ABSTRACT

THE CANADIAN MONEY SUPPLY

By

Paul Elmer Polzin

The purpose of this thesis is to construct a time
series which faithfully represents the stock of money in
Canada for the 1939-1966 period. Canadian institutions
and tradition present two obstacles to obtaining a series
which corresponds to the theoretical concept of money.
First, the Canadian money producing industry consists of
both regulated and non-regulated firms producing a variety
of products, only some of which are money. Second, a
large portion of checkable deposits pay explicit interest.
Analysis of the equilibrium position of a wealth port-
folio suggests that the entire value of checkable deposits
which pay interest should not be included in the measure
of the money stock. Such deposits earn two streams of
income, one from being used as money and the other con-
sisting of the interest payments. Only the portion of the
value of these deposits that is caused by the money stream
of income should be included in the momey stock. The re-
maining portion owe their value to the interest payments
and, like all other debt items, are not money. Empirically,
the money and the debt components may be estimated by com-
paring the rate paid on the checkable deposits to the

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market interest rate. The large number of different types
of money producing institutions required a discussion of
the correct definition of reserves. It was concluded that
the only balances which should be excluded from the esti-
mate of the money stock, be counted as reserves, are those
which are used as an input for money production. Un-
fortunately, the available data was not able to separate
the money held by firms for money production from that
used as an input for non-money products, chiefly debt items.
Thus, net money production was obtained by subtracting the
entire money holdings of money producing firms from their
gross output of money. This method led to the under-
estimation of the net money output of those firms, mostly
non-chartered banks, with large non-money production.
Each type of money producer was examined individually. The
debt portion of his output was estimated and his net money
production computed. A number of quarterly and yearly
money series, both seasonally and non-seasonally adjusted,
were constructed from the output data of the money pro-
ducing institutions.

In order to test the validity of the above analysis,
demand for money specifications were run using the con-
structed money stock estimates and a similar series, used
as a comparison, which included the debt portion. The two
series yielded different regression coefficients, but, be-
cause of the similarity of the demand for money and debt,
the results could not be used as an unambiguous test of

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the method used to construct the money stock estimates.
The only conclusion which can be held with reasonable
certainty is that the income elasticity and the rate of
adjustment of the adjusted series are greater than those of
the series which included the debt component.

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A thesis is supposed to represent original work.
However, no person knows better than the author that this
volume is simply a collection of suggestions and comments
made by colleagues, friends, and teachers. Their direct
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ing of the great minds of mankind is also present. Thus,
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CHAPTER I

INTRODUCTION

Economic theory and analysis provides a set of re-
lationships between magnitudes and behavior. It purports
to predict behavior on the basis of certain predetermined
conditions or values. The purpose of empirical investigation
is to test the accuracy of the relationships and, having
confirmed their veracity, use them to make predictions.

Rigorous testing of economic theory requires that
the empirical magnitudes closely resemble their theoretical
counterparts. Unfortunately, the real world does not always
provide goods with attributes similar to those employed in
theoretical analysis. Thus, the precondition for empirical
work is the existence of data which can be used to represent
the qualities employed in theoretical analysis.

Economic theory has provided lists of goods which
are critical for the explanation of different types of be-
havior. The quantity of money is a magnitude which is
predicted to have various and diverse effects throughout
the economic system. Before these causal mechanisms and
predictions can be tested, an accurate measure of the
quantity of money must be devised. The purpose of this study
is to provide a series which faithfully mirrors the

theoretical concept of money in Canada for the 1939-1966
period.

In the United States, almost all money is produced
by firms which are required to submit detailed reports to a
regulating authority. Except for a short period,[1] the
product of these firms has closely paralleled the theoretical
concept of money. Thus, with output data readily available
in a suitable form, the construction of a series which closely
approximates the theoretical magnitude is relatively easy.

Unfortunately, there are two conditions in Canada
which make it difficult to obtain an accurate estimate of
the stock of money in existence. The first problem is a
lack of breadth in the data collected and published by the
regulatory agencies. Although all money producers are under
regulation of some sort, the regulating bodies are diverse
and independent. The independence of these bodies has
resulted in a lack of coordination in the compilation of
data. There is simply no single source which gathers and
organizes reliable information concerning all money producers
in Canada.

The lack of a single regulatory or data gathering
body is the result of actions taken by the chartered banks.
During the first half of the last century, the chartered

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[1]Apparently, some banks in the 1920's allowed
checks to be written on time deposits. See Milton Friedman
and Anna Schwartz, A Monetary History of the United States
(Princeton: Princeton University Press, 1963), p. 443.

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banks spent considerable time and effort in obtaining the monopoly in the private production of notes, then the primary form of money.[2] In their zeal to procure this monopoly, they did not attempt to restrict checkable deposits. By the 1930's, when the chartered banks lost their monopoly in note production and their dominant position began to ebb, there were independent institutions with a long tradition of producing checkable deposits. The data gathering agencies grew, and were primarily concerned with, the chartered banks. They had no authority, and were not disposed toward collecting information from the non-chartered banks.

In 1939, the first year of this study, the structure of the Canadian money producing industry had reached its modern form. The chartered banks were still dominant but the "near-banks" were organized and poised for their rapid postwar growth. The outline of the industry is as follows:

I. The Bank of Canada and the Royal Canadian Mint.

The Bank of Canada and the Royal Canadian Mint are the money producing branches of the Canadian government. The Mint and the Bank of Canada have the monopoly in the production of coins and notes. Both agencies publish detailed information concerning their production of money.

II. 13 Chartered Banks.

The chartered banks are under the regulation of the

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[2]A more complete historical record of this period is available in Appendix I.

Bank of Canada. They are required to submit detailed monthly and weekly information regarding their operations. In general, the required data is complete and quite accurate.

III. Two Quebec Savings Banks.

The Quebec Savings Banks operate under a federal charter and are subject to about the same reporting requirements as the chartered banks.

IV. 70 Trust and Loan Companies.

The Trust and Loan Companies are the descendants of the Building Societies of the 19th Century. They may operate under a federal or provincial charter. The few that have a federal charter are required to make yearly reports to the Superintendent of Insurance. All companies operating in Ontario must submit yearly statements to the Registrar of Loan and Trust Corporation for the Province of Ontario. Both agencies publish yearly summaries of the reporting companies. Companies representing about three percent of the total of Trust and Loan Company assets report to neither.

V. Government Savings Offices.

During the 1920's and the 1930's the provincial governments of Ontario and Alberta opened savings offices. They are required to report only to their respective legislative bodies and usually do not publish detailed statements. The provincial governments have refused to release the information needed to estimate their money production. Consequently, they will not be included in this study.

VI. 1100 Credit Union and Caisses Populaires.

The Credit Union Movement began in Quebec in 1909 and has since spread throughout Canada. Most provinces have some legislation concerning credit unions, but their data gathering and publishing is minimal. However, many of the credit unions belong to "centrals," which can best be described as "central banks" for credit unions. Several of these "centrals" provide an excellent source of reliable data. In general, information regarding credit unions in scarce simply because nobody collects it.

The data of the Bank of Canada and its predecessor, the Ministry of Finance, concerning the chartered banks provides a fairly accurate description of the Canadian money supply up to World War II. However, the spectacular postwar growth of the non-chartered banks has gone unreported in their publications.

The second difficulty with estimating the money supply in Canada is due to the fact that Canadian money producers have a long tradition of paying interest on certain checkable deposits. A hypothesis will be presented in Chapter II which suggests that, in cases such as this, the theoretical concept of money is approximated only if these interest bearing and checkable deposits are deflated by an adjustment factor. This chapter will also present a method by which the adjustment factor may be estimated.

The original, and ambitious, goal of this study was to overcome both of the aforementioned obstacles and obtain a true representation of the Canadian money supply. However, as could have been predicted, difficulties arose which forced this goal to be compromised. The raw output data of the non-chartered banks was, after an appropriate number of setbacks, gathered and organized. But the characteristics of the product mix of these institutions combined with the method employed to estimate money output to result in the under-estimation of their net money production. Consequently, only a shadow of their rapid postwar growth and the corresponding increase in their influence on the Canadian economy is mirrored in the money series constructed in Chapter II.

The plan of the study will be as follows: Chapter II will begin with a general discussion of interest bearing and checkable deposits and the correct procedure for their in-clusion in the money supply. The following section will describe, in general, the method used for the construction of the money series. Next, the attributes of the Canadian money producing industry will be outlined and it will be shown how the general formulation will be adapted to the Canadian case. The two final sections will discuss in detail each money producer, the characteristics of the products produced and the data available, the construction of the money series themselves, and the secular and cyclical be-havior of the money supply.

Chapter III is an empirical chapter and attempts to set out some of the attributes of the money series constructed in Chapter II. Difficulties were encountered, again as should have been expected, when it was discovered that available hypotheses were insufficient for testing the model used for the construction of the money series. Rather than engaging in the precise analysis required to construct appropriate hypotheses, a broad sample of the results is presented with only an intuitive explanation as to their meaning. It is hoped that these results will provide the tests for, or the inspiration needed for the construction of, hypotheses at some time in the future.

The first Appendix is the result of the author's attempt to understand the institutional structure of the Canadian financial system and presents the historical beginnings of the money producing industry in Canada. The next two appendixes discuss important topics which are too short for a separate chapter but too long for a footnote.

CHAPTER II

THE SUPPLY OF MONEY IN CANADA

I. Theoretical Considerations

A. General Case

The theoretical concept of money does not have an
obvious and unique real world counterpart. Economic theory
describes money as simply a good which is used to eliminate
barter and facilitate transactions. This role may be per-
formed by any one of a number of physically different
capital goods. In other words, one cannot, on the basis
of Economic theory, predict the form which money will take.

A society may set aside one good which is to be
used exclusively as money. Or, it may use a good which can
be employed in other tasks. In the first case, the identi-
fication of money is straightforward. The second case pro-
vides some problems. If a good has a number of uses, only
one of which is money, how should the quantity of money be
determined? Should all of this good be money? None of it?
Or, should this good somehow be divided into a money and a
non-money protion?

All goods which serve as money, either partially or
wholly have in common the stream of income which eminates
from their use as money. The quantity of money, in value

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terms, may be obtained by discounting the marginal return of
each money to the present and then summing over all goods
used as money. Let $R_1 \ldots R_n$ be the marginal return of good
q serving as money in time periods $t_1 \ldots t_n$. Then, M, the
quantity of money in value terms, is

$$(\text{II-1}) \quad M = \sum_{\substack{i=1 \\ \text{all} \\ q}}^{n} R_{iq}/(1 + r)^n$$

Where r is the market rate of interest.

The money stream of income, R, is not an observable
phenomenon. If there exists a capital good which can only
be used as money, then one can conclude that its value is
equal to the discounted present value of the marginal returns.
In other words, knowing M and r, the R_is may be deduced.

If more than one stream of income accrues to a good
which is used as money, the entire value of this good should
not be counted as money. Assume that good X is a unit of
account and the marginal return to it as money is $R_1 \ldots R_n$
and $P_1 \ldots P_n$ because it has another use. The value of X
is equal to the discounted present value of the sum of the
marginal returns in each period.

$$(\text{II-2}) \quad X = \sum_{i=1}^{n} (R_i + P_i)/(1+r)^n = \sum_{i=1}^{n} R_i/(1 + r)^n + \sum_{i=1}^{n} P_i/(1+r)^n.$$

Only R_i is due to X being money. The discounted present
value of this stream alone measures the quantity of money.

A direct estimate of the R_is is usually impossible. However, if the P_is are an observable market stream of income, then the quantity of money can then be obtained by subtracting the value of the P_is from the value of X,

$$(II-3) \quad M = X - \sum_{i=1}^{n} P_i/(1 + r)^n = \sum_{i=1}^{n} R_i/(1 + r)^n.$$

In the following sections, specific cases will be examined so that an estimable equivalent to (II-3) can be obtained.

B. Case I: Pure Money

Assumptions:

(a) Reasonable certainty.

(b) Bonds (B), whose only return is explicit interest payments. R_b is the marginal payment.

(c) Money (M), whose only return is imputed payments because the good is money. R_m is the marginal imputed payment.

The wealth portfolio consists of only money and bonds. This portfolio will be in equilibrium when the marginal rate of return on money is equal to the marginal rate of return on bonds.

$$(II-4) \quad R_m/M = R_b/B.$$

The entire value of M is due to its being money and should be included in the quantity of money.

$$(II-5) \quad M = \sum_{i=1}^{n} R_{mi}/(1 + r)^n.$$

C. Case II. Money which earns an explicit return.

Assumptions:

(a) Reasonable certainty.

(b) Bonds (B), whose only return is explicit interest payments. R_b is the marginal payment.

(c) Money (MD), which receives an imputed return from its use as money and explicit interest payments. R_m and R_d are the marginal imputed and explicit payments.

Equilibrium in a wealth portfolio is obtained when the sum of the two marginal rates of return on money-debt, MD, is equal to the marginal rate paid on bonds.

(II-6) $(R_m + R_d) / MD = R_b / B.$

The value of money-debt is equal to the discounted present value of the sum of its two streams of income.

(II-7) $MD = \sum_{i=1}^{n} (R_{mi}+R_{bi})/(1+r)^n = \sum_{i=1}^{n} R_{mi}/(1+r)^n + \sum_{i=1}^{n} R_{bi}/(1+r)^n = M+D$

Where M is the present value of the imputed returns, the portion of the value of money-debt that is due to the money services. D is the present value of the explicit interest payments, the portion of the value of money-debt that is not money.

The proportion of the value of money-debt that is due to it being an interest bearing debt is the ratio of the explicit interest payments to the sum of the explicit and imputed returns.

$$(II-8) \quad \frac{D}{MD} = \frac{D}{(M+D)} = \frac{\displaystyle\sum_{i=1}^{n} R_{di}/(1+r)^n}{\displaystyle\sum_{i=1}^{n} (R_{mi}+R_{di})/(1+r)^n} = \frac{n R_{di}}{n(R_{mi}+R_{di})} = \frac{R_d}{R_m+R_d} .$$

The discounting cancels because, with the portfolio in equilibrium, the R_{di} and R_{mi} do not change from period to period. Rearranging (II-6) we obtain

$$(II-6') \quad R_m + R_d = (R_b/B)\ MD.$$

Then, substituting into (II-8),

$$(II-8') \quad \frac{D}{MD} = \frac{R_d}{(R_b/B)\ MD} = \frac{R_d/MD}{R_b/B}$$

The proportion of the value of money-debt that is due to it being a debt is simply the ratio of the rate paid on money-debt to the rate paid on pure debt. The proportion of the value of money-debt that should be included in the quantity of money is

$$(II-9) \quad \frac{M}{MD} = \left(1 - \frac{R_d/MD}{R_b/B}\right).$$

The quantity of money is

$$(II-10) \quad M = \left(1 - \frac{R_d/MD}{R_b/B}\right) MD.$$
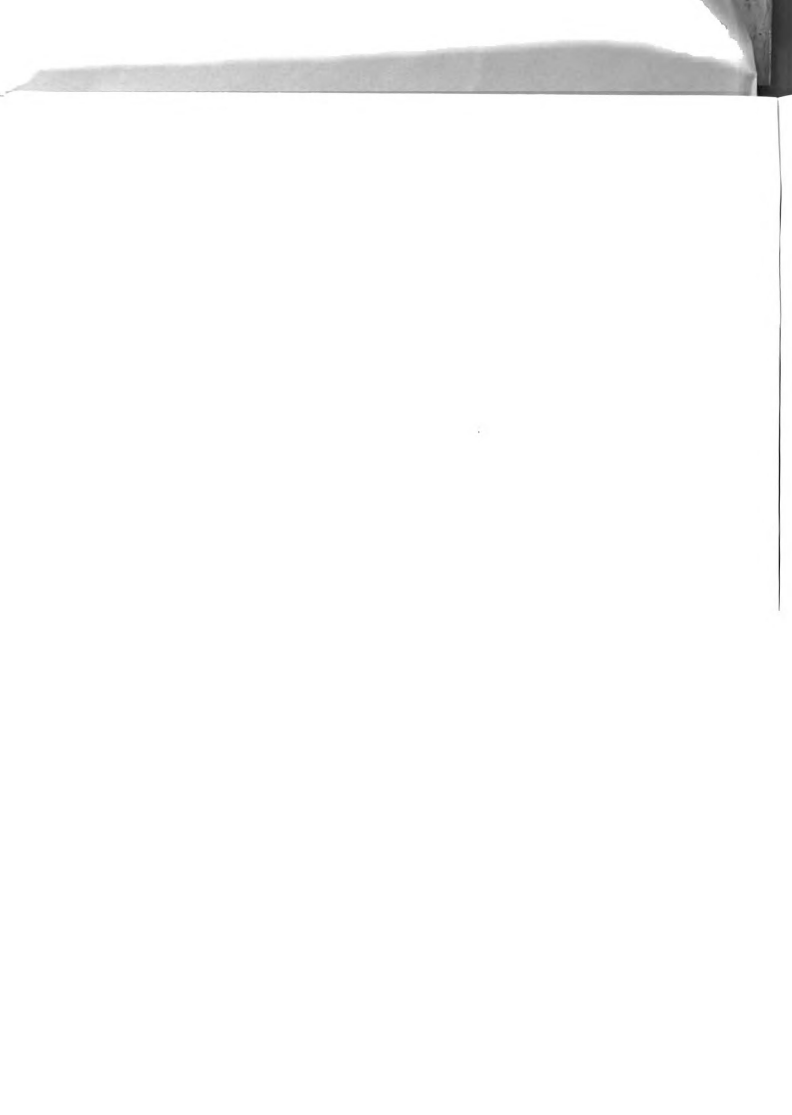
II. The Net Money Supply

A. General Comments

The net money supply is total money production minus
the amount of money which is used for its own production.
There is no rationale for the exclusion of money held by a
firm if it is not an input for money production. These
balances may be crucial for the determination of the
equilibrium quantity of money produced, but they should
not be excluded from the net money supply.

Chartered banks are required by law and the repurchase
clause to hold amounts of government money. Likewise, the
non-chartered banks hold government money and chartered bank
deposits. These "reserves" are a necessary input for the
production of money and their inclusion in the supply of money
available in the economy would be redundant. The general
form of the money supply estimates to be derived later is

(II-11) $M_n = M_t - M_r$.

M_n is the net supply of money, M_t is the total production of
money, and M_r is that amount of money used as an input to
produce money.

Conspicuously absent from the net money definition is
that statement that M_n is the supply of money in the hands of
the non-bank public and that M_r is the amount of money held by
the banking system. These statements would be equivalent to
the net money definition in the case where the only product
of the money producers was money. The usual case is that

money producers have a variety of products, only some of
which are money.

For simplicity, let us divide the money producer into
two parts, the first produces only money and the second
produces non-money goods. Clearly, the money held by the
money producing branch does not belong in the net money
supply. It is an input in the production of money. The non-
money producing branch may also hold balances, money may also
be an input in the production of a non-money good. However,
the rationale for the exclusion of the holdings of the money
producing branch does not apply to the other branch. Spe-
cifically, the "reserves" held by the non-money producing
branch are not used to produce money. It is only by accident
that these different operations of a money producer, producing
both money and non-money, take place under the same roof.
They are distinctly different and, for analytic purposes,
their holdings of money should not be grouped together.

Let us examine a non-monetary example. Suppose that
an electric generating company also distributes natural gas.
The net amount of electricity produced by the company, and
available for use in the economy, is to be estimated. Some
of the electric output of this company is used in generating
electricity and some is used to run the pumps on the gas
pipeline. The electricity used up in the generation plant
clearly should not be included in net production, it is an
input used to produce electricity. However, the power which

is used to operate the pumps belongs in net production,
available for general use. It is only by accident that the
natural gas operation is run by the same company that
produces electricity.

Let us take a bank which has $200 of non-checkable
deposits and $10 of demand deposits. It prefers to hold
"reserves" of 20% against the demand deposits and 5% against
the non-checkable deposits. If all the money holdings of
this bank were excluded from the money supply, the absurd
conclusion would be reached that this bank has a net money
output of - 2 dollars.

Failure to include the "reserves" held against non-
money production in the net money supply will result in
absolute and relative underestimation of the money manu-
factured by individual and groups of producers. Let M_m be
the amount of money used as an input for the production of
a non-money good. Then (II-11) becomes

(II-11') $M_n = M_t - M_r + M_m$.

$M_r + M_m$ is the total money holdings of a money producer. If
M_m is erroneously assumed to be zero, subtracting all the
"reserves" of a money producer from total money output will
underestimate net money production.

Let us assume two money producers. The first pro-
duces only money and the second produces money and a non-
money product which uses money as an input. (II-12) repre-
sents the net money production of the first producer and
(II-13) that of the second.

(II-12) $M_{n1} = M_{t1} - M_{r1} + M_{m1}$, $M_{m1} = 0$.

(II-13) $M_{n2} = M_{t2} - M_{r2} + M_{m2}$, $M_{m2} > 0$.

If M_{m2} is erroneously assumed to be zero, and all the money

holdings of the second producer is subtracted, the total net

production of money, $M_{n1} + M_{n2}$, and the relative net money

production of the second producer, M_{n2}/M_{n1}, are underestimated.

