THE DETERMINANTS OF BANK BORROWING

UNDER THE FINANCE ACT,

1914 - 1934

by

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We accept this thesis as conforming
to the required standard

THE UNIVERSITY OF BRITISH COLUMBIA

September, 1967
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Date September 30, 1967
The Finance Act (1914-34) provided the chartered banks with rediscounting facilities. During World War I, these facilities became part of the banks' regular means of cash adjustment. Subsequently, a controversy arose whether or not the chartered banks rediscounted for private gain. In defence of the banks, Sir Thomas White stated that the banks always borrowed sparingly because of the wish neither to incur the cost involved nor to be heavily indebted to the Treasury.

The purpose with the thesis is to test Sir Thomas' hypothesis. In order to do so, the hypothesis had to be revised; that is, the difference between the rate charged for advances and the cost of alternative means of adjustment (the least-cost spread) was substituted in the hypothesis for the simple cost determinant.

By the use of indifference curve analysis, certain criteria for testing the hypothesis were developed and used in testing data for borrowing by the aggregate as well as the individual banks.
The evidence showed that the revised hypothesis was overgeneralized both in its description of the banks' use of the Act and in its explanation of the causal relationships. Thus, in terms of both volume and duration of borrowing, the facilities of the Act were used extensively by several banks. Both the least cost spread and the aversion to be indebted appeared to be crucial determinants of borrowing. The strength of the relationships, however, varied significantly among the banks. In particular, for the more conservative banks, the aversion to borrowing was strong at any level of indebtedness. For the other banks, the aversion was apparent only at levels of heavy indebtedness.
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CHAPTER I

INTRODUCTION

Origin of the Finance Act

The Finance Act was designed to meet a banking crisis at the outbreak of World War I. At that time a world wide financial panic led to the closing of bourses and stock exchanges in the great financial centres. Both in England and in the U.S.A., emergency measures were taken to provide the banks with additional liquidity to meet an abnormal demand for cash.

In Canada there was fear that the gold standard could not be maintained if access to the capital market in London was disrupted by a war. During the last days in July a heavy demand for gold arose among the public. Especially in Toronto

---

1On August 1, 1914 Bank of England made an emergency issue of notes. This issue was authorized by Parliament on August 6, 1914 when the banks also were given the opportunity to obtain the new currency on loan from the government to be able to meet any abnormal demand for Bank of England notes.

In the United States, gold payments were temporarily informally suspended and emergency bank note issues were made under the Aldrich-Vreeland Act of 1908 on the collateral of commercial paper.
and Montreal, notes and deposits were converted into gold which was hoarded in deposit boxes.

There was no provision in the Bank Act to deal with the situation which was developing. Many runs throughout the country showed that the public was becoming panicky, and the banks' cash reserves would be insufficient to meet nationwide withdrawals of deposits into Dominion notes and gold. The situation was made worse by the fact that the banks' secondary reserves in the form of call loans in New York and London were not available at that particular time.

On August 4th, 1914, the day on which Britain declared war on Germany, an announcement was made by the Canadian government that the banks were authorized to make payment of

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1 An account of the events leading up to the passing of the Finance Act is provided by Sir Thomas White in *The Story of Canada's War Finance*, Montreal, 1921, pp. 6-10.


3 In U.S.A. gold payments were informally suspended during August, and in Britain a moratorium had been declared by the government on August 2.

4 The previous evening a proposal of measures had been embodied in an order-in-council which had been signed by the Governor-General and printed in a special issue of the Canada Gazette (vol. XLVIII, p. 466).
their liabilities in their own notes, and that the government was prepared to make advances of Dominion notes to the banks in addition to other possible assistance.

Although the Order-in-Council had no legal validity, confidence was restored. No further runs took place and when Parliament convened later in August the Finance Act 1914 was passed.

The Act legalized and elaborated the provisions of the Order-in-Council stating that in certain emergencies the Governor-in-Council could (1) authorize the Department of Finance to make advances of Dominion notes to the chartered banks on the security of promissory notes secured by their full value in such securities as approved by the Minister of Finance (2) authorize the chartered banks to pay the public by their own bank notes and thus suspend the right of redemption in Dominion notes and gold (3) authorize the extension of the period of excess circulation privilege from six months to a

1 It was thought that the public, unable to convert their deposits into gold, might possibly wish to hold bank notes as preferred to deposits. Bank notes were more secure because bank note holders in contrast to depositors were legally protected as "involuntary" holders of bank liabilities.

2 Canada, Statutes, 1914, 2nd Session, Chapter 3.
whole year and (4) suspend the convertibility of Dominion notes into gold. In addition, authorization was given to the government to declare a general moratorium; this provision, however, was never used.

In short, the original purpose of the Finance Act was to provide some borrowing facilities to the chartered banks in the event of a liquidity crisis. The Act was successful in curtailing the crisis, which passed almost immediately, and borrowing for the original purpose ceased to exist. The Finance Act, however, continued to be in force throughout the War and post war period until 1923, when part of the Finance Act mechanism was made a permanent feature of the financial system. Under the Finance Act of 1923, the Minister of Finance

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1 By a Bank Act amendment of 1908, the banks were permitted to issue notes in excess of the previous upper limit set by their paid-up capital. The period of excess circulation was at first limited to four months but was extended to six months in 1912. In the decennial revision of 1913, the banks were permitted to issue an amount of their own notes equal to the amount of gold and Dominion notes deposited by the banks in a Central Gold Reserve. These measures were made to provide further elasticity to the banks' note issue as the latter was found insufficient to meet liquidity demands during crop moving seasons.

2 The Finance Act of 1914 was originally passed as an emergency measure but in 1919 a new act "provided for the continuation in force of the proclamation made on September 3, 1914, 'until two years after the conclusion of peace on termination of the present war'." See MacMillan Report, p. 22.
was authorized to issue Dominion notes to the banks against approved securities deposited with the Minister in times when no proclamation under the Act of 1914 was in force. The duration of the advances was limited to one year.

The purpose of the Act, thus, changed from being an emergency war measure to becoming a normal cash adjustment mechanism for the banks, somewhat like the discount "window" of a central bank. The Act provided the banks with the facilities for obtaining funds at less inconvenience and often at a lower cost than by alternative devices. The Act was probably also intended as a means to inject additional liquidity into the financial system for brief periods such as crop-moving seasons and other temporary periods of heavy demands for liquidity.

Unlike a central bank, however, the facilities provided by the Act were not intended to be used as a means of implementing monetary policy. No attempts at regulating the

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1See Canada, Statutes, 1923, Chapter 48. The Acts of 1914 and 1923 are consolidated in Chapter 70, R.S.C. 1927.


volume of credit extended to the banks by altering the rate charged for advances appear to have been made, and there is no evidence that the Act was designed as a means of altering the total money supply over an extended period.

The Controversy over the Chartered Banks' Borrowings Under the Act

The banks' extensive use of the borrowing facilities of the Act during the 1920's and early 1930's gave rise to a public discussion of the banks' motives for "discounting" under the Act, and a controversy developed over whether the banks misused the facilities of the Finance Act. It was argued by some that the banks borrowed for a profit and through excessive credit expansion, caused inflation. On the other side it was argued that the banks only borrowed when necessary and then used the facilities of the Act quite sparingly.

Purpose and Structure of Thesis

The purpose of this thesis is to evaluate the controversy. Specifically, the aim is to test the following hypothesis provided by Sir Thomas White as part of his dissent to

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the MacMillan Report:

They (the banks) have always been sparing in their resort to its (the Finance Act's) privileges and pay off their advances as quickly as possible. There is a twofold reason for this policy: firstly because they do not desire to continue to pay interest any longer than necessary and secondly because they do not care to incur or show in their returns heavy indebtedness in respect of advances under the Act.1

The following chapter is devoted to an examination of the structure of Canada's financial system. The purpose of the chapter is to examine the mechanism of the Finance Act and to demonstrate how it fitted into the overall structure of the monetary system. It also contains a brief view of borrowing under the Finance Act.

In Chapter III, an attempt is made to clarify the conceptual and theoretical issues in the controversy in question. In the first instance it is necessary to identify the precise meaning of the "profit motive" and the "need and reluctance" hypotheses regarding borrowing under the Finance Act. It is demonstrated that these two interpretations can, in fact, be merged into one which we call "the least-cost hypothesis." The concluding section of the chapter is designed to specify the objective criteria, which must be

1MacMillan Report, p. 87.
satisfied if this hypothesis is to be accepted.

In Chapter IV, the aggregate borrowings by the banking system is examined in relation to the least-cost hypothesis. To facilitate the analysis of determinants other than alternative costs and reluctance, the analysis has been made in four subsections.

In Chapter V, the determinants influencing the borrowings of the individual banks are examined. It was found that the banks could be subdivided into groups according to their borrowing behavior. The banks in each group thus had certain characteristics in common with respect to frequency and relative size of borrowings. An attempt at explaining differences in borrowing behavior is made in terms of differences in conservatism of the various banks.

In Chapter VI, the findings from chapters IV and V are related to the hypothesis by Sir Thomas White and a conclusion is drawn.
CHAPTER II

THE CANADIAN FINANCIAL SYSTEM AND
THE FINANCE ACT

The purpose of this chapter is to give a brief description of the Canadian financial system as it existed in the early part of the twentieth century and to examine the role of the Finance Act within this system.

Functions and Structure of the Financial System

A financial system performs two basic functions. The first is the transfer of command over economic resources from surplus spending units to deficit spending units, that is, from ultimate lenders to ultimate borrowers. To this end, it must provide an array of possible assets for savers to hold, and it must provide a set of institutions and markets so that the savings can be transmitted in the form of credit to the investors, or spenders. This, then, is the function of the capital market. Secondly, the financial system must provide a payment mechanism. The latter makes possible the carrying on of specialized economic activity regulated by exchange and the market mechanism. In this chapter the capital market
and the monetary system are discussed separately. They are, however, highly interrelated and there is no sharp distinction between them. For instance, ultimate borrowers may either sell their financial assets directly to ultimate lenders or exchange them for claims against financial institutions. Such claims may take the form of deposits and debt certificates. Deposits in the chartered banks, however, are considered as means of payment and hence part of the monetary system.

2
The Capital Market

The function of the capital market in financing Canada's economic life was done partly by the financial institutions which held types of assets different in risk and liquidity from their liabilities, and partly by organizations which provided the facilities for exchanging the non-monetary financial assets such as stocks and bonds.

1 In Gurley and Shaw's terms, the institutions acquire primary securities (bonds, equities, mortgages, etc.) and issue indirect securities in the form of demand and time deposits and similar debts. See John G. Gurley and Edward S. Shaw, Money in a Theory of Finance, Washington, D.C., Brookings Institutions, 1960, p. 4.

2 For a more detailed description of the intermediaries, see the MacMillan Report, pp. 24-47.
Canada's Financial Institutions

During the early part of the twentieth century, Canada's major financial institutions consisted of the chartered banks, life and general insurance companies, mortgage and trust companies, and various savings institutions. The combined assets controlled by the banks and the life insurance companies constituted approximately 90 per cent of the assets held by all these institutions, as may be seen from Table I. Although the banks and the insurance companies had different functions, it is, nevertheless, obvious that the two types of institutions dominated the capital market with respect to loans and debt instruments.

The proportion of non-monetary financial assets held by the two institutions is shown for selected years in Table II.

The Canadian Bond Market

The means of transfer of securities were provided by the stock exchanges, the stock brokers and the investment dealers. The latter were instrumental in creating a bond market in Canada.

Before World War I only a small percentage of new bond issues were placed in Canada. During World War I, however, when the British capital market was closed to Canadian
### TABLE I
ASSETS OF CANADA'S MAIN FINANCIAL INSTITUTIONS, SELECTED YEARS 1911-1930
(IN MILLIONS OF DOLLARS AT YEAR END)

<table>
<thead>
<tr>
<th>Institutions</th>
<th>1911</th>
<th>1921</th>
<th>1930</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chartered Banks</td>
<td>1,390</td>
<td>2,747</td>
<td>3,144</td>
</tr>
<tr>
<td>Gov't and Other Savings Banks</td>
<td>93(^a)</td>
<td>98(^a)</td>
<td>165(^a)</td>
</tr>
<tr>
<td>Mortgage Loan Companies</td>
<td>n.a</td>
<td>n.a</td>
<td>250(^b)</td>
</tr>
<tr>
<td>Life Insurance Companies</td>
<td>275</td>
<td>658</td>
<td>1,973(^c)</td>
</tr>
<tr>
<td>Fire and Casualty Ins. Co.</td>
<td>53</td>
<td>113</td>
<td>177</td>
</tr>
</tbody>
</table>

\(^a\)Figures are estimates. Year end figures not available.

\(^b\)Not including estates, trust and agency funds.

\(^c\)Includes assets of Canadian Companies and assets in Canada of other than Canadian Companies.

Source: Canada Year Book.
<table>
<thead>
<tr>
<th></th>
<th>1911</th>
<th>1921</th>
<th>1930</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chartered Banks</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Canadian Loans(^1)</td>
<td>60.9</td>
<td>50.1</td>
<td>50.4</td>
</tr>
<tr>
<td>Securities(^1)</td>
<td>7.2</td>
<td>11.5</td>
<td>14.6</td>
</tr>
<tr>
<td><strong>Life Insurance Companies</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bonds</td>
<td>35.7</td>
<td>45.8</td>
<td>28.3</td>
</tr>
<tr>
<td>Stocks</td>
<td>4.9</td>
<td>3.3</td>
<td>23.8</td>
</tr>
<tr>
<td>Mortgage Loans and</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agreements for Sale</td>
<td>33.6</td>
<td>25.4</td>
<td>23.3</td>
</tr>
<tr>
<td>Other Loans</td>
<td>13.4</td>
<td>13.0</td>
<td>15.3</td>
</tr>
</tbody>
</table>

\(^1\) Average computed from monthly returns each year.

Sources: [Canada Year Book](#) and [Canada, Royal Commission on Canada's Economic Prospects, Financing and Economic Activity in Canada](#), (by Wm. C. Hood), 1958, p. 334.
borrowing, several great Victory loan campaigns were successful in the flotation of war loans to Canadians. These Victory loan campaigns were organized by Canada's investment dealers who subsequently formed a marketing committee to provide a market for outstanding government Victory bonds.

There was no bond exchange in Canada but a group of the larger dealers made markets in the majority of securities traded, and published quotations could be obtained from the individual bond dealers.

The investment dealers generally bought and sold bonds for their own accounts. They financed their inventories by call and short term loans from the banks and by borrowing from trust companies and other corporations.

