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FINANCIAL FRAGILITY AND CORPORATE
DEBT: AN EMPIRICAL
INVESTIGATION OF CANADA, U.S., AND JAPAN

by



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Abstract: The paper will assess the relevance of a rising debt to equity ratio for the fragility of the Canadian, U.S., and Japanese economies. In addition, it will also attempt to ascertain the significance of the nonfinancial corporations' liquidity and profits, as well as, the effects of *moral hazard*, *adverse selection*, and investor's confidence to the fragility problem. A series of Granger causality tests are performed in addition to the general statistical analysis of each country. The basic finding is that, despite a somewhat different banking structure, a rising debt to equity seems to be an important factor for the long-run stability of both the Canadian and U.S. economies. Whereas, in Japan, this seems to be less of a factor due to the relatively close ties between the banking and nonfinancial corporate sectors. Moreover, the lack of the *moral hazard* and *adverse selection* problems, coupled with the relatively smaller use of the securities market, the higher liquidity ratio, and the cooperative attitude of the Japanese workers and consumers, constitutes additional reasons as to why rising debt to equity has played less of a significant role in Japan.

Abstract: The paper will assess the relevance of a rising debt to equity ratio for the fragility of the Canadian, U.S., and Japanese economies. In addition, it will also attempt to ascertain the significance of the nonfinancial corporations' liquidity and profits, as well as, the effects of *moral hazard*, *adverse selection*, and investor's confidence to the fragility problem. A series of Granger causality tests are performed in addition to the general statistical analysis of each country. The basic finding is that, despite a somewhat different banking structure, a rising debt to equity seems to be an important factor for the long-run stability of both the Canadian and U.S. economies. Whereas, in Japan, this seems to be less of a factor due to the relatively close ties between the banking and nonfinancial corporate sectors. Moreover, the lack of the *moral hazard* and *adverse selection* problems, coupled with the relatively smaller use of the securities market, the higher liquidity ratio, and the cooperative attitude of the Japanese workers and consumers, constitutes additional reasons as to why rising debt to equity has played less of a significant role in Japan.

Introduction

The topic of financial fragility is one of great concern, for its impact on the world's economies could be devastating. Thus, this paper attempts to evaluate the full impact of the preconditions for a financial fragile state on the Canadian, U.S., and Japanese economies. In particular, it questions the relevance of the rising debt to equity (D/E) ratio of nonfinancial corporations (NFC). In particular, the question whether this warrants fear of a fragile financial state is raised. In addition to this rising debt, a series of underlying conditions is also evaluated in order to examine their significance for the fragility problem. For instance, the issues of *moral hazard* and *adverse selection*, the NFCs' liquidity ratio and profits, and the investor's confidence are all assessed.

Canada, Japan, and the U.S. were chosen in an attempt to establish whether the significant amount of trading and investment done amongst them have any bearing on their financial fragility. In addition, since Japan's banking system lies somewhere between the dispersed, fractionated U.S. system and the relatively concentrated Canadian system, this was another reason why these three particular countries were chosen. In particular, it was wished to see whether the proximity of the banking system with the NFCs plays a role. Furthermore, it is also worth noting that Choi *et al.* (1983) compared U.S., Japan, and South Korea and found no significant statistical differences in the D/E ratio and some

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other financial ratios, when they applied generally accepted accounting principles (GAAP) to the Japanese and Korean data, when compared to the original data.¹ The three were thereby also chosen because there may be a consistent comparison of their D/E ratios, for the NFCs, that will not be affected by various accounting practices.

The first section of the paper reviews the past literature on this subject. In the second section, a generalized theorem of fragility is stated, which is followed by the analysis of each individual country. In the fourth section a series of statistical tests are performed for each country. Finally, the paper concludes by providing a brief summary of the findings.

The Literature

We will begin our review with the works of Hyman Minsky since he was one of the forefathers in the study of financial fragility. Minsky's contribution to the area of financial crises has laid the essential ground work for those who followed in his footsteps as well as for those who have criticized his arguments. His theory of financial crisis is based upon his reinterpretation of the writings of John Maynard Keynes. The relationship among uncertainty, the business cycle, and finance forms the foundation of Minsky's theory. In his 1977 paper, Minsky's aim was to explore why the U.S. had three near financial crises since 1966, whereas no such episodes occurred in the first 20 years after W.W. II. His argument was that a fragile financial structure is a precondition for a financial crisis and that the emergence of a fragile financial structure resulted from the process by which investment and positions in the stock of capital assets were financed.

¹ Since Canada and U.S. have similar accounting procedures, that is, they both generally follow GAAP, it is presumed that there is little statistical differences in the ratios due to accounting procedures. Nobes and Parker (1995, 145).

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According to Minsky (1977), a financial crisis starts when some unit cannot refinance its position through normal channels and is forced to raise cash by unconventional instruments or by trying to sell out its position. In addition, he believed that there were three determinants of a financially fragile state. The first is the mix of what he calls *hedge*, *speculative*, and *Ponzi* finance in an economy. *Hedge* finance occurs when a unit's cash flow commitments to debt servicing are such that the cash receipts expected are greater than the cash payments by a significant margin, over a long period of time. *Speculative* finance entails the cash flow payments, over some period (typically near term), to exceed the cash flow receipts. A *speculative* unit has a positive net worth even though in some near-term periods cash payments exceed cash flow from operations. Finally, *Ponzi* finance is said to occur when a unit is a *speculative* financing unit for which the interest portion of its cash payment commitments exceed its net income. *Ponzi* units have to increase debt in order to meet commitments of outstanding instruments. Thus, they may have a negative net worth in any honest calculation of present value. Whereas, units that engage in *hedge* finance are vulnerable only to what happens in the market for their product, units that engage in *speculative* or *Ponzi* finance are also susceptible to changes in financial markets. That is, *speculative* and *Ponzi* financed units are vulnerable to changes in interest rates. Increases in interest rates raise cash flow commitments without expanding receipts. Furthermore, a rise in interest rates can transform a *speculative* unit into a *Ponzi* unit, in the respect that the increased cost of refinancing is not covered by the cash receipts. Thus, he argued, the greater the weight of *speculative* finance in the total financial structure, the greater the fragility of the financial structure. The second determinant of fragility is the liquidity of portfolios. And the third determinant is the

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extent to which ongoing investment is debt financed. Minsky (1977) thereby claimed, once *Ponzi* finance becomes a significant portion of the financial structure either the economy will go through a debt deflation or a serious depression or the debt is floated off by generating significant increases in the expected cash flows from operating capital assets, increases that may only be possible through inflation.

Minsky (1977) also believed that borrowing and lending takes place on the basis of various margins of safety. One margin of safety is the excess of expected cash receipts over cash payment commitments for all time periods and this exists for *hedge* financing units but not for *speculative*. A second margin of safety is the excess of present value of assets over the present value of liabilities and this margin exists for units that engage in both *hedge* and *speculative* finance. The third margin of safety is the holding of “cash kickers,” money and liquid financial assets that are superfluous to operations, so that a small shortfall in cash receipts or an unexpected need to make payments does not disrupt the normal functioning. Moreover, he believed the these three dimensions of margin of safety were all adversely affected by a rise in interest rates. From the aforementioned overview of safety it was apparent to Minsky that units which are heavily into *speculative* finance should keep large cash kickers. However, he found the opposite relationship for the U.S. economy. That is, the greater the volume of *speculative* finance relative to total finance interrelations, the smaller the cash kickers. He thereby argued that whenever these margin of safety are eroded, financial terms can be expected to reflect the increase in uncertainty that lenders bear.²

² When the margin of safety for a unit deteriorates, its financing terms increase beyond what takes place in measured market rates. Not only does the premium over market rate increase, but the liquidity security and maintenance of net worth provisions become more constraining even as increased prime rates decrease the margins of safety. He argued that even though these conditions were designed to protect the

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The financial instability hypothesis leads to important propositions that the internal workings of a capitalist economy generate financial relations which are conducive to instability and that the price and asset-value relations will trigger a financial crisis in a fragile financial structure are normal functioning events. One further proposition that follows from this hypothesis is, if the debt-deflation interactive process that leads to deep depression is quickly aborted by the deficits of big governments and by lender-of-last-resort intervention, then an inflationary recession will take place. In his comparison of the unstable mid-1920s and the unstable mid-1960s to 1982, Minsky (1982) showed that the overall behavior of the economy can be quite different. That is, all capitalisms are unstable, but some capitalisms are more unstable than others. Furthermore, he found that the system characteristics that result from the underlying instability can be quite different. The major implication of Minsky's financial instability hypothesis is that policy for a capitalist economy must recognize the limitations and flaws of capitalism if it is to be successful. In particular, as long as an economy is capitalist, it will be financially unstable.

Niggle (1989) provides an empirical evaluation of Minsky's theory of systemic financial instability and fragility by looking at the U.S. NFC sector over six complete business cycles, that is, from 1953 to 1982. Minsky (1977) believes that one of the major determinants of the robustness-fragility of a financial system is the mix of what he refers to as, *hedge*, *speculative*, and *Ponzi* financing. According to Minsky (1977), a firm engaged in *hedge* financing will have no short-term debt and mainly has equity liability. Whereas, *speculative* and *Ponzi* units will eventually have to acquire more debt to refinance their

lenders, they may have made their position worse - if only by constraining their freedom of action (Minsky, 1977).

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position. Furthermore, they are also vulnerable to disruptions in the financial market, such as a rise in interest rates. The rise in interest will have the combined effect of increasing the debt load of the *speculative* units, as well as pushing some of them into *Ponzi* type financing (i.e. unable to meet interest portion of debt). Hence, Minsky (1977) argues, the more units involved in *speculative* financing, the greater the instability of the financial system. Niggle (1989) is thereby able to represent this analysis by focusing on the behavior of an increase in leverage ratios. In addition, since the stock measures of leverage (i.e. debt to equity, debt to capital, or debt to assets) move slowly, and adjust to changes in net borrowing and purchases of assets sluggishly, the cyclical behavior of flow measures of leverage are also emphasized. That is, four such measures of leverage for the NFC sector were studied: the ratios of credit market borrowing to gross investment and to fixed investment as well as the ratios of total external funds to gross investment and to fixed investment.

Minsky (1982, 33) has also stated that the increase in interest rates, in an investment boom, and the successful functioning of the economy entices profit-seeking bankers and their customers to engage in speculative financial arrangements as well as causing them to reduce their holding of money and protected financial assets. Niggle (1989) is able to confirm this claim by finding all four of his measures of leverage to increase during the expansion phase of the business cycle, peaking in the later part of the expansion (see table 1 in Niggle 1989, 211). Moreover, he discovers, the corporate sector begins most expansions with a surplus on capital account which becomes a deficit as the expansions proceed, and this behavior is also consistent with Minsky's (1982) aforementioned analysis. In addition, all of the measures of investment (i.e. plant and

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equipment expenditure, fixed investment, and capital expenditure) were found to increase in the expansion more than either measure of internal funds (i.e. book value or with inventory valuation adjustment). As a consequence of cyclical behavior of internal funds and investment expenditure, he shows that the Federal Reserve Board's flow of funds account deficit on capital assets (i.e. the gap between investment and internal funds) grows dramatically in expansion by 246.9 reference points from initial trough to cycle peak (see figure 4 in Niggle 1989, 214). This investment gap can be financed in two ways: the corporations can either reduce their holdings of financial assets in their portfolios and/or they can resort to external sources of funds. He believes that the corporation adopts the latter solution, rather than dissave, and so the NFCs actually increase their net acquisitions of financial assets by 70.9 reference points in the average expansion (see figure 3 in Niggle 1989, 213). Consequently, the NFCs must issue securities and increase the necessary funds to finance their growing deficits on capital account externally.³

Niggle (1989) also argues that the increase in external financing of corporate economic activity, which occurs in the expansion phase of a typical business cycle, is partially explained by the differential rates of increases in capital expenditure and internal funds, and by differences in timing of these uses of funds and internal sources of funds. Moreover, he claims that the NFC sector increases its leverage, changing its capital structure toward a heavier debt and external sources of funds weight not just to finance positions in new real capital assets, but also to finance its sales, its investment abroad, and

³ Niggle (1989, 213) found that credit market borrowing for nonfinancial corporations increased by 71.3 reference points in an average expansion, peaking in stage 5, the cycle peak; and net funds raised in markets (i.e. borrowing plus net new equity issues) rises by 64.1 reference points, also peaking in stage 5. Total external funds also rises in expansions. This behavior is also consistent with Minsky's (1982) analysis that, during an investment boom, banks and corporations will engage in more speculative financial arrangements, thereby increasing the debt of firms.

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holdings of financial assets. In addition, increases in leverage might also refinance its outstanding debt, service that debt, and finance restructuring and combinations of firms. As expansions mature, all of these uses of funds outstrip the growth of internal funds, forcing the firms to seek external funds (Niggle 1989, 215-6).

In particular, Niggle (1989) finds that flow leverage ratios tend to peak late in the expansion stage and then to decline slowly throughout the contraction, often exhibiting a second (lower) peak in the mid-to-late contraction. He believes that these contraction peaks in leverage ratios, often higher than the expansion peaks, appear to be a combination of investment declining steadily throughout contractions, which reduces the denominator of leverage ratios, and coupled with the fact that borrowing appears to be increasing in the mid-to-late contraction, thereby increasing the numerator in the ratios. In the cycles in which investment declines a great deal, a relatively small increase in borrowing results in a significant increase in leverage ratios for the sector. Furthermore, he argues that the increase in borrowing in the contraction appears to be the result of increases in the extension of credit by the NFCs to their customers (which rises late in contractions), direct foreign investment (which also rises in contractions), and forced borrowing by firms to cover operating losses (to pay their fixed costs of administrative overhead, etc.), to make interest payments, and to refinance outstanding debt.

He concludes by stating that leverage ratios are almost always higher at the end of the trough-peak-trough cycle than at the beginning, providing an upward trend (see table 2

in Niggle 1989, 217).⁴ Moreover, he argues that the long-run intercycle behavior of these leverage ratios is also consistent with Minsky's model.⁵

In his book, *Manias, Panics, and Crashes: A History of Financial Crises*, Kindleberger also follows the works of Minsky, in that he argues that financial crises are associated with peaks in the business cycle. Kindleberger (1989) basically believes that there arises some event which changes the economic outlook. Thus, the development of what he refers to as mania ensues. That is, mania develops as a result of new opportunities for profits being seized and overdone in ways that closely resemble irrationality. However, once this characteristic is realized, the financial system experiences a sort of "distress" and thereby his phase of panic develops as a result of the abrupt rush to reverse the expansion process. In the manic phase, people of wealth or credit switch out of money and borrow to buy real or illiquid financial assets. In panic, the reverse movement takes place.

In order to prove his points, Kindleberger (1989) uses "literary economics," as opposed to mathematical economics, by providing a historical perspective on financial crises. In particular, he provides examples of when a boom or panic has been set off by

⁴ Table 2 shows this upward ratchet effect in flow measures of leverage which occurred in the first four out of five trough-peak-trough cycles; the stock measures of leverage (such as credit market debt outstanding to the market value of corporate equity) reflect that upward ratchet effect.

⁵ The flow measures of leverage peaked in cycle four (1970 to 1975); the expansion phase of this cycle succeeded the long expansion of the 1960s (105 months) and the brief recession of 1969-1970 (12 months). It can be recalled that Minsky (1982) has argued that profit-seeking firms and banks engage in more *speculative* type financial arrangements when the economy is running well. This will eventually lead to an incipient financial crisis when a substantial number of firms are pushed into *Ponzi* financing. From this perspective, Niggle (1989) postulates that the brief and shallow recession following the 1960s boom was not severe enough to dissipate expectations of profit and perceptions of risk which, if no longer "euphoric," were still strongly optimistic for the representative firm and its bankers. The greatest relative increases in leverage (in reference cycle units) occurred in cycle 3 (the long 1960s expansion, 1961 to 70) and the absolute level of leverage peaked in cycle 4, after the brief 12 month contraction of 1969-70. And although leverage temporarily declined in the late 1970s and early 1980s, that process reversed itself as the economy recovered from the latest contraction of 1981-82; currently (as of 1989), leverage ratios are the highest ever recorded for U.S. NFCs. Niggle (1989, 217-8).

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monetary events, for example, a discovery of precious metals, a sharp decline in interest rate as a result of a massive debt conversion, etc. He also looks at whether speculation can be destabilizing as well as stabilizing, in other words whether markets are always rational. In his model, displacement, euphoria, and distress are perhaps followed by panic, which is conceivably followed by a crash. He defines distress as a state of suffering and divides it into commercial and financial.⁶ According to him, while distress may be an objective condition for the single corporation, it cannot be so regarded for an economy at large. Henceforth, causes of distress are seen to be difficult to disentangle from symptoms, but they include demand on capital markets for cash, when cash is tight, sharply increasing interest rates in some or all capital markets, balance of payments deficits, or whatever else may have been the object of speculation. Moreover, he argues that, when financial distress is followed by a crash or panic, there is no standard interval, but it may be continuous or may oscillate in a rhythm of its own. The *causa remota* of the crisis is speculation and extended credit, the *causa proxima* is some incident that snaps the confidence of the system and makes people think of the dangers of failure and leads them to move from commodities, stocks, etc., back into cash. Kindleberger (1989) thereby views a crash as a collapse of the price of assets or perhaps the failure of an important firm or bank. Whereas, a panic is seen to be a sudden fright without cause and may occur in the assets market or involve a rush from less to more liquid assets. And he believes that financial crises may involve one or both and in any order. In addition, he finds that a

⁶ Commercial distress occurs when there is a sharp decline in prices and business activity and many mercantile and industrial firms are bankrupt. Financial distress, for a single firm, means that its earning power has fallen enough to create a nontrivial probability that it will be unable to pay interest and principal on its debt. Financial distress, for an economy, also has a prospective rather than an actual significance and implies financial adjustments or disturbances are ahead, a lull before a possible storm rather than havoc in its wake. Kindleberger (1989, 100).

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specific signal that hastens the happening of the crisis may be the failure of a bank or a firm stretched too tight, the revelation of a swindle or deflection by someone who sought to escape distress by dishonest means, or a decrease in price of primary object of speculation as it, at first alone, is seen to be overpriced.⁷ Furthermore, he finds that by and large the evidence suggests that official warnings cannot stop these manias, or at least that many crises followed warnings that were intended to head them off.

Kindleberger (1989) expands on Minsky's model by going further.⁸ That is, he claims that before banks evolved, and afterward, additional means of payment to fuel a speculative mania were available in the virtually infinitely expandable nature of personal credit. That is, he believes, even if the instability of the banks was corrected, the instability of personal credit would still be able to provide the means of payment to finance the boom. In addition, he does not agree fully with how Minsky classified corporate debt into *hedge*, *speculative*, and *Ponzi* financing. Kindleberger (1989) believes that Minsky is correct in emphasizing the quality of debt in gauging the fragility of a financial structure. However, he contends that debt contracted to finance very risky ventures is unstable. Thus, both assets and liabilities can be and should be judged by quality as well as quantity. Therefore, Kindleberger's (1989) model emphasizes that, in periods of euphoria, the

⁷ Prices fall, bankruptcies increase, and liquidation is sometimes orderly but more frequently degenerates into panic as the realization spreads that there is only so much money (this stage is called revulsion). Revulsion against commodities or securities leads banks to cease lending on collateral of such assets. Revulsion and discredit may go so far as to lead to panic, with people crowding the door before it slams shut. Kindleberger (1989, 19).

⁸ According to Minsky (1982), events leading up to a crisis start with a "displacement," some exogenous outside shock to the macroeconomic system. The nature of this displacement varies from one speculative boom to another. If sufficiently large and pervasive enough, it will alter the economic outlook by changing profits in some new and existing lines and closing others. The boom is fed by an expansion of bank credit that enlarges the total money supply (by issuing bank notes or lending in forms of additional deposits). Bank credit is, or at least has been, unstable, and Minsky's model rests on this fact.

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quality of debt deteriorates, even though the quantity of narrow money may be growing at some appropriate limited rate.

According to Kindleberger (1989), while better monetary policies would have moderated or even eliminated some of the mania and panics which he examined (i.e. the 1873, 1929, and 1987 crises), even optimal policies would have left residual problems of considerable dimension. This implies that, even if there were exactly the right amount of liquidity in the system, over the long-run there would still be a crisis and the need for additional liquidity in crises to be provided by the lender of last resort. However, he sees no *a priori* way to answer the question of whether holding the money supply constant, limiting the liquidity in money markets or increasing the discount rate, at the first sign of euphoric speculation, would prevent mania leading to crisis, or correct it after it had gotten under way. Nevertheless, he argues that the weight of historical evidence favors the case that, while monetary policy might have moderated booms leading to bust, it would not have eliminated them all.

Kindleberger (1989) also considers the international propagation of manias and crises. He believes that connections run through linkages including trade, capital markets, changes in central bank reserves of foreign exchange or gold, just to name a few. Moreover, he states that some crises are local and others are international. However, there is a fundamental ambiguity here on what constitutes the difference. Tight money in given financial centers can serve either to attract funds or to repel them, depending upon the expectations that an increase in interest rates generates. For example, with inelastic expectations - that is, no fear of crises or of currency depreciation - an increase in the discount rate attracts funds from abroad and helps provide the cash needed to insure

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liquidity. Thus, he argues that one complex method of initiating a financial crisis is the sudden halt to foreign lending because of a boom at home.

The issue of the lender of last resort is also considered by Kindleberger (1989). He argues that, if the market is sure it will be saved by a lender of last resort, its self-reliance is weakened, that is, the problem of *moral hazard* will develop. However, on the other hand, he claims that the government may choose to stop a panic for the sake of the system today rather than worry about effects on incentives tomorrow. He thereby views the paradox of the lender of last resort's role as equivalent to the prisoner's dilemma. Thus, in order to resolve this "dilemma" he conjectures that the central bank should act one way (lending freely) to halt the panic, but another (leaving the market to its own devices) to improve the chances of preventing future panics. The issue of lender of last resort also brings on political ramifications as well, especially when devices such as the Federal Deposit Insurance Corporation, and the Federal Savings and Loans Insurance Corporation have to answer questions of whom should it save, outsiders or insiders or both? He also looks at this aspect from the international perspective, that is, the International Monetary Fund and the World Bank are considered. He makes the tentative case that a lender of last resort does shorten the business depression that follows a financial crisis. The evidence turns mainly on 1720, 1873, and 1882 in France, and 1890, 1921, and 1929 (Kindleberger 1989, 238). In none of these was a lender of last resort effectively present. The depression that followed them were much longer and deeper than others. However, there are many other factors at work both long-term and short-term, and the occasions where panic has been allowed to run its course are so few that the material is not abundant enough for a strong conclusion.

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He concludes by stating that a lender of last resort should exist, but its presence should be doubted. The reason for this is that it should always come to the rescue in order to prevent needless deflation, but always leave it uncertain whether the rescue will arrive in time or at all, in order to install caution in other speculations, banks, cities or countries. He believes that a strong case can be made for stricter regulations and supervision of banks to forestall euphoric lending that may end in financial crisis. However, mismanagement of banks is hard to detect before the fact, and fraud is even more difficult. In a boom, increases in regulation and supervision build up danger spots that burst into view when the boom levels off. Thus, Kindleberger (1989) believes that timing presents a special problem. That is, as the boom reaches its peak, it must be slowed down without precipitating a panic. He thereby asserts that, after a crash has occurred, it is important to wait long enough for insolvent firms to fail, but not so long as to let the crisis spread to solvent firms who need liquidity: "Delaying the death of strong swimmers" as Clapham (1945, 102) so eloquently stated.

Skott (1992) also looks at certain aspects of the Minskian type stability question; however, he does not address the short-term and related issues. He points out that in addition to financial innovations, involving a change in both financial practices and institutions, policy intervention and institutional constraints may also be an essential part of the process towards increasing fragility. Moreover, he claims that the resolution of financial crisis and the construction of the foundations for renewed prosperity do not happen automatically, and since each crisis has its own characteristics, there are no proven remedies which can be easily referred to. The length and depth of crisis are thereby often variable and Minsky's financial instability hypothesis does not predict the emergence of

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regular and time-invariant cycles. Furthermore, he argues, the mere existence of endogenous change in financial sphere and of feedback effects from financial to real variables does not necessarily imply a cyclical tendency and Minsky has provided no formal demonstration of how real and financial interactions lead to financial instability. Thus, in order to model the endogenous change in financial practices, Skott (1992) applies an approach that incorporates the specification of the real side of the economy and the interaction between real and financial variables. His paper thereby tries to formalize Minsky's basic argument (that steady growth is unattainable in a capitalist market economy and that the interaction between financial factors and long-term investment makes the system prone to crises and generates an irregular pattern of fluctuation) by adding financial considerations to standard macroeconomic models. And he shows that under certain conditions the extended models may indeed yield fluctuations of the kind suggested by Minsky.

According to the financial instability hypothesis, there is a tendency during periods of expansion and financial tranquillity for all decision makers to adopt practices which are increasingly risky and which intensify the underlying fragility of the system. Hence, Skott (1992) believes that changes in financial behavior, in "fragility," are related to the current degree of "tranquillity" in financial markets, and thereby the essence of Minsky's cyclical argument is represented in terms of variables which are able to describes each of these degrees. He refers to the term fragility as the state of the financial system. That is, the system is fragile if a significant portion of firms are unable to meet their contractual obligations as a result of a small disturbances (e.g. an unforeseen drop in income, or a rise in interest rates). An increase in the share of contractual commitments in expected cash

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flow would therefore indicate an increase in fragility and it would make the financial unit more vulnerable to shocks to the system. Since the failure of one unit will have repercussions on the financial position of its creditors, he also believes that the fragility of the system depends on the complete network of financial commitments among firms, households, financial institutions and the public sector. These financial commitments have been made on the basis of expectations that may or may not prove accurate, and tranquillity - the ability to meet these commitments - therefore depends on realized cash flow as well as on the amount of contractual payment. Thus, he believes, high leverage and adventurous *Ponzi*-schemes may represent typical manifestations of a high degree of fragility.

Skott (1992) also notes that sometimes it may be difficult to decide whether fragility has been increasing or decreasing in a particular situation and the precise form of the interaction between two variables will depend upon historical and institutional context. As an example he points to the significance of a given debt to equity ratio, which depends on the institutional environment (e.g. What are the relations between firms and their banks? Who are the shareholders? etc.) and the rate of interest may be of little importance if credit markets are characterized by (variable degrees of) quantity rationing. In addition, he contends that financial difficulties also develop as a result of an incongruence between the optimism which motivated financial arrangements and the actual outcome. During normal times an increase in fragility (i.e. the laxity of financial practices) will also stimulate accumulation, but this positive relation may be reversed in periods of crises: low utilization rates and/or a low degree of tranquillity may imply that accumulation responds negatively to an increase in fragility. Moreover, he argues that the existence of this fragile

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financial system must be distinguished from the actual appearance of crises: a fragile system need not be characterized by a lack of tranquillity.

By using a discrete time model with full output adjustments, Skott (1992, 13) finds that, although the nature of the two financial variables makes it difficult to have a clear intuition about the functional form of the relationship between tranquillity and fragility, it may be possible to provide some justification for a concave specification of fragility. Thus, he believes that it can be argued - and it seems to be implicit to Minsky's argument - that tranquillity is an incentive to variations in financial practices as long as a reasonable margin of safety is maintained. Relaxation of financial constraints that have a given impact on accumulation may therefore be expected to have a larger effect on tranquillity in a fragile than in a robust financial environment. Marginal changes in leverage, for instance, will have little effect on the bankruptcy risk of well-consolidated firms while a high-debt firm whose contractual commitments cover a high proportion of expected earnings can be seriously affected.