Let us assume that both producers have a non-money

product and the amount of "reserves" held against it is

directly related to output. If both producers have the same

money output but the second has a larger non-money output,

then the relative net money production of this producer is

underestimated. Thus, the degree of underestimation depends

on the ratio of money production to the total output of

all products of the producers.[1]

The non-money producing branch of a bank is

analytically distinct from the money producing branch. If

the "reserves" of the non-money branch are to be excluded

from the money supply, logic would demand that the money

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[1]Consequently, the net money production of the various
types of producers which will be derived later cannot be
legitimately added to the growing body of Canadian literature
concerned with the extension of government control to the non-
chartered banks. One form which this argument has taken seems
to imply that when the market share of the non-chartered banks,
where the market is variously defined as the money market or
the market for all financial assets, reaches some critical
level, government regulation should be extended. The above
analysis implies that, given the different proportions of the
money - non-money product mix of various producers, the degree
to which the true money production is underestimated will
vary between producers. Thus, the net money series of this

holdings of other firms which produce similar products should also be excluded. Then we would have the "money supply outside banks, sales finance companies, insurance corporations, etc."

B.   The Net Money Supply in Canada.

During the period under study, the media of exchange in Canada were produced both domestically and abroad. Although the use of foreign media may be considerable, such as traveler's checks and American currency, the complete lack of information concerning their magnitudes forces their exclusion from this study.

The Canadian money industry produces (1) three types of money, coin, notes, and non-interest bearing and checkable deposits, (2) one non-money product, debt instruments, and (3) one joint products, money-debt. This section will attempt to show how the outputs of these producers can be combined to represent the net money supply in Canada.

1.   The Total Output of Money in Canada.

Coin, notes, and non-interest bearing deposits will be assumed to be pure money. Specifically, it is assumed that the only stream of income eminating from these goods is that which results from their use as money. The implication

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study will not provide unbiased estimates of the market shares of the different producers. See Canada, Royal Commission on Banking and Finance, Report (Ottowa: Queen's Printer, 1965), Chapter 6. and J. F. Graham, et. al., The Role of the Trust and Loan Companies in the Canadian Economy (London: School of Business Administration, University of Western Ontario, 1965), Part II.

of this assumption is that the positive and negative income streams produced by the services and costs of demand deposits are zero. This assumption being made, the entire value of these goods will be included in the output of money. Let C be coin, N_g be notes produced by the government, N_b be notes produced by private producers, and DD be checkable and non-interest bearing deposits. Then, this portion of money output can be represented by

(II-14) $C + N_g + N_b + DD$.

The money-debt produced in Canada consists of interest bearing demand deposits, or, a more accurate statement might be, time deposits transferable by cheque. Due to the actions of the money-debt producers, the holdings of money-debt producers release statements only quarterly or semi-annually, the marginal costs of checks rises very quickly, and they attempt to convince business or high turnover accounts to use Current Accounts (pure demand deposits). Thus, the owners of money-debt are mostly individuals. The amount held by business or commercial establishments is minimal.[2]

Let MD be the output of money-debt, r_{md} the explicit _rate_ paid on money-debt, and r a weighted average of rates paid on pure debt items. Then, the contribution of money-debt to the total money output is

(II-15) $(1 - r_{md}/r)$ MD.

The final type of product produced by the Canadian

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[2]For complete discussion of the attributes of Canadian money-debt, see below.

money producers are pure debt instruments. They are not media
of exchange and will not be included in the total money pro-
duction in Canada.

Thus, the total output of money in Canada may be
represented by

(II-16) $C + N_g + N_b + DD + (1-r_{md}/r) \ MD$.

2. Money Used as an Input.

The need to include the "reserves" held against non-
money production in the net money supply has been discussed.
Unfortunately, all attempts to estimate the money input of
non-money production has failed.

The required reserves, of those money producers have
reserve requirements, are a percentage of total output.[3]
Thus, there are no required reserve ratios for money and non-
money production.

Numerous attempts were made to estimate the "reserves"
held against money and non-money output for various types of
producers. The results of many different formulations of
cross sectional analysis were either insignificant or un-
reasonable on a priori grounds.

Another estimation procedure would be to investigate
several individual producers which sell either money or a
non-money exclusively. However, generalizing on the basis of
these few examples would be very risky. One would not only
have to generalize within types of money producers, but

[3]For a historical discussion of this practice see
below, Appendix I.

between very different classes of institutions. Certainly the desired reserve ratios of a credit union in Togo, Saskatchewan are different from the Bank of Montreal. The insignificant results may also be explained by the lack of a consistent relation of "reserves" to output between producers. One researcher concluded that for the Trust and Loan Companies "there is no common pattern in these percentage figures [desired reserve ratios] reported to us."[4] If a stable function within a classification is unobtainable, generalizing between types of producers is not justifiable.

The net money supply will be estimated by subtracting the total money balances of the producers from money production. The assumption being: the "reserves" held against non-money production are zero. This supposition is probably erroneous. Thus, the aforementioned warnings concerning the underestimations resulting from this method should be kept in mind.

3. The Net Money Supply in Canada.

In the two previous sections, the total output of money and the amount of money used as an input for money production were derived. Combining them we have the general formulation of the net money supply in Canada,

(II-17) $C + N_g + N_b + DD + (1 - r_{md}/r) \, MD - TR.$

Where TR is the total money holdings of money producers.

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[4] J. F. Graham, et al., Role, p. 11-36.

C. The Interest Rate

The first sections of this chapter have outlined the importance of the interest rate in determining the supply of money. Unfortunately, the empirical counterpart to "the interest rate" is not obvious. The range of rates which do exist exhibit a spectrum of values due to differences in risk and convenience premiums. The optimum rate, for the purpose of analyzing money-debt, would be one which had approximately the same risk and convenience premium as money-debt.

The money-debt produced in Canada is a fixed price asset whose ownership is effectively restricted to individuals. The correct comparison rate would be one on a short term fixed price pure debt instrument which is also sold mainly to individuals. Thus, the risk and convenience premiums of both goods would be approximately equal.

The best comparison rate would be that paid on the non-checkable deposits of the Trust and Loan Companies and several credit unions. Unfortunately, these rates are not available in reliable form. Consequently, the comparison rate used in this study is a weighted average of a rather arbitrary choice of pure debt items which seem to meet the criteria in one way or another.

The first item in this array is the Debentures and Guaranteed Investment Certificates of the Loan and Trust Companies. The Loan Companies' Debentures are sold over the

counter with maturities over one year and, in a few cases,
up to ten years. The average term to maturity being under
five years.[5] The Guaranteed Investment Certificates of the
Trust Companies have a much shorter term to maturity, but a
lower proportion are held by individuals. Almost all mature
within five years of the time of issue, with most coming due
within one year.[6] The majority of the holders of both
Debentures and G.I.C.s are individuals.[7]

The other item used in computing the comparison rate
is credit union shares. The use of this rate is subject to
several serious shortcomings. The reliable data available
is restricted to the Caisses Populaires of Quebec and credit
unions is Saskatchewan. Even if it is assumed that the rates
presented are representative of rates paid by all credit
unions, they may not reflect an alternative open to all
Canadians. Credit unions are concentrated in those locali-
ties where the "credit union movement" has had a strong
emotional appeal. Also, many credit unions, in an attempt
to restrict domination by a few members, allow each member
to own only one share.[8] This may result in these shares
paying a lower rate than would otherwise prevail. The mem-
bers could view the low rate as being the cost of having

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[5]Royal Commission, Report, p. 179. [6]Ibid. p. 182.

[7]J. F. Graham, et al., Role, p. 11-25.

[8]Royal Commission, Report, p. 159.

the access to the credit union facilities. However, all
shares may be withdrawn on demand or with short notice.

Canada Savings Bonds are not included in the com-
putation of the comparison rate. They are similar to Series
E bonds in the United States in that they are sold at a dis-
count and pay the stated rate if held to maturity. Infor-
mation concerning their stated rate is available. However,
there is no data concerning the effective rate or the
average time a bond is held until retirement.

The comparison rates presented in Tabel II-1 are
weighted averages of the annual rates paid on Debentures,
G.I.C.s, and credit union shares with the weights being the
annual average of the item outstanding. It may be argued
that a different weighting scheme may be in order. For
example, one may want to weight shares more than Trust and
Loan Company issues because of the latter's long term to
maturity. However, after all factors were considered, it
was felt that the weighting pattern used provides a good
index of rates available to individuals at a minimum cost
of time and effort.

D. Output of the Money Producers

1. Government Production

a. Bank of Canada

The primary government producer of money is the
Bank of Canada. It was incorporated under the Bank of
Canada Act of 1934 and began operations in March of

TABLE 1

THE COMPARISON RATE

Year	Trust Companies		Loan Companies		Credit Unions				Comparison Rate
					Saskatchewan		Quebec		
	1 G.I.C. (millions)	2 Rate Paid	3 Debentures (millions)	4 Rate Paid	5 Shares (millions)	6 Rate Paid	7 Shares (millions)	8 Rate Paid	9
1939	84.8	3.27	101.4	3.91			2.2	4.46	3.63
1940	80.4	3.29	100.1	3.77			2.4	4.45	3.57
1941	79.0	2.92	98.2	3.73	.1	4.08	2.7	4.22	3.38
1942	79.9	2.79	95.6	3.73	.2	3.40	3.2	3.86	3.31
1943	82.2	2.76	93.5	3.43	.3	2.58	3.9	3.61	3.13
1944	86.8	2.71	91.0	3.43	.9	2.36	5.2	3.32	3.08
1945	91.8	2.62	89.0	3.39	1.7	2.61	6.7	3.37	3.01
1946	108.0	2.47	94.0	3.23	2.6	2.65	8.7	3.33	2.84
1947	121.5	2.45	103.0	3.08	3.5	2.57	10.6	3.39	2.77
1948	132.5	2.26	114.0	2.95	4.7	2.52	12.4	3.52	2.62
1949	151.0	2.16	129.5	2.82	6.3	2.63	14.1	3.60	2.52
1950	170.0	1.94	145.5	2.88	7.6	2.65	16.0	3.64	2.44
1951	170.0	2.31	166.7	2.99	9.1	2.46	17.4	3.77	2.70
1952	187.8	2.49	195.5	3.18	12.0	2.49	19.2	3.75	2.88
1953	206.0	2.79	216.5	3.30	16.6	2.60	21.6	3.73	3.05
1954	262.3	2.94	268.5	3.64	20.5	2.63	24.2	3.85	3.29
1955	323.3	2.77	308.5	3.61	22.5	2.60	27.2	3.91	3.19
1956	336.3	3.11	346.5	3.71	25.3	2.63	30.6	3.89	3.41
1957	358.8	3.61	360.2	3.82	29.6	2.69	34.5	4.00	3.69
1958	492.3	3.75	437.3	4.20	36.0	2.79	37.8	4.16	3.93
1959	525.5	3.88	476.8	4.37	45.5	2.98	42.0	4.25	4.07
1960	725.0	4.91	560.3	4.68	57.4	3.07	46.5	4.44	4.73
1961	851.0	4.45	637.5	4.87	72.6	3.14	53.5	4.81	4.57

1962	1019.0	4.58	716.0	4.94	90.9	3.40	64.3	5.10	4.68
1963	1258.5	4.85	819.5	5.24	110.9	3.50	75.0	5.30	4.94
1964	1499.2	4.74	926.3	5.20	136.1	3.67	82.4	5.66	4.88
1965	1921.5	4.90	1047.3	5.40	165.4	3.73	98.9	5.35	5.02
1966	2310.5	5.45	1445.	5.61	189.2	3.86	123.7	4.86	5.42

1. Sources: 1939-1945, includes only Trust and Loan Companies operating in Ontario, Ontario, Registrar of Loan and Trust Companies, Report (Toronto: Queen's Printer, 1938 and later years). Canada, Bank of Canada, Statistical Summary (Ottawa:Bank of Canada, 1946 and later years).

2. Includes only Trust and Loan Companies operating in Ontario. Ontario, Registrar of Loan and Trust Companies, Report (Toronto: Queen's Printer, 1938 and later years).

3. Same as 1.

4. Same as 2.

5. Saskatchewan, Department of Co-operation and Co-Operative Development, Personal Correspondence.

6. Same as 5.

7. For the purpose of computation, it is assumed that the fiscal year of each Caisses ends on June 30. Includes only Caisses Populaires Desjardins from 1961 to 1966. Quebec, Quebec Bureau of Statistics, Quebec Statistical Annual (Quebec City: Quebec Bureau of Statistics, 1940 and later years). Canada, Department of Agriculture, Credit Unions in Canada (Ottawa: Department of Agriculture, 1946 and later years). La Federation Des Caisses Populaires Desjardins, Levis, Quebec, Personal Correspondence.

8. Same as 7.

1938.[9] It is charged with the sole responsibility for regulating "credit and currency in the best interest of the economic life of the nation.[10] In order to fulfill this obligation it was given the appropriate powers concerning the printing of notes and the regulation of bank output.[11]

The two types of money produced by this agency are Bank of Canada Notes and Deposits. Prior to the formation of the Bank of Canada, the primary note production of the government was Dominion Notes.[12] The 1934 Act transferred the "liability" of these notes to the Bank of Canada and it immediately began to replace them with its own issue.[13] The series used in this study is the month end reportings of the Bank of Canada's "Notes in Circulation." In the early years, this series includes both the Bank of Canada Notes and the Dominion Notes not yet retired.

The Bank of Canada accepts deposits from chartered banks, Quebec Savings Banks, the Government of Canada and its enterprizes, foreign central banks, and the provincial governments.[14] All deposits are checkable and none bear an

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[9]Canada, Dominion Bureau of Statistics, The Canada Yearbook, 1957 (Ottowa:Her Majesty's Printer, 1958) p. 1135.

[10]The Canada Yearbook, 1965, p. 1030. [11]Ibid.

[12]The Canada YearBook, 1959, p. 1108.

[13]Dennis deMelto, The Supply of Money in Canada 1867-1961 (unpublished M.A. thesis, McGill University, 1961), p. 103.

[14]Canada, Bank of Canada, Statistical Summary, 1966 (Ottowa: Bank of Canada, 1967) p. 14.

explicit rate of return.[15] Consequently, the full value of the deposits will be included in the output of money. The series used in the month end report of total Canadian dollar deposits at the Bank of Canada.

Until 1940 the Bank of Canada was required to hold gold "reserves" of not less than 25% of its outstanding notes and deposits. This requirement was suspended in 1940 and abolished in 1952.[16] Gold has always been "legal tender" in Canada, but only a few gold coins were produced and, during the period under study, very little gold circulated as a medium of exchange.[17] Consequently, it will be assumed that gold is not money. Thus, the gold holdings of the Bank of Canada will not be subtracted from money output to obtain net money production.

b. The Royal Canadian Mint

The Royal Canadian Mint produces silver, nickel, and bronze coins of various denominations less than one dollar.[18] Unfortunately, the only output information available is the month end reports of the "coins in circulation outside chartered banks." The lack of information concerning the chartered banks' holdings of coin will lead to an underestimation of the net money production of the Mint and an overestimation,

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[15]The Canada Yearbook, 1961, p. 1108.   [16]Ibid., p.1109.

[17]E. L. Stewart Patterson, Canadian Banking (Toronto: The Ryerson Press, 1940) p. 90.

[18]The Canada Yearbook, 1937. p. 888.

TABLE 2

BANK OF CANADA AND THE ROYAL CANADIAN MINT

End of Quarter	Notes and Coin	Deposits	Net Output and Net Money
1939 I	190	233	423
II	198	231	429
III	245	270	515
IV	267	281	548
1940 I	255	261	516
II	309	250	559
III	369	245	614
IV	398	239	637
1941 I	404	233	637
II	433	264	697
III	472	339	811
IV	538	312	850
1942 I	551	367	918
II	585	279	864
III	672	289	961
IV	742	331	1073
1943 I	768	307	1075
II	809	410	1219
III	868	353	1221
IV	930	378	1308
1944 I	953	448	1401
II	977	445	1422
III	1041	510	1551
IV	1096	443	1539
1945 I	1108	494	1602
II	1125	572	1697
III	1175	505	1680
IV	1192	704	1896
1946 I	1166	756	1922
II	1178	644	1822
III	1211	626	1837
IV	1251	720	1971
1947 I	1217	761	1978
II	1218	634	1852
III	1237	671	1908
IV	1278	673	1951
1948 I	1247	648	1895
II	1274	762	2036
III	1335	716	2051
IV	1359	726	2085
1949 I	1314	688	2002
II	1341	754	2095
III	1363	817	2180
IV	1381	700	2081

TABLE 2--<u>Continued</u>

End of Quarter	Notes and Coins	Deposits	Net Output and Net Money
1950 I	1331	789	2120
II	1351	795	2146
III	1395	836	2231
IV	1445	811	2256
1951 I	1398	830	2228
II	1432	886	2318
III	1470	825	2295
IV	1548	780	2328
1952 I	1477	737	2214
II	1527	653	2180
III	1562	669	2231
IV	1649	687	2336
1953 I	1581	728	2309
II	1617	779	2396
III	1645	670	2315
IV	1693	706	2399
1954 I	1602	771	2373
II	1648	764	2412
III	1679	629	2308
IV	1720	617	2337
1955 I	1648	643	2291
II	1717	684	2401
III	1765	658	2423
IV	1840	674	2514
1956 I	1779	585	2364
II	1839	658	2497
III	1876	655	2531
IV	1977	582	2559
1957 I	1832	623	2455
II	1894	619	2513
III	1929	577	2506
IV	2016	584	2600
1958 I	1923	659	2582
II	1993	702	2695
III	2028	779	2807
IV	2119	723	2842
1959 I	2041	704	2745
II	2094	704	2798
III	2101	738	2839
IV	2149	718	2867
1960 I	2047	696	2743
II	2129	670	2799
III	2146	660	2806
IV	2206	731	2937

TABLE 2--Continued

End of Quarter	Notes and Coins	Deposits	Net Output and Net Money
1961 I	2125	723	2848
II	2168	698	2866
III	2214	793	3007
IV	2305	823	3128
1962 I	2179	825	3004
II	2275	851	3126
III	2304	838	3142
IV	2411	827	3238
1963 I	2278	822	3100
II	2359	868	3227
III	2381	876	3257
IV	2503	899	3402
1964 I	2398	931	3329
II	2465	906	3371
III	2497	958	3455
IV	2610	987	3597
1965 I	2519	960	3479
II	2627	1024	3651
III	2671	1043	3714
IV	2798	1185	3983
1966 I	2690	1104	3794
II	2800	1087	3887
III	2843	1142	3985
IV	3022	1174	4196

a. Coin outside banks.

Sources:
   Canada, Bank of Canada, Statistical Summary (Ottawa: Bank of Canada, 1946 and later years).
   Dennis deMelto, The Supply of Money in Canada 1867-1961 (unpublished M. A. thesis, McGill University, 1963), Table I.

because their coin holdings are not subtracted from money output, of that of chartered banks. These errors will cancel when the government sector is combined with the chartered bank sector.

The assumption that neither government producer holds "reserves" leads to both the output and the net production of money being represented by the sum of Bank of Canada Notes, Deposits, and the Mint's production of coin.

a. Pure Money

(1)<u>Notes</u> - The chartered banks worked hard and long to obtain the monopoly in the private production of notes.[19] However, their position was gradually erroded by increased government production. With the formation of the Bank of Canada, in 1934, the license of the chartered banks to produce notes was revoked. By 1945 they were required to reduce their issue of notes to an amount not in excess of their paid-up capital. After January 1, 1945 they could issue or reissue no new notes. In 1950, the Bank of Canada paid the chartered banks a sum equal to the value of the unredeemed notes.[20] The private production of notes in Canada was brought to an end.

For the 1939 to 1950 period, the series used is the "total notes" of chartered banks. From 1950 to 1966, the

[19]See below, Appendix I.

[20]<u>The Canada Yearbook, 1955</u>. p. 1191.

value of the unredeemed bank notes are included in the Bank of Canada note production.

The practice of the chartered banks was not to re-issue notes of other chartered banks which came into their possession.[21] These notes were sent through the clearing houses for redemption.[22] Thus, the holdings of notes of other chartered banks would be included in Float.

(2) Public Demand Deposits - Public Demand Deposits, or Current Accounts, at chartered banks are essentially identical to demand deposits in this country. They are non-interest bearing and checkable deposits.

The "service" charges on these deposits vary between banks and over time. The usual procedure is a constant charge per deposit or withdrawal with a minimum per month charge. A certain number of free withdrawals or deposits are allowed depending on minimum monthly balances. The bank also reserves the right to assess additional "service" charges if an individual account warrants it. Cancelled checks and a

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[21]It is usually more profitable for a bank to sell its own money than to resell the money produced by another bank. If a bank receives a dollar of another bank's money and then returns it to circulation, the difference between the purchase and sale price would, in equilibrium, only be equal to the value of the intermediation services. However, if the receiving bank returned the money to its producer and requested dominant momey, this bank could use the receipts as "reserves" against the sale of a larger amount ot its own money. The small number of chartered banks and the well organized clearing process has provided a low cost mechanism for the redemption procedure. For the historical beginnings, see below, Appendix I.

[22]Patterson, Canadian Banking, p. 95.

statement are sent out monthly or more often if requested.[23]

In addition to Demand Deposits, chartered banks also offer Personal Chequing Accounts. These are non-interest bearing and checkable deposits available to individuals. They offer a lower cost per check than Personal Savings Deposits and regular statements with the return of cancelled checks.[24] They have not been very popular and amount to only 2% of Current Accounts.[25] Both Personal Chequing Accounts and Current Accounts are included in the Pure Money series.

