 1973. Long term rates remained higher than those of the United States with a larger spread in 1974. Despite large increases in credit demanded by all sectors and decreasing liquid asset ratios within the chartered banking system, there was no major sustained rise in interest rate levels until 1973. In 1973 and 1974, there was a move to restraint insofar as Bank policy further constrained chartered bank liquidity and allowed nominal rates to rise considerably.

TABLE IV

CREDIT EXPANSION BY SECTOR

	1970	1971	1972	1973	1974
(Millions of Dollars)					
Funds Raised in Credit Markets					
By Domestic Private Sector.....	6,423	10,080	10,924	17,300	20,588
(Per Cent of GNP).....	7.5	10.6	10.3	14.0	14.0
Loans to Persons.....	674	1,525	2,367	2,865	3,050
Mortgages.....	1,761	2,750	4,238	6,897	7,459
Non-financial Business Short-Term..	778	2,282	1,899	3,898	5,849
Non-financial Business Long-Term...	3,086	3,315	2,200	3,045	3,813
Short Term by Other Private Domestic.....	125	208	221	595	417
By Government Sector.....	3,346	4,759	4,454	2,916	7,866
Federal.....	1,952	3,012	1,520	-42	4,147
Federal Enterprises.....	-216	-274	249	393	16
Provincial.....	1,460	1,877	2,227	1,882	2,748
Municipal.....	240	144	458	683	975
By non-residents.....	3,028	2,250	875	1,953	1,621
Total.....	12,887	17,089	16,253	22,169	30,095
(Per Cent of GNP).....	15.0	17.9	15.4	17.9	20.3
Funds Raised Abroad.....	1,666	2,657	2,816	2,091	3,646
Funds Raised in Canada.....	11,221	14,432	13,437	20,078	26,449
(Per Cent of GNP).....	13.1	15.2	12.7	16.2	17.8

SOURCE: ECONOMIC REVIEW, APRIL, 1979

In spite of the move to restraint, financial requirements of all sectors in the economy continued to increase and furthermore, be satisfied. Total funds borrowed by non-financial business, consumers, mortgagors and governments rose from approximately \$9.8 billion in 1970 to \$14.8 billion in 1971, \$15.4 billion in 1972, \$20.2 billion in 1973 and to \$28.5 billion in 1974. The credit demands of all sectors were largely accommodated in Canada. Funds obtained domestically represented well over eighty percent of total funds raised from 1970 to 1972 and rose to over ninety percent in 1973 and eighty-eight percent in 1974. This was reflected in extensive growth in all chartered bank assets despite declining liquid asset ratios.

TABLE V

SELECTED CHARTERED BANK ASSETS
(Growth rates are in annual terms)

Year/Quarter	Canadian Dollar Major Assets	Business Loans	Ordinary Personal Loans	Mortgages	Canadian Liquid Assets	Net Foreign Assets (\$ Million)	Canadian Liquid Asset Ratio	Free Liquid Asset Ratio
	% Growth	% Growth	% Growth	% Growth	% Growth	Level	Level	Level
ANNUAL								
1970	8.4	2.8	10.5	10.0	20.8		28.4	14.5
1971	18.6	19.4	24.3	58.4	16.7		30.5	15.9
1972	18.5	24.6	20.0	51.4	1.3		26.7	13.4
1973	18.5	26.4	25.6	30.6	3.4		23.4	10.4
1974	20.2	21.5	21.1	32.0	15.6		21.5	8.9
1970:1	2.3	2.1	1.6	2.1	-0.8	-227	26.6	12.7
2	1.0	-1.3	2.0	8.8	31.8	94	28.4	14.6
3	15.6	12.4	15.7	11.3	20.4	-94	28.8	14.5
4	15.7	2.2	16.4	17.0	33.5	158	30.0	16.0
1971:1	16.7	11.2	19.3	19.1	31.9	146	30.9	16.3
2	17.2	6.5	21.1	63.6	19.9	266	31.1	16.2
3	20.2	22.0	25.6	56.0	10.7	281	30.5	15.7
4	20.5	13.2	24.0	48.5	6.4	307	29.5	15.5
1972:1	21.3	27.2	18.0	39.5	0.9	60	28.2	14.6
2	22.8	35.2	18.8	40.3	0.8	-434	26.9	13.4
3	11.6	12.4	25.6	42.8	-1.0	-476	26.1	12.8
4	14.5	16.0	22.4	40.7	4.3	-446	25.5	12.8
1973:1	18.1	21.2	26.4	33.7	1.5	-681	24.5	11.2
2	19.1	22.0	30.0	30.6	4.7	-974	23.7	10.6
3	17.9	23.6	18.0	30.1	4.4	-1,316	23.0	10.0
4	19.0	29.2	19.6	26.1	3.2	-1,279	22.2	9.8
1974:1	21.1	22.0	21.2	26.7	18.0	-1,626	22.1	9.1
2	19.9	22.6	22.8	30.4	4.9	-2,989	21.4	8.5
3	22.2	16.0	16.8	28.4	16.0	-2,473	21.1	8.5
4	17.7	18.0	17.6	25.2	24.7	-804	21.4	9.5

SOURCE: COOPER, Money Inflation and the Bank of Canada

The continued supply of credit reflected a decline, over the period, in desirable liquid asset ratios which was due in large part to more sophisticated liability management on the part of the banks. In addition Courchene has suggested the tolerable liquid asset ratio to be a chartered bank policy variable dependent on: the level and structure of interest rates; the composition of maturity structure of bank liabilities; composition of liquid assets and the composition of less liquid assets.³⁰ During the period, the maturity structure of bank liabilities was lengthened in that fixed term and notice deposits rose relative to demand deposits. Furthermore the growing incidence of mortgage loans and associated monthly payments rendered less liquid assets more liquid.

The continued demand for credit likely reflected the state of economic activity and the low real cost of credit. Although by late 1973 and 1974 the level of nominal interest rates was high, real rates were very low.

up in 1972 and accelerated sharply over 1973 and 1974.

TABLE VII

CHANGES IN GROSS NATIONAL EXPENDITURE

Years	Personal expenditure on consumer goods and services	Government current expenditure on goods and services	Gross fixed capital formation			Value of physical change in inventories ⁽¹⁾	Exports of goods and services	Imports of goods and services	Gross national expenditure at market prices	
			Total	Government	Business ⁽¹⁾					Housing
(Per cent change from previous period)										
1970.....	6.0	16.8	4.5	3.9	9.8	-9	-1,362	12.8	2.0	7.4
1971.....	10.5	10.5	15.5	18.3	7.8	37.6	287	4.8	8.9	10.2
1972.....	11.9	10.5	19.8	5.7	8.4	20.8	152	10.8	14.7	11.4
1973.....	14.6	13.5	20.8	8.5	21.8	26.9	1,044	25.0	22.8	17.4
1974.....	17.0	20.7	23.0	26.9	23.9	18.8	1,863	26.9	32.5	19.4

SOURCE: ECONOMIC REVIEW, APRIL, 1979

TABLE VIII

STRUCTURAL CHANGES IN DEMAND

Years	Personal expenditure on consumer goods and services	Government current expenditure on goods and services	Gross fixed capital formation			Value of physical change in inventories ⁽¹⁾	Exports of goods and services	Imports of goods and services	Residual error of estimate	Gross national expenditure at market prices	
			Total	Government	Business ⁽¹⁾						Housing
1970.....	58.7	19.4	21.0	3.7	13.2	4.1	0.1	24.7	-23.6	-0.4	100.0
1971.....	58.9	19.4	22.0	4.0	12.9	5.1	0.4	23.5	-23.3	-0.9	100.0
1972.....	59.1	19.3	21.9	3.8	12.6	5.5	0.5	23.4	-24.0	-0.2	100.0
1973.....	57.7	18.6	22.5	3.5	13.1	6.0	1.3	24.9	-25.1	—	100.0
1974.....	56.5	18.9	23.2	3.7	13.6	5.9	2.3	26.4	-27.8	0.4	100.0

SOURCE: ECONOMIC REVIEW, April, 1979

The dollar was maintained well within a 2% band of the U. S. dollar during most of the period. The Canadian currency however depreciated considerably relative to other major currencies which were allowed to float from late 1972 to mid 1973.³¹

Following the major oil price increases in December 1973, substantial capital inflows contributed to a steady appreciation against most currencies. The Canadian dollar reached a fourteen year high in April of 1974 at \$1.04 U. S. In the second and third quarters, capital inflows subsided and the increased deficit on current account - reflective of the much less pronounced economic decline in Canada relative to other major countries - engendered a steady fall in the exchange rate. This was tempered in the fourth quarter by a substantial rise in external borrowing. In 1974 therefore, fluctuation in the external value of the Canadian dollar was much greater than in previous years. This reflected a divergence in the performance of the Canadian economy relative to other major industrialized countries and a disadvantageous change in the Canadian terms of trade. Moreover, accelerating wage and price increases relative to the rest of the world implied the continuation of large current account deficits and future problems in external balance.

Distortions in financial markets were incurred in 1972. Reflecting the expansionary phase of economic activity and the low relative cost of credit, loan demand increased during a time of low relative liquidity in the chartered banking system. The C.L.A. and F.L.A. ratios had consistently declined from mid 1971 and the policy of

providing no new net issues of treasury bills was being continued. In addition, the financing of the cash deficit was accomplished by drawing down government deposits at the chartered banks. The banks consequently, vigorously bid for large term deposits in order to meet loan demands. This ultimately resulted in interest rates offered on term deposits being above the prime lending rate, and substantial erosion of the commercial paper market by the chartered banks. These distortions were arrested by the enactment of the Winnipeg Agreement in June, 1972 which limited the rates of interest offered on deposits of a \$100,000.00 or more for terms up to 364 days to a maximum of 5-1/2%.³²

Policy was accompanied by the increasing incidence of inflation and a decreasing unemployment rate. As indicated in Table VI, the rate of change in unemployment went from 5.7% in 1970, to 6.2% in 1971 and 1972, down to 5.6% in 1973 and 5.4% in 1974. The annual rate of change in the Consumers Price Index climbed from 2.9% in 1971 to 10.9% in 1974. There was possibly, therefore, some short run trade-off exhibited between inflation and unemployment but it entailed high rates of price increases to secure an appreciable drop in the unemployment rate.

Chartered Bank Reserves and Money Supply

As indicated in Table VI, the corollary of Bank policy in maintaining interest rates conducive to near exchange rate parity with the United States was the expansion of all definitions of the money supply.