The Money Market

The chartered banks' portfolio of call and short loans on stocks and bonds in Canada was often quite substantial. During the last two years of the 1920's, the banks, for

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1 The changes in amount of new Canadian bond issues and country of sale are indicated below:

<table>
<thead>
<tr>
<th></th>
<th>1911</th>
<th>1917</th>
<th>1921</th>
<th>1925</th>
<th>1931</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total bond issued (millions) $</td>
<td>267</td>
<td>756</td>
<td>400</td>
<td>459</td>
<td>1250</td>
</tr>
<tr>
<td>Percentage placed in Canada</td>
<td>16.9</td>
<td>74.6</td>
<td>50.4</td>
<td>56.8</td>
<td>85.8</td>
</tr>
<tr>
<td>&quot; U.S.A.</td>
<td>6.6</td>
<td>24.7</td>
<td>45.5</td>
<td>42.2</td>
<td>13.6</td>
</tr>
<tr>
<td>&quot; Britain</td>
<td>76.6</td>
<td>0.7</td>
<td>4.1</td>
<td>1.0</td>
<td>0.6</td>
</tr>
</tbody>
</table>

instance, had an average of approximately $260 million outstanding in this loan category. It might, therefore, be expected that a money market existed in Canada. However, the call loans in Canada were in practice not callable; moreover, the rate of interest charged on call loans was kept constant for years.

A Canadian money market was not created until 1954. Before that time, the Canadian financial system depended on the New York money market, which was crucial for the liquidity of the banking system. The New York money market was also used in connection with the banks' foreign exchange trading activities, for which foreign currency balances were held in New York as well as in London.

To sum up, the two characteristic features of the Canadian capital market was the dominant role played by the chartered banks and the lack of developed open markets for bonds in Canada.

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1 The interest rate charged by the banks was 6% regardless of the short term rates in New York. See Canada, Royal Commission on Banking and Currency (MacMillan Commission), Evidence by CIDA, Proceedings, pp. 2540-3.

Canada's Pre World War I Monetary System

The monetary system may be distinguished from the capital market by the different function performed. While the capital market, thus, performs the function of facilitating the transfer of command of resources from lenders to borrowers, the monetary system provides the payment mechanism.

In Canada, the major items of the payment mechanism consisted of legal tender, bank notes and deposits. Apart from certain British and U.S. gold coins, legal tender money consisted of Dominion notes. Limited legal tender was provided by silver and bronze coins.

The supply of money, as shown for selected years in Table III, consisted of coinage, Dominion notes, bank notes and deposits.

Dominion Note Issue

The issue of Dominion notes was managed by the Minister of Finance pursuant to the Dominion Notes Act of 1868. The notes were partly gold backed and partly fiduciary, and

1See the MacMillan Report, p. 37. Other monetary items consisted of inter-bank deposits and foreign exchange. In contrast to the banking system of the U.S.A. the inter-bank deposits were insignificant and will henceforth be ignored. Moreover, in terms of aggregate money supply, the inter-bank deposits, of course, cancel out. The banks' holdings of foreign exchange were nominal.
### TABLE III

**MAJOR ITEMS OF THE CANADIAN MONEY SUPPLY, SELECTED YEARS 1915-1930**

*(IN THOUSANDS OF DOLLARS)*

<table>
<thead>
<tr>
<th>Year</th>
<th>Circulation of Canadian Silver</th>
<th>Dominion Notes Outstanding(^2)</th>
<th>Bank Deposits by the public payable in Canada</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Nickel and Bronze Coins(^1)</td>
<td>Bank Notes in Notice &amp; Demand Deposits Deposits</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>$5 &amp; Large Under Notes Circulation</td>
<td></td>
</tr>
<tr>
<td>1915</td>
<td>19,801</td>
<td>25,184</td>
<td>126,937</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>105,137</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>690,904</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>358,444</td>
</tr>
<tr>
<td>1921</td>
<td>30,301</td>
<td>34,404</td>
<td>234,365</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>194,621</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1,289,347</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>551,915</td>
</tr>
<tr>
<td>1930</td>
<td>32,354</td>
<td>37,029</td>
<td>137,189</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>159,341</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1,427,570</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>622,895</td>
</tr>
</tbody>
</table>

\(^1\)Net issues of coinage since 1858.

\(^2\)Yearly averages.

Source: *Canada Year Book.*
the fiduciary issue was increased from time to time. While Canada was on the gold standard, Dominion notes were redeemable in gold.

Dominion notes were used for two purposes. Small denominations from one to five dollars were used as hand-to-hand currency and large denominations were used as cash reserves for the commercial banks. The latter notes, also called "large legals," circulated only among banks who used them to meet clearing house drains.

Bank Notes and Deposits

Under the Bank Act of 1880, the Chartered banks could issue bank notes in denominations of $5 and multiples thereof, up to an amount equal to their paid-up capital. As bank notes were not legal tender, the banks were required to maintain

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1 Before World War I, the first $30 million Dominion notes were covered by a 25 per cent gold reserve and all issues above this were covered by a 100 per cent reserve in specie. In August 1914, the partially covered issue was raised to $50 million, in 1915 a $26 million note issue was made without gold coverage but partly covered by railway securities, and in 1917 an emergency issue of $50 million was made without gold backing but secured by Imperial treasury bills.

2 The gold standard was adopted by the United Provinces of Canada in 1853 and it continued as the monetary standard of the Dominion of Canada until the outbreak of World War I in 1914. In July 1926 Canada returned to the gold standard which officially continued to be the base of the monetary structure until 1931.
convertibility of their notes. No legal reserve was required to be held by the banks against their note issue. By the 1890 revision of the Bank Act, however, the banks were required to deposit five per cent of their average yearly note issue in a fund called the Bank Circulation Redemption Fund. The fund provided a mutual guarantee by the banks of all bank notes in circulation. At the same time, bank notes were made a first lien on the assets of failed banks.

Prior to World War I, a currency shortage during crop-moving seasons had resulted in some revisions of the earlier system. In 1908 the limit on the note issue was raised and in 1913, the banks were permitted to issue an amount of their own notes equal to an amount of gold or Dominion notes deposited in a Central Gold Reserve.

The major items of the money supply consisted of bank deposits by the public payable in Canada. Deposits were created by a bank either upon receipt of cheques and monetary instruments, or when a bank made a loan by exchanging a deposit liability on itself for the debt instrument of the

1The limit on the note issue was raised to 115 per cent of the banks' combined paid-up capital and rest fund. To encourage quick withdrawal, the excess circulation was taxed at five per cent per annum. The period of excess circulation was at first limited to four months but extended to six in 1912.
borrower.

Bank Liquid Assets

A limit to the deposit creation by expansion of bank loans were provided by the reserve management practices of the system. Although no legal minimum reserve requirement existed, the banks kept a certain proportion of their deposit liabilities in the form of liquid funds in order to ensure the legally required convertibility. In other words, the banks held various forms of reserves, which may be classified as cash reserves, secondary reserves and liquid assets. Cash reserves shall be defined as consisting of gold and subsidiary coin, Dominion notes, foreign currencies, notes of other banks, cheques on other banks, balances due by other banks in Canada and deposits in the Central Gold Reserve not held against excess circulation. Secondary reserves shall here be defined as consisting of balances due by banks and banking correspondents elsewhere than in Canada and call and short

1 According to the Bank Act, 40 per cent of cash reserves were to be held in the form of Dominion notes.

2 The latter was in a sense a "free" deposit, i.e. an amount of gold and/or Dominion notes held in safekeeping by the Reserve for the banks.
(30 days or less) loans elsewhere than in Canada. In contrast to cash and secondary reserves, for which no uniform classification existed, liquid assets by general consensus included the two forms of reserves mentioned above plus that part of the deposits in the Central Gold Reserve which was held against excess note circulation, Dominion and Provincial Government securities, other Canadian and foreign public securities, bonds, debentures and stocks and finally, call and short term loans in Canada.

Cash reserves and secondary reserves were substitutes because of the high degree of liquidity of both. Part of the secondary reserves consisted of bank balances in New York which were used to settle clearing drain to other Canadian banks. Call loans in New York were, in contrast to Canadian call loans, payable on demand and, therefore, almost as liquid as the New York bank balances. The latter could, if necessary, be converted into gold or currency which could be shipped by train to Montreal and thus replenish cash reserves.

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with short notices.

The high degree of liquidity was not shared by other items in the liquid assets. For instance, deposits in the Central Gold Reserve up to the amount of excess circulation was "frozen" until the note circulation was reduced. Only the deposit above this was free and could be taken out at any time. The investment portfolio of the banks consisted mainly of high grade, short term securities, but no organized bond or money market existed in Canada at that time. The individual bank could in normal circumstances replenish its cash reserves by selling its securities in New York or by refraining

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1Before the enactment of the Finance Act, the banks relied on reserves held in New York for the maintenance of a stable cash reserve ratio. Viner found that gold movements in and out of Canada depended on the banks' reserve requirements rather than on the state of the international balance of payment. See Jacob Viner, *Canada's Balance of International Indebtedness, 1900-1913*, Cambridge, Harvard University Press, 1924, pp. 177-190.

2It is conceivable that the banks during the period allowed could reduce the frozen part of the deposit by taking advantage of the 1908 Bank Act amendment to issue excess notes up to 15 per cent of their combined rest fund and paid-up capital. In that case the banks would, of course, have to pay 5 per cent tax on this excess issue.

from replacing maturing securities. The illiquidity of the banks' investments was due to the fact that they might be sold only at a great loss if the New York market was depressed. The last item in the liquid assets, the call and short term loans in Canada, were in practice not callable.

There were several types of liabilities for which reserves might be held, but there was no consensus about the desired reserves for each type of liability. Thus, reserves were not stated to apply to Canadian or to foreign deposit liabilities, and no statements have been found about desired individual reserve ratios for each of the three liabilities—note issue, demand and time deposit.

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1 Bonds were considered unsatisfactory as reserves, because in case of need, the United States might simultaneously be in a financial panic which rendered the sale of American bonds "virtually impossible. This condition was remedied through the stabilizing influence of the Reserve System which has given greater security to the bond market and made bonds more readily salable or shiftable," B.H. Beckhart, The Banking System of Canada, New York, Henry Holt and Co., 1929, p. 433.


3 MacMillan Report, p. 32.

4 Some Canadian bankers expressed preference for 10-12 per cent cash reserves and 40-50 per cent liquid assets of deposit liabilities. See Select Standing Committee on Banking and Commerce, Proceedings, 1923, pp. 348, 574.
For deposits, it is probable that a larger reserve ratio was held against demand deposit than against time deposit. The clearing house drain was much greater for demand deposits, which were estimated to have a rate of turnover approximately fifty times that of time deposits.

In summary, before the discount facilities of the Finance Act became available to the banks, there was no way of replenishing aggregate cash reserves from sources within Canada. Liquidity of banking assets was obtained by resort to foreign financial centers, that is, primarily New York, and to a lesser degree, London.

The Finance Act: Provisions and Mechanism of Operation

The introduction of the Finance Act of 1914 made a basic change to the Canadian financial system.

Under its most important provision the Department of Finance was authorized to advance Dominion notes to the banks upon the pledge of acceptable collateral. While the other provisions of the Act ceased to exist at various dates, the provision regarding the re-discount feature was made a permanent part of the financial system with the 1923 revision of

¹MacMillan Report, p. 31.
the Finance Act.

One of the main attractions for borrowing under the Finance Act was the ease and speed with which the transaction could be made. Once or twice a year each bank would apply to the Treasury for a line of credit against which the bank pledged securities approved by the Minister. The securities were lodged with the Receiver General of Canada and whenever additional cash was needed, it could by telegraphic instructions from the Receiver General in Ottawa be made available in any province at the office of the Assistant Receiver General.

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1 The Finance Acts of 1914 and 1923 are consolidated in the Revised Statutes of Canada, Ch. 70, 1927.

2 Advances were extended against various types of securities, which were required to exceed the advances by the margins shown below:

<table>
<thead>
<tr>
<th>Security</th>
<th>Margin (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dominion Treasury bills and bonds</td>
<td>0</td>
</tr>
<tr>
<td>Bonds guaranteed by Government of Canada</td>
<td>10</td>
</tr>
<tr>
<td>British Government treasury bills and bonds</td>
<td>10</td>
</tr>
<tr>
<td>Provincial short term securities</td>
<td>10</td>
</tr>
<tr>
<td>Other securities issued by or guaranteed by a</td>
<td></td>
</tr>
<tr>
<td>Provincial Government</td>
<td>15</td>
</tr>
<tr>
<td>Canadian municipal bonds</td>
<td>20</td>
</tr>
<tr>
<td>Assignments secured by documents covering</td>
<td></td>
</tr>
<tr>
<td>grain, flour, cereals and feed</td>
<td>25</td>
</tr>
</tbody>
</table>

Except for Dominion Treasury bills and bonds, which were valued at par, all the securities were valued at market values (Sec. 2 of Finance Act, June 30, 1923). See evidence by Mr. J.C. Saunders, Select Standing Committee on Banking and Commerce, Proceedings, 1924, p. 344. Reprinted in Bank Act Revision Proceedings, p. 470.
Normally the Dominion notes were required in Montreal, where the Chartered banks' central clearing fund was situated.

All advances became due on May 1 each year but arrangements for renewals of outstanding amounts were usually made by each bank with the Treasury Board prior to this date. The Board had the authority to limit the amount of advances allowed each bank. This authority, however, appears not to have been used; as long as satisfactory securities were provided, no limit was placed on the borrowing of a bank.

Time Series of Bank Assets and Advances Under the Finance Act

In Figure 1 the yearly averages of month-end borrowings under the Finance Act have been plotted with some other time series. The purpose with the chart is to examine the time series of some of the assets which were interrelated with borrowings under the Finance Act.

The total loans made by the chartered banks (the top line in Figure 1) reflect economic activity. Another contributing factor to the expansion of loans during World War I

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1 Mr. J.C. Saunders, Deputy Minister of Finance, declared, "When we get the securities, if they are good we do not have to say to the bank, "Are you good?" If they give us the securities it protects any advance we make under the Act." See Select Standing Committee on Banking and Commerce, Proceedings, 1924, p. 360; reprinted in Bank Act Revision Proceedings, p. 454.
was the procedure by which the public undertook the purchase of war bonds. These were often paid out of deposits or bought on an installment basis, but it was also common to get loans from the banks to buy the bonds.

Total securities (second line from the top) also began to increase fairly early in the war. The rise, reflecting war financing, continued with interruptions to 1919. Whereas the banks' purchases of long term public war loans were insignificant, their purchases of short term treasury bills were relatively large. Another substantial part of the banks' securities consisted of British treasury bills. From 1914 to 1916 the banks had made loans to the British govern-


2 An account of war financing is given by R.C. McIvor, who also provides a list of some of the more important works on this period. See R. Craig McIvor, Canadian Monetary, Banking and Fiscal Development, Toronto, MacMillan Co., 1958, Chapter VI and pp. 254-5.

