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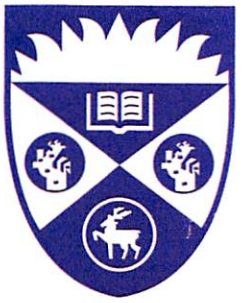

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The Economics of Canadian Deposit Insurance

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Abstract

The introduction of deposit insurance in Canada in 1967 is commonly explained as an efficiency-enhancing response to macroeconomic shocks and contagious runs by imperfectly informed depositors, as well as a means of promoting domestic institutions that would compete with the large chartered banks. We show that since 1967 insolvencies among Canadian banks, trust and mortgage loan companies have increased, and the number of domestic competitors for the large banks has been reduced. A model in the spirit of Akerlof and Romer (1993) links these observations to the incentives provided by deposit insurance. We argue that the Canadian scheme was primarily designed to force the incumbent banks to subsidize trust and mortgage loan companies and the entry of regionally based chartered banks. As such, the scheme was politically efficient in the sense of Becker (1983) but has reduced economic efficiency.

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I. Introduction

What is the explanation for the introduction of non-risk-rated deposit insurance? Macroeconomic shocks may cause contagious runs by imperfectly informed depositors of illiquid but otherwise solvent banks (Diamond and Dybvig 1983). The resulting contractions in the supply of money (Friedman and Schwartz 1963) and/or credit (Bernanke 1983), together with unit banking (Calomiris 1990) are widely considered to be the underlying historical causes of instability in the American banking system. Friedman and Schwartz (1963: 434) argue that in the US, public deposit insurance was "*the most important structural change in the banking system to result from the 1933 panic, and indeed in (their) view the structural change most conducive to monetary stability ...*"[1] This approach is widely used to explain the introduction of deposit insurance in Canada in 1967 (Binhammer 1993: 147, Boreham and Bodkin 1988, Cameron 1992: 339, Shearer Chant and Bond 1984). It is frequently argued, in addition, that deposit insurance has enhanced efficiency by promoting the emergence of competitors for the large Canadian chartered banks (especially Shearer Chant and Bond 1984: 362 -3). Public provision is assumed to be necessary because of the potential for exogenous shocks whose magnitude is so great as to require the taxation system to support the guarantee of bank deposits (Congress 1990: 25 - 27).

Macroeconomic shocks or regulatory changes[2] may determine the precise timing of bank failures, but in our view they offer little insight into the motivation for deposit insurance and the causes of insured bank failure. The Canadian banking system was extremely stable for a long period of time before the introduction of deposit insurance in 1967. There was neither a banking crisis nor evidence of illiquid but solvent banks being forced to close when deposit insurance was introduced. Moreover, Canada has a number of large banks that have remained solvent during every macroeconomic shock since the first half of the nineteenth century, including the Great Depression,[3] and that appear to be relatively immune to the

[1] Although Friedman (1960: 60-76) recommended public deposit insurance, his preferred solution to bank instability was 100 per cent reserves for banks.

[2] Keeley (1990) argues that deregulation of entry to US banking reduced the value of bank charters and activiated the moral hazard problem associated with deposit insurance.

[3] Kryzanowski and Robert (1993) claim that the Canadian banks were insolvent throughout the 1930's,

moral hazard that accompanies deposit insurance. Our interests lies in considering why deposit insurance was introduced into such a stable banking system, and why it provides incentives for some banks to adopt strategies that promote insolvency.

In our view, neither macroeconomic shocks nor contagious runs by imperfectly informed depositors explain the existence of deposit insurance in Canada. The weakness of some provincially-incorporated trust and mortgage loan companies in the mid-1960's was widely recognized and no threat to the stability of the banking system. We demonstrate that since 1967 stability in the Canadian financial system has been reduced (where stability is measured by the number of insolvencies), but note that none of the incumbent chartered banks with a large wholesale and foreign currency business have failed. We develop a model of the impact of deposit insurance on banking in the spirit of Akerlof and Romer (1993) which links these observations to the incentive provided by deposit insurance. Finally, we examine the political economy of the introduction of deposit insurance in Canada, and argue that Canadian scheme was primarily designed to force the incumbents banks to subsidize trust and mortgage loan companies and the entry of regionally based chartered banks. As such, it has reduced economic efficiency. This explanation is consistent with the public and mandatory constitution of the Canadian scheme, as well as with the adoption of flat-rate premiums and full coverage for depositors up to a nominal limit.

II. The Introduction of Deposit Insurance and Its Implications for Canada

The Canada Deposit Insurance Corporation Act (1967) applies to the federally chartered banks, and the trust and mortgage companies that may be federally or provincially chartered.[4] The products of these intermediaries have historically been imperfect substi-

and that they survived only because of regulatory forbearance and implicit deposit insurance provided by the Canadian Bankers Association and the federal government. Carr, Mathewson and Quigley (1995) show that these claims are incorrect, and in particular, that depositors in insolvent banks were not insured by either the Bankers Association or the government.

[4]In this paper we do not consider the credit unions and caisse populaire because there is no evidence that these institutions were important in the emergence of federal deposit insurance in Canada. They are not entitled to be members of the federal scheme.

tutes. Further, the trust and mortgage loan sector has been characterized by lower barriers to entry, greater freedom from regulation, and less vigorous public supervision and auditing. These differences in jurisdictional authority and products are central to the political economy of deposit insurance in Canada.

The original Canadian constitution (the *British North America Act* of 1867) contains *"overwhelming evidence of the conviction that money, banking and credit (in its public aspect) should be exclusively of federal concern"* (Laskin 1986: 726). From the outset, the courts took the view that this legislation gave the federal government exclusive jurisdiction over banks and the issue of bank charters. The cost of lobbying parliament for a charter encouraged entry into banking through trust and mortgage loan companies.

Under sections of the *British North America Act* (dealing with civil rights and property rights), responsibility for these trust and mortgage companies was ceded to the provinces. The first provincial charters for trust companies gave them the power to accept deposits in trust, and they subsequently acquired authority to operate outside the jurisdiction in which they were incorporated.[5] Federal challenges to these developments were rare, primarily because the provinces argued that the taking of some deposits was a legitimate part of the trust business and so outside federal jurisdiction (Baum 1971; McDonald 1972). Moreover, the federal definition of banking activity focused on matters reserved exclusively for institutions covered by the federal *Bank Act*; this included the issue of notes (before 1934), management of the cheque clearing mechanism, and the ability to make personal and commercial loans. Provincial legislators also encouraged companies to retain provincial charters by removing residential requirements on share ownership [6] and by reducing required capital ratios. Consequently, some of the largest trust companies in Canada retained provincial charters even

[5]Before 1916 federal officials took the view that only the Federal Parliament had the jurisdiction to incorporate a company that would operate in more than one province but provincial authorities refused to accept this view (Gisbourne and Fraser 1922:61, 228, 242.) These disputes were resolved in *Bonanza Gold Mining Co. v. The King* (1916) I A.C. 566, where it was held that unless the activities of a provincially incorporated company were explicitly restricted to that province by its charter or by its articles of association, the company could acquire the right to operate in other provinces whose laws allowed for this.