If deficit financing is accomplished in selling bonds to the non bank public - with no new creation of reserves - the effect is to generally tighten the money market and raise interest rates. If, however, the deficit is financed through a creation of additional reserves by the central bank, there will be no tightening of the money market. Government financial operations undertaken by the Bank of Canada during the 1970-1974 period substantially increased purchases of Canada Savings Bonds by the public and acquisitions of Government securities by the Bank of Canada and the chartered banks. The public's holdings of Government securities other than Canada Savings Bonds consistently declined. Purchases of securities by the Bank of Canada represented definite increases in chartered bank reserves and monetization of debt.

Chartered bank purchase of Government debt from the central Bank normally implies at least some temporary contraction in bank supply of credit insofar as these purchases result in less reserves. Sizeable purchases in

1970 and 1971 by the chartered banks were not accompanied by restriction in the supply of credit. Courchene contends the Bank of Canada - with the use of Government deposits - had an accommodative approach which ensured that chartered bank bond purchases not result in losses of cash reserves.³³ In the Annual Reports, the Bank frequently stated an accomodative stance to reserve management and relative to the average level of \$812 million in the seven previous years Government deposits increased appreciably.³⁴ The level of Government deposits at the chartered banks rose from \$1,257 million in 1970 to \$2,239 million, \$2,407 million, \$2,361 million and \$4,682 million in the subsequent four years. ³⁵ They reflected not only proceeds from the C.S.B. campaigns but also outstanding foreign exchange swaps with the Exchange Fund. The latter almost doubled in 1971 and again in 1973.³⁶ The rising incidence of government deposits undoubtedly aided the banks in satisfying large demands for credit and moreover coincided with a period in which the banks were apparently content to allow liquid asset ratios to decline.

IV. FAILURE OF THE CREDIT MARKET CONDITIONS STRATEGY

The failure of the credit market conditions strategy, in implementing policy was in not enacting restraint on the Canadian economy when the stated intention of policy - after 1972 - was restraint. Credit market conditions, however, did not essentially reflect the direction of policy but rather were the result of policy with regard to the exchange rate objective.

Technical Underpinning of the Credit Market Conditions Strategy

The econometric model of the Canadian economy that the Bank of Canada uses to explain the major components of aggregate demand and supply and to assess the impact of fiscal and monetary policies is the RDX2.³⁷ The central variable is constant dollar business product which is defined as the sum of personal consumption, business investment, residential construction, government non-wage expenditure and net exports. Personal consumption is explained principally by a permanent income hypothesis, in addition to private sector wealth and government transfers to persons. The

factor cost governing decisions by entrepreneurs to produce more output are the expected costs of labour and physical capital. The cost of physical capital is comprised of the real (inflation adjusted) cost of financing acquisitions of capital, the corporate tax rate and the rate of depreciation allowable for tax purposes. Residential construction is linked to mortgage approvals which are regarded as being dependent on prevailing interest rates and on the size of the financial sector which in turn depends on the flow of new savings into financial institutions. Demand for Canadian export is explained by the level of activity in foreign economies and by the ratio between Canadian export prices and the prices of foreign produced equivalent goods. Import demand is explained by the level of spending in the various expenditure categories as well as by the ratio of domestic prices to import prices and the level of capacity utilization in the domestic economy. The diverse nature of the major categories of government expenditure doesn't permit a simple unified explanation. However, the difference between government expenditure and receipts is the financing requirement of the government sector which must be met by the issue of new government debt.

The financial sector is constructed around the balance sheets of the major financial institutions in the

economy. The liabilities of these institutions are explained as part of a portfolio model that reflects the public's preferred holdings - in terms of wealth, income and relative rates of return - of all major liquid financial assets. These liabilities, along with the public's holdings in currency, constitute the various definitions of the money supply.

Short term interest rates are determined in the model by a function that represents the response of the monetary authorities to economic development; where the authorities are conducting policy in terms of specified monetary targets the short term interest rate is determined as a consequence of actions taken by the central Bank to keep the money supply within the target range. The long term interest rates are based on a term structure relationship with Canadian short term rates and are also influenced by U.S. long term rates. The real supply price of capital is defined as the inflation adjusted rate of return necessary to induce financial investors to purchase the debt on equity associated with new investment.

International capital flows are influenced by the relative rates of return in Canada and the United States in addition to the wealth of borrowers and lenders in the

U.S. and Canada - of which the outstanding amount of borrowers' debts, principally Canadian, and the stock of lenders' assets, principally U.S., are the dominant elements. The exchange rate is regarded as the price that clears the balance of payment once all speculative capital flows have stabilized. The determinants in the exchange rate equation include the basic balance of payments, an expectations variable to reflect leads and lags and elements involved in portfolio choices (the difference between Canadian and U.S. short term interest rates, stocks of assets and liabilities, the wealth of Canadian and U.S. borrowers and lenders, and expectations about the future rate of exchange) underlining the implicit equation for short term capital flows.

The basic view of price formation in RDX2 is that prices are set by applying a mark up on the anticipated unit cost of labour and capital. In addition, import prices, level of capacity utilization and the magnitude of unintended inventory holdings also play a role in determining prices. Wages in the private sector are determined according to the theory that over the long run workers bargain for and obtain a real wage that rises with the trend rate of growth in productivity. In the short run: the impact of unanticipated inflation and/or slack labour market conditions may prevent the attainment of

real wage targets; an unexpected decrease in the rate of inflation or tight labour market conditions may result in negotiated wages that temporarily exceed the real wage target.

A graphical illustration of the model can be depicted by the Hicks Hansen ISLM income expenditure model in which interest rates are the perceived transmission mechanism of monetary policy on the economic system. The IS curve represents all points where aggregate demand for real goods equals total quantity produced. The LM curve represents all points at which the demand for money equals the supply. The balance of payments schedule of an economy is incorporated into the model with a BP curve which represents all points at which the current account surplus (or deficit) equals the net capital outflow (or inflow). Therefore, at the current exchange rate, the demand for foreign currency equals the supply.

The particular shapes of the curves are derived from the underlying assumptions determining them. Savings, investment and import functions essentially determine the IS curve while demand and supply for money functions determine the LM curve. The export and import functions (current account) together with the domestic investment demand for foreign currency and the foreign

investment demand for domestic currency (capital account) determine the BP curve. The IS curve is conceived to be flatter the smaller the propensity to import, the larger the propensity to consume, and the more responsive investment is to the interest rate. The LM curve is conceived to be flatter the more responsive the demand for money is to the interest rate, the smaller the propensity to import and the more interest responsive international capital flows, the flatter the BP curve. Points of simultaneous internal and external balance are achieved, under fixed exchange rate systems, when the money supply is allowed to respond to short term capital flows thereby moving the LM curve to the intersection of the BP and IS curves. With flexible exchange rates, the BP and IS curves move until their intersection occurs along the LM curve. The latter system implies the domestic currency appreciates or depreciates in terms of foreign currency according to supply and demand forces in the international market. 38

The LM curve is depicted in Figure 1-1. The demand for real balances is in the southeast quadrant and the demand for speculative or transactions balances is in the northwest quadrant. The supply of real balances is in the southwest quadrant. The LM curve shifts outward causing a lower rate of interest to be associated with a given level of income if the supply of real balances is

rate-national income which equate net capital outflow to net exports. If the IS and LM curves intersect above the BP curve, as in Figure 1-3, this implies a current account surplus and for simultaneous external and internal balance either the currency must appreciate (BP_0 moves to BP_1) or expansionary monetary policy must promote lower interest rates to induce less capital inflow or more net capital outflow (LM curve shifts from LM_0 to LM_1)

Effects of Expansionary Policy

The exposition in the previous sections of this chapter suggests that, following the 1970 appreciation of the Canadian dollar, further appreciation was averted by expansionary monetary policy. The official aim of such policy in 1970 and 1971 was expansion. As stated previously, the chartered banks were encouraged to fund the major portion of Government financial requirements in 1970 and the level of Government deposits at the banks rose considerably over the 1970 - 1971 period. Within the ISLM model, this implies - as there is no reason to suspect any structural shifts in demand for money at the time - that the substantial reductions in short term interest rates over the period 1970:4 to 1971:4, reflected a shifting of the LM curve (as in Figure 1-1) from an increased supply of real balances. This was accompanied



by a shifting IS curve that was likely a result of both effects depicted in Figure 1-2. The corollary of lower interest rates is - all other things remaining equal - a reduction in the level of savings at any given level of income (due to an increase in real net worth). Furthermore, the exogenous increase in exports of the early seventies likely shifted the $i + g + x$ curve. Therefore, the IS and LM curves conceivably shifted outward as in Figure 1-3 thus preventing the current account surpluses of 1970 and 1971 together with the foreign demand for Canadian dollars from incurring a further appreciation of the domestic currency (BP curve rising). Consequently, GNE in constant 1971 dollars rose from \$88,390 million in 1970, to \$99,064 million in 1972. However, although the ISLM model implies that higher levels of income are associated with higher levels of short term interest rates, the level of the latter remained below that of 1970:4 until the second quarter of 1973, thereby suggesting a further shifting of the LM curve.

Canadian monetary expansion in the 1970 - 1974 period was accompanied by price rises and expectations that such rises would continue. During 1972 and early 1973, simultaneous peaks in the economic activity of most industrial countries led first to spiralling prices in

primary commodity exports and then led to marked increases in domestic prices. Sharp increases in international food prices from 1972 to 1974 and the late 1973 oil price rises injected further upward pressure on the price level. The effect of a rise in the domestic price level on the LM, IS and BP curves is to raise the equilibrium level of interest rates associated with a given income level. A rise in the price level reduces the supply of real balances causing a drop in the money market equilibrium (y) associated with any given (r). In the product market, a rise in the domestic price level, at a given income level, likely increases savings (as a result of a reduction in real net worth) and imports, while reducing exports. While it is theoretically possible for a domestic price increase to increase net exports, empirical studies suggest that this does not happen.³⁹ Therefore, as net exports are reduced the BP curve shifts upward, demanding a higher equilibrium level in interest rates with a given income level at the existing exchange rate. Expectations of further inflation tend to reinforce price effects on the IS curve in raising the desired financing price of physical capital that people are willing to pay and receive. Interest rate rises in 1973 and 1974 thereby likely reflected the relative rise in the Canadian price level and expectations of further inflation.

