

# Trends in the Canadian Financial System

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## Abstract

Over the 1990s, Canadian businesses became more heavily dependent on financial markets as their primary source of external funding. Data display a trend towards a more “market-oriented” financial system. Our econometric tests suggest that this new trend started after the 1980 banking legislation amendments. The trend was considerably accentuated after the 1992 amendments. We provide a new series for the off-balance-sheet activities of Canadian banks that measures the non-interest income of banks as a credit equivalent. Despite the market-oriented trend, this series combined with our data reveal a healthy trend in banks activities: thanks to the amendments, financial institutions are simply closer to the markets. However, our data indicate that Canadian firms issue a substantial share of their bonds in the U.S. bond market. They also issue an increasing share of their stocks in the U.S. stock market. We conjecture that there is some form of incompleteness in the Canadian markets. A noticeable fraction of Canadian issuances in the U.S. involves riskier firms for which U.S. markets seem more mature.

# 1. Introduction: Overview of the Subject

Over the last few decades, the Canadian financial system has undergone major changes. These changes are driven both by temporary (usually market-driven) and persistent shocks (e.g., persistent market conditions or regulatory changes). Temporary shocks should mainly contribute to *cyclical changes* in external financing behaviour -its short term volatility.<sup>1</sup> Regulatory shocks can permanently affect the way firms raise external funds. Indeed, regulatory shocks can induce *structural breaks* in the external financing trend.<sup>2</sup>

It is often difficult to determine the relative contribution of these two types of shocks because they interact with each other. More precisely, temporary shocks can contribute to the low-frequency variance of external-financing (“long-run variance”), and permanent shocks can contribute to the high-frequency as well. That could be the case if, for example, a regulatory shock was triggered by persistent market pressures. If we were interested in the exact decomposition of firms’ external financing between cycle and trend, we would need to consider both type of shocks simultaneously. As a first step, however, this paper focuses the analysis on changes in the financial trend (i.e., structural trend-breaks) only.

When focusing on the Canadian financial trend, our study reveals that the system is becoming more market-based with a greater proportion of financing being done through bonds and equity. More precisely, the intermediaries providing indirect financing to Canadian firms are more “market-oriented” because they are increasingly involved with financial market activities such as brokering securities. We investigate whether this new trend can partly be explained by Canadian legislative developments, which allowed financial intermediaries, especially banks, to become more market-oriented. Regular revisions in Canadian financial legislation, triggered by market conditions, are usually followed by a series of financial innovations as intermediaries adjust to the new regulatory environment and take advantage of it. In turn, these financial innovations can potentially lead to a structural break in the nature of external financing.

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<sup>1</sup>It should be noted that this study is dealing only with external financing: the financing provided to Canadian companies by external sources.

<sup>2</sup>Throughout the article, we define a financial trend as a trend in the way firms get their external financing.

Quite often, persistent market conditions<sup>3</sup> are the concomitant factors contributing to the trend. For example, in the 1990s, Freedman (1992) notes that “the increasing use of securities markets by corporate borrowers was probably the single most important factor driving the integration of the banking and securities industries. As the traditional bank loan lost ground to the bond, equity, and especially, the paper market (including bankers’ acceptances), as well as to Euro-Canadian dollar and foreign currency issues, the banks became increasingly concerned about their ability to operate profitably and to compete effectively with both domestic securities dealers and with foreign banks and securities dealers.”. The legislative restructuring has been undoubtedly influenced by diverse market conditions (Freedman and Goodlet 1992). Consequently, in this paper, we consider Canadian legislative developments as a proxy for those market conditions that can potentially contribute to the low frequency variance of external financing. The aim of the paper is then to investigate the statistical significance and explanatory power of this proxy variable as a determinant of external financing trend.

In the case of Canada, data suggest that the persistent shocks come in part from revisions to financial regulation that are often accompanying market pressures. In the study, we think of financial regulation changes in *global* terms. For example, persistent shocks can originate from changes in foreign regulation: if U.S. regulation allows a new financial product not available elsewhere, then some Canadian borrowers may be better served by an expanding (i.e., more complete) U.S. market. In other words, when a new financial product is only offered abroad, the Canadian financial system becomes, in relative terms, more incomplete than the foreign market. In this case, Canadian firms find the relatively more complete foreign market more attractive.