3 During the years 1917, 18 and 19, the banks' yearly purchases of Dominion treasury bills were, respectively, $200 million, $174 million and $245 million. The banks' only allotment of Canadian internal war loan bonds was $21 million of the first war loan. This allotment accounted for about one per cent of the total six war loans made, 1915-1919. C.A. Curtis, "The Canadian Banks and War Finance," Contributions to Canadian Economics, Toronto, University of Toronto Press, Vol. 3, 1931, pp. 12, 20.
ment of $175 million for which British treasury notes had been given as security. Only part of this had been repaid and in 1917 the chartered banks were reluctant to acquire more British treasury notes which at maturity could be expected to be renewed rather than paid off. At this point the rates on Finance Act advances were reduced for borrowing on the security of British treasury bills, which were not finally repaid until 1922.

From the end of World War I, there is a noteworthy inverse relationship between loans and securities reflecting the residual nature of bank investments.

The third line from the top in Figure 1 depicts the banks' deposits to the Central Gold Reserve. Variations in these deposits represented variations in the banks' note issue.

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1"It is quite probable that the loans of the banks to Britain were not made without pressure from the Canadian government, which apparently was anxious to have the banks give all possible aid to the British Government, and even went to the extent of reducing the rediscount rate on British treasury bills to three and one-half per cent." Ibid., pp. 25-6.

The similarity of the volume of the deposits with the advances during the war and immediate post-war years might indicate some direct causal relationship between the two series. This relationship, however, appears less close for the following decade. Only for the latter decade was it possible to examine the relationship on an individual bank basis; for that period, no relationship was apparent.
The advances under the Finance Act, as shown by the bottom line on Figure 1, had two peaks occurring at the time of high levels of economic activity. The notable increase in advances during 1932 was due partly to the government's policy measure of increasing the money supply. Thus, the government made it compulsory for the banks to buy $35 million Canadian treasury bills which were to be discounted under the Act. The banks subsequently reduced their voluntary borrowings under the Act until the balance outstanding consisted of the compulsory advance.

The Finance Act and the Private Sector of the Financial System

The introduction of the Finance Act influenced the banks' need for liquid reserves and reduced their dependency on the New York money market for reserve adjustment purposes.\(^1\)

\(^1\)Although the banking system's reliance on the New York money market was less under the Finance Act than previously, the banks' New York call loans increased during the first 15 years of the Act. Thus, the yearly average of month-end balances of call and short term loans elsewhere than in Canada was $119 million in 1915 and $301 million in 1929. The equivalent figure for 1931 had decreased to $109 million. Major factors accounting for variations in the banks' portfolio of New York call loans consisted of the expected changes in exchange rates (i.e. differences between the spot and the forward rates) and differences between the New York call loan rates and interest earnings opportunities available in Canada to the banks. See the forthcoming doctoral dissertation by K. Hay, Money and Cycles in Post-Confederation Canada, unpublished Ph.D. Thesis, Brown University, 1967.
Moreover, the individual items of the banks' portfolio were affected by the advances borrowed.

With the re-discount facilities provided under the Act, the liquidity of the banks' cash position, thus, became less essential. This may be part of the reason why the banks during the period of the Finance Act gradually reduced their cash reserve-deposit ratios from about 17 per cent to about 10 per cent.

The effect on the other items of the banking system depended on the use made of the Dominion notes borrowed under the Act. More specifically, the Notes could have been used to replenish the banks' cash reserves, thereby allowing a multiple expansion of loans and deposits.

1 Other factors probably contributed to the decline in the reserve ratio. One of these may have been economies of scale in relation to size of reserves. Through a number of amalgamations, a considerable concentration took place in the industry so that the number of banks were reduced from 30 to ten during the first third of the twentieth century.

2 The size of the multiplier would depend on whether the banks worked to a cash reserve ratio or a liquid asset ratio. There is no evidence that the liquid asset ratio during the period under discussion was ever a limiting factor to an expansion of the banks' deposits. This means that the multiplier could have been greater than unity. On the other hand, it also means that the banks could replenish their cash reserves by selling securities on the New York market and either repatriate the proceeds in form of gold, or leave the funds as secondary reserves in New York. Deposits could, therefore, be expanded as long as the liquid asset ratio provided the restraint. It was only a technical problem to convert cash substitutes into cash on the New York market.
The Dominion notes could also have been used to deposit in the Central Gold Reserve, thereby enabling the banks to issue an equivalent amount of their own notes. In that case the banks' outstanding note liabilities could have been expanded without reducing cash reserves by the amount deposited in the Central Gold Reserve.

Finally, the banks could have converted Dominion notes into gold to be exported. Gold was shipped abroad in payment of deficits either on the current account or on the long term capital account balance of international payments. The latter occurred, for instance, in 1928 when Canadians invested heavily in the New York stock market. The gold flow was also affected by the banks' movements of short term capital. During the 1920's, for example, there was a fairly steady increase of the Canadian banks' call loan portfolio in New York, where the call loan rates compared favourably with interest earned on Canadian loans.

Dominion Note Issue and Monetary Policy

In the pre-World War I monetary system, the Dominion note issue was limited by the government's gold reserves. With the enactment of the Finance Act, the Canadian system passed from the quasi-automatic rules of the gold standard to the system where deliberate rules were necessary
to maintain a fixed exchange rate. At the same time, the Finance Act itself constituted a potential instrument of monetary policy as the authorities could regulate both the discount rate and the volume of credit available to the banks.

After Canada returned to the gold standard in July 1926, however, a lack of conscious monetary policy in a few years led to the end of the free redemption in gold of Dominion notes. The termination of the gold bullion standard was caused by a heavy gold drain suffered by the government during 1928.

Under the gold bullion standard, it was the responsibility of the Department of Finance to convert Dominion notes into gold at the price fixed in the statutes. The banks could thus obtain gold for export by presenting Dominion notes and at the same time replenish their cash reserves by borrowing under the Finance Act. The rate charged for advances was not

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1 Between June 30, 1927 and June 30, 1929 the gold reserves declined from $106 million to $59 million, while the ratio of gold to Dominion notes outstanding declined from 60 to 28 per cent. See C.Y.B. From December 31, 1927 to January 31, 1929 the reserves declined from $128 million to $49 million. F.A. Knox, An Introduction to Money, Banking and International Finance, mimeographed text for Fellows Course in Banking, Queen's University, n.d., p. 299.

2 The Dominion notes issued this way were not required to be covered by gold as was the case with notes issued under the Dominion Notes Act.
kept at the same level or above the short term interest rates prevailing in New York. On September 1, 1928, for example, the rate charged for advances was reduced from 5 to 4-1/2 per cent, while the average monthly New York call loan rates for July, August and September, 1928 were 6.05, 6.87 and 7.26 respectively.

There was, in other words, no attempts made to use the discount rate as a device to reduce the gold drain. Neither was any attempt made before November 1932 to use monetary policy for stabilization purposes. When the Deputy Minister of Finance in 1924 was asked if the interest rate could be used as an instrument of monetary policy he declared that it had never been considered and that he did not think it would have any relation to that matter at all. Similarly, there is no evidence that the lines of credit made

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1Hence, the banks could profit by borrowing funds under the Act to lend out in New York.

2It should be pointed out that the Finance Act was not the only factor causing the gold drain; that is, $40 million of the gold reserves were used to pay off certain Canadian government obligations which became due in New York during 1928. See M.W. Stokes, The Bank of Canada, Toronto, Hunter-Rose Co., 1939, p. 24.

available to the banks were ever restricted for policy purposes.

In short, although the Finance Act could have provided the authorities with an effective policy instrument, there is no evidence before 1932 that the Act, with any effect, was used as such. For the purpose of this thesis, the Finance Act will, therefore, not be considered as a policy instrument.

Summary

The Canadian financial system was discussed in this chapter and it was pointed out that the introduction of the Finance Act made a basic change both to the capital market and to the monetary system.

Briefly, the advances under the Finance Act were aimed at giving ultimate borrowers, such as farmers, businessmen and industrialists, command over additional resources for temporary periods. The objective of the Act was achieved by increasing the fiduciary issue of Dominion notes and lending these to the banks.

The domestic as well as the international capital markets were, therefore, affected by the Finance Act. This was due to the circumstance that the banks could use their financial assets as collateral for loans rather than selling them
on the markets.

The monetary system was fundamentally changed by the Finance Act. The semi-automatic rules of the gold standard ceased to apply when the banks, at their own discretion, could obtain Dominion notes not covered by gold. To maintain the gold value of the Canadian dollar, it would have been necessary to conduct a deliberate monetary policy. This was not done although the Finance Act itself would have provided an effective policy instrument.
CHAPTER III

THEORETICAL ANALYSIS OF SIR THOMAS' HYPOTHESIS

Purpose and Structure of Chapter

The purpose of this chapter is to examine and clarify the hypothesis set out in Chapter I, and to check the hypothesis for logical consistency.

In the case of Sir Thomas' hypothesis, it is possible by theoretical means alone to prove that his hypothesis in its original form is logically inconsistent. It will, therefore, be re-formulated and the logical consequences of the revised hypothesis will be deduced. In the following chapters, the implications of the revised hypothesis will be compared with empirical data and a conclusion will be drawn.

The analysis of the hypothesis will begin in this chapter by interpreting the terms of the hypothesis on the background of economic theoretical developments during the 1920's and 30's.

Interpretation of the Terms of the Hypothesis

Sir Thomas postulated that the banks borrowed only
when it was "necessary," that is when a "need" for borrowing existed. He also made the assumptions that the banks would repay their borrowings to avoid incurring the interest cost of borrowing and to avoid being heavily indebted to the Treasury.

To explain the banks' borrowing behavior, Sir Thomas thus selected three explanatory variables - need, cost and reluctance. In abstracting these three elements as the crucial factors, Sir Thomas appears to have been influenced by some contemporary but rather imperfectly formed economic theories about re-discounting developed by American economists.

To interpret the meaning of Sir Thomas' hypothesis, it may, therefore, be helpful briefly to consider the historical development of American hypotheses about re-discounting. The reason being, of course, that the facilities of the Finance Act operated for Canadian banks in a similar manner as the re-discount facilities of the Federal Reserve System did for American banks.

Sir Thomas did not say that the banks would repay their loans when they became unnecessary for the operation of the banks. The repayment was assumed to be a function of cost and reluctance. This line of reasoning will be developed in a later part of the chapter.
Evolution of Theories about Discounting

The search for determinants of re-discounting had become an important theoretical issue in the United States during the 1920's, where a controversy had developed whether the banks re-discounted from necessity or to increase their profit. One of the earliest theories was the profit theory, according to which the banks were assumed to borrow from the Federal Reserve banks when they could find outlets for additional funds at higher net earnings than the interest rate charged on borrowings. Since the earnings, net of expenses, on loans and investments were often in excess of the discount rate, the banks could, under the requirements of profit maximization, be expected to increase their borrowings until the marginal net revenue on earning assets were equal to the fixed rate of borrowing.

In a study dealing with the first decade of the operation of the Federal Reserve System, Goldenweiser explored the relation of discount rates to member banks earnings. He argued that funds were borrowed, not to earn profit on the open markets or on customer loans, but in order to enable the

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banks to meet demand for loans by business and industry.

Goldenweiser gave two main reasons for this. First, according to American banking tradition, heavy borrowing by a bank, except in emergencies, reflected unfavourably on its standing; second, the spread between the discount rates and customer rates were usually found too narrow to more than cover the expenses of a loan. Similarly, the margin between discount rates and open market rates was said to be insufficient to make it profitable to invest borrowed funds in the open market.

Goldenweiser rejected the profit motive because the banks did not increase the volume of re-discounting whenever the spread between the re-discount rate and bank lending rates widened.

In an influential and widely quoted book, the first edition of which appeared two years after Goldenweiser's, the argument may be interpreted to mean that the banks were more concerned with their long run business relationships than with short run direct gains from re-lending borrowed funds. In other words, the bank would not borrow in order to take advantage of profitable opportunities on the open market but would borrow from the Federal Reserve System in order to meet a demand for loans. The latter they presumably regarded as their primary function.

"The volume of borrowing at the reserve banks is thus not immediately and directly responsive to changes in the discount rate as it would be if member banks were in the habit of borrowing as much as they could lend at a rate higher than the discount rate." Ibid., pp. 48-9.
Burgess listed five restraints tending to prevent excessive use of borrosed funds. These restraints were: (1) Tradition against borrowing, (2) Discount rate, (3) Open market operations, (4) Direct dealing with individual banks and (5) Publicity.

The tradition against borrowing went back to the pre-Reserve System under which a bank came under suspicion if it borrowed other than temporarily from its correspondents. The tradition of borrowing only in case of emergency and during seasonal strain on resources was encouraged by the Reserve banks.

The discount rates charged by the Reserve banks had usually been confined to a fairly narrow band bordered by the open market commercial paper rate and the ninety-day bankers' acceptance rate. To Burgess, a change in the discount rate was primarily significant as an indicator of planned Federal Reserve policy. As an increase or decrease in price of accommodation at a Reserve bank, an alteration in the discount rate was found to be of little economic significance. As long as the discount rate moved within its customary ribbon and as

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long as the tradition against continuous borrowing existed, member banks, according to Burgess, would borrow only to meet seasonal and unusual needs of agriculture, production and trade.

With respect to open market operations, Burgess rather vaguely suggested that their usefulness as a policy instrument lay in their effect on the indebtedness of member banks. He assumed that open market operations were largely offset by changes in member bank borrowings without directly affecting the money supply. However, as open market operations were not used as a policy instrument in Canada, Burgess' discussion of this factor is not directly relevant to the theme of the paper and will, therefore, not be further pursued.

The restraint of moral suasion could be used by the Reserve banks in their direct dealing with individual banks. A certain measure of discretion in the granting of credit was also provided by the Federal Reserve Act to guard against abuse by the banks of their borrowing privileges.

The publication of economic information by the Reserve System was regarded by Burgess as an influence toward financial stability. For example, the publication of the views of the Federal Reserve Board toward security speculation in 1929 affected the demand for bank accommodation for speculative
purposes.

In short, Burgess' opinion was that the banks borrowed mainly to replenish cash reserves when found deficient after completion of a day's operations. The aversion of the banks to being in debt rather than the cost was considered the main factor limiting the size and duration of borrowing.