The by-product of the Bank of Canada's particular use of a credit market conditions approach to implementing monetary policy in the 1970 - 1974 period was excessive monetary expansion. This was accompanied by inflation. The extent which this could have been averted ultimately relies on: whether inflation incurred during the period was a result of monetary expansion; the degree which further exchange rate appreciation would have provided insulation from the transmission of imported inflation. If, as Clarence Barber amongst others suggests, the inflation experienced in Canada from early 1972 to mid 1974 had primarily external sources - demand pull as world demand for raw materials increased and cost push from high world food prices ⁴⁰ - some further exchange rate appreciation during the period could have moderated these effects. Regardless, relative price changes can translate into price level changes only so far as increases in the money supply underwrite the process. Conceivably, had monetary growth during the period borne a closer relationship to growth in GNP, a re-allocation of real resources would have been necessary with income spent on unavoidable price rises balanced by less income spent on other things. However, as Franco Modigliani has recently commented, there is no Macro policy which can maintain both stable levels of employment and prices in the face of an exogenous price shock. Under such circumstances the

maintenance of stable prices would require a fall in all domestic output prices. This could be accomplished only by creating sufficient slack to put downward pressure on wages and in view of the sluggishness of wage response to unemployment, the amount of slack would have to be substantial. There is no known way of returning to the initial equilibrium except after a painful period of both above equilibrium unemployment and inflation.⁴¹

The weakness of a credit market conditions approach to policy implementation is that - in time and casual connection with credit conditions - the final targets of employment and price stability are remote whereas an exchange rate target is not. Consequently, in the particular circumstances of 1970 - 1974, the effects on price stability of the conditions achieved by adherence to an exchange rate target became apparent only when they were almost impossible to reverse.

FOOTNOTES

1. Thomas J. Courchene, Money Inflation And The Bank of Canada (Montreal: C.D. Howe Research Institute, 1976), P.69.
2. Ibid, P.69.
3. Pierre Fortin, "A Study Of The Bank of Canada's Behavior 1962 - 1973", Doctoral Thesis, University of California (Mimeo) 1975.
4. Ibid, P. 121.
5. Ibid, P. 111.
6. Ibid, P. 111.
7. Ibid, P. 129.
8. Ibid, P. 81.
9. Ibid, P. 90 - 91.
10. Ibid, P. 115.
11. Canadian Liquid Asset Ratio: Ratio of Canadian liquid assets (i.e., Bank of Canada Notes and Deposits, day to day loans, Treasury Bills, Government of Canada direct and guaranteed bonds, and call and short loans to stockbrokers and investment dealers) to total major assets (i.e., Canadian liquid assets plus less liquid assets which are principally loans, mortgages, and non-Government of Canada securities).
Free Liquid Asset Ratio: Ratio of free liquid assets (i.e., total liquid assets less the amount required to satisfy the primary and secondary reserve requirements) to total major assets.
12. Fortin, Op. Cit., pp. 210- 212.
13. Courchene, Op. Cit.
14. Bank Of Canada, Annual Report, 1970, p. 9.
16. Bank Of Canada, Annual Report, 1971, p. 7.

17. Bank Of Canada, Annual Report, 1970, p. 50.
18. Ibid, p. 7.
19. Ibid, p. 50.
20. Bank Of Canada, Annual Report, 1971, p. 35.
21. Ibid, p. 38.
22. Ibid, p. 39.
23. Bank Of Canada, Annual Report, 1972, p. 26.
24. Ibid, p. 27.
25. Bank Of Canada, Annual Report, 1973, p. 31.
26. Ibid, p. 32.
27. Bank Of Canada, Annual Report, 1974, p. 31.
28. Ibid, p. 32.
29. Ibid, p. 31.
30. Courchene, Op. Cit., p. 87.
31. Courchene, Op. Cit., p. 212.
32. Bank of Canada, Annual Report, 1972, p. 16.
This limit was raised to higher levels in 1973 as
other short term rates rose.
33. Courchene, Op. Cit. p. 121.
34. R.M. Richardson and C.B. Loewen, "Has Ottawa Had
a Policy Relapse" Loewen, Ondaaje, McCutcheon and
Company Ltd. (Mimeo) October, 1976, p. 11.
35. Bank Of Canada, Monthly Review, January, 1976, p.
8.
36. R.M. Richardson and C.B. Loewen, "Has Ottawa Had a
Policy Relapse" Loewen, Ondaaje, McCutcheon and
Company Ltd. (Mimeo) July 1976, p. 14.
37. T. Maxwell, "A Primer on RDX2", Bank of Canada
Monthly Review, January, 1978.

38. G. Copithorne, "Notes on the Hicks-Hansen-Mundell Model", University of Manitoba (Mimeo)
The above summary is derived essentially from these notes.
39. William H. Branson, Macroeconomic Theory and Policy (New York: Harper and Row Publishers Inc., 1972), p. 307.
40. Clarence L. Barber, "Recent Policy Documents", The Canadian Journal of Economics, February, 1976, p. 176.
41. Franco Modigliani, "The Monetarist Controversy or, Should We Forsake Stabilization Policies?" American Economic Review, March, 1977, p. 15.

CHAPTER TWO

MONEY SUPPLY STRATEGY

The adoption of a money supply strategy by the Bank of Canada followed a period of excessive monetary expansion and coincided with rapid inflation and interest rates at high nominal levels. Rather than reflecting any consistent position of restraint on the part of the monetary authority, these interest rate levels indicated the effects of inflation on prices individuals were willing to pay or exact for borrowed funds. The change in strategy also followed upon the emergence of a growing body of literature in support of a money supply strategy and the adaptation of such a strategy by the United States Federal Reserve.

A money supply strategy of policy replaces appropriate credit conditions, relative to final targets, with appropriate growth in the money supply. This can be achieved with either the money stock or interest rates as intermediate targets of policy. Theoretical rationales stem from two distinct sources - "Monetarist" and "Keynesian". Keynesian sources, in general, operate within the ISLM income expenditure model and look to stochastic properties within an economy as warranting either an interest rate or a money stock approach to policy. The Monetarists adhere to a money stock approach which constrains the money supply to a constant growth rate relevant to productive capacity. The implementation

of a money supply strategy, from whatever source, requires controlled interaction between the supply of money and the demand for money.

I. THEORETICAL SOURCES

Monetarist Conception

The principle dynamic of the monetarist model is the interaction between the supply of nominal balances - denominated in money terms - and the demand for real balances - in terms of a purchaseable volume of goods. Milton Friedman states the proximate determinants of the supply of nominal balances to be: the amount of high-powered money; the ratio of bank deposits to bank holdings of high-powered money; the ratio of the public's deposits to currency holdings.¹ He ascribes the demand for real balances as a function of: total wealth, expected rates of return on money and other assets, and other variables determining the utility of the services of money relative to those of other assets.² The responsiveness of the demand for money to interest rates is considered very small and changes in demand for real balances are attributed to occur very gradually or as a result of prior supply shifts. Changes in supply are perceived to be substantial and independent of changes in demand. The price level is considered the equilibrating mechanism between the supply of nominal balances and demand for real balances.

The key proposition of the model, essentially, is

that changes in the supply of money dominate other short run influences on output and other long run influences on the price level. Monetarist analysis essentially does not accept the slope properties of the ISLM diagram to contain all the relevant information pertaining to the transmission of monetary influences.³ The adjustment process is portrayed as one wherein a rise in the trend growth of money produces initial liquidity effects which may impact upon real variables in the short run. An increase in money prompts increased expenditure - investment spending as a result of lower interest rates and other spending due to holdings of real balances in excess of those desired. The effect of interest rates on aggregate demand is considered large and not limited to traditional fixed investments. Whether the change in spending impinges upon prices or output, depends on the initial state of the economy and the market process within it. If output can easily expand and the market is such that quantities adjust faster than prices, then output and employment increase. If the market process is one in which prices adjust faster than quantities, price rises precede quantity rises and temper ultimate output and employment increases. Where output can no longer expand, increased spending simply results in a rise in the general price level. The excess of nominal balances - and further economic effects - are eliminated, thereby, either by a

reduction in the real quantity of balances available through price rises or an increase in the real quantity desired by income rises.⁴ Monetarist theories and empirical studies indicate a relatively quick but short lived response of output to a change in money growth, with a longer time period required for prices to respond quickly.⁵

The monetary authority, ultimately, is attributed to control only nominal quantities. Any initial downward pressure on interest rates or decreases in the unemployment rate, incurred in the short run by an increase in the rate of monetary expansion, is postulated to be eliminated in the long run. Short run effects of rising income raise liquidity preference schedules, demand for loans and possibly prices. According to Friedman, these effects reverse any downward trend in interest rate levels in less than a year and tend to return them within a year or two to the level which otherwise would have occurred.⁶ Similarly, Friedman postulates that initial stimulation of employment is curtailed as workers realize price rises have eroded real wages. They, therefore, seek higher nominal wages in order to maintain real expected wage levels. The subsequent rise in real wages reverses output increases and the decline in unemployment. Furthermore, Friedman contends, that to the extent price

rises are expected to continue, inflationary premiums are incorporated into nominal interest and wage rates thereby resulting in higher levels of both than would have otherwise occurred.

Underlying the view of the unemployment process is Friedman's criticism of the Phillips curve concept of an inflation-unemployment trade-off. He perceives that relationship only short run in nature whereas the long run process is one in which there is a natural rate of unemployment, consistent with real forces and with accurate perceptions; unemployment can be kept below that level only by an accelerating inflation or above it by accelerating deflation.⁷ He expresses the short run process as one in which an unanticipated acceleration in demand leads firms to raise prices and employment. Firms are willing to pay higher wages as they perceive prices of their products to be higher and therefore the cost of real wages lower. The rise in nominal wages may be accepted by workers as a rise in real wages and therefore produce an increased supply of labour at the same time as an increase in demand. This situation is considered only temporary by Friedman; he posits that, as the higher rate of growth in aggregate nominal demands and of rises in prices continue, perceptions adjust to reality and ultimately reverse the initial effect.⁸ The unanticipated fall in demand leads

firms to reduce prices, output, employment and nominal wages. Workers, failing to judge correctly the current and respective fall in prices, misinterpret the reduction in nominal wages as a cut in real wages and therefore reduce the supply of labour. The effective real wage rises to the point where the resulting decline in demand for labour matches the reduced supply. Implicit in Friedman's analysis is that there is no involuntary unemployment, as wages are in reality perfectly flexible. Evidence to the contrary is a statistical illusion resulting from failure to differentiate between price change and unexpected price change.⁹

Within the monetarist model, therefore, the level of nominal income at any point in time is determined in the money market. A rise in the supply of money as in Figure 2-1 increases nominal income from Y_0 to y_1 and positions the LM curve at LM_0 in Figure 2-2. If the economy can readily expand then the IS curve shifts from IS_0 to IS_1 and the price level remains constant as in Figure 2-2. If the economy cannot expand, the shift in the IS curve as in Figure 2-4 is absorbed by a rise in the price level rather than a rise in real output. The LM curve therefore shifts upward to LM_1 resulting in an associated higher nominal interest rate with income level Y_0/P_0 .