Next, he uses an augmented Kaldor-Minsky model and finds it may generate endogenous cycles that are caused by the interaction between investment behavior and the financial structure (see Skott 1992, 18-20). Minsky's hypothesis concerning a dynamic relation between changes in fragility and the level of tranquillity increases the dimension of the reduced form dynamic system, and this increase allows cyclical fluctuations. Minsky's arguments appear to be substantiated in Skott's (1992) work. However, he notes that cycles are only one possible outcome of the Kaldor-Minsky model. The conditions for cycles may not seem unreasonable, but they are not really compelling either. Minsky's verbal argument as well as the existence of upper limits on the output capital ratio suggest

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to Skott (1992) that increased fragility ultimately cannot be offset by improved utilization: at least from some point, an increase in fragility will affect tranquillity adversely, even when derived effects on investment are taken into account.

Skott (1992) concludes that his model should not be seen as a direct attempt to explain the observed patterns of cyclical fluctuations in existing capitalist economies. Rather, it represents an effort to examine the logic of Minsky's theory of cyclical fluctuations as the consequence of systemic financial fragility. Financial factors may destabilize an otherwise stable system and produce cycles or in some cases a complete breakdown of the economy. In this sense, his analysis supports some of Minsky's claims.

Over the years there have also been those who have outright criticized the works of Minsky. In particular, Isenberg (1988) analyzes the plausibility of Minsky's hypothesis of financial fragility, during the U.S. 1920s recession and expansion. She provides a more detailed economic description than Goldsmith (1955), by adding the study of the producers' use of debt in the consumer durables sector.⁹ According to Isenberg (1988), the consumer durable sector was a growth sector during the 1920s. Given its strong growth pattern in the variety of its industries and prevalence of technological innovations, this sector has proper prerequisites for Minsky's conception of expansion.¹⁰ In addition to the trend analysis of financial ratios (e.g. debt to equity), she also considers a safety standard of threshold comparison in order to provide a qualitative determination of

⁹ Goldsmith's (1955) study indicated that the fundamentals of the Minsky scenario, the development of a financially fragile production sector, were absent in the 1920s. The production sector, non-financial firms, which is at the center of the financial fragility hypothesis, did not exhibit an increase in debt to equity ratio: contrarily, it exhibited a mild decline between 1922-1929. However, since Goldsmith (1955) produced ratios only for benchmark years and the data on individual years showed the peak income to debt ratio to have been reached in 1928, Isenberg (1988) believes a more detailed analysis is required.

¹⁰ The financial fragility hypothesis theorizes that there will be a deterioration in the ratios such as debt to equity and indicators of changing debt composition, as the business cycle expands. Given this long-term overview of sectoral and industrial behavior, the cyclical and trend activity becomes apparent.

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financial position. The major goal of her study is not to monitor movements into unsafe financial positions, but to determine whether firms increasingly rely upon debt finance as the business cycle expands. Thus, she uses a secular approach to display the trend of these ratios as well as their cyclical variations. The changing trend of these ratios over time indicates whether debt usage increases or decreases as the expansion continues. Isenberg (1988) also criticizes Minsky's work since his hypothesis is built on microeconomic foundations to produce macroeconomic effects. Investigating the financial behavior of a sector, rather than the macroeconomy, allows for a more detailed view of the micro units. Thus, she believes that an analysis of the sector's financial behavior in such an environment would provide evidence as to the existence of financial fragility.¹¹

Based on this belief, she provides a more detailed desegregation of the consumer durables sector in order to display the heterogeneity in the behavior of the sector's industries (see tables 4-7 in Isenberg 1988, 1059-64).¹² The interesting result of her division was that the musical industry was the only industry that shrank in asset size. It experienced a countercyclical growth pattern within the decade along with its secular decline. While going through its decline, the musical instrument industry, like the household appliance industry, maintained relatively high debt ratios. Since debt was not used for expansion purposes, she deduces that it must have been used for everyday production and overhead costs in the industry. Such behavior falls outside the Minskian hypothesis. The contrast between the musical instrument industry and the other industries is representative of the economy at large. Thus, she believes that in an expansion, not all

¹¹ She notes that this analysis of a sector would be appropriate, for evaluating the financial fragility hypothesis, so long as the microcosm, the sector, exhibits the required expansionary behavior.

¹² She divides this sector into four groups: automobile, household furnishings, household appliance, and musical instruments industries.

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sectors, industries, or firms expand, and those that do will do so at differing paces. This diversity within a sector or an economy provides balance to the expansion process. While some firms may be expanding rapidly and utilizing their own funds, still others will be shrinking in size and in outstanding debt. This variety in growth patterns usually reflects the heterogeneity of the economy and emphasizes the fact that the macroeconomic statistics are an assemblage of microeconomic actions.

After evaluating the data, Isenberg (1988) also finds that internal funds financed the bulk of capital purchases and that current assets were primarily financed through short-term debt. Thus, producers matched assets to liabilities maturities when debt was used, indicating a conservative approach to their use of debt. Such financing behavior does not follow the Minskian scenario (see table 3 in Isenberg 1988, 1057).¹³ A comparison of the actual values of the ratios to their threshold values shows them to be at all times in a safe position. Sources and uses of funds analysis shows that internal funds were primary source of fixed assets finance and that short-term debt primarily financed expenditures on current assets. Hence, she believes that the rewards of leverage could accrue to the sector without the added burden of increased risk due to mismatched maturities between assets and liabilities. That is, firms were using debt without moving into *speculative* or *Ponzi* finance.

Isenberg (1988) concludes by stating that the story of debt that emerges during the 1920s portrays a somewhat different picture than hypothesized by Minsky (1977, 1982). This sector entered the Great Depression in a stronger financial position than it entered the

¹³ Isenberg (1988) found that a cyclical view of the total debt to net worth, short-term debt to net worth, and short-term to long-term debt ratios shows a ratcheting up in their values, while a secular view indicates a decline in values by the end of the decade.

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1920s. In that ten year period the value of plant and equipment in the sector almost doubled, yet the debt ratios fell. A cyclical analysis of the decade provides more support for the Minskian hypothesis. The sector's ratios indicate that, once 1920-21 recession was past, a cyclical debt usage pattern evolved. Over the decade debt usage increased in an expansion and fell in a recession, but the decrease was less than the increase. This resulted in a ratcheting up of short-term and total debt ratios. These ratios, while exhibiting proper quantitative relationships for Minsky's hypothesis over the cycle, did not reflect a move into *speculative* or *Ponzi* finance. This same behavior was seen in all industries except for the automobile industry, which was dominated by the use of internal funds as finance. Given the domination of the secular tendency, Isenberg (1988) believes that her study provides greater support for Goldsmith's (1955) empirical view of the nonfinancial business sector in this period. The secular decline of total debt to net worth, in her study, coincides with the overall decline in the nonfinancial business debt that he found. Therefore, she believes that it may be useful to pursue clues provided by Goldsmith (1955). That is, his data showed a increase in private sector debt of non-agricultural households. While some of this debt may have been due to credit-financed consumer purchases, more of it may have been attributable to finance for stock market and real estate purchases. This latter possibility coincides with the speculative mania that pervaded the economy in the late 1920s. This phenomenon, along with the rise of the investment trust corporate form that came to be so closely associated with the utilities, may be the key in explaining the Great Depression.

Lavoie (1986, 1992, 1994) also criticizes Minsky's financial fragility hypothesis both on a theoretical and historical basis. With respect to history he refers to the

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aforementioned study done by Isenberg (1988). Lavoie's (1986) theoretical counter argument is also similar to the conclusion reached by Isenberg (1988), in that he argues the representative firm developed by Minsky does not necessarily extend to the macroeconomic setting. His reasoning is that, when investment increases, profits increase as well. However, he notes that profits could be induced to fall if other elements are present, such as a lower rate of savings by households or a deficient trade balance. Lavoie (1986) assumes these external factors away and he is thereby led to believe that the realized leverage ratio is more likely to decrease, even though firms and their banks are willing to increase the debt ratio. Moreover, he argues that, due to macroeconomic reasons, individual firms who wish to increase their debt to equity ratios may be unsuccessful in trying to do so. In addition, he argues, since the macroeconomics of profit realization are not incorporated in Minsky's visual depiction of the investment process, Minsky's graphical representation of borrowing and lending risk may be worthless at the macroeconomic level (Lavoie 1992, 199).

Lavoie (1994) also points to the similarities between Minsky and Kalecki's principle of increasing risk, that is, the positive relationship between the level of income, or the rate of investment and the rate of interest. However, he notes that one should be aware that Kalecki's 1937 version of the principle of increasing risk is such that expansion may lead to actual financial ratios that are less risky, a paradox noted by Robinson (1950, 23). This is not to deny that under some specific conditions, expansion may lead to profits decreasing, and hence increased leverage. But even if this were the case, he argues that one cannot presume that interest rates will necessarily increase as a consequence of

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increased leverage.¹⁴ Furthermore, he believes that this may help to explain Niggle's (1989) findings. That is, in a closed economy the overall leverage ratio does not increase in a boom; although each firm desires to take advantage of the more relaxed borrowing rules, firms can successfully increase their leverage ratio only by borrowing to invest abroad.

In an attempt to explain Minsky's belief that increasing activity induces higher debt to equity ratios and hence higher interest, and that financial needs of an investment boom increase interest, Lavoie (1994) tries to relate Minsky's work with the loanable funds approach. He states that, in order for Minsky to demonstrate that increases in the debt to equity ratio and turning points in the business cycle will necessarily occur, Minsky builds a model where the interest is determined by the demand curve for investment, *ex ante* savings and the terms upon which holders of liquidity are willing to substitute earning assets for cash and this, according to Lavoie (1994), is a clear depiction of the theory of loanable funds approach. In addition, since Minsky (1982, 136) states that equilibrium in his model requires the demand and supply price of investment goods to be equal, Lavoie (1994) believes that this is equivalent to Tobin's (1969) q-value to be equal to unity, which corresponds to assuming that the money rate of interest is equated to the Wicksellian natural rate.¹⁵ Moreover, because Minsky further assumes diminishing

¹⁴ Minsky (1980, 517), argued himself that in the expansion the acceptable degree of leverage increased so much that banks encouraged under-levied firms to go into debt and conform to more relaxed emerging standards.

¹⁵ Tobin's (1969) q theorem basically argues that a higher share price reflects the market's belief that the firm offers profit investment opportunities. In other words, share prices reflect incentives to invest in the stock of a particular company. Measure of these incentives is what Tobin refers to as q. The symbol q is equal to the market value of a firm's capital (assets) divided by the replacement cost of a firm's capital (current cost). The market value reflects investor's view of the present discounted value of the current and future profits of the firm. Thus, if investors value the firm more than the sum of the cost of its assets, they must be anticipating relative profit and q is thereby greater than one. As long as that condition holds, the firm's management have the incentive to try to raise market value of the firm's share by purchasing more

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marginal physical products, Lavoie (1994) argues that this greatly narrows the gap in the difference between Minsky's macroeconomic model and Tobin's Wicksellian one.

Lavoie (1994) concludes by stating, while the microeconomic relevance of each of the components of liquidity preference has been confirmed, these constructions do not justify the increase in interest with increased activity, based on empirical and theoretical considerations at the macroeconomic level. He thereby cautions that, while Kalecki's principle of increasing risk and Minsky's financial fragility hypothesis are valid microeconomic constraints, they are deficient in the macroeconomic role that some authors have assigned to them.

In addition to those who have criticized Minsky's work, there are those who have attempted to modify his theory by adding slight variations. For instance, Wolfson (1986) builds on the analysis of Minsky, by taking a historic perspective analysis of the financial crises that occurred in the U.S. economy. In particular, he outlined the significance of five major financial crises in the postwar U.S. history, that is, the Credit Crunch of 1966, 1970 Penn Central (bankruptcy), 1974 Franklin National, the Silver Crisis of 1980, and the 1982 crisis, as well as the legacy of 1982 (because of the failure of two financial institutions and the degree of interconnection of banks) (see chp. 4-9 in Wolfson 1986). He believes that financial crises are the result of normal functioning of the economic and financial system over the course of the business cycle. Endogenous processes take place near the peak of

capital, which of course, involves more borrowing. The opposite holds true if q is less than one. The firm has no incentive to replace capital because the market apparently believes that such investment will not generate a larger stream of income in the future. Thus, lower anticipated income signals lower investment and eventually lower output, and higher anticipated income signals the reverse. It is for this reason that investment and the business cycle are related to each other and the stock market is closely watched as an indicator of the failure of economic activity. Many firms issue stock. And to some extent, stock prices can tell us about the future state of the economy since the decision to incur some debt is an indication of a firm's earnings potential. A measurement based on this idea is Tobin's q .

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the expansion phase of the business cycle, in particular, the deterioration of the financial conditions of the business sector, which set the stage for a financial crisis. And he terms this view as the general business-cycle perspective. In addition, he argues, the crisis is brought about because of developments in the demand for and supply of credit. The key to understanding why crisis occurs is to be found in the way in which the supply of credit falls short of the demand. Especially important here is the role of commercial banks. The crisis itself is a response to these developments, which involve a disruption to the financial system. And he terms this point as the credit-market perspective.

Wolfson (1986) states that his model does not assume that financial crises must occur at the peak of business cycles, nor does it rule out crises at other times. Moreover, he claims that a crisis did not appear in postwar period before 1966. He asserts that financial crises do occur as a result of systematic forces that take place near the peak of business cycle expansion and that his model accurately accounts for the crises that have appeared at the last five business-cycle peaks, as of 1986. His model is constructed by beginning with the business-cycle and credit market perspectives. It is then filled out by addressing such issues as: the reasons for development of financial difficulties in the business sector, the factors influencing the demand and supply of credit, and the defining pattern of a financial crisis. He argues that, as the peak of the business-cycle expansion approaches, the financial condition of the corporate sector deteriorates. Corporations have more difficulty in meeting their fixed obligations, especially their payment on debts, as a result of debt obligations increasing at a faster rate than their ability to pay them. Debt increases in relation to equity and the maturity of this debt shortens, thereby causing increasing proportions to come due for payment. Interest rates increase, and so a given

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amount of debt requires greater repayment obligations (from either variable rates or refinancing). Also, liquidity and profit rates fall. Thus, corporations have more difficulty meeting debt payment obligations out of current income or, if necessary, by selling liquid assets. Hence, they attempt to borrow from the banks and in the commercial paper market in order to do so. The banks, however, are experiencing increased loan-quality problem and a slower growth of reserves; they are tightening their terms of lending and are cutting back on growth of investments and nonbusiness loans, but are responding to the loan demand of their best customers by relying on expensive, volatile, and uninsured purchased funds (Wolfson 1986, 128).

He also finds that, in the financial crises of the U.S. postwar period, there were two primary kinds of surprise events: one was the sudden application of institutional constraint, which took the form of government regulation whose purpose was to limit the continued expansion of credit by banks, and the second caused lenders to fear for safety of their funds (i.e. unexpected failure of large corporations or banks or a threatened default on outstanding loans obligations). Wolfson (1986, 128) believes that the surprise event is capable of initiating a crisis only because the financial system is fragile and therefore vulnerable. At the same time, the fragility of the system makes the appearance of such a surprise event unlikely. Although the precise timing of the surprise event is of course unpredictable, the existence of such an event should best be understood as itself as an endogenous reaction to the pressures building in the financial system as the expansion proceeds.

Wolfson (1986) argues that the conditions for a financial crisis are created when the inability of profits to continue to keep pace with rapid increase in debt threatens the

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further expansion of the debt structure. The crisis itself occurs because those forms of credit that serve as money or near-money during normal times no longer do so when the supply of credit is interrupted and normal financial patterns are disrupted. A financial crisis can thereby be defined simply as a sudden intense demand for money. According to Wolfson (1986, 130), there were three situations in the postwar U.S. economy that exemplify this demand. In the first situation, the intense demand for money came from corporations in a liquidity bind who needed money to meet debt payment requirements and other fixed commitments. The second was the banks whose reliance on purchased funds was suddenly interrupted. And the third came from investors who feared for the safety of their funds. Their fears were provoked by a surprise event, such as a bankruptcy, which led them to reevaluate the likelihood of loss.

Wolfson (1986) then uses a series of graphs and charts to prove his previously stated points. In particular, he discovers that the debt to equity, debt to maturity, and liquidity ratios (which all indicate the corporations financial strength) deteriorated as expansion developed (see figure 11.1-11.3 in Wolfson 1986, 134-6). Second, the interest coverage ratio improved in the initial phase of expansion, but began to decline as expansion progressed. It reached a minimum value during the recession itself (see figure 11.4 in Wolfson 1986, 137).¹⁶ Finally, the financing gap was found to peak very close to the dates of the financial crises.¹⁷ The financing gap increased in the periods immediately preceding financial crises not only because investment spending increases but also because

¹⁶ The interest coverage ratio indicates the ability of a corporation to meet debt payment requirement by measuring the amount of times that interest payments are covered by capital income, that is, the total gross profit before tax plus interest payments.

¹⁷ The financing gap measures the amount by which internal funds fall short of investment spending. It is calculated by taking the difference between capital expenditures and internal funds. See figure 11.8 in Wolfson (1986, 143) for a plot of the financing gap as a percentage of capital expenditures.

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of internal funds decreases. He found that the failure of internal funds to maintain their rate of growth, in fact their tendency to decline, resulted in an increasing financing gap - except for 1981 (see figure 11.14 in Wolfson 1986, 150). A decline in profit occurring near the peak of expansion generally has been responsible for this decline in internal funds. Thus, Wolfson (1986, 150) argues that it was the decline in profits that resulted in corporations having difficulty meeting their fixed payment commitments - due to involuntary plant and equipment investment as well as debt.

In his 1990 paper "The Causes of Financial Instability," Wolfson takes an empirical look at the financial crises that occurred in the postwar U.S. economy. He evaluates the financial crises that were mentioned in his 1986 book and observes that the financial instability in the later postwar period is a result of the interaction of two developments, one cyclical and the other secular. Furthermore, he states that most of these incidents occurred near the peak of the business cycle expansion, soon after the recession had begun. However, he notes that longer-term forces also play a role, and this is indicated by the recent increase in financial instability and the contrast between early and later postwar periods.

Wolfson (1990, 335) states that if the quasi recession of 1966-67 is included, a financial crisis has occurred near the peak of every business cycle expansion since 1966. Moreover, he argues that in each to these expansions there was an increase in outstanding debt. This increased reliance of credit, in the corporate sector, led to what he believes as the deterioration in the financial strength of corporate balance sheets.¹⁸

¹⁸ That is, the ratio of debt to equity increased, the maturity of debt shortened, and liquidity decreased.

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As stated previously, Wolfson (1990) argues that secular forces also play a role and thus he considers the effects that historical changes have had on the financial stability of the postwar U.S. economy. He points out that the growth of liability management has created an important class of bank liability that is not covered by depositors' insurance.¹⁹ This slippage in the ability of the federal deposit insurance to contain bank runs has led to an expansion of the federal guarantee to a broader "safety net."²⁰ This expanded role of the federal government in the economy enabled financial systems to avoid sharp crashes, panics, and banking crises that took place during the Depression and earlier periods. However, these macroeconomic policies, while successful in limiting the short-run consequences of financial instability, have encouraged the expansion of debt and have increased long-run fragility of the financial system. Moreover, by putting a floor on the fall of asset values and the liquidation of debt, these macroeconomic policies have prevented financial systems from making the kinds of adjustments that in the past had led to the resumption of economic growth without excessive reliance on debt.²¹

Wolfson (1990, 344) defines financial instability as the actual outbreak of problems in a financial system, such as a financial crisis or failure of banks and thrifts. He uses four variables to express financial instability: financial crisis (involves an intense demand for money due to an abrupt restriction in the supply of credit), bank failures (measured as the assets of failed banks as a percentage of total bank assets), thrift failures (measured in a

¹⁹ For example, runs on CDs and other uninsured liabilities by institutional investors have played a significant role in recent financial crises (e.g. Rescue of Franklin National Bank in 1974).

²⁰ That is, this safety net includes lender of last resort operations by the Federal Reserve; the automatic stabilizers, whereby transfer payments increase and taxes decline when aggregate income falls; and a conscious macroeconomic policy designed to limit the decline in output and employment.

²¹ Wolfson (1990) also notes that there is the problem of *moral hazard*. That is, the success of the federal safety net may be encouraging financial institutions to take more risk because they feel that public policy is oriented toward preventing significant adverse consequences.

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similar fashion), and insolvent thrifts (they have a negative net worth, liabilities are greater than assets and therefore should be counted with thrifts that failed, despite the fact that the thrift insurer, the Federal Savings and Loan Insurance Corporation, may have made it possible for many insolvent thrifts to remain open). He then plots this eigenvalue variable of financial instability against time and finds that the first 20 years after W.W.II as a period of stability. Thereafter, a clear cyclical pattern emerges, rising sharply to a peak in 1982, the most severe year of recession in the postwar period (see the top panel of figure 1 in Wolfson 1990, 346).²² He believes that the most important influence in both the cyclical and secular analysis was the increase in financial fragility. He notes that fragility is different from instability in that it is designed to measure the vulnerability of the system to future outbreaks of these problems. In order to analyze financial fragility, he takes the first principal component of the nonfinancial corporate sector and the banking sector. When evaluating the nonfinancial sector, he considers the ratio of corporate net interest payments to gross capital income, where gross capital income is the sum of profits before tax, depreciation, and net interest payments. The higher this ratio, which is the inverse of net interest coverage, the more difficulty corporations have in meeting their interest payments and, thus, the more fragile their situation. Whereas, for the banking sector, he uses the loan-loss ratio, the ratio of net loan losses (charge-off less recoveries) to average loans outstanding and the higher this ratio the more fragile the system.²³

²² In order to find the eigenvalue, Wolfson (1990) uses the first principal component of the four different variables of financial instability. That is, if a set of mutually orthogonal (uncorrelated) linear combinations of the four variables that accounts for the total variance of the four variables is formed, then the first principal component is the one that accounts for the maximum percentage of total variance. Thus, he believes this component is best able to represent the variation of the original four variables.

²³ In the bottom panel of figure 1, Wolfson (1990, 346) plots the first principal component of these two variables and finds the same cyclical and secular patterns are visible, but he notes that, in comparison to financial instability variable, the increase in fragility is more gradual.

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As Wolfson (1990) has previously mentioned, as the fragility of the corporate sector increases, purchased funds have played a key role in allowing banks to meet necessitous borrowing demands of corporations, but this method is not insured. The growth of purchased funds is thus a basic measure of the success of the banking system in meeting those credit supply needs of a corporation that are due to financial fragility. As the purchased funds increased, the necessitous need for funds from the corporations is accommodated and instability is avoided; when purchased funds run off, due either to a clash with the regulatory structure or the silent runs of institutional investors, financial instability is the result. Thus, he believes that purchased funds should be negatively related to financial instability. And, by plotting purchased funds as a percentage of total bank liabilities, he is able to illustrate this claim (see the top panel of figure 2 in Wolfson 1990, 348).

In order to derive a more complete analysis of the effect of the regulatory structure on financial instability, he finds it necessary to look at the thrift institutions' effects. He plots the first principal component of disintermediation (measured by the percentage increase in deposits), interest margin (measured by taking the difference between mortgage interest income and deposit interest expense), and asset diversification (the ratio of home mortgages, including securities backed by home mortgages, to total thrift) to measure the total effect of the regulatory structure on the thrift institution. He argues that each of these three variables should be negatively related to financial instability (see bottom panel of figure 2 in Wolfson 1990, 348).

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From his econometric analysis, his overall equation has an adjusted R-squared of 0.85 and his coefficients are highly significant.²⁴ All of the coefficients have the correct sign and the hypothesis of no autocorrelation cannot be rejected at 5% level. Thus, the econometric analysis appears to support institutional and historical analysis of the development of financial instability purposed by Wolfson (1990, see table 2, 350).

In a more recent study, Wolfson (1995) looks at the 1982-90 business-cycle expansion in the U.S., and finds the causes of financial fragility to be somewhat different than past experiences. That is, typically in the past, a strong investment boom in business plant and equipment is constrained at the end of the expansion by tight monetary policy and increased interest rates. This increase in interest rates has usually caused additional strain on the NFCs via increased debt burden, leading to financial problems. However, he discovers, at the end of the 1982-90 cycle there was no investment boom nor was the interest rate rising, in fact, he found it to be generally falling (see table 1 in Wolfson 1995, 346). As a result, the NFCs' fragility was not worsened by higher interest rates, the demand for credit to fund investment was lower, the banks' reserves were also under less pressure, and the banks thereby relied less upon purchased funds. Thus, he believes that the change in monetary policy may be playing a factor in the fragility aspect via the change in interest rate policy during the 1982-90 business-cycle expansion. Wolfson (1995) thereby claims that, although higher interest rates may have increased the financial burden of the NFCs during the early stages of the expansion, their effect near the peak seems to

²⁴ The dependent variable is financial instability regressed upon a constant; financial fragility [i.e. the first principal component of the ratio of corporate net interest payments to gross capital income (the sum of profits before tax, depreciation, and net interest payments) and the ratio of net loan losses (charge-offs less recoveries) to average loans outstanding]; bank credit availability (purchased funds); regulatory structure (thrifts); and a dummy to capture the effects of the introduction of money market deposit accounts in 1982 and 1983 (this dummy is multiplied by the purchased funds variable).

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have been in the opposite direction. However, he found that, as the peak approached, the financial fragility of the corporate sector did indeed increase, but this increase was due to high levels of outstanding debt and declining profits rather than increasing interest rates (see table 2 in Wolfson 1995, 349). He concludes by stating that even though long-term trends appear to provide a convincing explanation for financial crises that occur prior to a business-cycle peak, the changes in monetary policy also play an important role.²⁵

Seccareccia (1988) takes a somewhat different approach by trying to illustrate that recent Canadian financial problems were the symptoms of wider liquidity problem. He believes that these problems occurred cyclically during the postwar period, but were heavily accentuated by a misguided policy of monetarist restraint from 1975 to 1982. He looks at the periods leading to 1985 financial difficulties, by analyzing them within the framework of debt theory of capital formation set out by Veblen, Keynes, Foster, and modern French "Circuit" School economists.²⁶

Seccareccia (1988) argues that presumably every increase in the net cash flow of firms (sales less payments by corporations) would make it possible for them, taken as group, to add to their rate of reimbursement while at the same time attempting to increase their investment spending, thus further intensifying their indebtedness to the banking sector. He believes that this paradox arises because, in an expansionary phase, firms may be more willing to become indebted since they do not perceive any difficulty in meeting their financial commitments due to their relatively exuberant "animal spirits" (Seccareccia 1988, 54). Similarly, he postulates that banks are more willing to supply credit to firms

²⁵ As references for long-term trends, Wolfson cites studies by Minsky (1964) and Wolfson (1986).

²⁶ Modern debt theory places emphasis on the ability of the banking institution to finance by means of credit creation the accumulation of physical and financial capital.

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when both profits and proportion of the value of the credit outstanding that is being reimbursed are high.

He also discovers that during the high-growth years 1961-1969 and 1971-1974, the amount of net interest paid out by the private economy was greatly surpassed by the volume of newly created money (see figure 5 in Seccareccia 1988, 64). As a result, the firms' net cash flow increased and their debt to equity also grew. Moreover, he finds, during periods of prosperity, firms are becoming more indebted to the banking sector, and profits (i.e. net worth) are thereby increasing (see figure 6 in Seccareccia 1988, 67). Conversely, he notices that the economy tumbled into periods of recession as soon as a reversal of this pattern occurred, particularly during the latter half of the last decade. As an example, Seccareccia (1988) points to three periods in Canadian history in which this occurred. The first of these credit crunches occurred in 1969, and was followed by a recession in 1970. The second happened in 1974 and he links this to the recession of 1975. Finally, for the period from 1976 to 1983, he conjectures that the Canadian economy faced a prolonged macroeconomic state of *Ponzi* finance, which was accompanied by overall conditions of economic stagnation (Seccareccia 1988, 68).