(3) <u>Government Deposits</u> - In Canada, as in most countries, the various governmental units hold balances in the commercial banking system. The usual practice is to exclude these deposits from the supply of money. The rationale for this exclusion is usually not stated, but the implicit reasoning is that the money held by a governmental unit is somehow different from that "in the hands of the public." Extending this analysis further, one would reach the absurd conclusion that all capital goods held by a government should not be included in the net wealth of the nation.

The analysis of this study has concluded that the

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[23]The Canadian Banker's Association, <u>Submissions to the Royal Commission on Banking and Finance</u> (Toronto:Canadian Banker's Association, 1963),pp. 44-45.

[24]<u>Ibid</u>.   [25]Royal Commission, <u>Report</u>, p. 118.

only money which should be excluded from the net money supply is that which is held as an input for money production. The deposits held by the Dominion Government are used for transactions, as is the money held by the public, and do not seem to be viewed as "reserves" against Bank of Canada or Royal Canadian Mint production of money. Likewise, the deposits of Provincial Governments cannot be easily classified as a money input. Consequently, government deposits will be treated in the same manner as any other money produced in Canada and included in the net money supply.[26]

(i) Government of Canada - The deposits of the Dominion Government are allocated among the chartered banks with balances over an agreed minimum paying an explicit interest. An extensive search has been able to uncover only a meager outline of the rates paid on these deposits. In 1959 "they paid 10% below the average rate paid on accepted tenders at the weekly auction of Treasury Bills ... on the amount by which the Government's weekly balance at all banks exceeds $100 millions."[27]

For this study, it will be assumed that no interest is paid on these deposits. Thus, they are pure money and included in the output of money at full value.

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[26]For a similar treatment of the American case, see Boris P. Pesek and Thomas R. Saving, The Foundation of Money and Banking, (New York: The Macmillan Company,1968), p.223.

[27]Canadian Banker's Association, Submission, p. 45.

(ii) Provincial Government - Provincial Government
Deposits are simply demand deposits held by the provincial gov-
ernment.[28] Consequently, they will be considered as pure
money and included in the output of money at full value.

(4) <u>Deposits by Other Banks</u> - The nationwide character
of the Canadian chartered banks enables them to conduct
domestic business without correspondent banks.[29] Also, all
clearing house deficiencies are paid with Bank of Canada
balances. The deposits reported in this classification are
the Canadian dollar deposits of foreign banks.[30]

The foreign ownership of these deposits, while they
may have an important bearing on other economic problems, do
not qualify them for exclusion from the net money supply.
Specifically, they are not used as an input to produce money.

As best as can be determined, no interest is paid
on these deposits. Therefore, no adjustment will be made
before they are included in the output of money.

Unfortunately, this series is not available before
1946.

b. Money Debt: Personal Savings Deposits.

The nominal rate is uniform and changes simultaneously
throughout the country because it is set by the Canadian

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[28]<u>Ibid</u>., p. 46.

[29]G. E. Freeman, Chief, Research Department, Bank of
Canada, Personal letter, February 28, 1968.

[30]<u>Ibid</u>.

Banker's Association.[31] The interest payments are determined

by applying the nominal rate to the minimum quarterly balances

and are paid semi-annually.[32]

The policy of the chartered banks has been to use

direct and indirect means to restrict the ownership of

Personal Savings Deposits to individuals. The depositor

does not receive a statement nor cancelled checks. He is

presently allowed one free check per $100 of minimum quarterly

balance and 15 cents is charged for each additional check.[33]

Apparently, the banks also have the right to convert Personal

Savings Deposits into Current Accounts if they become "too

active." More than 3 or 4 checks a month was at one time

thought sufficient for an account to be examined.[34]

The attempt of the chartered banks to control the

ownership of Personal Savings Deposits has been quite suc-

cessful. In 1961, the average size of an account was $711

and 84% were below 1,000.[35] It is for these reasons that

Personal Savings Deposits are considered consumer wealth

items with an explicit rate reflecting the risk and conveni-

ence premiums associated with other items primarily intended

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[31]Joseph French Johnson, The Canadian Banking System, (Washington: Government Printing Office, 1910), p. 134.

[32]Canadian Bankers Association, Submission, p. 48.

[33]Ibid., p. 44-48.   [34]Patterson, Canadian Banking, p.122.

[35]Canadian Bankers Association, Submission, p. 48.

for individual's portfolios.[36] [37]

c. Pure Debt: Other Notice Deposits.

Other Notice Deposits is a catchall classification for a number of debt items sold by the chartered banks. Prior to 1939, the chartered banks were required to classify private deposits only as Demand or Notice Deposits. Beginning in that year, Notice Deposits were further divided into Personal Savings and Other Notice Deposits. A result of this decision was to segregate the checkable from the noncheckable deposits. However, the division was not complete and the first item mentioned below probably includes some checkable deposits. This study will abide with the spirit of the Bank of Canada classification and assume that Other Notice Deposits are all non-checkable. Therefore, they are not included in the output of money.

The first type of deposit in this classification is "the savings deposits of institutions and corporations which are maintained, charged service charges, and paid interest in exactly the same way as Personal Savings Deposits."[37] These deposits are probably used by small business as a short term and highly liquid asset.

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[36]Because it is assumed that the rate paid on money-debt reflects the same convenience and risk premiums as other consumer debt items, the rates paid on these issues, rather than a "true" interest rate, are used to represent the alternative cost of holding money-debt. See above.

[37]Canadian Banker's Association, _Submission_, p. 49.

TABLE 3

CHARTERED BANKS

end of Quarter	Pure Money [a] (millions)	Reserves plus Float [b] (millions)	Money-debt [c] (millions)	Rate Paid on Money-debt [d] (per-cent)	Money Portion of Money Debt (Millions)	Net Output (millions)	Net Money (millions)
1939 I	884	360	1514	1.31	968	2038	1492
II	952	394	1493	1.31	954	2051	1512
III	958	392	1503	1.31	961	2069	1527
IV	1092	424	1551	1.31	991	2219	1659
1940 I	1119	356	1471	1.30	935	2234	1698
II	1152	387	1419	1.30	902	2184	1667
III	1177	447	1465	1.30	932	2195	1662
IV	1202	488	1451	1.30	923	2165	1637
1941 I	1296	405	1512	1.27	944	2403	1835
II	1633	432	1274	1.27	795	2475	1996
III	1513	448	1361	1.27	850	2426	1915
IV	1468	546	1474	1.27	920	2396	1842
1942 I	1784	498	1345	1.27	829	2631	2115
II	1548	495	1378	1.27	849	2431	1902
III	1762	523	1513	1.27	932	2752	2171
IV	1943	591	1423	1.27	877	2775	2229
1943 I	1864	536	1640	1.26	980	2968	2308
II	2278	629	1532	1.26	915	3181	2564
III	2065	625	1739	1.26	1039	3179	2479
IV	2405	729	1698	1.26	1014	3374	2690
1944 I	2100	708	1975	1.26	1167	3367	2559
II	2608	834	1945	1.26	1149	3719	2923
III	2218	780	2214	1.26	1308	3652	2746
IV	2691	784	2173	1.26	1284	4080	3191

1945 I	2917	3930	1467	1.23	2480	732	2182
II	3431	4414	1422	1.23	2405	828	2837
III	3107	4210	1597	1.23	2700	773	2283
IV	3687	4765	1560	1.23	2638	959	3086
1946 I	3438	4680	1673	1.21	2915	824	2589
II	3359	4666	1760	1.21	3067	825	2424
III	3489	4857	1842	1.21	3210	913	2560
IV	3576	4931	1824	1.21	3179	1040	2792
1947 I	3503	4984	1828	1.24	3309	917	2592
II	3512	5010	1848	1.24	3346	865	2529
III	3408	4943	1893	1.24	3428	925	2440
IV	3588	5134	1907	1.24	3453	1042	2723
1948 I	3451	5185	1900	1.25	3634	978	2529
II	3560	5292	1898	1.25	3630	962	2624
III	3671	5450	1950	1.25	3729	1045	2766
IV	3896	5686	1962	1.25	3752	1097	3031
1949 I	3786	5744	1989	1.25	3947	989	2786
II	3894	5840	2023	1.25	4013	1079	2950
III	4080	6103	2055	1.25	4078	1119	3144
IV	3913	5940	2056	1.25	4086	1044	2898
1950 I	3916	6078	2042	1.25	4215	1054	2917
II	4085	6060	2037	1.25	4186	1121	2995
III	4218	6229	2270	1.25	4176	1053	3096
IV	4320	6357	2257	1.26	4256	1240	3421
1951 I	4223	6306	2284	1.26	4232	1084	3134
II	4267	6198	2291	1.26	4296	1163	3129
III	4271	6285	2535	1.26	4452	1381	3361
IV	4488	6276	2546	1.24	4471	1362	3315
1952 I	4566	6405	2590	1.24	4549	1341	3361
II	4722	6491	2619	1.24	4600	1361	3493
III	4725	6681	2828	1.24	4765	1605	3711
IV	4986	6706	2866	1.24	4829	1438	3596
1953 I	4996	6923	2933	1.24	4943	1595	3725
II	5093	6959	2822	1.24	4756	1506	3666
III	5258	7103		1.24		1640	4076
IV		7192					

TABLE 3--continued

end of Quarter	Pure Money[a] (millions)	Reserves[b] plus Float (millions)	Money-debt[c] (millions)	Rate Paid[d] on Money-Debt (percent)	Money Portion of Money-Debt (millions)	Net Output (millions)	Net Money (millions)
1954 I	3745	1522	4959	1.65	2472	7182	4695
II	3727	1636	5109	1.65	2547	7200	4638
III	3727	1407	5240	1.65	2612	7560	4932
IV	4067	1618	5218	1.65	2601	7667	5050
1955 I	3802	1395	5426	1.68	2569	7833	4976
II	4161	1629	5573	1.68	2638	8105	5170
III	4214	1599	5757	1.68	2725	8372	5340
IV	4752	1842	5633	1.68	2667	8543	5577
1956 I	4152	1354	5791	1.77	2785	8589	5543
II	4520	1730	5881	1.77	2828	8671	5618
III	4320	1679	6020	1.77	2895	8661	5536
IV	4711	2212	6007	1.77	2889	8506	5388
1957 I	4169	1651	6153	2.24	2418	8671	4836
II	4249	1819	6195	2.24	2434	8626	4864
III	4258	1835	6352	2.24	2496	8775	4819
IV	4751	2017	5248	2.24	2455	8982	5189
1958 I	4267	1822	6381	2.32	2614	8826	5059
II	4563	1963	6601	2.32	2704	9201	5304
III	4819	2080	6940	2.32	2843	9679	5542
IV	5228	2225	6844	2.32	2804	9847	5807
1959 I	4830	2020	7114	2.32	3059	9924	5869
II	4857	2066	7201	2.32	3096	9902	5887
III	4375	1810	7239	2.32	3113	9804	5678
IV	4822	1872	6900	2.32	2967	9850	5917
1960 I	4316	1551	7068	2.34	3571	9833	6336
II	4569	1691	7141	2.34	3608	10019	6486
III	4402	1647	7310	2.34	3694	10065	6449
IV	5131	1875	7215	2.34	3646	10470	6901

1961 I	4492	1652	7484	2.34	3652	10324	6492
II	4499	1744	7549	2.34	3684	10304	6439
III	4690	1821	7724	2.34	3769	10593	6638
IV	5639	2077	7618	2.34	3718	11180	7280
1962 I	5038	1724	7899	2.42	3815	11213	7129
II	5277	1882	7993	2.42	3861	11388	7256
III	4588	1630	8119	2.42	3921	11077	6879
IV	5769	2172	7932	2.42	3831	11529	7428
1963 I	4708	1625	8234	2.58	3933	11317	7016
II	5223	1829	8364	2.58	3995	11758	7389
III	5321	2097	8605	2.58	4111	11829	7335
IV	6466	2349	8443	2.58	4033	12560	8150
1964 I	5938	2220	8760	2.58	4129	12478	7847
II	5968	2063	8811	2.58	4153	12716	8058
III	5586	2056	9046	2.58	4263	12576	7793
IV	6257	2139	8935	2.58	4211	13053	8329
1965 I	5871	1987	9318	2.60	4492	13202	8376
II	6253	2113	9410	2.60	4537	13550	8677
III	6155	2108	9739	2.60	4695	13786	8742
IV	6825	2288	9725	2.60	4688	14262	9225
1966 I	6209	2161	10047	2.65	5135	14095	9183
II	6563	2351	10135	2.65	5180	14347	9392
III	6473	2276	10388	2.65	5309	14588	9506
IV	7423	2657	10248	2.55	5238	15014	10004

a. Demand deposits, Personal Chequing Accounts, Government of Canada Deposits, Provincial Government Deposits, and, from III, 1945, Other Bank Deposits.

b. Bank of Canada Notes and Deposits plus Canadian Dollar Items in Transit (net).

c. Personal Savings Deposits.

d. 1939-1945 estimated by assuming the proportion of deposits that were "inactive" is the same for Notice Deposits and Personal Savings Deposits.

Sources: Same as for Table 4.

Conversations[38] and logic, because of the low rate paid, seem to indicate that they are small in number and dollar amount.

The second item in this classification is the non-negotiable fixed term deposit receipts of $25,000 and over. They are sold by the chartered banks to compete with the Treasury Bills. They pay approximately the same rate as is current in the money market and have maturities of from 30 to 364 days.[39]

The final type of debt instrument are negotiable term notes issued in multiples of $10,000. The rates are periodically revised and the maturities run from two to six years.[40]

3. Quebec Savings Banks

The Quebec Savings Banks are the remnants of the "Savings Bank and Cooperative" movement of the 1800s. Presently, there are only two operating in Canada, one in Montreal and the other in Quebec City. They are authorized by Dominion legislation and are regulated by Federal authorities.[41]

The Quebec Savings Banks produce pure money and money-debt. The money-debt is essentially the same as that produced by the chartered banks. It is an interest bearing and checkable deposit which is held primarily by individuals. However,

[38]With several members of the Research Department, Bank of Canada, December, 1967.

[39]Canadian Banker's Association, _Submission_, p. 49.

[40]_Ibid_.   [41]Royal Commission, _Report_, p. 147.
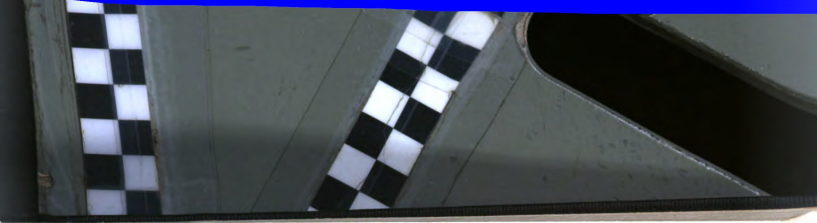
TABLE 4

QUEBEC SAVINGS BANKS

End of Quarter	Reserves a (millions)	Pure Money b (millions)	Money-c Debt (millions)	Rate Paid on Money-Debt (Percent)	Money Portion of Money-Debt (Millions)	Net Output (millions)	Net Money (millions)
1939 I	10		82	1.31	52	72	42
II	8		81	1.31	52	73	44
III	8		80	1.31	51	72	43
IV	11		83	1.31	53	72	42
1940 I	8		80	1.30	51	72	43
II	8		75	1.30	48	67	40
III	8		75	1.30	48	67	40
IV	9		75	1.30	48	66	39
1941 I	10		78	1.27	49	68	39
II	7		73	1.27	46	66	39
III	8		74	1.27	46	66	38
IV	9		76	1.27	47	67	38
1942 I	7		75	1.27	46	68	39
II	8		76	1.27	47	68	39
III	9		79	1.27	49	70	40
IV	8		78	1.27	48	70	40
1943 I	12		86	1.26	51	74	39
II	11		87	1.26	52	76	41
III	12		92	1.26	55	80	43
IV	11		94	1.26	56	83	45
1944 I	11		104	1.26	61	93	50
II	12		107	1.26	63	95	51
III	11	1	111	1.26	66	101	56
IV	11	1	112	1.26	66	102	56

| Period							
1945 I	14	1	123	1.23	73	110	60
II	12	2	124	1.23	73	114	63
III	13	1	130	1.23	77	118	65
IV	11	0	130	1.23	77	119	66
1946 I	12	0	140	1.21	80	128	68
II	12	1	145	1.21	83	134	72
III	12	1	147	1.21	84	136	73
IV	13	1	146	1.21	84	134	72
1947 I	11	1	153	1.24	85	143	75
II	16	1	160	1.24	88	145	73
III	15	2	160	1.24	88	147	75
IV	15	1	160	1.24	88	146	74
1948 I	21	1	170	1.25	89	150	69
II	13	1	170	1.25	89	158	77
III	14	1	172	1.25	90	159	77
IV	14	1	171	1.25	89	158	76
1949 I	20	1	185	1.25	93	166	74
II	16	1	184	1.25	93	169	78
III	13	1	185	1.25	93	173	81
IV	18	1	185	1.25	93	168	76
1950 I	17	1	193	1.25	94	177	78
II	18	1	195	1.25	95	178	78
III	17	1	193	1.25	94	177	78
IV	18	1	190	1.25	93	173	76
1951 I	16	1	194	1.26	103	179	88
II	17	1	194	1.26	103	178	87
III	17	1	194	1.26	103	178	87
IV	21	2	192	1.26	102	173	83
1952 I	20	1	200	1.24	114	181	95
II	20	1	201	1.24	114	182	95
III	18	0	204	1.24	116	186	98
IV	20	0	205	1.24	117	185	97
1953 I	20	0	214	1.24	127	194	107
II	20	1	215	1.24	128	196	109
III	20	1	217	1.24	129	198	110
IV	20	0	212	1.24	126	192	106
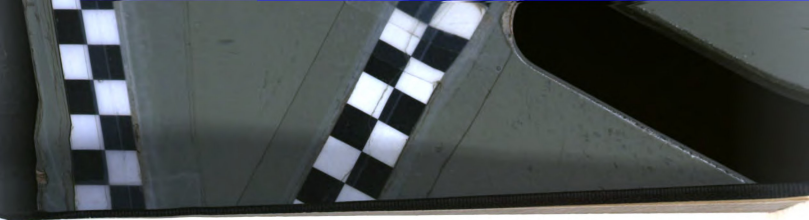
TABLE 4--continued.

End of Quarter	Reserves[a] (millions)	Pure Money[b] (millions)	Money-[c] Debt (Millions)	Rate Paid on Money-Debt (Percent)	Money Portion of Money-Debt (Millions)	Net Output (Millions)	Net Money (Millions)
1954 I	23	1	219	1.65	109	197	87
II	24	1	227	1.65	113	204	90
III	18	0	233	1.65	116	215	98
IV	19	1	227	1.65	113	209	95
1955 I	20	0	238	1.68	113	218	93
II	19	0	245	1.68	116	226	97
III	18	0	252	1.68	119	234	101
IV	19	0	247	1.68	117	228	98
1956 I	19	0	257	1.77	124	238	105
II	17	1	253	1.77	122	237	106
III	17	1	254	1.77	122	238	106
IV	20	1	251	1.77	121	232	102
1957 I	18	1	255	2.24	100	238	83
II	19	1	259	2.24	102	241	84
III	18	1	260	2.24	102	243	85
IV	26	13	255	2.24	100	242	87
1958 I	20	5	267	2.32	109	252	94
II	23	6	273	2.32	112	256	85
III	23	5	283	2.32	116	265	98
IV	25	11	274	2.32	112	260	98
1959 I	20	8	280	2.32	120	268	108
II	20	1	281	2.32	121	262	102
III	19	4	281	2.32	121	266	106
IV	26	4	268	2.32	115	246	93
1960 I	22	7	273	2.34	138	258	123
II	20	1	282	2.34	142	263	123
III	20	2	288	2.34	146	270	128
IV	26	10	285	2.34	144	269	128

1961 I	23	6	296	2.34	144	279	127
II	26	0	305	2.34	149	279	123
III	27	2	310	2.34	151	285	126
IV	24	1	306	2.34	149	293	136
1962 I	34	7	319	2.42	154	292	127
II	33	1	326	2.42	157	294	125
III	26	2	329	2.42	160	305	136
IV	29	13	324	2.42	156	308	140
1963 I	26	8	336	2.58	161	316	143
II	25	0	350	2.58	162	318	138
III	23	1	349	2.58	167	323	144
IV	30	6	347	2.58	166	326	142
1964 I	38	1	365	2.58	172	328	135
II	34	2	367	2.58	173	335	141
III	35	0	374	2.58	176	339	141
IV	29	10	375	2.58	189	355	147
1965 I	33	1	391	2.60	192	359	157
II	34	2	398	2.60	195	366	160
III	30	0	404	2.60	195	374	165
IV	28	6	402	2.60	194	380	172
1966 I	26	0	416	2.65	213	390	187
II	24	1	418	2.65	214	395	191
III	22	1	423	2.65	216	402	195
IV	27	16	421	2.65	215	410	204

a. Bank of Canada Notes and Deposits plus deposits with chartered banks.
b. Government of Canada plus Provincial Government Deposits.
c. Includes "Personal Chequing Accounts."
d. See footnote d, Table 3.