Two major empirical studies dealing with the basic monetarist premise were conducted by Friedman with David Meiselman and Leonall Anderson with Jerry Jordan of the Federal Reserve Bank of St. Louis. The Friedman-Meiselman findings were such that for annual data between 1897 and 1958 and quarterly data for a shorter sub-period, the relation between

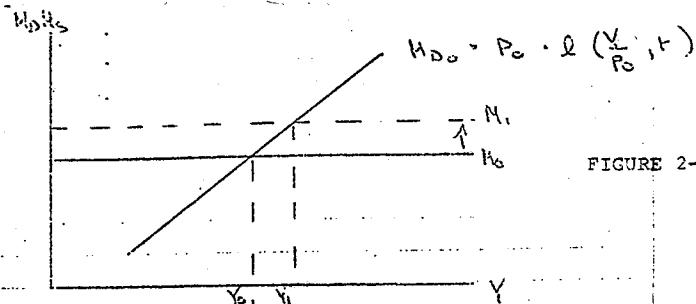


FIGURE 2-1

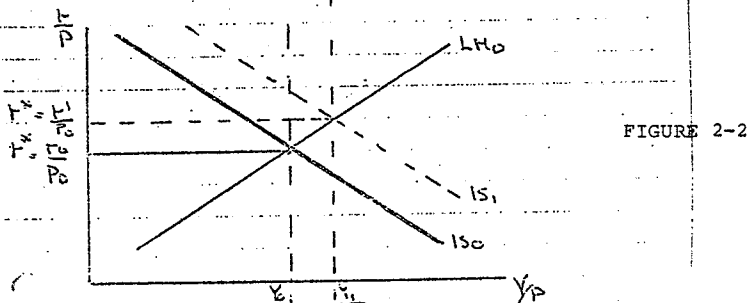


FIGURE 2-2

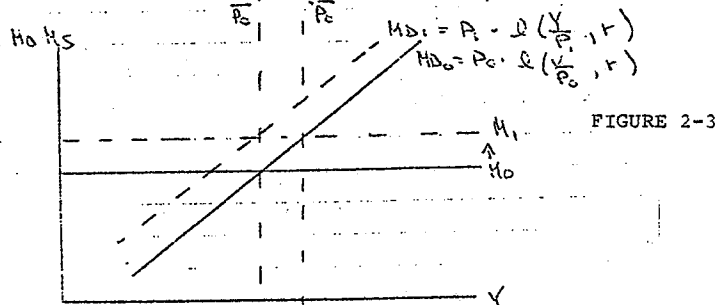


FIGURE 2-3

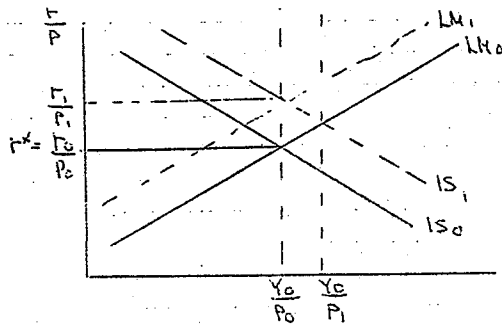


FIGURE 2-4

the money supply and consumption proved more stable than the relationship between investment and consumption (except for the years 1929 - 1934).¹⁰ Anderson and Jordan dealt with the period between 1952 to 1968.¹¹ They estimated monetary and fiscal multipliers through reduced form equations by relating the change in income to current and four lagged values of the money supply (M_1) and fiscal impulses (high employment federal expenditure). Their results showed the contribution of money, both current and lagged, as extremely large whereas fiscal effects peaked in two quarters to only about one and then disappeared by the fourth quarter.¹² Richard G. Davis, of the Federal Reserve Bank of New York, compared the multipliers of the St. Louis equations with those in the M.I.T. econometric model of the U.S. economy. The fiscal multiplier of the M.I.T. model was considerably higher than that of the St. Louis model whereas the money multiplier in the St. Louis model was

far greater than that of M.I.T. Moreover the speed of the St. Louis money multiplier was such that a \$1 billion once-and-for-all increase in the money supply in a given quarter would raise GNP by \$1.6 billion that same quarter and \$3.5 billion in the next quarter. The same money supply increase within the M.I.T. model had almost no effect on GNP in that quarter and very little one quarter later.¹³

The basic monetarist contentions are well summarized in a recent paper by Franco Modigliani as: a low sensitivity of the demand for money to interest rates; a large effect of interest rates on aggregate demand; a low value of the multiplier due to a high short run marginal propensity to save in response to transient income disturbances; a relationship between unemployment and inflation which can only be negative in the very short run. These contentions, as Modigliani suggests, engender the basic monetarist conclusions that: the economy is inherently stable; fiscal policy actions, like other demand shocks, have minor and transitory effects on money income; the observed instability of the economy is most likely the result of unstable growth in money - due to misguided endeavours to stabilize income, or to the pursuit of balance of payments goals.¹⁴ The monetarists argue, therefore, that the monetary authorities avoid

unstable growth in adopting publicly the policy of achieving a steady rate of growth in a specified monetary total."¹⁵

Modigliani states many of the monetarist contentions to have been substantiated. With regard to the interest elasticity of demand for money, post Keynesian theoretical developments point to a modest value of around one-half to one-third and empirical studies are largely consistent with this. In addition, both theoretical and empirical work have largely vindicated the monetarist contention that interest effects on demand are substantial and pervasive. Similarly, the dependence of consumption on long run income and wealth together with high marginal tax rates and leakages through imports leads to a rather low value of the multiplier.¹⁶ It is generally conceded, therefore, that there are inherent mechanisms within the economy that are fairly effective in eventually limiting the effects of shocks.

An essential point of conflict however remains regarding the magnitude and duration of the interim response. Modigliani points out that although the first link in the offsetting mechanism (a rise in short term interest rates) responds promptly and strongly, most expenditures depend on long term rates and these generally

respond gradually. The demand response is also gradual. Finally, change in the real money supply through prices displays an even longer lag due to the sluggish response of wages to excess demand. Simulations performed on the M.P.S. econometric model of the United States economy support Modigliani's views. A 1% exogenous demand shock showed an impact effect on aggregate output of barely 1% and a peak at about 2% in one year. Thereafter, the wage price mechanism was increasingly effective, returning the real response to impact level in a year and fully offsetting the shock by the end of the third year. Money income reached a peak of over 2.5% by the middle of the second year and declined thereafter. While these results do not reflect a highly unstable economy, neither do they indicate an economy which completely withstands demand shocks. Modigliani concludes that opting for a constant rate of growth in the nominal money supply can result in a stable economy only in the absence of significant exogenous shocks.¹⁷

Stochastic Model

Richard G. Davis of the Federal Reserve Bank of New York states the choice between a money supply target or an interest rate target to be quite distinct from

Monetarism versus Keynesianism. Rather in a world of uncertainties, the point is to aim at the most efficient target for monetary policy.¹⁸ Recent theoretical work by William Poole, within the ISLM framework, is relevant to such a view.¹⁹ Poole's analysis poses two major contentions. First, a money stock strategy may be superior to an interest rate strategy, given certain values of structural parameters and random sources of disturbance within an economy. Which strategy is optimal, however, may vary over time if the structural and stochastic parameters change. Second, it is possible to define an optimal combination policy wherein the interest rate and money stock are maintained in relation to each other - the nature of the relationship depending on the values of the parameters - that is as good as or superior to either an interest rate or money stock policy no matter what the values of the parameters.²⁰ Poole's prescription, therefore, follows a discretionary rather than rules approach to policy.

Poole assumes that selection of a particular strategy should depend on which minimizes the expected loss from failure of a level of income to equal the desired level (and therefore of actual from forecast income levels). This he determines will depend on the relative stability of the LM and IS curves (probable

sources of random disturbances) and their slopes (structural parameters). Poole finds a money supply target superior, the lower the interest sensitivity of the demand for money. In such instances, relatively large disturbances in the IS curve have small effects on income where small shifts in the LM curve have large effects. The corollary is that the larger the interest sensitivity of the demand for money, the smaller the effect on income of relatively large disturbances in the money sector and the greater the effect of small disturbances in the real sector. He further finds a money stock target minimizes the expected loss from failure of the level of income to equal that desired when random shocks occur in the IS curve; an interest rate target minimizes such loss when the shocks occur in the LM curve.

Stochastic disturbances, however, can be expected to occur in both the real and monetary sectors of the economy. Poole contends, therefore, that between values of structural parameters which would call for either a pure money stock or a pure interest rate policy, there is room for a combination policy which takes the expected sources of disturbances as criteria for the choice of policy. Unexpected disturbances from the real sector (IS curve) which lead via the demand for money function to high money growth should be matched by changes in interest

rates and therefore a money stock target. On the other hand, shifts in the demand for money (LM curve) should be met with the use of an interest rate target, thus preventing essentially financial disturbances from affecting real economic activity. The dynamic is depicted in the following diagrams. In Figure 2-5, with a stable LM function and an unstable IS function, setting the interest rate at r^* results in an LM function at LM_2 and income anywhere between Y_1 and Y_3 whereas a money stock target implies an LM function of LM_1 and income between Y_2 and Y_3 . The money stock target limits the effects on aggregate demand of shifts in the IS curve by allowing interest rates to rise or fall in an offsetting way. In Figure 2-6, with a stable IS function and an unstable LM function, setting the money stock leads to an LM function between LM_1 and LM_2 and income between Y_1 and Y_2 whereas setting the interest rate at r^* leads to LM_3 at Y_2 . An interest rate target is superior in this case as a money stock target allows the shift in the demand for money to be transmitted to interest rates and ultimately to aggregate demand.