Riefler, whose book was published in 1930, developed his concepts with greater clarity and precision than had been done by his predecessors. In his study he examined the relationship between open market rates and discount rates. If the banks borrowed for profit, he reasoned, the two interest rates could be expected to follow each other closely with only minor deviations as member banks otherwise would act to close the gap. For example, if short term market rates were above the discount rate, banks with eligible papers would discount them in order to lend the proceed on the open market. If the discount rate was the higher of the two, banks with funds in the short term market would withdraw them to repay their indebtedness at the Federal Reserve Banks. Either

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1 Ibid., p. 180.

action should hold the market rates close to the discount rate. Observing the actual divergency between the two rates, Riefler concluded that banks did not borrow for profit and did not pay off their indebtedness as soon as the discount rose above the short term open market rate. Instead, he found that banks generally were reluctant to borrow but that they did it "in order to meet a pressing need for quickly available funds such as arises out of unexpected deficits in
their reserves." According to Riefler, banks would repay their borrowings as soon as they could adjust their loans and investments to their own resources. He recognized, however, that the level of the discount rate would have a minor effect on the volume of borrowing as the speed of the adjustments by the banks would be affected by the cost of borrowing versus the short term open market rate. Hence, if call rates were below the discount rate, banks would adjust their reserves by calling in loans immediately. In the opposite case they might delay the adjustment for a few days.

Riefler divided the need for borrowing into two categories: the necessity for replenishing temporary deficits in reserves, as discussed above, and the necessity to borrow to

1Ibid., p. 32.
meet a heavy seasonal demand for banking accommodation. According to Riefler, the incentive for borrowing in the latter case arose from the credit need of bank customers, who would be deprived of accommodation in the absence of the discounting facilities.

It is noteworthy that the three studies all arrived at the conclusion that the reluctance to be in debt was the main factor responsible for early repayment, and that the cost of borrowing, the rate of discount, only played a minor role in affecting the amount of borrowings. Not implicitly stated was the implication that the banks regarded their unused line of credit with the Federal Reserve System as a liquid asset. This liquid asset, which was available for meeting unexpected demands, was in fact a substitute for cash and secondary reserves held by the banks. Unlike the assets held as reserves,  

1The implication of Riefler's theory was that open market operations, which affected the banks' indebtedness to the Reserve System, were a more significant factor in controlling the banks' behavior than was the discount rate. Member banks would borrow when open market operations reduced their reserves and repay borrowings when the Federal Reserve System increased reserves. "Member banks do not borrow in order to increase their loans, but rather endeavour to contract their loans in order to repay their indebtedness." (Ibid., p. 26). Therefore, an increase in the banks' indebtedness would be reflected in a rise of the interest on the credit markets resulting from the contraction of banks' lending activity.
however, the unused line of credit with the Federal Reserve System did not cost the banks anything. On the other hand, the disutility of drawing on the line of credit involved not only the cost of the discount rate but the aversion of being indebted to the Federal Reserve System.

The three studies also arrived at the conclusion that the banks borrowed because of need but in none of the studies was an attempt made to evaluate the need factor in monetary terms.

In one of the subsequent important studies, Robert C. Turner in 1938 reduced the need factor to a minor role by suggesting that banks made their cash reserve adjustment either by discounting or by open market transactions depending on the relative costliness of the two alternatives.

Turner tested this theory by correlating aggregate borrowings with the spread between the discount rate and various market rates. His conclusion is summed up by Meigs in the form of the equation

\[ R_B = f(\alpha R_U, R_B, r_m - r_d) \]

1Robert C. Turner, Member-Bank Borrowing, Columbus Ohio State University, 1938.

which means that a change in borrowed reserves (\( R_B \)) is a function of the change in unborrowed reserves (\( R_U \)), the level of borrowings (\( R_B \)), and the spread between the market rate and the discount rate. The level of borrowings functions as a restraint as borrowings increase. Turner believed that banks were unwilling to increase their borrowings above a certain limit which depended on various factors such as the size of the bank, tradition against borrowing, custom, personal attitudes and the need for borrowing.

Turner's conclusion thus differed from those of his predecessors by stressing the least-cost spread rather than the need as an essential explanatory variable. By substituting the least cost spread for the need he, in a sense, priced the value of need as the spread between the two rates. This procedure may be used in estimating the economic worth of the need factor.

**Evaluation of Need in Monetary Terms**

Sir Thomas would presumably have agreed with Riefler that need for borrowing could be categorized in (1) the necessity of temporary borrowing for daily cash adjustments,

\[ \text{Need was defined as arising from customer demand for bank accommodation or from the need to maintain secondary reserves; Turner, p. 156.} \]
and (2) borrowing in order to meet a heavy, often seasonal, demand for banking accommodation.

As long as a deposit expansion was not restrained by the liquid asset ratio, discounting in both of the two cases was really only the alternative to the purely technical matter of converting non-monetary assets into cash.

The value of borrowing for both types of need was consequently equal to the conversion cost and the rate of earnings on the assets which would alternatively have to be converted. The proportion of the two types of cost, however, varied according to the duration of the need. Thus, the cost of replenishing a temporary, perhaps self-reversing, cash deficiency consisted mainly of conversion expenses, while the cost of long term borrowing approached the opportunity earnings on the relevant assets.

On the basis of this reasoning it would seem useful to simplify the problem by postulating that the value of the need for daily cash adjustment was equal to the cost in terms of inconvenience and actual expenses of converting New York call loans into cash reserves plus the cost of the subsequent reversal of cash into earning assets. In a simplification of reality, the value of need for medium and long term borrowing may be assumed to be equal to the New York call loan rate.
Assuming the conversion cost always to be greater than the cost involved in discounting, temporary borrowing may be assumed to be a function of cash drains (or bank clearings) and the size of cash reserves. Borrowings other than for temporary cash adjustments may be assumed to depend partly on the difference between the discount rate and the New York call loan rate, and partly on the reluctance factor.

Accepting the proposition that need has an economic value directly comparable to the cost of discounting, it now becomes necessary to re-examine Sir Thomas' hypothesis. Two reasons were suggested by Sir Thomas as being restraining influences on borrowing — to avoid paying interest longer than necessary and to avoid being heavily indebted to the Treasury. However, the interest cost on advances under the Finance Act was simply the cost of that means of adjustment. Other means of adjustment also had their costs. In this sense, some costs were unavoidable and rather than reacting only towards the cost of borrowing under the Finance Act, rational behavior would lead the banks to compare alternative costs and select the cheapest way of adjustment. It appears, therefore, that the hypothesis may be either rejected as meaningless or reformulated to be consistent with rational behavior. Of these two alternatives, the latter will be chosen.
In a new formulation of Sir Thomas' hypothesis (hereafter called the revised hypothesis) the banks' reason for using the facilities sparingly must be changed from "they do not desire to continue to pay interest any longer than necessary" to: they will prefer the least-cost means of replenishing cash reserves.

The postulate about the banks' reluctance to borrow still applies, that is, "they do not care to incur or to show in their returns heavy indebtedness in respect of advances under the Act."

The central postulates of the reformulated hypothesis may be summed up as follows. Any borrowing depended on two crucial factors. One of these was the cost of alternative means of obtaining funds. The other factor was the banks' aversion to being heavily indebted to the Treasury. These, then, are the postulates which are to be tested by the empirical evidence.

Formulation of an Empirical Test

The problem in testing the revised hypothesis arises from determining the relative importance of the reluctance

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1 If the cost of borrowing on the open market was equal to the cost of advances, the bank would, hence, prefer to use the open market adjustment mechanism.
against borrowing and the least-cost consideration. One difficulty is that at "heavy indebtedness," to use Sir Thomas' phrase, the restraint against borrowing increases. The relative strength of the two determinants of borrowing, therefore, changes with the level of borrowing. In order to integrate the least-cost and the reluctance postulates into one theory and derive some objective criteria for empirical testing, the problem will be analysed by the use of indifference curves and utility functions.

In the following analysis a banker's aversion to be indebted is expressed in disutility while the saving from borrowings is assumed to give rise to utility. The rate of saving by borrowing, also called the least-cost spread, is assumed to be equal to the difference between the rate charged on advances ($r_d$) and the New York call loan rate ($r_b$). For the period under study, the latter rate may be assumed to be a suitable indicator of alternative cost of borrowing.

According to the revised hypothesis, the marginal disutility of incurring additional debt will after a point increase more rapidly than the marginal utility of the savings from such borrowing. This is the point where the analysis

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starts. The analysis may therefore not include some of the banks' short term borrowing at relatively low borrowing levels as little or no disutility may be involved in that range. In Figure 2 the horizontal axis represents the volume of an individual bank's borrowing ($R_B$), and the vertical, the total saving derived from borrowing ($r_b - r_d$). $R_B$.

The slopes of lines $s_1$, $s_2$, $s_3$ and $s_4$ represent successively greater interest rate differentials; the steeper the slope, the greater is the least-cost spread.

\[
\text{Saving} (r_b - r_d) \cdot R_B
\]

\[
\frac{\text{Saving}}{\text{Borrowed Reserves}}
\]

\[
\text{Figure 2. Expansion Path for Borrowing by One Bank}
\]

The slopes of the indifference curves, $i_1$, $i_2$, $i_3$ and $i_4$ are equal to $-\frac{MD_B}{\mu_S}$ where $MD_B$ is the marginal dis-
utility of borrowing and \( MU_S \) is the marginal utility of savings. The indifference curves may have many different shapes but have the usual characteristics of being non-intersecting and continuous, and all are positively sloped and curving upward. The positive slope indicates that the disutility of borrowing is increasing more rapidly than the utility of saving from the additional borrowing, and the upward curve indicates that the marginal disutility increases as the indebtedness becomes heavier.

If \( s_1 \) is assumed to represent the least-cost spread, the bank will borrow \( A_1 \) and save \( S_1 \). Maximization of utility will be at point \( X_1 \) where the ratio between the marginal utility of saving and the marginal disutility of borrowing (\(-\frac{MD_B}{MU_S}\)) is equal to the net rate of saving on borrowed funds (\( S_1 \) or \( S_1/A_1 \)). If the spread increases to \( s_2 \), \( s_3 \) or \( s_4 \) the borrowings will increase along the expansion path. It is, however, clear from the figure that even if the spread should increase beyond \( s_4 \), no additional borrowings will be made. Above \( X_4 \) the expansion path is vertical as any amount of advances above \( A_4 \) represents the too "heavy indebtedness" which the banks, according to Sir Thomas, were not
If the indifference curves of the individual Canadian banks had the suggested shape, the resulting aggregate expansion path may be supposed to look as the line A in Figure 3.

![Diagram](image)

**Figure 3. Possible Expansion Paths of Borrowing by Banking System**

In Figure 3 the reserves borrowed are shown as a function of the least-cost spread. Of the three possible paths shown, line A has the same shape as the individual

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1In his analysis of U.S. aggregate bank behavior, Polakoff suggests that the expansion path might bend backwards instead of rising vertically. His hypothesis reflects the U.S. banks' aversion for staying in debt for more than a temporary period.
bank's expansion path. If, therefore, an aggregate functional relationship as shown by line A was found by empirical investigation it would confirm the conclusion assumed from the micro analysis of Figure 2. If, on the other hand, a relationship as shown by line B or C was found, the assumption of Figure 2 might have to be rejected. An aggregate expansion path like line B or C might indicate either that aversion against borrowing was insignificant or that it became weaker relative to savings as the least-cost spread and volume of borrowings increased.

If the relationship should be found to be like B or C, the conclusion from Figure 2 may have to be rejected. On the other hand, that would not necessarily be the case as differences in the slopes of individual bank's indifference curves would lead to different borrowing behavior, and by aggregating different shaped expansion paths, any shape of the aggregate path could be plausible.

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1The latter view, contrary to that of Sir Thomas, has recently been expressed by Mr. C.E. Walker from Dallas Reserve Bank. "Experience has demonstrated that the reluctance in general tends to grow weaker as the profit spread between market rates ... and the discount rate widens." See Charles E. Walker, "Discount Policy in the Light of Recent Experience," Journal of Finance, vol. II, No. 2, May 1957, p. 230.
It therefore appears that both the aggregate expansion path and the individual bank's paths may have to be analysed.

**Conclusion**

Except for the reformulation of the necessity postulate, Sir Thomas' own words have been preserved in the following revision, which brings together all the elements of the hypothesis.

They (the chartered banks) have always been sparing in their resort to its (the Finance Act's) privileges and pay off their advances quickly. There is a twofold reason for this policy: firstly, because they prefer the least-cost means of replenishing cash reserves and, secondly, because they do not care to incur or to show in their returns heavy indebtedness in respect of advances under the Act.

The theoretical analysis of the hypothesis, which was the subject of this chapter, proceeded by revealing the implicit assumptions and the inconsistency of the original hypothesis. Corrected for the latter deficiency, the implications of the re-formulated hypothesis were deduced and objective criteria were developed to verify the validity of the hypothesis. The next stage—the empirical testing—will be undertaken in the next chapters.
CHAPTER IV

EMPIRICAL TESTING OF THE HYPOTHESIS

The purpose of this chapter is to provide some quantitative evidence relating to the revised hypothesis formulated in Chapter III.

The empirical analysis will be confined to what may be called the period of "extensive voluntary borrowing" under the Finance Act. Extensive use may be said to have begun in October 1917. During that month, balances outstanding under the Act increased from $1.45 million to $43.62 million. The period of voluntary borrowing ended in November 1932 when the government forced the banks to borrow $35 million by making the borrowings compulsory for all the banks.

The Data

In Chapter III it was noted that borrowing under the Act could be divided in temporary borrowing for cash adjustment and longer term borrowing for other purposes. It was, however, found that no satisfactory source of data was available for the short term borrowings.
Lacking a better measure of temporary borrowing, the total amount of advances paid out by the Treasury during a certain interval (that is the flow) has been used as an approximation for the volume of short term borrowing. Borrowings for other than day-to-day cash adjustment is assumed to approximate the month-end balances of outstanding advances. Thus, it was found that the two types of advances might be analysed in terms of flow of advances for short term borrowing and stock of advances outstanding at particular times for longer term advances.

At this point, a brief discussion about the sources, nature and limitation of the available data may be appropriate. The major part of the analysis is concerned with two sets of time series - advances under the Finance Act and interest rates. The sources of the data are few; most of the data has been obtained from the MacMillan Report and the "Monthly Returns of the Chartered Banks." The latter returns are found as supplements to the Canada Gazette.

With respect to the Finance Act, the flow series is available on a yearly basis only. The total amount of advances received and repaid by the chartered banks is, thus, published in the Sessional Papers of Canada under "Public Accounts." As to records of the stock or balances outstanding,
the only monthly series available for the full period under study is the month-end balances owed by the banks. From January 1927 to the end of the period under study, the monthly average of daily advances and the monthly high and low balances are, moreover, available in the MacMillan Report.

With respect to the alternative interest costs, the concept of least-cost spread was formulated in Chapter III. Briefly, the least-cost spread was defined as being the difference between the New York call loan rate and the discount rate charged on advances. As pointed out in Chapter II, there was no short term money market in Canada at the time and the banks, therefore, were using the New York market for cash adjustment purposes. The discount rate is supplied in the MacMillan Report and the New York call loan rate is readily

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1For the period up to December 1929, the aggregate month-end balances owed by all the Canadian banks may be found in Clifford A. Curtis, Statistical Contributions to Canadian Economic History, Toronto, MacMillan, vol. I, p. 27. From October 1923, the chartered banks also reported the borrowings under the Finance Act in their monthly returns.