[6]In Ontario they were required to have 75 percent of their shares owned by persons resident in the province (RSO 1927 c223 s 14(2)), but this restriction was removed by 1950.

though after 1914 it was possible for them to register under federal legislation (and avoid the costs of complying with the different regulations in force in each province).[7] The growth in trust and mortgage companies followed closely the evolution of the demand for mortgage finance and was particularly rapid in the 1950s and 1960s (Neufeld 1972).[8]

In 1965 it was revealed that the financial affairs of the British Mortgage and Trust Company were closely linked to those of an insolvent finance company, Atlantic Acceptance Corporation. Suspension of payments to depositors was averted when the Ontario government guaranteed a loan to British Mortgage until it merged with a larger company, but the event prompted the Minister of Finance to announce on July 5, 1966 that the federal government intended to introduce deposit insurance. Plans to allow for extensive parliamentary consideration of the draft legislation were interrupted by the withdrawal in 1966 of 11.1% of public funds from another trust company, York Trust and Savings Corporation. York was incorporated in Ontario, had 13 branches in the Toronto area, and was the 16th largest non-bank deposit-taking institution in Canada. In light of these developments the federal government expedited its introduction of deposit insurance. Simultaneously in an emergency sitting of the Ontario legislature, a provincial deposit insurance scheme was passed on February 10th 1967 to provide interim protection of depositors of this firm.[9]

[7]The issue of capital requirements was particularly important in Ontario. After 1927 mortgage loan companies were subject to the following 'standard' constraints: deposits no greater than twice the sum of their capital, reserves and holdings of cash, and total liabilities no greater than four times the same reference sum (RSO 1927 c 223 s 44(4) and 46(2)). From 1950 onwards these same companies faced a mandated liquid asset ceiling of 20 per cent of deposits (RSO 1950 c 214 s 72). By 1970 the 'standard' ratio for liabilities was increased not to exceed cash held plus four times captial and reserves (RSO 1970 c 254 s 82). In contrast, up to 1914 there were no explicit limitiations on the deposit business of trust companies. By 1927 they were required to hold and set aside securities at least as great as the full value of their deposits (RSO 1927 Ch 223 18 (4)). In the period 1966 to 1970, minimum capital ratio and liquid reserve constraints placed the trust companies on the same basis as the mortgage loan companies (RSO 1970 c 254 s 90 and s 93)). Federally regulated trust and loan companies had borrowing limitations similar to those applying to the Ontario mortgage loan companies (RSC 1952 c 272 s 70 (3); 7 Eliz II 1958 c 42).

[8]The *Bank Act* prohibited banks from making any mortgage loans until 1954, and these banks only obtained complete freedom to expand into the mortgage business after the 1967 revision to the *Bank Act*. Before this, mortgage finance was principally provided by trust and loan companies, and their ability to compete with the federal banks was closely linked to this business.

[9]The Ontario government never intended its deposit insurance scheme to stand alone (Ontario Legislature *Debates* 1967:222 - 223) - it was introduced to the Ontario legislature on February 8th, after the federal legislation had passed its second reading. Once the federal scheme had become law, the Ontario Act was

The York Trust episode represents the rational response of investors to a badly managed company, and cannot be reconciled with the information problem underlying the efficiency rational for deposit insurance.[10] The available evidence supports the claim that there was no general crisis in the chartered banks or in the trust and mortgage loan companies in 1966, and that the need to insure uninformed depositors was not the most important issue. Of 61 trust and mortgage loan companies with short or medium term public liabilities, only 6 (including York Trust) experienced a net withdrawal of funds in the 1966 calendar year. The remaining 54 companies experienced rapid growth during that year; their average increase in public liabilities was 31.8% (with a maximum growth of 254% and a standard deviation of 42.0%).[11] Depositors displayed an impressive ability to discriminate between the remainder of the industry and York Trust. Nonetheless, the *Canada Deposit Insurance Corporation Act* passed its third reading in the federal legislature on February 14, 1967. This act created the existing deposit insurance scheme in Canada and its administrative institution, the Canadian Deposit Insurance Corporation (CDIC).

Financial data taken from the balance sheets of federally regulated national banks and trust and mortgage companies regulated both federally and in Ontario permit an assessment of the impact of deposit insurance on the banking market in Canada.

The data displayed in **Table 1** demonstrate that deposit insurance promoted entry, particularly by trust and mortgage loan companies. From 1949 to 1966, gross entry involved 37 firms and net entry involved 12 firms. The corresponding figures for 1966 to 1985 involve the gross entry of 62 new firms and the net entry of 31 firms. Of the 91 trust and mortgage loan companies that existed in 1985, 62 had entered since 1968.[12] Was any market-driven

amended so that it applied only to firms that were not members of the federal scheme (SO 1967 c62).

[10]York Trust had operating losses equivalent to 25.3 per cent and 19.4 per cent of its equity for the years ended December 31, 1966 and 1967 respectively.

[11]There is no evidence of the dramatic decline in demand deposits which would be associated with a general run on trust companies. Chequable demand deposits in trust companies were 546 million dollars in the first quarter of 1966, 563 million dollars in the second quarter, 557 million dollars in the fourth quarter, and 571 million dollars in the first quarter of 1967.

[12]The explanation for this increased entry does not lie with an economy that is growing faster in the post-deposit insurance period. From 1949 to 1966, national output in Canada grew by 138 per cent (or an annual growth rate if 5.2 per cent) and from 1968 to 1985, national output grew by 94.6 per cent (or an annual growth rate of 4.0 per cent).

decline in concentration enhanced when deposit insurance was introduced? To answer this, we calculate the Herfindahl index using the assets of banks and trust and mortgage loan companies and run a simple regression of the index against time with a break in 1967 when deposit insurance entered the market. The negative time coefficient after 1967 (β_1) indicates that post-1967, concentration declined more rapidly (**Table 2**).

Table 3 reveals that post 1967 the average debt to equity ratio increased for banks and trust and mortgage loan companies in both sectors.[13] **Table 3** also reveals that the debt to equity ratio is larger for banks than for trust and mortgage companies.

Between 1949 and 1966, there were no failures of firms in our data set[14], while between 1968 and 1986, 22 institutions failed; 17 of these incorporated either federally or in Ontario are in our sample (the others were incorporated in provinces not included in our sample.) Of these 17, 14 were incorporated after 1967 and only 3 before.[15] This evidence suggests that deposit insurance increased the likelihood of insolvency among Canadian banks, trust and mortgage loan companies but it is notable that none of the chartered banks established before 1967 have failed. The combined effect of these failures and those that have taken place since 1985 (especially, Standard Trust, Central Guaranty Trust and Royal Trust) has been to reduce the effective competition for the large chartered banks in the retail deposit market.

[13]Debt includes all fixed interest obligations owing by the banks and trust and mortgage loan companies. Excluded from our sample are wholesale firms that do not accept public deposits and new firms that have just entered showing zero liabilities at the time of measurement in their initial year. In measuring deposits for trust companies, we exclude trust funds.

[14]This lack of failure, coupled with the observations on entry from **Table 1**, indicates that 25 trust and mortgage loan companies were wound-up voluntarily or merged during this period. These mergers were not government arranged. In contrast to the U.S., Canadian authorities did not follow a policy of merging failing institutions up to 1985.

[15]These 14 failed firms incorporated after 1967 are listed with their date of failure first and their date of incorporation (recorded as the year in which the company first appeared in the regulators' annual report) second as: 1980: Astra Trust (1976); 1983: Greymac Trust (1981), Seaway Trust (1978), Fidelity Trust (1972), Amic Mortgage (1976); 1984: Northguard Mortgage (1977); 1985: Pioneer Trust (1974), Western Capital Trust (1979), London Loan Ltd. (1977), Continental Trust (1973), Canadian Commercial Bank (1976), Canadian Commercial Bank Mortgage (1977), Northland Bank (1977); 1986: Bank of British Columbia (1968). The CDIC negotiated the sale of the Bank of British Columbia as a going concern to the Hongkong and Shanghai Banking Corporation in 1986. Fidelity Trust was originally incorporated as a provincial trust in 1909; it reincorporated as a federal trust in 1972 and, therefore, is counted as an entrant in 1972.

The candidate explanations for the increase in the failure rate include (i) increased volatility in growth of the real sector of the economy, and/or (ii) increased interest rate volatility over the period, and/or (iii) increased volatility in real estate prices. We believe that while macroeconomic shocks affect the timing of insolvency, they are not its cause. The volatility of growth rates is stable over the two periods. The standard deviation of real output growth in the pre-deposit insurance period (2.68%) is the same as that in the post-deposit insurance period (2.67%). We maintain that any impact of interest rate volatility on bank failure is through the deposit insurance scheme. Interest rates were both high and volatile between the late 1960s and the early 1980s but no more so than they had been in earlier periods. The key issue is that non-risk-rated deposit insurance reduces the costs of insolvency and so reduces the incentive for banks to match assets with liabilities, increasing the likelihood of bank failures. Arguments about volatility in real estate prices similarly ignore their on-going cyclical nature. We know of no evidence that real estate prices became more volatile after deposit insurance.[16] The important issue is that deposit insurance increases the incentives for financial institutions to take more risky mortgages making them susceptible to a fall in real estate prices.