Seccareccia (1988) concludes that policies which attempt to restrict monetary creation will stagnate the Canadian economy. Hence, his solution is to permit money and debt to grow so long as they are not checked by a mounting interest burden normally accompanying the acceleration of monetary growth. Therefore, Seccareccia (1988, 71) deduces, there is a need for a low interest (or interest free) debt money creation in order to release the economy from the burden of excessive interest payments.

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Finally, Jarsulic (1990) notes that there has been much interest in the problem of financial instability in the macro economy. He believes that there are two basic view-points, with respect to this topic. The first, deriving from works of Minsky, emphasizes the importance of ignorance and psychology. That is, firms are seen as financing accumulation on the basis of unverifiable expectations, accumulating debt burdens in the process. When the debt burdens are large enough, the economy becomes vulnerable to downward revisions of expectations and such revisions reduce effective demand and stimulate financial crises. The second view emphasizes a structural determinant of instability - declining profitability. That is, problems with profits are viewed as a major cause of debt burden and the source of potential financial crisis. He attempts to synthesize these two view points into a manageable analytical framework.

Jarsulic (1990) constructs a Keynes-Kalecki model of growth with debt, which suggests that, in economies where debt finances accumulation, stable and unstable configurations of economic variables coexist simultaneously. He is able to show that the proximity of these regions depend on expectational and distributional factors. His model, therefore, introduces a way to characterize financial fragility in terms of stability theory, and shows how structuralist and Minskian ideas complement each other. To keep things simple, he begins with a closed economy in which aggregate demand, composed of investment and consumption, determines the rate of output. He also assumes that capital markets are not perfect, that the goods market will clear immediately, and that money prices are fixed.

The model he develops provides a tractable framework for examining the connection of debt to macroeconomic stability. Using a series of phase diagrams,

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Jarsulic's model shows that, under a variety of assumptions, common to the Keynes-Kalecki tradition, an economy will have both stable and unstable regions (see figure 1-5 in Jarsulic 1990, 94-8). In addition, he argues that shocks of a reasonable size may cause oscillations, but the economy will tend toward acceptable values. For other growth rate/debt burden combinations - generally for lower growth rates and higher debt burdens, he claims, that the system will be unstable. Moreover, the closer these regions are, the more vulnerable is the system to shocks which move it away from the locally stable region (Jarsulic 1990, 99). He thereby believes that his model has the virtue of providing a definition of financial fragility in terms of stability theory. That is, the closer the stable and unstable basins, the more financially fragile is the system. He concludes by stating, since proximity is determined by expectational, distributional, and interest rate factors, his model argues for a multivariate analysis of the causes of any financial crisis.

Hence, from the analysis of Minsky (1977, 1982), and Kindleberger (1982, 1989), it becomes apparent, to some extent, that a rising debt could be a contributing factor to the financial fragility problem. This is further solidified by the empirical support provided in the work of Niggle (1989). However, criticism by Lavoie (1986, 1992, 1994) and Isenberg (1988) bring into question the validity of this proposition as the sole cause. In particular, Lavoie's 1994 paper tends to raise doubt about the soundness of Minsky's belief that a rise in the firms' debt to equity ratio causes an increase in the interest charged on loans to them. So rather than follow this aspect of Minsky, this paper will tend to proceed in the direction provided by other authors. For instance, the findings of Wolfson (1986, 1990) and Jarsulic (1990) lead me to believe that there are additional factors which contribute to this problem, besides a rising debt. That is, the issues of profitability,

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liquidity, and *asymmetric information* should also be considered. Furthermore, because of Kindleberger's (1989) claim that monetary policy could have moderated the crises but it would not have eliminated them, coupled with Wolfson's (1995) and Seccareccia's (1988) analysis on this topic, the ramifications of monetary policy, with regard to the fragility question, must also be taken into account. Finally, Kindleberger (1989) raises the possibility of investors playing a significant role and consequently this notion is also examined. Henceforth, the implications that all of these factors have on the financial fragility of NFCs will be investigated in the following section.

A Generalized Theorem of Financial Fragility

The following analysis is not intended to exclude the possibility of financial crises occurring in periods other than near the peak of the expansion phase, but rather its aim is to illustrate that the various economies may be more susceptible to a crisis when their NFCs' portfolios are financially unstable. That is, increased leverage (maybe excessive debt), decreasing liquidity, and declining profits are the rule (Mishkin, 1991). However, I believe that the fragility issue is a very complex and inter-related problem which is filled with a multitude of interwoven relations that are difficult to separate as the sole cause of the problem. Rather, it is more probable that the joint effect, of the aforementioned and following components, is more likely to lay the foreground for the resulting financially unstable economy.

Suppose there is an event which initiates a boom in the economy. Once the expansion phase begins, there are two basic phases through which it goes. The first is the recovery period. This is said to be occurring when the level of output lost during the

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previous recession is attained again. In the second phase, the expansion exceeds the previously measured high. At the start of the recovery, interest rates, wages, and inventory costs are usually low enough to bring the unit cost of production significantly below selling prices. Thus, profits improve even with reduced levels of production. As a result of their profits increasing, their stock prices also begin to rise. Economic activity increases with renewed consumer spending and housing construction. The rise in demand causes industries to start to increase their output, and their employment. As more sectors of the economy start participating in the expansion, a buoyant economy becomes reflected in the increase in business and consumer confidence. During this phase of the recovery, there is little need to raise the level of capital investment since businesses are able to increase output, not through expansion, but rather by putting existing plant and equipment back into production. With capacity utilization low, there is little upward pressure on prices. Moreover, employment is rising, but still unemployment keeps increased labor costs down. In the second stage of expansion, the economy moves beyond its previous peak. Inflation is still low, but is moderately rising in some sectors. Businesses have adjusted inventories to meet higher demand and capacity restraints now begin to appear. In various industries, major increases in capital expenditures become necessary to increase capacity to meet higher demands. So in this phase firms begin to act on their “animal spirits” to invest. Firms decide to increase investments since their confidence for success is now higher due to the fact that interest rates are lower coupled with their myopic belief that their expected cash receipts will be greater than their cash payments. That is, their return from their investment will exceed the contracted debt payment and its interest. Thus, in this stage, firms are following Keynes’ investment decision theorem. Investment

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decisions are made when the marginal efficiency of investment (the internal profit rate of the marginal investment plans) are equal to the interest rate. That is, when the interest rate on loans is high, corporations will make fewer investments than when it is low. By the same token, when interest rates are low, there will be more investment activity.

Therefore, expansion of plant and equipment may also be deemed as necessary in order to avoid shortages, but it is more likely that the firms view this as an opportunity to increase their profits. The result of all of this is that firms begin to take on greater amounts of debt to meet their expansion needs. This increase in expenditure is financed both externally and internally.

In the final stages of expansion, the economy is still growing as it reaches the peak in the reference cycle. However, some indicators are already moving against the tide. Stock and bond prices are falling, stock trading decreases, and the amount of new corporate securities issued declines. Employment, inventories, and capital expenditure are still increasing but at a slower rate. Interest rates are typically higher than in the early part of expansion, because of the combination of the authorities placing the “brakes” on inflation, via tight monetary policy, and by their involvement to stabilize their currency’s exchange rate. In addition, prices are higher and labor costs are also rising rapidly, relative to productivity growth, thereby squeezing profit margins. Thus, since inflationary price pressures also bring higher inventory costs, this in turn is usually passed on in the form of higher selling prices in order to maintain profitability.²⁷ However, these higher costs cannot always be passed on, and as a result buyer resistance eventually develops.

²⁷ Firms may also raise production to increase profits. However, increasing production requires greater amounts of inventory and with increases in inventory costs corporations are forced to raise their selling price if profit margins are to be sustained.

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The resulting squeeze on corporate profits is reflected in lower common share prices. Thus, some of the firms are placed in the precarious position to incur more debt in order to cover their costs. Firms thereby take out greater amounts of short-term debt, since the proper and usual industry practice is to match maturity of debt with relative length of assets, that is, short-term debt for current assets and long-term for fixed. This makes the firms more vulnerable to not only market fluctuations but also to variations in interest rates, since most short-term loans usually have a floating type interest rate (*cf.* Minsky, 1977). However, it may also be proposed that firms are taking out more loans because they have no other viable options. For example, in Canada the industry practice, according to the Canadian Securities Institute (1991), is for the investor to stop buying common stock and purchase short-term bonds in expansion. The reason for this strategy is that profit-seeking investors realize, from past experience, that the authorities usually raise interest rates and that some firms fail at the end of expansion. If in fact this is true, then it is probable that the investors themselves are “adding fuel to the fire,” so to speak, by decreasing their investments and causing a reduction in the value of the firms’ equity (net worth). Thus, the decline in the investor’s confidence may be inducing a self-fulfilling prophecy, in the respect that their fear of the probability of the firms going bankrupt or their profits declining is increased by their reduction in their investments (Kindleberger, 1989). Businesses thereby begin to find themselves typically financing high levels of inventories at high interest rates. This further erodes profitability and dampens plans for expansion as the cycle peaks, unfilled orders decrease, output exceeds sales and business confidence erodes. Henceforth, in expansion periods where the interest rate increases, the debt load of firms is raised, since it increases the cash payments without increasing the

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cash receipts. As a result of this excess burden, the firms who are unable to refinance their debt will be forced into bankruptcy and will thereby default on their loans. This in turn would also cause problems in the banking sector if these firms do not have adequate collateral. Henceforth, in order to try to save the system from crashing, the central bank steps in by providing the necessary liquidity to meet the increased demand. However, it sometimes is too late in its reaction or it chooses not to step in right away and hence some crisis occurs and this marks the downturn in the economy.

There are however, other underlying factors which also lead to the demise of the economy, which will now be elaborated upon. In particular, chartered banks have, in the past, been faced with monetary constraints which limit their funds available for loaning purposes. Thus, in an attempt to alleviate this constraint, many banks have taken on various liability management techniques, the most noted being the Certificate of Deposit (CD). However, the problem with these innovations is that they are not covered by the federal deposit insurance. Hence, following the lines of Wolfson's (1990) argument, it is put forth that the Federal government was forced to expand their role in the financial markets and thereby increasing the span of their "financial safety net." Although this may have helped to alleviate some of the short-term crises, it may in fact be just delaying the solution of greater long-term problems, as we will see in the following section of the paper. Moreover, additional problems arise due to the constraints placed on basic market defenses as a result of increased insurance use. That is, the three basic defenses against excessive speculation or risky behavior by the banks and thrift institutions may be hindered. The first defense is *market discipline*. Depositors may exert this action with their freedom to withdraw their funds from depository institutions perceived as unsafe.

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Second, there is a potential influence of the stockholders who, while they still possess a positive net worth in the firm, will have reason to restrain the bank (or thrift) management from imprudent or over-speculative activities. Finally, there are the regulators.

Unfortunately, however, the establishment of deposit insurance has tended to undermine the *market discipline* of depositors. For example, in the U.S. its depositors' insurance (FDIC) was established in the 1930s in response to the "run on the banks" experienced then. While it accomplished its goal of undercutting mass hysteria of bank runs, it did so at a cost. Since the federal government is assuring depositors that - at least up to the deposit insurance maximum - they cannot lose, they have no real incentive to *discipline* their deposit-receivers by withdrawing funds no matter how reckless their behavior. The problem now becomes apparent that, with this "net" in place, chartered banks may feel more confident in loaning out money to somewhat more risky ventures. In economic terms, this is often referred to as the problem of *moral hazard*.²⁸ Because of this *moral hazard* the chartered banks may be more willing to extend credit in the contraction phase, and this could be one possible factor to explain the increases in D/E during the recession periods. The reason that D/E is increasing for firms in contraction phases is probably due to the fact that their profits are lower than during the expansion phases, and, henceforth, they may require additional loans to cover their operating expenses. However, this *moral hazard* line of argument can also be used as an explanation for the demise of the economy as well. In addition, it is worth noting, at the root of all problems with insurance, is the fact of *asymmetric information*. That is, one group, the insurers, have relatively less

²⁸ *Moral hazard* refers to the tendency of people who have insurance to take on, perhaps unwittingly, more risks than they would in its absence.

relevant information than those who are being insured. The information relevant here is the degree of risk aversion on the part of depositors, as well as the abilities (and honesty) of the banks that manage the depositors' funds, of which one consequence is the already discussed problem of *moral hazard*. The other negative result of *asymmetric information* is the problem of *adverse selection*. In the case of bank deposits, *adverse selection* implies less concern over the riskiness of particular investment on the part of depositors as well as on the part of bank managers, who will focus on return alone. Banks that emphasize maximum returns, irrespective of risk consideration, are called risk neutral. Why do some banks react in this fashion? Because the deposit insurance in Canada and the U.S. is currently administered so that all participating deposit-taking institutions pay a flat premium, as an institution's record on risk management and its consequences is effectively ignored. This of course means that banks which are relatively cautious about how much risk to which they are willing to expose themselves pay premiums that are too high. By contrast, banks that seek the highest return, no matter what the associated risks, pay premiums that are too low. The recent *savings and loans* (S&L) fiasco in the U.S. is an excellent illustration of this phenomenon. The *adverse selection* problem also arises due to the fact that the banks know their own default risk, but the insuring agency does not know or does not bother to measure the default risk probability. As we know from the *moral hazard* argument, deposit insurance may cause high risk banks to become more reckless in borrowing and lending behavior, and in a market in which depositors do not or cannot distinguish between the two groups of banks, the low risk banks will become tempted to act more like the high risk banks.

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But what about the stockholders as a restraining influence? Logically it would seem that the larger the stockholder's equity - that is, the more they have to lose - the more likely they are to do whatever they can to guide the management into safe, prudent portfolio practice. However, the U.S. *savings and loans* case can once again be used as a somewhat contradictory example to this line of reasoning. By the middle and late 1980s, a very large number of S&L associations were already economically insolvent and hundreds more were tottering on the brink. The owners had already lost their financial stakes in their firms and could thereby lose no more no matter how much the firm itself lost. Under these circumstances then, the full burden of disciplining imprudent depositories, ordering them to cease unsafe practices, and managing them when they became insolvent, fell upon the regulators and it proved too heavy of a responsibility. Finally, no matter how well meaning they may be, the fact is that regulators do not always have the information, the resources, or the expertise required to provide the oversight needed. Moreover, regulators may sometimes consider it appropriate to practice voluntary forbearance rather than to "crack down" promptly. And most devastating of all is that, if the number of insolvencies has grown to the point where the insurance agency lacks sufficient funds to pay off their insured deposits should they be closed, the regulator has been known to allow them to continue to operate in hopes of some highly speculative undertaking succeeding.²⁹ However, eventually a rational regulator may choose to close these hopeless financial institutions on the principle that it is still better to cut one's losses.

²⁹ An example of this occurred during the late 1980s in the U.S. thrift industry. Hundreds of already insolvent S&Ls were still open for business. On the one hand, no matter how much more these firms lost from reckless venture, their owners could lose no more. On the other, there was the outside chance that a wild gamble financing some highly speculative undertaking just might succeed. If so, current management would be hailed as financial geniuses who saved the firm and benefited accordingly. In

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The U.S. established its deposit insurance (FDIC) in 1931, Canada (CDIC) in 1967, and Japan in 1971. But despite all this experience with deposit insurance around the world, the role it plays in ensuring the stability of a financial system is still unclear. The U.S., which introduced it, still experiences more bank failures than most developed countries. By contrast, both Canada and Japan, which also have it, have been reluctant to allow failures, opting instead for mergers of weaker banks with stronger ones. However, it is certain that, without major modification in the deposit insurance schema, the problems of *adverse selection* and *moral hazard* may persist in the future, causing further weakening to the financial systems.³⁰

An additional problem to the fragility issue lies in the fact that there are tax incentives in Canada, U.S., and Japan which promote the use of increased debt. That is, the tax treatment of debt and equity tends to favor debt, mainly because interest payments are tax deductible for firms while dividends payments are not. On the other hand, for the individual providing the financing, interest income is taxable but equity holdings offer the possibility of capital gains, which receive favorable tax treatment. What all of this implies is that the government, and its regulations, strongly influence the amount of debt taken on by nonfinancial corporations, that is, they are encouraging it. This problem was accentuated in the U.S. during the Reagan administration and will be discussed in the following section on the U.S. Thus, because of the different tax treatment of dividends

other words, at first glance it would appear as a “no loss” situation for them. However, their losses cost the tax payers dearly, once the deposit insurance lacked sufficient funds.

³⁰ A possible solution is to raise the capital requirements. If the proportion of equity to total assets were raised, failure would become more costly to owners, which may reduce *moral hazard* problems. The Bank of International Settlement (BIS) has started some of these reforms, and, although they are not enforceable, the BIS does have some moral suasion. For details on BIS policies, see chp. 10 in Siklos (1994).

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and interest payments, the Modigliani and Miller (1958) theorem that the debt to equity mix is irrelevant does not apply here.³¹

Analysis for Canada

The annual Canadian data does not appear to follow the cyclical pattern that is argued by Minsky (1977, 1982). It can be seen from figure 1 that over the period of 1961-1993 (five reference cycles) there are only two periods in which the D/E ratio appears to peak in or around the peak year, that is, 1979 and 1990. Furthermore, in both the expansion and contraction periods, the D/E ratio tends generally to rise and this would also contradict Minsky's theorem. However, in the expansion periods, the percentage change in D/E is increasing by a greater amount than the percentage change in contraction periods, the exceptions being 1979-80 and 1990-92.³² Thus, since there is a consistent and relatively large rise in D/E during the expansion phase, this implies that D/E may be a factor contributing to the financial fragility of the Canadian economy. Hence, in order to understand what is causing this increase in D/E, it may be helpful to evaluate the changes in the separate components of debt. That is, looking at the percentage change of bank loans, other loans, finance and short-term paper, mortgages, and other Canadian bonds may provide further insight into this problem.³³

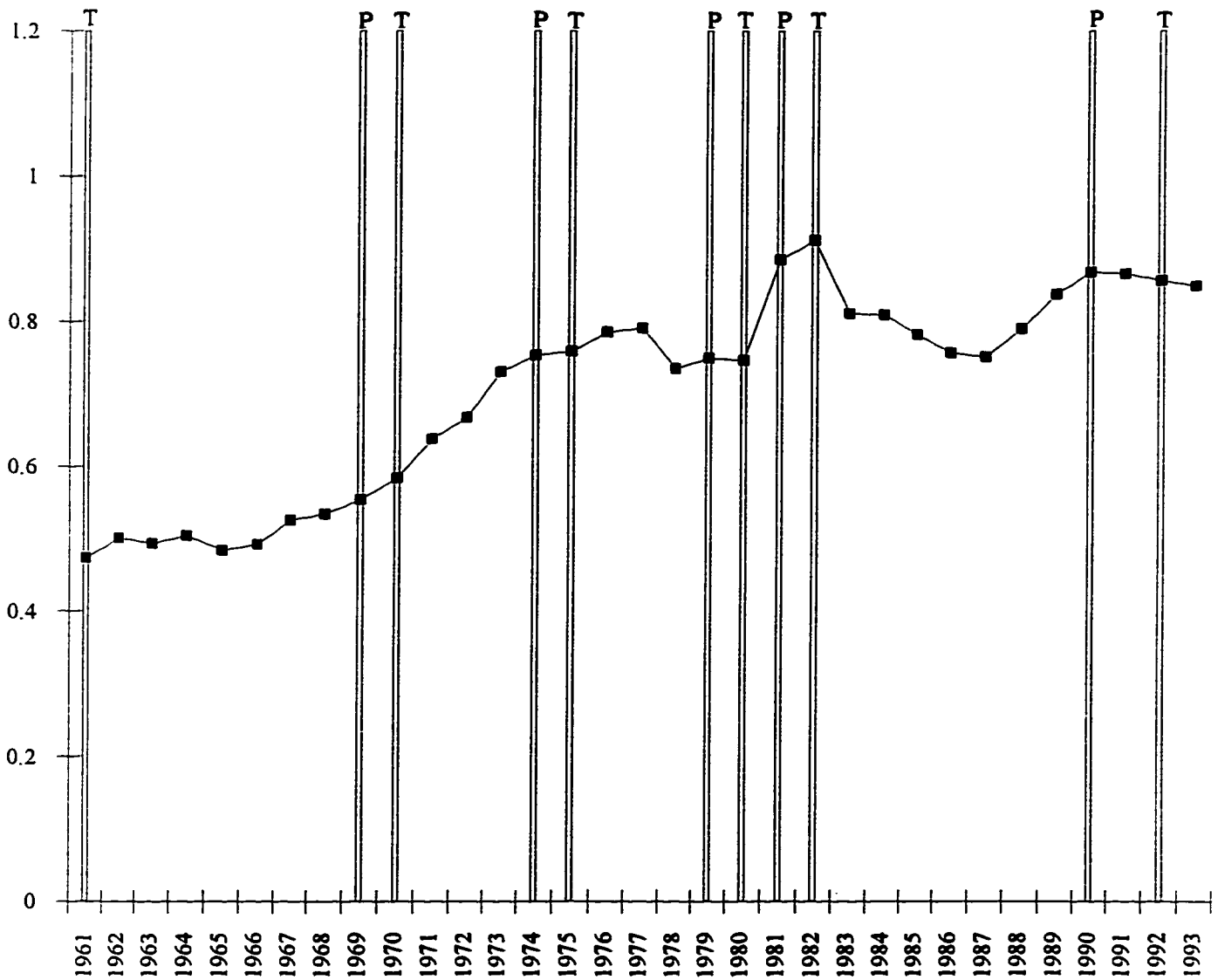
In the past, bonds have been a significant portion of the Canadian firms' debt. Over the years, however, the use of bonds has been consistently declining. That is, in

³¹ Modigliani and Miller (1958) propose that, under conditions that dividends and interest payments are treated the same, the choice between bond and stock financing is irrelevant. That is, the value of a firm, defined as the anticipated stream of income generated by the firm, is independent of the debt to equity mix. What ultimately matters is the net return on the firm's investment, not how that investment is financed.

³² See table 1.

³³ Refer to data appendix for definitions.

Figure 1: Canada's Short & Long Term Debt to Equity



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1962 the use of bonds was approximately 52% of total debt whereas in 1993 they were 27% of total debt. Conversely, the use of other loans and short-term marketable paper has been rising. That is, in 1961 other loans were 6.7% of total debt while in 1993 they were 12.55%, and short-term marketable paper in 1961 was 0.99% of total debt whereas it has risen to 8.57% in 1993. Finally, the use of bank loans and mortgages have been relatively constant.³⁴ However, bank loans and short-term paper appear to be the largest percentage change in an expansion period. This would tend to imply that NFCs are using a relatively greater amount of these types of debt to finance their expansion needs.³⁵ Therefore, based on the facts that short-term market paper has been increasing and that the use of bonds have been decreasing over the years, it can be concluded that Canadian NFCs may have begun to switch gradually from long-term financing of debt to more short-term types. This switch may be due to the general rise in interest rates over the period, making the desire to "lock in" for extended periods, at higher rates, less attractive. Henceforth, as NFCs take on greater amounts of short-term loans, not only are they susceptible to market fluctuations, but also they become more vulnerable to interest rate variations as well. Thus, this switch may be of future concern, for an increase in interest rates during an expansion phase could lead to greater financial difficulties for the nonfinancial sector, which thereby increases the likelihood of a financial crisis.³⁶

Looking at the overall secular trend, one discovers that the D/E ratio appears to be consistently rising from 1961-1982, with some small dips along the way, that is, 1978.

³⁴ For results see table 2.

³⁵ For results see table 1.

³⁶ It is unfortunate that Statistics Canada does not separate bank loans into short-term and long-term debt, since it would be of interest to see how these components are changing as well, given that bank loans are a significant portion of total debt.

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After 1982, the D/E ratio tends to fall off though rising again in 1990 - a peak year - but not to the same previous 1980s levels. So what happened in 1982 to cause this drop off?

One possible explanation could be that the rate of inflation for Canada was rising significantly throughout the 70s and early 80s.³⁷ In 1981 the Federal Reserve Board sharply increased the interest rate in an effort to reduce inflation. The Bank of Canada responded by sharply forcing the Canadian interest rate up to prevent a large depreciation of the Canadian dollar, which it feared would impede its fight against inflation. Over the period of 1981-1984 the Bank followed a very restrictive monetary policy with a much lower growth rate of money supply and very high interest rates. As a result of the rise in interest rates, this led to increased cash flow commitments of firms, which in some cases could not be met. Thus, some firms went bankrupt, causing defaults on loans, and for those who did not have adequate collateral this led to further problems for the banks as well, which is shown below with the failure of banks in the 1980s. Davis (1992) also found that eventually these high real and nominal interest rates eroded profitability, leading first to a sharp rise in external financing and then to a collapse along with investment as the recession began and profits declined further. Thus, defaults can be seen to be rising sharply in chart 2.12 in Davis (1992, 59). Reflecting balance sheet weakness of firms, the

³⁷ Sharp increases in the OPEC oil prices and world commodity prices in 1973 and 1974 contributed to inflationary pressures. By 1974 Canada experienced double digit inflation, that is, a 10.9% increase in the CPI. By 1975 the Bank of Canada recognized that decreasing the rate of inflation required decreasing the rate of monetary expansion. It thereby introduced its monetarist gradualism, and at the same time the federal government established the anti-inflationary board, which introduced wage and price controls. By decreasing the money supply over time, the Bank hoped to avoid the undesirable consequences of higher rates of unemployment associated otherwise with rapid deceleration of monetary growth. In the first three years of monetary gradualism the rate of inflation declined. However, near the end of 1978 the downward trend of the rate of inflation was reversed. By 1980 the Bank realized that its implementation of monetary gradualism was too gradual for coping with inflation. So in November of 1982 the Bank of Canada announced it was abandoning the practice of established M1 targets. The Bank shifted from stabilizing growth rates to stabilizing exchange rates, in particular vis-à-vis its American counterpart (Siklos, 1994).

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recovery from the recession was sluggish. However, the NFCs who were able to survive may have borrowed less since interest rates were high and they may have been able to finance their increased expenses through the use of more equity. This is apparent by the positive increase in the percentage change of equity in 1983 through to 1987 versus a lower and sometimes decreasing percentage change in debt.³⁸ Moreover, the NFCs also began to reduce their costs by decreasing production and laying off workers. As a result, starting in mid 1981 and continuing through to the end of 1982 Canada, along with most other countries, experienced the most severe recession since the Great Depression of the 1930s.³⁹ Inflation did not start to fall noticeably until 1983. Despite lower rates of inflation and relatively high rates of unemployment, after 1982 the Bank did not significantly reduce its policy of monetary deceleration until 1985. While it can be argued that the Bank's initial policy to control inflation was too slow and too weak, it can also be argued that its reluctance to allow exchange rate to depreciate, after the fight with inflation had been won, unduly delayed recovery in the Canadian economy from the severe recession of 1981-82. This line of reasoning is supported by the findings of Seccareccia (1988). By the spring of 1989, it was clear that the Bank was matching its words with actions, regarding price stability. By the end of 1989 signs that the boom of 1987 and 1988 was fading were numerous.⁴⁰ The Bank's further tightening of policy in the spring and summer of 1990 surely contributed to making the already developing recession more

³⁸ See table 3 for detailed results.

³⁹ A rough indication of the severity of recession is to look at the percentage change in real GDP from peak to trough: 1960 = -0.889%, 1970 = -0.506%, 1974 = 1.22%, 1980 = -0.149%, 1981 = -5.304%, 1990 = -1.872% (although not an official date, Statistics Canada believes the trough is around the third quarter of 1992).