The underlying adjustment dynamic of Poole's model, of a money supply target strategy, presupposes a relatively stable demand function for some definition of money having national income and interest rate levels as

explanatory variables. Any substantial deviation in the growth rate of nominal income from that expected leads to a change in interest rates providing the monetary aggregate can be induced by policy to grow at some chosen growth rate, and that changes in interest rates occur whenever the growth rate of the aggregate is not equal to the product of the nominal income growth rate and the income elasticity of the demand for money. Such interest rate change is in a direction to limit and perhaps reverse the original deviation in the growth of money income.²¹

Poole's combination policy implies the use at all times of some monetary aggregate as an indicator of policy. The success of the combination policy depends on the state of the knowledge of the parameters of the model and as Poole comments, on knowledge of more parameters than does a pure money stock or a pure interest rate policy.²²

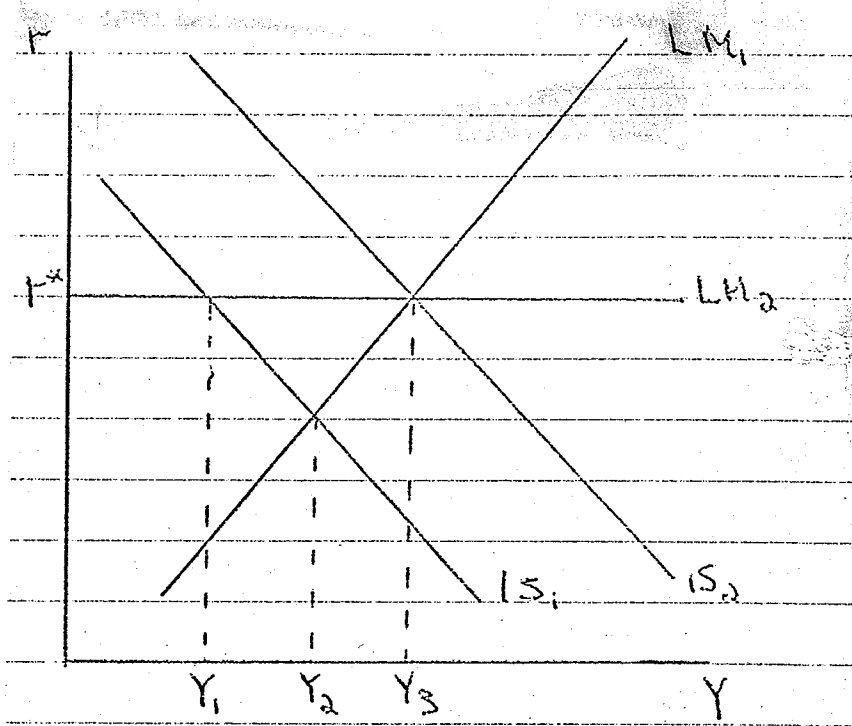


FIGURE 2-5

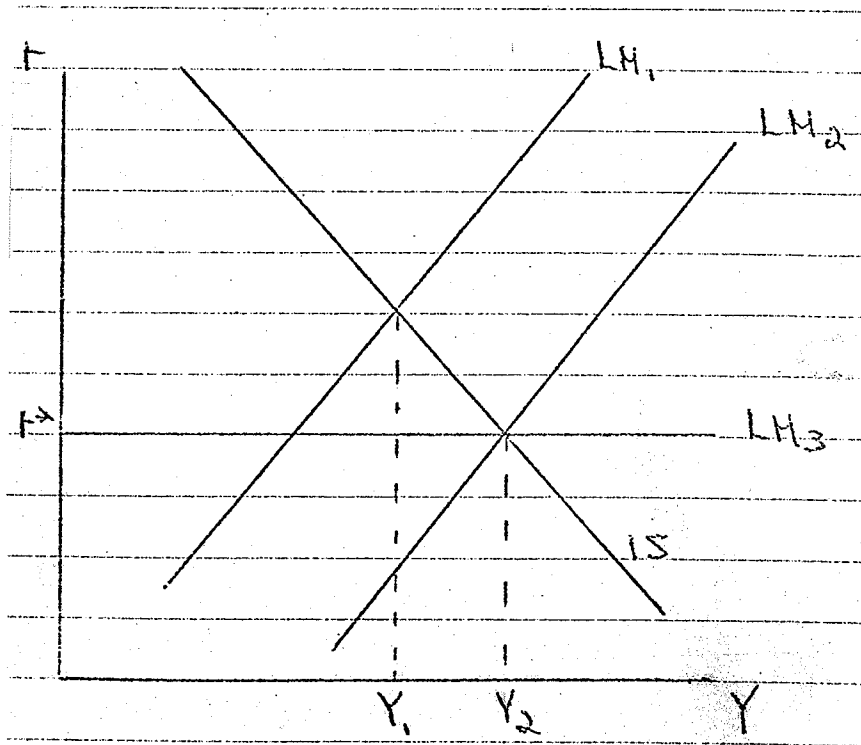


FIGURE 2-6

II. TECHNICAL COMPONENTS OF IMPLEMENTATION

Money Supply

The nominal money supply is comprised of:

- "...(i) the amount of high-powered money - ... determined through the balance of payments under an international commodity standard, by the monetary authorities under a fiduciary standard;
- (ii) the ratio of bank deposits to bank holdings of high-powered money - ... determined by the banking system subject to whatever requirements are imposed on them by law or the monetary authorities; and
- (iii) the ratio of the public's deposits to its currency holdings - ... determined by the public."²³

Therefore, changes in three variables - the volume of high-powered money (i.e., the monetary base), the commercial banks' ratio of deposits to reserves and the public's ratio of currency to deposits - result in changes in the money supply. The monetary base is determined, essentially, by the monetary authority in conjunction with government financial requirements. The size of the money multiplier (i.e., ratio of total money to the monetary base) is then determined by the particular usage of the monetary base by the banks and the public. Assuming the other two determinants remain constant, the money supply increases with a rise in the monetary base or a fall in

either the banks' reserve-deposit ratio or the public's currency-deposit ratio. TABLE I

RESERVE-DEPOSIT RATIO (millions)

	RESERVES (B-603)	TOTAL DEPOSITS (B-651)	R/D	EXCLUDING GOVERNMENT DEPOSITS (B-651- B-652)	R/D	PERCENTAGE CHANGE IN MONETARY BASE (B-200)
1970	1703	29,888	5.69	28,631	5.94	10.6
1971	2070	35,611	5.81	33,372	6.20	11.4
1972	2448	40,728	6.01	38,321	6.38	17.2
1973	2937	48,565	6.04	42,204	6.35	13.4
1974	3439	58,797	5.84	54,115	6.35	14.8
1975	3953	66,873	5.91	63,210	6.25	14.3
1976	4410	76,773	5.74	73,670	5.98	12.8
1977	5075	86,670	5.72	83,937	6.05	13.3
1978	5757	103,144	5.58	96,678	5.95	12.6

Source: Bank of Canada Monthly Reviews

TABLE II

PUBLICS' CURRENCY-DEPOSIT RATIO (millions)

	CURR- ENCY (B- 253)	DEMAND DEPOSITS (B-676+ B-677)	C/D DEPOSITS	TIME (B-654 + B-655)	C/D (1)+(2)	TOTAL	C/D
1970	3106	7082	44.85	21,065	14.74	28,147	11.03
1971	3506	8437	41.55	23,998	14.60	32,435	10.80
1972	4056	9722	41.71	27,593	14.69	37,315	10.86
1973	4620	11100	41.62	33,887	13.63	44,987	10.26
1974	5213	11570	45.05	40,999	12.71	52,569	9.91
1975	6079	14254	42.64	46,594	13.04	60,848	9.99
1976	6573	13374	49.14	58,136	11.30	71,510	9.19
1977	7268	15613	46.55	65,859	11.04	81,472	8.92
1978	8075	16840	47.95	77,467	10.42	94,307	8.56

SOURCE: Bank of Canada Monthly Reviews

The monetary base is comprised of the liabilities of the central bank and as such is a balance sheet quantity. Therefore, a change in magnitude of any Bank asset or liability account, unless offset, produces an equal change in the monetary base. Although the central bank cannot determine each item on its balance sheet, it does exert direct control over Government securities, foreign assets and Government deposits. Consequently, the effects of a reduction in uncontrollable items such as float (i.e., net balance of Government collections and payments in process of settlement) or deposits of other central banks can be offset by an equal increase in holdings of Government securities. Similarly, the effects on bank reserves (i.e., bank deposits at the central bank) of a decline in currency holdings by the public can be offset by a corresponding increase in Government deposits held at the Bank. The Bank, therefore, has sufficient instruments to maintain quite detailed control over the monetary base. In a study of the 1950 - 1969 period in the U.S., Jordan found growth in the monetary base largely determined by Federal Reserve holdings of Government securities.²⁴ Changes in the Treasury's gold holdings, potentially an important source of increase or decrease in the base, were largely offset by compensating holdings of Government securities.²⁵ Government of Canada securities comprise the largest category of assets in the

balance sheet of the Bank of Canada. They, thereby, represent the largest potential source of change in the base. As indicated in Table I the annual percentage change in the monetary base tended to rise over 1970 - 1974 and to fall in the subsequent period.

Non-official changes in the banks' reserve-deposit ratio occur because of variation in bank demand for cash and excess reserves or due to shifts in types of deposits. Demand and Government deposits require larger proportional reserves than do time deposits. Jordan found this ratio the least volatile compared to either the monetary base or the public's ratio of currency to demand deposits. It, however, did indicate a gradual downward trend and this Jordan attributed to a more rapid growth in time deposits relative to demand deposits. As indicated in Table I, a similar gradual downward trend exhibited in the Canadian reserve-deposit ratio, with the exception of the years 1971 and 1972. This trend reflects the 1967 Bank Act revisions and the consequent more rapid growth in time deposits in Canada as well. The 8% cash reserve requirement behind all Canadian dollar deposits was replaced with a 4% requirement for time deposits and 12% for demand deposits. This had the effect by early 1970, given the composition of deposits, of lowering the average required cash reserve ratio to 6.2% of Canadian

dollar deposits. The Bank Act also broadened the lending authority of chartered banks and removed the 6% ceilings on interest rates charged on bank loans, thereby enabling the banks to bid more aggressively for time deposits.²⁶ In addition, this downward trend after 1973 could reflect the effects of inflation on bank demand for cash and excess reserves.

Changes in the public's ratio of currency to deposit holdings result from changes in the level of income, wealth, substitutes for currency and uncertainties regarding general economic activity. As indicated in Table II, the public's currency-deposit ratio has gradually declined over the last decade in Canada - largely reflecting the ratio between currency holdings and time deposits. The ratio of currency to demand deposits has been quite volatile.

Control of the money stock can only be achieved if the central bank undertakes to use its instruments to offset actions which would cause monetary growth to deviate from the targeted rate. As Jordan suggests, the degree of accuracy is a function of the ability to determine the monetary base and to predict the net influence of the behavior of the public and the commercial banks as summarized by changes in the money supply multiplier.²⁷

Money Demand

Following the publication of the General Theory, a body of theoretical literature emerged which attempted to either extend or elaborate Keynes' version of the demand for money. Keynes postulated transactions, precautionary, and speculative demands for money. The demand for transactions and precautionary balances were determined chiefly by the level of income - increasing as income increased. The speculative demand depended chiefly on the rate of interest - varying negatively with the latter. Keynes determined at any point in time there would be a "normal" interest rate level and any variance from this would engender speculative expectations that the current rate would rise or fall in order to return to the "normal" level. He postulated that rises in interest rates above the normal level would induce expectations that they would subsequently fall and therefore incur a movement into bonds in anticipation of capital gains. Likewise, a fall in rates below the normal level would incur a movement out of bonds into money to avoid capital losses. Keynes further posited that at some low level of interest rates, expectations of a rise would be unanimous and at this point the demand for money with respect to interest rates would be perfectly elastic. The model implied that the relationship between the speculative

demand for money and the rate of interest shifted as the perception of the "normal" level changed, thereby making it unstable. Speculative demands were perceived to dominate transaction and precautionary demands.