The fact that none of the chartered banks established before 1967 has failed may be explained in two ways. First, their business was geared to relatively low-risk loans and it was costly for them to seek out new customers and design procedures to take on the high-risk operation being pursued by some of their competitors. Second, and more importantly, the large banks have a much smaller percentage of their deposits insured than do their competitors.

In 1993, banks operating in Canada had on average 46 percent of their deposits covered by the CDIC.[17] The large banks with the highest proportion of international business have ratios of insured depositors as low as 40 percent. The banks have a larger proportion of domestic and international wholesale deposits which are too large to be split into separate

[16]For example, real estate prices fell in the early 1960's, and yet there were not trust and mortgage loan company failures then.

[17]The data provided in this paragraph are drawn from the CDIC Annual Report (1993: 46) and estimates in Carr, Mathewson and Quigley (1994).

accounts to meet the deposit insurance ceiling, or do not qualify for deposit insurance coverage because they are denominated in currencies other than Canadian dollars and booked in branches outside of Canada. In these markets, competitiveness depends entirely on investors' perceptions of the size of the bank's equity and the precautions against high-risk strategies.[18]

In contrast, the large trust and mortgage loan companies have on average 81.2 percent of their deposits insured, but this figure reflects the relatively low ratio of insured deposits at the largest company in this sector — Canada Trust. The small trust and mortgage loan companies in Canada are currently operating with an average ratio of insured deposits near 95 percent, and rely on deposit brokers (whose activities promote the flow of funds to relatively risky institutions offering high deposit interest rates) for one-third of their deposits. They are therefore largely restricted to the retail market where coverage by the CDIC removes risk from depositors. The nature of the problem is illustrated by the very high ratios of insured deposits in almost all of the trust and mortgage loan companies which have required deposit insurance pay-out (**Table 4**).

Data reported in **Table 5** indicate that real minimum equity requirements doubled in 1969 for federal loan companies, quadrupled in 1968 for federal trust companies, and approximately doubled in 1968 for Ontario incorporated trust and mortgage loan companies. The timing of these increases is consistent with a legislative recognition of the changed incentives after the enactment of the deposit insurance scheme. While minimum equity requirements had existed in the past for banks and trust and mortgage loan companies, these requirements had generally not been binding. Recognition of the enhanced role for public regulators after deposit insurance would prompt legislators concerned about subsidized insolvency to raise the minimum equity requirements.

The evidence therefore suggests that in Canada deposit insurance has promoted entry, increased debt to equity ratios, and increased the likelihood of insolvency among insured institutions. Failures have been confined to retail institutions with high ratios of insured

[18]The role of uninsured depositors in providing market discipline is analogous to proposals that banks be required to issue subordinated debt (for example, Benston (1994)).

deposits, and to firms entering the market since 1967. The CDIC thus appears ex post to have forced the large incumbent chartered banks to subsidize trust and mortgage loan companies and new entrants. We utilize these observations to set out a model of bank behavior in the presence of deposit insurance.

III. Reduced Form Model

We consider a bank whose sources of funds are deposits, D, and equity, S. The bank has sole access to an investment portfolio which has a two-point distribution. An investment of $D + S \equiv A$ returns a positive outcome defined by $\pi(A)$ (where $\pi' > 0$ and $\pi'' < 0$) with probability ρ, and 0 with probability $1 - \rho$. Suppose that there is a risk-free alternative investment that guarantees a gross return of D. The bank writes a deposit contract which offers to risk-neutral depositors a gross return of $R = D/\rho$, an expected return equal to the risk-free alternative. The existing minimum equity investment of bank shareholders, enforced by regulation, is $S \geq cA \equiv \gamma D$, where $\gamma \equiv c/(1-c)$. The first-best investment for this bank is given by the solution to

$$\max_A E\Pi = \rho\pi(A) - A$$

subject to

$$S \geq cA$$

Provided the equity restrain is non-binding, the solution A^* is defined by

$$\rho\pi' = 1$$

Because D and S are perfect substitutes for investment purposes, the feasible set of intermediation contracts is given by $S = A^* - D$. Different investment opportunities (such as those arising from the distinction between chartered banks, trust and mortgage loan companies) give rise to different classes of business and within these, differences in the size of firms (characterized by differences in $\rho\pi'$).

A. Investment When Looting is Possible

Malfeasance on the part of the owners of the banks is possible when depositors do not monitor the assets in which the deposits are invested. The typical response to the potential for malfeasance (Becker and Stigler 1974) is for an equity bond to be posted by the bank that makes the deposit contracts self-enforcing. We assign this role to the equity investment by the bank owners, S, by assuming that once it is committed, it is sunk and that its presence is known and measurable by depositors. Having posted the equity bond, the owners of the bank obtain their deposits from the public by representing that they will invest the deposit funds obtained in an identical manner to the equity. In practice, they will only invest the deposits in this manner if the equity investment and the deposit contracts provide the necessary deterrence to doing otherwise.

The bank chooses to invest the deposits in the manner represented to the public or in some covert but legal security which would provide a return to the bank owners of $M(D) > D$, where $M' > 0$ and $M'' < 0$. The latter option results in a total loss of D for the bank. Following Akerlof and Romer (1993), we term this option 'looting'. For example, looting could be loans made to the owners of the bank to finance real estate speculation which provides a large pay-off for the personal wealth of the owners but leaves the bank holding collateral which is worth only a small fraction of the value of the loan.[19] Limited liability for the owners of the bank means that this net obligation to depositors can never be negative (beyond the banks' realized cash flow from its investments whatever their size). Depositors are indifferent to the choice of the bank owners *if* the bank is solvent, i.e. *if* the equity investment by these owners is sufficient to guarantee the anticipated pay-off ($R = D/\rho$) should the good state be drawn, that is, *if* $\rho\pi(S) - D \geq 0$.

These critical relationships are presented in **Figure 1.** **KN** represents the set of deposit contracts and equity investments that achieve the first-best investment A^*, and $S = \gamma D$ is the

[19]Many of the bank failures in Canada since the introduction of deposit insurance have been precipitated by losses on speculative real estate loans. An example is the 1983 failure of the Greymac and Seaway Trust and Mortgage Companies. The owners of these companies had the companies finance mortgages on real estate as a means of withdrawing funds from the companies (Binhammer 1993: 218 -219).

minimum equity restriction. Deposit and equity investments on the line segment **KZ** meet this equity constraint. In particular, the intersection of the convex relationship $\rho\pi(S) - D = 0$ with **KN** a line segment **KG** in **Figure 1** where deposit and equity investments yield both the first-best investment and sufficient equity in the banks to ensure solvency even if the bank owners loot.

In general, if banks were constrained only by the state-imposed minimum equity condition and looting were profitable, the bank's looting contract would be given as the solution to

$$\max_D \Omega(D, S) \equiv M(D) - S$$

subject to

$$S \geq \gamma D$$

With the minimum equity constraint binding, the solution is

$$M' = \gamma$$

In **Figure 1**, this is shown as **Y**, the tangency between the iso-looting curve (whose slope is $dS/dD|\overline{\Omega} = M'$) and the state-imposed regulatory constraint (whose slope is γ). In the analysis that follows, it is critical that **Y** lie to the right of **Z**. The relative position of **Y** and **Z**, together with the fact that the iso-looting curve is independent of S means that iso-looting curves through each first-best contract on **KZ** have a slope (M') greater than γ (the iso-looting curves are vertical displacements of each other). This establishes the incentive for banks to loot.