Sources for Tables 3 and 4:
Canada, Bank of Canada, Statistical Summary (Ottowa:Bank of Canada, 1946 and later years).
Canada, Bank of Canada, Personal Correspondence.
Canada, Inspector General of Banks, Personal Correspondence.
Dennis deMelto, The Supply of Money in Canada 1867-1961 (unpublished M.A. thesis,McGill University, 1967), Table III.

it tends to have a little higher turnover rate than Personal
Savings Deposits.[42]

The pure money produced consists of "Personal
Chequing Accounts" and Dominion and provincial government
deposits.[43] The data does not distinguish between money-debt
and the "Personal Chequing Accounts" for all years. For the
years that the division is available, the amount of "Personal
Chequing Accounts" is insignificant. Thus, no large biase
will be introduced by including all "Personal Checking Accounts"
in with money-debt. Thus, the pure money column will consist
of only Dominion and Provincial Government deposits.

The rate paid on money-debt and the charges on pure
money and money-debt are the same as for the chartered banks.[44]
As with the chartered banks, it will be assumed that no ex-
plicit charges are made on any deposit and that the govern-
ment deposits pay no explicit rate of return.

4. Trust and Loan Companies

The Trust and Loan Companies had their beginnings in
the 19th Century cooperative movement which spawned the Quebec
Savings Banks. However, these two institutions have de-
veloped along very different lines. While the Savings Banks
have restricted themselves to dealings with individuals

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[42]Ibid., p. 150

[43]Bank of Canada, Research Department, Personal cor-
respondence.

[44]Royal Commission, Report, p. 150.

in a certain geographic area, the Trust and Loan Companies

are concerned with general intermediation on a nationwide

scale.

In addition to Estate and Trust Administration, the

Trust and Loan Companies have specialized in the intermediary

business which is prohibited for the chartered banks. They

are not bound by the maximum interest rate provision of the

chartered banks. Thus, one would expect that they are a

source of borrowings for those projects rejected by the

chartered banks. Also, the Trust and Loan Companies are the

major source of mortgage loans.

The Trust and Loan Companies produce pure debt, in the

form of Debentures, Guaranteed Investment Certificates, and

non-checkable deposits, and money-debt, interest bearing and

checkable deposits. The money-debt production is only a

small proportion of total "liabilities", 17% in 1966.[45]

Thus, their net money production is probably underestimated

to a greater extent than that of producers with a smaller

proportion of non-money output.

The money-debt of the Trust and Loan Companies is

similar to that of the chartered banks. It is mostly held by

individuals and the companies maintain an active policy of

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[45]Checkable deposits as a percentage of checkable
plus non-checkable deposits plus Debentures plus G. I. C.s.

discouraging high turnover accounts.[46] However, the average
size of an account is three times that of Personal Savings
Deposits and the rate of turnover is slightly larger.[47] The
little information available concerning the actual procedure
of interest and cost calculation seem to indicate that they
are similar to those of Personal Savings Deposits.[48]

Complete information concerning Trust and Loan pro-
duction is not available for all years. Only since 1963
has the Dominion Bureau of Statistics distinguished checkable
from non-checkable deposits. From 1951 to 1963 only total
deposits, on a quarterly basis, were reported. Prior to
1951, only yearly reports are available.

In order to estimate the quarterly breakdown of
deposits for the 1951-1963 period, a sample of companies repre-
senting 68% of the total assets of Trust and Loan companies
operating in Ontario was used.[49] It is assumed that the
ratio of checkable to total deposits for this sample is the
same as for all Trust and Loan Companies operating in Canada.
This sample seems to be biased toward large companies.[50]
Thus, if large companies tend to have more checkable deposits,
the estimates will overstate the true money - debt

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[46]Royal Commission, _Report_, pp. 178-181.

[47]J. F. Graham, _et al_., _Role_, p. 11-53.

[48]Royal Commission, _Report_, p. 182.

[49]J. F. Graham, _et al_., _Role_, p. 11-58.   [50]_Ibid_., p.XXIV

production.[51]

The Trust Companies have always accepted non-checkable deposits. The Loan Companies began to offer and the Trust Companies emphasize non-checkable deposits in response to the growth of the short term money market in the mid 1950's.[52] These deposits are designed particularly to compete with the "Other Notice Deposits" of the chartered banks. From 1951 to 1955, before their growth began, non-checkable deposits were consistently equal to 15% of total deposits. Consequently, checkable deposits, money-debt, for the 1939-1950 yearly series will be estimated by calculating .85 of total deposits.

The only available interest rate information is the actual rate paid on total deposits for companies operating in Ontario and, for the 1951-1966 period, the stated rate of checkable deposits. The rates paid on total deposits will diverge from the rate paid on money-debt as the ratio of money-debt to total deposits declines. For the 1939-1950 period, when the ratio of checkable to total deposits is assumed to remain constant, the actual rate paid on total deposits to the stated rate on money-debt, was .83. Thus, the actual rate paid on money-debt will be assumed to be

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[51]Judging from the company data available from the Registrar of Loan and Trust Corporation in Ontario, large companies are more likely to have deposits, the type of deposit is not known, than are small companies.

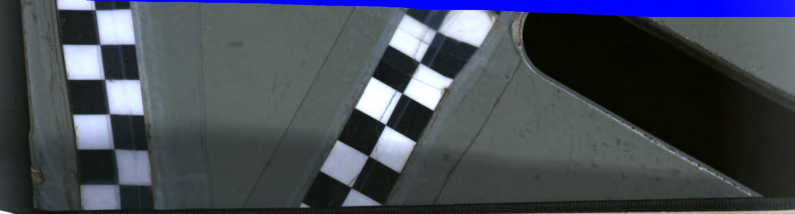[52]J. F. Graham, et al., Role, pp. 11-23.

TABLE 5

TRUST AND LOAN COMPANIES

Year	Money-Debt^{a,d} (millions)	Rate Paid^b on Money- Debt (percent)	Money Portion of Money-Debt (millions)	Reserves^{a,c} (millions)	Net Output (millions)	Net Money (millions)
1939	79	1.80	40	18	61	22
1940	79	1.77	40	18	61	22
1941	79	1.74	38	19	60	19
1942	77	1.84	34	20	57	14
1943	79	1.78	34	19	60	15
1944	90	1.70	40	22	68	18
1945	105	1.68	46	25	80	21
1946	131	1.50	62	27	104	35
1947	154	1.48	72	30	124	42
1948	172	1.60	67	30	142	37
1949	187	1.49	76	30	157	46
1950	204	1.61	69	35	169	34
End of Quarter						
1951 I	233	1.62	93	36	197	57
II	228	1.62	91	30	198	61
III	224	1.62	90	24	200	66
IV	221	1.62	88	39	182	49

|						
1952 I	227	1.66	96	34	193	62
II	226	1.66	96	27	199	69
III	228	1.66	97	25	203	72
IV	232	1.66	98	47	185	51
1953 I	238	1.73	103	32	206	71
II	242	1.73	105	31	211	74
III	243	1.73	105	29	214	76
IV	243	1.73	105	41	202	64
1954 I	248	1.98	99	42	206	57
II	263	1.98	105	50	213	55
III	281	1.98	112	39	242	73
IV	289	1.98	115	48	241	67
1955 I	307	2.11	104	43	264	61
II	323	2.11	109	49	274	60
III	330	2.11	112	42	288	70
IV	326	2.11	110	55	271	55
1956 I	321	2.28	106	36	285	70
II	310	2.28	103	32	278	71
III	309	2.28	102	39	270	63
IV	319	2.28	106	61	258	45
1957 I	319	2.60	94	40	279	54
II	320	2.60	95	39	281	56
III	331	2.60	97	40	291	58
IV	327	2.60	97	59	268	38
1958 I	334	2.63	110	44	290	66
II	359	2.63	119	46	313	73
III	383	2.62	127	62	321	65
IV	383	2.68	131	38	347	72
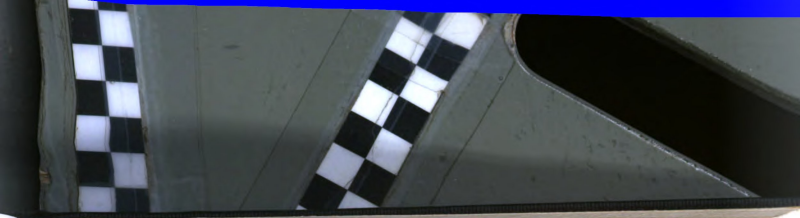
TABLE 5--continued.

End of Quarter	Money-Debt[a,d] (millions)	Rate Paid[b] on Money-Debt (Percent)	Money Portion of Money-Debt (Millions)	Reserves[a,c] (millions)	Net Output (millions)	Net Money (millions)
1959 I	385	2.68	131	38	347	93
II	372	2.68	127	33	339	94
III	381	2.68	130	37	344	93
IV	359	2.68	123	65	294	58
1960 I	368	2.75	154	40	328	114
II	368	2.75	154	45	323	109
III	388	2.75	162	51	337	111
IV	394	2.75	165	57	337	108
1961 I	424	2.76	168	45	379	123
II	425	2.76	168	51	374	117
III	455	2.76	180	60	395	120
IV	466	2.76	185	72	394	113
1962 I	484	2.97	177	68	416	109
II	495	2.97	181	76	419	105
III	488	2.97	178	56	432	122
IV	494	2.97	181	82	412	99
1963 I	512	3.05	196	90	422	106
II	544	3.05	208	95	449	113
III	575	3.05	220	71	504	149
IV	589	3.05	225	91	498	134

Year						
1964	I	588	3.09	216	74	514	142
	II	615	3.09	226	90	525	136
	III	636	3.09	233	126	510	107
	IV	667	3.09	245	149	518	96
1965	I	677	3.22	243	98	579	145
	II	732	3.22	262	113	619	149
	III	713	3.22	256	105	608	151
	IV	721	3.22	259	153	568	106
1966	I	703	3.32	272	143	560	129
	II	737	3.32	286	127	610	159
	III	731	3.32	283	109	622	174
	IV	731	3.32	283	120	611	163

a. 1939-1945 includes only companies operating in Ontario.
b. See text for derivation.
c. Bank of Canada Notes and Deposits, chartered bank deposits, and some foreign currency.
d. Estimated for I 1951 to IV 1962. See Text.

Sources:

Canada, Bank of Canada, Statistical Summary (Ottawa: Bank of Canada, 1963 and later years).

Canada, Bank of Canada, Research Department, Personal Correspondence.

J. F. Graham, et al., The Role of the Trust and Loan Companies in The Canadian Economy (London: School of Business Administration, University of Western Ontario, 1965), pp. 11-60.

Ontario, Registrar of Loan and Trust Companies, Report (Toronto: Queen's Printer, 1938 and later years).

.83 of the stated rate for the 1951-1966 period.[53]

5. Credit Unions

The Canadian credit unions may be divided into two groups according to how they view their function. The French speaking Caisses Populaires think of themselves as a "savings cooperative" which will make loans to its members only under special circumstances.[54] On the other hand, the English speaking credit unions view their function as one of providing low cost loans to its members for any of a variety of reasons.[55]

The difference in philosophy has led to a marked difference in the product mix offered by the two types of credit unions. The English speaking credit unions rely mostly on shares and non-checkable deposits, with checkable deposits available only in certain areas or from a few large credit unions, as a source of funds. The sales of the Caisses Populaires are almost entirely made up of money-debt with shares often being limited to one per member.[56]

The difference in the types of "deposits" offered by

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[53]The implicit assumption is that the ratio of minimum to average balance remains constant over the period. The data for the chartered banks covering the same period seem to indicate that this assumption is justified.

[54]La Federation Des Caisses Populaires Desjardins, Brief Submitted by La Federation de Quebec des Unions Regionales des Casses Populaires Desjardins to the Royal Commission on Banking and Finance (Levis: La Federation Des Caisses Populaires Desjardins), p. 39.

[55]Royal Commission, Report, p.155. [56]Ibid., p. 159.

the credit unions has led to difficulties in estimating their money production. The only nationwide data avaiable for credit unions does not distinguish between checkable and non-checkable deposits.[57] Consequently, each region was examined individually to isolate checkable deposits.

Most credit unions and all Caisses Populaires belong to one or more of 18 voluntary regional leagues.[58] Correspond-ence and examination of publications has disclosed that two of these associations have records which provide information on the checkable deposits of its members. Luckily, these two leagues accounted for 92% of all "deposits at credit unions" in 1966.[59] Increased coverage would require an examination of each individual credit union to see if its "deposits" are checkable.

The decision as to the interest paid on checkable deposits is made by the individual credit union.[60] Consequently, some credit unions produce pure money while others produce money-debt. Interest payments are available only for an entire league. Thus, it will be assumed that each unit sells money-debt and an average rate on the checkable deposits for the

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[57]Canada, Department of Agriculture, Credit Unions in Canada (Ottawa: Department of Agriculture, 1946 and later years).

[58]Royal Commission, Report, p. 165.

[59]The 1966 Money-Debt entry of Table 6 as a percent of "deposits at credit unions" in the source cited in 57.

[60]Brief of La Federation, p. 110.

entire league will be computed. Among the Caisses Populaires, interest is computed on minimum quarterly balances.[61] No information is available concerning the charges made on chequable deposits.

Each of the leagues used in this study has a credit union "central." The "central" is a combination investment agency and "bank of last resort." The local societies are encouraged to deposit their "excess" funds in the "central" and to borrow from it when necessary.[62] The deposits of the locals in the "centrals" are not only an interest bearing asset but are also used for check clearing and other inter-local transactions. It may be argued that, given the credit unions' strong preference for "liquidity," if they did not have the "centrals" many of these deposits would be in the chartered banks. The question becomes one of deciding if all the "reserves" of the local, deposits at "centrals" plus checkable deposits in other institutions plus cash, or the consolidated position of the league, cash held by the central plus cash and checkable deposits of the locals, should be subtracted from total money output in order to obtain net money production. Unfortunately, a choice is available only for recent years because the consolidated cash positions are not available for 1950. The decision

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[61]*Ibid.*
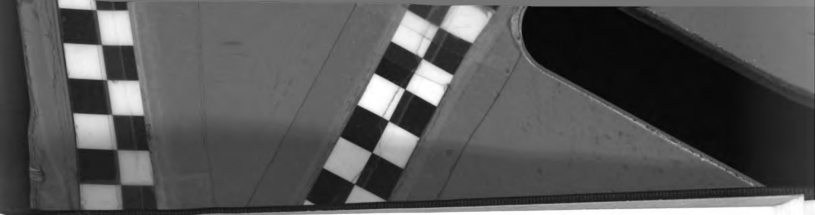
[62]Royal Commission, *Report*, p. 165.

TABLE 6

CREDIT UNIONS (QUEBEC)

Year	Reserves[a,b,c] (millions)	Money-Debt[b,c] (millions)	Rate Paid[b,c] on Money-Debt (Percent)	Money Portion of Money-Debt (millions)	Net Output (millions)	Net Money (millions)
1939	2.6	13.4	2.23	5.2	2.6	10.8
1940	3.5	14.9	2.19	5.8	2.3	11.4
1941	5.1	18.3	2.05	7.2	2.1	13.2
1942	7.7	25.6	1.93	10.7	3.0	17.9
1943	10.8	41.9	1.81	17.7	6.9	31.1
1944	15.3	69.1	1.76	29.6	14.3	53.8
1945	16.0	91.6	1.87	34.7	18.7	75.6
1946	24.7	127.4	1.69	51.6	26.9	102.7
1947	26.7	153.7	1.70	59.4	32.7	127.0
1948	31.2	173.1	1.76	56.8	25.6	141.9
1949	31.5	186.9	1.82	51.9	20.4	155.4
1950	30.7	198.5	1.82	50.4	19.7	167.8
1951	18.2	218.7	1.78	74.5	56.3	200.5
1952	20.4	249.7	1.75	98.0	77.6	229.3
1953	18.0	278.4	1.83	111.4	93.4	260.4
1954	19.9	304.7	1.91	127.8	107.9	284.8
1955	26.4	346.7	1.92	138.0	111.6	320.3
1956	30.9	401.5	1.94	173.1	142.2	370.6
1957	36.1	459.4	2.04	205.4	169.3	423.3
1958	40.8	525.9	2.13	240.9	200.1	485.1

Year						
1959	45.2	587.7	2.17	274.3	229.9	542.5
1960	56.0	628.7	2.19	337.6	281.6	577.7
1961	56.9	706.8	2.12	378.9	312.0	639.9
1962	70.3	735.6	2.21	388.2	317.9	665.3
1963	80.1	806.3	2.23	442.3	362.0	726.0
1964	87.8	887.6	2.30	418.3	330.5	799.8
1965	95.7	999.0	2.34	533.4	437.7	903.3
1966	108.9	1120.3	2.27	651.1	542.2	1011.4

a. 1939-1950, includes deposits of local Caisses in "centrals."
b. 1962-1966, includes only Caisses Populaires Desjardins.
c. The fiscal year of all Caisses is assumed to end on June 30.

Sources:

Canada, Department of Agriculture, Credit Unions in Canada (Ottawa: Department of Agriculture, 1945 and later years.)

La Federation Des Caisses Populaires Desjardins, Brief Submitted by La Federation de Quebec des Unions Regionales des Caisses Populaires Desjardins to the Royal Commission on Banking and Finance (Levis: La Federation Des Caisses Populaires Desjardins, 1962), pp. 138-174.

La Federation Des Caisses Populaires Desjardins, Memoire (Levis: La Federation Des Caisses Populaires Desjardins, 1967), pp. 37-56.

La Federation Des Caisses Populaires Desjardins, Research Department, Personal Correspondence.

Giles Mercure, Credit Unions and Caisses Populaires, Working paper prepared for the Royal Commission on Banking and Finance (Ottawa: Royal Commission on Banking and Finance, 1962), Appendix II. Table V.

Quebec, Quebec Bureau of Statistics, Quebec Statistical Annual (Quebec City: Quebec Bureau of Statistics, 1940 and later years).

III. The Money Supply Series

The information provided in Tables 2 through 6 may be used to construct a number of different money series. The "net output" and the "net money" entries of each producer may be combined into parallel series differing only by the debt component of money-debt. The summation of the net output of each producer would then correspond to what may be called a "traditional" concept of money. In other words, money-debt is included in the supply of money at its nominal value. The use of the net money entries allows the construction of a money series based on the analysis presented earlier, i.e. the debt component has been estimated and eliminated. These two series may then be used to test the validity of implications derived from the hypothesis presented in Section I.

Unfortunately, equivalent data is not available from every producer for each time period. Consequently, a number of pairs of series were constructed differing in coverage and time span. Each pair is presented and discussed below.

The basic quarterly series, Q_u and Q_a, runs from the first quarter 1939 to the fourth quarter 1966, and includes the production of the government, chartered banks, and the Quebec Savings Banks. Unfortunately, the comparison rates and the rates paid on money-debt, used to estimate the debt component of money-debt, could be computed only on a yearly basis. Consequently, Q_a, the series from which the

debt portion has been eliminated, is not a truly independent quarterly series. Its time trend within each year should be identical with that of Q_u, the unadjusted series. The major discontinuity in Q_a would appear between the fourth and the first quarter, when the new money-debt adjustment factor is applied. In order to minimize this discontinuity and to facilitate graphical comparisons, both Q_u and Q_a were seasonally adjusted by means of repeated applications of a ratio to moving average method. The seasonally adjusted series are entitled Q_u^s and Q_a^s.

Figure 1 presents Q_u^s and Q_a^s in graphical form along with reference cycle turning points.[63] As expected, the levels and the time profiles of the two series are almost identical. The fourth to first quarter discontinuities in Q_a^s cause the sign of the rate of growth of this series to differ from that of Q_u^s in seven of the twenty six opportunities. However, only two of this, from the fourth quarters of 1954 and 1957, are of significant magnitude. In both instances the rate of growth of Q_u^s is positive while that of Q_a^s is negative and this change in sign preceeds a trough in the reference cycle by about one year. However, Figure 2 dispels any hope that Q_a^s may be a better cyclical predictor than Q_u^s. The two instances mentioned above prove

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[63]Keith Hay, "Money and Cycles in Post Confederation Canada," <u>Journal of Political Economy</u>, 75 (June, 1967), 263-273.

