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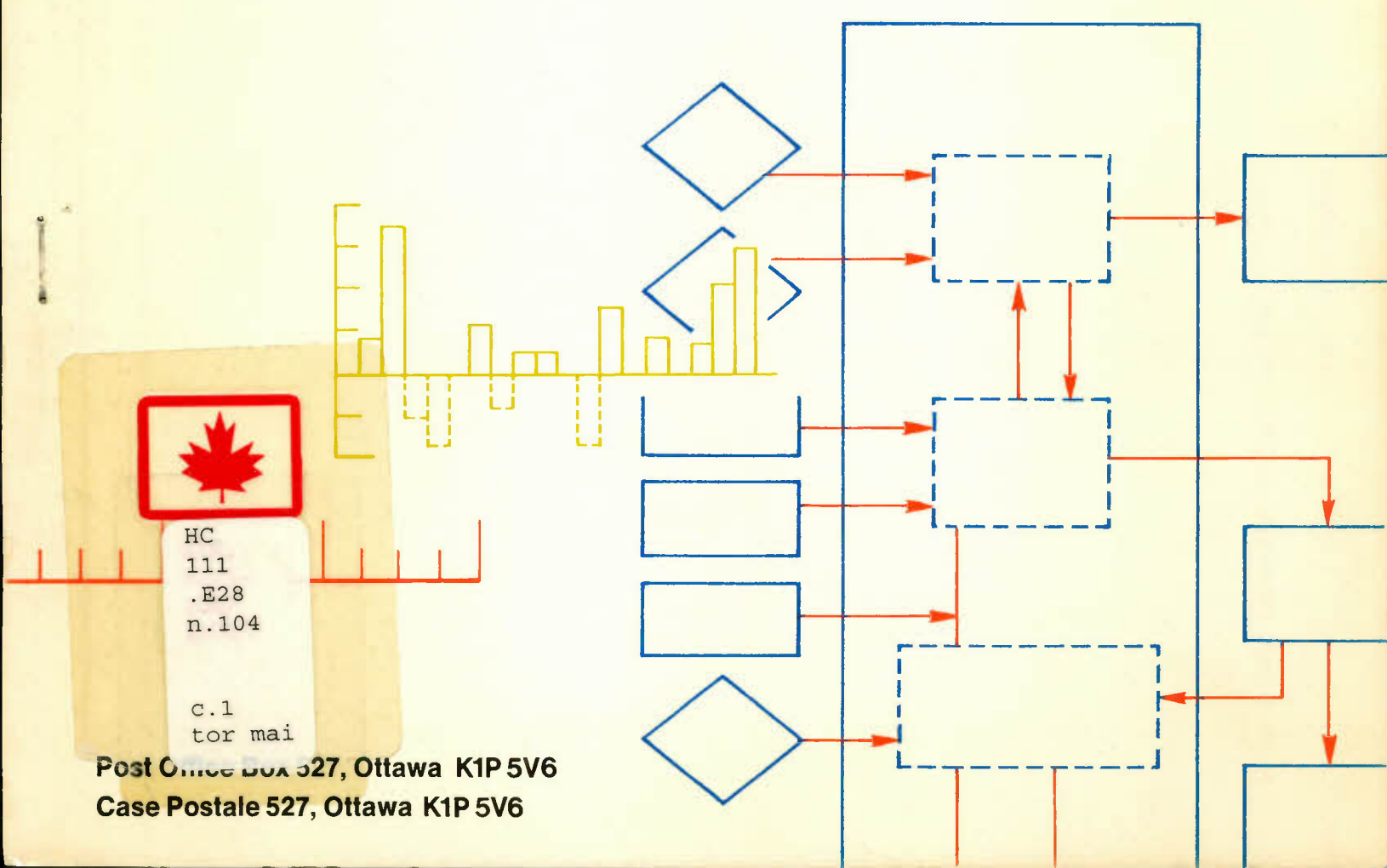

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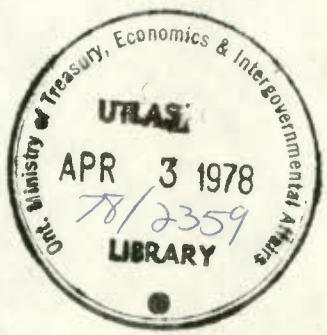
DISCUSSION PAPER NO. 104

The Performance of Canadian Banks

by

George Lermer



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ABSTRACT

In this paper the performance of Canadian banks is assessed relative to that of United States banks. A measure of performance is developed which is based on bank loan yield spreads, the difference between the rate of interest earned on loans and the rate paid on deposits. Legal and institutional differences in the two countries' financial systems are taken into explicit account in formulating and calculating these measures. These differences, however, make it impossible to divide the extra costs for Canadian banking services between depositors and borrowers.

We do establish the sum of excess costs in Canadian banking relative to the costs that would apply if U.S. loan yield margins replaced Canadian ones. The U.S. data is modified to reflect Canadian reserve ratios, tax rates and capital/asset ratios which differ markedly between the two banking systems. In 1973 excess resource costs, profits and taxes are estimated to be $634 million. Excess profit is given by the difference between the average bank rate of return and the all manufacturing rate; excess taxes include the saving on government debt financing costs due to the holding by banks of primary reserves above 3 per cent, as well as secondary reserves. In 1973 extra profit was $44 million, extra taxes $182 million, and wasted resources costs totaled $408 million. These conservative estimates omit the welfare loss (consumer surplus) due to the reduced use of banking services that accompanies higher charges, because reliable estimates of the elasticity of demand for banking services are not available.

The evidence reported here infers that the cost of protecting the Canadian banking system from the direct entry into banking of large nonbank financial intermediaries, as well as foreign financial institutions, is substantial. Part of this cost is a transfer to bank shareholders, another part a transfer from bank customers to the taxpayers at large, but the largest component of the cost is a result of a misuse of resources. Much is to be gained by a Bank Act reform that will expose the Canadian banking system to greater competition.

Résumé

Dans ce document, l'auteur évalue la performance des banques canadiennes par rapport à celle des banques américaines. Il met au point une mesure de la performance fondée sur les marges de rendement entre les prêts et les dépôts. Pour formuler et calculer cette mesure, il tient explicitement compte des différences légales et institutionnelles entre les systèmes financiers des deux pays. Toutefois, celles-ci ne permettent pas de répartir, entre les déposants et les emprunteurs, les frais supplémentaires des services bancaires canadiens.

L'auteur calcule la somme des coûts excédentaires des services bancaires canadiens, par rapport à ceux qui s'appliqueraient si l'on remplaçait les marges de rendement entre les prêts et les dépôts, aux Etats-Unis, par celles qui existent au Canada. Les données américaines sont modifiées en vue de refléter les coefficients de réserve, les taux d'impôt et les coefficients d'endettement des banques canadiennes, qui diffèrent beaucoup de ceux des banques américaines. On a estimé qu'en 1973 les coûts excédentaires des ressources, les profits et les impôts ont atteint 634 millions de dollars. Les profits excédentaires représentent la différence entre le revenu moyen des banques et le revenu moyen de l'ensemble du secteur manufacturier. Les impôts excédentaires comprennent l'épargne sur les frais du service de la dette des gouvernements du fait que les banques détiennent des réserves primaires dépassant 3 %, ainsi que des réserves secondaires. En 1973, les profits excédentaires étaient de 44 millions de dollars, les impôts excédentaires, de 182 millions, et le coût des ressources gaspillées, de 408 millions. Ces estimations prudentes ne tiennent pas compte de la perte de bien-être (excédent de consommation) attribuable à une plus faible utilisation des services bancaires à cause de frais plus élevés, car nous ne disposons pas d'estimations fiables de l'élasticité de la demande de ces services.

De tout ce qui précède, on peut conclure qu'il est très coûteux de protéger le système bancaire canadien contre l'entrée directe, dans ce secteur d'activité, d'importants intermédiaires financiers non bancaires et d'institutions étrangères. Le coût comprend notamment un transfert aux actionnaires des banques, un transfert des clients des banques aux contribuables en général, mais l'élément le plus important découle d'une mauvaise utilisation des ressources. Il y aurait beaucoup à gagner à entreprendre une réforme de la Loi sur les banques, qui permettrait d'exposer le système bancaire canadien à une plus grande concurrence.

PREFACE

I began writing this paper in July 1975 when it became apparent that it would be useful to buttress the case for increased competition in banking with estimates of the losses to Canadian consumers of bank services due to the current mix of protection, taxes and regulation. Initial drafts of this study were used as an input into the Economic Council of Canada's study Efficiency and Regulation. After the Council report was available, many requests for the details of the measurements reported there were received which prompted the decision to publish this working document. This study is not precisely the same one upon which the Council report relied, but they are similar both in spirit and in quantitative results. In addition, in returning to a study after a year's delay, it is inevitable that new avenues suggest themselves and require further exploration.

This study owes much to the intellectual interference of John Chant, who rarely misses any weakness in an argument, and Jack Mintz, who provided much of the detail on U.S. and Canadian banking markets relied upon in this study. Other people who provided invaluable support were Lillian Hughes who edited an earlier version of the study, and Janet Martin who managed and collected much of the data. I also appreciate the encouragement of André Raynauld and George Post of the Council, as well as Robert Bertrand, Director of Investigation and Research, Bureau of Competition Policy, who freed me from some of my current duties in order that I might finalize this work. Wayne E. Clendenning read, reviewed and edited the final draft of this study. His skill is reflected in these pages. The study's weaknesses rest on my shoulders alone. I trust that this work will stimulate further research and that it may make some small contribution to the rational liberalization of the regulatory structure confining the Canadian banking and financial markets. One task that requires attention is the updating of the data base on which this study draws to include material from 1974, 1975 and 1976.

INTRODUCTION

The need to measure industry efficiency arises when government takes upon itself the responsibility for regulating an industry.

As many studies have shown, regulation often involves means that do not achieve intended ends and may inadvertently increase costs beyond the value of the regulatory goals.[1] Economic theory teaches us that regulatory controls that raise entry barriers into specific economic activities or into a given industry are likely to allow existing firms to exploit the protection granted them. It follows that as a general principle restrictive regulation should be avoided unless some noneconomic considerations are of overriding importance. Even in this case the costs of regulation should be recognized, and rational policy-making requires the measurement of performance and efficiency.

The measurement of the performance of an industry as complex as banking is not an easy task. A small number of indicators must be chosen to represent a variety of activities and then norms against which these indicators can be compared must be established. It is often, therefore, more useful to investigate the structure of an industry, and then rely on the relationship between structure and performance implied in economic theory and observed in countless industry studies.

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1 See, for instance, Almarin Phillips (ed.), Promoting Competition in Regulated Markets, Brookings Institution, 1975.

Dean and Schwindt[2] have recently published a structural analysis of the banking industry, but the complex regulatory structure and subsequent confusion of firms that compete in some sub-markets but not others, limits the inferences one can draw from structural measures about the behaviour and performance of the industry. For this reason we reject the indirect approach and attempt to measure performance directly.

Since knowledge of the economic performance of the financial system must be an input into the process of regulatory reform, it is surprising how rare such measurement is. The Porter Royal Commission[3] did not, to our knowledge, study the question, and Neufeld's[4] massive study of the Canadian financial system documented its structure and growth rather than its economic performance. One recent study by Neave and Purvis,[5] has pioneered by comparing the performance of the Canadian and U.S. banking systems, as a basis for measuring the efficiency of Canadian banking. Our research is in this same tradition, but involves a considerably more detailed analysis than is to be found in Neave and Purvis.

In this study we first review some theoretical problems in measuring performance. Our main contribution is to develop a methodology for relating Canadian bank performance

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2 J. W. Dean and R. Schwindt, "Bank Act Revision in Canada, Past and Potential Effects on Market Structure of Competition," Banca Nazionale del Lavoro Quarterly Review, March 1976.

3 Royal Commission on Banking and Finance, Report (Queen's Printer, 1964).

4 E. P. Neufeld, The Financial System of Canada, McMillan, 1972.

5 E. H. Neave and D. D. Purvis, "A Comparison of Banking System Performance in Canada and the United States," Paper presented at the Queen's University Conference on Monetary Economics, August 1975.

with U.S. bank performance. This model takes into account the practices of requiring compensating balances for loans and remitting service charges to deposit holders which are widespread in the U.S. system, and make comparisons with Canada difficult. First, the characteristics of the performance measures we propose are developed in some detail. Then further differences in the U.S. and Canadian banking systems which call for modification or interpretation of our measures before they truly indicate relative performance, are outlined. Then we report our results on two bases. First, the Canadian bank performance is compared with actual U.S. bank performance. Second, the U.S. bank data are adjusted so that performance measures are calculated hypothetically, as if the U.S. banks operated under Canadian conditions pertaining to reserves, tax rates, and capital-asset ratios.

We are able to show that, compared with U.S. banks, Canadian banks operate with higher net revenues with respect to two basic banking functions -- the granting of loans and the provision of payment services. These extra revenues are partly a payment to government, taking the form of direct taxes, interest-free loans on primary reserves, and below-market rates on secondary reserves. A part of the remaining extra revenues goes into bank profits, since we find the rate of return to equity higher in Canadian banking than the average rate earned in Canadian manufacturing industries. The residual, after subtracting the tax and profit components, is the extra resource costs used in Canadian banking as compared with the resources used in providing similar services by U.S. banks.

The largest component of the excess cost represents higher resource costs. As the Economic Council has reported, "While these higher resource costs could merely reflect the influence of such factors as population distribution, the structure of [nonfinancial] industry, or other institutional factors [unaccounted for by our study], they are also consistent with less than full competition" and "this interpretation is reinforced by the presence of high profits."[6] We are firm in our opinion that the latter is the appropriate interpretation, and look forward to continued research that could provide further evidence on the matter.

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6 Efficiency and Regulation: A Study of Deposit Institutions, Economic Council of Canada (Ottawa: 1976), p. 47.

THE PERFORMANCE MEASURES EMPLOYED

Traditionally, firms are ranked according to efficiency levels by variables whose values are calculated by dividing an output by an input variable. However, an "output per unit of input" approach to the measurement of bank efficiency is only possible when output can be defined precisely. Banks are joint product firms producing many services simultaneously, so that the allocation of overheads to each product line would be the major task of an analyst proceeding with this approach to performance measurement. Detailed accounting data of individual banks, necessary for this exercise, are not available. We therefore do not pursue this line of attack. But even with data the measurement of bank efficiency with the "output per unit of input approach" may not be an appropriate method for arriving at efficiency measures.