⁴⁰ That is, exports and consumer expenditures had leveled off, business fixed investment, although still growing healthy, was down from double digit growth rates of previous two years, and employment growth was also beginning to subside.

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severe than it might otherwise have been. By the second half of 1990, the earlier gradual tightening was having a cumulative effect on output that was reinforced by acute shortage of liquidity, implied by the steepening fall in M1.⁴¹ Total business fixed investment began to fall as well. The demand for credit also fell as the economy contracted. The demand for short-term credit by businesses was particularly weak as they ran down inventories that had accumulated early in the slowdown. During the fourth quarter the Bank became less restrictive. However, only in early 1992, when it was clear inflation had been decisively reduced, did the bank begin to accommodate the economy's recovery from the recession that had begun in early 1990, a policy that it pursued aggressively as 1993 advanced.

Moreover, due to tighter monetary constraints banks were forced to seek alternative methods of financing, that is, liability management. The problem with recent innovations, such as CDs, is that they are not covered by insurance. Hence, as stated in the last section and by Wolfson (1990), this resulted in the federal government increasing its role in the financial market and thereby increasing the size of its "safety net." Thus, it can be argued that monetary policy is also a crucial factor to changes in economic conditions (*cf.* Wolfson 1995, Gatti *et al.* 1993, Gallegati and Gardini 1991, Kindleberger 1989, and Downe 1987). Tight monetary policy appears to have significant negative effects on both NFCs' D/E ratios as well as the banking structure's financial development, that is, financial innovations. It is, however, also worth noting that a review of any monetary policy will often show, in retrospect, a policy of errors. Thus, to blame solely

⁴¹ Laidler and Robson (1993) argue that short-term interest rates move in response to changes in the supply of money, and the demand for money is systematically affected by the interest rates offered on close substitutes for it. Since Canada's M1 bears no interest, the nominal return on close substitutes for it is thus an important representation of demand for it. Hence, by using M2 as a substitute, Laidler and Robson (1993, 97) find, in figure 11, that the growth in M2 is higher than M1 in this period, indicating a shortage of liquidity.

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the government for the downturns in the economy would be irresponsible and naïve. Rather, the argument is trying to establish that monetary policy was indeed a contributing factor. If monetary policy had not been too restrictive, then perhaps the previous Canadian recession would not have been as severe or prolonged. That is, the banks would not have been as constrained for funds and thereby may not have been forced to resort to such unprotected practices.

By looking at the dates of the peaks and troughs for both the Canadian and the American economies, it is apparent that they occur relatively close to each other. This relationship is probably due to the high volume of trade done between the two countries. An economic expansion or contraction in the U.S. leads to corresponding increases or decreases in U.S. demand for Canadian exports. Similarly, an increase or decrease in Canadian economic activity results in larger or smaller imports from the U.S. So what does this mean in terms of the financial fragility context? It implies that NFCs' debt to equity ratio will be influenced by its trading partner's economic state. That is, a recession in the U.S. will cause lower demand for Canadian exports, which will thereby decrease demand and sales for Canadian firms, thus reducing their profits. This would be even further accentuated if Canada were in a recession at the same time. The result of decreasing profits, for example near the peak, and increased debt commitments would cause firms to refinance their position, if the banks will allow it. For those unable to acquire more debt, bankruptcy would ensue, which may lead to the downturn in the economy.

Looking at the monthly data for the Toronto Stock Exchange (TSEA) for the period of 1956 to 1992, one can begin to notice a relatively interesting and significant

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pattern. That is, for six out of the seven reference cycle peaks the TSEA index appears to fall just prior to or in the same month as the cycle peak.⁴² This finding would seem to indicate that activity in the financial market is falling just prior to the downturn in the economy. This finding is further supported when one looks at the average price/earnings ratio for the TSEA. Looking at the same period, it follows the exact same pattern as the TSEA index, that is, for six out of the seven cycle peaks the average price/earnings falls.⁴³ It is also worth noting that the average price/earnings is often used as a measurement of investors' confidence in the market, and thus a reduction in it would imply a decrease in their optimism of the future of the market and thereby a reduction in their investments. This finding would seem to support the previous hypothesis, and Kindleberger's (1989) notion of the *causa proxima* of a crisis, that investors may be partially causing the downturn in the economy via their "self-fulfilling prophecy."⁴⁴ That is, the reduction in investment, near the peak of the expansion phase, would force the NFCs to cover a rise in their expenses by taking out greater amounts of debt. This increase in leverage may lead to their demise. For instance, if interest rises - say, in response to the authorities wanting to control inflation, for example - this would raise the NFCs' debt load and for those unable to obtain additional credit, bankruptcy would be inevitable.

The current ratio is an indication of the liquidity of a firm. It has been argued that firms tend to be less liquid near the peak of expansion, which leads to further complications for them. That is, had they been more liquid, the NFCs may have been able

⁴² See table 4.

⁴³ See table 4.

⁴⁴ It can be recalled from the first section that Kindleberger (1989) argued that the *causa proxima* of a crisis was some event which reduced the investor's confidence, with the fear of a possible failure, thereby prompting them to switch out of stocks back into cash.

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to liquidate more rather than borrow (see Wolfson 1986). Hence, it is worthwhile to evaluate Canada's NFCs' current ratio to see if this is indeed a problem.⁴⁵ In Canada, it appears, for the majority of cases, that NFCs are less liquid in peak years than in trough years, implying that this could also be a possible explanation to the fragility concept. In addition, profits were found to be generally declining in contraction phases and increasing in the expansion phase and this is what one would expect to find. This would tend to support the previously conjectured notion that due to declining profits in the contraction phase, firms are forced to take on more debt to cover their costs.⁴⁶

What caused the consistent rise during 1961-1982? A possible argument is that the government may have inadvertently created the problem of *moral hazard* by implementing various insurance and boards to protect depositor's investments (e.g. CDIC came into affect in 1967). Banks knowing that this "safety net" was in place may have felt more secure in lending to somewhat more risky prospects in hopes of turning a higher profit, and thus took on more of these so called "bad loans." For instance, in 1985 the Canadian Commercial bank (CCB) failed and some of the losses were covered by the federal government. That is, the CDIC paid out \$352 million for insured deposits and \$720 for the uninsured deposits (Siklos 1994, 390). Yet no such bailouts occurred in other instances. In particular, when the Calgary-based Tower Mortgage failed, uninsured depositors incurred sizable losses. The discrepancy arises because the government has the

⁴⁵ Current ratio = current assets / current liabilities. Current assets are made up of: currency and bank deposits, deposits in other institutions, foreign currency and deposits, government treasury bills, and finance and other short-term paper. Whereas current liabilities consist of: trade debt, bank loans, other loans, finance and other short-term paper. The reason for the use of these variables is to be as consistent as possible with the other two countries' current ratios.

⁴⁶ See table 5 for results. It would have been of greater interest to see if profits were declining just prior to the peak, in order to see if they have been an effect of the fragility of an economy. However, since profit data were only found to be provided annually, the analysis is limited by this constraint.

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view that some institutions are “too big to fail.” In addition, it is important to realize that in the early development of Canada’s banking structure, it moved from a large number of locally based banks to one with a relatively few large banks with nationwide branch networks and this is a characteristic feature of the Canadian banking system. Because of this type of structure, coupled with the government’s doctrine of “too big to fail,” it would seem that larger Canadian banks would thereby have a greater incentive to take on more risk, that is, increasing the *moral hazard* problem and thus adding to the financial fragility issue.⁴⁷ In fact, Borio (1990b) found that banks were willing to finance riskier activities such as leveraged takeovers in order to maintain balance-sheet growth and profitability. Thus, it can be argued that the rise in the D/E during both peak and trough periods could be due to the banks’ aggressive profit-seeking lending practices inspired by the government’s excessive “safety net.” That is, the Canadian government may have increased the long-run fragility of our economy by encouraging, in part, the NFCs’ debt to rise via the use of depositor’s insurance and other monetary rescues.⁴⁸

U.S. Analysis

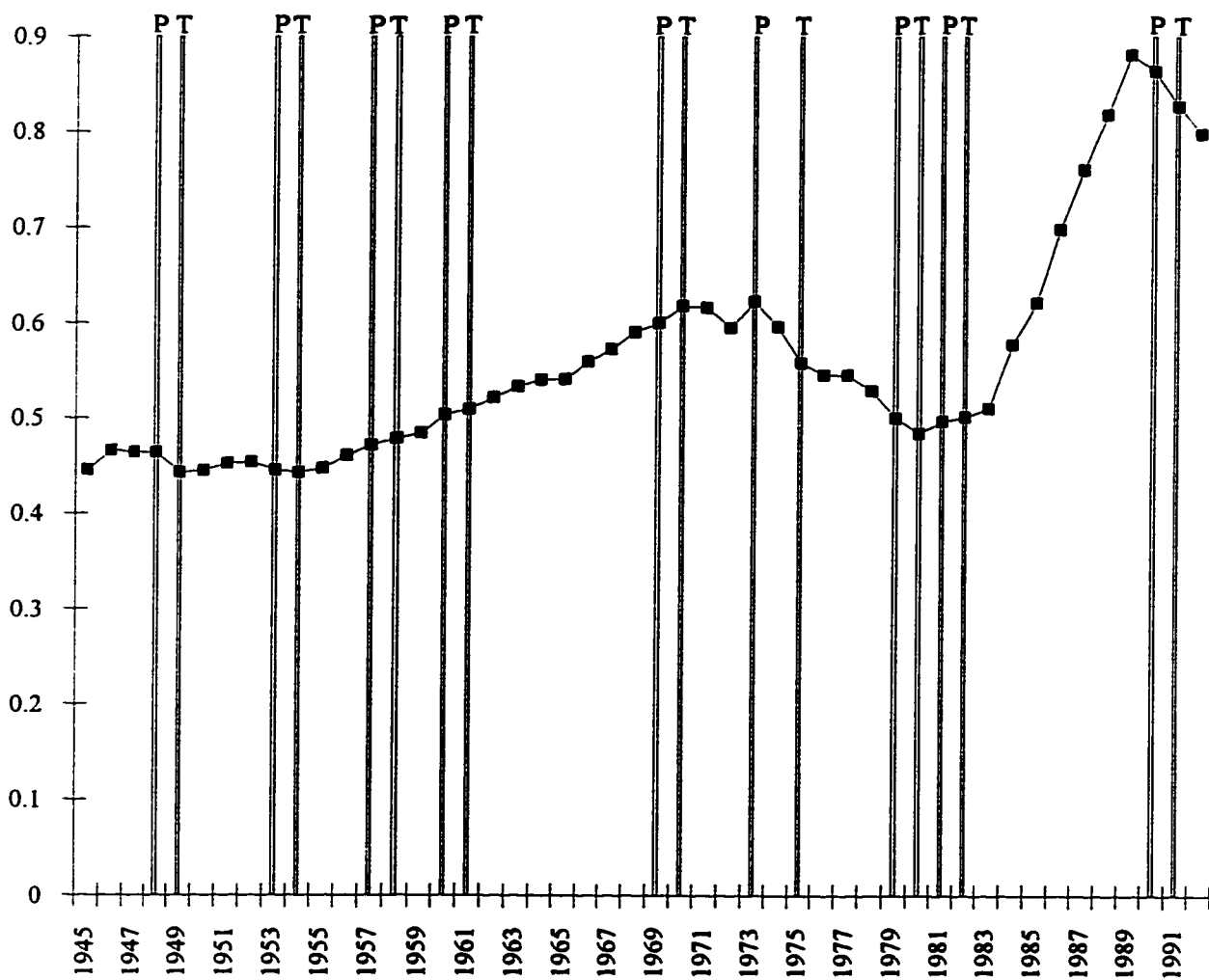
The U.S. annual data also do not seem to follow the cyclical pattern that is proposed by Minsky. Over the period of 1945 to 1992, the D/E ratio appears to peak for only two out of the nine reference cycle peaks.⁴⁹ Moreover, in the contraction phase it seems to rise in five out of the nine periods, but by a relatively smaller percentage change

⁴⁷ It could be argued that if the banks were more stringent in their lending practices, then the NFCs’ D/E ratios would not get too out of hand, and thus possibly avoiding financially unstable situations. See Kindleberger (1989).

⁴⁸ Wolfson (1986) and Minsky (1964) also have provided theoretical support for this notion of long-run perversity.

⁴⁹ See figure 2.

Figure 2: U.S. Short & Long Term Debt to Equity



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than in the expansion phase.⁵⁰ The rise in the contraction phase would seem also to contradict Minsky's theorem. This rise may be explained by the NFCs' increased need for cash to meet their operating expenses, since their profits tend to be declining in contraction periods, that is, they decrease for seven out of the nine periods.⁵¹ However, like the Canadian case, the D/E also appears to be consistently rising through the expansion periods with the only exception being 1975. Thus, once again, the argument will be established that the increase in D/E is one of the essential preconditions which leads to financial fragility and to an eventual downturn in the U.S. economy.

In order to derive a better understanding of what may have been causing the increase in D/E, it is worthwhile to consider the separate components of debt to see how they have been changing over the years. In particular, tax-exempted debt, corporate bonds, mortgages, bank loans, foreign loans, commercial paper, acceptances, nonbank loans, and U.S. government loans have been evaluated.⁵² Upon inspection of these variables it seems that commercial paper tends to have one of the more significant percentage increases during the expansion phase. That is, it has one of the greatest percentage change in each year except for 1957 and 1960, when bank loans and nonbank loans, respectively, seem to have the highest change. However, when foreign loans came into play in the 1970s, they appeared to have the largest percentage increase, although commercial paper still remained to have a significant effect.⁵³ Furthermore, looking at

⁵⁰ Refer to table 6.

⁵¹ This can be seen in table 7. Conversely, the table also shows that profits were rising for six out of the eight expansion phases. These results are consistent with one's expectations. However, since the profit data are annual, the more relevant issue of whether it is declining just prior to the peak cannot be ascertained.

⁵² Refer to data appendix for definitions.

⁵³ For results see table 9.

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commercial paper and foreign loans as percentage of total debt, it is discovered that they are both a relatively small portion; however, they have been growing. That is, foreign loans as a percentage of total debt in 1974 was 0.05% whereas in 1992 it had risen to 3.30% and commercial paper was 0.22% in 1945 and 4.64% in 1992. Another relatively small yet growing component of total debt is nonbank loans; for over the period of 1945 to 1992 it changed from 2.98% of debt to 6.78%. Conversely, the long-term debt components, such as corporate bonds and mortgages, have become a decreasing proportion of debt, though they still remain a significant portion. That is, corporate bonds as a percentage of total debt were 54.81% in 1945 and 47% in 1992 and mortgages were 19.95% in 1945 and 8.98% in 1992. The remaining categories have stayed relatively constant. This trend would seem to indicate that, over the total period of 1945-1992, NFCs have slowly begun to switch from long-term debt to shorter-term debt. This trend may be of great concern, for, if it continues in the future, it could lead to further problems for the fragility of the financial system since short-term debt is usually more likely to be vulnerable to interest rate fluctuations than long-term debt. Hence, if firms continue to increase D/E with even greater amounts of short-term debt, then not only will they be susceptible to changes in the goods market, but to changes in the interest rates as well. Furthermore, it is also interesting to note that the period with the largest percentage change in short-term debt is, coincidentally, also the one with one of the more severe recessions, that is, 1973. Conversely, the contraction phase does not seem to have any significant consistent pattern.

Looking at the overall secular trend, D/E in the U.S. has also been consistently rising from 1945-1973, thereafter declining until 1981. The fight against high inflation

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may have been partially responsible for the decline of D/E after 1973. During the period of 1974-1981 there were relatively high periods of inflation, that is, CPI growth was 11.04 in 1974 and 10.3 in 1981. So, in an effort to combat this inflation, the Fed stepped in and tightened monetary policy by increasing interest rates. This caused a number of firms that were unable to refinance the increased debt commitments to declare bankruptcy and thus to default on their loans, which led to a decline in D/E.

Similar to the Canadian case, the consistent secular rise in D/E from 1945-1973 can be explained by the problem of *moral hazard*. Developments in the 1970s began to undermine the stability of the fairly well regulated U.S. banking system. Rapid inflation and high, volatile interest led to the appearance of financial innovators who could find ways around regulatory restraints. In addition, enormous technological changes in communication and information processing permitted a redesign of many financial assets, which threatened to undermine financial intermediaries. And, as the U.S. went along, competition from foreign bankers, unrestrained by many of the prohibitions imposed on U.S. banks, began to make substantial inroads. These factors led to the use of more financial innovations, such as the CD, to get around these problems. However, this liability management was not covered by insurance, and thus the Fed found it necessary to increase its role in the financial market and hence increased its “financial safety net” (*cf.* Wolfson, 1990). With this larger “net” in place, banks, in an attempt to generate more profits, took on more loans or extended credit to customers or corporations whom they may have not dealt with in the past because they were perceived to be too risky. Hence, the U.S. government, like its Canadian counterpart, may have just been prolonging the

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inevitable long-run downturn.⁵⁴ In fact, Keeley (1990) was able to show that the fixed rate deposit insurance system of the U.S., provided a *moral hazard* for excessive risk taking. He argued that, even though the system had worked relatively well over its 50 year history, major problems began to develop in the early 80s.⁵⁵ His paper empirically substantiates his hypothesis that the increase in competition, in the U.S. during the 80s, has caused the bank charter values to decline, thereby causing the banks to increase their default risk through increases in asset risk and reductions in capital.⁵⁶ That is, he finds that the decline in the banks' market power, as proxied by their market to book asset value

⁵⁴ This can be seen in the relative severity of each recession. Using the percentage change in GDP from peak to trough as a rough indication, it is apparent that 1973 had one of the more severe recessions. That is, the percentage changes in GDP were: 1948 = 0.428%, 1953 = -0.697%, 1957 = -2.58%, 1960 = 0.313%, 1969 = -0.184, 1973 = -3.02, 1980 = -2.56, 1981 = -2.71, 1990 = -1.76.

⁵⁵ Kling (1986) also argues that the recent problem of increasing bank and thrift failures, in the U.S., can in part be attributed to *moral hazard*. But why has it taken 50 years for a major problem to arise? He claims that the recent episode simply reflects an increasingly risky economy, which in turn has increased the risk of bank portfolios. In the last few years, the world economies have experienced serious downturns such that they have affected the values of banks' and thrifts' assets. In addition, interest rates have become more volatile, increasing the riskiness of banks', especially thrifts', portfolios. Furthermore, according to Keeley (1990), the increase in bank and thrift failures may also reflect the decline in capital to asset ratios over the past two decades (see chart 1 and 2 in Keeley 1990, 1184-5). He believes there are two reasons why this decline has caused increased failures. First, the lower capital, holding asset risk constant, leads to less protection against failure. Second, as shown by Furlong and Keeley (1987, 1989), lower capital ratios increase the incentive for banks to increase asset risk. However, Keeley (1990) conjectures that these developments still do not explain why banks and thrifts have increased the riskiness of their portfolios by decreasing their capital ratios. He thereby argues that the differences and changes in the degree of competition faced by banks is a partial explanation to this puzzle.

⁵⁶ As it will be seen later in this section, banks were protected from competition by a variety of regulatory barriers. For example, chartering was very restrictive until the mid 1960s and state laws limiting branching, multi-holding companies, and interstate bank expansion were not liberalized until the 1980s. However, Keeley (1990) argues that the liberalization of these laws may have possibly eroded the banks' charter values. Likewise, he claims, deposit rate deregulation may have diminished charter values by increasing competition. In the 1950s and early 1960s regulatory restrictions on entry and competition made bank charters valuable. Banks thereby had an incentive not to risk failure since they could not sell the charter once they were declared insolvent. Instead, only the FDIC could sell the valuable charter of the insolvent bank. Thus, the possession of a valuable charter made it difficult to shift losses to the FDIC, and its potential loss in essence created a regulatory bankruptcy cost from the point of view of the bank owners. Banks thereby have an incentive not to increase default risk, either by reducing capital relative to assets or increasing asset risk, as long as expected loss of the charter exceeds the gains to the bank of the enhanced value of the deposit insurance put option. However, Keeley (1990) is able to show that the increase in competition, as a result of deregulation in the 1980s, has caused banks to increase their default risk.

ratios, was a primary cause of the decline in their capital to assets ratios. His empirical results showed that banks with more market power, as reflected in larger market to book asset ratios, hold more capital relative to assets (on a market-value basis) and they have a lower default risk as reflected in lower premiums on large uninsured CDs (see tables 2-4 in Keeley, 1990). Henceforth, following the findings of Keeley (1990), it is thereby argued that the reason that the *moral hazard* issue has not been as prevalent a problem until recent decades was due to the relative lack of competition in the U.S. banking sector. Another problem that promoted *moral hazard* was, over the years, that bank regulators and politicians have acted on the so-called “too big to fail doctrine.” That is, if a large institution failed, all its depositors were reimbursed even if the account exceeded the current limits. This action of the FDIC is unfair to small and conservative institutions. It encourages recklessness in the knowledge that default risk to depositors is effectively zero. However, there has been a recent proposal (1994) to Congress to have sweeping financial reform legislation that would among other things increase the fairness of depositors’ insurance. But, despite this current plea for reform, it does not change the past fact that the “too big to fail doctrine” has been implemented, and thereby this can be seen as a problem in that it promotes *moral hazard*. Furthermore, the problems for the FDIC during the 1980s and 1990s provide reason for concern about its reliability in the future. In the first 50 years of operation, the FDIC has averaged 16 bank failures per year, a sharp contrast from the average of 600 per year in the prosperous 1920s. However, in the period of 1982-1987 this average rose to 100 per year, from its 5 per year average from 1943-1981, and in the period of 1988-1990 it rose again to nearly 200 per year (Hutchinson 1992, 100). Had these bank failures been ones which were relatively small in

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size, this increase would not be of great concern. However, the recent failures have included some sizable banks, so that the cost of resolving them has been a matter of greater significance. Therefore, it can be concluded that not only does the FDIC promote the problem of *moral hazard*, but its recent relative effectiveness in preventing bank failures may be somewhat questionable.

The banking structure of the U.S. has been limited due to regulations such as *The McFadden Act of 1927* and *The Douglas Amendment of 1970*.⁵⁷ The U.S. commercial banking system thus turned into what some refer to as a *unit banking system*, composed of many individual, one office banks, rather than a few mammoth banking companies controlling extensive nationwide system of branch offices, like Canada. However, despite these acts, banks have managed to get around them to have some interstate banking.⁵⁸ In spite of the fact that there are a greater number of different banks in the U.S. than in Canada, this does not weaken the notion that *moral hazard* is also a significant problem for the U.S. as well, since its government has also acted on the “too big to fail” doctrine.

⁵⁷ By limiting national bank branching privileges to those granted by the state in which the bank is located, *The McFadden Act* effectively barred interstate branching. *The Douglas Amendment*, at least until the 1980s, was almost equally successful in banning interstate banking via the holding company device.

⁵⁸ Prior to the establishment of *The Douglas Amendment*, banks had a large number of bank holding companies, which were allowed to remain in place after the enactment due to the “grandfather clause.” Furthermore, a large number of banks were already involved in a limited type interstate banking through loan production offices and *Edge Act* corporations. Loan production offices, established by banks in other towns and states, would seek out potential borrowers from the bank’s home office. Since the paperwork was done at the bank itself, these offices were not considered to be branches under *The McFadden Act*. Under the *Edge Act*, banks were chartered under the federal government and were explicitly authorized in Federal Reserve to carry out banking business related to financial international transactions. Hence, the main movement toward a truly widespread nationwide interstate banking system came almost entirely during the 1980s through state laws inviting out-of-state bank holding companies in, thereby dismantling the obstacle that *The Douglas Amendment* had long imposed. Moreover, through widespread exploitation of a loophole in the *Bank Holding Company Act* via the so called “nonbank bank” movement, the interstate banking system grew (Hutchinson, 1992).

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After 1981, D/E began to increase beyond any previous values, peaking late in 1989, and recently has begun to decline again. The significant rise during the 80s could possibly be explained as a result of the “Reagan years.” It can be recalled that one of the main focus of “Reaganomics” was to increase tax breaks to businesses to stimulate growth. That is, Reagan’s Economic Recovery Tax act of 1982 decreased the price of capital, thereby increasing investment. Supply-siders argued that increased tax incentives encourage investment and as a result of these benefits the demand for investment increased. This increased demand was financed by more debt, due to the tax incentives. Hence, when one looks at the percentage of tax-exempted debt in total debt during the 1980s, one will find that it was growing.⁵⁹ “Reaganomics” was also promoted on the basis that these incentives for businesses to expand would increase their profits and would thereby have positive trickle-down effects in the forms of increased employment and economic growth. With inflation under double digits (CPI growth in 1982 was 6.2) the Fed began slowly to relax its monetary policy by decreasing its interest rates. This in turn provided a greater incentive for businesses to expand by taking out more loans. However, problems for the financial system started to arise in the late 1980s when firms’ profits began to decrease, which led to a decline in the investors’ confidence, and thus firms were forced to refinance increased debt loads by taking on greater amounts of loans. But for those unable to obtain additional funds, bankruptcy ensued, thereby causing defaults on their loans. Adding fuel to this fire was the S&L debacle of the 1980s, which was one of the largest and most expensive financial disasters in U.S. history - an estimated \$500 billion cost to the U.S. taxpayer; this figure includes not only the cost of paying insured

⁵⁹ Refer to table 9.

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depositors at the failed S&L association, but also the interest cost incurred by borrowing most of that money and paying it over time (Hutchinson 1992, 53). The problem of the S&L could be attributed to the skyrocketing interest rates (since a substantial portion of the mortgages they owned were fixed at relatively low interest rates of 6 to 8%), to their long-entrenched practice of "borrowing short and lending long," and to their fraudulent behavior. Therefore, Warshawsky's (1989) claim that there has been an increase in the leverage of U.S. corporations since 1986, due to tax reform, is substantiated. Moreover, he argues that these private incentives may conflict with the social desire for financial stability. Hence, his conclusion that the available evidence and logical considerations indicate that there should be some degree of concern about the financial health of the U.S. nonfinancial corporate sector appears to be appropriate (Warshawsky 1991, 29).

The U.S. and Japanese reference cycles often appear to occur in or around the same time frame. Thus, similar to the U.S. and Canadian scenario, the explanation of a relatively significant amount of trade done between the two can once again be used. That is, due to the high volume of trade between the U.S. and Japan, their respective NFCs' D/E ratios would be effected by each countries' economic state. For instance, a recession in Japan will cause a reduction in the demand for U.S. exports, which will thereby reduce U.S. NFCs' profits. If this happens near the peak of expansion, then the NFCs who are unable to obtain additional credit - to meet their increasing debt load - will go bankrupt and thereby mark a downturn in the economy.

Looking at the monthly stock market data for the Dow Jones, over the period of 1959-1993, we see that for four out of the six reference cycle peaks the market's index

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falls a month prior to or in the same month as the peak.⁶⁰ This would seem to indicate that the decrease in the stock market usually precedes the downturn in the economy. This is further supported when one also considers the effect the Dow Jones average price/earnings ratio has on the reference cycle. Looking at the same period of 1959-1993, we find that, for four out of the six cycles, the average price/earnings ratio falls just prior to or in the same month as the reference cycle peak.⁶¹ It can be recalled that the average price/earnings ratio is often used as a measurement of the indication of the investor's confidence. Henceforth, since it is declining prior to the downturn of the economy, this leads to the probable conclusion that this may also be a precondition for the financial instability of the economy. Moreover, it adds further strength to the argument that investors may be causing a self-fulfilling prophecy of market failure (*cf.* Kindleberger, 1989).