The bank's incentive to loot dominates when

$$\Gamma(D, S) \equiv M(D) - [\rho\pi(D + S) - D] \geq 0$$

In general, the slope of the locus defining points at which looting dominates ($\Gamma(D, S) = 0$) is given by

$$\frac{dS}{dD}\Big|_{\Gamma(D,S)=0} = \frac{M' - \left[\rho\pi'(D + S) - 1\right]}{\rho\pi'(D + S)} \tag{1}$$

Define the corresponding level of deposits and equity where looting is profitable and the investment portfolio is at the first-best size (A^*) as **L**= (D_L, S_L). The slope of $\Gamma(D,S)=0$ at **L** is given by

$$\frac{dS}{dD}\,|_{\Gamma(D,S)=0,A^*} = M'$$

The relative position of **Y** and **Z** mean that to the right of **KZ** the relationship between the slope of the looting dominance contour relative to the iso-looting contour is given by

$$\frac{dS}{dD}\,|_{\Gamma(D,S)=0} > \frac{dS}{dD}\,|_{\overline{\alpha}} > \gamma$$

Together these conditions mean that looting is profitable for all banks with first-best contracts along **KZ**. Whether looting is observed, however, depends on the discipline imposed by depositors on banks. The incentives to discipline are conditional on the location of **L** relative to **G** on **KZ** in **Figure 1.** We consider the two possibilities.

1. L to the left of G

Denote as one possible solution $\mathbf{L}^0 = (D_L^0, S_L^0)$ as illustrated in **Figure 1.** ($\Gamma^0(D,S)=0$ defines the corresponding locus on which looting is the dominant strategy.) Any first-best contract on **KG** is dominated by a looting contract. Depositors are indifferent to looting when the bank is solvent (i.e., when $\rho\pi(S) - D \geq 0$). If banks are solvent under looting, all contracts along **KG** are dominated by the single looting contract at **H**. Banks loot but are solvent so that depositors are covered. This situation might arise where banks have monopoly access to some high-yield investment, and where bank owners are prepared to commit sufficient equity to guarantee payment to depositors so that they can exploit the opportunity created by regulation.

2. L to the right of G

Denote the second possible solution by $\mathbf{L}^1 = (D_L^1, S_L^1)$ as illustrated in **Figure 1.** ($\Gamma^1(D,S) = 0$ defines the corresponding locus of points at which looting is the dominant

strategy.) To discipline banks, depositors must be capable of defining and rejecting all deposit contracts to the right of the looting dominance locus. The information that is required by depositors is knowledge of (i) the bank's opportunities for looting, and (ii) two of the set $\{A^*, D, S, D/S\}$. That is, depositors must be capable of accurately determining the location of any bank's deposit contract in (D, S) space. Successful screening by depositors means that the first-best, non-looting deposit contracts along $\mathbf{KL}^1$ are self-enforcing in that they yield higher profits than looting. Even if contracts involve equity that does not cover the deposit obligation, therefore, contracts can still be first-best and self-enforcing. This case accords with the observation that while most solvent banks do not post equity bonds sufficient to cover their deposit contracts, looting does not occur because depositors monitor the deposit to equity ratios and investments of the banks to verify that the contracts are self-enforcing.

B. Non-risk-rated Deposit Insurance

Unanticipated, non-risk-rated deposit insurance is introduced to this banking industry, where deposits are covered up to a maximum of $\overline{D}$.[20] The presence of a non-risk-rated deposit insurance scheme produces two effects:

1. *It assures the depositors that up to the nominal limit $\overline{D}$ the deposit contract will be honored even if the bank is insolvent.* For depositors, there may be a time cost associated with the return of the deposit and possibly some lost interest revenue. Nonetheless, the deposit insurance scheme covers the opportunity cost of the funds used by the banks to underwrite their output.

2. *The deposit insurance scheme reduces the value that depositors place on the sunk equity commitment.* Entrants have the option of a reduced equity investment. Incumbents who have already made their commitment may desire to lower their equity even though regulations prohibit this.

[20]These limits are currently set at $60,000(CDN) in Canada and $100,000(US) in the U.S.

Although state-controlled deposit insurance in Canada is financed by a non-risk-rated, flat per unit tax on insured deposits of all solvent banks, we characterize the tax as a flat tax T_x on bank profits. $\overline{D}$ may or may not be binding. When $D \leq \overline{D}$, depositors are guaranteed payment of their deposit contracts at the risk-free rate, so that $R = D$ $(D \leq \overline{D})$. When $D > \overline{D}$, the return demanded by risk-neutral depositors is $R = \left[D - (1-\rho)\overline{D}\right]/\rho = \overline{D} + \left(D - \overline{D}\right)/\rho$. That is, a risk premium is demanded on the deposits above the coverage limit. In general, the expected net profit for banks in the two classes of business is

$$E\Pi = \rho\left[\pi(D+S) - D\right] - S - T_x \text{ if } D \leq \overline{D}$$

$$E\Pi = \rho\pi(D+S) - \left[D - (1-\rho)\overline{D}\right] - S - T_x \text{ if } D > \overline{D}$$

In general, deposit insurance of this type alters the relative cost of deposit and equity funds so that banks will wish to fund as much of their investment portfolio as possible through deposits. Banks will be constrained in this action not only by the limits of coverage but also by the minimum equity investment imposed by the regulatory constraints of the state (and given by $S \geq \gamma D$). Incumbents, however, will be disadvantaged relative to entrants for incumbents will have committed their equity bond prior to the introduction of the deposit insurance scheme.

1. Full Coverage

We begin by considering the contracts offered by entrants for a class of business where $D \leq \overline{D}$, so that there is complete insurance for depositors. To illustrate the incentives facing an incumbent in this class of business, consider a contract that was self enforcing prior to the introduction of deposit insurance defined as $\mathbf{T} = (D_T, S_T)$ (illustrated in **Figure 2**) and the corresponding non-looting maximization problem after deposit insurance. The optimal deposit contract for a fixed level of equity (S_T) is defined by solving

$$\max_D E\pi(D + S_T) = \rho\left[\pi(D + S_T) - D\right] - T_x$$

The solution is

$$\pi'(D + S_T) = 1 \tag{2}$$

Equation (2) reveals that each non-looting incumbent has a larger deposit base for its committed level of equity. **Figure 2** illustrates the pre- and post-deposit contracts, absent looting. The feasible post-deposit insurance contracts for incumbents, initially at T for example, are $\mathbf{T^1}$. At S_T this involves a lateral shift from D_T to D_T^1 where $D_T^1 > D_T$. The line $\mathbf{KN'}$ reveals the non-looting possibilities. Deposit contracts on this line are relevant conditional on the incumbent's equity investment prior to deposit insurance. Even if banks continue to offer non-looting contracts to the market, they would wish to adjust their financing package as deposits are now relatively less costly than equity. This means that profits are not identical at all points on the investment frontier: as we move down $\mathbf{KN'}$, expected profits increase.[21]

The impact of deposit insurance depends on whether banks will find it more profitable to market the relevant deposit contracts along $\mathbf{KN'}$ or to loot. As deposit contracts are always covered by deposit insurance, depositors bring no monitoring discipline to bear on bank owners. If the state does not substitute monitoring discipline for that removed by depositors, the only relevant constraint is the state-imposed minimum equity requirement. Imposition of this constraint reduces the set of relevant contracts on $\mathbf{KN'}$ to $\mathbf{KZ'}$. With bank deposits fully insured, the condition defining the situation in which looting will be the dominant strategy becomes

$$\hat{\Gamma}(D,S) \equiv M(D) - \rho\left[\pi(D+S) - D\right] + T_x \tag{3}$$

Define $\hat{\mathbf{L}}$ as the relevant looting point on $\mathbf{KN'}$. The slope of the revised dominance-of-looting locus ($\hat{\Gamma}(D,S) = 0$) is

$$\frac{dS}{dD}\Big|_{\hat{\Gamma}(D,S)=0} = \frac{M' - \rho\left[\pi'(D+S) - 1\right]}{\rho\pi'(D+S)}$$

Under these conditions, all banks loot. For example, the bank originally at T will not offer the contract $\mathbf{T^1}$ with subsidized deposit and no looting. This bank will offer the contract

[21] In general, if equity were flexible, we could solve equation (2) as $D = D(S)$ with $D' = -1$. Then $d\left[E\pi(D(S)+S) - S\right]/dS = \rho - 1 < 0$: with flexible equity and deposits covered by insurance, each non-looting bank could increase its expected net profits by substituting subsidized deposits for equity.