The output-to-input-ratio approach is impractical because the number of distinct activities to be considered is large, and some are not easily measurable. Number of loans, for instance, is not an adequate measure of loan output. Loans of different values, risk categories and terms to maturity all have different characteristics and are differentiated to the point that they would need to be defined as separate products. In addition, the resources used by a financial institution associated with lending activities may be influenced by the risk-taking characteristics of the firm. Two firms with the same number of depositors, loans and other activities, may nevertheless

be producing quite different total output if one firm's strategy is to match the term of maturity of its assets and liabilities, whereas the other lends longer in term than it borrows. The former firm will require fewer resources in managing its asset-liability portfolio and will, in the long run, earn lower average profits than the second. An output-input ratio measure of efficiency may classify the second firm as less efficient than the first because it employs more resources in managing its portfolio than does the first. We reject the output-input ratio measures of performance because insufficient data are available, the number of specific lines of activity are large, and the risk associated with the management of the total portfolio cannot easily be measured as a distinct service or output.

Firms can also be ranked in order of efficiency by using the difference between revenue earned per dollar of asset and interest paid per dollar of liability. If the assets and liabilities of two institutions or groups of intermediaries were identical then, other things being equal, the differential, which we call the "net interest revenue", is the source of revenue from which taxes are paid, profits are earned and operating expenses (other than those paid for out of service charges) are paid. If after accounting for differences in taxes and profits the "net interest revenue" per dollar asset is larger in one group than in another, then we have a prima facie case that the operating costs per dollar asset of that group are higher.

If one could find two institutions that operated with identical asset and liability structures, and if the conditions were also similar in both input and output markets, then one would not need to refer to "net interest revenue" concepts but could simply turn to data on operating costs per dollar asset. In general, a major component of operating costs are overheads that can only arbitrarily be allocated to a specific asset or liability. Therefore, it is useful to rely on "net interest revenue" concepts which can more easily be identified with specific asset and liability types. This allows us to compare costs of similar intermediation even when the institutions have different mixes of assets and liabilities.

This approach to measuring efficiency will not work if two firms are in the same competitive market because the firms will be price-takers on both the asset and liability sides. If we take a financial industry, rather than a firm, then the approach is successful to the extent that the industry is not a price-taker on both assets and liabilities. Either bank loans are not perfect substitutes for nonbank loans, bank deposits are not perfect substitutes for nonbank liabilities, or banks as an industry form such a large part of the financial market that both loan and deposit rates are established by the banking industry and nonbank institutions are the price-takers. In general terms, this approach to efficiency measurement is the one used in this study.

The standard with which Canadian bank performance is compared is different groups of United States banks. The advantage of this approach is that in recent decades, U.S. bank

activities in Canada have grown considerably, suggesting that foreign banks are confident of their greater efficiency and consequent ability to compete in Canada. Another reason is, as some have argued, competition is greater in U.S. financial markets and regulatory constraints are less disturbing to competition there than here. To the extent that this is not the case, and the American banking system is less than competitive, our estimates of the cost of protection and inefficiency in Canada will be conservative.

The Model

Of the many activities banks are involved in, two are fundamental. One is the practice of making loans, a category in which we include mortgages, commercial loans and consumer loans, but exclude securities. The other is the provision of payment services in which we include the services households and firms make use of in managing their transactions. Banks use resources to supply payment services in order to attract demand depositors to whom no interest is paid. The cost to users of payment services per dollar of demand deposits, assuming there are no service charges, is the interest forgone in not holding interest-paying deposits. A third function, the supplying of services to nondemand depositors, is a relatively minor item because nondemand depositors are attracted primarily by interest payments. To simplify our analysis we assume, in what follows, that all noninterest costs associated with the handling of nondemand deposits are covered by service charges to these

depositors so that the banks do not meet any expenses for nondemand depositors out of the revenues earned on loans.[9]

We let X_c be the Canadian cost per dollar loan, X_a the U.S. cost per dollar loan, and X equal to X_c minus X_a is a measure of relative efficiency in loan handling. Similarly we let Y_c and Y_a be the Canadian and U.S. banks' average expense on payments services per dollar demand deposit, respectively, and Y equal to Y_c minus Y_a is a relative measure of efficiency in supplying payments services. Finally, a single valued index of Canadian bank efficiency can be defined as in Equation (1) below:

$$(1) \quad \$ = W_1 X + W_2 Y$$

where the criteria for selecting the weights W_1 and W_2, are to be explained below.

In the absence of detailed accounting data and because of differences in the asset and liability portfolios between U.S. and Canadian banks, X_c, X_a, Y_c, Y_a, X and Y, cannot be calculated from cost data. An indirect approach for estimating these values is introduced, and it is possible to calculate an estimate of $ despite difficulties in calculating X and Y separately.

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9 This assumption probably favours the Canadian banks as regards the measurement of Y because Canadian banks incur payment service costs on part of nondemand deposits. On the other hand, the U.S. banks may be made to appear more efficient in providing loan services. Since loan services loom larger in our measurements than payment services, this may be a weakness in the study. We do not believe this is the case because Canadian nondemand service charges are rather high (see Table 4), whereas turnover rates on these funds are low. The extent to which costs of providing these services exceed the charge for the service is probably low, and we continue as if it is zero. If revenues exceed costs, and we have no evidence pointing one way or another, then the bias in our measurement is reversed and Canadian banks will be shown to be more efficient in loan handling and less efficient in the provision of payment services. See footnote 10 below for an algebraic demonstration of these points.

In principle, Y_c and Y_a can be calculated for a competitive banking system from the rate on nondemand deposits. A bank will shift between demand deposit and nondemand deposit financing, depending on which form of raising funds has the lowest marginal costs. In equilibrium the two marginal costs must be equal. We begin by assuming that no service charges apply to demand deposits. Since both banking systems are assumed to be competitive, each firm is a price-taker, the nondemand deposit interest rate is the marginal cost of nondemand deposits. Banks face increasing marginal costs for supplying extra payments services and establish the quantity of demand relative to nondemand deposit financing when the marginal cost of payments services (per dollar demand deposit) just equals the interest cost of nondemand deposits. In our analysis we compare one banking system with another system so that, again assuming perfect competition, the marginal costs of the individual firms just equate with the long-run average cost. Under these conditions, profits over and above the competitive norm necessary for keeping these resources in banking in the long run are zero. Therefore, Y_c (Y_a) is just the nondemand deposit cost C_n (A_n), where C_n and A_n, the nondemand deposit cost per dollar of the Canadian and U.S. banks, respectively, are defined in Table 1, and are readily calculated from reported data. Since part of the cost of payments services is paid out of service charges associated with demand deposits, we calculate Y_c, Y_a and Y as in Equation (2) below:

$$(2) \quad Y_c = C_n + SCD$$

$$Y_a = A_n + SAD$$

$$Y = Y_c - Y_a = (C_n - A_n) + (SCD - SAD)^{10}$$

where

SCD is the Canadian demand deposit service charge rate, and

SAD is the equivalent U.S. rate.

This same reasoning leads us to the conclusion that the cost of acquiring funds for lending purposes is, at the margin, independent of the source of financing and is just equal to the interest costs per dollar of nondemand deposits. Therefore, the expense of making loans, after interest costs are recovered, must be paid for out of the difference between the loan revenues and the nondemand deposit costs. Again, assuming both systems are competitive, the long-run average cost and marginal cost of making a dollar loan will be the same, and excess profits will be zero. X_c, X_a and X can be calculated from reported data as given by Equation (3).

$$(3) \quad X_c = L_c - C_n \qquad X_a = L_a - A_n$$

$$X = X_c - X_a = (L_c - C_n) - (L_a - A_n) .$$

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10 If nondemand deposit service costs and charges are introduced into the analysis, Y_c and Y_a need to be modified to reflect the marginal cost of nondemand deposit funds. This follows below:

$$Y_c = (C_n + CCN) - (SCN - SCD)$$

$$Y_a = (A_n + CAN) - (SAN - SAD)$$

where SCN is the service charge on Canadian nondemand deposits,

SAN is the service charge on U.S. nondemand deposits,

CCN is the actual cost of providing nondemand deposit services in Canada,

CAN is the actual cost of providing nondemand deposit services in the United States.

Canadian banks provide substantial amounts of payment services on nondemand deposits, whereas the U.S. banks have only recently begun to provide similar services. It is, therefore, in all probability, valid to say that net costs are higher in Canada than in the United States. That is (CAN-SAN) equals zero since no services are provided, whereas (CCN-SCN) is strictly positive; service costs are somewhat higher than service charges. By ignoring these service charges we are letting (CCN-SCN) equal zero, thereby reducing Y. The lower the value of Y the more efficient Canadian banks appear in providing payment services. To see this more clearly notice that Y can be written as follows:

$$Y = C_n - A_n + SCD + (CCN - SCN) .$$

On the other hand, X_c needs to be modified and X can be written as follows:

$$X = (L_c - L_a) + A_n - (C_N + CCN - SCN) .$$

Reducing (CCN - SCN) to zero increases X, causing the Canadian banks to look worse than should be the case.

Table 1

Definitions

Measure of Deposit Rates			Measure of Loan Yield Spread		Different Loan Yield Spread Measures
Name of Deposit Rate	Symbol of Deposit Rate	Deposits	Name of Loan Yield Spread	Symbol of Loan Yield Spread	
Total Deposit Rate (Canada)[1]	C_T	Total Canadian Dollar Deposits	Total Deposit Loan Yield Spread (Canada)	$CS_T = L_C - C_T$[2]	1. $D_T = CS_T - AS_T + (SCD-SAD)$
Nondemand Deposit Rate (Canada)[1]	C_N	Nondemand Canadian Dollar Deposits	Nondemand Deposit Loan Yield Spread (Canada)	$CS_N = L_C - C_N$[2]	2. $D_N = CS_N - AS_N$
Total Deposit Rate (U.S.)[1]	A_T	Total Deposits (U.S.)	Total Deposit Loan Yield Spread (U.S.)	$AS_T = L_A - A_T$[3]	3. $D_X = D_T + (K_C - K_A)A_N + K_C(SCD-SAD)$
Nondemand Deposit Rate (U.S.)[1]	A_N	Nondemand Deposits (U.S.)	Nondemand Deposit Loan Yield Spread (U.S.)	$AS_N = L_A - A_N$[3]	

1 Deposit rates are calculated by dividing the relevant total annual interest paid on deposits by the third column entitled "Deposits". The Canadian deposit figures are averages for each October of two consecutive years, whereas the U.S. figures are averages of December, June and December data.

2 L_C is the Canadian loan yield, total Canadian dollar loan revenue (annual) divided by average annual loans outstanding, which are averages for each October of two consecutive years.

3 L_A is the U.S. loan yield, total U.S. dollar loan revenue (annual) divided by average annual loans outstanding, which are averages of December, June and December data.

4 Canadian service charges per dollar demand deposit minus the U.S. rate is defined as SCD-SAD.

5 K_C is the ratio of nondemand deposits to total deposits in Canada, and K_a, the same ratio for the relevant U.S. bank group.

These measures of bank performance are based on perfect competition within each banking system, but the two systems must be separated by economic or regulatory barriers or else the comparison would be meaningless.

Unfortunately the assumption of perfect competition cannot be made for either market. In the United States regulatory authorities in many states impose loan interest ceilings and all banks were, over the period of our study, restricted as to the interest rates they could pay on some nondemand deposits by regulation Q. These regulatory constraints may not have restricted competition, since compensating balances and service charge remissions can be used to get around both restrictions. However, even if competition is undisturbed, the measured values of the variables used in Equations (2) and (3) will not be, and this poses a major problem of measurement. In the Canadian case the existence of entry barriers into banking and particularly the commercial lending market, makes it still more difficult to presume competition. Indeed, profit figures prepared by the staff at the Economic Council of Canada and reported in "Regulation and Efficiency"[11] suggest that entry barriers exist not only into banking proper, but also into at least some of the markets where banks compete with nonbank financial intermediaries. The effect of market power is to leave us unsure of how to divide the net interest revenue (loan revenue per dollar loan minus deposit costs per dollar loan) between excess profit, loan handling costs, and payment services costs. We are therefore forced to turn to measures of efficiency which mix various types of efficiency into a single value, so that the sum of costs is captured even though each type is not calculated separately.

11 Economic Council of Canada, op. cit.

The American practice of using both compensating balances and service charge remissions to avoid regulatory restrictions causes the measured value of loan rates, L_a, and the nondemand deposit rate, A_n, to differ from their true values. By true value we do not mean a competitive value, but rather the implicit marginal cost of loan handling and payment services which banking firms use as an input into their decision-making. Compensating balances are idle demand deposit balances that provide their holders neither interest income nor payment services, but are instead held as a form of contractual obligation against a loan. They are used when legislation causes nominal interest rates to be lower than market rates -- a method by which the bank and its customer establish a market rate without contravening regulations. Similarly, if banks are prevented from competing for deposits by a ceiling on deposit rates, banks can attract nondemand deposits by reducing service charges on payment service business or offering reduced interest rates on loans to these depositors. We first consider the effect of compensating balances in the United States on both X and Y, maintaining the hypothesis that the Canadian banks operate in a competitive market.

In what follows, a prime symbol, L'_a, designates that the value of the variable is as measured, and is not its true or market value. Compensating balances cause L'_a, the U.S. loan rate, to be lower than L_a, so that X' is higher than X, and this measure of efficiency has the effect of making the Canadian banks appear less efficient in the provision of loan

services than is in reality the case. On the other hand U.S. controls on interest payments by banks to nondemand depositors causes A_n' to be lower than A_n, so that it is unclear whether, on balance, X' overstates or understates the Canadian banks' relative efficiency in supplying loan-handling services.

Y, the measure of payment services efficiency, is affected by compensating balances because SAD', the U.S. service charge per dollar demand deposit, is lower than SAD. The measured value is lower than the true value, because the excess demand deposits held against loans are idle balances for which no service charges apply and no service is supplied. The numerator, service charge income, is unchanged, but the denominator, the value of demand deposits, is raised. Y' is higher than Y, so that Canadian banks appear more inefficient in the provision of payments services than if the true value of SAD were available.