Finally, in the U.S., the NFCs' current ratio appears to have a very consistent pattern. That is, for eight out of the nine peak years, it is less liquid than in the trough years.⁶² This may imply that liquidity may be a factor in the problems for NFCs during an expansion. The reason may lie in the argument that, had they been more liquid, they might have been able to meet their debt problems more readily by liquidating assets rather than borrowing (see Wolfson 1986).

⁶⁰ See table 10.

⁶¹ See table 10.

⁶² Refer to table 7. The current ratio = current assets/current liabilities. Current assets are comprised of: checkable deposits and currency, small and large time savings deposits, money market fund shares, security repurchases, foreign deposits, U.S. Government securities, tax exempt securities, and commercial paper. Whereas current liabilities are: bank loans, commercial paper, other loans, taxes payable, trade debt, and miscellaneous liabilities, such as foreign direct investment in the U.S. and pension fund contribution payments. This is how the Federal Reserve Board of Governors defines the current ratio, which is the reason for its use.

Japan's Analysis

The D/E of the Japanese NFCs also does not follow the Minskian type cyclical pattern; in fact, it seems to be the opposite. That is, for five out of the seven business cycles, the ratio appears to peak at or shortly after the trough period.⁶³ Furthermore, the percentage change in the contraction phase tends to be consistently positive, except for 1977.⁶⁴ This would also contradict Minsky's argument, since D/E is consistently rising in the trough phases. The percentage change in the expansion periods, however, reveals that they are positive until 1976, where after they become negative. Therefore, unlike Canada and the U.S., Japan does not seem to have the same consistent rise in the D/E ratio in the expansion phase. However, the overall secular trend indicates that it has been consistently rising over the period of 1960 to 1976, after which it has been generally declining. Hence, it may be of some interest to look at the reasons why this trend has occurred.

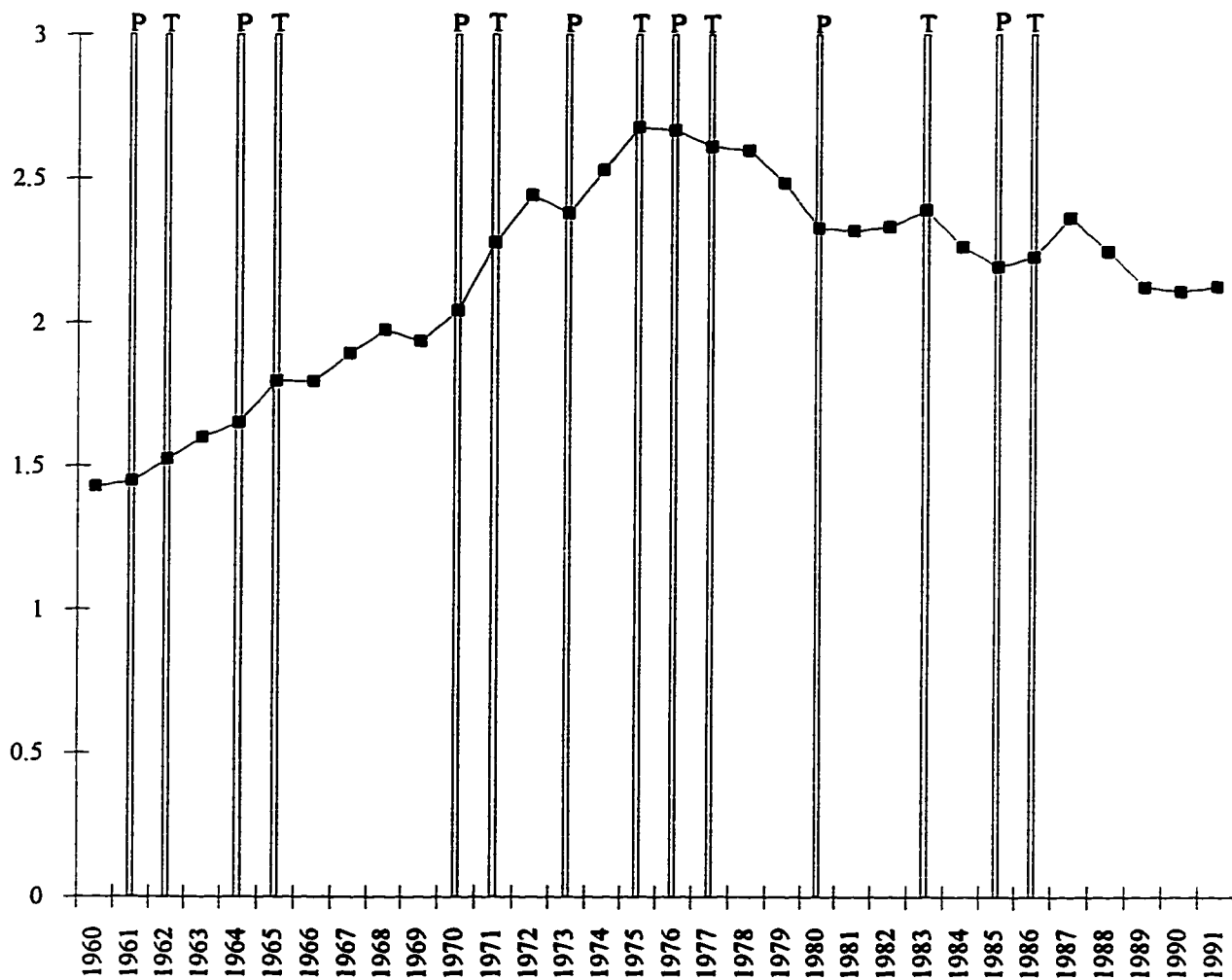
Once again, it may be useful to evaluate the separate components of debt in order to derive a possible explanation of this trend. However, when looking at long-term loans, short-term loans, and corporate bonds, a dominant separate component does not appear, unlike in the North American case. That is, in an expansion, Japanese NFCs appear to finance their debt relatively equally amongst the three components.⁶⁵ In addition, from table 13, long-term loans as a percentage of total debt are found to be a relatively sizable portion, whereas corporate bonds are relatively small. This would seem to reinforce the well-known notion that Japanese firms tend to rely more on loans rather than the bond market to finance their expansions (*cf.* Davis 1992 and Singleton 1993). In Japan, unlike

⁶³ See figure 3.

⁶⁴ See table 11.

⁶⁵ Refer to table 12.

Figure 3: Japan's Short & Long Term Debt to Equity



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North America, the market for corporate bonds is relatively small. The reason is that regulatory impedance, particularly collateral requirements, used to be severe enough to prevent a large market from emerging in such instruments. Although deregulation has eased restriction, growth in the domestic market has been very slow since borrowing from abroad has been either cheaper or easier to obtain. However, since 1970 deregulation has also caused the capital flow restriction to be dropped and there are no longer interest rate ceilings on CDs. Moreover, since 1985 money market certificates have grown in popularity and negotiable CDs and large denomination time deposits have become important financial instruments. In addition, the marked disintermediation of Japanese financial markets has also caused a substantial change in the way in which the NFCs finance their debt. In 1970, 97% of all corporate debt was held by banks and insurance companies, while in 1990 they held only 60% of this debt (Singleton 1993, 1).

Nevertheless, deregulation has been slower than in other countries. In general, financial innovations have been hampered by strict Ministry of Finance regulations.⁶⁶ As a result, the Japanese money market for uncollateralized debt (e.g. commercial paper) did not develop until 1989. Furthermore, due to the development of their financial system, Japanese NFCs have also tended to rely less on financing via equity (the stock market) and this will be explained below. These combined factors are an explanation as to why the Japanese NFCs have a relatively higher D/E ratio than their North American counterparts (see Davis 1992 and Dosse 1986). That is, since they rely more heavily on debt, which

⁶⁶ For example, because of restrictions on interest paid on deposits, personal cheques are not widely used and many government bonds are issued at negotiated rates rather than at auction setting.

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would increase the numerator, and less on equity, which would decrease the denominator, the overall effect would result in a larger D/E ratio.

Evaluating the contraction phases reveals that, once again, there is no clear and consistent pattern for the type of financing the Japanese NFCs rely on. That is, it often varies from the greatest percentage change being short-term loans to long-term loans. Thus, given these relatively ambiguous findings, one would suspect that there must be other reasons that explain Japan's rise in D/E over 1960-1976.

In order to discover the cause of this trend, perhaps it would be insightful first to look briefly at the development of Japan's financial system. In general, Japan's banking system lies somewhere between the dispersed, fractionated U.S. system and the relatively concentrated Canadian system. Japan's system reflects both local and western concepts. Industrial growth necessitated large amounts of financial capital, augmented by a small group of conglomerates, such as the *zaibatsu* ("financial cliques"), which are a rich and somewhat unique aspect of Japanese financial development. After 1945, the *zaibatsu* and special banks were abolished in order to get in line with U.S. banking practices.⁶⁷

Another U.S. import was the separation of commercial lending and securities underwriting, which eventually led to the lesser use of the stock market. However, despite these changes the Japanese banking system eventually developed particular characteristics, the most notable policies being *overloan* and *overborrowing*, as well as an imbalance in liquidity positions of large and small banks (Ito T., 1992). *Overloan* (or overdraft) policy is one that maintains net bank reserves - that is, cash in the bank and

⁶⁷ After W.W.II, the U.S. decided to help Japan in its economic recovery. So, in an effort to modify its system, the U.S. government requested these specific changes to the Japanese system.

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reserves at the central bank - in a negative position by making loans or investments funded from sources other than deposits as equities. That is, Japanese banks are essentially in debt to the central bank, as, unlike other industrial countries, its loans to financial institutions are larger than the reserves it holds. Until the 1980s, overlending used to only be a phenomenon of city banks (i.e. large banks that control significant market shares) while other financial institutions had positive net reserves. The reason for this imbalance is the favorable position in the city banks' access and ability to borrow from the central bank and the relatively greater demand for credit from them. A city bank is usually the main bank for some large industrial enterprises. On the other hand, *overborrowing* is a policy that encourages the corporate sector's reliance on bank loans instead of equity to raise funds. The reason for this policy is the historical close ties between commercial and banking concerns as well as the prohibition of stock market operations imposed by the U.S. for a short time after W.W.II. The result is little effective competition between the banking and nonbanking sectors. In addition, the latter tends to lend to high-risk enterprises. The implication is that the nonbanking sector faces a high degree of credit risk; only government assistance prevents large-scale failures. Hence, with these types of characteristics, one can easily see the reasons why Japanese NFCs have a relatively high D/E ratio, compared to North American firms. Furthermore, even though the *zaibatsu* do not formally exist nowadays, their inherent presence is still felt in Japanese business dealings, that is, the close-knit dealings and relationship between the corporations and the banking sector. Thus, the most important difference from other countries was the Japanese government's and conglomerates' prominent role.

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Hence, a possible explanation of the rise in the D/E ratio over 1960 to 1976 could lie in the close ties that firms have with banks in Japan. In the 1970s, *keiretsu* had a precise meaning of being a pyramidal structure of subsidiaries and highly dependent suppliers and subcontractors who were all grouped around a large manufacturing firm. In more recent times, however, it has been generalized, by westerners, to be like the old *zaibatsu* - an interconnection of firms or firms who share the same main bank - and this relationship has been seen as the main force for denying access, in the past, to the Japanese economy. As a result of these types of relationships, Japanese firms have been notorious for having very close relationships with their banks. For instance, the main banks in Japan are major shareholders of corporations, which have the closest ties to them in terms of cash management and short-term and long-term credits. It thereby plays the role of a manager of a loan consortium when a group of banks extends major long-term credit to the company and is responsible for closely monitoring the business affairs of the company. If the company suffers a business crisis, the main bank assumes the major responsibility for various rescue operations, which include the rescheduling of loan payments, emergency loans, advice for liquidity of some assets, the facilitation of business opportunities, the supply of management resources, and finally, reorganization to secure the claims of the consortium. If the profits of a company begin to decline, the main bank is able to detect the problem at a rather early stage through information gained from the management of commercial assets, short-term credit, long-term personal contracts with top managers and its business partners, etc., because of its special position. Thus, if the bad state of affairs continues, banks can reorganize the management of the corporation. Recent experience indicates, however, that banks do not change the fundamental nature of

internal management; rather, they hand over the top management positions after reorganization to internally promoted employees. Because of this relationship, internal managers naturally would detest external interference by the main bank, since the bank taking control is a humiliating blow to the failed management and, hence, it would seem that management would aspire to pursue high profits.⁶⁸ However, in normal circumstances, it does not play an explicit role in the selection of management or corporate policy-making. Perhaps then the rise in the D/E ratio during the trough periods could be explained by the main banks' relation to the NFCs. That is, in bad times, the main banks take control over the NFCs, which they deal with, and thus extend credit to them in this time of need. One would presume that these types of relationships would heighten the problem of *moral hazard*. However, because of the way the *keiretsu* are structured, it promotes risk-sharing and the joint creation and ownership information, which are safeguards against the abuse of trust (see Ito, M. 1994). In addition, with increased deregulation the Ministry of Finance, in 1991, revoked its doctrine of bailing out failing banks. This in turn may also reduce the problem of *moral hazard*, since Japanese banks may be less inclined to take on more risky loans because of fear of not being bailed out, in the event of a default on these types of loans. However, the recent Daiwa scandal is sure to change or to be at least an exception to this policy, since it has brought the government back into the financial circle by promising that no depositor will lose money in the event of a bank failure. This recent event, perhaps, indicates that in reality the Japanese government may not be able to truly abandon its doctrine of "too big to fail,"

⁶⁸ See Pascale and Rohlen (1983). They found a positive correlation between the degree of management freedom from bank control and the level of corporate profits.

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without the threat of a serious banking panic. However, despite the use of this doctrine and the 1971 inception of depositors' insurance, it appears that the problem of *moral hazard*, for the time being, does not seem to be as substantial a problem in Japan as it is in Canada and the U.S. In fact, Davis (1992) found that the *moral hazard* problem in Japan is reduced between borrowers and lenders, due to the relatively close ties between them. In addition, Mayer (1988) also found that this relationship may lead to superior risk-sharing, in Japan. That is, it may avoid unnecessary liquidations arising from illiquidity (inability to pay interest owing to lack of cash flow) rather than insolvency (liabilities exceeding assets), as well as help to stabilize company's profits and promote long-term investment. And as Davis (1992, 24) notes, such "commitment" is absent in many cases of financial fragility and systemic risk. Whereas, in North America, *moral hazard* was discovered to be more prevalent as a result of borrowers having more difficulty in assessing the risk of an investment or being less concerned with the risk due to the "financial safety net" (Mishkin, 1991). Thus, due to the close relationship between the banking sector and the NFCs, the consistent rise in D/E can be explained by the banks extending credit to the NFCs in their time of need. By the same line of reasoning this close tie may also be an explanation why the D/E ratio may not play as substantial role in the fragility of the Japanese economy as it does in North America.

The main objective of North American firms are short-term, that is, increase the rate of return on investments or boosting the share price. Thus, managers in the North America are under strong constraints to keep short-term share prices at high levels and assure as much profit as possible. This makes it difficult for them to look at matters from a long-term point of view when it comes to expanding the business. The choice to

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sacrifice current profit in order to introduce a new production facility, for instance, is a difficult one for them to make. Rather, they tend to look for strategies that will allow them to boost profits in a short time and are probably more likely to acquire or merge with a company already in the field in question. In contrast, the Japanese corporations tend to focus on more long-term goals, such as market shares and new product development. Thus, they tend to concentrate on research and development and planning. These departments have a large say in what goes on and corporations are indeed focused on long-range goals. This makes them aggressive when it comes to new capital spending to introduce new technology.⁶⁹ In 1986, a survey by the Economic Planning Agency of Japan, *Corporate Awareness and Actions*, indicated that Japanese corporations are not paying as much attention to decision factors that are directly related to short-term profits (i.e. the operating conditions of existing facilities, profit levels, etc.). On the other hand, reflecting investment in high technology, corporations are looking to more long-term factors such as technological innovations and diversification. This would tend to add strength to the previously conjectured notion that Japanese firms focus more on long-term goals. However, it can be recalled that, in the past, the Japanese securities market has been seriously regulated. Therefore, Japanese firms have relied upon it less for financing and this may be a possible reason for the difference in their focus, from the North American NFCs. In addition, the discount rate for corporations was lower in Japan than in North America, which made more long-term investments possible. However, a discrepancy also arises here because of the previously noted relationship between the main

⁶⁹ For a comparison of management policies of the firms in the U.S. and Japan, see chp. 6 in Takenaka (1991), and chp. 12 in Ito, T. (1992).

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banks and Japanese corporations. That is, NFCs' managers may feel compelled to focus on profits, in order to maintain their pride as well as their job. Thus, so long as the relationship between the main bank and NFCs exists, the Japanese manager's focus may change in the future as the markets become less regulated, that is, it may shift to be more congruent with the North American goals and thereby D/E may play a more prominent role in the future fragility of Japan. In fact, Okimoto (1988) found that recent U.S. and Japanese business strategies are indeed becoming more similar. That is, some of the major companies in Japan are beginning to take on low debt financing (e.g. Sony and Matsushita). Hence, they are starting to rely on greater amounts of equity financing like the U.S. firms. In addition, Hoshi *et al.* (1990) has also shown that, despite the fact that Japanese banking relations reduce information problems and relax liquidity constraints, many companies have sought to weaken bank ties, following the liberalization of the financial markets. That is, increased generation of internal funds may have facilitated these reductions in bank ties to become more in line with the North American approach. And, as we have already seen, from Davis (1992) and Mayer (1988), these relationships have helped to stabilize the Japanese economy, thereby implying such a move may not be in Japan's best interest.

Global developments have also affected the way in which the Japanese system has developed. In particular, the *Plaza Accord of 1985* unleashed a dramatic increase in the yen against the U.S. dollar, which in turn had numerous and profound impacts on the Japanese economy.⁷⁰ As Japanese businesses realized that the strong yen would continue

⁷⁰ The accord called for the yen to be raised and the U.S. dollar depreciated. Because of "Reaganomics" in the 1980s, there were high interest rates and a strong dollar. This allowed Japan to expand greatly its exports and achieve renewed economic development at the same time. However, a large external

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into the medium term, their behavior, in such fields as production and investment, shifted significantly. The most direct expression of this change in attitude was the dramatic increase in direct investment in the U.S. and the Association of Southeast Asian Nations (ASEAN). Today, Japanese firms are manufacturing less at home and more overseas. This tends to imply that not only are the NFCs' D/E affected by domestic events, but also international situations play a strong role. That is, the investments abroad of the Japanese increased as a result of the strong yen, thereby increasing their debt to finance this desire. Along with these international changes came changes from within. The 1980s brought reforms in Japanese legislation to give corporate tax incentives but they were not implemented until 1989. These incentives followed the establishment of the Special Tax Measures laws of 1952 (see Tsuru 1993, 105-6). The effect on investment is debatable, but Tsuru (1993) believes that these incentives have played an important role in Japanese development over the last few decades. Moreover, since the tax burdens on industrial corporations in Japan have also been found to be lighter than in other advanced countries, this would also tend to increase further the incentives for Japanese NFCs to expand via increased debt.⁷¹ Thus, these combined factors can be seen as another reason why Japanese NFCs have a relatively higher D/E ratios than the North American sector. In addition, since Japanese firms relied heavily on external debt for financing investments,

imbalance was generated and countries around the world began to demand that Japan assume more international responsibility, and hence the establishment of the accord.

⁷¹ In the background for this favorable conditions are two features of the Japanese economy which are somewhat distinctive. The first is that the Japanese tax system imposes, on the whole, a relatively light load on tax-payers. In terms of percentage to GNP, tax revenue in Japan, both national and local, was 21.1% in 1972 compared with 36% for West Germany and 28.1% for the U.S. (OECD, 1975). The second unique feature is the heavy reliance on external debt in the capital structure of Japanese corporations. The interest payments on borrowed capital are thereby treated as expenses to be deducted before arriving at the figure of profits, which are the object of corporate taxation, thus providing tax incentives to borrow (Tsuru, 1993).

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one can thereby readily understand that the level of interest is of particular importance (see Takenaka, 1991). Here is a situation where the proverbial function of the interest rate as a crucial market variable in automatically rationing investible funds could come into play, that is, an increase will discourage excessive investment demand and a decrease will invite new investment through impersonal interactions of supply and demand. However, what has transpired in postwar Japan has essentially been not the balancing of supply and demand through the free play of the market rate of interest, but rather the rationing of funds at the discretion of the Bank of Japan (BOJ), major commercial banks, special banks (e.g. Japan development bank), and the Treasury Investments and Loans Authority. Furthermore, a resort has been made systematically to subsidize specific industries to keep the interest burden low. In circumstances where administrative limitations exist on the volume of loans that each bank can make, each bank, in turn, is forced to impose some form of rationing on its own clients. Thus, the natural inclination of commercial banks would be to favor, especially in times of tight money situations, borrowers with traditional ties of the *zaibatsu* type. This “low interest policy” was therefore, in actual fact, more of a direct rationing policy based upon a peculiar monetary instrument called “window guidance” (similar to moral suasion), and the availability of sizable investible funds through government and semi-government financial institutions.⁷² Relatively low interest rates could thus be maintained more or less in an inflexible manner and have contributed to the buoyancy of investment demand in the high growth decades in Japan. Thus, the central importance of bank credit in financing real investments in Japan and the influence

⁷² “Window guidance” is a form of suggestions on specific quantitative ceilings on aggregate lending of each bank, by the BOJ, at the discount window and usually is invariably accepted.

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that the BOJ has over the extension of bank credit suggest that monetary policy may have also been an important determinant of the flow of funds to corporations and, hence, of real growth in Japan during recent decades. A study by Yoshikawa (1993) found that monetary policy has a substantial impact on real output primarily through its effect on fixed investment and imports. However, with increased liberalization of Japanese financial markets, there seems to have been a concurrent increase in the BOJ's reliance on the market mechanism rather than on moral suasion to influence interest rates and the banks' lending activities. One might expect a further weakening of the influence of moral suasion, and the increased reliance on market mechanisms, by the BOJ and the Ministry of Finance, as corporations increasingly gain access to overseas markets and the accounting procedures for Japanese companies change. Consistent with this view, the BOJ announced in June of 1991 it would no longer use "window guidance" in the conduct of monetary policy. If this change in policy is maintained, it would constitute another example of a shift from direct administrative guidance of bank behavior to a reliance on market mechanism for controlling loans. However, is this necessarily a change for the better? From past experience it would seem not to be. Until very recently Japan has managed to have no bank failures. But since the changes have been implemented, Japan has already experienced a couple of failures. Furthermore, as Bludnell-Wignall and Browne (1991) have pointed out, liberalized financial markets have been associated with certain undesirable outcomes, which may partly offset the benefits, such as asset price inflation and volatility, changes in the effectiveness of monetary policy, financial fragility and systemic risk. Moreover, if one looks at the U.S.'s banking history, a sudden sense of fear may come upon the Japanese as more deregulation takes place in Japan.

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A possible explanation as to why D/E declined after 1976 could be the result of Japan's fight against extremely high inflation rates during the mid 70s, that is, annualized CPI growth in 1973 was 11.65, 23.12 in 1974, and 11.76 in 1975. Authorities stepped in and raised interest rates, bringing inflation rates down - annualized CPI growth in 1977 fell to 6.2 and to 4.15 in 1978. However, this rise in interest rates caused firms to require increased amounts of capital to cover the rise in contractual cash flows and, despite the close ties with the banks, some firms were unable to attain refinancing and, as a result, a number of firms went bankrupt, causing D/E to fall.

Looking at the effects of the stock market, the average Tokyo Stock Exchange (TSE) price index shows a dip, in the reference cycle, after only three peaks out of the possible seven studied.⁷³ In fact, in four out of the seven contraction phases of the reference cycle, the TSE average price index increased. This tends to indicate that, generally speaking, investors do not seem to be consistently swayed, as in North America, by declining profits and increased debt, implying that there may be no "self-fulfilling prophecy" per se in Japan. Rather, the reason for higher debt can be explained by the previously noted fact that the stock market has been less influential, for Japanese NFCs, since they have traditionally relied more upon debt than equity to finance their investments. That is, since the Japanese manager's focus has, in the past, been primarily on long-term goals, they have felt less compelled to be concerned with price/earnings ratios and profits (see Okimoto, 1988).

As figure 3 has shown, the D/E in Japan does not appear to play as prominent a role, for the fragility problem, as in North America. A reason for this may be explained by

⁷³ See table 14.

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the somewhat cooperative attitudes of the Japanese consumers and workers. It has been noted that Japanese workers have taken pay cuts in difficult times, in order to help save the company (see Aoki 1990 and Takeshi 1988). However, it is possible to show through game theory that this act may in fact not be unselfish, but rather in their own self-interest. But what cannot be explained by game theory as self-interest is the Japanese consumers' remarkable tolerance towards increasing prices. It has been a well known fact that, in the past, Japanese consumers have been more willing to accept increases in prices, as compared to other advanced countries' consumers, as a sacrifice for their country's growth and development (see Higashi and Lauter 1990). However, they too can only be pushed so far.⁷⁴ Thus, the future of the NFCs may not be as stable as in the past. With increased use of the securities market, coupled with the probable increasing consumer resistance, the NFCs will probably face a future with less security. This may be apparent by recent Japanese financial problems.⁷⁵

⁷⁴ The resistance of the consumption tax of 1989 is an example of this. Consumer awareness of the marketing system was raised because of the potential effects of the tax. Concerns arose because 70 percent of all companies were exempted from collecting the tax, but these small firms could still raise their prices to the levels of large firms and, thus, earn wind-fall profits. As a result of public outcry, the government ministries warned numerous businesses, where price increases were said to be rampant (e.g. barbers and restaurants), to restrain themselves (Higashi and Lauter 1990).

⁷⁵ An unhappy characteristic of the Japanese financial system has been a large number of financial scandals involving banks and securities companies. Securities companies have been found to be covering up losses of large clients in the stock exchange. Banks have been caught making a substantial number of illegal loans. The high degree of leverage, scandals, and recently burst real estate bubble have placed many commercial banks on shaky financial ground. For example, it has been recently revealed that the Daiwa Bank, in New York, has been concealing, for the past eleven years, a \$1.1 billion dollar loss, prompting the resignation of its president on October 9, 1995. But it seems that the Japanese finance minister was well aware of the problem earlier on; however, he failed to alert regulators at New York's Federal Reserve Bank for more than a month after he got wind of them. In addition, until this year, the ministry also veiled the troubles in the banks, refusing to acknowledge the extent of non-performing loans. In June it also dropped this pretense. The finance ministry now says that Japan's banks may have 50 trillion yen (\$500 billion U.S.) of bad loans. This is still way below most private estimates, which hover around 80 trillion yen. But the ministry at least concedes that it has a problem. It is preparing to use public money to rescue the weakest lenders. Helped by a stock market recovery and the Bank of Japan's super-loose monetary policy, the big banks will probably be strong enough to solve their problems. However, some pessimists argue that the apparent strength of Japan's city banks disguises their exposure to weaker brethren. Big banks have lent huge sums to small ones, partly because they were offered juicy

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Looking at the current ratio, it is apparent that during most of the peak periods, firms tend to be slightly less liquid than in trough periods. Nevertheless, overall NFCs in Japan tend to be relatively liquid, that is, they have a current ratio of approximately 70%.⁷⁶ This would seem to imply that, unlike the North American NFCs, the lack of liquidity at the end of expansion does not appear to be a factor in Japan. Moreover, this ratio is higher due to the fact that, since the NFCs are encouraged to take out greater amounts of debt - because of tax incentives and strict government regulations on alternative sources, there are higher government safety requirements imposed on them to be more liquid, as compared to Canada and the U.S. (see Borio 1990a). Thus, the fact that Japanese NFCs' current ratio is higher than North American NFCs can also be used as an explanation as to why their higher levels of D/E appear to be less of a factor. That is, Japanese firms seem to be less constrained by a lack of liquidity when they truly require it - near the peak of an expansion (*cf.* Wolfson 1986). Finally, when the percentage change in profits, during an expansion, are inspected, we see in every case that profits are increasing whereas conversely they are consistently declining in the contraction phase.⁷⁷

rates, and partly because this let them side-step the rules restricting their exposure to property. The closure in late August of 1995, of Hyogo, a regional bank, highlighted the risk this poses to bigger banks and led to the "Japanese premium" (i.e. a higher rate of interest charged by foreign lending financial institutions). However, the real worry about big banks should lie in the fact that none of them knows exactly how many bad loans they have. Some bankers are said to prevent loans from souring by lending clients fresh cash with which to carry on paying interest. Given this kind of obfuscation, foreigners' anxiety seems to be justified. Another problem is Japan's continuing cover-up about land. Owning up to the severity of the property crash will take enormous courage. Banks will be forced to set aside yet more cash to provide for non-performing loans, since many of these were backed by land collateral. Small firms, which lack alternative forms of collateral, may be denied new loans. But a crash is a crash. At present, the government encourages property owners to pretend that their land is worth more than it is. This merely makes it unsellable. With no property changing hands, development and construction firms have little to do. Together, these employ one in ten Japanese workers. So many idle hands are a big reason why, even after four years, Japan's recession is not over. *The Economist* (1995), Oct 14-20 p. 89-90.