The evolution of the financial system is driven by (global) regulation and financial innovations. Canadian firms have in fact been able to take an advantage of the larger diversity of financial products provided in the United States.<sup>4</sup> Our data show that Canadian businesses

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<sup>3</sup>We define as persistent those market conditions that are deep enough to qualify as factors that motivates a legislative restructuring of the financial industry. For an exhaustive list of these factors see Freedman and Goodlet (1992) page 25, or Engert et al (1999) section 2.

<sup>4</sup>The U.S. bond market was forced to develop and become deeper than in other countries, because banking regulation kept the U.S. banking system artificially fragmented. Note that this regulatory condition seems sufficient rather than necessary, see for instance the U.K. experience.

rely more or less *equally* on the Canadian and U.S. bond markets, the U.S. stock market being increasingly used throughout the 1990s for the financing of risky projects. For that reason, the study considers (global) regulation as one of the potentially significant factors explaining the evolution that occurred in the Canadian financial system during the 1980s and 1990s.

As it stands, the Canadian financial system has evolved from its traditional four-pillars structure into a resilient, complex financial web.<sup>5</sup> We believe that this transformation is closely related to legislative revisions. The next section describes the trends we draw from the data, while the third section explains them. In this latter section we provide a new series for banks' adjusted assets to establish that financial intermediaries have become increasingly closer to the markets - i.e., market-based. Based on a simple econometric model, we also show herein that regulatory revisions can significantly explain the structural trend-breaks we observe in the data. The last section concludes with a few additional remarks regarding the structure of the Canadian financial system.

## 2. The Data

### 2.1 Indirect Finance

#### 2.1.1 Canadian banks and other financial institutions

Indirect finance involves a financial intermediary that stands between lender-savers and borrower-spenders and helps transfer funds from one to the other. The principal financial intermediaries that exist in Canada are: (1) chartered banks; (2) trusts and mortgage loan companies; (3) non-depository credit intermediaries; (4) credit unions and caisses populaires; and (5) life insurance companies.

Figure 1 provides a comprehensive way of looking at the 30-year-evolution of loan pro-

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<sup>5</sup>Canadian financial system used to be divided into four distinct pillars: banking, insurance, securities, and trust services. Participants in each of these "pillars" were generally confined to offering products and services within their respective core businesses. For more detailed definition of the traditional financial system see Binhammer (1993).

vision to non-financial businesses by these five categories.<sup>6</sup> In the figure, the *Chartered Banks* category includes business loans, foreign currency loans, banker's acceptances, non-residential mortgages, and leasing receivables.<sup>7</sup> The loans extended by *Trust and Mortgage Loan Companies* are composed of non-residential mortgages, leasing receivables, and short-term business loans.<sup>8</sup> The category of *Non-depository Credit Intermediaries* also consists of business loans, non-residential mortgages, and leasing receivables.<sup>9</sup> Finally, the loans extended by *Credit Unions and Caisses Populaires* is a category composed of short-term business loans and non-residential mortgages, while *Life Insurance Companies* category includes only non-residential mortgages.

The figure shows that trust and mortgage loan companies grew gradually until the early 1990s when they started to be bought up by the large Canadian banks. Recently, 75 per cent of loans have been provided by Canadian banks, having risen slowly from a low point around 65 per cent in 1992. The increasing share of banks has also been at the expense of life insurance companies whose share has declined slowly since 1994.

As explained in Freedman (1998), this situation is related to the change in banking regulation that permitted banks to own trust subsidiaries. Indeed, after the 1992 amendments, most of these banks acquired trust subsidiaries either by purchase or creation. This is obvious from the figure: the vertical bar marking the 1992 amendments coincides with the reversal of a declining trend at banks. Since that time, banks have been gaining market share, primarily at the expense of the trust and mortgage loan industry but also from life insurance companies. Hence, with the regulatory amendments, the loan business has been increasingly absorbed by Canadian banks, allowing them to preserve their share of activity.

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<sup>6</sup>For a detailed description of the data see Appendix A.

<sup>7</sup>It should be noted, however, that the series for non-residential mortgages and leasing receivables begin in October 1972 and July 1977, respectively. Therefore, these two series were backcasted to January 1969, which is the starting point for most of the series used. For backcasting see Appendix A.

<sup>8</sup>The first observation for non-residential mortgages is in January 1973, thus we had to backcast this series as well -see Appendix A.