Market power of Canadian banks makes it difficult to allocate inefficiency to either loan handling or payments services. Assuming banks have market power only in the loan market and not in the two deposit markets, the return earned from market power will all appear in a higher value of X_c (loan costs) and Y_c (payment service costs) will be unaffected. On the other hand, if the individual banks have market power in either deposit market, then C_n', the observed rate of interest paid on nondemand deposits, will be affected. If the payments services market is competitive and banks have power in the nondemand deposit market, C_n' understates the marginal cost of providing payments services since C_n' will be lower than the marginal cost of nondemand deposits

to the banks. It is the two marginal costs that the banks equate, not the rate of interest. This result is illustrated in Figure 1. On the other hand, if the banks have market power in the supply of payments services and not in nondemand deposits, C_n' will be higher than the marginal cost of nondemand deposits. This case is illustrated in Figure 2.

Figure 1

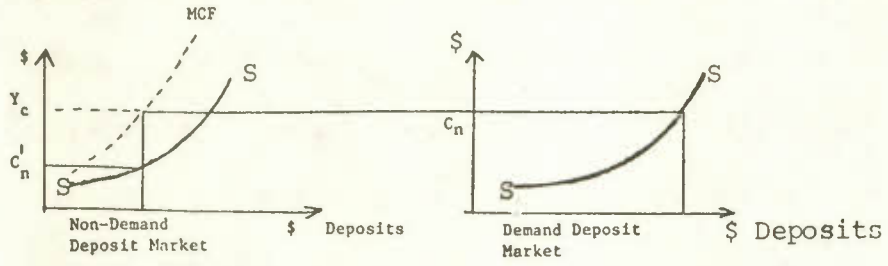
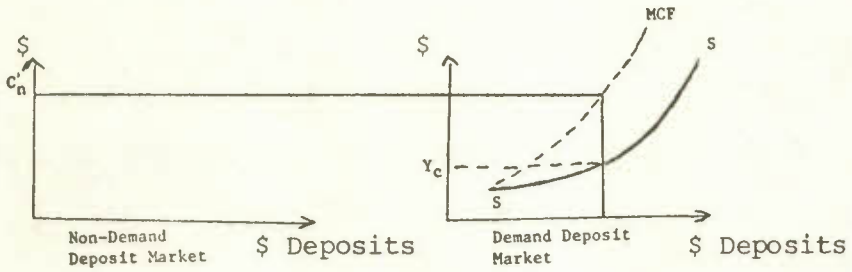


Figure 2



A way around these problems of interpretation is to consider a measure of efficiency which mixes both activities and treats monopoly return as a cost of production. A measure of this sort does not allow us to allocate any extra costs of bank services to loan handling, payments services, or market power. Since the extent of market power profits can be estimated

from the difference between the average of all industries' rate of profit and the profit rate of chartered banks, this overall efficiency measurement does permit the quantification of extra resource use; but the allocation of this resource use to one function or the other can only be made with further information.

Our approach is to measure efficiency relative to a representative dollar deposit. Recall Ψ as defined in Equation (1). Letting W_1 and W_2 both be unity has the effect of placing equal weight on loan handling costs and payments services expenses per dollar of bank business. In Canada, loans account for a large part of assets, whereas demand deposits to which payments services are tied account for a small fraction of total liabilities. Since our central interest is in Canadian banking, we let W_1 equal one, and W_2 equal the ratio of chartered bank demand deposits to total deposits.

This choice of W_1 and W_2 allows us to say that when Canadian loan costs per dollar of loan rise relative to the United States, Ψ rises by the same amount. When, however, the cost of a dollar Canadian-demand deposit rises (the rate on nondemand deposits) relative to the United States, then Ψ rises by a fraction of this amount, since the Canadian banks rely only partially on this sort of financing.

Ψ can now be rewritten as follows:

$$(4) \quad \Psi = X + Y\ (1-K_c)$$

where K_c = NDC/TDC

and NDC is nondemand deposits,

TDC is total deposits, and

K_c is the ratio of nondemand to total deposits in Canadian banks.

Since we do not have valid measures of X and Y we are no further ahead unless we can find a way of estimating ß directly, using available data. A measure that permits this is D_t as defined below:

$$(5) \quad D_t = (L_c - C_t + SCD) - (L_a' - A_t + SAD')$$

where C_t (A_t) is the total deposit rate found by dividing total deposit costs by total deposits and all variables are observable. It is important to see that D_t as defined in Equation (5) is not affected by compensating balances and service charge remissions. Higher compensating balances reduce L_a' but also reduce A_t. If D_t is defined in terms of true (market) rates alone as in Equation (6), we have:

$$(6) \quad D_t = (L_c - C_t + SCD) - (L_a - A_t + SAD).$$

The first terms in the two definitions (5) and (6) are identical. It follows from the assumption that U.S. banks are profit maximizers: that the second term in both definitions is also the same. To show this we let α be the fraction of demand deposits held as compensating balances to total deposits, and β the fraction of total service charges remitted. The revenue from which banks pay for providing services is given by $(L_a' - A_t + SAD')$, as in Equation (7) below:

$$(7) \quad (L_a' - A_t + SAD') = L_a - A_n(K_a - \alpha(1-K_a)) + SAD(1-\beta)$$

where K_a is the ratio of nondemand to total deposits. If a ceiling is imposed on L_a and A_n, then the banks have two instruments, compensating balances (α) and service charge remission (β) which can be varied in order to leave the right-hand side of Equation (7) unchanged. If extra costs are involved in arranging and enforcing these informal contracts, then the U.S. banks incur costs while Canadian banks do not, so that our results will be biased in favour of the Canadian banks.

D_t, as defined in Equation (5), is the key to our performance measurement scheme because it is unaffected by the devices used to evade regulated ceilings and it can be related to the theoretical performance measure π. D_t, as defined in Equation (6), can be rewritten entirely in terms of X, Y and nonobservable (market) variables as follows:

$$(8) \quad D_t = X + Y - K_c C_n + K_a A_n$$ [12]

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12 $D_t = (L_c - C_t) - (L_a - A_t) + (SCD - SAD)$

But $C_t = K_c C_n$ and $A_t = K_a A_n$, since interest is not paid on demand deposits,

where $K_c = \frac{NDC}{TDC}$ and $K_a = \frac{NDA}{TDA}$.

Therefore, $D_t = (L_c - K_c C_n) - (L_a - K_a A_n) + (SCD - SAD)$.

Add and subtract C_n, A_n

$D_t = (L_c - C_n) + (1 - K_c) C_n - (L_a - A_n) - (A_n - K_a A_n) + (SCD - SAD)$

But $X = (L_c - C_n) - (L_a - A_n)$.

Therefore, $D_t = X + (C_n - A_n) + (SCD - SAD) - K_c C_n + K_a A_n$,

But $Y = (C_n - A_n) + (SCD - SAD)$.

Therefore, $D_t = X + Y - K_c C_n + K_a A_n$.

Subtracting Equation (8) from Equation (4) results in Equation (9) below:

$$(9) \quad (\text{Ƶ} - D_t) = -K_c\, Y + K_c\, C_n - K_a\, A_n$$

Substituting for Y from Equation (2) in Equation (9) gives us Equation (10) below:

$$(10) \quad (\text{Ƶ} - D_t) = (K_c - K_a)A_n + K_c\, [SAD - SCD].$$

If $(\text{Ƶ} - D_t)$ is always positive, then D_t, a measurable index of performance, will always be a lower limit to Ƶ, the theoretical index of Canadian bank performance. Not all the variables on the right-hand side of Equation (9) are measurable, but we know that K_c is considerably greater than K_a in each of the years we have measurements for the groups of U.S. banks used. Since, due to regulation Q, A_n' is never larger than the ceiling A_n, and if service charge remissions are used, SAD' is lower than SAD, $(D_t - \text{Ƶ}_t$ is reduced when A_n' replaces A_n, and SAD' is used in place of SAD. With these changes Equation (10) can be rewritten as inequality (11):

$$(11) \quad \text{Ƶ} - D_t > (K_c - K_a)\, A_n' + K_c\, [SAD' - SCD].$$

All terms on the right-hand side of inequality (11) are measurable and their sum is strictly positive, so that D_t underestimates Ƶ as hypothesized above.[13]

D_t is a performance measure that overrides the effect that restrictive U.S. loan and deposit rate ceilings have on

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13 The right-hand side of inequality (11) is simply the difference between D_x and D_t. D_x was found to be larger than D_t in every case, as reported in our research results.

a Canadian U.S. bank comparison, but this advantage is attained at a price because D_t is sensitive to the share of demand deposits. Demand deposits and associated payment services are more important to U.S. banks than to their Canadian counterparts. The higher share of demand deposits in the U.S. industry causes the spread between the U.S. loan rate and the U.S. (total) deposit rate to be large. If we could measure X and Y independently and without measurement error, then the different demand deposit to total deposit ratios in the two banking systems would not be a source of error. Introducing D_t as a performance index eliminates the bias due to compensating balances and service charge remissions but a new distortion associated with the extra payment services provided by U.S. banks is added.

To appreciate this point we subtract D_t from $\bar{z}$, assuming the following:

(12) (i) $SAD = SAD'$

(ii) $A_n = A_n'$

(iii) $L_a = L_a'$

Equations 12 (i), (ii), and (iii) above establish that no distortions exist in the U.S. data and imply that $\bar{z} - D_t$ ought to go to zero, since an important property of a performance index is that when the system is distortion-free, the performance index should equal $\bar{z}$. Under the conditions specified $\bar{z} - D_t$ should go to zero, but instead we have as in Equation (13) that $Z - D_t$ is

$$(13) \quad \text{Ƶ} - D_t = A_n (K_c - K_a)$$ [14]

Since

$$K_c > K_a ,$$

it follows that

$$(\text{Ƶ} - D_t) > 0.$$

Equation (13) suggests that a major simplification in the analysis is possible if A_n is set equal to A_n'. By doing this we are assuming that the U.S. nondemand deposit rate is not affected by schedule Q restrictions on the payment of interest on deposits. What is the consequence of this assumption on the comparative measurement of Canadian efficiency?

If this assumption were not true, the U.S. nondemand rate would be lowered, thereby making the U.S. banks appear more efficient in the provision of payments services than is true in reality. On the other hand, it would increase the U.S. loan yield spread by the same amount, causing the appearance of less efficient loan handling service than is in fact the case.

This assumption causes part of the cost of U.S. banking to be transferred from payments services to loan handling services. Since the objective function used to measure Canadian bank performance weights loan handling efficiency about five times more heavily than payments services efficiency, letting A_n' equal A_n causes the results to favour Canadian banks because any error in the estimation of Ƶ that involves this assumption reduces the

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14 This follows immediately by substituting from Equations (12) (i), (ii), and (iii) into Equation (10) above.

estimate of $\mathcal{Z}$ and indicates greater efficiency in Canadian banking. We therefore proceed as if A_n equals A_n' .

Recall Equation (10),

$$(10) \quad (\mathcal{Z} - D_t) = (K_c - K_a)\, A_n + K_c\, (SAD - SCD)$$

If $A_n = A_n'$, and since K_c SCD is measurable, a natural extension of D_t is D_x as defined in Equation (14) below:

$$(14) \quad D_x = D_t + (K_c - K_a)\, A_n' + K_c\, (SAD' - SCD).$$

From (10) and (14), and recalling that $SAD = \frac{SAD'}{(1-\beta)}$, we have that

$$(15) \quad (\mathcal{Z} - D_x) = K_c\, (SAD - SAD') = K_c\, SAD' \left(\frac{1}{1-\beta} - 1\right)$$

$$= K_c\, SAD' \frac{(\beta)}{(1-\beta)}$$

where β is the share of service charges remitted. Since β is less than one, we have that

$$(16) \quad \mathcal{Z} - D_x > 0$$

D_x is an underestimate of $\mathcal{Z}$, that approaches Z as β, service charges remitted goes to zero.[15]

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15 D_x can be calculated directly from observable variables as follows:

$$D_x = (L_c - K_c\, C_n) - (L_a' - K_c\, A_n') + (1-K_c)(SCD - SAD')$$

To get this result we simply add $(K_a\, A_n' + SCD + SAD')$ to both sides of Equation (14). D_x can also be interpreted as the difference between the Canadian total deposit loan yield margin and the U.S. margin after U.S. demand deposit costs are adjusted by a fraction of the nondemand deposit rate, A_n'. That fraction is just

$$\frac{(K_c - K_a)}{(1 - K_a)} .$$

D_x is a measure which values U.S. demand deposits at a fraction of the nondemand deposit rate in order that the measure of total deposit spreads in U.S. and Canadian banking be comparable. To avoid becoming involved in the question of how to account for the differing role of demand deposits in the two systems we define D_n which omits demand deposits entirely. D_n is simply an observable proxy for X, the loan handling costs.

$$(17) \quad D_n = (L_c - C_n) - (L'_a - A'_n).$$

The relationship between D_n and X is given in Equation (18) below:

$$(18) \quad (X - D_n) = (L'_a - L_a) - (A_n - A'_n).$$

If the ceiling on U.S. loan interest rates causes greater distortion than the ceiling on nondemand deposit rates, then D_n understates X, otherwise it overstates X. To assume that A'_n equals A_n, that the U.S. nondemand rate is a market rate, and that the ceiling is not effective, is to bias our results in favour of the Canadian banks, since if A'_n is low, loan handling costs in the United States are overstated and loan handling efficiency has a higher weight in $\bar{s}$ than payments services performance. We again proceed on this basis, assuming that the loan rate ceiling is effective, whereas the deposit rate ceiling is not. This means that the following conditions apply:

$$(19) \quad \text{(i)} \quad A'_n = A_n$$

$$\text{(ii)} \quad L'_a < L_a$$

$$\text{(iii)} \quad \bar{s}AD' < \bar{s}AD .$$

Under these assumptions D_n understates X, but it is also possible for us to establish the relation between ℵ and D_n as in Equation (20) below:

$$(20) \quad \aleph - D_n = \frac{K_c \, SAD'\beta}{(1-\beta)} - (1 - K_c) \left[(A'_n + SAD') - (C_n + SCD)\right]^{16}$$

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16 Recall that:

$D_n = (L_c - C_n) - (L'_a - A'_n)$,

Add

$K_c \, C_n$ and $K_a \, A'_n$ to both sides of this equation.

Then $D_n = (L_c - K_c \, C_n) - (L'_a - K_a \, A'_n) - (1 - K_c) \, C_n + (1 - K_a) \, A'_n$.