FIGURE 1

Net Money and Net Output
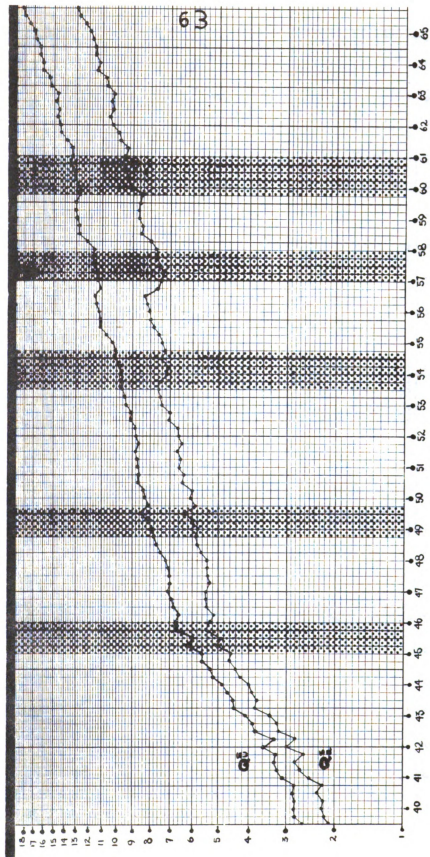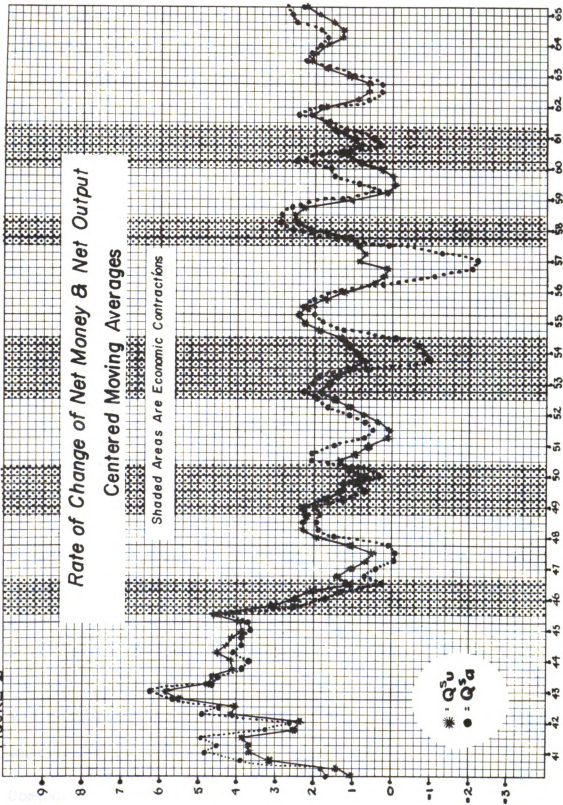
Shaded Areas Are Contractions

Figure 2

Rate of Change of Net Money & Net Output
Centered Moving Averages

Shaded Areas Are Economic Contractions

Q^s_m = *
Q^s_o = •

to be simply extentions of an already declining rate of growth
with the troughs in Q_a^S coinciding with those of Q_u^S.

The similarity of the two series is more strikingly
demonstrated in Figure 2 where centered five quarter moving
averages of the rates of growth of Q_u^S and Q_a^S are plotted.
The cyclical profile, with the exception of the downturns
in 1948, 1954, and 1958, and the turning points of the two
series are almost identical. Thus, the discovery of differ-
ences in the cyclical behavior of the two series, if they
exist, must await more sophisticated analytical tools.

Another quarterly series, running from the first
quarter 1951 to the fourth quarter 1966, was computed in
order to include the quarterly data of the Trust and Loan
Companies. The estimated net output and money production of
these institutions, presented in Table 5, is small and
probably would cause little change to the previous series
if it were simply added when it became available.[64] In the--
possibly vain--hope of providing data as free as possible from
exogenous influences, separate series, Q_u' and Q_a' and their
seasonally adjusted counterparts $Q_u's$ and $Q_a's$, were constructed
which cover the period when quarterly Trust and Loan in-
formation is available. No separate analysis of these series
was attempted because the small increase in coverage should

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[64]The net output and net money of the Trust and Loan
Companies is probably underestimated to a greater degree than
that of any other producer. These companies are not as insig-
nificant and the data in Table 5 seems to indicate. See
above, pp. 47--54.

have little effect on cyclical behavior.

The use of annual average net output and net money production will enable series to be constructed which will incorporate data from all producers in every time period. The yearly series, M_u and M_a, run from 1939 to 1966 and, because of the inclusion of the credit unions, constitutes a major improvement in coverage. Also, the corresponding entries of the two series are independent in the sense that the money-debt adjusting factor differs in each period.[65] Thus, the differences between the two series should be capable of detection with relatively simply statistical tools.

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[65]This is reflected in the fact that the simple correlation between the rates of change of M_u and M_a is .335 while that of Q_u and Q_a is .856.

TABLE 7

QUARTERLY NET OUTPUT (Q$_u$)
(millions)

Quarter	I	II	III	IV
Year				
1939	2533	2533	2656	2839
1940	2822	2810	2876	2868
1941	3108	3238	3303	3313
1942	3617	3363	3783	3918
1943	4117	4476	4480	4765
1944	4861	5236	5304	5721
1945	5642	6225	6008	6780
1946	6730	6622	6830	7036
1947	7105	7007	6998	7231
1948	7230	7486	7660	7929
1949	7912	8148	8456	8189
1950	8375	8384	8637	8786
1951	8713	8694	8738	8777
1952	8800	8853	9098	9227
1953	9426	9551	9616	9783
1954	9752	9816	10083	10213
1955	10342	10732	11029	11285
1956	11191	11405	11430	11297
1957	11364	11380	11524	11824
1958	11660	12152	12751	12949
1959	12937	13052	12909	12963
1960	12834	13081	13141	13676
1961	13451	13449	13885	14601
1962	14509	14808	14524	15075
1963	14735	15301	15412	16285
1964	16135	16422	16370	17005
1965	17040	17567	17874	18625
1966	18279	18629	18975	19620

Sources:
  Tables 1 to 6.

TABLE 8

QUARTERLY NET MONEY (Q_a)
(millions)

Quarter	I	II	III	IV
Year				
1939	1957	1985	2085	2249
1940	2257	2266	2316	2313
1941	2511	2732	2764	2730
1942	3072	2805	3172	3342
1943	3422	3824	3743	4043
1944	4010	4396	4353	4786
1945	4579	5191	4852	5649
1946	5428	5253	5399	5619
1947	5556	5437	5391	5613
1948	5415	5673	5799	6057
1949	5862	6067	6341	6070
1950	6117	6140	6394	6550
1951	6636	6628	6649	6682
1952	6797	6841	7051	7158
1953	7402	7501	7518	7763
1954	7155	7140	7338	7482
1955	7360	7668	7864	8189
1956	8052	8221	8173	8049
1957	7474	7461	7510	7876
1958	7735	8094	8487	8747
1959	8722	8787	8623	8877
1960	9202	9408	9383	9966
1961	9467	9428	9771	10544
1962	10260	10507	10157	10806
1963	10259	10754	10736	11694
1964	11311	11570	11389	12073
1965	12012	12488	12621	13380
1966	13164	13470	13686	14404

Sources:
  Tables 1 to 6.

TABLE 9

QUARTERLY NET OUTPUT, SEASONALLY ADJUSTED (Q_u^s)
(millions)

Quarter	I	II	III	IV
Year				
1939			2675	2808
1940	2826	2815	2897	2837
1941	3112	3243	3327	3277
1942	3622	3369	3811	3876
1943	4123	4484	4513	4714
1944	4868	5245	5343	5660
1945	5650	6236	6053	6707
1946	6740	6634	6881	6961
1947	7116	7019	7050	7154
1948	7249	7499	7717	7844
1949	7924	8162	8519	8101
1950	8388	8399	8702	8692
1951	8726	8709	8803	8683
1952	8814	8869	9166	9128
1953	9441	9568	9688	9679
1954	9767	9833	10158	10104
1955	10358	10751	11112	11165
1956	11208	11425	11516	11176
1957	11382	11400	11610	11698
1958	11678	12174	12846	12811
1959	12957	13075	13006	12825
1960	12854	13104	13239	13530
1961	13472	13473	13989	14445
1962	14532	14835	14633	14914
1963	14758	15328	15527	16111
1964	16160	16451	16493	16824
1965	17067	17599	18008	18427
1966	18308	18663		

Sources:
   Tables 1 to 6.

TABLE 10

QUARTERLY NET MONEY, SEASONALLY ASJUSTED (Q_a^s)
(millions)

Quarter	I	II	III	IV
Year				
1939			2119	2200
1940	2270	2267	2354	2263
1941	2526	2733	2809	2670
1942	3090	2806	3224	3269
1943	3442	3825	3804	3955
1944	4034	4398	4424	4682
1945	4607	5193	4931	5526
1946	5461	5255	5487	5497
1947	5589	5439	5479	5491
1948	5448	5675	5894	5926
1949	5897	6069	64445	5938
1950	6154	6142	6499	6408
1951	6676	6631	6758	6537
1952	6838	6844	7167	7003
1953	7447	7504	7641	7597
1954	7198	7143	7458	7320
1955	7405	7671	7993	8011
1956	8101	8224	8307	7875
1957	7519	7464	7633	7705
1958	7782	8097	8626	8557
1959	8775	8791	8765	8685
1960	9258	9412	9537	9750
1961	9524	9432	9931	10316
1962	10322	10511	10324	10572
1963	10321	10759	10912	11441
1964	11380	11575	11576	11812
1965	12085	12493	12828	13090
1966	13244	13476		

Sources:
  Tables 1 to 6.

TABLE 11

QUARTERLY NET OUTPUT AND NET MONEY, INCLUDING TRUST AND LOAN COMPANIES ($Q_u^!$ and $Q_a^!$)

Net Output
(millions)

Quarter	I	II	III	IV
Year				
1951	8910	8892	8938	8959
1952	8993	9052	9301	9412
1953	9632	9762	9830	9985
1954	9958	10029	10325	10454
1955	10606	11006	11317	11556
1956	11476	11683	11700	11555
1957	11643	11661	11815	12092
1958	11950	12465	13072	13277
1959	13284	13391	13253	13257
1960	13162	13404	13478	14013
1961	13830	13823	14280	14995
1962	14925	15227	14956	15487
1963	15157	15750	15916	16783
1964	16649	16947	16880	17523
1965	17619	18186	18482	19193
1966	18839	19239	19597	20231

Net Money
(millions)

Quarter	I	II	III	IV
Year				
1951	6693	6689	6715	6731
1952	6859	6910	7123	7209
1953	7473	7575	7594	7827
1954	7212	7195	7411	7549
1955	7421	7728	7934	8244
1956	8122	8292	8236	8094
1957	7528	7517	7568	7914
1958	7801	8167	8552	8819
1959	8815	8881	8716	8935
1960	9316	9517	9494	10074
1961	9590	9545	9891	10657
1962	10369	10612	10279	10905
1963	10365	10867	10885	11828
1964	11453	11706	11496	12169
1965	12157	12637	12772	13486
1966	13293	13629	13860	14567

Sources:
    Tables 1 to 6.

TABLE 12

QUARTERLY NET OUTPUT AND NET MONEY, INCLUDING TRUST AND LOAN COMPANIES, SEASONALLY ADJUSTED

(Q$_u$'s and Q$_a$'s)

Net Output (millions)

Quarter	I	II	III	IV
Year				
1951			6827	6565
1952	6913	6921	7242	7032
1953	7531	7587	7721	7634
1954	7268	7207	7535	7363
1955	7479	7741	8066	8041
1956	8185	8306	8373	7895
1957	7587	7529	7694	7719
1958	7862	8180	8695	8602
1959	8884	8896	8861	8715
1960	9389	9533	9652	9826
1961	9665	9561	10056	10395
1962	10450	10629	10451	10637
1963	10446	10885	11067	11537
1964	11543	11725	11688	11870
1965	12252	12658	12985	13155
1966	13397	13652		

Net Money (millions)

Quarter	I	II	III	IV
Year				
1951			8985	8848
1952	9844	9067	9350	9296
1953	9686	9778	9881	9862
1954	10014	10046	10379	10325
1955	10666	11024	11376	11413
1956	11541	11703	11761	11412
1957	11709	11681	11877	11943
1958	12017	12486	13141	13113
1959	13359	13414	13323	13093
1960	13236	13427	13549	13840
1961	13908	13846	14355	14810
1962	15009	15253	15035	15296
1963	15243	15777	16000	16575
1964	16743	16976	16969	17307
1965	17719	18217	18579	18956
1966	18946	19272		

Sources:
    Tables 1 to 6.

TABLE 13

YEARLY NET OUTPUT AND NET MONEY (M_u AND M_a)

Year	Net Output (M_u) (millions)	Net Money (M_a) (millions)
1939	4373	2717
1940	5263	2916
1941	6563	3313
1942	8337	3745
1943	9043	4551
1944	9826	5412
1945	9840	6320
1946	9821	5487
1947	10361	7336
1948	12003	7860
1949	12905	8488
1950	14161	8883
1951	16588	9125
1952	18654	9419
1953	19294	10062
1954	19032	10477
1955	20737	11441
1956	23166	11975
1957	24011	12226
1958	25011	13176
1959	26482	13838
1960	27433	14087
1961	28250	14875
1962	30653	15814
1963	32869	16628
1964	35397	17800
1965	38919	19273
1966	43306	20487

Sources:
Tables 1 to 6.

CHAPTER III

SOME EMPIRICAL ISSUES

I. Introduction

The central hypothesis of this study is that only a portion of the value of checkable deposits that earn explicit interest should be considered as money. The implications of this analysis were derived only insofar as it was necessary to construct specific money series. The novelty of this approach, and the time constraint placed on the author, has not allowed inferences to be made which would enable a direct test of this hypothesis. However, it was felt that some of the statistical properties of the data gathered should be presented.

The demand for money was chosen as a topic which could display the attributes of the constructed money series. Consequently, several classical money demand specifications are fitted to money series derived in Chapter II. However, in this chapter, precise theoretical analysis is kept to a minimum. Results which, on an intuitive level, support the hypothesis are noted but will not be examined in detail. Other findings which bear on more general

topics in monetary analysis will also be discussed. Thus, this section is intended to be simply a presentation of characteristics of the constructed series which might be worthy of future study and not a rigorous test of the pre-ceeding analysis.

II. The Demand for Money in Canada

A. General Comments

The demand for money may be viewed as a partial equilibrium model or as one of the many interdependent markets of the economic system. In the single equation model, it is assumed that the actual money stock is equal to the demanded stock and then the money series is regressed against in number of variables which are thought to repre-sent magnitudes which influence the demand for money. The regression coefficients are then interpreted as represent-ing the parameters of the demand for money function.[1]
The same empirical specification of independent and depend-ent variables may, according to a different model, describe a reduced form of a sector of the economic system. The estimated parameters are then subject to an entirely differ-ent interpretation. This possibility of error in speci-fying the underlying model should be kept in mind when

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[1]It may be argued that, on a macro level, the train of causation runs from money to the "independent" variables. See A. A. Walters, "The Demand for Money-The Dynamic Proper-ties of the Multiplier," Journal of Political Economy, 75 (June, 1967), 293.

interpreting the results which will be presented.

The various series of Chapter II were constructed so as to facilitate testing of the treatment of money-debt. Corresponding series are identical except that the debt component is eliminated in one but included in the other. Thus, the various specifications may be run using both series and the results compared to see if they shed any light upon the validity of the hypothesis underlying their construction.

Assuming that the analysis of Chapter II is correct, that interest bearing and checkable deposits are not entirely money, it is not at all clear what differences should be expected between the regressions of the independent variables on the Net Output and the Net Money series. The Net Output series supposedly contains a non-money, a pure debt, component. But debt is probably influenced by the same factors, income, prices, and the interest rate, that affect the demand for money. Thus, unless further information can be obtained concerning the effect of the independent variables on the demand for debt, very little can be said about the differences between the Net Output and the Net Money regressions. All money demand specifications were run for the Net Output and the Net Money series and the results will be presented side by side. However, the differences in the results will not be discussed unless an intuitive explanation can be given.

The usual specification for the demand for money has income or wealth, in real or nominal form, as the scale variable and the interest rate representing the alternative costs of holding money. Various simple formulations involving these variables will be run using several of the series derived in Chapter II.

Net National Product, in nominal and deflated terms, was chosen as the appropriate counterpart to "income." All of the income series available from the Dominion Bureau of Statistics are highly correlated and give almost identical results. Net National Product was selected because its definition seemed to correspond most closely to the theoretical concept of income. Current income is available in both yearly and, beginning in 1947, quarterly form. In order to facilitate comparisons, most specifications will be presented using quarterly, yearly, and permanent income data.

B. The Interest Rate

The alternative costs of holding money can best be described with an index of all interest rates. In the absence of such an index, individual rates are included in the specification in the hope that their characteristics conform, more or less closely, to that of the entire spectrum of rates.[2]

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[2]David Laidler, "Rate of Interest and the Demand for Money," Journal of Political Economy, LXIV (December, 1966), 547.

On the basis of a priori knowledge, one is unable to state
which of a number of different rates would perform best in
the various specifications. Consequently, a number of long
and short rates on both government and private bonds were
included in the various models in this study.

None of the interest rates chosen gave consistently
significant results in the quarterly formulation of the de-
mand for money. The only rate which seems at all related to
the money series is the end of quarter rate on three month
Treasury Bills. However, the coefficients yielded by the
current value of this rate, presented in equations Q_1 and
Q_2, are either insignificant or of the "wrong" sign.

It seems plausible that a quarter may be too short
a time span for money balances to be adjusted for changes in
the interest rate. Consequently, a first difference and
percentage change specification, used to eliminate multi-
collinearity, of the parameters in the current and the
previous time period was run, and the results are presented
in equations Q_3 and Q_4. As in the previous results, the cur-
rent value of the interest rate yields insignificant results.
However, the values of the interest rate parameters lagged
one period to show a significantly negative coefficient.
Thus, the results would not be inconsistent with a hypothesis
which stated that, due to either a lack of information or the
difficulty and costs of altering a portfolio, the demand for
money adjusts to interest changes only with a lag of several

time periods.

In contrast to the interest rate, changes in income do seem to have an immediate impact on the demand for money. In three of the four multi-period specifications, the sign of the current income parameter is positive and significant. Equations (Q^4) and (Q_4') yield the somewhat inexplicable result that the effect of lagged income is negative. This could be rationalized with a hypothesis which stated that, initially, the demand for money over reacts to change in income. Consequently, a change in the opposite direction is required in the following period.

Both the Treasury Bill rate and the rate on long term government bonds yield acceptable and significant results in the yearly and permanent income models. Comparison of the elasticities of the long and short rates, presented in Table 15, seem to indicate that the numerical values of the long rate are significantly larger than those of the short rate. Similar results have led other investigators to conclude that the "demand for money in Canada is more sensitive to changes in the long rate than in the short rate."[3] Strictly speaking, this conclusion is a proper interpretation of the estimated elasticities. However, it is not correct to go one step further and infer that the

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[3] G. S. Laumas and P. Formuzis, "The Demand for Money," _Canadian Journal of Economics_, I (August, 1968), 694.
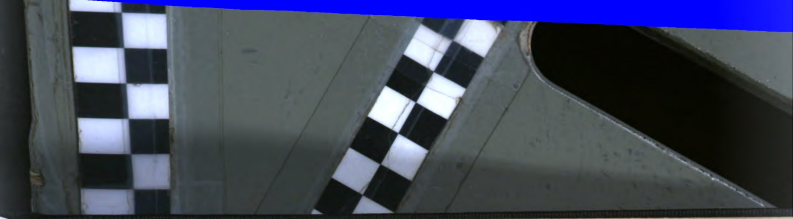
TABLE 14

DEMAND FOR MONEY: LINEAR SPECIFICATION [a]

Quarterly Model

(Q1) $*$ Q_u = 1687.11 + .9899 Y + 75.391 r - 2066.18 D_1
(75.54)   (.1014)   (62.366)^s (218.20)
.0005   .0005   .231   .0005

1478.18 D_2 - 691.17 D_3
(166.57)   (104.72)
.0005   .0005

R^2 = .6307   D.W. = 1.89   rho = .9

(Q1') $*$ Q_a = 1371.01 + .7678 Y + 6.825 r_s - 1762.81 D_1
(69.10)   (.0928)   (57.050)   (199.61)
.0005   .0005   .905   .0005

1262.35 D_2 - 776.45 D_3
(152.37)   (95.81)
.0005   .0005

R^2 = .5983   D. W. = 2.18   rho = .9

(Q2) $*Q_u/P$ = 1594.08 + .6908 Y/P + 55.502 r_s - 1531.77 D_1
(76.59)   (.1186)   (56.306)   (257.05)
.0005   .0005   .328   .0005

1084.40 D_2 - 597.68 D_3
(189.85)   (102.72)
.0005   .0005

R^2 = .4261   D.W. = 1.78   rho = .9

(Q2') $*Q_a/P$ = 1332.66 + .6349 Y/P - 11.055 r_s - 1542.09D_1
(70.08)   (.1084)   (51.520)   (235.20)
.0005   .0005   .831   .0005

1096.84 D_2 - 746.15 D_3
(173.72)   (93.98)
.0005   .0005

R^2 = .5005   D.W. = 2.23   rho = .9

(Q3) ΔQ_u^t = .2579 ΔY^t + .0683 ΔY^{t-1} + 49.24 Δr_s^t - 119.93 Δr_s^{t-1}
(.1124)   (.1082)   (43.92)   (43.94)
.025   .529   .266   .008

TABLE 14--continued.

$$- 628.8 \; D_1 - 395.7 \; D_2 - 315.5 \; D_3 + 465.0 \; D_4$$
$$(236.6) \quad (392.9) \quad (228.0) \quad (152.9)$$
$$.010 \qquad .294 \qquad .171 \qquad .003$$
$$R^2 = .3299 \qquad\qquad D.W. = 2.48$$

(Q3') $\Delta Q_a^t = .3057 \; \Delta Y^t + .1165 \; \Delta Y^{t-1} - 1.089 \; \Delta r_s^t - 115.54 \; \Delta r_s^{t-1}$
$$(.1267) \qquad (.1219) \qquad (49.520) \qquad (49.54)$$
$$.018 \qquad .343 \qquad .983 \qquad .023$$

$$- 835.7 \; D_1 - 491.3 \; D_2 - 409.3 \; D_3 + 507.7 \; D_4$$
$$(266.7) \qquad (262.6) \qquad (257.1) \qquad (172.5)$$
$$.003 \qquad .066 \qquad .116 \qquad .004$$
$$R^2 = .4602 \qquad\qquad D.W. = 2.54$$