⁷⁶ See table 15. The current ratio for Japan is calculated by dividing the sum of cash, deposits, and accounts receivable (including bills receivable) by current liabilities.

⁷⁷ See table 15.

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This finding is consistent with what one would expect to find. Once again, given that the data are only provided annually, it is impossible to assess the more relevant question of whether profits are declining just prior to the peak.

Thus, the Japanese analysis tends to create a somewhat different result from the U.S. and Canadian cases. As previously noted, the D/E ratio does not appear to be consistently rising in the expansion phases, which may possibly indicate that, at least in Japan, it is not as much of a factor for laying the foreground to a financially fragile state. However, because of Japan's notorious history of scandal and cover-ups, one may truly question the accuracy of the data provided by them. But going on the assumption that they are correct, it is probable that the close relationship between the government, banks and firms play a prominent role in explaining the differences. In addition, it was argued that the lack of *moral hazard*, the relatively lower use of the stock market, the higher liquidity ratio and the general altruistic attitudes of the Japanese have also contributed to the explanation as to why D/E plays a less significant role than in North America.

The Regressions

The theoretical and statistical analysis of the last two sections have suggested that a rising D/E, a change in monetary policy and investors' behavior, along with a shift in the firm's profitability and liquidity, may all be laying the foreground to a fragile financial state. This section thereby attempts to use the insights offered by economic theory to develop a more rigorous empirical approach, in order to test the validity of these suggestions. The modeling approach is to determine the causation effects of different variables on the business cycle. That is, D/E; imports (to see if trade amongst them plays

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a role); the bank rate; the prime rate; markup (prime rate - bank rate); profits; stock market indices (to evaluate investor's behavior); and the current ratio (current assets/current liabilities, as a indication of liquidity) are all tested against each other as well as on real GDP (a proxy for business conditions).⁷⁸

The data for all three countries were rendered stationary by either differencing or detrending the variables. Augmented Dickey-Fuller (ADF) tests were initially performed on the log values of each variable, in an attempt to establish which of these stationary techniques would be more appropriate. In addition, LM tests were also conducted in order to ensure that there was no autocorrelation, which would invalidate the ADF tests.⁷⁹ The results of the ADF seem to indicate that, for almost all of the variables, a unit root was present and thus a differencing approach was implemented. In addition, a test for cointegration was performed on the variables that had the same integrating level. The reason for this was that it has been argued that differencing the data may sometimes change the long-term relationship between the variables involved. Thus, using data in levels may be more appropriate, when the data allow it, that is, when they are cointegrated (see Engle and Granger 1987). Furthermore, Granger (1988, 204) notes that causation may be present, but that the testing procedures would not detect it if the series were $I(1)$ and cointegrated. One can thereby appreciate the importance of this test. However, upon inspection of the results none of the variables were found to be cointegrated and therefore, where appropriate, the differenced data had to be used. The remaining few variables appeared to have a linear trend and thus a detrending process was used in an effort to

⁷⁸ For a detailed listing, refer to data appendix.

⁷⁹ For a detailed discussion on the importance of proper detrending and the significance of using stationary data, see Nelson and Plosser (1982).

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make them stationary.⁸⁰ After the data were determined to be stationary, a series of Granger (1969) causality tests were performed in hopes of shedding some light upon the direction of causation amongst the chosen variables. That is, upon initial inspection of the data there appeared to be a simultaneity problem with some of the variables. For example, it was uncertain whether real GDP was causing D/E or conversely, whether D/E was causing real GDP or if they had some feedback relationship or no relationship at all (i.e., were independent). However, some may criticize the use of these tests with annual data for several reasons. The first is that the degrees of freedom are relatively small as compared to quarterly or monthly data, and this may in turn place some strain on the validity of these tests. Second, it has been argued that, when performing two-variable causality testing, the Granger (1969) test fails to take into account that there may be a third variable which is influencing this causal relationship.⁸¹ Finally, it may be argued that since peaks and troughs occur monthly, using annual data may be considered inappropriate truly to capture these effects. The first two arguments are certainly valid complaints and they are considered to be potential limitations of these tests. The readers should thereby bear these constraints in the back of their minds when interpreting the results, that is, they should be cautious about the extent that the results can apply. The last argument, however, may be misguided in its accusation. Granger (1988, 202) states, "There is no reason for the available data to be measured in the same unit of time that the definitions

⁸⁰ That is, since higher order roots were not detected - by higher differencing techniques, these variables were regressed against time and their residuals were used, in an effort to detrend the data. Numerous studies have used this approach such as Krol and Ohanian (1990), Stock and Watson (1989), and Nelson and Kang (1981), to name just a few.

⁸¹ It should be noted that Granger (1969, 429) is aware of this limitation as he states, "If relevant data have not been included in this set, then spurious causality could arise." Others have criticized the tests along these lines and caution the interpretation of the results, such as, Zellner (1988) and Cooley and LeRoy (1985).

would require for a proper test of causation. The data may be available monthly and the actual causal lag be only a couple of days for example.” Despite these potential limitations, Granger (1969) tests are believed to be a relatively good indication of the direction of causality. For it can be argued that to proceed by placing *a priori* restrictions on these variables relationships may be even more short-sighted.

In addition, it is also worth noting that only one lag was used in these tests. The reason is that, since annual data are being used, it is thereby presumed that any higher lagging may not be deemed to be economically sound and would come at the expense of the already limited degrees of freedom.

Using the Granger (1969) tests as a basic guideline, a series of simple OLS regressions were performed in order to determine the correlation amongst the variables involved. However, due to the fact that a relatively low adjusted R-squared often appeared, the interpretation of the results was limited by this constraint. Hence, a series of vector autoregressions (VAR) tests were performed as a supplementary test. The reason for these tests was to ascertain whether the specified variables were jointly neutral in the regression. This was determined by analyzing the log likelihood ratios of the restricted and unrestricted VAR.⁸² Once again, a lag value of one was used in order to prevent the possibility of *overparameterization*.⁸³

⁸² That is, they were tested with the likelihood ratio statistic, $2|LL_R - LL_{UR}| \sim \chi^2$. Where LL_R is the log likelihood of the restricted form and LL_{UR} is the log likelihood of the unrestricted, which has degrees of freedom equal to the number of parameter restrictions. Here the null hypothesis is that they are jointly neutral. For an illustrative example of this technique, see Sims (1980).

⁸³ For example, suppose we consider six lags for each variable and we have a system with four variables. Then each equation would have 24 parameters to be estimated and thus we would have 96 parameters to be estimated overall. Hence, one can see how an increase in lags can limit the degrees of freedom for annual time series data. See Maddala (1992, 580).

Canada's Regression

The stationary annual data were placed through a series of Granger (1969) causality tests. The variables used were real GDP, D/E, markup, Toronto Stock Exchange index (TSEA), imports, profits, the bank rate, and the prime rate.⁸⁴ The majority of the tests seem to find a feedback or bilateral causality type of relationship amongst the variables. However, of the three countries, Canada seems to produce the most interesting and concrete results. In particular, it was found that D/E was causing real GDP. This may tend to support the notion that D/E may be laying the foreground for changes in the business cycle. Another interesting finding was that profits were also found to be causing real GDP. This may lend some creditability to Wolfson's (1986, 1990, 1995) argument that a declining rate of profits is a factor for financial fragility. In addition, TSEA was found to be causing real GDP as well. This would tend to support the generally accepted notion that investors' behavior affects the business cycle (*cf.* Kindleberger, 1989). Furthermore, it was also discovered that markup was causing D/E. This finding would contradict Minsky's notion of fragility, since he has argued that the direction of causation was the other way around (*cf.* Minsky 1977, 1982). However, as will be seen below, this finding was only prevalent for the Canadian data and thereby its implications are somewhat weakened. Finally, it is worth noting that the prime rate was found to be causing real GDP, indicating that it too may be an important factor for the business cycle. Thus, the change in interest rates can be seen as a probable cause of the fragility of the Canadian economy. However, these causation tests do not tell us whether the variables are positively or negatively correlated. Additional testing is thereby required

⁸⁴ See data appendix for description of variables.

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in order to ascertain the true effects of these variables on the Canadian business conditions.

In an attempt to achieve this goal, a series of simple OLS regressions were performed. For instance, real GDP was regressed upon D/E, profits, the prime rate, and TSEA. Upon inspection of the results, it was found that there was no autocorrelation (as shown by LM test) and the variables were not cointegrated. However, all of the variables contained a single unit root, and thus first difference equations were used in this regression. The adjusted R-squared was 0.315 and the significant variables (that is, the ones with a significant t-statistic of at least 1.96) were D/E and TSEA, which were both positive. However, even though profits and the prime rates were not deemed as statistically significant, they still produced moderately high t-statistics of 1.14 and 1.50 respectively. Bearing the R-squared in mind, these results would tend to imply that both D/E and TSEA have positive relationship with the business conditions. That is, as these variables increase, so does real GDP, or conversely, as they decline, so does real GDP. Thus, one could possibly argue that this tends to strengthen the notion that a decrease in investment activity may lead to negative impacts on the Canadian economy, thus reconfirming the “self-fulfilling” hypothesis of the previous section, as well as the Kindleberger (1989) proposition of the *causa proxima* of a crisis. Moreover, the positive correlation between D/E and real GDP implies that a rising D/E may eventually lead to a downturn in the economy and thereby may be a contributing factor to the financially fragile state. But, once again caution should be exercised in accepting the strength of this

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conclusion due to the relatively low R-squared and the potential problem of multicollinearity between the variables.⁸⁵

Another simple OLS was performed on D/E against markup and a constant. Once again no autocorrelation was found. However, the adjusted R-squared was relatively small at 0.1186. The markup was found to be significant and positive, but due to the low R-squared interpretation of this result is constrained.⁸⁶

In order to test whether D/E, profits, the prime rate, and TSEA were jointly neutral in relation to real GDP, a VAR was performed.⁸⁷ The $\chi^2(4) = 29.20$, which leads to a p-value of approximately zero and, thus, the null that they are jointly neutral was rejected. This would tend to imply that together these variables are affecting real GDP, which may be considered as a proxy to the business conditions. Therefore, D/E, profits, the prime rate, and TSEA may be perceived as constituting the foreground for a financially fragile state in Canada.

U.S. Regression

Granger (1969) causality tests were applied to the stationary U.S. annual data. The same variables were used as in the Canadian case, in an attempt to maintain a

⁸⁵ See table 16 for results. Due to the fact that some of the independent variables were found to have a bilateral causality type relationship between them, this may lead to the problem of multicollinearity. Thus, in an attempt to alleviate this problem, a ridge regression was performed. However, the results of this regression did not significantly improve the original results. Moreover, the principal components technique was not implemented due to the difficulty in choosing an appropriate unit to use, for all the variables involved. That is, Maddala (1992, 285) points out that problems arise, when using the principal components, if the variables used do not have the same unit of measurement.

⁸⁶ Refer to table 17.

⁸⁷ That is, the dependent variable in the unrestricted VAR was real GDP, whereas the exogenous variables were a constant, D/E, profits, the prime rate, and TSEA. The log likelihood value was taken from this regression and tested against the restricted VAR 's (i.e. a VAR with GDP as dependent and only a constant as exogenous) log likelihood value in the likelihood ratio statistic.

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consistent comparison.⁸⁸ Once again the majority of the results tend to find a bilateral causality relationship in the variables tested. However, in spite of this, the U.S. produced very interesting findings as well. For instance, it was found that real GDP caused profits. This finding contradicts the findings of the other two countries and thereby brings in to question the validity of Wolfson's (1986, 1990, 1995) views. That is, his hypothesis may be slightly weakened by the lack of consistency of this result amongst the three countries. Finally, the markup was found to be causing both real GDP and profits. This would tend to indicate that markup is important in determining the business cycle, via its effect on real GDP as well as its effects on profits. However, like the Canadian case, additional testing is required to determine the correlation between the variables.

A simple OLS was thereby run on real GDP against the markup and it was found to have no autocorrelation and a adjusted R-squared of 0.129. The t-statistic for the markup was significant and positive at value of 2.686. Hence, bearing the low R-squared in mind, this would imply that an increase (decrease) in markup leads to an increase (decrease) in real GDP. Another simple OLS was run on the prime rate against real GDP. This led to an adjusted R-squared of 0.224 with no autocorrelation. The t-statistic for real GDP was significant at 3.58. This would imply that an increase (decrease) in real GDP causes the prime rate to increase (decrease). It is worth noting that, since the Granger (1969) tests also showed that the bank rate causes the prime rate, therefore this variable was added to this regression. However, the adjusted R-squared declined to 0.207 as the t-statistic of the bank rate was insignificant at -0.381.⁸⁹

⁸⁸ See data appendix

⁸⁹ See tables 18 and 19 respectively for results. Once again the problem of multicollinearity, between real GDP and the bank rate, could be used as an explanation for the decline in the adjusted R-squared. However, performing the ridge regression did not improve the results. Furthermore, the implementation

A VAR was performed on the dependent variables of profits and the prime rate, with the exogenous variables being a constant and real GDP. The reason for this construction was because of the results obtained from aforementioned Granger (1969) tests. The results of the test indicate a $\chi^2(1) = 21.5$, which leads to a p-value of approximately zero. Thus, the null that real GDP is neutral was rejected. This would tend to imply that, in the U.S., it is real GDP or the business conditions which cause profits and the prime rate to change, which would appear to be the opposite of the findings in Canada.⁹⁰

Japan's Regression

Once again the stationary annual data was placed through a series of Granger (1969) causality tests. The variables used were the same as the Canadian case.⁹¹ Unfortunately, for the Japanese results, there was a problem of autocorrelation in some of the tests. Despite numerous correcting techniques, not all of the autocorrelation could be removed and thereby, some of the results may be deemed to be inefficient. This is a probable explanation as to why Japan's Granger (1969) tests failed to produce as many results as their Canadian and U.S. counterparts. Similarly, the majority of tests seem to indicate a feedback relationship. However, despite this mishap, there were a few interesting results which emerged that were free from autocorrelation. In particular, it was

of the principal components technique also could not be used because of the same unit measurement problems, as in the Canadian case.

⁹⁰ A similar test was performed on the Canadian data, testing whether the prime rate and profits were jointly neutral from real GDP, led to a $\chi^2(2) = 27.93$, resulting in a p-value of approximately zero, thereby rejecting the null of neutrality. This result, combined with the U.S. findings, would imply that the business conditions are affecting the prime rate and profit in the U.S. whereas, conversely in Canada, the prime rate and profits are affecting the economic conditions.

⁹¹ See data appendix.

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also found in Japan that profits cause real GDP. This finding would lend further support to Wolfson's (1986, 1990, 1995) profits analogy, in that it may not just be a Canadian quirk. In addition, it was also discovered that D/E caused Tokyo Stock Exchange index (TSE), implying that changes in D/E may be affecting the behavior of investors. One may suspect that this would tend to contradict the previous section's notion that D/E does not influence investors' behavior in Japan. However, since the correlation between D/E and the investors' behavior is unknown, this suspicion may be premature.

Once again, a simple OLS were performed on the Granger results; however, none of them produced any statistically significant results. That is, they all produced extremely small adjusted R-squares and t-ratios. Thus, a VAR with TSE and the bank rate as the dependent variables with a constant and D/E as the exogenous variables was performed as a supplementary test. The bank rate was added as a dependent variable since Granger (1969) testing revealed that it too caused D/E. As a result of this test, a

$\chi^2(1) = .094507$ was produced, which led to a p-value of 0.75852, and thus, the null that D/E is neutral was strongly accepted. This would imply that D/E, in Japan, does not seem to be a factor in TSE and the bank rate. Therefore, since the correlation between D/E and TSE is still unknown, coupled with this finding, it is thereby conjectured that the preceding section analysis, regarding the lack of concern by investors' confidence, is more likely to occur. That is, it may be concluded that D/E does not influence investors' behavior when it is coupled with the bank rate.

Summary and Conclusion

What can be concluded from all of these tests is that there is no real consistent causation, of any variables, for all three countries. However, a possible argument could be put forth regarding the possibility that profits caused real GDP in two out of the three countries. The implication of this result would lend support to Wolfson's (1986, 1990, 1995) hypothesis that a declining rate of profits is a contributing factor to the fragility of a country's economy. The only problem is that the opposite causation was found for the U.S. case and, ironically, this is the country on which Wolfson's studies have tended to focus. The most striking finding was that, in Canada, it was discovered that together D/E, profits, the stock market, and the prime rate were affecting the business conditions, that is, real GDP. This would lend support to the notion that these factors may be contributing to the changes in economic well-being. However, causation tests do not tell us if the variables involved are positively or negatively related. Thus, it is difficult to base any significant conclusion from these results alone. Even though the correlation tests seem to indicate that the significant variables - D/E and TSEA - were positively correlated with real GDP, these results may be weakened by the relatively small correlation between them.

In all three countries a feedback relationship was found between imports and real GDP as well as for imports and D/E. These findings would tend to indicate that the economy of other countries may indeed have some effect on each other's business conditions, due to the amount of trade between them. However, one should once again be cautious about this claim due to the feedback relationships.

In Japan and the U.S., a bilateral type causality was found between real GDP and D/E as well as for markup and D/E. This is not to say that D/E does not play a significant

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role in affecting the business conditions in these two countries; rather, it is to warn of the extent to which it can be argued that D/E does contribute to them, due to this feedback relationship. However, since the Granger (1969) test results do not conclude that real GDP and D/E are independent, then one cannot dismiss the possibility that, in some respect, D/E is affecting the business conditions in Japan and the U.S. However, for Japan, other more probable reasons have been provided in an attempt to explain the relative lack of importance of a rising D/E. These reasons include: a close tie between the banking and NFC sector - reducing the *asymmetric information* problems, a relatively high liquidity ratio, the general cooperative behavior of the Japanese, less use of the securities market, and investors not being so easily swayed by a rising debt.

Finally, in the U.S., a feedback relationship was found between investment activity (via the stock market indices) and the business conditions. Once again, the argument is put forth that, since the Granger (1969) tests did not find these variables to be independent, than it can be postulated that, in some respect, investment activity affects the U.S. economy, thereby implying the prevalence of the self-fulfilling prophecy notion in the U.S. That is, investors may be adding to the fragility problem by decreasing investment in fear of the NFCs going bankrupt or losing profits.

Hence, it can be concluded that, despite a somewhat different banking structure, a rising D/E may be seen to be laying the foreground for a financially fragile economy in North America. Nevertheless, it does not seem to be as important a factor as in Japan. Thus, Davis' (1987, 1992) results that a rising debt in Canada and the U.S. have entailed increased fragility are reinforced. Moreover, his findings that business failures are less strongly related to leverage in countries characterized by "relationship banking," such as

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Japan, are also solidified. Therefore, it is probable that Mayer's (1988) and Davis' (1992) conclusion of leverage playing less of a role for the financial systems of countries like Japan, due to superior risk sharing, lower information asymmetries, and lower agency costs, is a likely explanation.

The focus of the paper, however, was not to limit the fragility of an economy solely on the basis of excessive debt. Rather, it has attempted to establish that there is also a series of other conditions which are necessary. In particular, the issues of investors' behavior, profitability, liquidity and monetary policy were all addressed. In addition, the negligent behavior of the banking sector also appears to be one of great concern. In particular, the problems of *moral hazard* and *adverse selection* can be mentioned. If the North American governments do not change their policies regarding the larger banks, their financial future may be at risk. A good starting point would be to try to reduce these problems, as in Japan. However, as more deregulation takes place in Japan - reducing the banks' close ties to the NFCs and increasing the use of the stock market - and as consumer resistance begins to build, I suspect that in the near future they will be in the same leaky financial boat as we. Unfortunately, this may have already begun to happen. Japan has recently begun to change its financial system to become more in line with the goals of the North American NFC and as a result their system appears to be less stable than in the past (see Dosse, 1986, and Bludnell-Wignall and Browne, 1991). Perhaps, in retrospect, this move has not been one for the better, as they too may now be entering a system where a rising D/E may potentially lead to a financially fragile state. Consequently, in contrast to the objectives of deregulation, Japan may be regressing rather than developing, sadly indicating that they may not have been paying close attention to the

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misfortunes of their North American counterparts. Conceivably then, Kindleberger (1989) may have been correct in supporting the notion of stricter regulations and supervision of banks to forestall euphoric lending and thereby limiting financial crises. Thus, it would appear that authorities should readdress the issue of deregulation in hopes of pursuing a more stable economy. To proceed without such scrutiny may jeopardize the future of our financial system.

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Tables

Table 1 - Canadian NFC's Percentage Change in D/E and Separate Components of Debt for the Period of 1961 to 1993

Year	Percentage Change in D/E Trough to Peak (Expansion)	Percentage Change in D/E Peak to Trough (Contraction)	Percentage Change in Bank Loans Trough to Peak (Expansion)	Percentage Change in Other Loans Trough to Peak (Expansion)
1969	16.919		140.260	178.035
1970		5.276		
1974	29.176		160.264	109.269
1975		0.6404		
1979	-1.195		120.804	96.329
1980		-0.3884		
1981	18.613		52.603	19.503
1982		3.024		
1990	-4.831		13.398	108.730
1992		-1.358		
Year	Percentage Change in Short-term Paper Trough to Peak (Expansion)	Percentage Change in Mortgages Trough to Peak (Expansion)	Percentage Change in Other Canadian Bonds Trough to Peak (Expansion)	
1969	340.299	224.125	73.644	
1970				
1974	139.877	80.424	19.627	
1975				
1979	83.975	53.506	45.389	
1980				
1981	9.217	6.109	31.402	
1982				
1990	312.092	140.107	80.200	
1992				

Table 2 - Canadian NFC's Separate Components of Debt as a Percentage of Total Debt for the Period of 1961 to 1993

Year	Bank Loans as a % of Total Debt	Other Loans as a % of Total Debt	Short-term paper as a % of Total Debt	Mortgages as a % of Total Debt	Other Canadian Bonds as a % of Total Debt
1961	24.4509	6.70069	0.991051	15.63494	52.22247
1962	25.0766	6.78335	1.191855	16.08663	50.86154
1963	25.0467	7.38523	0.959372	17.15923	49.44949
1964	25.1342	7.07249	1.262314	18.38023	48.15077
1965	25.8452	6.75648	1.284719	18.81827	47.29533

1966	25.2272	8.02478	1.315611	20.76947	44.66296
1967	26.5441	8.12772	1.124819	20.408	43.79536
1968	26.0727	8.19783	1.14047	21.63505	42.95393
1969	26.3318	8.35074	1.955909	22.71507	40.64644
1970	24.0247	8.72835	2.930425	23.20369	41.11284
1971	24.8657	8.05653	3.498928	22.33544	41.24342
1972	27.1454	10.5236	2.564165	22.20562	37.56123
1973	34.5051	10.1535	1.733713	22.5323	31.07546
1974	34.9571	10.2117	3.929912	23.40525	27.49598
1975	30.8266	11.0577	3.974709	25.73414	28.40684
1976	33.32	10.6631	3.893276	25.28892	26.83474
1977	33.0438	10.5363	3.346866	26.14355	26.92952
1978	33.6983	10.2722	3.327839	25.24434	27.4573
1979	38.2627	12.2037	4.110611	22.20643	23.21653
1980	41.6102	11.5966	5.474469	19.71231	21.60642
1981	47.8714	10.4478	4.50762	15.769	21.40424
1982	44.5925	11.1497	6.397301	15.46594	22.39454
1983	40.019	11.7053	7.336971	16.60404	24.33476
1984	40.7174	12.0102	7.571652	15.48137	24.21934
1985	39.6629	12.2303	8.25007	15.82027	24.03653
1986	35.6898	11.6297	11.68813	16.34197	24.65036
1987	33.2149	12.0368	13.16016	17.29376	24.29444
1988	30.0657	12.5108	15.91392	18.29901	23.21055
1989	28.7964	13.0742	15.94675	19.46527	22.71733
1990	28.4576	13.0972	14.83621	20.89837	22.71058
1991	28.4946	13.1041	11.58224	22.30805	24.51106
1992	29.5343	13.3778	7.167239	24.10752	25.81312
1993	27.1155	12.5509	8.577553	24.56893	27.1871

Table 3 - Canadian NFC's Percentage Change in Debt and Equity for the Period of 1961 to 1993

Year	Percentage Change in Debt	Percentage Change in Equity	Year	Percentage Change in Debt	Percentage Change in Equity
1961					
1962	8.59404	2.63222	1978	12.4162	21.0172
1963	5.77539	7.55071	1979	19.6227	17.2969
1964	9.15588	6.73801	1980	16.5258	16.9806
1965	13.4077	18.3371	1981	32.6435	11.8284
1966	15.0473	13.0295	1982	6.86789	3.73066
1967	12.1389	5.03981	1983	-2.445	9.79222
1968	7.11176	5.35699	1984	9.54536	9.74552
1969	13.5388	9.41155	1985	5.88382	9.63576
1970	10.6382	5.09359	1986	5.24885	8.67004
1971	13.2109	3.48691	1987	8.45204	9.25797
1972	8.06977	3.35591	1988	13.4991	7.96836

1973	23.0383	12.3668	1989	13.1599	6.67807
1974	18.824	15.2114	1990	7.11616	3.35372
1975	7.302	6.61921	1991	2.53758	2.85145
1976	16.848	12.8558	1992	1.22762	2.30684
1977	13.2123	12.3879	1993	3.34525	4.21343

Table 4 - Canada's Monthly Toronto Stock Exchange Index and Average Price/Earnings for the Period of 1956 to 1995