Add and subtract SCD, SAD'

$D_n = (L_c - K_c \, C_n) - (L'_a - K_a \, A'_n) + (SCD - SAD') - (1 - K_c) \, C_n$

$+ (1 - K_a) \, A'_n - (SCD - SAD')$.

From Equation (6)

$D_n = D_t - (1 - K_c) \, C_n + (1 - K_a) \, A'_n - (SCD - SAD')$

But from Equation (14),

$D_x = D_t + (K_c - K_a) \, A'_n + K_c \, (SAD' - SCD)$.

Subtract D_x from D_n ,

$D_n - D_x = -(1 - K_c) \, C_n + (1 - K_a - K_c + K_a) \, A'_n - (1 - K_c)(SCD - SAD')$

$D_n - D_x = (1 - K_c)(A'_n - C_n) - (1 - K_c)(SCD - SAD')$

Also, from Equation (15) $\aleph = D_x + \frac{K_c \, SAD'\beta}{(1-\beta)}$

Therefore subtracting $(D_n - D_x)$ from ℵ we have,

$$\aleph - D_n = \frac{K_c SAD'\beta}{(1-\beta)} - (1 - K_c)(A'_n - C_n) + (1 - K_c)(SCD - SAD')$$

$$= \frac{K_c \, SAD'\beta}{(1-\beta)} - (1 - K_c) \left[(A'_n + SAD') - (C_n + SCD)\right]$$

or $\aleph - D_n < (1 - K_c) \left[(C_n + SCD) - (A_n + SAD')\right]$

and since $\frac{K_c \, SAD' \beta}{(1-\beta)} > 0$

inequality (21) follows:

$$(21) \quad \text{Ƶ} - D_n < (1 - K_c) \left[(C_n + SCD) - (A'_n + SAD') \right].$$

The term $\left[(C_n + SCD) - (A'_n + SAD') \right]$ can be calculated, and is reported in the second half of Table 4. It is sometimes negative and other times positive. In the latter case it is always small in absolute value.

D_n appears to be very close to Ƶ and sometimes an overestimate. D_x is an underestimate. Therefore, the true performance measure falls in the range D_x, D_n. Of course, the upper bound is conservative because in some years A_n is less than Ƶ, and A'_n was assumed equal to A_n. It is important to note that in defining Y and Ƶ we have implicitly assumed that the volume (or quantity) of payment service per unit of demand deposit is the same in both systems. We let t_c (t_a) be the annual number of units of payment service per dollar demand deposit in Canada (United States). Then Y should be expressed as follows:

$$Y^* = \frac{Y_c}{t_c} - \frac{Y_a}{t_a}$$

$$\text{and } \text{Ƶ}^* = X - \left[\frac{Y_c}{t_c} - \frac{Y_a}{t_a} \right] (1 - K_c) \, t_c \, ,$$

since the appropriate weight is the total number of units of payment service per dollar deposit.

The problem, of course, is that t_c and t_a are not available. A proxy that has some merit is to replace t_c (t_a) by the Canadian (United States) demand deposit turnover rate. The turnover rate is imprecise because turnover is not the sole element of payment services. Branch expenses and tellers' salaries are related to payment services that frequently do not involve a clearance, for instance cash withdrawals. It is also true that interbank clearances are included but intrabank clearances are excluded. If the ratio of interbank to intrabank clearance differs, turnover rates will not measure relative turnover appropriately. Some practical issues arise in this measurement as well.

As reported in Table 2, the U.S. all-insured turnover rates have been rising rapidly since 1969, whereas in Canada the rate has risen only moderately. One possible explanation for this is that U.S. banks have increased their use of nondemand chequeable accounts, similar to Canadian chequeable savings accounts. As a result the nondemand deposits' share of deposits has been rising. The low turnover demand deposits from the 1969 period have increasingly become nondemand deposits, so that the average demand deposit turnover rates have risen. For this reason we have more confidence in the later year comparisons. It stretches the imagination to accept that the dramatic change in U.S. turnover rates reflects a true increase in payment services per dollar deposit. A further explanation of the change in turnover rates may be the decreased use of compensating balances. Lower compensating balances increase the turnover rate without affecting payment service efficiency

because fewer demand deposits are held against which the bank does not provide services. Because of these reasons, although we report these imprecise measures, we caution the reader to interpret them carefully.

A further problem arises when we turn to the New York banks. In this case the U.S. turnover rate is so much higher than the Canadian rate that the Canadian banks appear absurdly inefficient by comparison. This is probably the result of the larger size of the average transaction involving the New York banks. Since payment services costs are a function of the volume of services rather than the amount of each cheque, the turnover rate in the United States is higher even if the physical services supplied is lower than in Canada. For this reason we do not report adjusted measures for the New York banks.

D_y is the measure used and is defined as in Equation (22) below:

$$(22) \quad D_y = D_x - A_n (1 - K_c) \quad T,$$

$$\text{Where } T = \left(\frac{t_c}{t_a} - 1\right)$$

It is related to ⊭ as follows:[17]

$$(23) \quad (⊭^* - D_y) = \frac{SAD'}{(1-B)} \left[\beta K_c - (1 - K_c)\right] T$$

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[17] $⊭^* = X - \left[\frac{Y_c}{t_c} - \frac{Y_a}{t_a}\right] (1 - K_c)\, t_c$,

Replaces ⊭ as the performance measure

add $Y_a (1 - K_c)$ to both sides,

continued next page

Since in comparing Canadian banks with U.S. all-insured banks $\frac{t_c}{t_a}$ as reported in Table 2, is greater than one, ($\not{Z}^* - D_y$) is more likely to be negative for low values of B, so that D_y overestimates $\not{Z}^*$ by an unknown amount.

Table 2

U.S. and Canadian Turnover Rates for Demand Deposits

	U.S. All-Insured (Total 233 SMSAS) (t_a)	New York (t_a)	Canadian (t_c)	U.S. All-Insured t_c / t_a
1969	68.53	145.13	103.43	1.509
1970	73.28	155.21	116.31	1.587
1971	81.80	187.56	114.75	1.420
1972	86.40	206.48	113.10	1.309
1972	102.61	247.98	129.78	1.264

Source Federal Reserve Bulletin (various issues), and Statistics Canada, Cheques Cashed in Clearing Centres, Cat. No. 61-210, annual (1975).

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17 continued

$$\not{Z}^* = X + Y_c \ (1 - K_c) - Y_a \ (1 - K_c) - Y_a \ (1 - K_c) \ T$$

$$= \not{Z} - Y_a \ (1 - K_c) \ T$$

But, $(\not{Z} - D_x) = K_c \frac{SAD' \ B}{1-B}$

$$\not{Z}^* = D_x + \frac{K_c \ SAD'B}{1-B} - Y_a \ (1 - K_c) \ T$$

and $D_y = D_x - A_n \ (1 - K_c) \ T$

Subtracting, and recalling that $Y_a = (A_n + SAD)$,

$$\not{Z}^* = D_y + \frac{K_c \ SAD'B}{(1-B)} - (1 - K_c) \ T \qquad SAD$$

Recall that $\frac{SAD'}{(1-B)} = SAD$

$$\not{Z}^* = D_y + K_c \ SAD \ (B + T) - TSAD \ ,$$

or

$$\not{Z}^* - D_y = \frac{SAD'}{(1-B)} \quad BK_c - (1 - K_c) \ T$$

In the selections that follow we report our findings regarding these measures of performance as well as modifications that attempt to exclude the effect of other differences in U.S. and Canadian banking that make it difficult to isolate the extent of comparative inefficiency. The measures defined above account for the most serious problems, and in this section we have also explained why a single performance measure, weighted as in Equation (1), is the proper way of measuring comparative performance.

A COMPARISON OF THE BANKING ACTIVITIES IN THE UNITED STATES AND CANADA

In this section, we consider the major distinctions in U.S. and Canadian banking practice, law, and data, some of which have already been reviewed above. Some differences can be accounted for quantitatively, while others allow us to comment on the direction of bias in our results but are not amenable to quantitative correction.

The important differences in U.S. and Canadian banking markets and practices are as follows:

(1) The mix of wholesale and retail banking varies considerably among the distinguishable groups of U.S. banks. This is a problem for our analysis since we do not know the mix of wholesale and retail banking in Canada or in the group of U.S. banks that has a similar mix.

(2) U.S. federal funds purchased and sold are reported along with agreements for repurchase made with nonbank federal fund dealers and loans from Federal Reserve banks in the U.S. data. This type of bank financing is not used extensively in Canada.

(3) Demand deposits are a far larger share of bank liabilities in the United States than in Canada.

(4) Regulation Q and state usury laws place ceilings on U.S. bank deposit interest rates, encourage the use of compensating balances in loan

transactions, and favour service charge remissions as a method of attracting depositors. These elements are not present in Canada to any significant degree.

(5) Service charges per dollar of deposits are higher in Canada than in the United States.

(6) Reserve ratios differ in the two jurisdictions.

(7) U.S. banks receive tax-exempt returns from municipal and state securities which are not available to Canadian banks.

(8) Effective tax rates, as measured by taxes paid divided by before-tax profit, are higher for banks in Canada than in the United States.

(9) Canadian banks have higher asset/capital ratios than U.S. banks.

(10) Interest earned on interbank deposits is reported as loan income by Canadian banks but not by American banks.

(11) The term to maturity for bank loans is longer in the United States than in Canada.

(12) The loan loss ratio is higher for U.S. banks than for Canadian banks.

Before reporting the results of our research, we review the implications of each of the major differences between the two banking systems and indicate how we have attempted to to account for them in our analysis.

(1) The differences in performance are large among the three groups of U.S. banks investigated. The evaluation of Canadian bank operations thus depends on the particular class of U.S. banks selected for matching. The U.S. all-insured category includes numerous small banks for which the loans and deposit rates reflect retail rather than wholesale banking activities. The thirteen New York banks manage assets that are 14 per cent of the assets of the fourteen thousand banks in the U.S. all-insured groups. The New York banks do a larger wholesale business but are not representative of the majority of U.S. banks, which operate with a smaller involvement in international markets and business finance. The U.S. all-insured banks do proportionately more retail business than Canadian banks, and the New York banks considerably less.

The mix of wholesale and retail business in the different banking systems is important to any evaluation of performance because costs of banking activities will be higher in retail markets. One part of operating costs associated with banking activities is a function of the number of activities, and the other is related to the dollar value of the activities. Since deposit and loan yields, as well as margins, are based on a dollar value only, the costs associated with the absolute number of accounts, loans and transactions are neglected in these measures. A wholesale bank with the same dollar value of assets and liabilities as a retail bank, will have fewer deposits, fewer customers, fewer loans and probably lower operating costs

per dollar of liability. It is for this reason that we do not rely on a single group of U.S. banks with which to make comparisons.

(2) We found that the group of U.S. all-insured banks were persistently indebted to the Federal Reserve banks and nonbank securities dealers active in the federal funds market. Federal funds are deposits of commercial banks held with Federal Reserve banks. Since the cost to U.S. banks of federal funds is closer to loan yields rather than private deposit costs, the inclusion of this category of assets and liabilities leaves the loan return per dollar of loans unchanged but raises the deposit costs per dollar of deposits quite considerably. The calculated deposit yield is therefore not a rate that is available to private depositors. Since we are, in part, interested in the rate which private depositors receive relative to the rate which private borrowers pay for loans, the inclusion of federal funds on both sides of the balance sheet reduced the apparent loan yield margin available to private depositors and borrowers. By omitting federal funds purchased and sold from the balance sheet and the corresponding interest paid and received from the income statement, we get a more accurate measure of the loan rates and deposit rates actually available to the public. On the other hand, the banks would not undertake the costs of borrowing federal funds unless it was profitable to do so. The use of federal funds and loans from the Federal Reserve banks must be one element which accounts for the U.S. banks' asset portfolios being longer in term than those of Canadian banks. This would otherwise be unexpected, since demand deposits are a much larger

part of U.S. bank liabilities than of Canadian bank liabilities. In this sense, the higher deposit costs due to federal borrowing are probably offset by average loan revenues that are higher, reflecting the longer term of the assets held. Therefore, under these conditions federal funds should be included on both sides of the balance sheet and we report our results this way.

Although we believe this is the most appropriate basis for comparing bank performance we were also interested in reporting the average loan and deposit rates paid and received by bank customers in the United States. As a result, we also report loan and deposit yields after we have removed the effect of federal funds transactions from the data.

(3) Table 3 reports the ratio of demand deposits to total deposits in Canadian and, in some categories, U.S. banks. U.S. banks are not permitted to pay interest on demand deposits by virtue of Regulation Q. Canadian banks are not legally restricted from paying interest and indeed do pay interest on a negotiated basis when demand deposits average some minimum, reportedly $100,000. Therefore, the interest cost per dollar of deposits is bound to be higher in Canada than in the United States.

Demand deposits may be a larger share of total deposits in U.S. banks than they are in Canadian banks for a number of reasons. Regulation Q of the Federal Reserve Board restricts the payment of interest on time and savings deposits in such a way as to limit the competitiveness of the commercial banks with near-banks. Second, a variety of state usury laws place

ceilings on loan interest charges which have caused the U.S. banks to turn to compensating balances as a vehicle for making loans economically feasible. If borrowers are required to hold compensating demand deposit balances, then the total value of demand deposits rises. Finally, the relatively larger demand deposits in U.S. bank liabilities may simply reflect the greater specialization of U.S. banks in providing payment services. Both Canadian and U.S. banks provide a mix of payment services and intermediary services. If the mix is not the same, then a difference in net interest revenue per dollar of assets, or in loan yield margins, may reflect a difference in the relative mix of the two types of services, rather than a difference in the cost per unit of service. These differences have been accounted for in the definition of performance measures.

Table 3

Demand Deposits as a Percentage of Total Deposits: Canadian Banks, U.S.-Insured, New York, 1969-73

Years	Canadian	U.S.-Insured	New York
1969	26.1	51.3	70.5
1970	23.9	50.6	67.4
1971	22.0	47.3	61.7
1972	21.7	44.9	56.8
1973	21.4	42.7	52.1

Source Schedule Q, Report to the Inspector General of Banks, Federal Reserve Board of Governors, Bulletin.