2In calculating the opportunity cost, it would have been preferable to combine the New York call loan rate with a forward exchange rate but no record of a forward rate has been found for that period.
The data and its limitations are discussed more fully in Appendix A. In short, the only stock time series of advances available for the whole period under study is the record of month-end balances. This series, of course, is a record of balances for only one, not necessarily representative, day out of each month. The conclusion from the examination of the data in the appendix is that the month-end balances in general overstated the volume borrowed during the months and were subject to considerable random variations. On the other hand, if quarterly averages are used and if allowances are made for month-end peak borrowings, the month-end series, on the whole, give a reliable indication of the "stock" or balances borrowed under the Act. Moreover, all the major trends found in the record of daily averages and high and low monthly balances are evident in the series of month-end balances.

Method of Analysis

In Chapter III the examination of Sir Thomas' original hypothesis revealed certain inconsistencies with the basic

economic principle of rational behavior. The hypothesis was, therefore, reformulated and an attempt was made to devise a means of testing the hypothesis using indifference curve analysis. Briefly, the postulates of the hypothesis were that the advances under the Finance Act for purposes other than day-to-day cash adjustment depended, firstly, on the alternative cost of obtaining funds for the banks, that is the least-cost spread; and, secondly, on the strength of the banks' aversion towards being indebted to the Treasury. According to these postulated relationships, the banks' expansion paths of borrowing could be expected to be positively correlated with the least-cost spread up to a certain range of borrowing. Thereafter, as the aversion against heavy indebtedness became stronger, the rate of borrowing would become less responsive to an increase in the least-cost spread.

Borrowings for daily cash adjustment were also discussed in Chapter III. It was found that this type of borrowing differed from other types, not only in regard to purpose and length of time of borrowing, but also in regard to the determinants of borrowing. Instead of being determined by the least-cost spread and aversion to being indebted, short term borrowing was found to be a function of clearing drains.
For the testing of these postulates, charts rather than multiple correlation analysis have been used. A multiple correlation analysis was tried but rejected. The high correlation between the advances and the least-cost spread combined with a high degree of multicolinearity of other factors, made the results of the multiple correlation analysis inconclusive. The less sophisticated method of simple correlation, therefore, appeared better suited for the analysis.

Advances as a "Stock" Concept

For the purpose of testing the hypothesis, the period during which the Finance Act was used extensively has been analysed in four subsections. From 1917 to 1932 there were thus two periods of heavy borrowings during high level of economic activity and a period of relative light borrowings following each of the booms.

The first peak period occurred during and immediately after World War I. It was therefore by no means a normal period. The banks had been urged to buy British treasury bills, for which an incentive in the form of a preferred discount rate had been provided. The government had thus in a sense encouraged the use of the borrowing facilities, and there had been little or no talk about the desirability on the part of the banks of using restraint with respect to heavy continuous bor-
Figure 4. The relationship between the least-cost spread and month-end balances of Finance Act advances (seasonally adjusted); quarterly averages, October 1917 - December 1921

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Least-Cost Spread
rowing. Still, the banks' reluctance to be heavily indebted to the Treasury is apparent from Figure 4. Although the least-cost spread reached its highest yearly average during 1920, the seasonally adjusted advances levelled off during the end of 1919.

The next boom occurred in the late 1920's. The least-cost spread and the volume of borrowing began a steady increase during the second half of 1927. While the interest spread reached its peak in the third quarter of 1929, the advances began to level off in the second quarter of 1929.

From Figure 5 it may also be seen that the month-end balances declined in absolute terms from the second to the third quarter of 1929, although the least-cost spread widened.

The two booms were thus similar with respect to the relationship between the advances and the least-cost spread. In both cases there was at first a strong positive correlation between the two factors. In both cases, moreover, any increases in borrowing above a certain level of indebtedness appear to have been restrained by the reluctance factor. It is also noteworthy that relative to the least-cost spread, the level

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1 Figure 13 in Appendix A indicates that the levelling off process began already during the fourth quarter of 1928.
Figure 5. The relationship between the least-cost spread and month-end balances of Finance Act advances; quarterly averages, July 1927 - September 1929.

(Arabic numerals indicate year, Roman numerals indicate quarter.)

Finance Act Advances
Million Dollars

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<th>90</th>
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<td>80</td>
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<td>70</td>
<td>'28 IV</td>
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Least-Cost Spread
of borrowings was considerably lower in the latter period. This was the case both in terms of absolute amounts and of borrowings in per cent of the banks' deposits.

The banks evidently behaved in a similar manner with respect to borrowing during the two separate peak periods. The same does not apply to the aggregate behavior of the banks during the two troughs. In the period 1922-1927 there was apparently little relationship between borrowings and the least-cost spread (see Figure 6). During the trough from 1930 to 1932, the relationship, on the contrary, appeared quite strong, even at maximum borrowings during the particular period. The aggregate expansion path of the latter period, as shown in Figure 7, does not seem to level off like the expansion paths during the peak periods. The reason for the absence of restraint was the relatively low level of borrowings made during the trough period. At such levels the reluctance to borrow could be expected to be weak according to the hypothesis.

Of the four sets of observations, only the one for the trough period between the two booms does not confirm the least-cost spread as being an important determinant of borrowings. To find the causes for the "abnormal" relationship, it is necessary to examine the distinctive features of that period.
Figure 6. The relationship between the least-cost spread and month-end balances of Finance Act advances; quarterly averages, January 1922 - June 1927

(Arabic numerals indicate year, Roman numbers quarter)
Figure 7. The relationship between the least-cost spread and the month-end balances of Finance Act advances; quarterly averages, January 1930 - September 1932. (Arabic numerals indicate year, Roman numerals indicate quarter.)
Determinants of Borrowings During Trough 1922-26

The particular period must first of all be considered in context to the post-war boom. The banks' loans had continued to expand until late 1920 after which a recession began. During the following couple of years, a rapid and severe price decline took place, and the banks suffered heavy losses from loans granted during the previous expansion.

From Figure 6 it may be seen that the Finance Act advances continued a gradual decline from their previous peak until they reached a low point in the second quarter of 1923. The 1922's high level of borrowings relative to the least-cost spread may therefore be explained by a lag in adjustment. The observations, apparently randomly distributed within a narrow range of $15 million and zero interest spread, do not contradict the least-cost hypothesis. This group of observations show that in the small interval between plus and minus 3/4 of one per cent spread, the borrowings were fairly tightly bunched with variations caused by random factors such as

1According to C.A. Curtis, the enormous losses which the banks unquestionably incurred from 1921 to 1924 "were owing in part to the break in prices all over the world, many were also a result of loans which were made to poorer risks during the period of expansion." Clifford A. Curtis, "The Canadian Banks and War Finance," Contributions to Canadian Economics, Toronto, University of Toronto Press, III, 1931, p. 31.
clearing drains. The observations which are more difficult to explain are the ones occurring in the last quarter of 1923 and during 1924. In spite of the large negative least-cost spread, the borrowings during those five quarters were generally higher than the rest of borrowings between 1923 and 1927.

As previously mentioned, the banks began to show their month-end balances owing under the Finance Act in the last quarter of 1923. By examining these records it was found that approximately 65 per cent of the borrowings from October 1923 to September 1924 was done by banks which were subsequently absorbed by more solvent banks. Several of these banks were approaching insolvent conditions mainly from losses suffered during the previous years of contraction. An indication of losses suffered by the weaker banks is the fact that between 1921 and 1923 the reserves of these banks (including the Merchant Bank and the Home Bank) were reduced by approximately $20 million. In the months (or years in the case of the Standard Bank) before the banks ceased to exist as independent banks, they apparently used the Finance Act as a

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1A more detailed account of the reasons for insolvency or decline in earnings may be found in A.B. Jamieson, Chartered Banking in Canada, Toronto, Ryerson Press, 1953, pp. 63-8; a few of the pertinent facts about size and time of merger are given below.
source of substitute for working capital paying no regard to the least-cost spread.

Apart from the borrowings by the insolvent banks, the Finance Act was used to finance the purchase of Dominion securities. During 1924 the banks' portfolio of Dominion and Provincial securities as a percentage of total assets reached

<table>
<thead>
<tr>
<th>Name of Bank</th>
<th>Date of Merger</th>
<th>Approximate Final No. of Branches</th>
<th>Relative Capital Reduction Fund, Dec. 31, 1920: % of Total Assets of all Banks</th>
<th>Rest in Reserve Fund, 1922-35</th>
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<td>31/12/23</td>
<td>152</td>
<td>2.80 $9,850,000</td>
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<td>226</td>
<td>3.00 $6,750,000 $2,250,000</td>
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</tbody>
</table>

*Rest Fund reduced $2,000,000 at take over in January 1925.

Sources:

1. MacMillan Report, p. 19. The dates given are those of the Orders-in-Council authorizing the absorptions. The arrangements among the banks were previous to these dates.
2. Canada Year Book and Jamieson, pp. 63-68.

Except for the Union Bank, none of the absorbed banks had any call loan portfolio in New York. The least-cost spread may only be an important determinant when, in this case the New York call loan rate represents an actual opportunity cost of funds which are readily available.
a peak higher than at any time before the 1930's, including World War I. Part of the Dominion securities may have consisted of Treasury notes or Treasury bills carrying interest at up to 5-1/2 per cent during 1924. The reason for the purchase of longer term bonds may be found by comparing their yields with short term interest rates during 1923 and 1924. The yearly average of New York call loan rates had fallen from 4.86 in 1923 to 3.08 in 1924 while the long term rates on Dominion securities had decreased from 5.09 to 5.00 per cent only. During 1924, bankers may have felt the large difference between long and short rates to be indicating a rise in bond prices. The banks could be expected to switch some of their funds out of call loans into securities in such a situation. That this was actually done is indicated by the fact that the banks' portfolio of New York call loans during 1924 was reduced to the lowest balance during the decade.

When the rates charged for Finance Act advances in November 1924 was reduced by 3/4 of one per cent, they suddenly became lower than the long term bond yield and the banks may have used the Finance Act to finance purchase of securi-

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1See Curtis, Statistical Contributions to Canadian Economic History, p. 65.
"Window-Dressing" as a Determinant of Borrowing

The Finance Act was, moreover, used for the purpose of window-dressing. This term refers to the past custom among the banks to manipulate their assets and liabilities in order to give their balance sheets an appearance of greater than usually prevailing liquidity. On the last day of a monthly or yearly accounting period, the banks would, thus, increase their cash reserves by various means. The banks might, for instance, obtain Dominion notes by increasing their liabilities under the Finance Act.

It could be expected that if window-dressing was ever felt to be necessary, it would be in a year such as 1924 which had seen sporadic runs on the banks caused by the banking episodes during 1923 and 1924. Under the Finance Act,

1 During the last quarter of 1924 the borrowings by Canadian Bank of Commerce increased from no borrowings during the previous quarter to an average of $8 million. In the same quarter, the holdings of securities increased by $8 million. The Royal Bank borrowed $12 million in December 1924, during which month the holdings of Dominion securities increased by $12.9 million.

2 The adjustments of reserve funds, the bank absorptions during the previous years and particularly the failure of the Home Bank, resulted in "sporadic 'runs' by the depositors, which only a few of the very strongest banks escaped." Jamieson, p. 65.
a bank's cash reserves could be replenished for one or a few
days at the end of a month. This form of window-dressing was
particularly important at the end of a bank's financial year,
which for all the banks fell in the last quarter of the
calendar year. An indication of "window-dressing" may be gained
by comparing the two different records of the Dominion notes
held by the banks. In the monthly returns, the banks reported
not only the balances held at the month-end but also the
average amount held during the months. By comparing the
quarterly averages for these two series it becomes apparent
that for the last quarter of 1924 the excess of month-end
balances over the average amount held during the months averag­
ed about $20 million a month, which represents about 13 per
cent of the average amount held.

To sum up, the least-cost spread hypothesis was not

1The equivalent "excess" amounts for the last quarters of 1925 to 1929 were, in millions, $15.5, 10.1, 15.5, 14.3,
and 36.1. In the last quarter of 1929, the difference between
the month-end balances and the "average held" amounted to 34
per cent. The last quarter of 1924 must be compared with the
last quarters of other years only, as "window-dressing," ac­
cording to this indicator, was always considerably smaller
during the first three quarters than during the last. During
the first nine months of 1924, a monthly average of the dif­
ference between the month-end balances and the average amount
of Dominion notes held during the months was less than $5
million. The equivalent figure for the first nine months of
1925 and 1927 was only about $2 million.
refuted by the relationship between borrowings and least costs during the period 1922 to 1927. During this period, special events tended to disturb the usual strong aggregate relationship between the two factors. The major part of the interest inelastic behavior was caused by banks approaching insolvency. For them the rate on advances probably represented the least cost of borrowing. For the other banks the New York call loan rate may for a period not have been an appropriate opportunity cost in case the banks were unwilling to reduce the New York call loan portfolio any further.

Advances as a "Flow" Concept

In discussing the data about the balances of advances outstanding, the high correlation between month-end and average daily balances was noted (see Figure 12, Appendix A). The correlation between the same month-end balances and the total yearly amount of advances paid out (Figure 8) is much lower, in so far as any comparison is valid.

This poor relationship might be expected as the temporary borrowings, approximated by the flow of advances, were assumed to have been made for a different purpose than the balances outstanding and were assumed to depend on clearing drains rather than least-cost spread and aversion toward indebtedness. Comparing the graphs of bank clearings plotted
Figure 8. The relationship between amount of advances paid to the banks during fiscal years and the yearly average of month-end balances of Finance Act advances.

Finance Act Advances
Yearly average of month-end balances

Million Dollars

<table>
<thead>
<tr>
<th>Total Advances paid to Banks during Fiscal Year Million Dollars</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
</tr>
<tr>
<td>-------------------</td>
</tr>
<tr>
<td>0</td>
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<tr>
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</tr>
<tr>
<td>600</td>
</tr>
</tbody>
</table>
against month-end balances (Figure 9) and advances paid out (Figure 10), the considerably closer relationship evidenced in the latter graph appears to confirm that clearing drains are more closely associated with short than with the longer term borrowings.

Conclusion

In this chapter the empirical evidence of the banks' borrowing under the Finance Act was compared with the hypothesis formulated in Chapter III.

The balances of month-end borrowings were analysed in four periods. During the two booms, the hypothesized relationship between the advances borrowed, the least-cost spread and the reluctance factor was confirmed. During the early 1930's the amounts of borrowings appeared to be below the "threshold of reluctance," but the least-cost factor was evident. During the trough of the early and middle 1920's, other factors also obscured the least-cost relationship.