T^2 and loot, exploiting subsidized deposit and deposit insurance as doing so yields even greater profits. There is one additional feature. As **Y** lies to the right of **Z**, some incumbent banks, as shown in **Figure 2**, may increase their equity investment to realize that looting contract at **Y** that maximizes the return to looting. Of course, an entrant, unconstrained by a previous equity commitment, will locate at **Y**. Thus, the relevant looting contracts lie on $S = \gamma D$ to the right of **Y**.

2. Insurance Providing Partial Coverage For Depositors

The incentives for banks to loot will be altered if the deposit insurance scheme does not provide full coverage. This may take the form of a ceiling on insured deposits, such as those in the schemes in Canada and the US, or co-insurance such as that contained in the scheme in the UK. When a ceiling, $\overline{D}$, is imposed, the impact of deposit insurance will vary across the size class of banks conditional on the proportion of their deposit base that is covered. If banks can write contracts where $D \leq \overline{D}$ they will loot, but if $D > \overline{D}$ the impact of deposit insurance is correspondingly limited (**Figure 3**).[22]

Incumbent banks whose deposit contracts lie below $\overline{D}$ face the dominance-of-looting locus defined above as $\hat{\Gamma}(D, S) = 0$. All incumbent banks whose deposit contracts prior to deposit insurance are less than $\overline{D}$ increase their deposit contracts up to $\overline{D}$ but do not loot.[23] By not having to pay a risk premium on their deposits, these banks receive a subsidy. If these banks increase their deposit base above $\overline{D}$, they will be subject to whatever depositor discipline is faced by firms whose contracts already exceed the cap on the deposit insurance. That is, banks along the pre-deposit insurance segment **KQ** now offer contracts on the bold line segments **KH** and **HQ**. Bank profits along the two line segments **KH** and **HQ** are maximized

[22]**Figure 3** is constructed under the assumption that looting remains unattractive at levels of equity that would cover deposit obligations of banks.

[23]If the dominance of looting point on **KN'** lies below the deposit ceiling cap, then those incumbent banks whose contracts lie on **KN'** above this critical contract but below $\overline{D}$ will be induced to increase their deposit base up to the limit $\overline{D}$ and to loot. It is, therefore, possible to find conditions under which an incumbent bank's equity is sufficiently large and its deposit base sufficiently small, that even capped deposit insurance can lead to incumbent bank looting.

at **Q**.[24] Banks profits remain constant along **QN**. No bank with equity below S_Q would wish to increase its equity to underwrite a corresponding deposit contract.

We may investigate the impact of deposit insurance with a constraining ceiling on the set of self-enforcing contracts with depositor monitoring. For banks with $D > \overline{D}$, looting dominates when

$$\hat{\Gamma}(D,S) \equiv M(D) - \left[\rho\pi(D+S) - \left(D - (1-\rho)\overline{D}\right) - T_x\right] \geq 0$$

Defining a variable $\delta = 0$ as corresponding to no deposit insurance and $\delta = 1$ as corresponding to the presence of deposit insurance with a binding cap (i.e. with $D > \overline{D}$), we may write the general dominance-of-looting locus as

$$\tilde{\Gamma}(D,S) \equiv M(D) - [\rho\pi(D+S) - D] + \delta\left[(1-\rho)\overline{D} - T_x\right] = 0$$

For a given value of S, we may ask whether deposit insurance with a cap at $\overline{D}$ expands or contracts the set of self-enforcing deposit contracts. The answer depends on

$$sign\ \frac{dD}{d\delta}\ |_{\tilde{\Gamma}(D,S)=0}$$

where

$$\frac{dD}{d\delta}\ |_{\tilde{\Gamma}(D,S)=0} = \frac{\left[(1-\rho)\overline{D} - T_x\right]}{M'}$$

This reveals that for incumbents with $D > \overline{D}$, the impact of deposit insurance on the set of self-enforcing contracts is uncertain. Deposit insurance confers the windfall gain of lower required deposit payment for that portion of the deposit contract covered $\left((1-\rho)\overline{D}\right)$, expanding the set of self-enforcing contracts. But the presence of a deposit insurance tax (T_x) expands the set of looting contracts to permit banks to loot, declare insolvency and avoid payment of the deposit insurance tax. As illustrated in **Figure 3**, incumbent banks

[24] To see this consider a bank's expected profits at **H**. These are $E\Pi = \rho\left[\pi(\overline{D}+S) - \overline{D}\right] - S - T_x$. Then,

$$\frac{dE\Pi}{dS}\ |_{(D_H,S_H)} = \rho\pi'(\overline{D}+S) - 1 = \rho - 1 < 0$$

so that expected profits increase as S falls to the limit at **Q**.

with $D > \overline{D}$ face depositor discipline that permits them to offer self-enforcing contracts QL^2 where L^2 defines the transformed point on the first-best investment line where looting just becomes profitable.

Any entrant into this class of business has the opportunity to write the deposit contract $Y^e = (\overline{D}, \gamma\overline{D})$ and loot to realize a return of $M(\overline{D}) - \gamma\overline{D}$. Whether this is the dominant entry strategy for any entrants into this class of business is uncertain. Whether entry into a larger but constrained class of business dominates entry into a smaller but unconstrained class of business is uncertain. These are empirical issues. **Table 4** reveals that empirically both classes of banks exist and these classes appear to have survival value in the market.

In sum, for classes of business where the deposit insurance cap is non-binding, incumbents and entrants will loot. Entrants enjoy the flexibility of defining looting contracts that maximize their returns. Where the deposit insurance cap represents a binding constraint, firms with deposits below the cap will increase their deposit contracts to exploit the subsidy offered through deposit insurance. Incumbent banks whose contracts are above the cap will not alter their contracts. They will enjoy any subsidy associated with lower payments to depositors for that portion of their deposits below the ceiling. Solvent banks will also face the payment of their obligation to the fund. Entrants into this class of business have the flexibility to loot with deposits limited to the insurance ceiling and equity limited to that required by the regulatory constraint.

Co-insurance introduces depositor discipline, but in a slightly different manner than a cap. Without developing the details, it is sufficient to note that co-insurance causes the investment portfolio line KN of **Figure 1** to rotate to the right but not as far as the line KN′ which is relevant when the coverage is complete and not partial. The partial subsidy will promote some substitution of deposits for equity, with implications for looting similar to those for a scheme with caps. The presence of some residual risk for all depositors, however, maintains their incentives to monitor banks to guarantee that deposit contracts offered to the market continue to be self-enforcing. The important point is that all banks are subject to some depositor monitoring when the deposit insurance scheme provides for co-insurance. Unlike the situation with a cap, there is no opportunity to avoid depositor monitoring by

limiting deposit-taking activity to the range where the funds are fully insured.

3. Cross Subsidy

We assume that the deposit insurance fund operates under the mandate that it will break even. This restraint means that prudently managed solvent banks will subsidize those who loot. A simple example readily illustrates the subsidy. Imagine one solvent incumbent bank (whose contracts are such that depositor vigilance guarantees non-looting) and one entrant (whose coverage is complete and so loots). Denote their respective deposits contracts as D^B and D^Y. The entrant loots and is bankrupt; in this case, the entrant makes no contribution to the deposit insurance fund. The incumbent invests in a conventional manner but is bankrupt with probability $1-\rho$. The break-even tax rate is given by $T_x = \left[D^Y + (1-\rho)\, D^B\right]/\rho$ which exceeds the actuarially fair rate of $(1-\rho)\, D^B/\rho$.

All of these results may be summarized as:

Proposition: *When unanticipated deposit insurance is introduced, incumbents wish to reduce their sunk equity and expand their deposit base. Incumbents' incentives to loot depend upon the coverage ceiling for insurance (their business class), and the gains from looting. Fully covered banks will loot; those with sufficiently smaller coverage will not. All such looting incumbents become insolvent. Entrants into banking unconstrained by the cap on insurance post a lower equity bond, loot and become insolvent. Deposit insurance promotes looting whether by entrants or by incumbents although entrants have the greater flexibility to exploit the system to their private advantage.*

Corollary: *Non-risk-rated deposit insurance with coverage caps leads non-looting incumbent banks with deposit above these caps to subsidize all other financial firms, smaller non-looting and looting incumbents and entrants, those operating below or at the limits of the coverage caps. Imputing to entrants the pre-insurance attributes of incumbents will lead to perpetual losses in the insurance fund.*

In **Section IV**, we consider the reasons why the Canadian federal system permitted this subsidization.