<sup>9</sup>The series for leasing receivables was backcasted to 1969 -see Appendix A.

### 2.1.2 The loan business

While the share of Canadian banks has been stable relative to other lending institutions, the financial institutions together have been losing market share to the financial markets in the provision of external funds to Canadian non-financial businesses. As illustrated in Figure 2, the trend in the Canadian financial structure is towards a more market-based system.

In the figure, the *Loans* category<sup>10</sup> is the total of all intermediary or indirect lending described in Figure 1. More specifically, the *Loans* category includes total short-term business credit excluding commercial paper and securitization. It is the sum of business loans, chartered bank foreign currency loans, bankers' acceptances plus other business credit by institutions (non-residential mortgages and leasing receivables). The *Bonds* category includes bonds and debentures plus commercial paper issued by non-financial corporations, while *Stocks* consists of shares outstanding. Finally, the *Other* category includes other sources of external funds such as special purpose corporations (securitization).

In Figure 2, the vertical bars once again correspond to the amendments in financial regulation. Indirect financing clearly decreased, in relative terms, in the 1990s and has returned to the same level as in the late 1960s.<sup>11</sup> In other words, Canadian financial institutions have been experiencing a relative decline in the market share of their loan portfolios. More precisely, there has been a relative drop in loan business, from approximately 60 per cent of external financing in the early 1980s to just under 40 per cent in recent years. At the same time, bonds, equity, and other category have all increased as a share of external funding.

Figure 3, with a U-shaped direct/indirect lending ratio<sup>12</sup>, confirms this trend. Indirect financing provided by financial institutions was gaining market share until the early 1980's when the situation stabilized. After 10 years of little change, until around 1991 or 1992, direct financing started to capture a growing share of external funding and has increased steadily ever since.

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<sup>10</sup>For a detailed description of the data see Appendix A.

<sup>11</sup>The overall picture does not change much when the same four series (loans, bonds, stocks, other) are expressed relative to nominal GDP.

<sup>12</sup>The direct/indirect ratio is a ratio between bonds, shares and other over loans extended by financial institutions.

As pointed out by Engert, Fung, Nott, and Selody (1999), the Canadian financial system is undergoing noticeable restructuring. The traditional operations of Canadian banks are changing. For example, advances in computer technology enable financial firms to design and sell different types of financial instruments that are sometimes more closely related to direct market financing than to traditional loan business (Engert et al 1999). Diverse financial innovations give banks more flexibility than they used to within the conventional business of lending (see Freedman and Goodlet 1998). Freedman (1992, p.373) mention that “while the Canadian financial system was historically characterized by a separation of functions among the different institutions, the separation has been blurring over the past 25 years or more, with the penetration by each group into the others’ primary areas of business accelerating over the recent period”. Hence, the relative decline of the loan business is simply the result of a historical trend towards the blurring of the boundaries between financial intermediation and direct financing.<sup>13</sup>

## 2.2 Canadian direct financing

With direct financing, businesses borrow funds directly from savers in financial markets by selling them securities (bonds or stocks) through a broker. Stocks securities are equities (residual claims) on the borrower’s future assets, bonds are residual claims on the borrower’s future income.

In Figure 4, we plot gross new issues of securities (bonds plus stocks)<sup>14</sup> by non-financial businesses.<sup>15</sup> The category *In Canada* is composed of all corporate preferred shares, common shares and warrants, plus bonds, issued in Canada. As the name suggests, the category *In U.S.* includes corporate shares and bonds issued in U.S., while the category *Elsewhere* contains the same securities issued in all other countries such as U.K., Switzerland, Japan, Germany, etc.

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<sup>13</sup>On that topic see the special issue of the *Journal of Financial Intermediation*, vol 10 (3/4), July/October 2001.

<sup>14</sup>We are interested by external-financing requirements of canadian firms. We judge the gross new issues measure appealing but it is possible to consider net new issues as well.

<sup>15</sup>For a detailed description of the data see Appendix A.

The figure shows that, abstracting from the volatility, there has been a relative decrease in gross new issues of securities (stocks and bonds) in Canada since the early 1980s. The data reveal that the share of issues in Canada fell from around 80 per cent in the 1960s, 1970s, and early 1980s to approximately 65 per cent in the 1990s and recent years.