(4) Regulation Q interest rate ceiling on deposits and state usury laws restricting interest rates on loans cause U.S. banks to employ indirect methods of attracting demand deposits even if the depositor is not demanding payment services. In

the United States, banks are reported to attract demand deposits by providing services at reduced service charges. They also offer lower interest rates on loans to those customers who maintain high average, or so-called compensating, amounts in their demand deposit accounts. The practice of requiring compensating balances increases the actual cost of a loan to the borrower above the quoted rate, since he commits part of the proceeds of the loan to a non-interest-earning demand deposit. The method employed by U.S. banks may not be important to their customers or their net revenues, but it influences the loan yield comparisons. If compensating balances are used, then U.S. loan yields are understandably lower than Canadian yields: the effect of these imperfections in U.S. banking are so central to our measurement problems that they have been considered in the definition of performance measures developed above.

(5) It is apparent from Table 4 that service charges per dollar of deposits are higher in Canada than in both U.S. banking groups. The difference is particularly large for demand deposits. Canadian banks have been charging a full eighty-five basis points more than the New York banks, and about fifty basis points more than U.S. all-insured banks per dollar of demand deposits. Even on a total deposit basis, Canadian bank service charges have been about 30 basis points higher than charged by New York banks, and 15 basis points more than U.S. all-insured banks. Any comparison of loan yield margins, without reference to service charges, is biased in favour of Canadian banks in the sense that the Canadian bank

Table 4

(a) Canadian and U.S. Service Charge Rates,[1] 1969-73

(Per cent)

Year	Canadian Total Deposit Rate	Canadian Demand Deposit Rate	Canadian Nondemand Deposit Rate	U.S. All-Insured Total Deposit Rate	U.S. All-Insured Demand Deposit Rate	New York Total Deposit Rate	New York Demand Deposit Rate
1969	.40	.97	.21	.26	.48	.10	.13
1970	.41	.99	.22	.26	.50	.10	.14
1971	.39	.99	.22	.24	.49	.10	.15
1972	.38	.93	.22	.22	.46	.10	.16
1973	.35	.87	.30	.21	.45	.09	.16

(b) Differences, Canadian and U.S. Nondemand Deposit Rates After Adjusting for Differences in Demand Deposits Service Charges[2]

(Per cent)

	Canadian-U.S. All-Insured		Canadian-New York City Rates	
	Including Federal Funds	Excluding Federal Funds	Including Federal Funds	Excluding Federal Funds
1969	.00	.45	-1.13	.39
1970	.49	.90	-1.22	.49
1971	.16	.21	- .30	.07
1972	.04	.06	.35	.48
1973	-1.01	-.53	-2.35	-1.45

1 Dollars of service charges in one year per one hundred dollars average annual deposit. The Canadian deposit figures are averages for each October of two consecutive years, whereas the U.S. figures are averages of December, June and December data.

2 The adjusted nondemand deposit rate difference rates shown are equal to (Canadian nondemand deposit rate - U.S. nondemand deposit rate) + (Canadian demand deposit service charge rate - U.S. demand deposit service charge rate), $((C_N - A_N) + (SCD - SAD))$.

Source Schedule Q, Report to the Inspector General of Banks, Bank of Canada Review, Federal Reserve Board of Governors, Bulletin.

interest margin covers a smaller proportion of costs and should, therefore, be lower than the U.S. spread.

(6) Reserve ratios fall into two categories; primary and secondary. Primary reserves are held in a non-interest-earning form, and secondary reserves are held in specified assets that usually earn lower-than-average interest rates. In the United States secondary reserve requirements do not exist, whereas in Canada they add significantly to the cost of banking. Table 5 reports the average reserve requirements for Canadian and U.S. banks. Secondary reserves are converted to a primary reserve basis by multiplying the dollar value of secondary reserves by the difference between the average 1-3 year Canadian government bond yield and the 90-day Treasury bill yield. Then a single reserve ratio which captures the cost effects of the primary and secondary ratio is calculated.

If we neglect the difference in reserve ratios, then we will miss the fact that banks must earn enough on their loan yield margins to cover not only operating expenses and explicit taxes, but also the implicit tax, or loss of revenue, associated with reserve requirements. The cost of reserves is neglected in the unadjusted data, but is introduced in the "hypothetical" model. Net profit of U.S. banks is increased by the cost of reserves at U.S. rates, and then decreased by the cost of reserves at Canadian rates. In 1969, 1970 and 1971, U.S. reserve ratios were higher than Canadian ones, so that the unadjusted loan yield spread differences exaggerate the efficiency differences in the Canadian banks' favour. The U.S. banks are

forced to earn a larger spread in order to cover extra reserve costs. In 1972 this relationship reversed itself, and in 1973 the reserve ratio difference is minor.

(7) Because U.S. banks hold "nontaxable" municipal and state securities and Canadian banks do not, the income earned per dollar of assets will be lower in the United States. In part, we avoid this problem by considering loan yield margins in both jurisdictions rather than securities yield margins or net revenue margins over all assets. Nevertheless, in our "hypothetical" model, when we calculate loan yield spreads in the United States, on the assumption that Canadian taxes, reserves, and asset/capital ratios apply to U.S. banks, we are forced to adjust for nontaxable securities, otherwise, the effective tax rate on U.S. banks would be artificially low. Using Canadian

Table 5

Actual Reserve Requirement Ratios for Canadian and U.S. Banks as of December 31 of Each Year

(Per cent)

	Canadian Banks		
Year	Primary	Primary and Secondary	United States
1969	6.2	6.8	9.6
1970	6.1	6.1	8.9
1971	6.2	8.2	8.5
1972	6.1	9.4	7.7
1973	6.1	8.0	7.8

Note: The secondary reserve ratio, converted to a primary ratio, was estimated by assuming that the investment of all secondary reserves would be made in Government of Canada 1-3 year bonds. Interest rates were assumed to be unaffected by shifts in the banks' portfolios.

Source Jack Mintz, "The Measure of Profitability in Canadian Banking," a background study for the Economic Council of Canada (forthcoming).

tax rates to evaluate U.S. loan yield spreads would add artificial costs and make the U.S. banks appear inefficient as compared with Canadian banks.

To account for this, we calculate the drop in pre-tax revenue due to holding nontaxable assets. This is simply the yield earned on "other U.S. Government Securities" by U.S. banks minus the yield on state and political subdivision securities, multiplied by the value of outstanding nontaxable assets. This pre-tax loss is an implicit tax. It is added to both taxes paid and before-tax profit, and an equivalent effective tax rate is then calculated. It is simply the explicit and implicit tax divided by actual and implicit before-tax profit.

(8) Effective tax rates, despite being adjusted as in (7) above, differ between Canadian and U.S. banks. Canadian banks pay a higher effective tax rate. One reason for this may be that U.S. banks are allowed to apply a lower tax rate to capital gains, while they are permitted to deduct capital losses directly from income.[16] These provisions are not available to Canadian banks. Another reason may be the greater role of leasing in U.S. bank business, since leasing permits the lessor to deduct depreciation charges from current income, thereby reducing effective tax rates. When we are concerned

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16 E. J. Kane, "A Cross-Section Study of Tax Avoidance by Large Commercial Banks," Inflation, Trade and Taxes: Essays in Honour of Alice Bourneuf, edited by D. A. Belsley, E. J. Kane, P. A. Samuelson and R. M. Solow (The Ohio University Press, 1974).

with after-tax loan yield spreads, the appropriate tax rate to apply is the effective tax rate, unless the measures used to avoid or postpone taxes reduce the loan yield. This does not seem to be the case. Before-tax income from securities, or from leasing activities, may be affected but not the yield on loans.

If U.S. banks operated under Canadian tax and banking laws, then not only would Canadian tax rates apply, but bank income from leasing and capital gains would be affected. One approach is to leave U.S. net profit unchanged and apply Canadian effective tax rates. However, if U.S. net profit (before tax) is lower because of the tax avoidance policies of the U.S. banks, we would be overcompensating for the higher Canadian tax rates. A proper adjustment would be to adjust both tax payments and net profits, as in the case of nontaxable securities. Unfortunately, the data is not available for this adjustment. Instead, we report the U.S. spreads both with and without an adjustment for different U.S. and Canadian effective tax rates, which biases our results in favour of Canadian bank efficiency.

(9) Asset/capital ratios are considerably higher in Canada, as has been reported and commented on above. This biases the basic loan yield spread differences in favour of the Canadian banks. If the higher asset/capital ratio is due only to differences in regulation, then Canadian banks should be able to reduce loan yield spreads relative to competitors of equivalent efficiency, in order to attract more business.

If U.S. banks were able to operate with Canadian asset/capital ratios, they would be able to shave margins and still earn the same return on capital. To adjust for the asset/capital ratio differences, we assume that U.S. banks operated with the same asset portfolio as they held in reality, except for additional reserves. The liability structure of U.S. banks is assumed to change by the addition of nondemand deposits, in order to replace the drop in capital. Capital is assumed to fall so that the Canadian bank asset/capital ratio applies to U.S. banks. The replacement of capital by nondemand deposits requires an increase in reserves, which are non-interest-earning and are assumed to be added to assets. Now we calculate a new cost per dollar of nondemand deposits, based on the assumption that the rate of return to the smaller (hypothetical) amount of capital is the same as the old rate of return. This calculation gives rise to new deposit yields and loan yield spreads for comparison with Canadian loan yield spreads. These are reported in the section titled "Adjusted Relative Performance Indicators."

(10) Loan yields calculated for Canadian banks included interest earned on deposits in other banks. Since the deposit interest is lower than loan yields, the Canadian bank loan yield is lowered somewhat. In the United States, interbank deposits were not reported in group data; therefore, to put both sets of data on an equivalent basis, we subtracted interest earned on interbank deposits, and the value of inter-bank deposits from the Canadian data.

(11) The average term to maturity of U.S. loan assets is longer than the term to maturity of Canadian loan assets. The average term to maturity, which is not published by either banking system, was estimated by calculating the typical reaction of bank loan revenues to a change in prime business loan rates. When prime business loan rates (annual average) increase by 100 basis points, Canadian bank loan yields rise by 52 basis points in the first year, 77 points by the end of the second year, and adjust almost completely within three years. By contrast, U.S. all-insured loan revenues rise by only 42 basis points in the first year, 66 by the second, and 80 by the third. This result shows that the majority of Canadian bank assets mature within one year, whereas a large share of U.S. bank loan assets mature in two or three years. The higher rates which Canadian banks are able to maintain in the Canadian domestic market are underestimated by the basic comparative data presented, since, in most periods, interest rates should rise with term to maturity. As a result, U.S. banks ought to be earning higher revenues on loans which are for a longer term and which, therefore, increase the capital risk of the lender.

On the deposit side we found that average maturity of the New York banks' nondemand deposits is about one year. In the case of these banks, when commercial paper rates rise by 100 basis points, the bank nondemand yield rose by 73 basis points in the first year, whereas the U.S. all-insured yield rose 33 points, and the Canadian bank nondemand deposit cost rose by 37 basis points. The New York banks, however, pay higher rates on nondemand deposits, even though their average

term to maturity is lower than the average term of U.S. all-insured and Canadian bank nondemand deposits. Therefore, as far as nondemand deposit maturity is concerned, the U.S. all-insured and Canadian performance indicators are unbiased. The New York banks' performance indicators, relative to Canadian banks, are understated because the nondemand deposit costs are associated with shorter-term liabilities than the Canadian bank nondemand deposit costs.

(12) A final significant difference between U.S. and Canadian bank loan portfolios, as can be seen in Table 6, is that the U.S. banks have higher loan loss ratios than do Canadian banks. Canadian bank loan loss ratios averaged .15 of one per cent between 1968 and 1973. The figure for U.S. uninsured banks was .25 of one per cent. Since U.S. banks are holding loan portfolios that have a higher default rate, they should be able to charge a higher price on loans to cover the greater loss incidence. This difference does not affect our comparisons, since the unpaid loans reduce the interest income on loans used in calculating the rate. Only extreme variations in loss experience would interfere with the validity of the loan rate comparison. The latter does not appear to be true of either loss ratio.

Table 6

Loan Loss Ratio for Canadian Banks, U.S. Insured Banks, and New York City Banks, for the Years 1969 to 1973

(Per cent of loans)

Year	Canadian Bank Total	U.S. Insured Banks[1]	New York City Banks[1]
1969	.08	.17	.09
1970	.19	.33	.39
1971	.19	.33	.44
1972	.18	.24	.29
1973	.16	.25	.39

1 Loan loss ratio for assets booked at U.S. offices only.

Source Jack Mintz, "The Measure of Profitability in Canadian Banking," a background study for the Economic Council of Canada (forthcoming).

THE RELATIVE PERFORMANCE OF U.S. AND CANADIAN BANKS

We have adopted two approaches in dealing with the impediments to making reliable results from the basic data as reported in the Federal Reserve Bulletin for U.S. banks and Schedule Q Reports to the Inspector General of Banks for Canadian banks, the data rearranged somewhat to permit reasonable interpretations of our results. These basic results are reported in the section titled "Unadjusted Relative Performance Indicators". In addition, we have re-calculated U.S. loan yield spreads on the basis of a "hypothetical" model. These results are reported in the section titled "Adjusted Relative Performance Indicators". The latter re-calculations are made as if U.S. bank operations between 1959 and 1973 were unchanged except that Canadian conditions were imposed with respect to tax rates, reserve ratios and asset/capital ratios. This model is designed to answer the hypothetical question: what would U.S. loan yields, deposit costs and loan yield spreads have been if U.S. banks operated in the United States but under regulatory and tax restrictions that applied in Canada?

If the difference in banking business between the United States and Canada outlined above did not exist, then an evaluation of efficiency would be a straightforward exercise. Loan yields and deposit costs ought to be identical in both markets. If loan yields were higher in Canada, but deposit rates the same, then we would conclude that the entry barriers into Canadian banking permit Canadian banks to earn higher profits and/or operate inefficiently at the expense of retail

borrowers. On the other hand, if loan yields were the same but deposit rates lower in Canada, then the inefficiency costs could be allocated to the Canadian retail depositor. As it is, an ideal measure of relative efficiency is not available, and the measures we defined above do not permit us to decide whether inefficiency costs are paid by borrowers or depositors. However, they do indicate the extent of inefficiency summed over both types of banking services.

The loan yields of all U.S. insured banks has been lower than the Canadian banks. However, as data in Tables 7 and 8 show, the difference between the Canadian and U.S. loan rates appears to be falling. On the other hand, the Canadian loan rate had been rising relative to the New York rates until a sharp drop occurred in 1973. One simply cannot make much either of the difference or of the trends in loan rates, since levels and changes in the use of compensating balances either in response to changes in state usury laws or in reaction to quite frequent announcements of different maxima under Regulation Q may be at fault.