(Q4) $\%Q_u^t = .0605 + .0468 \; \%Y^t - .0637 \; \%Y^{t-1} + .0117 \; \%r_s^t$
$$(.0081) \; (.0319) \qquad (.0309) \qquad (.0088)$$
$$.0005 \quad .147 \qquad .043 \qquad .191$$

$$- .0232 \; \%r_s^{t-1} - .0307 \; D_1 - .0378 \; D_2 - .0494 \; D_3$$
$$(.0089) \qquad (.0306) \qquad (.0120) \quad (.0123)$$
$$.011 \qquad .316 \qquad .011 \qquad .001$$
$$R^2 = .4085 \qquad\qquad D.W. = 2.41$$

(Q4') $\%Q_a^t = .0706 + .1313 \; \%Y^t - .0628 \; \%Y^{t-1} + .0099 \; \%r_s^t$
$$(.0130) \; (.0514) \qquad (.0497) \qquad (.0143)$$
$$.0005 \quad .013 \qquad .211 \qquad .488$$

$$-.0310 \; \%r_s^{t-1} - .0790 \; D_1 - 10737 \; D_2 - .0832 \; D_3$$
$$(.0144) \qquad (.0200) \quad (.0194) \qquad (.0197)$$
$$.034 \qquad .0005 \qquad .0005 \qquad .0005$$
$$R^2 = .4776 \qquad\qquad D.W. = 2.33$$

Yearly Model

(Y1) $M_u = 2771.04 + .5817 \; Y - 654.69 \; r_1$
$$(699.05) \quad (.0339) \quad (334.69)$$
$$.001 \qquad .0005 \qquad .062$$
$$R^2 = .981 \qquad\qquad D.W. = .406$$

(Y1') $M_a = 2702.78 + .3357 \; Y - 485.15 \; r_1$
$$(514.78) \; (.0249) \quad (245.92)$$
$$.0005 \quad .0005 \qquad .061$$
$$R^2 = .975 \qquad\qquad D.W. = .464$$

TABLE 14--continued

(Y2) * M_u = 548.53 **+** .3424 Y - 64.75 r_s
    (154.53) (.0452)   (111.45)
    .002   .0005   .567
    R^2 = .737   D.W. = 1.12   rho = .9

(Y2') M_a = 1283.31 + .3897 Y - 700.06 r_s
    (360.68) (.0347)   (229.49)
    .002   .0005   .006
    R^2 = .952   D.W. = 1.88

(Y3) M_u/P = 3499.2 **+** .5363 Y/P - 895.83 r_1
    (764.2) (.0841)   (481.79)
    .0005   .0005   .076
    R^2 = .863   D.W. = .3997

(Y3') M_a/P = 4240.2 **+** .3153 Y/P - 684.70 r_1
    (583.0) (.0642)   (367.57)
    .0005   .0005   .075
    R^2 = .753   D.W. = .419

(Y4) * Mu/P = 991.18 **+** .1654 Y/P - 51.405 r_s
    (314.18) (.1026)   (160.777)
    .004   .083   .753
    R^2 = .125   D.W. = 1.11   rho = .9

(Y4') M_a/P = 1457.88 **+** .4021 Y/P - 822.51 r_s
    (1054.78) (.0475)   (264.89)
    .176   .0005   .005
    R^2 = .729   D.W. = 1.73

Permanent Income Model

(p1) * M_u = 3620.4 **+** .4457 Yp - 52.109 r_s
    (1341.2) (.0433)   (86.353)
    .011   .0005   .552
    R^2 = .836   D.W. = 1.35   rho = .9

(P1') M_a = 1349.2 **+** .4315 Y_p - 752.65 r_s
    (357.1) (.0390)   (236.68)
    .001   .0005   .004
    R^2 = .951   D.W. = 2.047

TABLE 14--continued.

(P2) * $M_u = 4127.4 + .4996 \, Y_p - 486.30 \, r_1$
$(1152.9) \, (.0425) \quad (182.44)$
$.002 \qquad .0005 \qquad .014$
$R^2 = .871 \qquad D.W. = 1.379 \qquad rho = .9$

(P2') $M_a = 3567.2 + .3539 \, Y_p - 791.22 \, r_1$

$(817.8) \quad (.0390) \qquad (366.29)$
$.0005 \qquad .0005 \qquad .041$
$R^2 = .941 \qquad D.W. = 1.44$

(P3) * $M_u/P = 3349.6 + .4327 \, y_p - 127.71 \, r_s$
$(1381.6) \, (.0833) \qquad (147.22)$
$.088 \qquad .0005 \qquad .394$
$R^2 = .5715 \qquad D.W. = 1.33 \qquad rho = .8$

(P3') $M_a^a/P = 1471.6 + .4314 \, y_p - 850.59 \, r_s$
$(865.0) \, (.0598) \qquad (224.78)$
$.102 \qquad .0005 \qquad .001$
$R^2 = .788 \qquad D.W. = 2.18$

(P4) * $M_u/P = 3590.1 + .5575 \, y_p - 853.80 \, r_1$
$(1533.0) \, (.0831) \qquad (292.48)$
$..028 \qquad .0005 \qquad .008$
$R^2 = .674 \qquad D.W. = 1.33 \qquad rho = .8$

(P4') $M_a/P = 4595.7 + .3614 \, y_p - 883.50 \, r_1$
$(678.9) \, (.0616) \qquad (358.40)$
$.0005 \qquad .0005 \qquad .021$
$R^2 = .731 \qquad D.W. = 1.41$

SYMBOLS

Quarterly Model

Q_u - Non-seasonally adjusted quarterly Net Output.

Q_a - Nonseasonally adjusted quarterly Net Money.

P - Quarterly implicit price deflator.

Y - Quarterly Net National Product, seasonally adjusted.

r_s - End of quarter paid on three month Treasury Bills.

D_i - Seasonal dummies.

TABLE 14--continued.

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* - Equation fitted using first order autoregressive scheme

rho- Value of first order autocorrelation coefficient.

<u>Yearly and Permanent Income Models</u>.

M_u - Annual average Net Output.

M_a - Annual average Net Money.

P - Implicit price deflator.

Y - Net National Product.

Y_p - Permanent income, in nominal terms.

y_p - Permanent real income.

r_s - Annual average rate paid on three month Treasury Bills.

r_l - Annual average rate paid on long term Dominion Bonds.

p - Permanent price level.

* Equation fitted using first order autoregressive scheme.

rho- Value of first order autocorrelation coeffecient.

long rate is, in some sense, "more important" than the short
one. Theory implies, and inspection of the Canadian data
confirms, that fluctuations in the short rate are larger
than those in the long rate.[4] Thus, when a given stock of
money is regressed against these two rates, one would expect
the estimated coefficient on the long rate to be larger than
that of the short rate.

Another author uses the higher R^2, obtained in his
results, of the short rate to justify its choice as correct.[5]
The use of this technique on the evidence presented in this
study has, at least, doubtful validity. The failure of a
first order autogressive scheme to yield acceptable Durban-
Watson values in many of the equations may indicate the
presence of higher order autocorrelation or other serious
specification errors. It would, of course, be nice to
point to one rate as truly representing the alternative
costs of holding money. But, until better criteria are de-
veloped, the choice of a "correct" rate, if it exists,
must be postponed.

C. Income and Prices

Other empirical studies have used current income,
non-human wealth, and permanent income, assumed to be a proxy

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[4]R. A. Musgrave, The Theory of Public Finance, (New
York: McGraw Hill Book Company, 1959), p. 596.

[5]David Laidler, The Rate of Interest, p. 547.

for total wealth, as scale variables in the demand for money.
Unfortunately, a series of non-human wealth is not available,
to the best of the author's knowledge, for Canada. However,
values for permanent income were computed using the yearly
values of Net National Product and a series of expotentially
declining weights.[6] Thus, two of the three commonly used
scale variables employed by others are represented in the
money demand estimates.

The analysis of Chapter II was constructed under the
assumption that money, just as all other capital goods, was
demanded for the services which it rendered. The amount of
money in a wealth portfolio is usually assumed to be directly
related to the size of the portfolio. If wealth is zero,
the demand for money will also be zero. Thus, combined with
one of the usual linearizing assumptions needed for empirical
testing, this analysis leads to the often investigated
hypothesis that the demand for money has unit elasticity
with respect to wealth.[7]

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[6]These weights were kindly provided by G. L. Laumas
and P. Formuzis. It will be assumed that the same adjustment
process is appropriate for real income and the price level.
Thus, permanent prices and permanent real income are calcu-
lated using the same weights as permanent income.

[7]Most studies assume, as is done here, that the cor-
rect specification is linear in the untransformed variables
or in logs. However, Zaremka has demonstrated that these two
specifications are simply limiting cases of the general form.
See Paul Zaremka, "Functional Form of the Demand for Money,"
Journal of the American Statistical Association, 63 (June,
1968), 502-511.

Alternative analysis, which seems to imply a differ-
ent hypothesis, states that the demand for money is directly
related to transactions, represented by current income. Since
the purpose of money is to facilitate transactions, the demand
for money may be expected to be positively related to the
number, or value, of transactions. If transactions were
zero, the demand for money, because there is then no use
for this type of good, would also be zero. Thus, this analy-
sis also implies a unit elasticity with respect to this
scale variable.

These two hypothesis, despite their use of different
scale variables, are not in conflict. An increase of items
in a wealth portfolio can be obtained, in a money economy,
only by undertaking transactions. Thus, it is quite use-
less to argue whether the increase in wealth or transactions
is the cause of an increase in the demand for money.

Equations (Y5) through (Y8) and (P5) to (P8) in Table 15,
seem to indicate an estimated elasticity of close to unity
for the demand for money with respect to current yearly and
permanent income. However, the quarterly elasticities,
presented in (Q5) and (Q6) are much lower than the corres-
ponding yearly and permanent income estimates.

The quarterly, yearly, and permanent income elastici-
ties of the demand for money display a characteristic found
in the demand for many other goods: namely, the value of the
elasticity increases as the time period represented by the

data points is lengthened. Thus, it may be more appropriate
to view the income variables in light of an expectation
process rather than the simple wealth or transactions hy-
potheses presented above. A very simple version of this
hypothesis would state that permanent income is a "long run"
estimate of "expected" income, or the return on wealth, in
that it allows the incorporation of, properly weighted,
realized incomes of many past periods. Yearly and quarterly
income are shorter run estimates because they incorporate
progressively fewer periods.

If an expectation process of the above type is
assumed, then one may expect that the income elasticity of
the demand for money would approach unity as "expected"
income is approximated. In other words, quarterly, yearly,
and permanent income, being progressively better estimates
of "expected" income, would yield elasticities closer and
closer to one.

As was previously stated, the quarterly estimates of
the income elasticities are substantially below those of the
yearly and permanent income models. However, the estimates
of the current yearly and permanent elasticities are all
quite close to unity. Thus, one is unable to distinguish be-
tween the effect of yearly and permanent income. In other
words, if the long run elasticity is one, this evidence seems
to indicate that the entire adjustment is completed

TABLE 15

DEMAND FOR MONEY: LOG SPECIFICATION [a]

Quarterly Model

(Q5) * $\log(Q_u)$ = .3232 + .2900 log(Y) + .0367 log(r_s)
     (.0158) (.0507)   (.0165)
      .0005 .0005   .029

     -.0459 D_1 - .0344 D_2 - .0171 D_3
     (.0084)   (.0066) (.0042)
      .0005   .0005   .0005

     R^2 = .43242   D.W. = 1.19   rho = .9

(Q5') * log (Q_a) = .2938 + .3593 log (Y) + .0245 log (r_s)
     (.0181) (.0582)   (.0189)
      .0005 .0005   .199

     - .0635 D_1 - .0316 D_2 - .0463 D_3
     (.0097)   (.0048) (.0075)
      .0005   .0005   .0005

     R^2 = .5069   D.W. = 1.69   rho = .9

(Q6) * log (Q_u/P) = .3552 + .1837 log (Y/P) + .0263 log (r_s)
     (.0152) (.0491)   (.0142)
      .0005 .0005   .069

     - .0303 D_1 - .0223 D_2 - .0144 D_3
     (.0080)   (.0032) (.0036)
      .0005   .001   .0005

     R^2 = .3051   D.W. = 1.42   rho = .9

(Q6') * log(Qa/P) = .3207 + .2699 log(Y/p) + .0147 log (r_s)
     (.0187) (.0605)   (.0175)
      .0005 .0005   .403

     - .0504 D_1 - 10372 D_2 - .0294 D_3
     (.0099)   (.0076) (.0094)
      .0005   .0005   .0005

     R^2 = .4264   D.W. = 1.90   rho = .9

(Q7) * $\log(Q_u)$ = .3609 + .1644 log(y) + 1.0869 log (P)
     (.0158) (.0513)   (.2246)
      .0005 .002   .0005
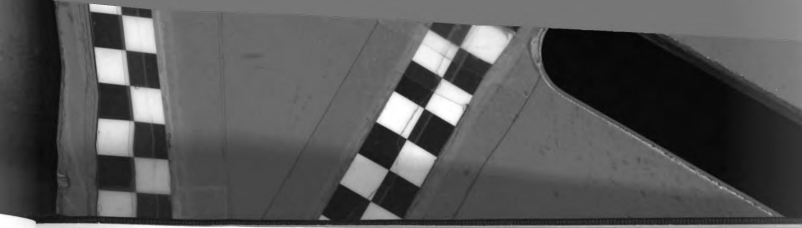
TABLE 15--continued.

$+$ .0216 log(r_s) $-$ .0275 D_1 $-$ .0199 D_2 $-$ .0141 D_3
  (.0147)   (.0083)   (.0064)   (.0036)
   .147   .001   .0005   .0005

$$R^2 = .5766 \qquad D.W. = 1.536 \qquad rho = .9$$

(Q7') * log(Q_a) $=$ .3232 $+$ .2617 log(Y) $+$ .8453 log(P)
         (.0197) (.0639)   (.2797)
           .0005   .0005   .003

$+$ .0127 log(r_s) $-$ .0492 D_1 $-$ .0367 D_2 $-$ .0292 D_3
  (.0183)   (.0103)   (.0080)   (.0046)
   .489   .0005   .0005   .0005

$$R^2 = .5631 \qquad D.W. = 1.942 \qquad rho = .9$$

Yearly Model

(Y5) log(M_u) $= -$.4411 $+$ 1.1058 log(Y) $-$ .4813 log(r_1)
        (.2404) (.0726)   (.1463)
         .079   .0005   .003
$$R^2 = .966 \qquad D.W. = .467$$

(Y5') log(M_a) $=$ .0865 $+$ .9349 log(Y) $-$ .3741 log(r_1)
        (.2359) (.0713)   (.1436)
        .717   .0005   .016

$$R^2 = .957 \qquad D.W. = .445$$

(Y6) log(M_u) $= -$.8520 $+$ 1.1432 log(Y) $-$ .1540 log(r_s)
        (.2888) (.0692)   (.0413)
        .007   .0005   .001

$$R^2 = .974 \qquad D.W. .749$$

(Y6') log(M_a) $= -$.8685 $+$ 1.1175 log(Y) $-$ .2147 log(r_s)
        (.2925) (.0700)   (.0418)
        .007   .0005   .0005

$$R^2 = .966 \qquad D.W. = 2.008$$

(Y7) log(M_u/P) $= -$.5473 $+$ 1.1186 log(Y/P) $-$ .4043 log(r_1)
        (.4637) (.1217)   (.1338)
        .250   .0005   .006

$$R^2 = .873 \qquad D.W. = .518$$

TABLE 15--continued.

(Y7') $\log(M_a/P) = .1089 + .9448 \log(Y/P) - .4698 \log(r_1)$
    (.5467) (.1434)   (.1577)
    .844   .0005   .007

$R^2 = .7346$ D.W. = 1.207

(Y8) $\log(M_u/P) = - .8835 + 1.1467 \log(Y/P) - .1157 \log(r_s)$
    (.5801) (.1351)   (.0403)
    .141   .0005   .008

$R^2 = .869$ D.W. = .599

(y8') $\log(M_a/P) = -.9015 + 1.1220 \log(Y/P) - .1838 \log(r_s)$
    (.5759) (.1342)   (.0399)
    .131   .0005   .0005

$R^2 = .809$ D.W. = 1.786

(Y9) $\log(M_u) = .4844 + .8399 \log(Y) + .6035 \log(P)$
    (.7223) (.1652)   (.3020)
    .509   .0005   .058

     $- .1571 \log(r_s)$
     (.0389)
     .001

$R^2 = .9776$ D.W. = .799

(Y9') $\log(M_a) = .2021 + .8748 \log(Y) + .4830 \log(P)$
    (.7548) (.1727)   (.3157)
    .791   .0005   .140

     $- .2171 \log(r_s)$
     (.0407)
     .0005

$R^2 = .9689$ D.W. = 2.139

Permanent Income Model

(P5) $\log(M_u) = - .5545 + 1.0855 \log(Y_p) - .1455 \log(r_s)$
    (.1583) (.0384)   (.0239)
    .002   .0005   .0005

$R^2 = .990$ D.W. = 1.36

(p5') $\log(M_a) = - .4950 - 1.0412 \log(Y_p) - .1953 \log(r_s)$
    (.2415) (.0585)   (.0365)
    .057   .0005   .0005

$R^2 = .972$ D.W. = 2.332

TABLE 15--continued.

(P6) $\log(M_u) = .0344 + 1.0056 \log(Y_p) - .3591 \log(r_1)$
(.1181)   (.0366)   (.0846)
.773   .0005   .0005

$R^2 = .986$ D.W. = .349

(P6') $\log(M_a) = .2851 + .9024 \log(Y_p) - .3924 \log(r_1)$
(.1911)(.0593   (.1369)
.149   .0005   .009

$R^2 = .954$ D.W. = 1.271

(P7) * $\log(M_u/P) = -.0426 + 1.0873 \log(y_p) - .3294 \log(r_1)$
(.0562)   (.1392)   (.1006)
.453   .0005   .003

$R^2 = .752$ D.W. = 1.216   rho = .7

(P7') $\log(M_a/P) = -.5796 + .8285 \log(y_p) - .3684 \log(r_1)$
(.4072)   (.1076)   (.1262)
.167   .0005   .008

$R^2 = .961$ D.W. = 1.069

(P8) $\log(M_u/P) = -.5946 + 1.0873 \log(y_p) - .1092 \log(r_s)$
(.2696)   (.0633)   (.0201)
.037   .0005   .0005

$R^2 = .961$ D.W. = 1.069

(P8') $\log(M_a/P) = -.3936 + 1.0112 \log(y_p) - .1632 \log(r_s)$
(.3991)   (.0937)   (.0296)
.334   .0005   .0005

$R^2 = .872$ D.W. = 2.376

(P9) $\log(M_u) = -.1052 + .9845 \log(Y_p) + .2328 \log(p) - .1564 \log(r_s)$
(.5280) (.1196)   (.2609)   (.0270)
.844   .0005   .381   .0005

$R^2 = .991$ D.W. = 1.445

(P9') $\log(M_a) = -.0632 + .9441 \log(y_p) + .2237 \log(p) - .2058 \log(r_s)$
(.8135)(.1843)   (.4019)   (.0416)
.939   .0005   .583   .0005

$R^2 = .972$ D.W. = 2.326

[a]Symbols defined in Table 1.
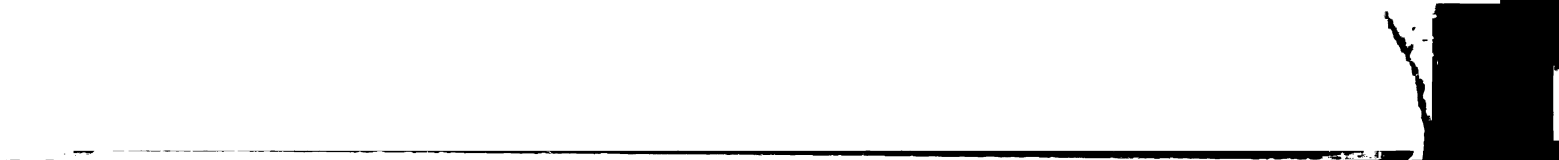
within one year.[8]

It has been asserted that the approximate equality
of the coefficients on the real and nominal scale variables
implies that the demand for money is homogeneous one in
prices.[9] Similar comparisons for the results of this study,
i. e. comparing (Y6) and (Y6') with (Y8) and (Y8') could
lead to the same conclusions.

Rather than relying on indirect inference, the price
level was explicitly included in the quarterly, yearly, and
permanent income models. The results are presented in (Q7),
(Y9), and (P9). A disturbing phenomenon is observed when
the estimated price elasticities in the three models are
compared. The price elasticities are close to one in the
quarterly formulation, the yearly elasticities are about
.55, and the permanent price elasticities are not signifi-
cantly different from zero. If these estimates are accurate,
they imply that changes in prices have no long run effect
on the demand for nominal balances. This is certainly con-
trary to the accepted notion of the reaction of the demand
for money to price level changes.

An explanation which would rationalize these

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[8]An alternative hypothesis stating that the differ-
ence between the effect of current yearly and permanent in-
come is not accurately measured with this specification
is presented below.