At the same time, the share of issues placed in the United States rose from less than 10 per cent in the 1980s to more than 35 per cent in recent years. This suggests that the market-oriented trend that is taking place in Canada benefits U.S. markets *relatively* more than Canadian markets. More precisely, the trend has probably fed several U.S. markets, including the high-yield bond market where approximately 40 per cent of the recent Canadian high-yield issuances in the U.S. came from the telecommunications sector.<sup>16</sup>

Engert (2001) notes that there has been a sharp increase in Canadian based stock issues inter-listed on U.S. exchanges. If we look at Figures 5 and 6 we see that the relative decrease in the issues of securities (bonds and stocks) in Canada can be almost entirely accounted for by a relative decrease in stock issues. Figure 6 shows that, in the 1980s and 1990s there was a relative decline in gross new issues of stocks in Canada, offset by an increase of shares placed in the U.S. exchanges. At the same time, Figure 5 shows that, despite the volatility, the Canadian bond market kept its relative share generally stable, and on average accounted for approximately 50 per cent of total Canadian bond issuances. For Canadian bonds, Engert (2001, p.2) explains that the “growth in the relative importance of corporate USD issues over the 1990s came at the expense of outstanding EuroCAD issues and other currency issues.” This can help explain how Canadian bond issuances have been preserved.

Finally, note that based on the outstanding amounts, stocks rather than bonds are the largest component of direct financing component. This was particularly true in the early seventies when bonds accounted for approximately 20 per cent of external financing, while stocks accounted for more than 45 per cent. In recent years, bonds have become a more important source of financing, jumping to around 30 per cent. Equity and other now represent only a slightly higher proportion of external funding.<sup>17</sup>

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<sup>16</sup>See Figure 13 and cited reference herein.

<sup>17</sup>For similar findings see also Miville and Bernier (1999).

### 3. Interpretation of the Trends

#### 3.1 A credit equivalent series for Canadian banks

There are several indicators showing that the Canadian banking sector is growing well despite the decreasing trend in the loan business. The banks' total assets as a percentage of nominal gross domestic product indicates that Canadian banks are quite healthy: these findings are similar to those obtained by Boyd and Gertler (1994) for the U.S. banks. Indeed, as illustrated by Figure 8, although the loan portfolios by financial intermediaries have been slowly declining relative to nominal GDP, total assets of financial intermediaries have been obviously increasing relative to nominal GDP. The balance sheet numbers indicate a continual increase in banking relative to overall economic activity over the entire period.

However, even more important is the increase in off-balance-sheet activities. These activities generate non-interest income<sup>18</sup> without relying on traditional lending. Statistics Canada (The Daily 2002, p.6) reported that, in 2000, non-interest income of Canadian financial institutions rose to \$23.8 billion, a 19.5 per cent increase from the previous year (74.3 per cent gain for corporate and institutional finance services): "The growth in non-interest income, which continued the trend seen over the last several years, indicated a shift away from income earned by deposits and loans to income earned mostly by providing fee-based services".

As shown in Figure 9, non-interest income has grown much faster than net-interest income. The data is consistent with the observation of Freedman (1998, p.36): "[a]nother important trend in the operations of Canadian banks in recent years, in line with developments in other major banks worldwide, has been the shift towards off-balance-sheet activities and fee income". This has been particularly true during the last decade, and more precisely since the 1992 (and 1997) Bank Act amendments. The financial restructuring mentioned above explains why a growing share of bank activities is done off-balance-sheet. The markets for these alternative instruments have experienced high rates of financial innovation over the last decade or so.

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<sup>18</sup>Non-interest income is the income generated by banks outside of their traditional lending/retailing activities -i.e., off-balance-sheet activities including market-related activities. For a complete definition of non-interest income see Reporting Guide (2002) and Appendix B.

Off-balance-sheet activities are by definition not reported as regular lending, so it is difficult to get an accurate measure of a bank activities in these areas. Following the Boyd and Gertler (1994) methodology, we use the non-interest income series to assess the importance of off-balance-sheet activities. We build a new credit-equivalent series for these Canadian bank activities.<sup>19</sup> The idea is to transform the non-interest income series into an asset series, as if this non-interest income had been generated from tangible assets in the same manner as regular lending.

Figure 8 shows that, after the 1992 and 1997 amendments, the credit equivalent of off-balance-sheet items began to grow more quickly. Thus, in the last ten years much of the growth in total banks assets, on- and off-balance sheet, has in fact come from non-interest income. Since banks are competing over service fees it is unlikely that this growth comes from increased fees<sup>20</sup>: despite the fact that a decomposition of non-interest income is beyond the scope of this study, it is reasonable to think that the growth is driven by market-related activities such as trading income.