IV. THE POLITICS OF DEPOSIT INSURANCE

Credibility of the political cross-subsidy hypothesis requires an answer to the following question: Why did a scheme that provided a subsidy to small imprudently managed institutions and new entrants carry the day even though there were no general runs in the banking system? Our examination of the evidence and the revealed political objectives of the financial regulatory system, suggests that the enacted scheme minimized the cost of satisfying these objectives in Becker's (1983) sense.

A. Power of Trust and Mortgage Loan Companies

Two factors favored an enhanced power for local trust and mortgage loan companies:

(i) Between 1951 and 1966, the deposits of trust and mortgage loan companies increased from 8 to 27 percent of the Canadian deposits of banks. Their increased size enhanced their political power.

(ii) While federal regulators, similar to all regulators, wished to extend their control over the institutions subject to their regulation, they were constrained by both case law on the assignment of powers between the provincial and federal governments and the federal political objectives of permitting some regional autonomy. Enacting federal deposit insurance permitted the federal regulators to expand their control to the provincial trust and mortgage loan companies. Yet this deposit insurance scheme had to meet the restrictions from a dual banking system and the associated jurisprudence. Decisions of the courts had restricted federal jurisdiction over provincially chartered banking institutions.[25] Recognition of this provides a rationale for the option offered to these provincially chartered institutions. Permitting rather than requiring these provincial firms to join avoided any legal challenge to the jurisdiction of the federal scheme. Membership in a federal scheme nonetheless reduced provincial regulatory autonomy. This required some inducement for provincial institutions

[25]In *Bergethaler Waisenamt* (No.2)[1949: 1 W.W.R, p. 332), it was held that firms could perform some of the functions of banking without actually being banks as defined by the *British North America Act*. Similarly it had been held in *Dominion Trust Co* [1918: 3 W.W.R, p. 1023] that a firm could provide chequing facilities without infringing federal authority to charter banks.

to exercise their option. Non-risk-rated premiums were the reward. High-risk provincially chartered institutions and new entrants into the trust and mortgage loan business would be the recipients of the subsidy.

B. Promotion of Entry

The political equilibrium in Canada in the 1960's promoted entry into banking. We identify two factors.

(i) One interpretation of the deposit insurance scheme is that it was a means of transferring wealth from the large chartered banks — shielded from competition by entry restriction — to the trust and mortgage loan companies. This claim is that deposit insurance was a competition tax on these large chartered banks (Shearer, Chant and Bond 1984: 362-363). The issue of competition, and claims of a chartered bank cartel, were widely discussed in the 1960's. The lobbying efforts of the trust and mortgage loan companies in 1967 stressed the role of deposit insurance in strengthening their ability to compete (Canada 1967: 2503-2509, 2539-2544). We think, however, that the evidence weighs against the claim that deposit insurance was required to promote competition. First, entry into chartered banking was possible (Carr, Mathewson and Quigley 1995). Second, the relative growth and success of trust and mortgage loan companies prior to deposit insurance (Canada 1964: 368) indicates the absence of effective regulatory barriers protecting the deposit business of the major chartered banks from competition of the trust and mortgage loan companies. Third, the claimed evidence for inefficiency resulting from collusion among the banks rested on the presumed superiority of price over non-price competition (Canada 1964). As Stigler (1968) demonstrated, economic theory does not support this presumption.

(ii) In the early 1960's, lobbying for political support for regionally-based banks resulted from a widespread belief that the branch banking system had been inadequately responsive to the needs of entrepreneurs in the western and maritime provinces of Canada. The promotion of trust and mortgage loan companies by provincial governments had not ameliorated this sentiment because these companies were prohibited from making commercial loans. Pro-

motion of regional banks became possible with the introduction of deposit insurance as a means of reducing the risk associated with the liability instruments of such institutions.

The Canadian Commercial Bank (CCB) and the Northland Banks were two of the progeny of this new policy initiative. They obtained their charters in 1975 by presenting a specific plan to make higher-risk, mid-range loans to firms and sectors in Western Canada to which the established banks refuse to lend (Estey 1986). The poor quality of the managements of the CCB and the Northland banks — in particular, the inappropriateness of their lending policies — became apparent in 1983 as the collapse of the boom in the energy sector sent the western economy into recession. The combined efforts of the Bank of Canada, which made very large 'liquidity' loans to the two banks, and the federal and Alberta governments, which together with some of the large banks provided an injection of funds failed to ensure their survival. Both banks failed in 1985.

These failure threatened the federal government's policy of promoting regional chartered banks, even with deposit insurance. The reason was that the insurance coverage limit of $60,000 per account left uninsured depositors. To reassure depositors even further, the federal government provided compensation to the uninsured depositors of these two failed banks by enacting the *Financial Depositors Compensation Act* in December 1985.[26] The immediate cost of this legislation was estimated at $875 million, but additional costs have resulted because it implied that uninsured depositors might anticipate reimbursement in the future and it encouraged private interest lobbying to secure benefits for similar depositors in future failed institutions.

C. Goals and Cost Minimization

We now address the issue of defining the policy options that met the revealed political objectives. The evidence suggests that the political objectives were:

[26]In a release announcing the bailout of uninsured depositors, the federal Minister said that the act rewarded investors who *"by maintaining their deposits in these two Alberta-based banks ... had expressed their confidence in the government's policy of encouraging the development of regionally-based financial institutions"* (Canada, Department of Finance, *Press Release*, October 3, 1985).

1. the extension of federal regulation to provincially-chartered institutions,

2. the promotion of entry,

3. the provision of a subsidy to regionally-based banks.

The feasible policy options included:

1. the extension of federal regulation through constitutional amendment,

2. the introduction of deposit insurance for trust and mortgage loan companies alone,

3. the introduction of deposit insurance with market discipline such as co-insurance, deductibles or risk-rated premia,

4. the introduction of deposit insurance with flat premia and 100% coverage to the nominal limit (and implicit coverage above this) that is compulsory for banks.

Table 6 summarizes the political benefits and costs of each policy option. The extension of federal regulation by constitutional means would have met only the first objective and would have been opposed by the provinces and subject to costly and lengthy court challenges. Introducing a non-risk-rated deposit insurance scheme for trust and mortgage loan companies alone (modeled on the FSLIC in the US) was suggested,[27] but it would have taxed more heavily the large trust and mortgage loan companies, reducing their ability to compete with the chartered banks, and would not have provided any subsidy to support the creation of new regional banks. Similarly any scheme with market discipline would have reduced the achievement of policy objectives (2) and (3). Only a deposit insurance scheme involving both sectors, and removing the risk from retail depositors had the potential to meet all of the political objectives that we identify. In this sense, this enacted scheme was politically efficient: it was the sole option that met all of the political objectives.

The evidence is that the adopted scheme taxed the large and prudently managed institutions, particularly the large established chartered banks. As net subsidizers of the scheme,

[27]See the submission of H.H. Binhammer in Canada, House of Commons 1967: 2305-2309.

these banks vigorously opposed its inception. The Canadian Bankers Association maintained that they did not require deposit insurance and the sector 1 banks should not be forced to subsidize other institutions in favor of the scheme. After the initial announcement that federal deposit insurance legislation was being prepared, the President of the Association met with the Minister of Finance and then wrote a memorandum to him suggesting that "*...the real objective at issue here is the extension of better supervision and inspection to that segment of Canadian deposit-taking institutions that is not now adequately supervised. The Minister has indicated that federal-provincial consultation would be necessary in working out arrangements for the insurance scheme. Would it not be preferable to first try to work out with the provincial authorities an effective system of inspection, since it is the soundness of an institution rather than the insurance arrangements themselves which is the real objective to be obtained?*"[28] The Association indicated a willingness to participate in the scheme *if* doing so would improve the regulation of provincial trust and mortgage loan companies and *if* premiums were risk-rated.[29] While the premiums were not risk rated, other changes to the Bank Act (1967) were favorable to the large banks.[30]

The explicit subsidy provided by the enacted scheme explains the necessity for mandatory membership and public provision. If macroeconomic shocks and contagious bank runs were a threat to the Canadian banking system, then the Bankers Association should have supported the introduction of a non-risk-rated scheme or provided one itself. Because deposit insurance in Canada was explicitly introduced to tax the prudently managed nationwide banks to provide a subsidy to their less efficient competitors, only a mandatory public scheme was feasible. This subsidy also explains the fact that the authorities in each province except Quebec[31] require provincially chartered trust and loan companies to become members of

[28]President of the Canadian Bankers' Association to Hon. Mitchell Sharp, Minister of Finance, October 18th, 1966. We thank Shawn Cooper, Vice-President of Financial Institutions, Canadian Bankers' Association for supplying us with a copy of this letter.