[9]Allen H. Meltzer, "The Demand for Money: The Evi-
dence from Time Series," *Journal of Political Economy*,
LXXI (June, 1963), 225.

elasticities is obtained by assuming that the "true" money demand specification is

(III-1) $\log (M/P) = a + b \log (Y/P) - c \log (r)$.

This specification may than be rewritten as

(III-2) $\log (M) = a + b \log (Y) + (1-b) \log (P) - c \log (r)$.

Thus, if (III-1) is the correct specification of the model, the coefficient on $\log (P)$ in (III-2) is really an independent estimate of the real income elasticity.

In the quarterly case, the coefficients of $\log (P)$ in (Q7) and (Q7') are, taking account of the standard errors, approximately equal to one minus the estimated coefficients on $\log (Y)$. These indirect estimates are also not inconsistent with the direct estimates of the real income elasticities presented in (Q5) and (Q5'). Likewise, all of the estimates of the permanent real income elasticities are not far from the predicted value of unity. However, in the yearly current income model, the coefficients on $\log (P)$ predict real income·elasticities of about .55 while the coefficients on $\log (Y)$ in (Y7) and (Y8) are not significantly different from unity.

The two sets of estimates of the elasticity of the demand for money with respect to current yearly income are in conflict. The direct estimates indicate an elasticity of close to unity, which is not significantly different from the permanent income estimates. On the other hand, the indirect estimate of the current real income elasticity, just

presented, is about one half that of the direct estimate.

Consecutive values of yearly current income are highly correlated with each other and with permanent income. Thus, current income may be a proxy for permanent income which results in estimates of permanent, rather than current, income elasticities. In an attempt to obtain estimates free from this serial correlation, the relevant series were converted to percentage change. Then, the following form was run using the transformed data of the quarterly, yearly, and permanent income models,

(III-3) $\% M = b \ \% Y.$

Where $\%$ represents percentage change and Y is current or permanent income. Using this specification, b would be a direct estimate of the income elasticity.

The estimated elasticities for the quarterly data are presented in Table 3, equations (Q8) and (Q9). They are lower than, but of approximately the same magnitude as, the estimates obtained from the various log specifications. Also, they are consistent with the estimates obtained from the coefficients on log (P) in Table 15, equations (Q6) and (Q6'). Thus, all the estimates seem to imply that, even in a period as short as a quarter, the demand for money begins to adjust to changes in income.

The results, in both real and nominal terms, for current yearly and permanent income are also presented in (Y10), (Y11), (P10), and (P11) in Table 16. The estimated

TABLE 16

DEMAND FOR MONEY: PERCENTAGE CHANGE ELASTICITY ESTIMATES[a]

$$(Q8) \quad \%Q_u = \underset{\substack{(.0328)\\.045}}{.0669} \%Y - \underset{\substack{(.0081)\\.988}}{.0001} D_1 + \underset{\substack{(.0054)\\.072}}{.0100} D_2 + \underset{\substack{(.0046)\\.634}}{.0022} D_3$$

$$+ \underset{\substack{(.0061)\\.0005}}{.0329} D_4$$

$$R^2 = .2841^b \qquad\qquad D.W. = 2.269$$

$$(Q8') \quad \%Q_a = \underset{\substack{(.0508)\\.004}}{.1505} \%Y - \underset{\substack{(.0127)\\.086}}{.0220} D_1 + \underset{\substack{(.0071)\\.918}}{.0009} D_2 - \underset{\substack{(.0085)\\.396}}{.0061} D_3$$

$$+ \underset{\substack{(.0094)\\.0005}}{.0592} D_4$$

$$R^2 = .4242^b \qquad\qquad D.W. = 2.245$$

$$(Q9) \quad \%Q_u/P) = \underset{\substack{(.0434)\\.093}}{.0737} \%(Y/P) - \underset{\substack{(.0102)\\.325}}{.0102} D_1 + \underset{\substack{(.0068)\\.783}}{.0019} D_2 - \underset{\substack{(.0060)\\.440}}{.0047} D_3$$

$$+ \underset{\substack{(.0081)\\.003}}{.0251} D_4$$

$$R^2 = .2002^b \qquad\qquad D.W. = 1.886$$

$$(Q9') \quad \%(Q_a/P) = \underset{\substack{(.0599)\\.006}}{.1684} \%(Y/P) - \underset{\substack{(.0142)\\.021}}{.0334} D_1 - \underset{\substack{(.0094)\\.410}}{.0077} D_2 - \underset{\substack{(.0084)\\.181}}{.0113} D_3$$

$$+ \underset{\substack{(.0112)\\.0005}}{.0536} D_4$$

$$R^2 = .3647^b \qquad\qquad D.W. = 2.084$$

<u>Yearly Model</u>

$$(Y10) \quad \%M_u = \underset{\substack{(.1106)\\.0005}}{.5865} \%Y$$

$$R^2 = -.7197^b \qquad\qquad D.W. = .6311$$

TABLE 16--continued.

(Y10') $\%M_a = \underset{(.2093)}{.7614} \%Y$
.001

$\qquad R^2 = .061^b \qquad$ D.W. = 2.814

(Y11) $\%(M_u/P) = \underset{(.1590)}{.4286} \%(Y/P)$
.012

$\qquad R^2 = -.1665^b \qquad$ D.W. = .9673

(Y11') $\%(M_a/P) = \underset{(.2876)}{.5700} \%(Y/P)$
.058

$\qquad R^2 = .014^b \qquad$ D.W. = 2.737

Permanent Income Model

(P10) $\%M_u = \underset{(.0912)}{.8160} \%Y_P$
.0005

$\qquad R^2 = .1223^b \qquad$ D.W. = .8503

(P10') $\%M_a = \underset{(.2357)}{.9195} \%Y_p$
.001

$\qquad R^2 = .1060^b \qquad$ D.W. = 2.941

(P11) $\%(M_u/P) = \underset{(.1549)}{.7519} \%(y_p)$
.0005

$\qquad R^2 = .216^b \qquad$ D.W. = 1.216

(P11') $\%(M_a/P) = \underset{(.3266)}{.8356} \%(y_p)$
.015

$\qquad R^2 = .101^b \qquad$ D.W. = 2.906

a. Symbols defined in Table 1.
b. When the constant is restricted to zero, R^2 is defined as unity minus the Sum of Squares Regression divided by the Sum of Squares of the dependent variable about its mean. Thus, it may be negative and does not reflect the significance of the estimated relation.

yearly elasticities are all significantly lower than the direct log estimates of Table 15, equations (Y5) through (Y8), and different from one. The permanent income elasticities for the Net Output series are also significantly different from the log estimates and from unity. However, the permanent income elasticities of the Net Money series are quite close to the log estimates and are not different from unity.

Conveniently, the elasticities estimated in this way may be arranged in ascending order as one moves from the short to the long run. The quarterly income elasticities are the lowest, the yearly are larger and significantly lower than one, and the permanent income elasticities are close to unity. These results would not contradict a hypothesis which stated that the long run income elasticity of the demand for money is unity and that the estimated values tend toward this limit as one extends the time period allowed for adjustment. The period needed to adjust money holdings to a change in income is certainly longer than a quarter and probably greater than a year.

The estimated permanent income elasticities of Net Output and Net Money present a rather puzzling situation. The Net Output elasticities, in (P10) and (P11) are not statistically different from the corresponding Net Money estimates, but they are significantly less than unity. One may expect that the income elasticity of debt is larger than

that of money. This would tend to increase the elasticity of Net Output over that of Net Money.[10] Thus, these results are somewhat inconsistent with the hypothesis concerning the debt component in Net Output.[11]

D. Adjustment Processes in the Demand for Money

In order to more carefully examine the adjustment process implied in the various demand functions, a variant of a stock adjustment model was estimated. It is assumed that the long run "desired" stock of money is a function of "expected" income and interest rates.

(III-4) $M^d = b_0 + b_1 Y^e - b_2 r^e$.

The superscripts "e" and "d" denote "expected" and "desired" magnitudes. The observable stock of money is related to the "desired" by means of an adjustment mechanism.

(III-5) $M_t = M_{t-1} + s(M_t^d - M_{t-1})$.

M_t is the observed stock of money and "s" represents the amount of the divergence from the "desired" made up in one period. When the variables are in log form, "s" is the elasticity of adjustment. Substituting into (III-4) for M^d, we obtain,

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[10]For example, Friedman's well known conclusion that M_2 is a luxury good.

[11]The author has estimated that the elasticity of Trust and Loan Company Debentures, a pure debt item similar to Personal Savings Deposits, with respect to current yearly income is about 1.15. If the permanent income elasticity for the debt component of money-debt is similar to that of

(III -6) $M_t = sb_0 + (1-s)M_{t-1} + sb_1 Y^e - sb_2 r^e.$

Unfortunately, the inclusion of "expected" interest rates and income imply similar adjustment mechanisms for these variables. When these mechanisms are substituted into (III-6), these are not sufficient conditions to determine all parameters.[12] Thus, it is necessary to choose values for "expected" interest rates and income such that they already reflect the adjustment process.[13]

Evidence from the United States seems to show that the adjustment of interest rates is completed in one year.[14] Thus, it would be reasonable to include the current value of this variable. Previous analysis has implied that the elasticity of the demand for money with respect to wealth, or long run "expected" income is unity. Reversing the logic, one may say that the unitary elasticity, found in nearly all the specifications, implies that permanent income

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Debentures, the "predicted" elasticity of Net Output might not be too much larger than that of Net Money.

[12]Edgar Feige, "Expectations and Adjustments in the Monetary Sector," American Economic Review, XVII (May, 1967), 462-473.

[13]For example, one study did not consider the adjustment in income and, using the current value of this variable, obtained a quarterly estimate of .32 for "s". If there actually exists an adjustment in income, this estimate is much too high. See R. Teigen, "Demand and Supply Functions for Money in the United States," Econometrica, XXXII (October, 1964), 488-489.

[14]Feige, p. 470.

has taken account of all the adjustments in this variable.
Therefore, using current interest and permanent income, one
is left with only the lag in money balances. Estimation of
(III-6) will then lead to a direct estimate of the rate of
adjustment in money.

The estimates of (III-6) are presented in Table 17
equations (P12) and (P13). In both log and non-log form,
the adjustment coefficient of Net Output is about .3 and
that of Net Money .65. These estimates seem to imply that,
in each period, twice as much of the divergence is made up
in the Net Money as in the Net Output series. However, in
neither case, is the entire discrepancy eliminated in one
period. For the United States, it was found that the ad-
justment coefficient of M_2, which contains time deposits,
a debt item, was below that of M_1. But neither was
statistically different from unity.[15] Thus, the Canadian
results would not be inconsistent with a hypothesis stating
that the money holdings in a wealth portfolio are brought
into equilibrium faster than debt items.[16]

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[15]Feige, p. 470.

[16]However, these results are also not inconsistent
with a hypothesis stating that consumers are slower in ad-
justing their discrepancies of money holdings than are
firms. The Net Output series includes Personal Savings
Deposits, which are held mostly by individuals, at their
nominal value. The Net Money series give Personal Savings

TABLE 17

DEMAND FOR MONEY: STOCK ADJUSTMENT SPECIFICATION[a]

Permanent Income Model

(P12) $M_u^t = 1264.95 + .7335\ M_u^{t-1} + .1796Y_p^t - 312.11\ r_1^t$
$\quad\quad\quad\quad(384.16)\ (.0878)\quad\quad\ (.0504)\quad (129.09)$
$\quad\quad\quad\quad\ \ .001\quad\ \ \ .0005\quad\quad\quad\ .002\quad\quad\ .024$

$\quad\quad\quad R^2 = .998 \quad\quad\quad\quad\quad D.W. = 1.235^b$

(P12') $M_a^t = 2520.86 + .3023\ M_a^{t-1} + .2772\ Y_p^t - 536.26\ r_1^t$
$\quad\quad\quad\quad(1057.76)(.2009)\quad\quad\ (.0862)\quad (395.17)$
$\quad\quad\quad\quad\ \ .026\quad\quad\ .146\quad\quad\quad\ .004\quad\quad\ .188$

$\quad\quad\quad R^2 = .9465 \quad\quad\quad\quad\quad D.W. = 1.235^b$

(P13) $\log(M_u^t) = .1601 + .7118\ \log(M_u^{t-1}) + .2515\ \log(Y_p^t)$
$\quad\quad\quad\quad\quad(.0610)(.0796)\quad\quad\quad\quad\quad\ (.0861)$
$\quad\quad\quad\quad\quad\ .015\quad\ .0005\quad\quad\quad\quad\quad\ \ .008$

$\quad\quad\quad\quad\quad - .0795\ \log(r_s^t)$
$\quad\quad\quad\quad\quad\ (.0514)$
$\quad\quad\quad\quad\quad\ \ .135$

$\quad\quad\quad R^2 = .997 \quad\quad\quad\quad\quad D.W. = .859^b$

(P13') $\log(M_a^t) = .3005 + .3814\ \log(M_a^{t-1}) + .5261\ \log(Y_p^t)$
$\quad\quad\quad\quad\quad\quad(.1801)\ (.1887)\quad\quad\quad\quad\ (.1994)$
$\quad\quad\quad\quad\quad\quad\ .109\quad\ .055\quad\quad\quad\quad\quad\ .013$

$\quad\quad\quad\quad\quad - .2029\ \log(r_1^t)$
$\quad\quad\quad\quad\quad\ (.1594)$
$\quad\quad\quad\quad\quad\ \ .216$

$\quad\quad\quad R^2 = .961 \quad\quad\quad\quad\quad D.W. = 2.184^b$

a. Symbols defined in Table 1.

b. The Durban-Watson Statistic has doubtful validity when a
   lagged value of the dependent variable is used. See Marc
   Nerlove, and Kenneth Wallis, "Use of Durban-Watson Statis-
   tic in Inappropriate Situations," Econometrica, Vol. 34,
   No. 1, pp. 235-238.

The differences between the speed of adjustment of Net Output and Net Money is consistent with the percentage change estimates of the income elasticities. In the quarterly and yearly estimates, the elasticity of the Net Output series is below, although sometimes insignificantly so, that of the Net Money series. The permanent income estimates of the two elasticities are quite close. Thus, the two formulations do not contradict each other in implying that the Net Money series adjusts faster to a change in income than the Net Output Series.

Deposits a smaller weight. See Harold Shapiro, "Distributed Lags, Interest Rate Expectations, and the Impact of Monetary Policy: An Econometric Analysis of a Canadian Experience," American Economic Review, LVII (May, 1967), 474.

CHAPTER IV

SUMMARY

I. Introduction

Chapter I presented the two major obstacles to the construction of a money supply series for Canada: 1. The large proportion of checkable deposits bearing explicit interest. 2. The data published by the Bank of Canada does not reflect the change in the post war Canadian money producing industry. This chapter will attempt to summarize the methods used to overcome these difficulties and the statistical findings of Chapter III.

II. Interest Bearing and Checkable Deposits

A large portion of the output of private money producers consists of interest bearing and checkable deposits. The checkability of these deposits indicates that they are money. However, the presence of explicit interest payments, characteristic of debt items, creates uncertainty as to their exact position in the money stock. Consequently, a general method for the analysis of money-debt was presented.

The marginal rates of return on each item in a wealth portfolio will, in equilibrium, be equal. Money-debt

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earns one stream of income from its use as money and another
from the explicit interest payments. Thus, the sum of these
two rates must, in equilibrium, be equal to the market inter-
est rate.

Capitalizing the two streams of income accruing to
money-debt, one has the portion of its value that is due to
it serving as money and the portion due to its being an
interest bearing debt. The first component is then included
in the money stock. Empirically, the proportion of the value
of money-debt that is not money can be estimated by the ratio
of the explicit rate paid on these deposits to the market
interest rate. Subtracting this portion from the value of
money-debt, one is left with the money component.

III. Construction of the Money Series

Derivation of the money stock from the data of many
different types of producers required the construction of a
general methodology for the classification of their outputs.
It was concluded that the only rationale for the exclusion
of the money held by any firm is that it be used as in
input in the production of money. Two major results fol-
lowed from this analysis.

The estimate of the money production of private
money producers was biased downward. Private money producers
also manufacture the type of pure debt which requires the use
of money as an input. Balances used as "reserves" against

debt production, because they are not an input for money, should not be excluded from the money stock. However, data limitations did not allow the division of money holdings of these firms into "reserves" against money and non-money output. Consequently, the net money production of these money producers was calculated by subtracting their entire money holdings from their gross output of money. The degree of underestimation, because the "reserves" held against both money and non-money production are subtracted from gross output, of the net money production of different institutions will be related to the proportion of money in their output of all goods. The firms which had the lowest proportion of money in their mix of products were the non-chartered banks. Consequently, their contribution to the money stock was greatly underestimated.

The second implication of this analysis is that the deposits of the various governmental units in the money producing industry should certainly be included in the money stock. In the present setting, they are not viewed as "reserves" against government money production and should, therefore, not be excluded.

The empirical counterpart to the market interest rate was taken to be a weighted average of the rates paid on a number of consumer debt items. Canadian money-debt is sold primarily to individuals, with its rate reflecting the risk premium prevalent in this market. Thus, the appropriate

comparison rate is on items with the same degree of risk.

Each money producer was examined in detail and his net money production was estimated. First, the debt portion of his money-debt was estimated and eliminated. Then the remainder of the value of his output of money-debt was added to his output of pure money and "reserves" were subtracted. The result was designated "Net Money." Another entry was calculated by following the same procedure but not eliminating the debt portion of money-debt. This series was titled "Net Output."

By summing across the money producers, two estimates of the money stock were obtained. The first, the sum of the Net Money of each producer, corresponds to the view that interest bearing and checkable deposits consist of a money and a non-money portion and only the former should be included in the money stock. The second, the sum of the Net Output, may represent a more traditional view of the money stock.

Identical output data was not available from each type of producer for every time period. Consequently, a number of series, differing in coverage and time interval, were constructed. The basic quarterly series runs from 1st quarter 1939 to 4th quarter 1966 but excludes a number of important producers. Complete coverage is obtained in a yearly series encompassing the same period.

The comparison rate, used to estimate the debt

portion of money-debt, was calculated only as an annual
average. Consequently, the movement of Net Money within
each year can be expected to be identical to that of Net
Output. Simple graphical comparisons of the two quarterly
series confirmed the suspicion that there is little differ-
ence between their movements over time.

IV. The Demand for Money in Canada

The demand for money was chosen as a topic which
could present the attributes of the constructed series. How-
ever, it was clearly pointed out that available hypotheses
were not sufficient to test the analysis underlying their
construction. Specifically, if the analysis is correct, then
the only difference between Net Money and Net Output is the
debt component of money-debt, included in the latter. But,
without further information concerning the demand for debt,
very little may be implied from the money demand estimates
concerning the validity of the exclusion of the debt
component.

Various specifications of the demand for money were
run using quarterly, yearly, and permanent income models.
Results for Net Money and Net Output were presented side by
side.
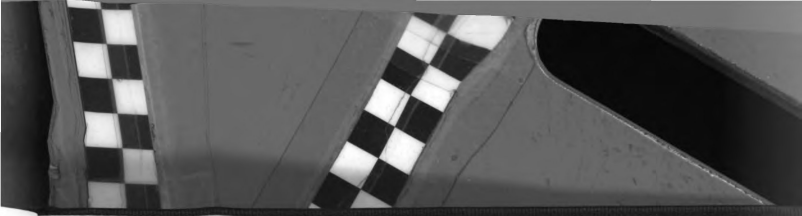
In the quarterly model, current income yielded
significant coefficients with the correct sign. However, all
interest rate variables were either insignificant or perverse
in their effect. Only in a first difference model, with the

interest rate lagged one period, were the results consistent with a priori expectations.

Current yearly income, permanent income, and rates on long and short term government bonds yielded significant coefficients with the correct sign. However, the log estimates of the elasticity of the demand for money with respect to both current yearly and permanent income were close to unity. A percentage change specification was used to distinguish between the effects of these two concepts of income. This formulation yielded a permanent income elasticity of close to unity but a much lower current income elasticity.

In most models and specifications, the estimate of the income elasticity of Net M_{o}ney was larger, although sometimes insignificantly so, than that of Net Output. In order to explicitly investigate these implications, a stock adjustment model was estimated. The results indicated that the speed of adjustment of Net Money is almost twice that of Net Output.

In summary, simple statistical techniques seem to indicate that there are differences, at least on the annual level, between the properties of Net M_{o}ney and the Net Output series. However, available hypotheses are not sufficient to test if these differences are consistent with the analysis underlying the construction of the two series.

MONEY PRODUCTION IN PRE-CONFEDERATION CANADA

I. Introduction

The cultures of the United States and Canada have developed along parallel lines. However, certain historical events have caused the institutions of the two countries to differ. Thus, even though the broad outlines are similar, one cannot generalize about the structure of specific Canadian industries from their American counterparts. In particular, the structure of the Canadian money producing industry is quite different from the American money producing industry. The differences between the current form of the two industries is, of course, the result of influences occuring throughout their histories. But two of the primary characteristics of Canadian money production, the coexistence of a regulated cartel with groups of non-regulated money producers and the production of money-debt, may be traced to events occurring prior to the Confederation.