The total deposit costs of the Canadian banks are higher than for all categories of U.S. banks but this difference has been falling rapidly, in part due to the decline in the demand deposit share of total deposits in the United States. When one turns to nondemand deposits then the picture changes, and all U.S. banks pay higher rates to nondemand depositors. There is no apparent trend in these series.

Table 7

All U.S. Insured Banks, Canadian Chartered Banks' Loan Yields, Deposit Yields, and Spreads,[1] 1969-73

(Per cent)

	L_C	L_A	$L_C - L_A$	C_T	A_T	$C_T - A_T$	C_N	A_N	$C_N - A_N$
Including Federal Funds Transactions									
1969	8.54	7.60	.94	3.63	2.59	1.04	4.88	5.37	- .49
1970	9.17	7.94	1.23	4.04	2.64	1.40	5.33	5.33	.00
1971	8.21	7.41	.80	3.46	2.55	.91	4.50	4.84	- .34
1972	8.02	7.06	.96	3.29	2.58	.71	4.26	4.69	- .43
1973	8.65	8.34	.31	3.68	3.55	.13	4.77	6.20	- 1.43
Excluding Federal Funds Transactions									
1969	8.54	7.52	1.02	3.63	2.29	1.34	4.88	4.92	- .04
1970	9.17	7.92	1.25	4.04	2.33	1.71	5.33	4.92	.41
1971	8.21	7.54	.67	3.46	2.42	1.04	4.50	4.79	- .29
1972	8.02	7.20	.82	3.29	2.46	.83	4.26	4.67	- .41
1973	8.65	8.33	.32	3.68	3.11	.57	4.77	5.72	- .95

1 Canadian yields are based on an October year end, and exclude interbank deposits. U.S. yields are based on a December year end. Symbols are defined in the following manner:

L_C is the Canadian loan yield;
L_A is the U.S. loan yield;
C_T is the Canadian Total Deposit Rate;
C_N is the Canadian Nondemand Deposit Rate;
A_T is the U.S. Total Deposit Rate;
A_N is the U.S. Nondemand Deposit Rate.

Source Federal Reserve Board of Governors Bulletin; Schedule Q, Report to the Inspector General of Banks; Bank of Canada Review.

Table 8

New York City Banks, Canadian Chartered Banks' Loan Yields, Deposit Yields and Spreads,[1] 1969-73

(Per cent)

	L_C	L_A	L_C-L_A	C_T	A_T	C_T-A_T	C_N	A_N	C_N-A_N
Including Federal Funds Transactions									
1969	8.54	7.28	1.26	3.63	2.02	1.61	4.88	6.85	- 1.97
1970	9.17	7.73	1.44	4.04	2.41	1.63	5.33	7.40	- 2.07
1971	8.21	6.51	1.70	3.46	1.99	1.47	4.50	4.20	- .70
1972	8.02	6.09	1.93	3.29	2.02	1.27	4.26	4.68	- .42
1973	8.65	8.39	.36	3.68	3.75	- .07	4.77	7.83	- 3.06
Excluding Federal Funds Transactions									
1969	8.54	7.16	1.38	3.63	1.36	2.27	4.88	5.33	- .45
1970	9.17	7.71	1.46	4.04	1.60	2.44	5.33	5.69	- .36
1971	8.21	6.51	1.70	3.46	1.65	1.81	4.50	4.83	- .33
1972	8.02	6.08	1.94	3.29	1.72	1.57	4.26	4.55	- .29
1973	8.65	8.29	.36	3.68	2.88	.80	4.77	6.93	- 2.16

1 Canadian yields are based on an October year end, and exclude interbank deposits. U.S. yields are based on a December year end. Symbols are defined in the following manner:

L_C is the Canadian loan yield;
L_A is the U.S. loan yield;
C_T is the Canadian Total Deposit Rate;
C_N is the Canadian Nondemand Deposit Rate;
A_T is the U.S. Total Deposit Rate;
A_N is the U.S. Nondemand Deposit Rate.

Source Federal Reserve Board of Governors Bulletin; Schedule Q, Report to the Inspector General of Banks; Bank of Canada Review.

UNADJUSTED RELATIVE PERFORMANCE INDICATORS

We can now summarize the basis for our measures and report our results. We are after estimates of ℬ. D_x is an underestimate and D_n an overestimate, so that ℬ is bracketed by these values. In some years D_n is less than D_x which appears to be inconsistent with our earlier finding that D_n is greater than ℬ, which, in turn, is greater than D_x. This occurs because our measures assume that A_n^1 equals A_n. In years in which A_n^1 is less than A_n, D_n is reduced from its true value by the full amount $(A_n - A_n^1)$, whereas D_x is reduced by $(K_c - K_a)$ $(A_n - A_n^1)$, a smaller amount. That D_n is lower than D_x implies that A_n^1 is lower than A_n. Since D_x is less sensitive to this type of error than D_n, it is, in our view, the closest to ℬ and the most appropriate measure with which to evaluate Canadian bank performance. D_y, the measure adjusted for turnover rates, is reported for U.S. all-insured banks only, and we repeat our warnings about the application of this measure.

In Tables 9 and 10 the measures are reported in two ways. One is based on U.S. data including federal funds, which we believe is the appropriate measure. We report the second set of results, U.S. data excluding federal funds, because this provides a more conservative estimate of excess Canadian bank costs.

These measures of efficiency differences are reported in percentages, but in order to convert them into more meaningful numbers, we multiply ℬ times the average value of Canadian bank loans outstanding in a given year. These conservative measures of the extra cost to Canadian bank customers due to market

power, excess profits, extra taxes and greater use of resources, are presented in Tables 11 and 12. Alternatively, since ℔ is based on a unit deposit rather than a unit loan, we would have been justified in multiplying ℔ by total deposits. However, we weighted the loan handling cost component in ℔ by one, rather than the loan to total deposit ratio, in order to simplify the algebraic manipulation needed to establish the properties of the performance measure. To avoid any possibility of overstating extra costs we again report the more conservative result, based on loans outstanding.

One more point is in order before we turn to the numbers. We reported the annual excess cost to Canadian bank customers as if U.S. rates had applied, using the five-year average performance indicator as well as each year's value. The reason for this is that we do not observe a trend in the performance indicators. Generally the indices decline from 1969 to 1971 and climb to their highest level in 1973. We are unable to comment then on any possible shift in efficiency over time. With this in mind it is reasonable to associate year-to-year variation with errors and changes in circumstances we have not accounted for.

If the Canadian and United States banking systems were equally efficient, then the efficiency measures for Canadian banks would be expected to fall in an intermediate range between those of the New York banks and all insured banks in the United States. That is, D_t, D_n, D_x performance indicators relative to U.S. all-insured banks ought to be

negative, and those measured in relation to New York banks positive. This would be expected because the New York banks do more wholesale business than the Canadian banks, whereas the U.S. all-insured group includes many small retail banks. In fact, however, even the raw yield spread, based on total deposits (D_t), shows that Canadian bank spreads exceeded the U.S. all-insured bank spreads in every year between 1969 and 1973. This was even true when federal funds are removed from the U.S. data. The five-year average differential was 27 basis points (Table 9) on the conservative assumption, and 47 basis points on the more appropriate one.

The appropriate measure, and the one used throughout the following narrative review of results is D_x, federal funds included. This measure shows that U.S. all-insured banks' spreads averaged 141 basis points lower than the Canadian spread. In 1973, Canadian bank customers paid $452 million more than would have been the case had the comparable U.S. margins applied.

As expected, the New York banks appear far more efficient. How much of this is the result of the wholesale/retail differential between the two systems is difficult to establish. Still, the five-year average value of D_t is 82 basis points. Keep in mind that this measure is particularly biased against the New York banks, since demand deposits are a very much larger share of their total deposits than is true of the Canadian banks. D_x averaged 424 basis points, which in 1973 resulted in a $775.79 million overpayment on the part of Canadian bank customers.

Table 9

Canadian Bank Loan Yield Spreads Minus
U.S. All-Insured Banks, 1969-73

(Per cent)

Year	Including Federal Funds				Excluding Federal Funds			
	D_T	D_N	D_X	D_Y	D_T	D_N	D_X	D_Y
1969	.44	1.43	1.44	.72	.27	1.06	1.16	.50
1970	.30	1.24	1.35	.60	.11	.84	1.06	.37
1971	.34	1.14	1.17	.73	.18	.96	1.00	.56
1972	.72	1.39	1.44	1.11	.52	1.24	1.24	.33
1973	.53	1.74	1.67	1.32	.27	1.27	1.30	.98
Five-year average	.47	1.39	1.41	.90	.27	1.07	1.15	.55

Source Schedule Q, Report to the Inspector General of Banks; Bank of Canada Review; Federal Reserve Board of Governors Bulletin.

Table 10

Canadian Bank Loan Yield Spreads Minus
New York City Banks, 1969-73

(Per cent)

Year	Including Federal Funds			Excluding Federal Funds		
	D_T	D_X	D_Y	D_T	D_X	D_Y
1969	.52	3.23	2.94	.19	1.82	1.94
1970	.65	3.51	1.92	.11	1.82	1.94
1971	.58	2.40	1.99	.44	2.03	1.70
1972	1.38	2.35	2.42	1.34	2.22	2.38
1973	.97	3.31	2.81	.64	2.51	2.48
Five-year average	.82	2.96	2.42	.54	2.08	2.09

Source Schedule Q, Report to the Inspector General of Banks; Bank of Canada Review; Federal Reserve Board of Governors Bulletin.

Table 11

Estimates of Excess Costs Paid by Canadian Bank Customers,
Based on Comparisons with U.S. All-Insured Banks, 1969-73

(Millions of dollars)

	Chartered Bank Canadian Dollar Loans	Including Federal Funds				Excluding Federal Funds			
		D_T	D_N	D_X	D_Y	D_T	D_N	D_X	D_Y
1969	17,741.5	78.06	253.70	255.48	127.74	47.90	188.10	205.80	88.90
1970	19,248.0	57.74	238.70	259.84	115.49	21.17	161.70	204.03	71.22
1971	21,169.0	71.98	241.30	247.68	154.53	38.10	203.20	211.69	118.54
1972	25,676.0	184.87	356.90	369.73	285.00	138.51	318.40	318.38	84.73
1973	32,057.5	169.90	557.80	535.36	423.16	86.56	407.10	416.75	314.16
Using Five-Year Average Margins									
1969		39.19	246.61	250.15	159.67	47.90	189.83	204.02	97.57
1970		90.46	267.54	271.40	173.24	51.97	205.93	221.35	105.87
1971		99.49	294.24	298.48	190.52	57.16	276.30	243.44	116.43
1972		120.67	356.90	362.03	231.08	69.32	274.73	295.27	141.21
1973		150.67	445.60	452.01	288.52	86.55	343.02	368.66	176.42

Source Schedule Q, Report to the Inspector General of Banks; Bank of Canada Review; Federal Reserve Board of Governors Bulletin.

Table 12

Estimates of Excess Costs Paid by Canadian Bank Customers,
Based on Comparisons with New York Banks, 1969-73

(Millions of dollars)

	Chartered Bank Canadian Dollar Loans	Including Federal Funds			Excluding Federal Funds		
		D_T	D_N	D_X	D_T	D_N	D_X
1969	17,741.5	92.25	573.10	521.60	33.71	322.90	344.18
1970	19,248.0	125.11	675.60	369.56	21.17	350.30	373.41
1971	21,169.0	122.78	508.10	421.26	93.14	429.70	359.87
1972	25,676.0	354.32	603.40	621.36	344.05	570.00	611.09
1973	32,057.5	314.16	1,061.10	900.81	205.16	804.60	795.02
Using Five-Year Average Margins							
1969		145.48	525.14	429.34	95.80	369.02	370.80
1970		157.83	569.74	465.81	103.36	400.36	402.28
1971		173.59	626.60	512.29	114.31	440.31	442.38
1972		210.54	760.01	621.36	138.65	534.06	536.63
1973		262.87	948.90	775.79	173.11	666.79	670.00

Source Schedule Q, Report to the Inspector General of Banks; Bank of Canada Review; Federal Reserve Board of Governors Bulletin.

ADJUSTED RELATIVE PERFORMANCE INDICATORS

As we have seen, Canadian banks are circumscribed by primary and secondary reserve requirements and effective tax rates that are more onerous than those facing their U.S. counterparts. On the other hand, the Federal Reserve maintains a system of surveillance on U.S. bank asset/capital ratios and limits them. It may be that Canadian banks are compensated for the restrictions outlined above by being permitted higher asset/capital ratios than is considered normal. On the other hand, the U.S. asset/capital ratios may be an unwarranted and arbitrary limitation on the U.S. banks, which acts to inhibit bank growth.

To evaluate this effect we recalculate U.S. loan yield margins and our performance indicators after allowing U.S. nondemand deposit liabilities to rise and the U.S. capital account to fall until the asset/capital ratio of the U.S. banks is equivalent to the Canadian ratio and U.S. reserve ratios and taxes are both at Canadian levels. It is assumed that the rate of return to capital remains unchanged, since this rate responds to competitive forces. We also assume that the change in liabilities has no effect on the asset structure of the U.S. banks, except insofar as noninterest earning reserves need to be held when deposit liabilities are expanded. Under these conditions, competition will cause U.S. banks to attract non-demand deposits by paying higher rates of interest. Our motivation for assuming that demand deposits are left unchanged is that nondemand deposits, including debentures, are a better

substitute for capital, so that a relaxation of capital requirements would lead to an expansion of a substitute liability. This is all the more important, since we maintain the hypothesis that the asset structure is unchanged, which would be implausible if demand deposit liabilities increased in lieu of capital.

The following symbols are used in the model:

TCAN = Canadian tax rate;

TUS = U.S. tax rate adjusted for tax-exempt bonds;

R = unadjusted U.S. nondemand deposit rate;

RP = new U.S. nondemand deposit rate;

DO = unadjusted U.S. nondemand deposits;

DCH = increase in U.S. nondemand deposits;

KO = unadjusted U.S. capital;

KN = adjusted U.S. capital;

AO = unadjusted U.S. assets (total);

AN = adjusted U.S. assets (total);

RR = reserve ratio (4 per cent applies to Canadian nondemand deposits);

A1 = U.S. asset/capital ratio (AO/KO);

A2 = Canadian asset/capital ratio (total assets)(AN/KN);

P = U.S. net revenue adjusted for tax-exempt bonds;

PS = U.S. net revenue adjusted for tax-exempt bonds and the U.S.-Canada reserve ratio difference;

RT = adjusted total deposit rate;

TD = initial total deposits;

DD = initial demand deposits;

RESCH= change in reserves.