[29]Submission of the Canadian Bankers' Association, Canada *House of Commons* (1967: 2272 - 3).

[30]These changes (i) removed the 6 per cent loan interest ceiling imposed on sector 1 banks, (ii) gave national banks full access to the mortgage loan market, (iii) allowed national banks to raise funds through debentures, and (iv) effectively reduced the cash reserve requirement for sector 1 banks.

[31]Quebec established an separate scheme because of the value that authorities in that province placed on their ability to pursue regulatory policies distinct from those in the rest of Canada.

the CDIC. The benefits of the subsidy must outweigh the reduction in regulatory autonomy resulting from membership in a federal institution.

V. CONCLUSIONS

Prior to 1967, Canada had a stable financial system and no explicit or implicit deposit insurance scheme (Carr, Mathewson and Quigley 1995). Public deposit insurance was initiated in a period when there is no evidence of large macroeconomic shocks or runs on banks by imperfectly informed depositors. The introduction of deposit insurance was supported by trust and mortgage loan companies. The chartered banks opposed it, arguing that the likelihood of their insolvency was low. The data on entry, debt to equity ratios, insolvency, and the proportion of the deposits at each institution that are insured suggest that non-risk-rated deposit insurance taxed the relatively safe banks and subsidized the relatively risky regional banks and trust and mortgage loan companies, especially new entrants who had the maximum flexibility to "game" against the plan. We have argued that cross-subsidization was not the inadvertent outcome of a policy designed to promote economic efficiency; it was the primary objective of the legislators who introduced the deposit insurance scheme in Canada.

We conjecture that our analysis has relevance for the US and the international literature on deposit insurance. Dual federal and state jurisdiction over banking was related to the emergence of deposit insurance in the US. The proliferation of small state-chartered banks in the period after 1890 resulted in lobbying for state deposit insurance schemes, and when these schemes failed, a national scheme. Even in the US during the Great Depression, the assumption that imperfect information underlay the system-wide failure of banks is open to examination. Failure rates were disproportionately high among small banks, state banks and in rural areas. Deposit insurance was an attempt to stabilize the banking system while retaining the unit banking laws and dual jurisdictions that represented the fundamental weaknesses of the US banking system.

In both Canada and the US, the existence of a dual banking system, the view that com-

petition in banking required large numbers of independent institutions, depositor awareness of the relative risk associated with small undiversified institutions with weak management, and political support for the continued existence of these weak institutions, motivates the deposit insurance in place. This helps to explain why the response to the huge losses suffered by the US and Canadian deposit insurance schemes in the last decade has been to fine-tune the regulatory structure (CDIC 1993, Congress 1990, Mishkin 1992) rather than consider the more fundamental reform that appears to be warranted on the grounds of economic efficiency.