The empirical issues raised by Keynesian or post-Keynesian theory include: the liquidity trap hypothesis; the dependency of the demand for money on the rate of interest; the relationship of the demand for money to total wealth.²⁸

Milton Friedman offered an alternative analysis of the demand for money in treating money as an asset which yields a flow of services which become less valuable relative to the services of other assets as holdings increase.²⁹ In his framework the demand for money is a function of total wealth, the rates of return on other assets, and the utility attached to the services of money.

His total wealth variable comprises a concept of permanent income, as opposed to only current income, and the division of wealth between human and non-human forms. Rates of return on other assets include that on bonds, equity and expected changes in prices of other goods. Friedman perceives the demand for money to increase with an increase in wealth and decrease as the rates of return

on other assets rise or the expected rate of inflation rises. The empirical issues on the demand for money raised by Friedman include: whether the demand for money is a stable function of a few variables; whether the expected rate of change of prices is an important influence on asset choices; which concept of wealth is appropriate.³⁰

U.S. studies on the empirical properties of the demand for money function, using both income and wealth variables, have verified a negative relationship with various definitions of the interest rate. Assuming the demand for money proportional to income, Tobin, Bronfenbrenner, Mayer and Latane all concluded a distinct negative relationship with the interest rate.³¹ In a study of the 1900-1958 period, Alan Meltzer used three alternative wealth variables - the level of income, the level of non-human wealth or the level of permanent income - as well as alternative definitions of money - excluding time deposits at commercial banks, including them, or including additionally deposits at mutual savings banks. Regardless of the wealth variable included in the function, Meltzer found a significant negative relationship between the demand for money, however defined, and the rate of interest on twenty year bonds. Although there was some variation, the computed value of

the interest elasticity of the demand for money was in general about -0.7 . Using a similar function, David Laidler matched this result for the 1892 - 1960 period as well as finding a short term interest rate elasticity of $-.15$. In addition, Brunner and Meltzer and Teigin performed respective studies which explicitly took account of the identification problem between money supply and money demand and corroborated these elasticity findings for the short and long rate.³² The only empirical study of the demand for money function which failed to find a relationship with the rate of interest was that undertaken by Milton Friedman of the 1869 - 1957 period. However, this was due to an error in setting up the empirical work and the findings were later refuted by Laidler.³³

Studies of the U.S economy over the last sixty years, therefore, using fairly simple formulations of demand for money functions have yielded stable negative relationships with the rate of interest. Considering the 1892 - 1960 period, Laidler points out that the elasticity of the demand for money (M_2) with respect to the short term rate of interest varied roughly between -0.12 and -0.15 and with respect to the long rate between -0.2 and -0.6 . The relevant elasticities for M_1 are -0.17 to -0.20 and -0.5 to -0.8 .³⁴ The fact that most studies constructed their empirical equations on the assumption of

the demand for money being homogeneous of degree one in prices provided an indirect test of that assumption in that the regression results based on it fit well. Moreover, Meltzer ran a direct test and his estimates produced an elasticity of nominal money demand to prices approximately equal to one.³⁵

Little evidence was produced to substantiate the liquidity trap hypothesis. Studies conducted by Bronfenbrenner and Mayer of the period 1914 - 1957 did not indicate any tendency for the elasticities of the interest rates they measured to be higher at low rates of interest. Studies undertaken by Laidler of the period 1892 - 1960 resulted in similar findings. Nor was there any evidence that the function was any less stable at low rates of interest.³⁶ Moreover, work involving the observation of shorter periods also produced similar evidence. In their respective studies, Teigin, Brunner and Meltzer and Laidler found little discrepancy between the interest elasticities of the demand for money in the 1930s, when interest rates were remarkably low, and later post-war periods.³⁷ Furthermore, these results were achieved using long and short rates of interest with narrow and broad money definitions as well as income, wealth and expected income variables. Kostas and Khouja found some evidence for the elasticity of a long interest

rate to be higher at lower levels. There is some suspicion, however, as these findings pertained to the late forties in the U.S., they represented a perfectly elastic supply of money function rather than a perfectly elastic demand for money function.³⁸

With respect to the use of either income or wealth variables in the demand for money function, the evidence is in favour of a permanent income or wealth variable. Comparisons of the performance of functions with either wealth or income variables using identical evidence and statistical techniques, were carried out by Meltzer, Brunner and Meltzer, Laidler and Chow using U.S. data; the wealth variable (using different definitions) performed better.³⁹ However, as Laidler points out, implicit in these studies was the possibility that when measuring permanent income (as a weighted average of present and past levels of income) they were fitting a relationship between the demand for money and measured income where the public is slow to adjust its cash balances to an equilibrium level. Laidler determined that a study by Feigie largely resolved this question in favour of a permanent income variable.⁴⁰ Laidler also carried out tests on British data using measured and permanent income variables as alternatives and found permanent income provided systematically better results; C. Clarke's

work on Canadian data led to a similar conclusion.⁴¹

The U.S. evidence suggests a shifting relationship between the demand for money and the level of wealth (or income). Using the United States data, Laidler determined the elasticity of demand for money defined to include time deposits with respect to permanent income to have been 1.39 from 1900-1916, 1.28 from 1919-1940 and .65 for 1946-1965.⁴² Similar results were achieved when non-human wealth was used as the independent variable or time deposits excluded from the definition of money. This tendency, Laidler suggests, may be caused by an improved accuracy in the data used to measure the variables, a slow change in the public's taste for money holding, or reflect the omission from demand for money functions of some variable that has changed slowly over time.⁴³

The significance of the expected rate of inflation as a factor influencing the demand for money under conditions of hyperinflation and rapid inflation has been well established. Earlier studies of the mild inflations that characterized most advanced economies until the mid-sixties could not find a role for the expected inflation rate. Work done in the fifties by Friedman and Selden was unsuccessful in establishing any systematic influence of this variable on the demand for

money in the U.S. However, more recent studies by Shapiro and Goldfeld were able to establish one in post World War II data.⁴⁴

A study performed by William R. White of the Bank of Canada, on the empirical properties of the demand for money function in Canada found only narrow money to have an unequivocal negative relationship with interest rates.⁴⁵ The period covered was 1959-1974. It was treated both in its entirety and as two periods - 1959.3 to 1968.11 and 1968.12 to 1974.3; the latter period followed structural revisions enacted by the 1967 Bank Act. The basic equation used M_{1A} (currency plus personal chequing accounts plus current accounts) as the dependent variable. Real domestic product (RDP), the gross national expenditure price deflator (PGNE) and the rate on non-chequable personal savings deposits at banks (RNCB) were used as the independent variables. Three variations were employed which either assumed - no constraints (Model A), long run homogeneity of prices (Model B), or M_{1A} as a function of nominal income (Model C). Comparison tests of narrow and broad definitions of money used Model B and representative dependent variables of M_{1A} , CA (current accounts), M_{2*} (M_{1A} plus personal savings deposits), and PHMS (the privately held money supply). The rate on 90 day finance paper (R90) was

the interest rate used with the narrow aggregates (M_{1A} and CA). The broad aggregates (M_{2*} and PHMS) were estimated with both R90 - reflecting the opportunity cost of holding cash - and RNCB (the rate on non-chequable personal savings deposits at banks) - as measuring the own rate on money holdings. The narrow aggregates showed a consistently negative relationship with interest rates whereas the relationship of the broader aggregates was mixed. A rise in the 90 day rate did induce a downward shift in the quantity of broad money demanded, however, a rise in RNCB exerted an even more powerful positive influence.

Chow stability tests were performed by White both on his basic equation and a variant using R90 (the rate on 90 day finance paper) instead of RNCB (the rate on non-chequable personal savings deposits at banks). The evidence showed neither specification of the M_{1A} equation to be formally stable everywhere. However, the R90 variant did perform relatively well in the most recent sub-periods. ⁴⁶ As White states: "The nature of the problem...is that during much of the latter part of the estimation period the demand for money function appears to be shifting upward."⁴⁷

With regard to income, White's results indicated a positive relationship with both broad and narrow definitions of money. However, the long run income elasticity of M_{1A} , M_2^* and PHNS all showed a definite tendency to rise over the data period; this tendency was progressively evident as the definition of money broadened.⁴⁸

A study performed by Norman Cameron, with Canadian data from the 1954-1975 period, also finds a shift in the demand for money function.⁴⁹ These results indicate both narrow and broad money demand to have shifted over the post-war period to the extent that for neither is the stability hypothesis supported at even the

1% level using Cusum tests. Cameron finds the type of structural change detected to be gradual for M_1 while abrupt and then gradual for M_2 subsequent to 1968.⁵⁰

In his comprehensive survey of related theory and empirical studies of the properties of the demand for money function, David Laidler concludes:

"...the importance of the rate of interest for the demand for money is now established beyond any reasonable doubt, while the evidence is only less clear that the interest elasticity never becomes infinite. Similarly, some form of wealth variable seems clearly preferable to income in the demand for money function, while there does not seem to be room for both variables to operate simultaneously...as to the price level, the demand for nominal balances does appear to be proportional to it."⁵¹

The unsettled issues pertaining to the demand for money function, according to Harry Johnson, include:

"...(i) whether total wealth including human wealth is a better variable than non-human wealth; (ii) whether currency plus demand deposits is better or worse than currency plus demand deposits plus time deposits; and (iii) the debate on whether the long term rate of interest or the short rate is the relevant variable."⁵²

Choice of a Monetary Target

White states that a viable aggregate must have a demand function with a reasonably stable relationship to income and be controllable by the monetary authority, in order to have predicted effects on the real economy.⁵³ Available aggregates are definitions of narrow money,

broad money, bank reserves and the monetary base. The distinction between narrow and broad money is essentially, liquidity and the most common definition of the narrow version is the public's holdings of currency and demand deposits denoted as M_1 .