The after-tax rate of return after the adjustment is given by the left-hand side of Equation (1) below. It is equated with the after-tax rate of return as given on the right-hand side of Equation (1).

$$(1\text{-}TCAN)\ [PS - (RP\text{-}R)\ DO - (RP)\ (DCH)] \div KN \qquad (1)$$

$$= \frac{P(1\text{-}TUS)}{KO}$$

Multiply (1) by AN:

$$[PS - (RP\text{-}R)\ DO - (RP)\ DCH]\ A2 \qquad (2)$$

$$= \frac{P(1\text{-}TUS)AN}{KO(1\text{-}TCAN)}$$

But AN = AO + RESCH, so that Equation (2) can be written:

$$\left[PS - (RP\text{-}R)\ DO - (RP)\ (DCH)\right] A2$$

$$= \frac{P(1\text{-}TUS)}{(1\text{-}TCAN)} \left[A1 + \frac{RESCH}{KO}\right] \qquad (3)$$

But

$$RESCH = RR(DCH) \qquad (4)$$

and

$$DCH = KO - KN = \frac{AO}{A1} - \frac{AN}{A2} \qquad (5)$$

$$DCH = \frac{AO}{A1} - \frac{AO}{A2} + \left(\frac{RESCH}{A2}\right) \qquad (6)$$

$$DCH = \frac{AO}{A1} - \frac{AO}{A2} + \left(\frac{RR(DCH)}{A2}\right) \qquad (7)$$

Solving Equation (7) for DCH gives:

$$DCH = \frac{AO(A2 - A1)}{A1(A2 + RR)} \qquad (8)$$

Substituting for DCH from Equation (8) into Equation (3):

$$\left[PS - (RP-R)\ DO - \frac{(RP)\ (AO)\ (A2-A1)}{(A1)\ (A2+RR)}\right] \qquad (9)$$

$$= \frac{P(1-TUS)}{A2(1-TCAN)}\left[A1 + RR\ \frac{(A2-A1)}{(A2+RR)}\right]$$

Solve Equation (9) for RP:

$$RP = \left[PS + R\ (DO) - \frac{P(1-TUS)\ (A1+RR)}{(1-TCAN)\ (A2+RR)}\right] \div \left[DO+DCH\right] \qquad (10)$$

RP is simply the rate that a bank could afford to pay on all nondemand deposits, when part of capital is replaced by nondemand deposits and the after-tax rate of return to capital is the rate that actually applied. Since demand deposits earn no interest, total interest costs are now given by:

$$RT = RP\ (DO-DCH) \div (TD+DCH) \qquad (11)$$

plus the difference between Canadian and U.S. service charges per dollar demand deposit.

Tables 13 through 16 report the D_t, D_n and D_x indicators using the new nondemand deposit rate for U.S. banks. Since the increase in U.S. bank asset/capital ratio is partly offset by the increase in tax rates and reserve requirements, the overall impact on these measures is relatively minor. The five-year average value of D_x, in relation to all U.S. insured banks and including federal funds, rose to 157 basis points from 141 basis points, and the same figure based on the New York bank data rose from 242 basis points to 262 basis points.

Table 13

Canadian Bank Loan Yield Spreads Minus
U.S. All-Insured Banks, Adjusted for Canadian Taxes,
Reserves and Capital/Asset Ratio, 1969-73

(Per cent)

	Including Federal Funds			Excluding Federal Funds		
	D_T	D_N	D_X	D_T	D_N	D_X
1969	.45	1.67	1.50	.33	1.31	1.27
1970	.52	1.71	1.70	.35	1.35	1.43
1971	.47	1.37	1.37	.32	1.19	1.20
1972	.73	1.52	1.48	.58	1.36	1.33
1973	.73	2.15	1.81	.49	1.70	1.47
Five-year average	.58	1.68	1.57	.41	1.38	1.34

Table 14

Canadian Bank Loan Yield Spreads Minus
New York City Bank, Adjusted for Canadian Taxes,
Reserves and Capital/Asset Ratio, 1969-73

(Per cent)

	Including Federal Funds			Excluding Federal Funds		
	D_T	D_N	D_X	D_T	D_N	D_X
1969	.66	3.94	3.39	.37	2.64	2.47
1970	.42	3.50	2.98	.29	1.92	1.84
1971	.51	2.55	2.31	.38	2.18	2.05
1972	.12	2.29	2.16	.11	2.17	2.07
1973	.42	3.22	2.24	.17	2.45	1.72
Five-year average	.63	3.09	2.62	.39	2.27	2.03

Table 15

Estimates of Excess Costs Paid by Canadian Bank Customers, Based on Comparisons with U.S. All-Insured Banks, Adjusted for Canadian Taxes, Reserves and Capital/Asset Ratio, 1969-73

(Millions of dollars)

	Chartered Bank Canadian Dollar Loans	Including Federal Funds			Excluding Federal Funds		
		D_T	D_N	D_X	D_T	D_N	D_X
1969	17,741.5	80.22	295.95	266.71	57.73	232.56	224.66
1970	19,248.0	99.98	329.96	327.02	67.54	259.48	274.73
1971	21,169.0	100.89	290.38	289.96	68.16	252.84	254.69
1972	25,676.0	187.97	389.02	380.31	149.40	348.20	340.61
1973	32,057.5	234.80	688.28	580.11	156.68	545.58	470.92
Using Five-Year Average Margins							
1969		103.35	298.63	278.99	73.41	245.23	237.46
1970		112.13	323.99	302.68	79.64	266.06	257.63
1971		123.32	356.33	332.90	87.59	292.61	283.34
1972		149.58	432.19	403.77	106.24	354.91	3 43.66
1973		186.75	539.61	504.13	132.64	443.12	429.08

Table 16

Estimates of Excess Costs Paid by Canadian Bank Customers, Based on Comparisons with New York Banks, Adjusted for Canadian Conditions, 1969-73

(Millions of dollars)

	Chartered Bank Canadian Dollar Loans	Including Federal Funds			Excluding Federal Funds		
		D_T	D_N	D_X	D_T	D_N	D_X
1969	17,741.5	116.68	698.05	601.64	65.15	467.87	438.45
1970	19,248.0	81.02	673.66	575.12	5.57	369.63	354.63
1971	21,169.0	106.38	537.00	488.84	80.55	462.97	433.61
1972	25,676.0	291.93	587.69	553.39	282.56	558.31	532.80
1973	32,057.5	135.47	1,032.54	717.42	54.02	784.46	549.96
Using Five-Year Average Margins							
1969		111.44	549.31	464.17	70.53	403.30	360.25
1970		120.91	595.95	503.59	76.52	437.55	390.84
1971		132.97	655.43	553.85	84.16	481.21	429.85
1972		161.28	794.98	671.76	102.07	583.67	521.36
1973		201.37	992.56	838.72	127.44	728.73	650.94

It appears that the penalty associated with a lower asset/capital ratio in the United States is a lesser burden than the higher effective tax rate in Canada, and especially the higher reserve costs in Canada due to secondary reserve requirements.

ALLOCATION OF THE EXTRA COSTS PAID BY CANADIAN BANK CUSTOMERS

We have shown that banking services are more expensive in Canada than in the United States. This difference in performance is not sustainable for a long period of time if Canadian banks faced domestic and international competition in banking proper and each of the submarkets in which banks operate. Spokesmen from the Canadian chartered banks often point to the degree of competition in the Canadian market in order to counter allegations of inefficiency. We would accept this perspective if we felt it were valid, but the evidence simply does not support this view. The higher than average after-tax profit rates of the Canadian banks have persisted since 1967 and are testimony to the market power of the banks. Entry into banking over the period has not reduced the higher after-tax profit margins of the banks.

Nevertheless, the differences in after-tax rates of return between banking and other industries are not so large as to suggest that a major flow of new entrants into banking ought to have occurred. One reason for this may be that existing firms are keeping profit rates at a lower level so as to dissuade entrants. In our judgment, however, the tax burden borne by the banks is the main reason why more entrants have not appeared in banking. Our evidence on before-tax profits earned by the chartered banks, as compared with the manufacturing sector, reported in Table 17, reveals a very great difference in profit rates, particularly when one includes the losses of revenue from primary and secondary reserves.

Before-tax profit rates in banking are far higher than in manufacturing or than in trust companies in every year since 1967. The loss on primary and secondary reserves were found by first assuming that a reserve level of 3 per cent would be normal for the banks, and then by valuing primary reserves above this level at the ninety day finance company paper rate. The loss in revenue on secondary reserves was found by subtracting the actual return on the reserves from the return if the finance company paper rate had applied. We conclude that, despite tax disadvantages reported in Table 18, the chartered banks have sufficient market power to maintain very high before-tax profit margins in order to achieve moderately higher after-tax profit margins than other industries. This means that the Canadian government shares substantially in the profits made possible by chartered bank market power.

Since nonbank financial institutions are taxed less onerously they should, in the absence of barriers to entry into banking markets, be able to bargain away business from the banks in the many markets in which they both compete. The same argument applies to the activities of foreign banks operating in Canada, booking business at head office abroad. U.S. banks are taxed less heavily than Canadian banks even after one accounts for the effect of nontaxable securities in bank portfolios. U.S. banks, therefore, face lower tax rates on earnings associated with Canadian business booked in the United States. They also avoid much of the burden of Canadian taxation on their subsidiaries in Canada because of U.S. tax

Table 17

Excess of Realized Bank Rate of Profit Over All Manufacturing Rate of Profit,* 1963-74

(Per cent)

	Before Tax	After Tax	Before-Tax Adjusting for Reserves[1]
1963	- 5.1	- 4.1	--
1964	- 5.1	- 3.9	--
1965	- 6.5	- 4.8	- 3.2
1966	- 3.8	- 2.8	1.1
1967	1.7	- 1.2	6.4
1968	4.7	4.2	7.9
1969	6.7	1.5	10.3
1970	10.8	2.9	14.6
1971	7.6	1.6	10.6
1972	8.2	3.0	12.1
1973	3.9	.5	9.6

*Rates of return are to average shareholder's equity.

1 Reserve costs were estimated on the assumption that roughly 3 per cent of primary reserves are required for normal financial business. Secondary reserves were revalued at the finance company paper rate. Prior to 1968, unnecessary primary reserves were taken as 5 per cent of Canadian dollar deposits. Since 1968, 3 per cent of Canadian dollar deposits were used as a measure of extra reserves. The cost of reserves as we have calculated them are conservative estimates, since primary reserves have been higher than 6 per cent.

Source Data is taken from Jack Mintz, "The Measure of Profitability in Canadian Banking," a background study for the Economic Council of Canada (forthcoming).

provisions which permit them to write off all or part of tax payments on Canadian business against income from other countries with lower tax rates.

Though near-banks are taxed less than banks, regulatory limitations on their leverage ratios may restrict them when competing with banks. What is important in assessing the competitive position of near-banks is the calculation of before-tax profit per unit of asset, as compared with that of banks,

Table 18

Asset/Capital Ratios and Tax Rates of Chartered Banks and Trust Companies, 1963-73

	Asset/Capital Ratios				Effective Tax Rates	
	Trust Companies	Chartered Banks	Chartered Banks Canadian $	Chartered Banks Booked in Canada	Bank Tax Rates[1]	Trust Company Tax Rates
1963	10.51	14.55	11.54	13.76	--	.4284
1964	11.28	14.90	11.59	14.08	--	.4158
1965	11.82	15.21	11.85	14.46	--	.3736
1966	12.47	16.18	12.80	15.37	--	.3458
1967	13.86	16.88	13.35	15.91	.5116	.3526
1968	13.25	17.76	13.85	16.60	.4230	.3755
1969	14.06	18.92	14.02	17.41	.5785	.4191
1970	15.36	19.78	13.92	17.85	.6204	.4120
1971	16.73	20.57	14.56	18.30	.5688	.4516
1972	17.30	21.38	15.56	18.93	.5356	.4302
1973	18.83	22.97	16.43	20.14	.5447	.4462

1 Bank Tax Rates given include implicit taxes on reserves and are on a realized basis.

Source Jack Mintz, "The Measure of Profitability in Canadian Banking," a background study for the Economic Council of Canada (forthcoming).

in such a way that the rate of return on capital after tax would be the same. This calculation has been made for a variety of asset/capital ratios for the banks, and is reported in Table 19.

Table 19

Trust Companies' Competitive Advantage Relative to Banks[1]

K	1969	1970	1971	1972	1973
K_1	0.9764	0.8314	0.9668	1.0072	1.0029
K_2	0.7235	0.5851	0.6843	0.7330	0.7174
K_3	0.8985	0.7502	0.8601	2.8918	0.8793
K_4	0.7256	0.6456	0.7863	0.8150	0.8221

Note: See Table 18 above for asset/capital ratios and effective tax rates used.