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FIGURE 1

Feasible Deposit Contracts and Looting

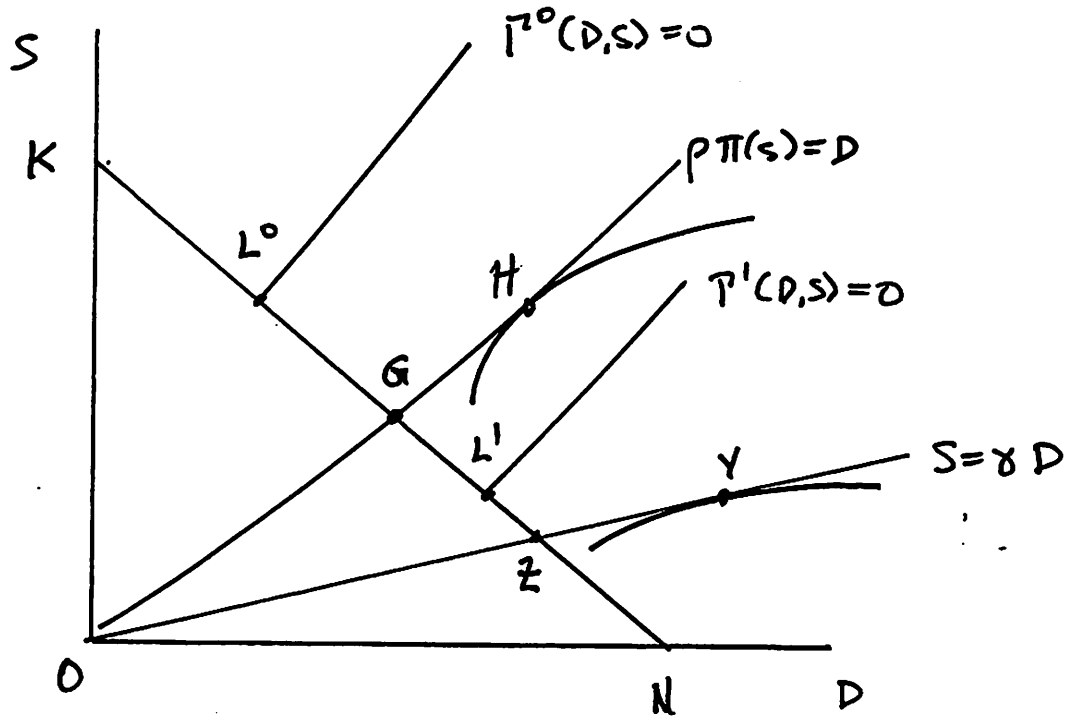


FIGURE 2

Post Deposit Insurance

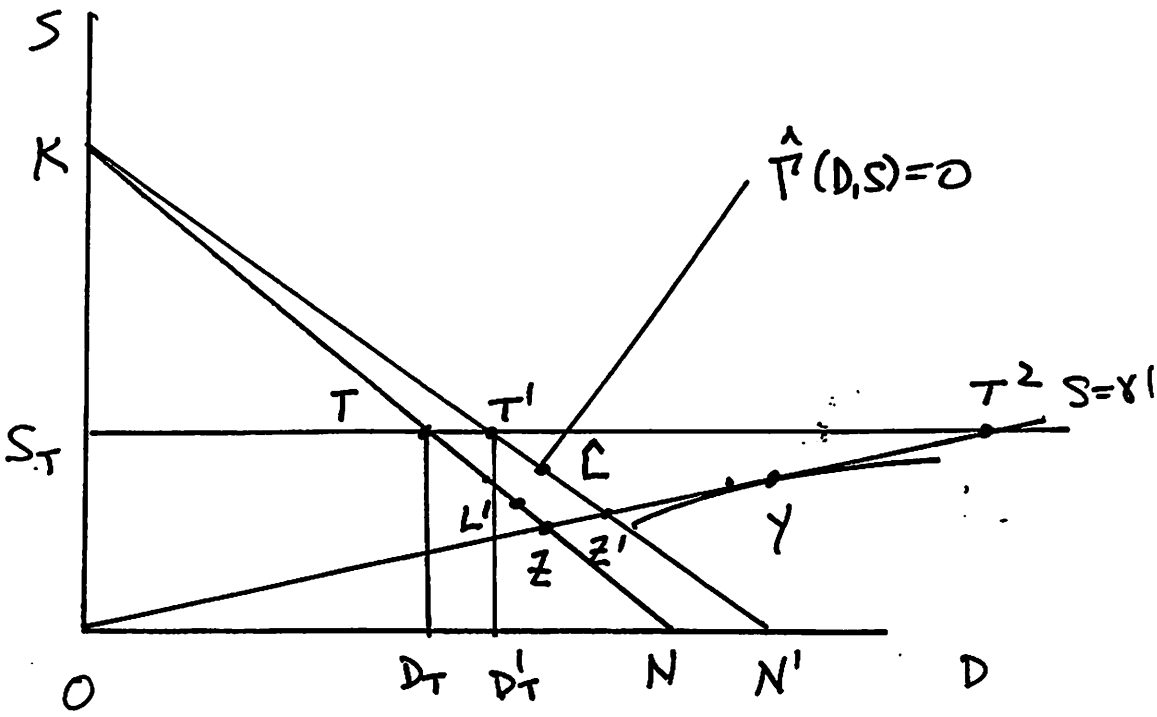
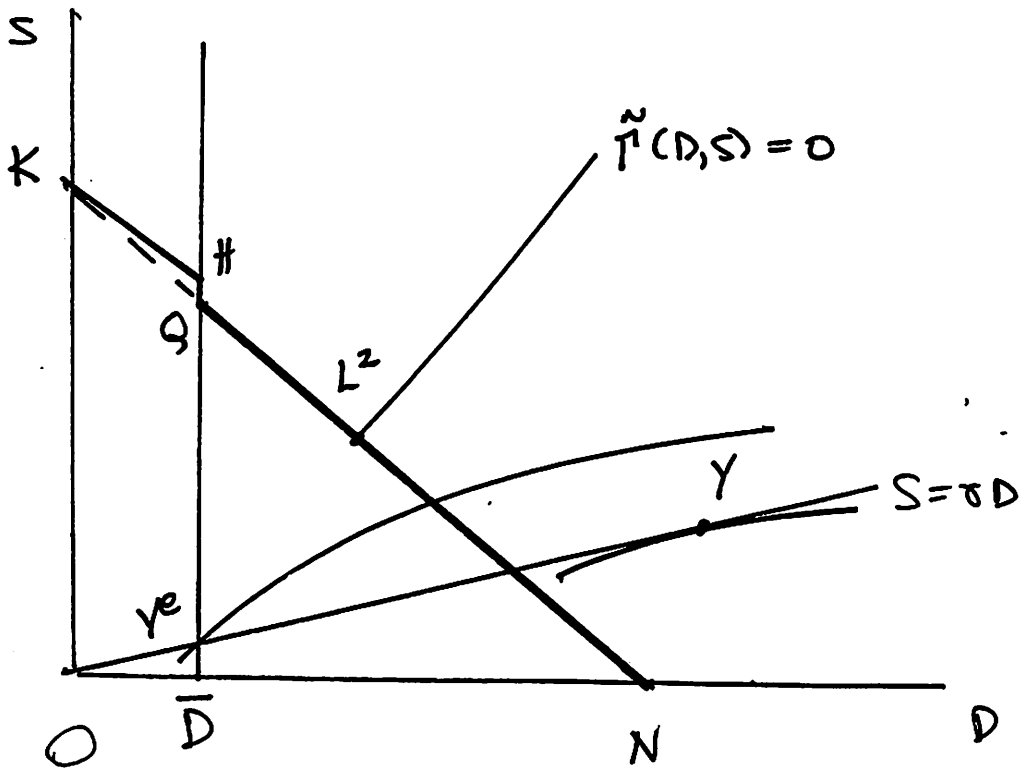


FIGURE 3

Caps on Coverage



TABLES

TABLE 1

Entry of New Provincial and Federal Trust and Mortgage Loan Companies

	1949	1966	1949 - 1966		1968	1985	1968 - 1985	
	Stock	Stock	Gross Entry	Net Entry	Stock	Stock	Gross Entry	Net Entry
Ontario	19	28	20	9	27	22	15	-5
Federal	29	32	17	3	33	69	47	36
All	48	60	37	12	60	91	62	31

TABLE 2

$$HI = (\alpha_0 + \alpha_1 \cdot D) \cdot e^{(\beta_0 + \beta_1 \cdot D)t} \cdot \epsilon$$

where D = 1 after 1967, = 0 otherwise

α_0	α_1	β_0	β_1	R^2
-1.8	0.19	-0.004	-0.009	.86
(-114.1)*	(4.06)	(-2.60)	(-4.34)	

* gives the t-statistic for the estimated parameters

TABLE 3

A Comparison of Debt to Equity Ratios for Banks, Trusts, and Mortgage Loan Companies, 1949 - 1967, 1968 - 1985

	Bank Sector			
	P	F	A	B
Year				
Mean 1949 to 1967	10.13	5.75	7.18	22.25
Mean 1968 to 1985	13.14	16.18	14.22	29.65
t Value for Δ in Means	2.5*	4.4*	5.2*	5.5*

P = Provincial Trust and Mortgage Loan Companies (Ontario)
F = Federal Trust and Mortgage Loan Companies
A = All Trust and Mortgage Loan Companies
B = Schedule A, Chartered Banks

* indicates significant at the 5 per cent level

TABLE 4

Insured Deposits in Trust and Mortgage Loan Companies in which CDIC Intervened

Company	Date	Total Deposits (millions)	Percent Insured
Commonwealth Trust	1970	5.4	100
Security Trust	1972	10.3	100
Astra Trust	1980	22.9	92
District Trust Company	1982	231.0	84
Amic Mortgage Investment Corporation	1983	22.8	100
Crown Trust Company	1983	930.0	73
Greymac Mortgage Company Greymac Trust Company	1983	791.0	93
Seaway Mortgage Company Seaway Trust Company	1983	414.0	95
Northguard Mortgage Company	1984	28.1	99
CCB Mortgage Investment Company	1985	76.2	Unknown
Continental Trust Company	1985	117.0	93
London Loan Limited	1985	23.9	99

TABLE 4 Continued

Insured Deposits in Trust and Mortgage Loan Companies in which CDIC Intervened

Company	Date	Total Deposits (millions)	Percent Insured
Pioneer Trust	1985	231.1	87
Western Capital Trust	1985	78.8	99
Columbia Trust Company	1987	101.3	99
Northwest Trust Compant	1987	727.0	95
Principal Savings and Trust Company	1987	127.8	91
Financial Trust Company	1988	1217.0	95
Settlers Savings and Mortgage Company	1990	148.9	99
Saskatchewan Trust Company	1991	58.9	99
Standard Loan Company	1991	160.4	97
Standard Trust Company	1991	1240.6	92
Dominion Trust	1993	460	97

Source: CDIC Corporate Communications

TABLE 5

Minimum Equity Requirements for Banks (in Thousands of 1986 Dollars)

Year	Banks	Fed. Trusts	Fed. Loans	Ont. Trusts	Ont. Loans
1927	3623	1812	1812	2174	2174
1954	4651	1163	1163	1395	1395
1966	3759	940	940	1880	1880
1968	3484	871	871	3484	3484
1969	3333	3333	1667	3333	3333
1980	2976	1488	744	1488	1488
1988	1842	921	460	9208	4604

TABLE 6

Political Objectives, Policy Options and the Introduction of Deposit Insurance in Canada

Political Objectives

(1) Extend federal regulation to provincially-chartered institutions
(2) Promote entry
(3) Provide a subsidy to regionally-based chartered banks

Policy options	Objectives Met	Disadvantages
Extend federal regulation through amendments to the constitution	(1)	a: Erosion of provincial autonomy b: Challenge to policy through courts c: No promotion of entry d: No subsidy to regional banks
Deposit insurance only for trust and mortgage loan companies	(1) (2) (trust and mortgage loan companies)	c: No promotion of bank entry d: See above e: Taxes prudently managed trust and mortgage loan companies – less competitive with banks
Deposit insurance with market discipline (through co-insurance, deductibles or risk-rated insurance)	(1)	c: See above d: See above
Deposit insurance with flat premiums, 100 percent coverage to the nominal limit that is compulsory for chartered banks	(1) (2) (3)	f: Taxes prudently managed institutions, particularly the large chartered banks