One example of such off-balance-sheet activities is securitization.<sup>21</sup> As Figure 10 reveals, the use of securitization started in the early 1990s, and exploded a few years later. There is no doubt that the securitization business will continue to grow, as Canadian financial institutions start to issue high-yield mortgage securities and other new instruments; i.e., as the market deepens to incorporate riskier investments. It is important to mention this variable, as it can signal growth in the housing market in the same manner as regular mortgage expansion (and, hence, could indicate speculation or inflationary pressures).

Another example of off-balance sheet activities is given by the involvement of the financial institutions in angel investing and venture capital. As explained in Liu (2000), angel investing had grown quickly until the recent economic slowdown. Cayen (2001) notes that venture capital has also displayed a similar pattern. While the *evolution* of the involvement

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<sup>19</sup>For details regarding the construction of this series see Appendix C.

<sup>20</sup>We thank Jim Armstrong for this remark.

<sup>21</sup>Freedman (1998, p.33) also notes that banks increasingly participate “in the rapidly growing securities lending and repo markets, as well as to the use of securities to hedge interest rate swaps and other derivatives transactions.”

of financial institutions in these activities has still to be analyzed, this illustrates how fungible financing can be.<sup>22</sup>

Finally, note that the transition toward a more sophisticated system of financial intermediation is taking place not only in Canada but also abroad. The increase in off-balance sheet activities corresponds to a transition driven by regulatory changes, financial innovations, as well as by the technological progress accompanying them. For example, for the U.S., the periodical *EconSouth* (2002, p. 4) mentions that “[c]redit derivatives, loan sales markets, and the buying and selling of credit risk provide hedges, and bankers have become much more receptive to using these approaches with the evolution of computer support.”

This common transition translates into more sophisticated relationships between firms, banks, and investors (see Olson 2002). Financial institutions provide more services to investors, while at the same time they are more involved with the firms -i.e., the nature of their relationships has changed. As the financial system becomes more complex, financial intermediaries play the role of an expert adviser for both investors and firms (see Gale 2000).<sup>23</sup> However, for the United States, Conrad et al. (2002) note that advanced investment banking relationships can lead to misreporting by financial institutions.

### 3.2 Econometric test of structural breaks in the trend

Banks’ size and profitability have not declined: consistent with the transition mentioned above, data only suggest a decline in indirect financing (e.g., lending by Canadian banks, trust, other financial intermediaries) and a structural break in trend in the direct-indirect financing ratio. The 1980 amendments—the 1980 change in the Canadian financial regulation—was a first of a series that had a persistent effect on banks and other financial institutions.

Canadian banks are all federally incorporated and regulated under the Bank Act, which defines their range of activities. A very important element of this banking legislation is the

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<sup>22</sup>Nixon (2002) insists on the crucial need for economic innovation vis-à-vis the Canadian productivity challenge outlined by Fortin (2002). For trends in Canadian productivity growth see also Crawford (2002). According to Nixon (2002), small Canadian firms have difficulties enhancing their productivity partly because of a lack of funds. Nixon (2002) also argues that new financial regulations are required to facilitate the external financing of small firms, a point also reported in Liu (2000).

<sup>23</sup>Actually, in some countries, banks can be market makers. We could argue that it is the case for Canada.

“sunset” clause, which requires a periodic reassessment and updating of the laws governing Canadian banks.<sup>24</sup> In the past, the legislation provided for a decennial review. The 1992 Bank Act, however, shortened the review period from ten to five years. The formal review process led to significant Bank Act amendments in 1980, 1987, 1992, and 1997.

The 1980 Bank Act is important since it allowed banks to have subsidiaries in different areas such as venture capital and mortgage loans. This led to the purchase of mortgage loan companies by the banks. Following the financial reforms in 1987 and 1992<sup>25</sup> the banks entered into a range of new businesses with a particular emphasis on off-balance-sheet activities. In 1987, banks were permitted to invest in corporate securities, as well as underwrite and distribute government bonds. All major banks made substantial investments in the securities business and purchased control of most of the existing, large investment dealers.