Little data was available for analysing the temporary borrowing for cash adjustment purposes, but it was briefly shown that, in contrast to the month-end balances, the amounts paid out during each fiscal year appeared to be related to the banks' clearing drains. The lack of data relating to
Figure 9. The relationship between yearly total bank clearings and yearly average of month-end balances of Finance Act advances.

<table>
<thead>
<tr>
<th>Finance Act Advances</th>
<th>Million Dollars</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<tr>
<td></td>
<td>100</td>
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<tr>
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<td>0</td>
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</tbody>
</table>

Bank Clearing - Billion Dollars
Figure 10. The relationship between yearly bank clearings and advances under the Finance Act paid to the chartered banks during fiscal years, 1918-32.

(*Estimates of bank clearings)

Finance Act Advances paid out

Million Dollars

<table>
<thead>
<tr>
<th>0</th>
<th>12</th>
<th>14</th>
<th>16</th>
<th>18</th>
<th>20</th>
<th>22</th>
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<tr>
<td>500</td>
<td>29</td>
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<td>400</td>
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<td>200</td>
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</tr>
</tbody>
</table>

Bank Clearings - Billion Dollars
short term borrowings, regrettably, curtailed the analysis of this important function of the Finance Act.

While the empirical aggregate data on the whole appeared to confirm the revised hypothesis, it was evident that the individual bank's borrowing behaviors at times were essentially different. During the middle twenties, there was, for instance, a marked contrast between the behavior of the solvent and insolvent banks. Any inference about the individual bank's behavior from the aggregate data would, therefore, be invalid. If the individual banks were found to react in different ways, this paper would be incomplete without a discussion of the factors influencing the borrowings of each bank. This, then, will be the purpose of Chapter V.
CHAPTER V

AN EXAMINATION OF THE INDIVIDUAL BANK'S BORROWING BEHAVIOR

In Chapter IV an examination was made of the relationship between the aggregate advances under the Finance Act, the least-cost spread and the banks' aversion to being heavily indebted. The empirical evidence appeared to confirm the hypothesis formulated in Chapter III at the aggregate level.

The purpose of this chapter is first, to examine the borrowings of the individual banks to see if they were dependent on the two hypothesized factors - the least-cost spread and the aversion against heavy indebtedness - and second, to explain any important variances in the relationships among the various banks.

The following analysis will be limited to the boom period of the late 1920's. For that period the records of the month-end borrowings by each bank are available. At the same time, both the least-cost spread and the volume of borrowings varied over a wide range, thus making the period quite suitable for studying the influence of both factors.

81
Classification of Borrowings According to the Least-cost Spread

To facilitate the analysis, the banks may be grouped according to their manner of borrowing. In this section the banks will be classified according to the strength of the least-cost factor on their borrowing.

The data supplied in Table IV and charted in Figure 11 show that the banks fell into three fairly distinct classes. First, there was a group of banks whose borrowings apparently were strongly influenced by the least-cost spread. These banks either borrowed frequently or were continuously in debt to the Minister of Finance. Second, there was a group of banks which only borrowed when the least-cost spread was 1.70 and above. Compared with the banks in the first group, the banks in the second group borrowed less frequently.

The banks of these two groups, here called the "least-

1A brief discussion relating more to the individual banks is provided in Appendix B.

2In this paper, frequency of borrowing refers to frequency of reported indebtedness. The only record available for the individual bank's borrowings is the month-end balances of advances owed. Some of these balances were outstanding for several months at a time while others were repaid within a few days. No distinction has been made between these two types of borrowings.
<table>
<thead>
<tr>
<th>Name of Bank</th>
<th>Period</th>
<th>1927</th>
<th>1928</th>
<th>1929</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Q2</td>
<td>Q3</td>
<td>Q1</td>
</tr>
<tr>
<td>Royal Bank</td>
<td></td>
<td>4,000</td>
<td>9,667</td>
<td>14,000</td>
</tr>
<tr>
<td>Can. Bank of Com.</td>
<td></td>
<td>3,000</td>
<td>7,333</td>
<td>4,667</td>
</tr>
<tr>
<td>Banque Can. Nationale</td>
<td></td>
<td>8,500</td>
<td>667</td>
<td>2,500</td>
</tr>
<tr>
<td>Dominion Bank</td>
<td></td>
<td>2,000</td>
<td>2,833</td>
<td>3,833</td>
</tr>
<tr>
<td>Sub Total</td>
<td></td>
<td>17,500</td>
<td>20,500</td>
<td>22,500</td>
</tr>
<tr>
<td>Bank of Montreal</td>
<td></td>
<td>11,667</td>
<td>15,000</td>
<td>15,000</td>
</tr>
<tr>
<td>Bank of Nova Scotia</td>
<td></td>
<td></td>
<td>5,667</td>
<td>6,667</td>
</tr>
<tr>
<td>Imperial Bank</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sub Total</td>
<td></td>
<td>11,667</td>
<td>15,000</td>
<td>20,667</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name of Bank</th>
<th>Period</th>
<th>1927</th>
<th>1928</th>
<th>1929</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Q2</td>
<td>Q3</td>
<td>Q1</td>
</tr>
<tr>
<td>Bank of Toronto</td>
<td></td>
<td>333</td>
<td>1,167</td>
<td>3,000</td>
</tr>
<tr>
<td>Banque Prov. du Can.</td>
<td></td>
<td>1,250</td>
<td>750</td>
<td>1,167</td>
</tr>
<tr>
<td>Sub Total</td>
<td></td>
<td>1,583</td>
<td>1,917</td>
<td>4,167</td>
</tr>
<tr>
<td>Standard Bank</td>
<td></td>
<td>2,833</td>
<td>4,333</td>
<td>2,333</td>
</tr>
<tr>
<td>Weyburn Security B.</td>
<td></td>
<td></td>
<td>2,833</td>
<td>4,333</td>
</tr>
<tr>
<td>Sub Total</td>
<td></td>
<td>2,833</td>
<td>4,333</td>
<td>2,333</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>21,916</td>
<td>26,750</td>
<td>29,000</td>
</tr>
</tbody>
</table>

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a Bank of Montreal began to borrow in May, 1928. Average for May and June: $17,500.

b Standard Bank ceased to exist on Nov. 3, 1928. October borrowing: $3,000.

Figure 11. The relationship between the least-cost spread and the month-end borrowings under the Finance Act by each class of banks; quarterly averages, July 1927 - September 1929.

Finance Act Advances
Million Dollars

Total Advances to all banks

Frequent Borrowers

Infrquent Borrowers

Non-Least-Cost Borrowers
Remaining Banks
Absorbed Banks

Least-Cost Spread

Time

Year 1927 1928 1929
Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3
cost banks," consisted of those banks which maintained a portfolio of call loans in New York. They included all the large well established banks and some of the smaller ones.

A third group consisted of the banks whose borrowings apparently were not dependent on the least-cost spread. These "non-least-cost banks" consisted of some of the smaller banks which usually had no call loans in New York. For such banks, the New York call loan rate did not appear to be a relevant alternative cost to the rate charged on advances. The following analysis will mainly be concerned with the solvent banks of this group. The borrowing pattern of the insolvent banks, which were subsequently absorbed by other banks, has already been discussed in Chapter IV. Briefly, the absorbed banks appeared to use the Finance Act as a substitute for their deficient working capital; they often borrowed continuously with little month-to-month variation.

Classification of Borrowings According to Volume

According to the revised hypothesis, the reluctance to

During the last two years before November 1928, when the Standard Bank was absorbed by the Canadian Bank of Commerce, the former interrupted its month-end borrowings only on the last day of each financial year so as to show no balance owing on the balance sheet. The Weyburn Security Bank borrowed uninterruptedly during 19 months before it in the beginning of 1931 was absorbed by the Imperial Bank of Canada.
be heavily indebted under the Finance Act tends to exert an increasingly restraining influence as the amount of indebtedness grows.

In Table V the banks have been grouped according to relative level of heavy borrowing. The average of the six highest month-end balances were used as a measure for heavy borrowing. To standardize to size this measure has been calculated as a percentage both of the banks' net worth and total assets. The number of months during which the banks reported balances of advances owing, as shown in the last column of Table V, appears to separate the banks along the same lines as does the relative measure of indebtedness.

Explanation of Differences in Borrowing Habits

The borrowing habits relating to volume and frequency have been described, but no reason has been provided for variances in behavior among the banks. It was evident in respect to both frequency and volume that the "Heavy Borrowers"...

---

1 Various measures for heavy borrowing were tried before it was decided to use the average of six high balances as an indicator of normal heavy borrowing. Thus it was found that the single highest balance could be considered an exception which might not reflect a bank's normal policy. On the other hand, the average borrowing during a period would reflect the level of continuous borrowing rather than high borrowing. Still, if the highest quarterly averages had been used the result would have been essentially the same.
TABLE V
HEAVY VOLUME AND FREQUENCY OF BORROWINGS UNDER THE FINANCE ACT BY INDIVIDUAL BANKS, JULY 1927-SEPT. 1929

<table>
<thead>
<tr>
<th>Class of Borrowing and Name of Bank</th>
<th>High Advances Ave. of six highest month-end balances (Thousand Dollars)¹</th>
<th>High Advances as percentage of Net Worth²</th>
<th>Total Assets³</th>
<th>Frequency of Reported indebtedness by continuing banks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Heavy Borrowers</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Royal Bank</td>
<td>25.000</td>
<td>25.7</td>
<td>2.60</td>
<td>25</td>
</tr>
<tr>
<td>Can. Bank of Com.</td>
<td>22.167</td>
<td>37.1</td>
<td>3.00</td>
<td>27</td>
</tr>
<tr>
<td>Banque Can. Nat.</td>
<td>10.950</td>
<td>78.2</td>
<td>7.09</td>
<td>21</td>
</tr>
<tr>
<td>Dominion Bank</td>
<td>6.333</td>
<td>39.6</td>
<td>4.11</td>
<td>25</td>
</tr>
<tr>
<td>Banque Prov. du Can.</td>
<td>2.083</td>
<td>37.9</td>
<td>3.90</td>
<td>21</td>
</tr>
<tr>
<td><strong>Light Borrowers</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Bank of Montreal</td>
<td>15.833</td>
<td>21.4</td>
<td>1.77</td>
<td>16</td>
</tr>
<tr>
<td>Bank of Nova Scotia</td>
<td>7.000</td>
<td>23.3</td>
<td>2.55</td>
<td>17</td>
</tr>
<tr>
<td>Imperial Bank</td>
<td>2.500</td>
<td>16.7</td>
<td>1.73</td>
<td>2</td>
</tr>
<tr>
<td>Bank of Toronto</td>
<td>3.333</td>
<td>22.2</td>
<td>2.53</td>
<td>9</td>
</tr>
<tr>
<td><strong>Absorbed Banks</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Standard Bank</td>
<td>4.416</td>
<td>57.2</td>
<td>4.21</td>
<td></td>
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<tr>
<td>Weyburn Security</td>
<td>677</td>
<td>87.4</td>
<td>11.00</td>
<td></td>
</tr>
</tbody>
</table>

¹The six observations were taken from the period July 1927 to September 1929. Only two month-end borrowings were found for the Imperial Bank; on the basis of borrowing done subsequently, the higher of these were chosen as representing a normal level of high borrowing.

²Paid-up Capital and Reserve fund were taken as of December 31, 1929 for all banks except the Standard Banks for which the Net Worth as of December 31, 1927 was used.

³Total Assets as of December 31, 1929 were used except in the case of the Standard Bank for which the calculations were based on December 31, 1927.

used the facilities of the Finance Act more than the banks in the other group. To account for this, it would seem likely that the aversion to being indebted under the Act would be stronger among conservative banks than among less conservative banks.

To test this assumption, the whole structure of the banks' policies must be examined. A confirmation of the assumption would require that the banks with the more restrained borrowing policies generally would be more conservative than the other banks. Thus, if classified by other policies, the banks could be separated in the same two groups, then the borrowing policies could be explained as being part of a coherent policy structure. To make such a classification, it will be attempted first, to find some objective criteria of conservatism, and second, to order each bank in rank of degree of conservatism. Unless the result of such a test shows the more conservative banks also to be the light users of the facilities under the Finance Act, the assumption must be rejected.

It may be difficult, if not impossible, to find several criteria of conservatism which are indisputable, independent

---

1 Both Burgess and Turner hypothesized that tradition against borrowing was a factor influencing rediscounting policies. See discussion in Chapter III.
and for which data are available. The conservatism of a bank may, for instance, be defined according to the bank's lending and investment policies. Thus, an auditor might be able to determine the aggressiveness of a bank's lending policies by examining its current loans according to the distribution of risks, the ratio of overdue accounts and the percentage of bad debts. Compared with the less conservative, the conservative banks could be expected to have relatively smaller losses from bad debts. The degree of conservatism might also be apparent to the auditor by an examination of the bank's securities, their maturities and their evaluation for balance sheet purposes. All this information, however, is not available.

An apparently obvious criteria of conservativeness is the reserve ratio which a bank held against its liabilities. The data for calculating reserve ratios are available, but there are major problems in interpreting any calculated ratios. For example, the reserve ratios of small banks and large banks

1It is desirable for a bank to distribute its loans over various industries and regions and to refrain from making excessively large loans to a single interest. The danger in making large loans to one firm was demonstrated by the heavy loss sustained by La Banque Nationale in 1923. The principal reason for the absorption of that bank was the default on the payment of a loan of approximately $5 million by a farm implement plant which went bankrupt. See Jamieson, p. 63.
may not be directly comparable. Reserves were held partly against random variations of clearing drains, but the proportions of random variations were conceivably smaller for a large than for a small bank. Also, the large banks had large deposit liabilities in other countries and it is not known what proportion of their reserves were held against foreign liabilities.

However, it would be reasonable to expect that conservative banks would generally be willing to forego some earning power by holding a larger proportion of money or near-money than would less conservative banks. Consequently, one criterion might, therefore, be based on the opportunity cost of holding reserves. Such a cost is obvious for cash reserves which earn no interest at all. But cash reserve ratios cannot be considered separately from their substitute, secondary cash reserves, that is, call loans in New York. Moreover, a bank which had a large liquid security portfolio would obviously need less cash and secondary reserves than a bank with a small

---

1The high liquidity of reserves is usually obtained by a sacrifice of earning power. Thus, securities of very short maturities and call loans in New York generally pay less interest than current loans and securities of longer maturities.
liquid security portfolio. To gauge a bank's conservatism with respect to reserves, it would, therefore, be necessary to consider its liquid assets (not including Canadian call loans) in relation to its liabilities.