Richard Davis of the New York Federal Reserve Bank suggests that, as the point is to influence the economy at large and not the banking sector per se, measures of reserves and the monetary base are inappropriate targets, although useful in developing strategies to achieve goals in the other aggregates. He further comments that in normal times policymakers can set goals in terms of either narrow or broad money with reasonable safety. When distortions in rate spreads occur, however, marked acceleration or deceleration in time deposit growth make the broader definition of money overstate or understate the expansiveness of policy.⁵⁴ Meltzer of the Federal Reserve Bank of St. Louis made similar observations that, with the exception of times when changes in market rates relative to imposed ceiling rates caused large temporary changes in time deposits, growth rates of both narrow and broad money, in the U.S., have almost always been in the same direction with changes in both growth rates generally occurring at the same time.⁵⁵ Friedman has expressed a preference for the

U.S. broad definition of money M_2 (excluding large certificates of deposit) on the basis that its income velocity, essentially, has not shown any trend since the early 1960s whereas that of M_1 has continued to indicate an upward trend of uncertain dimensions.⁵⁶

White points out that broad and narrow money move dissimilarly in Canada. He attributes the widening disparity in recent years to the increased bidding by banks for deposits, subsequent to the removal of statutory restrictions on loan rates in 1967⁵⁷. He further observes that in Canada the distinction between narrow and broad money is sometimes artificial in both liquidity and chequability. Chequable personal savings deposits exact higher transaction costs than personal chequing accounts thus possibly causing many holders of chequable savings deposits to regard them as non-chequable. Furthermore, although non-chequable personal savings deposits are in principle non-chequable, facilities are evolving for the automatic transfer of such funds to personal chequing accounts to cover overdrafts. In addition, penalties for early withdrawal of fixed term non-personal term and notice deposits are not always significant, thus possibly rendering them quasi-chequable. Therefore, there is a spectrum of deposits in Canada all having more or less liquidity.⁵⁸

According to his criteria, a positive relationship with income and controllability by the monetary authority, White finds narrow money preferable to broad money. An underlying assumption of his criteria, however, is that controllability implies a systematic response by the aggregate to policy induced changes in short term interest rates.⁵⁹ As a rationale for the necessary link with short term interest rates, White states the monetary authority in Canada to have traditionally attempted to control short term interest rate levels (or more precisely their average over periods as long as a month) and are likely to continue to do so.⁶⁰ As noted in the previous Section, White's particular study found both narrow and broad definitions of money to have the appropriate positive relationship with income but only narrow money to show a consistent negative relationship with interest rates. White, therefore, concludes that in Canada the broad monetary aggregates cannot be properly controlled through the use of interest rates.⁶¹ With regard to forecasting abilities, White also found the narrow definition superior.⁶²

Thomas Courchene has consistently favoured the use of broad money over narrow money as an indicator or target of policy in Canada. His rationale is essentially

two-fold: broad money as denoted by M_2 is a better predictor of changes in the level of nominal income; M_2 is controlled easier within the current Canadian institutional framework. An underlying assumption of the latter judgment is that control should be exercised directly by chartered bank reserve management. His first conclusion appears to have derived from a study undertaken by Gillian Clinton using Canadian data from 1953-1973. Clinton's results showed M_2 to perform considerably better than M_1 , both in explaining the variance in quarterly change in nominal GNE and in predicting the net impact of money on the latter.⁶³ Courchene's second conclusion is engendered by the particular Canadian institutional framework which requires banks to hold reserves against all Canadian liabilities. He posits that, within such a context, money based on a broader definition is easier to control than that based on a narrow definition. He further argues that control of M_1 implies the Bank of Canada forego control of the overall size of the chartered banking system as remaining bank liabilities settle at levels consistent with the desirable stock of demand deposits.⁶⁴

The issue of superiority between broad or narrow definitions of money is an empirical one which remains unresolved. However, the evidence for Canada indicates

that only the narrow aggregates display a consistently negative relationship with short term interest rates.

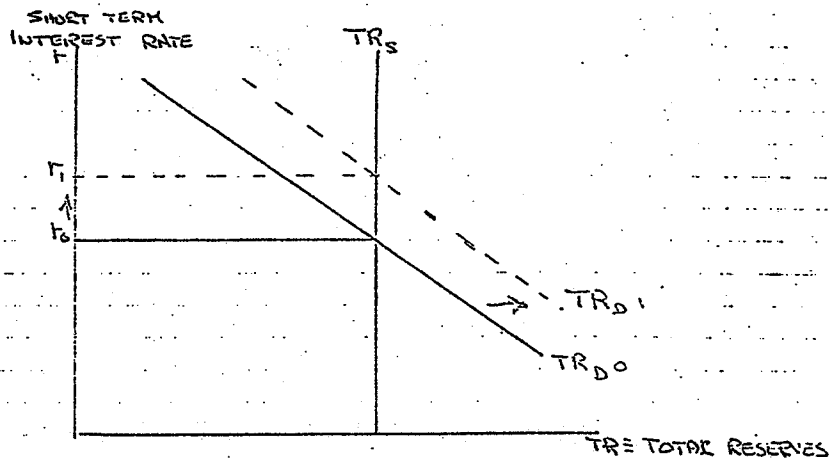
Achieving Monetary Objectives

Precise information about the movement of monetary aggregates -either narrow or broad - is not immediately available. This necessitates the use of short run operating targets over which the central bank has direct control and that have fairly predictable results on the chosen monetary aggregate. Alternative short run operating targets are the monetary base, bank reserves, or interest rates. Depending on the choice of the short run operating instrument, the growth rate desired for the monetary aggregate is translated into a relevant growth rate in either the monetary base or bank reserves, or an appropriate level of short term interest rates. The actual growth rate of the monetary aggregate is then used as an indicator of monetary policy. There are an infinite number of monthly or quarterly growth patterns that can average out to a targeted yearly rate. Shortfalls or overshoots in one period, therefore, may be compensated for in subsequent periods.

With the use of either the monetary base or some measure of bank reserves as short run operating targets,

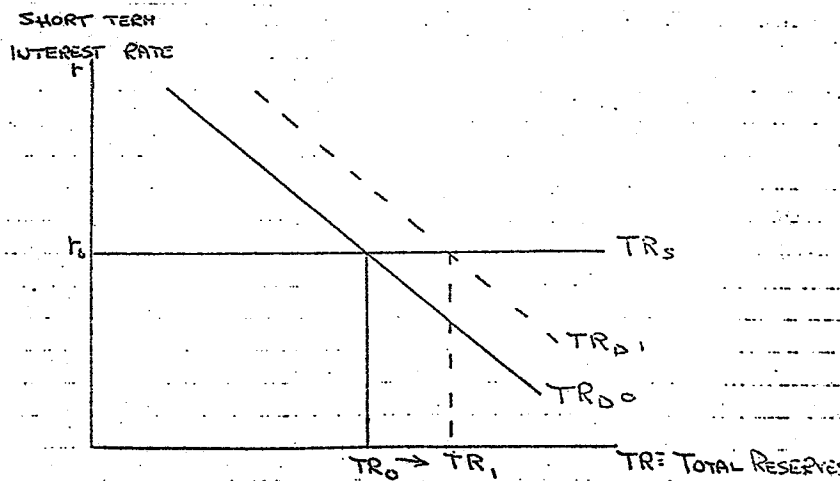
interest rate levels are demand determined. Such a case is portrayed in Figure 2-7 wherein the central bank supplies that level of total reserves (comprised of both required and excess reserves) estimated as consistent with the desired monetary growth rate. Short term interest rates are determined by the interaction of total reserves demanded (TR_D) with those supplied (TR_S). Using reserves as the short run operating mechanism, errors in achieving monetary goals can arise from both unforeseen shifts in bank demand for excess reserves and movements in the average required reserve ratio. Such shifts result in changes in the level of deposits (and thereby in changes in the money supply) engendered by a given level of total reserves. In such cases, the use of interest rates as short run operating targets perform better.

FIGURE 2-7



The use of interest rates as short run operating instruments achieves monetary targets by sliding up or down the demand for money function. The amount of reserves supplied, therefore, at any particular interest rate, is demand determined. With such an approach to policy implementation, as indicated in Figure 2-8, the supply function TR_s becomes horizontal or perfectly elastic at r_0 and the amount of reserves are determined by the banks' demand for reserves at the particular interest rate. Errors in achieving money supply goals with interest rates as the short run target derive from random shifts in the demand for money or errors in projected income estimation. Both types of errors tend to be accommodated. In such cases, a short run reserve target is superior, in that, an increase in the demand for money is accommodated only to the extent that the banks themselves are induced by rising interest rates to accommodate the increase in demand by increased borrowings or by drawing down excess reserves.⁶⁵

FIGURE 2-8



The economic costs of failing to hit monetary targets in the short run are related to lag structures between money growth and the behaviour of the economy. If monetary influence is instantaneous then deviations for even very short periods could have marked impact. If, however, it operates with a distributed lag, the effect of impact at any point in time reflects a weighted average of past money supply growth rates and thereby, will be tempered by subsequent compensation. U.S. models of the St. Louis type suggest a one quarter deviation of M_1 growth from target, amounting to 4 percentage points or less, has essentially negligible effects on GNP; deviations from target lasting two quarters have only moderate effects while deviations amounting to 4 percentage points and lasting for as long as three quarters have more serious effects.⁶⁶ The larger scale structural models, such as the M.I.T. or M.P.S models, incorporate somewhat longer lags in the money-GNP relationship. These suggest that sizeable deviations from M_1 target growth rates lasting up to six months can occur with negligible effects - providing there is subsequent countervailing growth.⁶⁷ Pierre Duguay and Paul Jenkins of the Bank of Canada found similar Canadian evidence using both RDX2 and a reduced form model. M_1 was raised over two quarters to a peak deviation of 5 percent from control, maintained for two quarters and

subsequently reversed. A maximum effect of one percent on nominal GNP occurred in quarter 6 with RDX2 and two percent in quarter 7 using the reduced form monetarist model. Due to a secondary cycle induced by exchange rate movements in RDX2 however, GNP did not stabilize around control values until seven years after the initial shock.⁶⁸

The superiority of interest rates, the monetary base or bank reserves as short run operating targets is also an empirical issue that remains unresolved. In an article on implementing monetary aggregate objectives, Richard Davis computed a table of errors in forecasting incurred by using all three as alternative independent variables.⁶⁹ His results indicate the reserve and interest rate targets superior to the Federal Reserve Bank of St. Louis' money-reserve base multiplier method. All three methods do very poorly in forecasting monetary growth rates for individual months. However, as time horizons are lengthened, the results are considerably better but the errors are not negligible. White's Canadian study, which deals only with interest rates as the short run operating targets, similarly shows a high incidence in forecasting errors, which lessen somewhat as time horizons are expanded to 6 months.⁷⁰ Consequently, shortening the attempted time horizon of monetary control increases the technical problems of monetary management

and the likelihood of an unacceptable degree of money market instability.