One of these legislative amendments was put in place in 1987 for accompanying market pressures.<sup>26</sup> As explained by Freedman (1998), during the early 1980s Canadian banks were “concerned about their loss of business to direct market financing” and they “entered the securities business in a major way following the 1987 legislative change”. Figure 3 clearly shows this pattern: the financial structure currently displays a trend toward a more market-oriented system with a pronounced trend-break associated with the implementation phase of the 1987 amendments. More precisely, in 1987 there was a move towards indirect financing followed by a switch back that started a long term change around 1989 or so.

After the change in legislation, and with the help of financial innovations, Canadian financial intermediaries became more market-oriented. In other words, intermediaries embraced and promoted the trend toward market financing through greater direct involvement in financial markets. This situation became obvious in 1992, when banks were given the right to enter the trust business through the establishment of, or acquisition of, trust com-

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<sup>24</sup>For further details on sunset clause see Ifrim (2000).

<sup>25</sup>Obviously, changes in regulation can also occur at the provincial level. For example, Ontario used to have very strict restrictions - see Freedman (1992).

<sup>26</sup>The 1987 amendments allowed financial intermediaries to conduct brokerage activities. For more details see Freedman (1998, p.29), our benchmark reference. To some extent, our contribution can be seen as a continuation of the argument in Freedman (1998) - see also *The Regulation of Canadian Financial Institutions* (1985). In this paper, however, we focus more closely on the recent evolution of the financial system.

panies. Over the next few years, the major banks bought up most of the trust companies still in operation. An important reason for enabling bank acquisition of trust companies was the financial difficulties many trust companies experienced following the collapse of the speculative real estate boom in the late 1980s.

In 1992, banks were also permitted to offer a number of in-house activities such as portfolio management and investment advice. Finally, in 1997, new legislation included various changes to update and refine the amendments made in 1992.

Given the nature of these amendments, we believe that they constitute a credible candidate as one of the underlying sources of the market-oriented trend. Indeed, part of the trend can be explained by the financial cycle and such factors as general economic conditions, market conditions, interest rates, inflation, and exchange rates. However, the accompanying regulation plays a significant role as well. We assume that Figure 3 depicts the realization of a stochastic variable, the direct/indirect lending ratio (Ratio), that follows a data generating process (DGP) with shifts in its trend. Our goal is to determine whether there is evidence that these shifts coincide with the amendment dates to the Bank Act (1980, 1987, 1992, and 1997). We estimate a regression using dummy variables that correspond to these dates. More precisely, we assume there is a phase-in period of six months for adjusting to new legislation and, thus, we start the shifts two quarters after the amendments. For example, in order to capture the effect of the amendments that took place in 1980Q4, we use a dummy variable at 1981Q2.

After investigating various specifications, we found the following to be the most appropriate (based on Chow tests)

$$\Delta Ratio_t = \alpha + \beta_1 \Delta Ratio_{t-1} + \beta_2 y80_t + \beta_3 y92_t + \varepsilon_t,$$

where  $\Delta Ratio_t$  represents the first difference in the ratio of *direct* to *indirect* financing; and  $y80_t$  and  $y92_t$  represent two amendments dummies. These dummy variables are defined as follows:

$$y80 = 1 \text{ from 1981Q2 on; } 0 \text{ otherwise;}$$

$$y92 = 1 \text{ from 1993Q2 on; } 0 \text{ otherwise.}$$

Table 1 shows the results of our estimation using quarterly data. Dummy variables for the 1987 and 1997 Bank Act amendments were found not significant. These dummies did however have the expected positive sign. Similarly, shifts in the AR slope coefficient also proved to be insignificant.

Table 1: Dependent variable:  $\Delta Ratio_t$

Variable	Coefficient	Standard error	T-statistic
Constant	-0.011	0.004	-3.197
$\Delta Ratio_{t-1}$	0.576	0.072	7.987
$y80_t$	0.014	0.005	2.960
$y92_t$	0.009	0.005	1.917

$$R^2 = 0.631, \text{ Durbin - Watson Statistic} = 1.861$$

Before 1980, the direct to indirect financing ratio was characterised by negative drift as illustrated by Figure 3 and the significantly negative constant. However, after 1980, the drift term shifted to become slightly positive but insignificant (+0.003). The next significant change arrived with the 1992 amendment dummy, which raised the overall drift term to 0.012. Given these estimates, direct finance could be once again (as in 1969) twice as large as indirect bank finance in as little as four years.