Another problem arises in choosing an appropriate date for which to calculate the reserves. If a ratio were calculated as of the beginning of the period under study, it would be relatively large compared to a ratio calculated later. A large holding of securities in 1927, however, did not reflect deliberate reserve policies. Rather, the large security portfolios were the result of lacking demands for current loans during which securities substituted as alternative earning assets. In short, it would not be relevant to speak of an opportunity cost of a large security portfolio for that period.

1As previously mentioned, there are no data available about the maturities of securities held by the banks. The liquidity of security portfolios may have varied substantially among the banks, but for the purpose of this analysis it will be assumed that the banks generally held short term securities and that the proportion of very liquid to longer term maturities was the same for all the banks.

2Total securities were 18.3 per cent of total assets in July 1927, compared to 12.7% in December 1929. See Curtis, Statistical Contributions to Canadian Economic History, p. 64.

3Apart from the recent recession, there had been a decline in demand for bank loans by large firms which increasingly had turned to the capital market for working capital. See McIvor, p. 117.
On the other hand, during 1929 the security holdings were reduced but the call loans in New York had increased. Again the increase was made for the purpose of taking advantage of the high call loan rates rather than for the accumulation of required reserves. Thus, these rates increased from about 4 per cent in 1927 to more than 9 per cent in the middle of 1929. No sacrifice of earning power was, therefore, made by being liquid during the first three quarters of 1929. In the last quarter, the New York call loan rate began to fall and the banks' New York call loans declined. At the end of the year the call loans had, consequently, lost some of their attractiveness as earning assets. The end of 1929 was, therefore, used for the calculation of a measure indicating the banks' reserve policies. The measure itself consisted of the ratio of total current loans and Canadian call loans to total assets. The smaller the ratio, the larger were the reserves and, therefore, also the liquidity of the bank.

A second index of rank was based on the ratio of the banks' rest fund to their paid up capital. A large ratio was a sign of stability and security to the bank's creditors.

---

1 Reserve or rest funds were considered to be a result of
   a) long years of careful, persistent and economic management on the part of the banks
   b) long years during which the shareholders were content
A third index was constructed from the ratio of net worth to total liabilities. The larger the ratio, the safer were the claims of the creditors, *ceteris paribus*. These first three indexes are ordinary and quite universal indicators of the conservatism of a bank.

The fourth index is peculiar to the circumstances of the late 1928 and first three quarters of 1929 as it is based on the proportional change in each bank's Canadian call loans. In the banks' annual reports for 1929, the banks warned against speculative activity and branch managers had been counselled against making loans for speculative purposes, including Canadian call loans. In these circumstances, it could be expected that the banks' Canadian call loans would show a decline except perhaps in the case of some of the less conservative banks. The fourth index, in short, compares the average of September and October holdings of Canadian call loans for 1928 and 1929 and the banks are ranked according to the relative change. The most conservative bank is the one with the greatest
to accept low dividends and allow earnings to accumulate
c) premiums obtained by the sale and allotment of new stock.


^See Jamieson, p. 71.
reduction during that year.

In Table VI the banks are ranked according to four indexes. Moreover, the rank–order numbers for each bank have been added. For convenience of comparison with Table V, the banks have been divided into two groups. A comparison with Table V shows the conservative banks to be those formerly rated as light borrowers, while the less conservative banks were the heavy users of the facilities under the Act.

To examine if the less conservative banks could be identified by their aggressive policies, the banks were ordered in ranks according to their achievements as shown in Table VII.

From Table VII it appears that the banks' borrowing policies could not be predicted from their achievements.

---

1It may be observed that if only one or two indicators were used, the banks might not fall into the same classifications. This reflects the fact that the whole policy structure of a bank is made up by many individual policies and the more policies taken into account, the stronger the trend should show up.

2It is sometimes difficult to determine whether an indicator such as the change in call loans should be included as an indicator of conservatism or it should be included as an indicator of aggressiveness, giving the bank with the greatest increase the highest rank as an aggressive bank. In this particular case it was assumed that an increase in call loans reflected a passive accommodation of customers, whereas a reduction required an active and sometimes unpopular policy.
TABLE VI
RANK-ORDERING OF THE BANKS ACCORDING TO THE CONSERVATISM OF THEIR POLICIES
(HIGHEST NUMBER GIVEN TO THE MOST CONSERVATIVE BANK)

<table>
<thead>
<tr>
<th>Name of Bank</th>
<th>Ratio of Current Loans to Total Assets</th>
<th>Ratio of Reserve Fund to Paid-up Capital</th>
<th>Ratio of Net Worth to Total Liabilities</th>
<th>Relative Change in Canadian Call Loans During year ending Oct. 31, 1929</th>
<th>Total of Rank Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less Conservative Banks</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Royal Bank</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>11</td>
</tr>
<tr>
<td>Can. B. of Com.</td>
<td>8</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>15</td>
</tr>
<tr>
<td>Banque Can. Nat.</td>
<td>7</td>
<td>3</td>
<td>4</td>
<td>7</td>
<td>21</td>
</tr>
<tr>
<td>Dominion Bank</td>
<td>3</td>
<td>7</td>
<td>5-1/2</td>
<td>1</td>
<td>16-1/2</td>
</tr>
<tr>
<td>Banque Prov. du Can.</td>
<td>2</td>
<td>1</td>
<td>5-1/2</td>
<td>4</td>
<td>12-1/2</td>
</tr>
<tr>
<td>Conservative Banks</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bank of Montreal</td>
<td>9</td>
<td>5</td>
<td>3</td>
<td>6</td>
<td>23</td>
</tr>
<tr>
<td>Bank of Nova Scotia</td>
<td>6</td>
<td>9</td>
<td>8</td>
<td>9</td>
<td>32</td>
</tr>
<tr>
<td>Imperial Bank</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>5</td>
<td>23</td>
</tr>
<tr>
<td>Bank of Toronto</td>
<td>1</td>
<td>8</td>
<td>9</td>
<td>8</td>
<td>26</td>
</tr>
</tbody>
</table>

*aTo reduce random variation, the calculations were based on a two months average (September and October) for 1928 and 1929.*

Source: Calculations based on "Monthly Returns by the Chartered Banks," Canada Gazette.
## TABLE VII
### RANK-ORDERING OF THE BANKS ACCORDING TO THEIR AGGRESSIVENESS AND ACHIEVEMENTS (HIGHEST NUMBER GIVEN TO THE MOST SUCCESSFUL BANK IN TERMS OF PERCENTAGE CHANGE)

<table>
<thead>
<tr>
<th>Name of Bank</th>
<th>Number of Branches opened 1923-29a</th>
<th>Change in Canadian Current Loans 1927-29</th>
<th>Change in Total Assets 1927-29</th>
<th>Increase in Share Values from 1926 low to 1928 high</th>
<th>Total of Rank Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Less Conservative Banks</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Royal Bank</td>
<td>10</td>
<td>8</td>
<td>9</td>
<td>9</td>
<td>36</td>
</tr>
<tr>
<td>Can. B. of Com.</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>6</td>
<td>33</td>
</tr>
<tr>
<td>Banque Can. Nat.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Dominion Bank</td>
<td>5</td>
<td>3</td>
<td>8</td>
<td>2</td>
<td>18</td>
</tr>
<tr>
<td>Ban. Prov. du Can.</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>5b</td>
<td>17</td>
</tr>
<tr>
<td><strong>Conservative Banks</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bank of Montreal</td>
<td>6</td>
<td>7</td>
<td>6</td>
<td>8</td>
<td>27</td>
</tr>
<tr>
<td>Bank of Nova Sco.</td>
<td>2</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td>Imperial Bank</td>
<td>3</td>
<td>6</td>
<td>2</td>
<td>3</td>
<td>14</td>
</tr>
<tr>
<td>Bank of Toronto</td>
<td>9</td>
<td>10</td>
<td>7</td>
<td>7</td>
<td>33</td>
</tr>
</tbody>
</table>

a. The period 1923 to 1929 was chosen in preference to 1927 to 1929. The establishment of new branches were part of long term policies and the period 1927-29 was too short to give a true indication of the banks' long term achievements.

b. The shares of Banque Provinciale du Canada were not listed on the stock exchanges. The rank is therefore only an estimate. The estimate is based on the relative change in net profits, which in the case of the other banks were strongly related to the change in share values.

Although the Royal Bank and the Bank of Commerce are shown to be among the most aggressive, the Banque Canadienne Nationale, the Bank of Toronto and the Bank of Montreal fall in the wrong category if conservative were equated with unprogressive and less conservative, with aggressive.

**Conclusion**

The purpose with this chapter was to test that an analysis of the individual bank's borrowing behavior would yield results consistent with those of last chapter's aggregate analysis.

The findings of the micro analysis appear to confirm that both the least-cost spread and the reluctance to borrow were important determinants of the banks' borrowings. Moreover, the micro analysis revealed certain behavioral relationships which are obscured by aggregation.

The conclusions of this chapter may be briefly stated as follows. The least-cost spread appears to have exerted an influence on the borrowing of most of the banks. It appears, however, that the New York call loan rate was an alternative cost only for those banks which had regular portfolios of call loans in New York. For the others, mainly the smaller banks, the use of the call loan rate appears not to have been relevant as a measure of alternative cost comparable to the
rate charged on advances.

The micro analysis shows the reluctance factor to be important but different in effect from what had previously been assumed. Not only did the factor operate as a voluntary ceiling to the banks' indebtedness, to some conservative banks the tradition against borrowing from the Government also constituted an aversion to borrow at all. Only the advantage of a comparatively high least-cost spread would outweigh the reluctance to borrow of the more conservative banks. Each of these banks, moreover, abstained from increasing their indebtedness beyond a ceiling which was considerably lower than those of the less conservative banks.

Because the conservative banks began to borrow only at a significant least-cost spread when some of the other banks had reached their ceiling, the aggregate expansion path of borrowings does not indicate the full effect of the aversion to borrow. Based on the analysis of the individual banks, it can be stated that the aggregate expansion path in Figure 5 gives a misleading impression; that is, the least-cost relationship appears stronger and the reluctance factor, weaker, than revealed by the analysis of the individual bank's borrowing.
CHAPTER VI

CONCLUSION

The purpose of this thesis is to evaluate the controversy over the use made by the chartered banks of the facilities provided under the Finance Act.

During the inquiry of the MacMillan Commission, the Act was criticized for having operated to the private benefit of the chartered banks rather than to the benefit of the country's economy in general.

Sir Thomas White defended the banking system's use of the Act by stating that the banks had always borrowed sparingly and repaid their loans quickly. The reason for this behavior, he hypothesized to be due to the banks' disinclination to pay the interest rate on advances combined with an aversion on the part of the banks of being heavily indebted to the Treasury.

In Chapter III Sir Thomas' hypothesis was examined for logical consistency. The hypothesis, however, was found meaningless as originally expressed. The interest cost of
advances, thus, could only be avoided by using other means of adjustment, which also had their cost. On the assumption that the banks would prefer the least costly means of adjustment, Sir Thomas' hypothesis was revised to the following form:

They (the chartered banks) have always been sparing in their resort to its (the Finance Act's) privileges and pay off their advances quickly. There is a twofold reason for this policy: firstly, because they prefer the least-cost means of replenishing cash reserves and, secondly, because they do not care to incur or to show in their returns heavy indebtedness in respect of advances under the Act.

A method for testing the hypothesis was devised by indifference curve analysis. It was argued that if both the least-cost consideration and the aversion toward heavy indebtedness were important determinants, the effects would be apparent from the shape of the expansion path of borrowing relative to the least-cost spread. In that case the expansion path could be expected to level off when a level of heavy indebtedness was reached.

In Chapter IV, the hypothesis was confirmed by an empirical test of aggregate data of the banking system's borrowings under the Act. However, when the individual bank's borrowings were examined in Chapter V, it was found that individual variation in the behavioral relationships had obscured
some of the effects of the aversion factor in the aggregate analysis. Hence, it was observed that some banks had initiated borrowings at a least-cost spread at which other banks had begun to level off in their borrowings.

An examination of the policy structures of the individual banks showed the aversion factor to be part of a coherent set of policies. In this connection, the more conservative banks were found to be reluctant to borrow at all levels of indebtedness, while the less conservative banks were reluctant to borrow only at levels of heavy indebtedness.

On the basis of the empirical analysis, the question whether to accept or reject the revised hypothesis must be answered. The answer may be divided in two parts as the hypothesis itself, clearly, consists of two sections. The former section is a statement of facts while the latter is a statement of causal relationships.

The statement of facts must be judged to be a misleading and incorrect overgeneralization. There were, thus, great differences among the banks. While the conservative banks borrowed relatively small amounts, some of the other banks borrowed up to 80 and 90 per cent of their net worth. Moreover, while a few banks borrowed for relatively brief periods, other banks were indebted to the government for years at a
time.

With respect to the relationships of the second part of Sir Thomas' statement, it must be concurred that both the least-cost spread and the aversion to indebtedness were crucial factors. The least-cost spread, which was not part of the original hypothesis, appeared to influence the majority of the solvent banks although it was most obvious in relation to less conservative banks.

The aversion hypothesis, however, appeared to be deficient by not recognizing an aversion to borrow at all levels of indebtedness by the more conservative banks. For these reasons the revised hypothesis must be rejected.

Summing up the discussion, it is evident that apart from substantial individual differences the banks could be classified by their borrowing behavior into three groups: conservative banks, less conservative banks and insolvent banks.

The conservative banks borrowed only at substantial least-cost spreads and borrowed only moderate amounts. The

1No relevant alternative cost was found for those banks which did not have regular call loans in New York. If a relevant alternative cost had been used for all banks in the calculation of the least-cost spreads, a further confirmation of the least-cost hypothesis would not have been unlikely.
less conservative, but solvent, banks borrowed frequently and remained indebted to the Treasury up to several years. They borrowed comparatively larger amounts than the conservative banks. The insolvent banks borrowed relatively large amounts and were regularly in debt to the Treasury until they were absorbed.

The determinants of borrowings consisted of the least-cost spread and the aversion to indebtedness. The least-cost spread may be assumed to have effected all banks to varying degrees. The aversion to being indebted under the Act was apparent at all levels of borrowing for the conservative banks but only at high levels for the others.

With respect to the controversy which led Sir Thomas to formulate his hypothesis, it appears that the majority of the banks took advantage of the Finance Act to their own benefit.
APPENDIX A

A COMPARISON OF THE DATA FROM THE VARIOUS AVAILABLE RECORDS OF ADVANCES UNDER THE FINANCE ACT

As previously noted, the only monthly record of advances covering the whole period of the Finance Act is the record of month-end balances owed by the banks. This is a record of balances owed by the banks for one day only out of each month.