Lengthening the period of control, however, increases probable deviations of aggregate demand and related variables from final policy objectives.⁷¹ All economic evidence points to lags between a change in operating targets and the full impact of that change on the money supply. Most econometric work suggests the effects take approximately six to eight months to work themselves out.⁷² This implies that a maintained increase in the supply of bank reserves or a once-and-for-all rise in the chosen interest rate target will not have its full effect on the level of the money supply for several months.⁷³

FOOTNOTES

1. Milton Friedman, "A Theoretical Framework for Monetary Analysis", in: Milton Friedman's Monetary Framework, ed. by Robert J. Gordon (Chicago: The University of Chicago Press, 1974), pp. 38 - 39.
2. Ibid., pp. 11 - 13.
3. Karl Brunner, "Commentary on 'The State of the Monetarist Debate'", Federal Reserve Bank of St. Louis Review, September 1973, p. 12.
4. Ibid., p. 7.
5. Leonall C. Andersen, "The State of the Monetarist Debate", Federal Reserve Bank of St. Louis Review, September 1973, p. 14.
6. Milton Friedman, "The Role of Monetary Policy", in: Monetary Economics: Readings on Current Issues, ed. by William E. Gibson and George Kaufman (New York: McGraw-Hill Inc., 1971), p. 172.
7. Milton Friedman, "Nobel Lecture: Inflation and Unemployment", Journal of Political Economy, Vo. 85 No. 3, June 1977, pp. 451 - 472.
8. Ibid, pp. 456 - 457.
9. Modigliani, Op. Cit., p. 4.
10. Harry G. Johnson, Macroeconomics and Monetary Theory (Chicago: Aldine Publishing Company, 1972), pp. 130 - 131. Johnson's criticisms of the Friedman-Meiselman tests are as follows:
 - (i) the money supply may be partially induced and therefore in such cases other influences may be picked up within the Friedman-Meiselman context as an influence on money;
 - (ii) methodological, in that there is questionable reliability in a single education that relies on high correlation coefficients as a criterion for a model's predicted capacity;
 - (iii) their identification of autonomous expenditure elements is as guilty of a priori specification as Keynesian

- formulations and does not give unambiguous results.
11. Leonall C. Andersen and Jerry L. Jordan, "Monetary and Fiscal Actions: A Test of Their Relative Importance in Economic Stabilization", in: Monetary Economics, ed. by Gibson and Kaufman, pp. 114 - 131.
 12. The Andersen-Jordan results were attacked on the basis that the authors used the wrong measure of monetary and fiscal actions. Modigliani states, however, that alternative measures do not change the qualitative results. His criticism is that income is subject to substantial shocks from many sources other than monetary and fiscal, so that these variables account for only a moderate proportion of variation in income (in the U.S. it has been of the order of one-half to two-thirds).
 13. Richard G. Davis, "How Much Does Money Matter? A Look at Some Recent Evidence", in: Monetary Economics, ed. by Gibson and Kaufman, pp. 135 - 136. Davis comments that the money supply is an endogenous variable in the M.I.T. model and therefore has no explicit money multiplier. However, he states the arithmetic multiplier can be derived by dividing the GNP multiplier of non-borrower reserves by the money multiplier of non-borrowed reserves.
 14. Modigliani, Op. Cit., p. 4.
 15. Friedman, The Role of Monetary Policy, p. 178.
 16. Modigliani, Op. Cit., p. 8.
 17. Ibid., pp. 9 - 11.
 18. Richard G. Davis, "Implementing Open Market Policy With Monetary Aggregate Objectives", Federal Reserve Bank of New York Monthly Review, July 1973, p. 171.
 19. William Poole, "Optimal Choice of Monetary Policy Instruments in a Simple Stochastic Macro Model", The Quarterly Journal of Economics, Volume LXXXIV, 1970, pp. 197 - 215.
 20. Ibid., p. 197.
 21. William R. White, The Demand For Money in Canada and the Control of Monetary Aggregates: Evidence From the Monthly Data (Ottawa: Bank of Canada Publications, 1976) p. 7.

22. Poole, Op. Cit., p. 209.
23. Friedman, The Role of Monetary Policy, p. 11.
24. Jerry L. Jordan, "Elements of Money Stock Determination", in: Monetary Economics, ed. by Gibson and Kaufman, pp. 248 - 261.
25. Ibid., p. 251.
26. D.E. Bond and R. E. Shearer, The Economics of the Canadian Financial System: Theory, Policy and Institutions (Scarborough, Ontario: Prentice-Hall of Canada, Ltd., 1972) pp. 327 - 328.
27. Jordan, Op. Cit., p. 261.
28. Johnson, Op. Cit., pp. 120 - 123.
29. Friedman, The Role of Monetary Policy, p. 13.
30. Johnson, Op. Cit., pp. 122 - 123.
31. David E. W. Laidler, The Demand For Money: Theories and Evidence (New York: International Textbook Company, 1969), pp. 92 - 93.
32. Ibid., pp. 93 - 95.
33. Johnson, Op. Cit., p. 125.
34. Laidler, Op. Cit., p. 105.
35. Johnson, Op. Cit., p. 124.
36. Laidler, Op. Cit., p. 97.
37. Ibid., p. 98.
38. David E.W. Laidler, The Demand for Money: Theories and Evidence (New York: Dien-Donnelly Publishing Corp., 1977) 2nd ed., p. 132.
39. Laidler, Op. Cit., 1st ed., pp. 98-99.
40. Ibid., p. 102.
41. Laidler, Op. Cit., 2nd ed., p. 141.
42. Ibid., p. 149.

43. Laidler, Op. Cit., 1st ed., p. 107.
44. Laidler, Op. Cit., 2nd ed., p. 136.
45. White, Op. Cit., p. 45.
46. Ibid., pp. 31 - 312.
47. Ibid., p. 32.
48. Ibid., p. 43.
49. Norman Cameron, "Stability of the Demand for Money Under Casum Tests: An Application to Canada", University of Manitoba (Mimeo) 1976.
50. Ibid., p. 14.
51. Laidler, Op. Cit., 1st ed., p. 90.
52. Johnson, Op. Cit., p. 128.
53. White, Op. Cit., p. 33.
54. Davis, Implementing Open Market Policy With Monetary Aggregate Objectives, p. 173.
55. Allen H. Meltzer, "Controlling Money", Federal Reserve Bank of St. Louis Review, May 1969, p. 18.
56. Davis, Implementing Open Market Policy With Monetary Aggregate Objectives, p. 173.
57. White, Op. Cit., p. 36.
58. Ibid., pp. 35 - 36.
59. Ibid., p. 38.
60. Ibid., p. 35.
61. Ibid., p. 46.
62. Ibid., p. 44.
63. Courchene, Money, Inflation and The Bank of Canada pp. 102 - 103.
64. Ibid., pp. 104 - 105.
65. Davis, Implementing Open Market Policy With Monetary Aggregate Objectives, p. 178.

66. Ibid., p. 174.
67. Ibid., p. 175.
68. W.R. White, "Alternative Monetary Targets and Instruments in Canada: Criteria For Choice", Ottawa, Bank of Canada, (Mimeo) 1978, footnote 24.
69. Ibid., p. 179.
70. White, The Demand For Money in Canada, p. 109.
71. Davis, Implementing Open Market Policy With Monetary Aggregate Objectives, p. 182.
72. Ibid., p. 180 Davis points out that although estimation of lag structures is a very uncertain business, even lags of one half the 6 - 8 month range have significant implications.
73. Ibid., pp. 180 - 182.

CHAPTER THREE

BANK OF CANADA MONEY SUPPLY STRATEGY

The 1975 Annual Report of the Bank of Canada comprehensively outlined the shift in general orientation of Canadian monetary policy. The main objective of current policy was stated as the control of domestic price inflation; the underlying principle to be a rate of monetary expansion which more closely approximated sustainable real economic growth. Policy intentions were defined in terms of a range within which the Bank was currently attempting to keep the trend rate of increase in the money stock and this range gradually would be lowered over time.

As background to the changed focus of policy, the Report described the emerged divergence between Canadian and foreign price trends. It cited the 1972 - 1974 period of strong external demand for primary commodities as having added substantially to Canadian incomes and expectations of further increases. Such expectations were not dampened by the energy crisis of late 1973 as Canadians then regarded themselves as being largely insulated from that event. In consequence, the impact of the 1974 - 1975 recession was much less severe in Canada than in other countries; the decline in Canadian real GNP was approximately 1 1/2% compared with over 6 1/2% in the U.S. and 5 1/4% in Germany. The corollary to this situation was that by the end of 1975 the U.S. and Germany

were experiencing considerably improved balances in their international payments and rates of price increases in the 5% to 7% range whereas Canada showed a large increase in current account deficit and an inflation rate of close to 11%. Unlike the other countries, wage and salary increases continued to escalate in Canada through 1975 and, as the largest element in prices, resulted in higher Canadian prices. In addition, the relative strength of Canadian domestic demand maintained imports at high levels while demands for exports faltered. The relative buoyancy of the Canadian economy, thereby, was reflected in a distinctly less favourable evolution of domestic costs and balance of international payments.¹

The Report suggested that under the circumstances more restraint should have been placed on Canadian aggregate demand through 1973 and 1974 and implied that the discretionary monetary policy prevalent during previous years had exerted destabilizing influences on the trend of expenditure growth.² Current policy, therefore, would rely on stable monetary growth in order to secure contra-cyclical changes in credit conditions in the short run and price stability in the long run. The measure of the money stock chosen as target and indicator of policy was the public holdings of currency and demand deposits (M_1) and the control instruments - short term

interest rates.

The stated basis for the selection of M_1 was the apparent systematic relationship of that aggregate with the trend of national expenditure and those short term interest rates most directly subject to central bank influence. It was observed that the Canadian public had tended over the long run since the beginning of the 1970's, to increase M_1 holdings by close to 1% for each 1% rise in the money value of GNE while responding in the short run to changes in short term interest rates. A rise in the latter, and thereby an increase in the opportunity cost of holding non-interest bearing balances, would prompt a downward adjustment in the average level of M_1 that the public would be willing to hold per dollar of GNE; a decline in short term rates would have the opposite effect. Similar relationships using a broader measure of the money stock were remarked to have become less clear subsequent to the institutional changes enacted by the 1967 Bank Act revision.³

The Bank's decision to use short term interest rates as the operating instruments of policy likely reflected the wish to minimize the impact of money supply control on interest rates and the exchange rate. A cash base target would require interest rates to respond freely

to any short run shifts in either the demand for or supply of money. The available casual and econometric evidence indicates a great deal of short run instability in demand for money functions and therefore considerable week to week and month to month changes in money growth rates. This would imply unacceptably large interest rate changes to clear money markets subject to cash base control and substantial exchange rate volatility as a consequence.

Control of a narrow measure of the money stock follows logically from the use of short term interest rates as operating instruments. As many components of broad money are interest bearing, the pace of growth responds to interest rate changes in much lesser degree than that of narrow money. Furthermore, growth of broad money reflects changes in interest rate differentials between deposit rates and other market rates. The latter includes rates which are not directly subject to central Bank control and the former reflects the desire of financial institutions to attract monies to source their loan portfolios.⁴ Attempts of the Bank to control a broad rather than narrow aggregate, therefore, would likely require considerably wider movements in short term interest rates in order to achieve monetary targets with similar precision.