Obviously, this specification for the DGP of Ratio is very simple and ignores possibly important cyclical and other economic factors (e.g. fiscal changes of the 1990s). It only highlights the significant impact that the concomitant regulatory changes can have.

### 3.3 Interpretation

The fluctuations of the three main components of the financial structure (loans, bonds, and stocks) are often market driven. For example, the change in the financial structure that we observed in the 1970s is partly attributable to the business cycle. In particular, inflation was so severe at the time that it likely had deep and persistent impact on the Canadian

financial trend itself.<sup>27</sup> The extended period of high inflation would have induced businesses to shift in favour of short-term loans and away from long-term instruments such as stocks and bonds. This can help explain why the equity portion of financing fell quickly throughout the 1970s while the fraction of bonds was stable and loans were increasing.

However, the high inflation environment of the 1970's might have played a role in convincing policy makers to change the Bank Act as they did in 1980. Engert et al (1999) note that there has been three economic factors driving the legislative restructuring: the technological revolution, an ageing population, and the variability of inflation and interest rates. There is evidence that high inflation can cause financial innovation as agents attempt to deal with the erosion of wealth<sup>28</sup>, and it is plausible that it triggered regulatory changes. Data suggest that, in turn, these changes might have contributed to the evolution in external financing. We could explain some of the recent increase in the use of stocks and bonds based also on the same argument. Over the 1990s, the low inflation—high growth environment—may have contributed to the increasing share of direct financing, with regulation accomodating these market conditions<sup>29</sup>.

Interestingly, the composition of external financing in Canada seems different from that in most other countries and somewhat contrary to theory. Theory would predict that firms should first rely on internal financing, followed by loans, bonds, and, finally, stocks. One of the reasons for this order in the financial structure is that a firm tries to avoid the dilution of the ownership of his/her firm.<sup>30</sup> In contrast, Figure 2 shows that the relative share of bonds is quite modest, and actually inferior to equity's share of external financing. One possible factor to explain why equity financing has been larger than bond financing is the relative tax advantage in Canada of dividends and capital gains over interest income. A lower average tax rate on dividend, because of the dividend tax credit, will create a demand side effect in favour of equity.

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<sup>27</sup>To further investigate that issue the reader is referred to Cayen (2001), Thurlow and Gupta (1994).

<sup>28</sup>For a theoretical explanation see Alexopoulos (2002).

<sup>29</sup>Since the determinants of the legislative changes are not the subject of this article, the interested reader is referred to Freedman and Goodlet (1992), Freedman (1992), or Engert et al. (1999). Engert et al. (1999) give details about the current trend that are consistent with our argument - see page 13-14.

<sup>30</sup>There is an extensive literature dealing with this order, including the “pecking order” theory.

Relatedly, one specificity of the Canadian experience is the maturation process of the Canadian bond market (see Chouinard et al. 2001). This process originated in the early 1990s, when government borrowing started to decrease and corporate bonds started to fill the gap—public “crowding out” (Chelsky et al. 2002). During that phase, this market was left with lower liquidity, whereas the U.S. bond market was already quite mature. Indeed, in the past, due to regulation, the fragmented U.S. banking system forced companies to rely on the bond market earlier than elsewhere. Hence, Canadian firms might have relied significantly on this U.S. market at the time.

Canadian banks lent more to foreign companies recently (see Figures 11 and 12). With consecutive amendments, they also became market-oriented. Consequently, Canadian firms had to rely more on markets. Our data suggest that Canadian businesses have never relied more on bond markets than today: as it stands, the Canadian bond market is relatively large by international standards (it is ranked sixth in size, see Miville and Bernier 1999). The interest of Canadian firms to issue bonds still benefits foreign bond markets, as the Canadian bond market continues its march toward completeness. Indeed, there is evidence that the Canadian bond market keeps lagging behind the U.S. in financial maturity. For example, Woodman et al. (2002, p.14) mention that “the lack of a meaningful high-yield market in Canada is one of the main reasons that a number of Canadian companies issue debt in the U.S.”. According to the authors “high-yield credits account for roughly 40-50% of the value of US dollar new [Canadian] issues each year” (Woodman et al. 2002, p.15). By comparison, between 1996 and 2001 new issues of high-yield bonds in Canada were only accounting for 3 per cent of total bond issues. Nevertheless, the fact that Canadian firms rely on the (more mature) U.S. bond market is not necessarily a concern, although it may constitute a poor diversification of funding (Chelsky et al. 2002). Further investigation of this matter leads to a simple conclusion: the U.S. bond market might allow some risky Canadian firms to finance themselves more easily in the U.S. than in Canada.