The borrowings reported in the monthly returns reflect four different types of borrowings. First, there is the discounting for cash adjustment purposes. This type of borrowing may be assumed to have been made generally for periods of one day to perhaps a few weeks. This type of borrowing probably occurred during the month according to the cash drain at the Clearing Houses. Thus, a month-end balance may sometimes reflect a borrowing for cash adjustment. Secondly,

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1 The data from August 1914 to December 1929 may be found in Curtis, Statistical Contributions to Canadian Economic History, p. 27.

From October 1923 a record of borrowings is also provided in the "Returns of the Chartered Banks," Canada Gazette.
borrowings may reflect attempts at "window-dressing." As noted, this term referred to the custom among the banks to change their assets and liabilities in their monthly and yearly statements to give an appearance of greater soundness of the bank's position. Borrowings under the Finance Act were an easy way to replenish cash reserves on the last day of the month. There is strong evidence that the banks used the Finance Act for this purpose which, of course, tended to make the recorded balances greater than the average borrowings. Thirdly, borrowings were made during seasons and other periods of exceptional heavy demand for bank loans, and fourthly, borrowings were made by banks suffering from a more than seasonal or temporary shortage of working capital. Such borrowings were often made during several quarters before the illiquid banks were finally absorbed by larger and usually financially stronger banks.

For the period from January 1927 to July 1933, the MacMillan Report contains some series of borrowings which

---

1 For a brief discussion of "window-dressing" see Curtis, Statistical Contributions, p. 5.

provide a means of checking the reliability and biases of the month-end balance series as an indicator of the "true" average borrowings under the Act.

In the following part of this appendix, an analysis of the series will be made. In order to reduce the element of random variations, which is especially pronounced in the month-end balance series, quarterly averages of monthly data will be used in the comparison of month-end balances and monthly averages of daily advances.

In Figure 12, a correlation is done of these two series for the years 1927 to 1932. The month-end balances appear always to be higher than the daily averages. The latter are approximately zero when month-end balances are $10 million and the daily averages vary generally 75% of the variation in the month-end balances.

From an examination of month-end balances and monthly "high," there is little doubt that the advances are consistently at their highest point at the end of each month. This fact provides a strong indication of "window-dressing."

In Figures 13 to 16 different series have been correlated with the least-cost spread for the period 1927-32. Quarterly averages of monthly data have been used in the first two cases.
Figure 12. The relationship between the advances under the Finance Act calculated as quarterly averages of daily balances and advances calculated as quarterly averages of month-end balances, January 1927 - December 1932.
Figure 13. The relationship between the least-cost spread and the quarterly averages of daily balances of advances under the Finance Act, January 1927 to December 1932.
Figure 14. The relationship between the least-cost spread and the quarterly averages of month-end balances of advances under the Finance Act, January 1927 - December 1932.
The correlation of month-end balances evidently has two important similarities with the correlation based on daily averages. Both figures show a levelling off of borrowings as a level of "heavy indebtedness" is reached. The levelling off process begins earlier and is more pronounced in Figure 13 than in Figure 14. Secondly, both correlations show a distinct shift in the borrowing relationship occurring at the end of 1929. For some reason the banks' demand curve for advances appears to have shifted upwards between the late 1920's and the early 1930's.

Many explanations could be made of the shift. It could conceivably be related to the "need" of borrowing. Thus, a large part of the previous year's crop had not been exported and when in the fall of 1929 the new crop had to be moved, loans were required not only to move the crop but to finance the inventory of the previous year's crop. As the Finance Act was especially provided to finance seasonal requirements, the banks could be expected to use the facilities for that purpose with even less restraint than usual. This explanation has much in common with the old "need and reluctance" theory and is not too satisfactory.

There are, however, some other reasons for the shift. The least-cost spread, as previously explained, was defined
as the difference between the New York call loan rate and the rate charged on advances. With stable exchange rates the risk of exchange losses for reserves held in New York would be small. After the crash, the insecurity relating to exchange rates was greatly increased as reflected in a worldwide talk of devaluation. For whatever reason, the banks began a rapid reduction of their New York reserves. The banks' call and short loans elsewhere than in Canada, thus, declined from $282 million in November 1929 to $184 million in March 1930, and to $90 million in September 1931. In the later part of the period under discussion, several banks who had previously used their New York reserves for cash adjustment purposes, may simply not have had sufficient funds in New York to continue to do so.

---

1 If the banks covered themselves against exchange loss in the forward market, the cost of doing so after the crash would have increased as the spread between spot and forward rates probably widened. (No record of forward rates for the 1920's and early 30's seems to be available.) An eventual increase in the cost of protection would, if applicable, increase the cost of using New York funds to meet temporary requirements in Canada.

2 Another reason for the decline of the banks' New York call loans and the increase in security holdings was the fact that while the call loan rate continued to decrease from a yearly average of 7.61 per cent in 1929 to 1.74 per cent in 1931, the bond rates remained high during those years.
A third reason for the apparent shift was the increasing use of borrowing for short term purposes. Comparing the amounts of advances paid to the banks during the middle 1920's with those of the early 1930's, it is obvious that the flow of advances had shifted upwards in the intervening years. While the advances paid out in the fiscal year ending in 1927, for instance, amounted to $234 million, the equivalent figure for 1931 was $364 million. Some of these short term borrowings would be reflected in the month-end balances and would therefore explain the shift.

Part of the shift in month-end balances may conceivably have been caused by an increase in the use of the Finance Act for purposes of "window-dressing" during the early part of the depression. During that period of economic insecurity, it is likely that the banks were especially concerned to present a sound appearance to the public.

The shift in the use of the Finance Act for short term borrowings would not necessarily be reflected in the record of low monthly balances. In Figure 15 the lowest quarterly balances are correlated with the least-cost spread and the

1The deposits in Canada were approximately 7 per cent greater in the latter year compared with 1927.
Figure 15. The relationship between the least-cost spread and the "low" quarterly balances of advances under the Finance Act, January 1927 – December 1932.

(Minimum balance was zero for 1927 I, 1931 I and II)
shift, if any, is much less pronounced. Figure 15 shows a strong relationship to exist between borrowings and the least-cost spread. However, no indication of a reluctance is apparent. This lack of conformity with the other series may be explained by random variation in the "low" balance series. The quarterly "low" occurred during one day out of three months and the low for two consecutive months varied up to $15 million. To reduce the size of the random variations, the second lowest quarterly observation was used in Figure 16. A quarterly average of monthly "lows" could also have been used to reduce the random variations. Such an average would have shown approximately the same trend as Figure 16. It is obvious that Figure 16 conforms better than Figure 15 to the other series. The levelling off process obviously began in the second quarter of 1929 according to the latter graph.

When comparing the four last graphs of the appendix, it is noteworthy that the observation for the fourth quarter of 1929 is not part of the same "universe" as the other observations from 1929. Part of the reason for the exceptionally high borrowing in relation to the relatively narrow least-cost spread may be found in the previous discussion about the shift in borrowing behavior. There may thus have been a strong seasonal demand for loans which in a more normal time
Figure 10. The relationship between the least-cost spread and the "median low" quarterly balances of advances under the Finance Act. (The "median low" is the median of the three monthly "low" observations in each quarter.) January 1927 to December 1932.

<table>
<thead>
<tr>
<th>Advance</th>
<th>Finance Act</th>
<th>Million Dollars</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>29 IV</td>
<td>29 II</td>
</tr>
<tr>
<td></td>
<td>29 I</td>
<td>29 III</td>
</tr>
<tr>
<td></td>
<td>28 III</td>
<td>28 IV</td>
</tr>
<tr>
<td>50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>32 II</td>
<td>32 I</td>
</tr>
<tr>
<td></td>
<td>32 III</td>
<td>30 II</td>
</tr>
<tr>
<td>10</td>
<td>31 IV</td>
<td>27 IV</td>
</tr>
<tr>
<td></td>
<td>31 III</td>
<td>30 III</td>
</tr>
<tr>
<td></td>
<td>31 I</td>
<td>30 IV</td>
</tr>
<tr>
<td>-3</td>
<td>-2</td>
<td>-1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
</tr>
</tbody>
</table>

Least-Cost Spread
would have been met by calling some of the New York loans. In that particular quarter, however, the banks largely refrained from calling their stock market call loans. If the Canadian banks as a group had begun to call large volumes of their New York call loans, it would not only have been disastrous for the brokers and other borrowers directly involved, but it would have depressed stock prices still further.

The conclusion of the examination of the various series relating to the Finance Act must be that for the six years examined, the month-end balances in general overstated the volume borrowed during the particular month and were subject to considerable random variations. On the other hand, if quarterly averages are used as done in this appendix and if allowances are made for month-end peak borrowings, the month-end series gives a reliable indication of the "stock" or balances borrowed under the Act. Moreover, all the major trends found in the other series are also apparent in the series of month-end balances.
APPENDIX B

The Frequent Borrowers

As indicated in Figure 11, the greater part of the total advances outstanding were usually owed by the frequent borrowers. Although this group only made up about 55 per cent of the banking system's net worth and total assets, it generally borrowed 70 – 80 per cent of the total balances owing by all banks.

The frequent borrowers consisted of four banks, namely, the Royal Bank of Canada, the Canadian Bank of Commerce, the Banque Canadienne Nationale, and the Dominion Bank.

The Royal Bank was Canada's largest bank in terms of total assets and number of branches. Except for two months in 1927, the Royal Bank had balances of advances owing each last day of all the other months. Not only was the Royal Bank one of the most frequent borrowers, but it borrowed with a few exceptions the largest amount each month. With respect to its size, however, the Royal Bank's borrowings were the lowest in the particular class. Relative to net worth, the Royal Bank's high balances were slightly below those of the Canadian Bank of Commerce and the Dominion Bank. Relative
to total assets, the Royal Bank's borrowings were considerably lower than those of the other banks in the class.

As shown in Figure 17, the expansion path of the Royal Bank's borrowings has a distinct shape. The volume of borrowings is initially quite responsive to increases in the least-cost spread and the amounts borrowed rise rapidly as the spread widens. However, when the borrowings reach $25,000, i.e. 35 - 40 per cent of net worth, they become completely inelastic to further improvement in the spread.

The Canadian Bank of Commerce and the Dominion Bank were fairly similar in their borrowing behavior considered in relative terms of their sizes. In general the Dominion Bank borrowed relatively heavier and reached its levelling-out point at a lesser spread than did the Bank of Commerce.

The borrowing habits of the Banque Canadienne Nationale were quite distinct from the rather uniform habits of the other three banks in the group. Not only were the borrowings by the Banque Canadienne Nationale approximately twice as heavy as those of the other three banks but the expansion path rose in an almost straight line until the second last quarterly observation after which a rapid decline took place. Although the Banque Canadienne Nationale borrowed less regularly and with greater variations in the amounts borrowed than the
Figure 17. The relationship between the least-cost spread and month-end borrowings under the Finance Act by individual bank, July 1927 - September 1929.

Borrowings as per cent of Net Worth

Frequent Borrowers
- Royal Bank
- Can. B. of Com.
- Dominion Bank

Infrequent Borrowers
- Bank of Montreal
- Bank of N.S.
- Imperial Bank

Remaining Banks
- Bank of Toronto
- Ban. Prov. d'C.

Absorbed Banks
- Standard Banks
- Weyburn Sec. B.
other banks in its class, it was still the heaviest borrower of the group.

The Infrequent Borrowers

The infrequent borrowers consisted of the Bank of Montreal, the Bank of Nova Scotia and the Imperial Bank of Canada. Together these three banks had close to 40 per cent of the banking systems' total assets. The average borrowings over the last year studied constituted, however, only about 25 per cent of the balances owing under the Finance Act.

The Bank of Montreal was by far the largest bank in its group. It was about the same size as the Royal Bank, but its high borrowings were only about 60 per cent of the latter's. The expansion path of the Bank of Montreal is completely different from those of the frequent borrowers. From having had no recorded borrowings during the first 3-1/2 years since October 1923, the Bank of Montreal borrowed $20 million in May 1927. The following month the balance was reduced to $15 million, which, except for one interruption, remained the

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1October 1923 was the first month for which the monthly returns of the chartered banks specified the month-end balance owing under the Finance Act.

2The Bank of Montreal began to borrow in the middle of the second quarter of 1928 when the spread had reached approximately 2.00.
month-end balance until September 1929 when the balance was reduced to $10 million. Considering the borrowing relative to its size, the Bank of Montreal's borrowings were considerably below those of the banks in the frequent borrower category.

The Bank of Nova Scotia was the second largest bank among the infrequent borrowers. Its expansion path was different from any other bank's. Thus after four years of no recorded borrowing, the Bank of Nova Scotia in October 1928 borrowed $6 million. As the least-cost spread continued to widen, the borrowings were increased to $8 million in April and May of 1929, whereafter the borrowings declined in spite of an improvement in the spread. In relation to its size, the borrowings by the Bank of Nova Scotia were slightly above those of the Bank of Montreal but below those of the frequent borrowers.

The Imperial Bank had only two recorded monthly balances. The first of these occurred in June 1929 and the second one took place three months later. Relative to its size, the borrowings by the Imperial Bank were the lowest of all the Canadian Banks.

Small Stable Banks with no New York Call Loans

The stable or remaining banks were the ones which were
not merged during or immediately following the period under study. Only two banks, the Bank of Toronto and the Banque Provinciale du Canada, were in this group.

In contrast to the fairly uniform group characteristics of the frequent and infrequent borrowers, the Bank of Toronto and Banque Provinciale had few borrowing habits in common.

Initially in the period, they both borrowed regularly but as the least-cost spread widened to about 2 (that is where the infrequent borrowers began to borrow), the Bank of Toronto, according to the month-end returns, stopped borrowing for the rest of the period. The Banque Provinciale continued its pattern of borrowing up to the end of the period. With respect to the volume of borrowings relative to the size of the banks, the Bank of Toronto resembles the infrequent borrowers while the Banque Provinciale resembles the frequent borrowers.

Absorbed Banks

The aggregate borrowings by the subsequently absorbed banks fluctuated with minor deviation about $3 million until November 1928 when the Standard Bank was absorbed by the Canadian Bank of Commerce. From May 1929, the Weyburn Security Bank became a continuous borrower. Thus in June 1929,
its balance owing was $700,000, which, with two exceptions, remained as a debt during the following 18 months, during which the least-cost spread changed from +4.52 to -2.05.

An interbank comparison of borrowings relative to size is made difficult by the fact that the Standard Bank ceased to exist in 1928 while most of the remaining banks had their high borrowings subsequently. Thus, the other banks' borrowings rose generally about 40 per cent since the recorded high borrowings by the Standard Bank.

The borrowings by Weyburn Security Bank were, relative to its small size, far above all the banks in the system. The discussion of the various types of borrowing is summarized in Figure 12, which for each bank provides an expansion path proportional to the bank's net worth.

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1If the high borrowings by the Standard Bank were 40 per cent higher, they would be approximately 80 per cent of its net worth.
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