The purpose of this section is to trace the development of the Canadian money producing industry from its inception to the time of the Confederation. The emphasis will be on the two characteristics mentioned above. The result

will not be a description of the modern Canadian money producing industry. But, hopefully, a feeling will be given for the historical context within which the modern institutions operate. Then, certain qualities of the products and the data of the modern money producers will be more meaningful.

II. Commodity Money

During the 16th, 17th, and 18th Centuries, Canada was sparsely settled frontier with only a few settlements scattered along the eastern seaboard and the Great Lakes. The economy was correspondingly primitive and simple.

In this primitive setting, most economic units were self-sufficient and production for market sale was minimal. The need for a standardized medium of exchange was small because direct barter was capable of satisfying the needs of trade. However, within certain geographic areas, different commodities were at one time or another used to eliminate the inconvenience of direct barter. Beads, blankets, and tobacco were the usual commodities chosen, with the latter even being elevated to the status of dominant money in several communities.[1]

In the populated areas, and extending somewhat into the frontier, assorted metal coins were used as money. American, British, Spanish, and Latin American coins were

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[1]Canada, The Canada Yearbook, 1938, p. 892.

used in both domestic and international trade.[2] Until the
Confederation, the various provinces designated one or the
other of the coins as specie, dominant money, and set the
prices of the other coins valid for that province.[3]

III. Paper Money

The first recorded use of paper money in Canada was
in 1685. At this time a French official cut playing cards into
quarters, wrote amounts on them, and used them to buy goods and
services.[4] This paper money worked well and was convertible on
demand into Bills of Exchange drawn on the French government.
During the next 100 years, as the French position deteriorated,
the repurchase clause was not consistently honored as sub-
sequent issues of French paper money increased the supply many
thousandfold.[5] The value of this money decreased and by 1763
its price had dropped to zero and it disappeared from use.[6]

Expectations of capital loss, derived from the French
experience, reduced the demand for paper money produced by any
government or by a firm whose major product was money.

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[2]Ibid.

[3]Victor Ross, The History of the Canadian Bank of
Commerce (Toronto: Oxford University Press, 1920), I, p. 4.

[4]Ibid., p. 5.

[5]B. E. Walker, A History of Banking in Canada (Toronto:
1920), p. 8.

[6]Ross, Bank of Commerce, pp. 3-6.

Consequently, during the 55 year period following the French and
Indian Wars several attempts to form banks met with a total lack
of interest.[7] There was, however, production of paper money by
firms whose primary business was in other areas. This money
consisted of the notes of exchange of the most prominent busi-
nessmen. The supply of these notes was very small.[8] Conse-
quently, the problems of the French with the repurchase clause
were avoided.

During the War of 1812, the British army produced
paper money in order to buy goods and services. The repurchase
clause of this money was in terms of interest bearing govern-
ment bonds.[9] The army produced only limited quantities of money
and promptly honored any demand for repayment, probably by
simply printing bonds. The Canadians became convinced that
they would not suffer a capital loss by holding this money
and the old fears and distrust of paper money disappeared.

With this example of a "well managed" paper money firmly
in mind, two groups of merchants in Montreal and one in Quebec
attempted to incorporate into firms which would produce money.
At first their incorporations as joint stock companies was re-
fused by the legislature. However, the demand for paper money
was great and the profitability of money production promised

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[7]Roeliff Morton Breckenridge, The Canadian Banking
System, 1817-1890 (Toronto: Printer Unknown, 1894), p. 8.

[8]Ross, Bank of Commerce, p. 8.   [9]Ibid., p. 9.

to be high. Consequently, these groups went ahead and operated under agreements of partnership. Finally, in 1821, the legislature granted three joint stock charters to enter the business of banking.[10]

The charters granted to these banks were probably the single most important influence on the future structure on the Canadian money producing industry. A brief outline of one charter, that of the Bank of Montreal, will serve as to represent the attributes of all. The Bank of Montreal may

1. "hold real estate only to the value of 1,000 pounds.
2. sue and be sued.
3. issue promissory notes intended to circulate as money and payable in gold or silver coin current [read dominant money] by law of the province.
4. receive deposits and deal in (a) bills of exchange, (b) discount notes of hand and promissory notes and to receive the discount at the time of negotiation, (c) deal in gold and silver coin and bullion, and (d) the sale of stock pledged for money lent but not redeemed.
5. to take and hold mortgages on real property for debts contracted in the ordinary [emphasis mine] course of the dealing, but on no account to lend on land, mortgages, nor to purchase them on any pretext except here permitted.
6. not to demand or to receive more than the lawful interest of six per cent per annum on any of its dealings.[11]
7. have total liabilities not in excess of "treble the amount of capital stock paid in, plus a sum equal to moneys deposited with it for safe keeping."[12]

Almost immediately two of the characteristics of modern Canadian banking made their appearance. To counter the

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[10]Breckenridge, System, pp. 19-21. [11]Ibid. pp. 24-25.
[12]Ibid.

entry of competitors, these three banks began to open branches in the other population centers of the province. At the same time, they began to cooperate closely in the clearing of notes and checks.[13] Through time, this cooperation was to develop into a cartel with the clearing house, by restriction of use, becoming the means for controlling members and restricting entry into the money producing industry.[14]

The production limit imposed on the banks, essentially at their own volition because the charters were but a copy of their own acts of incorporation might seem illogical. One explanation might be that they believed that their most profitable output was at some amount less that triple their paid in capital. Then, the inclusion of a maximum was simply propaganda. But this would not explain the inflexibility of establishing the unchangeable legal maximum which cannot be quickly altered if circumstances changed. A plausible explanation is obtained by remembering that the producers of money, the merchants, were also the largest demanders of money. They would gain most from having a paper money of reasonable value and be greatly hurt if the supply of money increased to such an extent that its price dropped to zero and could not be used. Thus, because of their gain as users of money outweighed their

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[13]Ibid., pp. 27-28.

[14]Joseph French Johnson, The Canadian Banking System (Washington: U.S. Government Printing Office, 1910), p. 134.

profit as producers of money, the money producers subjected themselves to this output maximum. Another aspect which is to play an important role later is the form of this production limit, which was a precedent followed in later periods. It stated that <u>total</u> "liabilities" of the bank was not to exceed triple the paid-in capital. There was no restriction on the composition of total "liabilities".

The position of the money producing cartel was enhanced by legislation of the 1830's. At this time the banking lobby was able to obtain legislation which restricted note issue to chartered banks or to institutions which were granted licenses by the legislature.[15] These acts did not mention or restrict deposits or the granting of checking privileges.

During the same period there was the first attempt to legally remove the barriers of entry into the money producing industry.[16] Several bills were proposed concerning uniform banking legislation which would allow "free banking". These attempts failed with the passage of an act in 1838 which stated that it "is inconsistent with due regard to the protection of commerce and the welfare and security of the people, that any person or number of

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[15]Breckenridge, <u>System</u>, p. 35.

[16]Roeliff Morton Breckenridge, <u>The History of Banking in Canada</u> (Washington, Government Printing Office, 1911), p. 34.

persons, some of whom may be of doubtful solvency, should
be allowed, without legislative authority, to issue
promissory notes as money.[17]

There seem to have been a few note producers out-
side the cartel operating as banks under agreements of
partnership. Their operations were either in direct con-
flict with the law or they exported their money to the
United States. In either case, these banks were of little
consequence. By 1841, all but one of them either went out
of business or were bought up by members of the cartel.[18]

In contrast to these short lived "private banks",
several non-cartel money producers began operation which
have continued to the present. The first are the "savings
banks". They were mutual organizations formed with the
stated purpose of producing a low risk debt instrument for
consumer's portfolios.[19] The second were the Building
Societies, the forerunners of the Trust and Loan Companies.
Both of these groups sought to take advantage of certain
restrictions placed on the chartered banks. Namely, the
6% maximum interest on loans and the prohibition of
lending for mortgages. The legal status of these organ-
izations was established in an act of 1855 which clarified

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[17]Breckenridge, System, p. 58.

[18]Breckenridge, History, pp. 36-37.

[19]Canada, Royal Commission on Banking and Finance,
Report (Ottawa: Queen's Printer, 1965), p. 147.
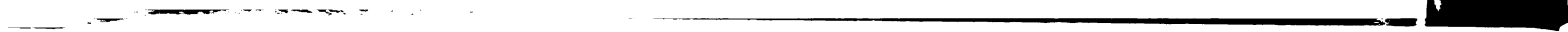
their right to borrow via debentures and deposits and to
lend for mortgages.[20] However, the status of their money
production at this time is unclear. Both deposits and
debentures paid interest and at least in several instances,
deposits were checkable up to a specified maximum.[21]

In 1850 the provinces of Upper and Lower Canada
were combined into the Province of Canada. The output
restrictions of the chartered banks, triple their paid-in
capital, had resulted in the opinion being expressed that
the supply of money was much too small to facilitate the
transactions of the Province.[22] Rather then allowing the
existing chartered banks to increase their capital, and
thus their output maximum, a "free banking act" was
passed. The provisions of this act were: 1) the pro-
duction of notes less then five shillings was prohibited.
The production of notes of more than five shillings was
restricted to "banks". 2) the barriers of entry into the
money production industry were nominally removed.[23]

The Free Banking Act of 1850 extended the privi-
lege of note issue to "other persons or corporations" which

    1. had a minimum of 25,000 $ of capital stock,

    2. had but one office, no branches.

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[20]Ibid., p. 173. [21]Ross, Bank of Commerce p. 220.

[22]Walker, A History of Banking in Canada, p. 42.

[23]Breckenridge, System, p. 106.

3. would deposit 25,000$ of provincial securities
   with the Receiver General as a redemption fund
   against possible default.[24]

This act provided for free banking in name only.
Because of the severe restrictions, only five "free" banks
were formed and only one lasted beyond the Confederation.[25]
In 1866 the Free Banking Act was repealed and Canada re-
verted back to the old system of chartered banks.[26]

The result of this experience with "free banking"
was that the position of the chartered bank cartel was so
enhanced that it has not been challenged to this day. The
failure of the "free banks" was inevitable. Superficially
it seemed as though the cartel was willing to accept
competition in return for the legal restriction of note
issue. But the barriers to entry were never really lowered.
The restrictions placed on the "free banks" were tailor made
so that success was almost impossible. Thus, in 1866, the
chartered banks could point to themselves as the only pro-
ducers who could profitably produce notes, and they were
the only institution which had the legal right to do so.

The government first began to consider the pro-
duction of money in 1860. At this time, there was a
proposal to establish a national bank of issue, or

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[24]Ibid., pp. 106-107.   [25]Ibid., pp. 113-114.
[26]Ibid., p. 116.

Treasury Department. It was defeated. However, in 1866,
the Province, being in financial trouble, decided that it
would use the profits from money production to finance its
own operations.[27] Thus, the Provincial Note Act of 1866
authorized the entry of the government into the money
producing industry.

The exact beginnings of money-debt production is
unknown. One source cites the Agricultural Bank of Toronto
paying interest on deposits in 1834. This bank is described
as a joint stock company and possibly outside the cartel.[28]
Apparently, the cartel members were at first hostile toward
this practice[29] but, by 1841, the public statements of the
chartered banks contained the entry "cash deposits bearing
interest" without comment.[30] In any event, the tradition,
and competitive necessity, of paying interest on certain
deposits was firmly established long before the confed-
eration.

In 1866, on the eve of the Confederation, the
structure of the modern Canadian money producing industry
was beginning to take shape. All of the modern producers
but two, the credit unions and the Provincial Savings

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[27]Ibid., pp. 124-137.

[28]A. B. Jamison, Chartered Banking in Canada
(Toronto: Ryerson Press, 1953), p. 6.

[29]Ibid.

[30]Walker, History of Banking in Canada, p. 40.

Offices, were in operation. The underlying causes of future difficulties in the determination of the amount of money produced, the lack of a single regulatory body and the tradition of money-debt production, were also present.

Briefly, the Canadian money producing industry as it stood in 1866 is as follows:

I. 19 chartered banks.

    A. Issued notes.

    B. Accepted deposits.

        1. Subject to checking.

        2. A portion bore interest.

    C. No explicit reserve requirement in dominant money.

    D. Output limit.

        1. Total "liabilities" cannot exceed three times paid-in capital.

        2. Composition of "liabilities" unimportant.

II. Government production just beginning.

III. Savings Banks and Building Societies.

    A. Could not issue notes.

    B. Checkability of deposits unknown, but probable.

    C. Paid interest on deposits.

    D. No output limit.
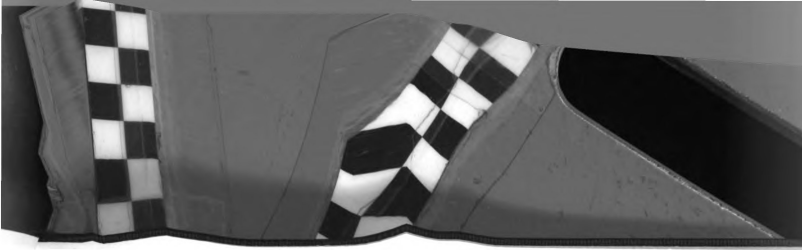
APPENDIX II

"ACTIVE BANK DEPOSITS

            The Bank of Canada compiled and published, from
1946 to 1957, a series entitled "Active Notice Deposits."
Superficially, the rationale and the method for the con-
struction of this series bears a striking resemblance to
the approach used in this study. But, on further ex-
amination, the concept of money implied by this series is
very different from the one employed in Chapter II.

            "Active Notice Deposits" was derived from total
"Notice Deposits", Personal Savings plus Other Notice
Deposits, and purported to take into account the low turn-
over of Notice Deposits.[1] The Bank of Canada felt that,
because the number of checks written on Notice Deposits was
far below that written on Demand Deposits, some correction
should be made so not to overstate the contribution of
Notice Deposits to the money supply. They recognized the
fact that, because of the explicit interest payments,
Notice Deposits were also held as a non-money asset. They
wished to include only the money portion in the money supply.
They reasoned that the money portion of Notice Deposits

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[1]The information concerning the methods and motives
for this series was obtained from a number of interviews with
W. E. Scott, the Inspector General of Banks, and his staff
and the Research Department of the Banks of Canada during
December, 1967.

would have checks written against them, be "active," and that the remainder would remain stationary, "inactive," in the accounts.

The method used by the chartered banks for the computation of interest payments on Notice Deposits allows accurate estimation of "inactive Notice Deposits" to be made. Actual interest payments are computed by applying the announced rate and the actual interest payments, the minimum balance, the amount against which no checks were written in that period of time, can be computed. Subtracting the minimum balance from total Notice Deposits, "Active Notice Deposits" is obtained.[2]

Reformulating the Bank of Canada's analysis using the terminology of Chapter II: abstracting from costs, "Active Notice Deposits" earn only an explicit rate of return equal to the announced rate r_d. Presumably, in equilibrium, $r_m = r_d = r$, all rates equal the market rate. But, at least in recent history, the announced rate has been below the market rate. Therefore, in order for the minimum balances, the "inactive" portion, to be held in wealth portfolios, an additional stream of income must accrue to them in order to bring their total rate of

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[2]The fact that some Notice Deposits are non-checkable tends to overestimate "Active Notice Deposits." Normal cash withdrawals from a non-checkable account would result in a decrease of minimum balances in the same way as writing a check.

return to approximately the level of the market rate. The
hypothesis will be set forth that this additional rate of
return is a money rate, equivalent to r_m. Thus, a part of
minimum balances should be included in the money supply
even though they were not spent in the unit of time.

The concept of money implied by Bank of Canada's
rationale has some very strange characteristics. In es-
sence, the capital good money is defined in an ex post
sense. A dollar of Notice Deposits is included in the
money supply only if a check has been written against it,
if it has been used to facilitate exchange, in a period of
time. If this approach would be applied to other capital
goods its lack of generality would be obvious. The supply
of automobiles would include only those driven in a period
of time. A dollar bill would not be money if it remained
in a person's wallet or safe.

The problem arises because this definition of a
capital good depends on the unit of time chosen. If an ob-
ject is used for a certain purpose during this period of
time, it is a capital good. If it remains idle, it is not
a capital good, even if it were used in the previous period
and will be used again the following period. Most capital
goods are not in continuous use. By their nature they are
used only when needed, resulting in periods of idleness.
Simply because a good is not used in one period of time does
not imply that it is not capable of use, that it is not a

capital good. Periods of activity and idleness vary be-
tween capital goods. Short of infinity, no one unit of
time can be chosen such that all capital goods are in use.
Rather, the definition of a capital good should not be in
terms of its use during one period of time.

Economics is often concerned with the change in
behavior associated with the possession, or non-possession,
of certain capital goods. Defining money in terms of one
of its effects in a period of time results in an incomplete
view of the consequences. For example, an increase in the
quantity of money may increase the amount of money used in
transactions. But, part of the increase may be held for
later expenditures or as a permanent addition to a wealth
portfolio. By only looking at the amount of money that is
spent, one only sees that portion of the increase that has
been allocated to a particular use during this period of
time. Only one form of behavior, spending, is allowed to
be affected by a change in the quantity of money.

Despite the fact that "Active Notice Deposits"
imply a narrow concept of money, the originators of this
approach must be given credit for being the only ones to
attempt to adjust for the debt component of money-debt.
They intuitively saw that, because these deposits bore an
explicit return, they would be held in wealth portfolios
both as money and an interest bearing asset. The problem
arose because of their attempt to measure the money

component. Their definition results in measuring the portion of the money component which has been used in a certain way. It does not measure the money component itself. In other words, "Active Notice Deposits" measure the result of behavior, not the magnitude which influences behavior.[3]

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[3]There is no reason to believe that two identical capital goods would be used with the same intensity. Thus, the large differences between the turnover rates of Demand Deposits and Notice Deposits does not, by itself, imply that Notice Deposits are not entirely money. Even after adjusting for the inactive portion, the turnover rates of "Active Notice Deposits," that portion which was used as money, is still much below that of Demand Deposits.

TABLE 18

RATES OF TURNOVER

Year	Demand Deposits	Active Notice Deposits	Notice Deposits (Total)
1943	30.39	7.55	1.20
1944	31.16	7.31	1.16
1945	31.49	7.20	1.19
1947	28.45	6.63	1.17
1948	29.86	7.27	1.16
1949	34.02	7.35	1.13
1950	33.00	8.29	1.27
1951	35.04	8.79	1.37
1952	35.19	8.16	1.32
1953	34.46	9.22	1.51
1954	38.11	8.65	1.39
1955	38.53	9.02	1.44
1956	43.01	9.64	1.46

Source:
  Bank of Canada Statistical Summary, 1946, 1954.
  Cheques Cashed in Canada, D. B. S. , 1967.
  Canada, Bank of Canada, Statistical Summary (Ottawa: Bank of Canada, 1946 and 1954).
  Canada, Dominion Bureau of Statistics, Cheques Cashed in Canada, 1966 (Ottawa: Queen's Printer, 1967), p. 32.

APPENDIX III

AVERAGE OF MARGINAL RATE ?

Most Canadian money producers compute interest payments on money-debt by applying the announced rate to the minimum balance in a period of time. This practice may be though to create problems because the rate on moneydebt used in Chapter II is computed by taking the interest payments and dividing by the average balance in a period of time. Thus, the rate used is an average rate which, at first glance, may not seem to be equal to the marginal rate.

Let us divide money-debt into two portions: (1) the minimum balance in a period of time, and (2) the "active" portion. Abstracting from explicit costs, the first earns interest equal to the announced rate, the second earns no explicit interest.

The "active" portion of money-debt earns no interest and is obviously money. The only stream of income is that obtained from its use as money.
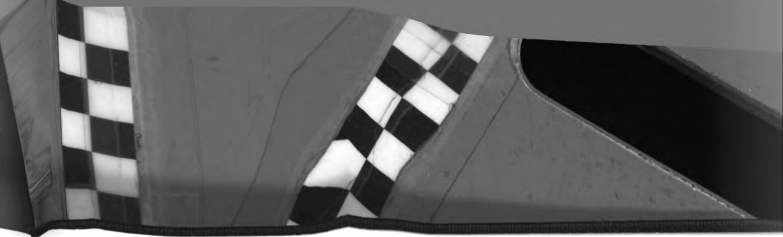
Assume that the announced rate on money-debt is below the market interest rate. Then, the minimum balances earn a rate below its alternatives. The differences between the market rate and the announced rate must be

caused by the balances earning a money rate. As was dis-
cussed in Appendix II, money does not have to be spent in
order for it to be money. An amount of the minimum balance
equal to the discounted present value of the money stream
of income is just as much money as are the "active" bal-
ances. For the lack of a better term, the portion of mini-
mum balances which are money may be called "idle balances."
Or, they may be used to satisfy the "precautionary demand
for money."

It is not necessary to divide money-debt into
"active" and minimum balances in order to compute the
quantity of money. Assume $1000 of money-debt, an an-
nounded rate of 2%, a market rate of 5%, and the minimum
balance of $800. Three-fifths, $480, of the value of the
minimum balance must be money. When the "active" portion
is included, the total quantity of money is $680. The ef-
fective rate on money-debt (.02(800)/1000) is 1.6%. From
this it would be concluded that $(1 - 1.6/5) = .68$ or $680,
of money-debt is money. Both methods give the same answer.

This analysis implies that the difference in rates
applies to the changing of the form in which money is held.
The marginal cost of switching from "idle" to active bal-
ances, and thus lowering the minimum balances, is equal to
the announced rates.

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