K_1 = Total asset/capital
K_2 = Canadian $ asset/capital
K_3 = Booked in Canada assets/capital
K_4 = Trust company assets/capital

1 Profit per dollar asset of trust companies divided by profit per dollar asset of chartered banks has been calculated so as to maintain equal after-tax rates of return to capital, 1969-73. If a figure is less than one, then trust companies should have been able to operate with lower profit margins than the banks. The model used was:

$$\frac{\frac{P_{Trust}}{A_{Trust}}}{\frac{P_{Bank}}{A_{Bank}}} = \frac{(1-T_{Bank})K_{Bank}}{(1-T_{Trust})K_{Trust}}$$

where:

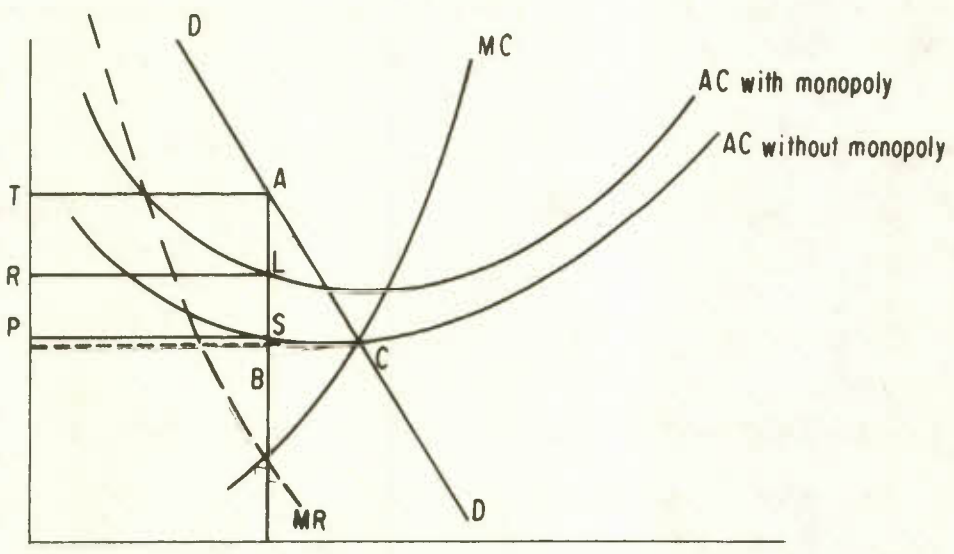
K is asset/capital ratio,
P is profit,
A is assets, and
T is taxes

In 1969 and 1970, the effective tax for banks was so high that the trust companies could certainly have operated with smaller before-tax yield margins than the banks. Since trust company after-tax profits were considerably lower than bank profit rates in both years, our calculations understate the extent of bank market power in 1969 and 1970. As expected,

the market power of banks relative to trust companies is not as extreme in 1971, 1972 and 1973. We conclude, however, that the chartered banks have sufficient market power in some activities, such that they are able to resist competition from financial institutions less heavily taxed than themselves.

This analysis of before- and after-tax profit rates of Canadian banks indicates that market power is one cause of the relatively poor performance of the Canadian banks as compared with the U.S. banks. It is natural to inquire what the social cost of monopoly is.[18] Monopoly costs can be divided into three components: (1) the deadweight loss; (2) the redistribution effect; and (3) extra costs associated with obtaining and maintaining the monopoly position. These can be illustrated with reference to Figure 3.

Figure 3



18 Richard A. Posner, "The Social Costs of Monopoly and Regulation," Journal of Political Economy, August 1975, p. 807.

The deadweight loss is the consumer surplus lost by consumers of bank services who cut back on its use, and is the area of the triangle ABC.[19] The extra profit earned by the banks is the area of the rectangle TARL, and is a redistribution from the users of bank services to the shareholders of banks. Finally, Figure 3 is drawn to reflect the assumption that the extra costs of monopoly are fixed costs that affect overheads and the average cost curve, but not marginal costs. These costs are given by the area PRLX.

The extra costs for bank services paid by Canadians as compared with the costs that would apply if U.S. rates pertained is the area TASP. We can calculate excess profit by using the after-tax manufacturing rate of return to equity as a standard profit rate, so that the area TALR is measurable. This permits us to measure the area RLSP, excess charges due to extra costs as a residual. Finally, higher than average tax rates and reserve costs can be interpreted as a mechanism by which the federal government shares in the monopoly power the banks are allowed. The latter component of monopoly earnings are easily calculated. The source of loss which is difficult to measure, is the monopoly deadweight loss given by the triangle ABC. Estimates of the elasticity of demand and the supply curve would be needed to estimate this triangle, and neither is available. It should be borne in mind when reading the subsequent analysis of the allocation of extra charges paid by bank customers to governments, profits and extra costs, that the deadweight loss due to the loss of consumer surplus is not included in our calculations.

19 Producer surplus is neglected because it is the loss incurred by users of bank services that is of interest.

In recent years, the banks have been able to earn gross revenues amounting to many hundreds of millions of dollars more than if they had no market power. However, as mentioned above, the net revenues to the banks after paying taxes are considerably lower than this. The after-tax excess profits of the banks are shown in Table 20, column (1). These profits are excess in the sense that, if banks had earned standard rates of return to capital and also had paid standard tax rates over the period 1968 through 1973, then their earnings after tax would have been lower. In 1973, after-tax excess return of the banks was $44 million, as compared with $226.7 million before taxes. However, these recalculations of bank profits under various alternative conditions are carried out with bank costs and asset levels left unchanged. For this reason the figures reported in Table 20 only serve to illustrate the relative advantages of the current structure as between the banks and the government. They do not reflect the overall costs of the system which were estimated using the U.S. performance standard, and are reported in Table 21 below.

The excess profits reported in Table 20 are based on the before-tax rate of return in manufacturing as a standard rate of return in the absence of market power. This sector includes many firms undertaking sufficiently varied activities, so that the average rate of return can be safely selected as a norm for competitive rates of return. After-tax rates of return are not used because tax laws cause effective tax rates to differ considerably over sectors. Instead, we use the trust company effective tax rate as the standard rate of tax that ought to apply to banks in a financial system free of distortions.

Table 20

Excess Chartered Bank Profits and Excess Government Revenues Relative to Three Standards,[1] 1968-73

(Millions of dollars)

	Norm 1		Norm 2		Norm 3	
	Current Profits Minus Norm 1 Profits	Current Taxes Minus Norm 1 Taxes	Current Profits Minus Norm 2 Profits	Current Taxes Minus Norm 2 Taxes	Current Profits Minus Norm 3 Profits	Current Taxes Minus Norm 3 Taxes
	(1)	(4)	(2)	(5)	(3)	(6)
1968	72.04	- 17.52	72.04	40.18	- 18.51	18.51
1969	21.26	56.12	21.26	127.92	- 96.57	96.57
1970	1.24	81.53	1.24	158.43	-124.37	124.37
1971	79.84	22.32	79.84	93.02	- 63.63	63.63
1972	97.14	19.61	97.14	123.81	- 78.98	78.98
1973	44.24	19.72	44.24	182.42	-109.83	109.83

1 Norm 1 structure: standard rate of return and taxes but reserve requirements maintained.
Norm 2 structure: standard rate of return and taxes but no reserves over 3 per cent of deposit liabilities.
Norm 3 structure: actual rate of return and standard tax rates and no reserves over 3 per cent of deposit liabilities.

The banks earn high profits due to the present system, but they lose part of the benefit as a result of paying higher explicit and implicit taxes. To determine the excess profits to banks and the excess tax revenues for government from the present structure, one must define alternative market structures to act as a standard from which to measure differences in profits earned and taxes collected. Three standards are introduced here. All three are market structures that may follow from Bank Act revisions, but all are limited and understate the cost of the current system because they assume that bank operating costs will remain unchanged after revision.

The first structure, called Norm 1, is a market structure in which entry into banking proper is made easy so that banks cannot earn a rate of return above the standard rate, and the tax rates are standardized. On the other hand, primary and secondary reserve requirements are maintained at current levels. For Norm 1 to be a viable market structure, banks as a group will need sufficient protection to allow them to earn the extra revenue to cover the costs of holding reserves, since near-banks will not be assumed to face the same reserve requirements. Norm 1 then differs from the current structure only in that entry into banking proper will be relaxed. The excess profit and taxes relative to Norm 1 are reported in Table 20, columns (1) and (4), respectively. Since the government would continue to profit from bank reserve holdings under Norm 1, the extra tax revenues under the current system are only moderately larger than under Norm 1.

A more complete reform of the Bank Act would result in a market structure we call Norm 2. According to Norm 2, entry will not only be eased into banking, but reserve holdings over 3 per cent of deposit liabilities would not be required. If entry is free into banking and reserve requirements do not apply, competition within the banking industry is assumed to drive profits to the standard level. Since the banks earn the standard level of profit under norms 1 and 2, the excess profit level of the current structure relative to both norms are identical. However, government tax revenues are lower under Norm 2. Total tax revenues lost, if Norm 2 were adopted, or what is the same thing, excess tax revenues relative to Norm 2, is reported in column (5) of Table 20, and was $182.42 million in 1973.

Finally, it is possible that reserve requirements and tax rates will be standardized but entry conditions into banking and from near-banks into bank markets will be left unchanged. The market structure that follows from it is called Norm 3. Under Norm 3, banks would be able to maintain the current level of before-tax profits but would pay the general tax on all revenues. Tax costs of the banks in 1973 under Norm 3 conditions would have been $109.83 million lower than actual taxes. The figures for other years are given in column (6) of Table 20. If Norm 3 applies, then a major transfer of revenues from the government to bank shareholders would occur without any immediate benefit to the users of financial services.

It needs to be stressed that the three standards used here are not predictions as to the long-run effect of changes in market structure. They only allow us to get at the question of who benefited from the structure in the past. If one of the market structures described in Norm 1, 2 or 3 should follow Bank Act revisions, then long-run changes will modify the static calculations we have made. For instance, if Norm 3 is established, then the level of after-tax profit in banking would rise by about 28 per cent, based on 1973 data. Such an increase would attract a great deal of interest from potential entrants despite the existing regulatory and legislative limits on entry. It is unlikely that the current restrictions on entry into banking markets could be effective if the government tax burden on banks was reduced to this extent.

Norm 2 is the market structure we believe to be in the best interest of Canadians. Relative to that structure, the current structure benefits government to a greater extent than banks. The government causes the relative price of financial services to be distorted by imposing the equivalent of an excise tax on financial services. To maintain the collection of the tax, the government must protect the banks from the competition of near-banks and foreign banks that are not taxed so heavily. The protection, however, has also permitted inefficiencies that have been more costly than the extra tax revenue and profit.

The current financial structure has developed over many years. We do not believe that it was designed as a tax-gathering mechanism. Certain government officials may appreciate

placing Treasury Bills with the banks at below-market-interest rates, but reserves are usually justified by their role in effecting monetary policy rather than as a revenue source. Indeed, we have shown that the government has no interest in maintaining protection for the banking industry. Government revenues would not decline markedly in a competitive environment because existing market power gives rise to excessive costs. Competition causes these costs to fall as banks move to protect their profit rates, so that net income of the banks should fall by less than the saving to consumers of financial services. Therefore, tax revenues would not fall by the amount we have calculated as excess taxes under current conditions. In addition, tax revenues would be recouped from corporate bank customers whose profits will rise by at least the extent of the savings on financial service costs, as well as the tax yield from higher interest income earned by depositors.

The sum of column (5) and column (2) in Table 20 measures the area of the rectangle TALR in Figure 3 if the bank reserve costs over and above 3 per cent are treated as an element of bank profit to be shared with the government. In 1973, this amount was $226.66 million. The extra resource cost, the area of rectangle RLSP, is not included in this total. To estimate this amount we define Norm 4, which is the market situation that would arise when in addition to Norm 2 conditions, foreign banks are given access to the Canadian market on the same terms as domestic banks, or if Canadian competition is sufficient to eliminate both the excess costs and profits. Table 21 reports on one estimate which is based on U.S. all-insured bank yield margins adjusted to Canadian taxes, capital/asset ratios and

reserves. Excess resource costs were over $400 million in 1973. It should not be forgotten that this extra resource cost is net of extra profit and taxes. The total excess cost of banking services to Canadians is the sum of the areas TALR and RLSP which, relative to Norm 4, is given by the sum of column (1) in Table 21, and column (5) in Table 20, and is reported as column (4) in Table 21. In 1973 this total was over $600 million.

Table 21

Excess Profit and Taxes, Charges and Costs in Canadian Banking, 1969-73

(Millions of dollars)

	Excess Charges in Canadian Banking Net of Taxes	Excess Profit in Canadian Banking	Excess Resource Cost in Canadian Banking	Excess Resource Cost, Profit and Taxes in Canadian Banking
	(1)	(2)	(3)	(4)
1969	250.15	21.3	229.85	378.07
1970	271.40	1.2	270.20	429.83
1971	298.48	79.8	218.68	391.50
1972	362.03	97.1	264.83	485.84
1973	452.01	44.2	407.81	634.43

(1) Figures are from D_X as reported in Table 11. They represent our estimate of the drop in bank revenues if U.S. all-insured loan yield margins apply to Canadian banks. The U.S. data used includes federal funds, is adjusted for Canadian conditions, is based on five-year average margins, and relates to all U.S. insured banks.

(2) Drop in bank after-tax profits if Canadian banks earned the manufacturing rate of return and paid trust company tax rates.

(3) Column (1) minus column (2).

(4) Column (1) Table 21, plus column (5) Table 20.

CONCLUSION

Many policy-makers tend to take an understandably conservative stance when proposals arise for any substantive change in existing institutional arrangements, asking for evidence that the existing arrangements are harmful, as well as quantitative estimates of the costs. It may be argued, for example, that even though protection is afforded to financial institutions by barriers to entry, these barriers cannot be exploited because competition within the protected financial sector is sufficient to eliminate excessive profits to protected institutions. In contrast, many economists argue that if barriers to entry exist, their removal can force an industry into a structure that results in better performance and, in any case, cannot cause any harm. While it may be argued that entry into deposit-taking activities is different than entry into other activities, because of the importance of safety of deposits, the authorities have recognized this problem and dealt with it through such measures as separation of financial from nonfinancial activities and deposit insurance. If barriers are effective, someone must pay the price of protection and a case exists for removal. If, however, they are ineffective, their removal is simply a matter of paper work, without any real effect.

While we accept the economist's view that a logical case can be made for removal of entry barriers, we have responded in this study to the demand for quantitative estimates of the costs to the Canadian public of protection in banking. Even though a number of approaches are used, the evidence, from

whatever source, points in the direction of a considerable amount of market power in banking markets and that banking services should be priced lower in a more competitive market. However, a most important conclusion following from our work is that it is the government of Canada which is a party to and apparent benefactor from the maintenance of protection. Still, taxes are not so high that banks have been unable to share in the advantages of a protected market. Indeed, the benefit to banks has been quite high in 1971, 1972 and 1973. We know of no reason to believe that conditions in banking markets have changed sufficiently in recent years to reverse these conclusions about bank performance. The major effect of protection, however, is the extra resources used in providing banking services.

We believe that there can be little doubt that the current status of bank legislation gives rise to substantial costs to Canadian households. These annual costs are in the hundreds of millions of dollars. Part is a transfer from users of bank services to governments and bank shareholders, and not a simple waste of resources benefiting no one. Nevertheless, the waste component of the cost is hardly negligible. In addition, the higher price charged for financial services necessarily causes households and firms to obtain these services through inferior methods. For all these reasons, we believe that in the interests of providing more efficient banking services to Canadians the barriers to entry into banking should be relaxed.

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