Year (Monthly)	TSEA	Year (Monthly)	TSEA	Year (Monthly)	TSEA	Year (Monthly)	TSEA
1956-01	525.63	1959-12	555.09	1963-11	679.15	1967-10	868.65
1956-02	545.15	1960-01	529.8	1963-12	702.71	1967-11	890.69
1956-03	588.91	1960-02	512.23	1964-01	721.44	1967-12	899.2
1956-04	583.61	1960-03	512.05	1964-02	715.36	1968-01	873.62
1956-05	560.09	1960-04	503.08	1964-03	743.19	1968-02	835.33
1956-06	575.39	1960-05	517.97	1964-04	770.46	1968-03	814.79
1956-07	617.67	1960-06	505.11	1964-05	797.14	1968-04	887.47
1956-08	603.75	1960-07	494.06	1964-06	795.63	1968-05	879.08
1956-09	566.99	1960-08	526.47	1964-07	813.76	1968-06	925.39
1956-10	554.02	1960-09	500.33	1964-08	808.84	1968-07	920.14
1956-11	524.63	1960-10	500.2	1964-09	843.59	1968-08	943.95
1956-12	564.97	1960-11	519.43	1964-10	846.66	1968-09	989.11
1957-01	568.14	1960-12	544.74	1964-11	850.1	1968-10	1003.97
1957-02	545.24	1961-01	575.6	1964-12	853.53	1968-11	1041.56
1957-03	563.76	1961-02	594.4	1965-01	901.4	1968-12	1062.88
1957-04	589.32	1961-03	605.61	1965-02	897.45	1969-01	1090.82
1957-05	606.14	1961-04	633.44	1965-03	889.54	1969-02	1039.02
1957-06	592.74	1961-05	646.09	1965-04	911.26	1969-03	1072.16
1957-07	577.34	1961-06	650.67	1965-05	909.11	1969-04	1102.46
1957-08	520.16	1961-07	662.35	1965-06	847.1	1969-05	1131.04
1957-09	483.3	1961-08	672.44	1965-07	838.42	1969-06	1008.55
1957-10	447.81	1961-09	661.6	1965-08	858.92	1969-07	950.75
1957-11	458.28	1961-10	665.52	1965-09	873.38	1969-08	998.53
1957-12	432.11	1961-11	685.69	1965-10	888.86	1969-09	991.79
1958-01	448.97	1961-12	700.85	1965-11	863.75	1969-10	1005.69
1958-02	444.1	1962-01	682.83	1965-12	881.14	1969-11	1031.26
1958-03	457.38	1962-02	686.81	1966-01	917.75	1969-12	1019.77
1958-04	454.02	1962-03	686.01	1966-02	895.21	1970-01	980.23
1958-05	472.88	1962-04	667.55	1966-03	883.03	1970-02	1006.4
1958-06	484.63	1962-05	612.41	1966-04	891.22	1970-03	1006.06
1958-07	508.17	1962-06	572.46	1966-05	861.74	1970-04	917.72
1958-08	514.82	1962-07	586.08	1966-06	856.94	1970-05	828.21
1958-09	531.72	1962-08	600.28	1966-07	842.77	1970-06	810.78
1958-10	537.39	1962-09	571.84	1966-08	780.38	1970-07	847.78
1958-11	539.95	1962-10	580.7	1966-09	761.11	1970-08	869.99

1958-12	547.72	1962-11	626.17	1966-10	775.89	1970-09	909.19
1959-01	562.52	1962-12	628.99	1966-11	770.76	1970-10	883.67
1959-02	566.64	1963-01	659.89	1966-12	789.51	1970-11	922.19
1959-03	562.67	1963-02	638.45	1967-01	843.44	1970-12	947.54
1959-04	567.91	1963-03	657.52	1967-02	851.43	1971-01	975.13
1959-05	568.99	1963-04	689.22	1967-03	879.95	1971-02	974.5
1959-06	573.36	1963-05	700.41	1967-04	898.15	1971-03	1000.73
1959-07	598.96	1963-06	674.43	1967-05	864.58	1971-04	1017
1959-08	568.5	1963-07	656.32	1967-06	886.91	1971-05	973.05
1959-09	541.36	1963-08	660.72	1967-07	915.45	1971-06	986.85
1959-10	541.19	1963-09	680.62	1967-08	904.64	1971-07	983.49
1959-11	538.37	1963-10	686.03	1967-09	922.5	1971-08	976.33
1971-09	961.97	1975-10	930.93	1979-11	1699.62	1983-12	2552.35
1971-10	881.41	1975-11	980.81	1979-12	1813.17	1984-01	2468.88
1971-11	885.54	1975-12	953.54	1980-01	2027.7	1984-02	2419.83
1971-12	990.54	1976-01	1039.43	1980-02	2192.58	1984-03	2382.1
1972-01	1078.92	1976-02	1074.38	1980-03	1797.58	1984-04	2323.34
1972-02	1114.89	1976-03	1054.09	1980-04	1869.93	1984-05	2229.75
1972-03	1087.72	1976-04	1075.02	1980-05	1971.73	1984-06	2220.94
1972-04	1099.12	1976-05	1075.92	1980-06	2061.35	1984-07	2139.99
1972-05	1129.41	1976-06	1055.55	1980-07	2197.38	1984-08	2388.81
1972-06	1104.29	1976-07	1050.07	1980-08	2218.01	1984-09	2392.65
1972-07	1129.86	1976-08	1048.3	1980-09	2260.04	1984-10	2353.26
1972-08	1189.29	1976-09	1028.8	1980-10	2240.15	1984-11	2368.54
1972-09	1167.44	1976-10	989.55	1980-11	2402.23	1984-12	2400.33
1972-10	1136.74	1976-11	920.1	1980-12	2268.7	1985-01	2595.05
1972-11	1186.74	1976-12	1011.52	1981-01	2226.66	1985-02	2594.98
1972-12	1226.58	1977-01	996.6	1981-02	2179.52	1985-03	2612.81
1973-01	1246.82	1977-02	1008.92	1981-03	2333.08	1985-04	2635.31
1973-02	1250.03	1977-03	1022.11	1981-04	2306.43	1985-05	2736.31
1973-03	1239.14	1977-04	994.79	1981-05	2371.22	1985-06	2712.5
1973-04	1198.19	1977-05	981.19	1981-06	2361.13	1985-07	2778.6
1973-05	1153.39	1977-06	1031.24	1981-07	2253.9	1985-08	2819.98
1973-06	1149	1977-07	1033.53	1981-08	2176.71	1985-09	2632.25
1973-07	1226.4	1977-08	1003.3	1981-09	1883.42	1985-10	2674.84
1973-08	1196	1977-09	1000.07	1981-10	1842.62	1985-11	2857.18
1973-09	1250.38	1977-10	970.53	1981-11	2012.09	1985-12	2900.6
1973-10	1319.26	1977-11	1017.48	1981-12	1954.24	1986-01	2842.96
1973-11	1182.57	1977-12	1059.59	1982-01	1786.91	1986-02	2855.83
1973-12	1187.78	1978-01	998.44	1982-02	1671.34	1986-03	3047.26
1974-01	1196.44	1978-02	1005.68	1982-03	1587.83	1986-04	3078.89
1974-02	1241.78	1978-03	1063.26	1982-04	1548.17	1986-05	3121.97
1974-03	1214.88	1978-04	1081.5	1982-05	1523.68	1986-06	3085.5
1974-04	1099.92	1978-05	1128.76	1982-06	1366.8	1986-07	2935.33
1974-05	1031.74	1978-06	1126.16	1982-07	1411.9	1986-08	3028.2
1974-06	1009.23	1978-07	1193.79	1982-08	1613.32	1986-09	2979.3

1974-07	1056.96	1978-08	1232.21	1982-09	1602.01	1986-10	3038.89
1974-08	919.88	1978-09	1284.66	1982-10	1774.04	1986-11	3046.8
1974-09	847.19	1978-10	1215.84	1982-11	1838.31	1986-12	3066.18
1974-10	895.71	1978-11	1269.8	1982-12	1958.08	1987-01	3348.85
1974-11	850.4	1978-12	1309	1983-01	2031.47	1987-02	3498.93
1974-12	835.42	1979-01	1355.4	1983-02	2090.37	1987-03	3739.47
1975-01	979.6	1979-02	1385.36	1983-03	2156.06	1987-04	3716.74
1975-02	1006.33	1979-03	1466.37	1983-04	2340.81	1987-05	3685.24
1975-03	989.6	1979-04	1484.31	1983-05	2420.65	1987-06	3740.19
1975-04	1008.53	1979-05	1519.67	1983-06	2446.97	1987-07	4030.35
1975-05	1030.7	1979-06	1618.41	1983-07	2477.62	1987-08	3993.6
1975-06	1055.29	1979-07	1558.1	1983-08	2483.09	1987-09	3902.37
1975-07	1051.67	1979-08	1695.3	1983-09	2499.58	1987-10	3019.27
1975-08	1038.9	1979-09	1751.89	1983-10	2361.08	1987-11	2978.34
1975-09	976.37	1979-10	1579.27	1983-11	2540.89	1987-12	3160.05
1988-01	3057.22	1990-06	3543.93	1992-11	3282.83		
1988-02	3204.83	1990-07	3561.12	1992-12	3350.44		
1988-03	3313.79	1990-08	3346.25	1993-01	3305.47		
1988-04	3339.77	1990-09	3159.37	1993-02	3451.69		
1988-05	3249.22	1990-10	3081.26	1993-03	3602.44		
1988-06	3441.48	1990-11	3151.01	1993-04	3789.41		
1988-07	3376.73	1990-12	3256.75	1993-05	3882.68		
1988-08	3285.82	1991-01	3272.9	1993-06	3966.37		
1988-09	3283.71	1991-02	3462.37	1993-07	3967.23		
1988-10	3395.52	1991-03	3495.67	1993-08	4137.55		
1988-11	3294.68	1991-04	3468.81	1993-09	3990.61		
1988-12	3389.99	1991-05	3546.1	1993-10	4255.54		
1989-01	3616.64	1991-06	3465.82	1993-11	4180.21		
1989-02	3572.12	1991-07	3539.64	1993-12	4321.43		
1989-03	3578.22	1991-08	3517.89	1994-01	4554.85		
1989-04	3627.85	1991-09	3387.88	1994-02	4423.84		
1989-05	3707.44	1991-10	3515.76	1994-03	4329.62		
1989-06	3760.91	1991-11	3448.51	1994-04	4267.12		
1989-07	3970.75	1991-12	3512.36	1994-05	4326.77		
1989-08	4010.18	1992-01	3596.12	1994-06	4025.25		
1989-09	3943.02	1992-02	3581.94	1994-07	4178.97		
1989-10	3918.62	1992-03	3412.14	1994-08	4349.5		
1989-11	3942.77	1992-04	3355.56	1994-09	4354.18		
1989-12	3969.79	1992-05	3387.93	1994-10	4291.65		
1990-01	3704.42	1992-06	3387.7	1994-11	4093.41		
1990-02	3686.7	1992-07	3443.42	1994-12	4213.61		
1990-03	3639.54	1992-08	3402.92	1995-01	4017.48		
1990-04	3340.91	1992-09	3297.88				
1990-05	3581.99	1992-10	3336.12				

Year (Monthly)	Average P/E	Year (Monthly)	Average P/E	Year (Monthly)	Average P/E	Year (Monthly)	Average P/E
1956-01	18.15	1960-02	15.59	1964-03	18.07	1968-04	16.15
1956-02	15.34	1960-03	15.59	1964-04	18.68	1968-05	15.93
1956-03	16.64	1960-04	15.34	1964-05	19.2	1968-06	16.77
1956-04	16.57	1960-05	15.81	1964-06	19.12	1968-07	16.68
1956-05	15.84	1960-06	15.36	1964-07	19.55	1968-08	17.02
1956-06	16.07	1960-07	15.09	1964-08	19.38	1968-09	17.82
1956-07	17.24	1960-08	16.08	1964-09	20.13	1968-10	18.1
1956-08	16.64	1960-09	15.31	1964-10	20.17	1968-11	18.74
1956-09	15.81	1960-10	15.37	1964-11	20.18	1968-12	18.63
1956-10	15.34	1960-11	15.99	1964-12	20.5	1969-01	18.93
1956-11	14.53	1960-12	16.48	1965-01	21.61	1969-02	17.12
1956-12	15.8	1961-01	17.6	1965-02	18.84	1969-03	17.62
1957-01	15.88	1961-02	17.84	1965-03	18.63	1969-04	18.15
1957-02	14.31	1961-03	18.18	1965-04	19.09	1969-05	18.55
1957-03	14.79	1961-04	19.02	1965-05	18.96	1969-06	16.51
1957-04	15.47	1961-05	19.35	1965-06	17.66	1969-07	15.56
1957-05	15.87	1961-06	19.55	1965-07	17.37	1969-08	16.31
1957-06	15.68	1961-07	20.02	1965-08	17.77	1969-09	16.2
1957-07	15.17	1961-08	20.28	1965-09	18.04	1969-10	16.14
1957-08	13.76	1961-09	19.85	1965-10	18.31	1969-11	16.58
1957-09	12.81	1961-10	19.94	1965-11	17.8	1969-12	16.25
1957-10	11.87	1961-11	20.52	1965-12	18.16	1970-01	15.69
1957-11	12.14	1961-12	20.74	1966-01	18.95	1970-02	16.47
1957-12	11.49	1962-01	20.22	1966-02	16.85	1970-03	16.49
1958-01	12.03	1962-02	19.47	1966-03	16.57	1970-04	15.03
1958-02	13.23	1962-03	19.44	1966-04	16.76	1970-05	13.46
1958-03	13.61	1962-04	18.89	1966-05	16.21	1970-06	13.18
1958-04	13.5	1962-05	17.26	1966-06	16.12	1970-07	13.82
1958-05	14.07	1962-06	16.13	1966-07	15.86	1970-08	14.19
1958-06	14.5	1962-07	16.46	1966-08	14.71	1970-09	14.85
1958-07	15.21	1962-08	16.85	1966-09	14.32	1970-10	14.44
1958-08	15.48	1962-09	16	1966-10	14.55	1970-11	14.72
1958-09	16.04	1962-10	16.17	1966-11	14.44	1970-12	15.37
1958-10	16.21	1962-11	17.57	1966-12	14.59	1971-01	15.89
1958-11	16.28	1962-12	17.65	1967-01	15.63	1971-02	16.32
1958-12	15.96	1963-01	18.5	1967-02	15.25	1971-03	17.09
1959-01	16.58	1963-02	16.39	1967-03	15.73	1971-04	16.81
1959-02	20.04	1963-03	16.91	1967-04	16.02	1971-05	16.94
1959-03	19.87	1963-04	17.72	1967-05	15.51	1971-06	17.28
1959-04	20.12	1963-05	18	1967-06	15.88	1971-07	17.07
1959-05	20.17	1963-06	17.34	1967-07	16.4	1971-08	17.19
1959-06	20.39	1963-07	16.84	1967-08	16.15	1971-09	16.34
1959-07	21.27	1963-08	16.9	1967-09	16.47	1971-10	15.22
1959-08	20.25	1963-09	17.35	1967-10	15.49	1971-11	15.77

1959-09	19.31	1963-10	17.44	1967-11	15.84	1971-12	16.83
1959-10	19.27	1963-11	17.24	1967-12	16.02	1972-01	18.31
1959-11	19.14	1963-12	17.92	1968-01	15.57	1972-02	18.82
1959-12	20.1	1964-01	18.41	1968-02	15.24	1972-03	17.94
1960-01	19.09	1964-02	17.48	1968-03	14.82	1972-04	18.11
1972-05	18.03	1976-06	9.37	1980-07	8.65	1984-08	15.19
1972-06	17.42	1976-07	9.3	1980-08	8.6	1984-09	15.07
1972-07	17.82	1976-08	9.31	1980-09	8.97	1984-10	14.72
1972-08	18.11	1976-09	9.19	1980-10	8.56	1984-11	14.95
1972-09	17.59	1976-10	8.88	1980-11	9.41	1984-12	15.24
1972-10	16.88	1976-11	8.21	1980-12	8.81	1985-01	15.38
1972-11	17.52	1976-12	9.01	1981-01	8.89	1985-02	16.17
1972-12	17.79	1977-01	8.8	1981-02	8.95	1985-03	15.43
1973-01	18.26	1977-02	8.85	1981-03	9.5	1985-04	14.43
1973-02	16.95	1977-03	8.96	1981-04	9.83	1985-05	14.73
1973-03	16.95	1977-04	8.48	1981-05	10.15	1985-06	13.85
1973-04	16.24	1977-05	8.19	1981-06	10.12	1985-07	14.54
1973-05	14.81	1977-06	8.62	1981-07	9.62	1985-08	14.68
1973-06	14.84	1977-07	8.7	1981-08	9.24	1985-09	13.57
1973-07	15.71	1977-08	8.31	1981-09	7.64	1985-10	13.7
1973-08	14.21	1977-09	8.2	1981-10	7.51	1985-11	14.8
1973-09	14.65	1977-10	7.93	1981-11	8.76	1985-12	14.54
1973-10	15.56	1977-11	7.9	1981-12	8.57	1986-01	14.19
1973-11	12.9	1977-12	8.24	1982-01	7.85	1986-02	14.22
1973-12	12.95	1978-01	7.64	1982-02	7.54	1986-03	14.92
1974-01	13.22	1978-02	7.65	1982-03	7.61	1986-04	15.15
1974-02	11.97	1978-03	8.09	1982-04	7.81	1986-05	15.48
1974-03	11.5	1978-04	8.06	1982-05	8.32	1986-06	15.32
1974-04	10.45	1978-05	8.25	1982-06	7.86	1986-07	15.03
1974-05	9.09	1978-06	8.23	1982-07	8.78	1986-08	15.6
1974-06	8.83	1978-07	8.58	1982-08	11.38	1986-09	15.72
1974-07	8.95	1978-08	8.66	1982-09	12.53	1986-10	16.19
1974-08	7.54	1978-09	9.12	1982-10	14.82	1986-11	17.04
1974-09	6.81	1978-10	8.4	1982-11	17.33	1986-12	17.39
1974-10	7.45	1978-11	8.37	1982-12	19.12	1987-01	18.91
1974-11	6.64	1978-12	8.87	1983-01	20.87	1987-02	19.32
1974-12	6.58	1979-01	8.71	1983-02	24	1987-03	21.38
1975-01	7.65	1979-02	8.53	1983-03	24.72	1987-04	20.93
1975-02	7.9	1979-03	8.78	1983-04	27.93	1987-05	20.34
1975-03	7.75	1979-04	8.65	1983-05	28.78	1987-06	20.95
1975-04	7.91	1979-05	8.59	1983-06	28.79	1987-07	21.63
1975-05	8.29	1979-06	9.21	1983-07	28.11	1987-08	20.25
1975-06	8.39	1979-07	8.45	1983-08	26.67	1987-09	19.54
1975-07	8.37	1979-08	8.9	1983-09	25.73	1987-10	14.83
1975-08	8.68	1979-09	9.17	1983-10	23.15	1987-11	13.89
1975-09	8.04	1979-10	7.98	1983-11	22.65	1987-12	14.32

1975-10	7.67	1979-11	8.22	1983-12	22.41	1988-01	13.42
1975-11	8.67	1979-12	8.72	1984-01	20.22	1988-02	12.87
1975-12	8.21	1980-01	9.38	1984-02	18.52	1988-03	13.21
1976-01	8.94	1980-02	9.35	1984-03	18.27	1988-04	12.54
1976-02	9.43	1980-03	7.66	1984-04	15.91	1988-05	12.03
1976-03	9.1	1980-04	7.7	1984-05	15.32	1988-06	12.75
1976-04	9.27	1980-05	7.96	1984-06	15.28	1988-07	12.05
1976-05	9.63	1980-06	8.21	1984-07	14.3	1988-08	11.38
1988-09	11.12	1991-06	24.55	1994-03	63.06		
1988-10	11.24	1991-07	28.43	1994-04	58.7		
1988-11	10.71	1991-08	30.75	1994-05	51.04		
1988-12	10.86	1991-09	31.62	1994-06	45.11		
1989-01	11.63	1991-10	40.32	1994-07	33.71		
1989-02	11.35	1991-11	47.17	1994-08	32.6		
1989-03	11.27	1991-12	45.83	1994-09	31.59		
1989-04	11.09	1992-01	59.22	1994-10	26.47		
1989-05	11.39	1992-02	68.3	1994-11	22.65		
1989-06	11.49	1992-03	58.1	1994-12	21.65		
1989-07	12.16	1992-04	68.61	1995-01	17.93		
1989-08	12.55	1992-05	82.39				
1989-09	12.36	1992-06	87.71				
1989-10	12.43	1992-07	94.47				
1989-11	12.47	1992-08	105.72				
1989-12	14.79	1992-09	110.15				
1990-01	14.67	1992-10	75.82				
1990-02	14.49	1992-11	72.75				
1990-03	14.5	1992-12	156.5				
1990-04	14.44	1993-01	75.07				
1990-05	15.85	1993-02	64.79				
1990-06	16.42	1993-03	76.52				
1990-07	17.45	1993-04	94.69				
1990-08	17.31	1993-05	83.85				
1990-09	16.49	1993-06	70.47				
1990-10	17.58	1993-07	113.72				
1990-11	17.65	1993-08	91.85				
1990-12	16.09	1993-09	83.75				
1991-01	15.45	1993-10	92.48				
1991-02	18.68	1993-11	90.35				
1991-03	19.79	1993-12	124.6				
1991-04	21.32	1994-01	254.98				
1991-05	24.67	1994-02	88.43				

Table 5 - Canadian NFC's Current Ratio and Percentage Change in Profits for the Period of 1961 to 1993

Year	Current Ratio	Percentage Change in Profits, Trough to Peak (Expansion)	Percentage Change in Profits, Peak to Trough (Contraction)
1961	27.17391		
1962	26.23889		
1963	25.35264		
1964	24.11014		
1965	20.29455		
1966	18.31318		
1967	18.43106		
1968	21.05911		
1969	19.17873	57.96179	
1970	17.3419		-11.2457
1971	17.75721		
1972	16.45501		
1973	15.98143		
1974	13.98286	115.5872	
1975	14.41218		-0.84547
1976	14.34709		
1977	17.33573		
1978	18.63648		
1979	20.21444	37.83425	
1980	19.47774		-38.7129
1981	17.50829	-22.5393	
1982	19.79947		-79.4957
1983	19.57852		
1984	25.26524		
1985	26.01936		
1986	25.81591		
1987	29.05651		
1988	28.33824		
1989	29.01868		
1990	29.44131	0.50079	
1991	28.00928		
1992	30.70327		
1993	32.14223		

Table 6 - US NFC's Percentage Change in D/E for the Period of 1945 to 1992

Year	Percentage Change in D/E Trough to Peak (Expansion)	Percentage Change in D/E Peak to Trough (Contraction)
1949		-4.464
1953	0.474	
1954		-0.554
1957	6.451	
1958		1.53
1960	5.225	
1961		1.111
1969	17.966	
1970		3.019
1973	0.7433	
1975		-10.424
1979	-10.331	
1980		-3.272
1981	2.756	
1982		0.8754
1990	72.027	
1991		-4.309

Table 7 - US NFC's Current Ratio and Percentage Change in Profits for the Period of 1945 to 1992

Year	Current Ratio	Percentage Change in Profits, Trough to Peak (Expansion)	Percentage Change in Profits, Peak to Trough (Contraction)
1948	63.7931		
1949	74.80945		-22.1553
1950	60.494		
1951	56.47574		
1952	55.97629		
1953	57.6766	208.4889	
1954	58.88727		17.41819
1955	54.07347		
1956	45.64893		
1957	44.43426	10.6407	
1958	46.14897		11.22598
1959	45.65694		
1960	39.77879	-15.2574	
1961	40.40077		30.05198
1962	40.0747		
1963	38.7052		
1964	35.62681		
1965	31.49708		
1966	27.66476		

1967	26.93473		
1968	25.74239		
1969	22.52946	56.7655	
1970	21.64123		-18.6936
1971	23.05352		
1972	22.83091		
1973	22.06535	47.54181	
1974	23.88516		
1975	28.83769		-15.9777
1976	29.17615		
1977	26.58129		
1978	25.18307		
1979	22.02594	48.84693	
1980	22.06303		-17.3487
1981	21.57243	-0.79677	
1982	25.24891		-33.9647
1983	34.75356		
1984	33.32004		
1985	33.63294		
1986	35.92136		
1987	35.36676		
1988	32.75531		
1989	32.81605		
1990	32.74413	15.82015	
1991	34.39013		-30.3354
1992	33.92063		

Table 8 - US NFC's Separate Debt Components as well as Debt and Equity for the Period of 1945 to 1992

Year	Percentage Change in Tax-Exempt Debt, Trough to Peak (Expansion)	Percentage Change in Corporate Bonds, Trough to Peak (Expansion)	Percentage Change in Mortgages, Trough to Peak (Expansion)	Percentage Change in Bank Loans, Trough to Peak (Expansion)	Percentage Change in Foreign Loans, Trough to Peak (Expansion)	Percentage Change in Commercial Paper, Trough to Peak (Expansion)
1953	0.000	37.536	36.691	57.746	0.000	100.000
1957	0.000	24.466	29.187	47.005	0.000	-20.000
1960	0.000	9.326	22.924	18.730	0.000	14.286
1969	0.000	82.382	73.913	157.963	0.000	390.909
1973	0.000	92.465	82.205	98.408	0.000	425.000
1979	422.388	33.136	22.828	42.369	866.667	155.208
1981	29.194	6.209	2.134	13.634	211.905	52.500
1990	54.631	139.115	140.235	74.380	464.103	210.904

Year	Percentage Change in Acceptance Liabilities, Trough to Peak (Expansion)	Percentage Change in Nonbank Loans, Trough to Peak (Expansion)	Percentage Change in US Government Loans, Trough to Peak (Expansion)	Percentage Change in Credit Market Debt, Trough to Peak (Expansion)	Percentage Change in Equity, Trough to Peak (Expansion)	
1953	100.000	45.455	66.667	42.550	41.865	
1957	0.000	50.000	-12.500	30.225	22.323	
1960	33.333	70.833	12.500	15.758	10.011	
1969	155.556	154.762	100.000	101.912	71.159	
1973	327.273	121.918	5.000	95.756	75.811	
1979	81.579	107.353	76.923	44.141	60.750	
1981	25.146	12.641	14.286	12.000	8.996	
1990	41.063	220.000	-19.266	120.933	28.429	

Table 9 - US NFC's Separate Debt Components as a Percentage of Total Debt for the Period of 1945 to 1992

Year	Tax Exempt Debt as a % of Total Debt	Corp. Bonds as a % of Total Debt	Mort. as a % of Total Debt	Bank Loans as a % of Total Debt	Foreign Loans as a % of Total Debt	Comm. Paper as a % of Total Debt	Accept. Liability as a % of Total Debt	Nonbank Loans as a % of Total Debt	US Govt Loans as a % of Total Debt
1945	0	54.817	19.954	20.413	0	0.2294	0.2294	2.982	1.376
1946	0	50.405	20.04	25.304	0	0.2024	0.4049	2.632	1.012
1947	0	48.94	19.965	27.385	0	0.3534	0.3534	2.120	0.883
1948	0	50.874	20.191	25.596	0	0.318	0.318	1.908	0.795
1949	0	53.61	21.352	21.813	0	0.3072	0.3072	1.690	0.922
1950	0	50.624	21.359	24.827	0	0.2774	0.4161	1.664	0.832
1951	0	48.954	20.787	27.183	0	0.369	0.369	1.599	0.738
1952	0	50.454	20.295	25.964	0	0.3401	0.3401	1.814	0.794
1953	0	51.724	20.474	24.138	0	0.431	0.431	1.724	1.078
1954	0	52.766	21.414	22.234	0	0.5123	0.6148	1.639	0.820
1955	0	51.412	21.375	24.105	0	0.3766	0.2824	1.789	0.659
1956	0	49.53	21.264	26.217	0	0.3416	0.4269	1.623	0.598
1957	0	50.433	21.243	25.098	0	0.3147	0.4721	1.888	0.551
1958	0	51.325	22.165	23.196	0	0.5155	0.4418	1.767	0.589
1959	0	49.761	22.83	24.129	0	0.2051	0.4101	2.119	0.547
1960	0	48.473	23.537	23.791	0	0.509	0.509	2.608	0.573
1961	0	48.148	24.731	22.879	0	0.6571	0.5376	2.509	0.538
1962	0	46.896	25.721	23.226	0	0.6652	0.4989	2.384	0.610
1963	0	45.661	26.86	23.399	0	0.5165	0.3616	2.583	0.620
1964	0	44.573	26.966	24.071	0	0.5306	0.3859	2.798	0.675

1965	0	42.845	25.936	26.728	0	0.3523	0.3963	2.994	0.749
1966	0	42.642	25.188	27.41	0	0.6347	0.4363	2.896	0.793
1967	0	44.095	23.691	27.302	0	1.083	0.4695	2.564	0.795
1968	0	44.161	22.767	27.936	0	1.374	0.5234	2.682	0.556
1969	0	43.491	21.302	29.231	0	1.598	0.6805	3.166	0.533
1970	0	45.203	20.434	28.076	0	1.924	0.8401	2.954	0.569
1971	0.0253	46.857	20.121	27.19	0	1.565	0.9095	2.929	0.404
1972	0.1394	45.957	19.819	27.997	0	1.626	0.8597	3.183	0.418
1973	0.4863	41.925	23.445	27.781	0	1.702	0.9524	3.283	0.426
1974	0.7489	41.388	21.023	29.114	0.0548	2.281	1.315	3.397	0.676
1975	1.19	45.064	20.845	25.479	0.0533	1.705	1.349	3.622	0.692
1976	1.533	46.092	20.613	23.346	0.0833	1.833	1.7	4.116	0.683
1977	2.606	44.849	20.32	23.196	0.0898	1.917	1.707	4.717	0.599
1978	3.39	43.477	20.003	23.746	0.122	2.102	1.343	5.045	0.773
1979	4.311	41.624	17.763	25.166	0.3572	3.018	1.7	5.211	0.850
1980	5.246	41.783	14.994	26.32	0.48	3.2	1.954	5.063	0.960
1981	6.051	39.622	13.673	26.704	1.337	4.357	2.184	5.092	0.980
1982	7.24	39.553	9.1059	30.952	1.516	3.654	2.012	4.908	1.059
1983	7.546	38.043	10.145	30.659	1.646	3.31	2.482	5.234	0.935
1984	8.077	36.291	9.3919	30.257	2.421	4.526	2.352	5.787	0.897
1985	8.821	37.727	7.6261	29.455	2.285	5.015	1.966	6.119	0.986
1986	7.097	40.63	8.5818	28.709	2.473	3.812	1.703	6.097	0.897
1987	6.357	40.984	10.98	26.392	2.336	4.038	1.784	6.500	0.629
1988	5.771	42.253	10.268	25.747	2.667	4.249	1.616	6.936	0.491
1989	5.261	42.186	10.427	25.213	3.034	4.879	1.631	6.933	0.437
1990	5.067	42.808	9.902	24.43	3.871	5.142	1.284	7.108	0.387
1991	5.006	46.195	9.670	23.297	3.14	4.326	1.023	6.996	0.347
1992	4.84	47.983	8.976	22.26	3.295	4.647	0.8753	6.784	0.339

Table 10 - US Monthly Dow Jones Industrial Average and Quarterly Average Price/Earnings Ratio for the Period of 1959 to 1995

Year (Monthly)	DJIA	Year (Monthly)	DJIA	Year (Monthly)	DJIA	Year (Monthly)
		1963-01	682.9	1967-02	839.4	1971-03
1959-01	594	1963-02	662.9	1967-03	866	1971-04
1959-02	603.5	1963-03	682.5	1967-04	897.1	1971-05
1959-03	601.7	1963-04	717.7	1967-05	852.6	1971-06
1959-04	623.8	1963-05	727	1967-06	860.3	1971-07
1959-05	643.8	1963-06	706.9	1967-07	904.2	1971-08
1959-06	643.6	1963-07	695.4	1967-08	901.3	1971-09
1959-07	674.9	1963-08	729.3	1967-09	926.7	1971-10
1959-08	664.4	1963-09	732.8	1967-10	879.7	1971-11
1959-09	631.7	1963-10	755.2	1967-11	875.8	1971-12
1959-10	646.6	1963-11	750.5	1967-12	905.1	1972-01
1959-11	659.2	1963-12	763	1968-01	855.5	1972-02

1959-12	679.4	1964-01	785.3	1968-02	840.5	1972-03
1960-01	622.6	1964-02	800.1	1968-03	840.7	1972-04
1960-02	630.1	1964-03	813.3	1968-04	912.2	1972-05
1960-03	616.6	1964-04	810.8	1968-05	899	1972-06
1960-04	601.7	1964-05	820.6	1968-06	897.8	1972-07
1960-05	625.5	1964-06	831.5	1968-07	883	1972-08
1960-06	640.6	1964-07	841.1	1968-08	896	1972-09
1960-07	616.7	1964-08	838.5	1968-09	935.8	1972-10
1960-08	626	1964-09	875.4	1968-10	952.4	1972-11
1960-09	580.1	1964-10	873.1	1968-11	985.1	1972-12
1960-10	580.4	1964-11	875.4	1968-12	943.8	1973-01
1960-11	597.2	1964-12	874.1	1969-01	946.1	1973-02
1960-12	615.9	1965-01	902.9	1969-02	905.2	1973-03
1961-01	648.2	1965-02	903.5	1969-03	935.5	1973-04
1961-02	662.1	1965-03	889.1	1969-04	950.2	1973-05
1961-03	676.6	1965-04	922.3	1969-05	937.6	1973-06
1961-04	678.7	1965-05	918	1969-06	873.2	1973-07
1961-05	696.7	1965-06	868	1969-07	815.5	1973-08
1961-06	684	1965-07	881.7	1969-08	836.7	1973-09
1961-07	705.4	1965-08	893.1	1969-09	813.1	1973-10
1961-08	719.9	1965-09	930.6	1969-10	856	1973-11
1961-09	701.2	1965-10	960.8	1969-11	812.3	1973-12
1961-10	703.9	1965-11	946.7	1969-12	800.4	1974-01
1961-11	721.6	1965-12	969.3	1970-01	744.1	1974-02
1961-12	731.1	1966-01	983.5	1970-02	777.6	1974-03
1962-01	700	1966-02	951.9	1970-03	785.6	1974-04
1962-02	708.1	1966-03	924.8	1970-04	736.1	1974-05
1962-03	707	1966-04	933.7	1970-05	700.4	1974-06
1962-04	665.3	1966-05	884.1	1970-06	683.5	1974-07
1962-05	613.4	1966-06	870.1	1970-07	734.1	1974-08
1962-06	561.3	1966-07	847.4	1970-08	764.6	1974-09
1962-07	597.9	1966-08	788.4	1970-09	760.7	1974-10
1962-08	609.2	1966-09	774.2	1970-10	755.6	1974-11
1962-09	579	1966-10	807.1	1970-11	794.1	1974-12
1962-10	589.8	1966-11	791.6	1970-12	838.9	1975-01
1962-11	649.3	1966-12	785.5	1971-01	868.4	1975-02
1962-12	652.1	1967-01	849.9	1971-02	878.8	1975-03
1975-04	821.3	1979-05	822.3	1983-06	1222	1987-07
1975-05	832.3	1979-06	842	1983-07	1199.2	1987-08
1975-06	879	1979-07	846.4	1983-08	1216.2	1987-09
1975-07	831.5	1979-08	887.6	1983-09	1233.1	1987-10
1975-08	835.3	1979-09	878.6	1983-10	1225.2	1987-11
1975-09	793.9	1979-10	815.7	1983-11	1276	1987-12
1975-10	836	1979-11	822.4	1983-12	1258.6	1988-01
1975-11	860.7	1979-12	838.7	1984-01	1220.6	1988-02
1975-12	852.4	1980-01	875.9	1984-02	1154.6	1988-03

1976-01	975.3	1980-02	863.1	1984-03	1153.2	1988-04
1976-02	972.6	1980-03	785.8	1984-04	1183	1988-05
1976-03	999.5	1980-04	817.1	1984-05	1102.6	1988-06
1976-04	996.9	1980-05	850.9	1984-06	1130.1	1988-07
1976-05	975.2	1980-06	867.9	1984-07	1115.3	1988-08
1976-06	1002.8	1980-07	935.3	1984-08	1224.4	1988-09
1976-07	984.6	1980-08	932.6	1984-09	1206.7	1988-10
1976-08	973.7	1980-09	932.4	1984-10	1207.4	1988-11
1976-09	990.2	1980-10	924.5	1984-11	1188.9	1988-12
1976-10	964.9	1980-11	993.3	1984-12	1211.6	1989-01
1976-11	947.2	1980-12	964	1985-01	1286.8	1989-02
1976-12	1004.7	1981-01	947.3	1985-02	1271.4	1989-03
1977-01	954.4	1981-02	974.6	1985-03	1266.8	1989-04
1977-02	936.4	1981-03	1003.9	1985-04	1258.1	1989-05
1977-03	919.1	1981-04	997.8	1985-05	1315.4	1989-06
1977-04	926.9	1981-05	991.8	1985-06	1335.5	1989-07
1977-05	898.7	1981-06	976.9	1985-07	1347.5	1989-08
1977-06	916.3	1981-07	952.3	1985-08	1334	1989-09
1977-07	890.1	1981-08	881.5	1985-09	1328.6	1989-10
1977-08	861.5	1981-09	850	1985-10	1374.3	1989-11
1977-09	847.1	1981-10	852.6	1985-11	1472.1	1989-12
1977-10	818.4	1981-11	889	1985-12	1546.7	1990-01
1977-11	829.7	1981-12	875	1986-01	1571	1990-02
1977-12	831.2	1982-01	871.1	1986-02	1709.1	1990-03
1978-01	769.9	1982-02	824.4	1986-03	1818.6	1990-04
1978-02	742.1	1982-03	822.8	1986-04	1784	1990-05
1978-03	757.4	1982-04	848.4	1986-05	1876.7	1990-06
1978-04	837.3	1982-05	819.5	1986-06	1892.7	1990-07
1978-05	840.6	1982-06	811.9	1986-07	1775.3	1990-08
1978-06	819	1982-07	808.6	1986-08	1898.3	1990-09
1978-07	862.3	1982-08	901.3	1986-09	1767.6	1990-10
1978-08	876.8	1982-09	896.3	1986-10	1877.8	1990-11
1978-09	865.8	1982-10	991.7	1986-11	1914.2	1990-12
1978-10	792.5	1982-11	1039.3	1986-12	1896	1991-01
1978-11	799	1982-12	1046.5	1987-01	2158	1991-02
1978-12	805	1983-01	1075.7	1987-02	2224	1991-03
1979-01	839.2	1983-02	1112.6	1987-03	2304.7	1991-04
1979-02	808.8	1983-03	1130	1987-04	2286.4	1991-05
1979-03	862.2	1983-04	1226.2	1987-05	2291.6	1991-06
1979-04	854.9	1983-05	1200	1987-06	2418.5	1991-07
1991-08	3043.6	1993-05	3527.4			
1991-09	3016.8	1993-06	3516.1			
1991-10	3069.1	1993-07	3539.5			
1991-11	2894.7	1993-08	3651.3			
1991-12	3168.8	1993-09	3555.1			
1992-01	3223.4	1993-10	3680.6			

1992-02	3267.7	1993-11	3684			
1992-03	3235.5	1993-12	3754.1			
1992-04	3359.1	1994-01	3978.4			
1992-05	3396.9	1994-02	3832			
1992-06	3318.5	1994-03	3636			
1992-07	3393.8	1994-04	3681.7			
1992-08	3257.4	1994-05	3758.4			
1992-09	3271.7	1994-06	3625			
1992-10	3226.3	1994-07	3764.5			
1992-11	3305.2	1994-08	3913.4			
1992-12	3301.1	1994-09	3843.2			
1993-01	3310	1994-10	3908.1			
1993-02	3370.8	1994-11	3685.7			
1993-03	3435.1	1994-12	3834.4			
1993-04	3427.6	1995-01	3843.9			
Year (Quarterly)	Average P/E	Year (Quarterly)	Average P/E	Year (Quarterly)	Average P/E	
1959-01	19.4	1971-01	17.3	1983-01	105.4	
1959-02	18	1971-02	16.7	1983-02	118.7	
1959-03	17.7	1971-03	16.6	1983-03	30	
1959-04	19.8	1971-04	16.2	1983-04	17.4	
1960-01	18.2	1972-01	16.6	1984-01	13.3	
1960-02	20.5	1972-02	15.8	1984-02	11.1	
1960-03	18.3	1972-03	15.3	1984-03	11.2	
1960-04	19.1	1972-04	15.2	1984-04	10.7	
1961-01	22.9	1973-01	13.2	1985-01	11.7	
1961-02	23.4	1973-02	11.5	1985-02	13.1	
1961-03	24.2	1973-03	11.5	1985-03	14.6	
1961-04	22.9	1973-04	9.9	1985-04	16.1	
1962-01	20.7	1974-01	9.5	1986-01	18.9	
1962-02	16.2	1974-02	8.6	1986-02	18.3	
1962-03	16.3	1974-03	6.1	1986-03	14.9	
1962-04	17.9	1974-04	6.2	1986-04	16.4	
1963-01	18.3	1975-01	8.2	1987-01	18.2	
1963-02	18.3	1975-02	10.5	1987-02	19.2	
1963-03	18.2	1975-03	10.5	1987-03	18.8	
1963-04	18.5	1975-04	11.3	1987-04	14.6	
1964-01	19.1	1976-01	12.2	1988-01	13.8	
1964-02	18.7	1976-02	11.1	1988-02	12.7	
1964-03	19.1	1976-03	10.3	1988-03	11.7	
1964-04	18.8	1976-04	10.4	1988-04	10.1	
1965-01	18.3	1977-01	9.6	1989-01	10	
1965-02	17.1	1977-02	9.4	1989-02	10.8	
1965-03	17.6	1977-03	9.4	1989-03	11.9	
1965-04	18.1	1977-04	9.3	1989-04	12.4	

1966-01	16.8	1978-01	8.5	1990-01	13.2
1966-02	15.5	1978-02	9	1990-02	13.9
1966-03	13.5	1978-03	8.5	1990-03	12.7
1966-04	13.6	1978-04	7.1	1990-04	15.3
1967-01	15.3	1979-01	6.9	1991-01	18.9
1967-02	15.8	1979-02	6.5	1991-02	22.1
1967-03	17.6	1979-03	6.4	1991-03	29.9
1967-04	16.8	1979-04	6.7	1991-04	64.3
1968-01	15.6	1980-01	6.5	1992-01	53.4
1968-02	16.1	1980-02	7.5	1992-02	46.3
1968-03	16.4	1980-03	8.4	1992-03	38.8
1968-04	16.3	1980-04	7.9	1992-04	30.5
1969-01	15.8	1981-01	8.1	1993-01	30.2
1969-02	14.7	1981-02	7.6	1993-02	41.2
1969-03	13.6	1981-03	6.9	1993-03	34.4
1969-04	14	1981-04	7.7		
1970-01	14.5	1982-01	8.5		
1970-02	12.8	1982-02	10.2		
1970-03	14.7	1982-03	25.5		
1970-04	16.4	1982-04	114.4		

Table 11 - Japanese NFC's Percentage Change in D/E for the Period of 1960 to 1991

Year	Percentage Change in D/E Trough to Peak (Expansion)	Percentage Change in D/E Peak to Trough (Contraction)
1962		5.171
1964	8.284	
1965		8.929
1970	13.735	
1971		11.421
1973	4.462	
1975		12.545
1976	-0.407	
1977		-2.127
1980	-10.818	
1983		2.711
1985	-8.25	
1986		1.66

Table 12 - Japanese NFC's Percentage Change in the Separate Components of Debt as well as for Debt and Equity for the Period of 1960 to 1991

Year	Percentage Change in Short-term Loans, Peak to Trough (Contraction) and in Brackets Trough to Peak (Expansion)	Percentage Change in Long-term Loans, Peak to Trough (Contraction) and in Brackets Trough to Peak (Expansion)	Percentage Change in Corporate Bonds, Peak to Trough (Contraction) and in Brackets Trough to Peak (Expansion)	Percentage Change in Debt, Peak to Trough (Contraction) and in Brackets Trough to Peak (Expansion)	Percentage Change in Equity, Peak to Trough (Contraction) and in Brackets Trough to Peak (Expansion)
1962	22.806	21.109	7.640	20.759	14.833
1964	(32.205)	(31.637)	(21.292)	(31.089)	(21.060)
1965	16.765	20.361	13.803	17.917	8.245
1970	(116.704)	(170.098)	(83.784)	(135.162)	(106.781)
1971	16.909	29.746	17.934	22.733	10.149
1973	(48.257)	(50.839)	(28.893)	(48.413)	(42.079)
1975	31.459	37.029	54.153	35.236	20.158
1976	(7.102)	(8.695)	(13.225)	(8.216)	(8.658)
1977	7.816	0.447	9.193	4.276	6.543
1980	(33.420)	(29.038)	(37.489)	(31.591)	(47.552)
1983	42.818	24.680	30.842	33.654	30.129
1985	(11.053)	(14.029)	(57.550)	(15.191)	(25.545)
1986	13.610	9.355	15.302	11.929	10.104

Table 13 - Japanese NFC's Separate Components of Debt as a Percentage of Total Debt for the Period of 1960 to 1991

Year	Short-term Loans as a % of Total Debt	Long-term Loans as a % of Total Debt	Corporate Bonds as a % of Total Debt
1960	53.838	36.883	9.279
1961	52.716	38.041	9.243
1962	53.610	38.151	8.239
1963	52.706	38.944	8.350
1964	54.066	38.311	7.623
1965	53.538	39.105	7.357
1966	53.991	39.022	6.988
1967	53.952	39.368	6.680
1968	51.819	41.845	6.337
1969	50.566	43.470	5.964
1970	49.336	44.914	5.750
1971	46.995	47.480	5.525
1972	46.754	48.372	4.874
1973	46.945	48.256	4.798

1974	47.718	47.628	4.654
1975	45.634	48.896	5.470
1976	45.165	49.113	5.723
1977	46.698	47.309	5.993
1978	47.155	46.677	6.168
1979	49.044	44.530	6.426
1980	47.347	46.392	6.261
1981	46.946	46.943	6.111
1982	46.795	47.014	6.191
1983	50.594	43.277	6.129
1984	49.687	43.676	6.638
1985	48.776	42.840	8.383
1986	49.509	41.855	8.636
1987	46.708	44.690	8.602
1988	46.605	43.903	9.491
1989	41.283	47.654	11.063
1990	40.027	48.946	11.027
1991	40.695	48.032	11.273

Table 14 - Tokyo Stock Exchange Average Price Index for the Period of 1960 to 1991

Year	Tokyo Stock Exchange Average Price Index	Year	Tokyo Stock Exchange Average Price Index
1960	97.35	1976	347.51
1961	112.1	1977	376.78
1962	98.59	1978	415.41
1963	108.2	1979	449.88
1964	95.56	1980	474.00
1965	91.68	1981	552.29
1966	109.88	1982	548.28
1967	110.48	1983	647.41
1968	118.91	1984	815.47
1969	151.05	1985	997.72
1970	163.48	1986	1324.26
1971	179.62	1987	1963.29
1972	282.42	1988	2134.24
1973	362.46	1989	2569.27
1974	307.21	1990	2177.96
1975	312.06	1991	1843.18

Table 15 - Japanese NFC's Current Ratio and Percentage Change in Profits for the Period of 1960 to 1991

Year	Current Ratio	Percentage Change in Profits, Trough to Peak (Expansion)	Percentage Change in Profits, Peak to Trough (Contraction)
1960	61.2		
1961	62.5		
1962	63.4		-2.27
1963	65.3		
1964	65.3	24.73	
1965	66.6		-0.828
1966	68		
1967	68.2		
1968	68.5		
1969	70.4		
1970	69.8	243.32	
1971	71.2		-53.46
1972	72		
1973	69.7	127.78	
1974	65.99		
1975	68.59		
1976	68.94	61.98	
1977	68.82		5.327
1978	68.31		
1979	68.28		
1980	67.45	93.88	
1981	68.82		
1982	67.95		
1983	68.81		-14.11
1984	69.13		
1985	69.3	26.92	
1986	69.18		-2.025
1987	68.61		
1988	70.05		
1989	72.97		
1990	72.05		
1991	67.8		

Table 16 - Ordinary Least Squares for Canada for the Period of 1962 to 1991

Dependent Variable		Differenced log of Real GDP	
Adjusted R-Squared		0.314695	
Breusch/Godfrey LM: AR/MA1		2.10127 with a p-value of 0.147	
Variables:	Estimated Coefficient:	Standard Error:	T-Statistic:
Differenced log of D/E	0.346645	0.134665	2.57413
Differenced log of Profits	0.018963	0.034172	1.14021
Difference log of Prime Rate	0.046181	0.030868	1.4961
Differenced log of Toronto Stock Exchange Index	0.113323	0.050198	2.25751

Table 17 - Ordinary Least Squares for Canada for the Period of 1962 to 1993

Dependent Variable:		Differenced log of D/E	
Adjusted R-Squared		0.118685	
Breusch/Godfrey LM: AR/MA1		2.54184 with a p-value of 0.111	
Variables:	Estimated Coefficient:	Standard Error:	T-Statistic:
Constant	0.018234	0.00864566	2.10901
Detrended Markup	0.013462	0.00591772	2.2748

Table 18 - Ordinary Least Squares for US for the period of 1950 1992

Dependent Variable:		Differenced log of Real GDP	
Adjusted R-Squared		0.128937	
Breusch/Godfrey LM: AR/MA1		0.199376 with a p-value of 0.655	
Variables:	Estimated Coefficient:	Standard Error:	T-Statistic:
Constant	0.030885	0.00426956	7.23387
Detrended Markup	0.00582596	0.00216866	2.68644

Table 19 - Ordinary Least Squares for US for the period of 1951 to 1992

Dependent Variable: Detrended Prime Rate			
Adjusted R-Squared: 0.207237			
Breusch/Godfrey LM: 1.98396 with a p-value of AR/MA1 0.159			
Variables:	Estimated Coefficient:	Standard Error:	T-Statistic:
Constant	-0.171014	0.06773	-2.52494
Differenced log of Real GDP	5.78366	1.79879	3.2153
Differenced log of Bank Rate	-0.086973	0.228217	-0.38095

Data Appendix

Before we delve into each particular country's data and their sources, there are a few statistical clarifications worth mentioning. The first is that, after an extensive and exhaustive search, a comprehensive source of data, for all three countries, could not be ascertained and thereby, the individual country's data had to be used.¹ Secondly, since both Canada and Japan only produce annual data for the debt to equity (D/E) components, the analysis is limited by this constraint.² Since the peaks and troughs of the reference cycles are provided monthly, this created the problem of determining whether the D/E ratio was peaking due to the peak or trough, in the years in which both occurred. Thus, in an attempt to alleviate this hindrance, the following procedure was implemented. In years in which both the peak and trough occurred in the same year, either the peak was pushed back to the previous year or the trough was pushed forward to the subsequent year, depending on which was more appropriate. For example, in Canada in 1970, a peak and trough occurred in February and June respectively. Hence, by implementing the aforementioned procedure, the peak was pushed back to 1969.³ A third statistical consideration is that Japan only produces equity values at book or historical cost values. Thus, once again, in order to maintain consistent data among the three countries, historical cost figures are used.

¹ In order to maintain a relatively consistent comparison, the data were compiled as closely as possible to each other.

² It is realized that Canada produces quarterly data. However, these data only go back to 1980. Thus, by using these data one would be constrained to this limited time frame for the analysis.

³ Looking at quarterly or monthly data may be the road for future studies to pursue when such data become available.

Canada:

The following data comes from CANSIM:

- **Bank loans** - Covers loans and overdrafts booked in Canada by Canadian chartered banks. However, no distinction is made between short-term and long-term loans.
- **Other loans** - Covers loans by foreign banks and by foreign branches, agencies and subsidiaries of Canadian chartered banks. It excludes loans to consumers and loans to affiliates.
- **Finance and Short-term paper** - Covers marketable short-term notes, that is, original term to maturity of one year or less. These are issued by a variety of financial and nonfinancial corporations and sectors, usually at a discount bearing no coupons.
- **Mortgages** - Covers mortgage loans and agreements of sale secured by real property, mostly residential buildings.
- **Other Canadian bonds** - Consists of largely bonds and debentures issued by Canadian corporations. By definition, they are issued with an original term to maturity in excess of one year.

Note: The above categories are what constitutes the Canadian credit market debt, as defined by Statistic Canada.

- **Net worth** - The book value of shares outstanding (shares issued plus contributed surplus) plus retained earnings. For private nonfinancial corporations this represents net worth with assets at historical cost or book value and is the same as shares/stocks.

Note: The above is used for Canadian equity.

- **TSEA** - The TSEA is a composite index which measures changes in the market value of a portfolio of 300 stocks due to changes in the prices of the individual stocks, which are traded on the Toronto Stock Exchange. Each stock is weighted by the total number of shares outstanding (less known control blocks of 20% or more). The 300 stocks have also been classified by industry so 14 major group indices and 43 sub-group indices are computed.
- **Profits** - Are before-tax profits and are in current dollars.

The following come from the International Financial Statistics disc by the IMF:

- **Real GDP** - Comes from the first quarter of one year to the first quarter of the next. They are in 1991 prices. And are used as a proxy for business conditions.
- **Changes in CPI** - Used as a rough indication of inflation.
- **Imports** - Total imports from all the countries with whom Canada (US or Japan) trade. They are given in current dollars. And are used to see if trade or other countries' economies play a role.
- **Bank rate**
- **Prime rate**

Note: These five IMF data variables are used for all three countries.

US:

The following comes from data provided by the Board of Governors of the Federal Reserve system:

- **Mortgages - Represents all mortgage debt, including bank as well as nonbank owed by corporations.**
- **Bank loans - All funds supplied by banks to the corporate business sector, except for funds supplied through mortgage loans and through purchases of corporate securities.**
- **Foreign loans - All loans made by foreign banks and their branches.**
- **Commercial paper - Covers marketable short-term notes.**
- **Nonbank loans - Funds from other financial intermediaries.**
- **US Government loans**
- **Tax exempt-debt**
- **Corporate bonds - Bonds and debentures issued by corporations.**
- **Acceptance liability**

Note: The above is what constitutes the US credit market debt, according to the Board of Governors.

- **Equity - Net worth at historical cost, that is, total assets less total liabilities.**
- **Profits - Before tax profits in current dollars.**
- **DJIA - The Dow Jones Industrial Average is comprised of 30 issues on the New York Stock Exchange. Because the calculation of the average simply adds the prices of 30 issues before applying the divisor, a stock that sells for a higher price receives a larger weight in the calculation than one selling for a lower price. In addition, criticisms are raised because so few companies are used and they are only blue chip performers. Thus, it is argued that the DJIA may not be a complete representation of the market. But despite these drawbacks, the DJIA is used quite widely and this is the reason for its use here. It is the average of 30 blue chip stocks listed on New York stock exchange.**

Japan:

The following series come from data provided by the Bank of Japan, *Statistics Index Yearbook*:

- **Short-term borrowings from financial institutions.**
- **Corporate bonds or debentures.**
- **Long-term borrowings from financial institutions.**

Note: These three combined constitute Japan's credit market debt.

- **Equity - Net worth at historical cost.**
- **TSE - The Tokyo Stock Price Index covers all issues listed on the First Section of the Tokyo Stock Exchange (agriculture, mining, construction, commerce, communication, to name a few) and is calculated by dividing the current total market value (obtained by multiplying the number of shares of listed stocks by their prices) by the total market value at the base date (Jan. 4, 1968). The Bank of Japan admits that these indexes reflect the price movement of listed stocks as a whole, because the number of shares of listed stocks is adopted as an index weight. However, they argue that these indexes do not reflect sensitively the movement of stock prices, for the reason that larger weights are allotted to large-capital stocks whose prices move within a relatively narrow range.**
- **Profits - Operating profit/loss plus non-operating revenue less non-operating expenses.**