In a sense, the U.S. bond market could have the advantage of a “first entrant”. It was developed earlier and offers a high degree of liquidity and many financial products (liquidity and completeness being related). This can be especially true for Canadian firms involved in risky projects. With a high risk profile, a firm may encounter difficulty when dealing with

the Canadian financial system, since Canadian investors seem rather reluctant (or not well informed) to fund some type of high-risk projects. Canadian markets being less liquid, and in the quasi-absence of a meaningful low rating bond market in Canada, these firms are sometimes left with no choice but to rely on the less risk averse, more developed, U.S. bond market.

Ultimately, Canadian companies considering bonds or stocks as their source of external financing have the possibility of issuing them either in Canadian or U.S. markets. When choosing where to issue, companies consider several aspects. Among these factors are the level of risk firms present to the market, the cost involved, and the size of the investment that they require. The combination of these three aspects determines whether they go south or rely on Canadian markets.<sup>31</sup> The first hurdle companies face is the level of risk of the liability they plan to issue. If it is too high, they are limited to the U.S. market since the Canadian high-yield market does not yet have the liquidity to make it attractive to investors. Second, if the level of risk is appropriate for the Canadian market, then the size and the cost of the investment are the determinants. The larger the size, the more attractive the U.S. market. Lastly, it should be noted that with the increased use of derivatives, the cost of issuing those instruments in the U.S. and Canada has decreased substantially. In the case of the U.S., the relative depth of the market might be reflected by lower costs of derivatives. Regarding Canada, the increasing use of derivatives during the last decade has lowered the cost and made the Canadian market more accessible as well.

With the financial innovations factor, it can be added that the availability of derivatives, such as currency swaps, permits Canadian companies to issue in U.S. dollars, while hedging against currency fluctuations and still having access to the corresponding value in Canadian dollars.<sup>32</sup> Thus, as the use of derivatives became more popular in the early 1980s, it became possible for Canadian companies to increase their exposure in the U.S. financial markets, accessing a larger pool of funds while mitigating their currency risks. Moreover, risky Canadian companies also relied on the U.S. NASDAQ market since no equivalent market existed

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<sup>31</sup>There are numerous aspects that can be invoked as well, such as basic quality signaling whereby a firm listed in the U.S. attracts more attention.

<sup>32</sup>See Appendix B for a definition of swaps and currency swaps.

in Canada until recently. That might help explain the downward slope of the *In Canada* stocks series of Figure 6 for the last decade.

## 4. Conclusion

We find some evidence that regulation that accompany market pressures influences the financial structure trend. Regulatory shocks help explain the relative decrease of indirect financing since 1980. This decrease coincides with an increase in the credit equivalent we built for the banks' non-interest-income component. The adjusted-total-asset-level of banks grew quickly after the 1987 and 1992 regulatory amendments.

However, the change in the Canadian financial system brings its challenges to regulators (see Chelsky et al. 2002 about recent recommendations). One of them is obviously the need to consider regulation more globally, that is, taking into account the impact of foreign regulations and their associated series of financial products (see Martin 2002).<sup>33</sup> Furthermore, if we were to confirm that medium sized Canadian firms relied more on foreign markets for their issuances of high-yield bonds, because of tax, cost, or regulation concerns, and that small and some risky firms were somewhat credit constrained (no easy access to high-yield bond markets or Canadian stock market), it might also be appropriate to revise regulations regarding risky investment like high-yield bonds, angel investment, and venture capital to enhance their performance.<sup>34</sup> As shown in the Figure 13, half of the time, the high-yield bond issuers are firms involved in risky businesses naturally subject to investors' "speculation". In a sense, it appears that foreign investors are willing to bear the risk to finance risky Canadian firms.

The financial system is not only influenced by regulation. As we have suggested in several

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<sup>33</sup>This could be done with respect to fiscal policy of the financial system if there were major discrepancies between domestic and foreign rules. Indeed, theoretically, firms are insensitive to the way they get external financing: only structural breaks in their economic environment can induce persistent change in the composition of their financing. The "usual suspect" studied in financial economic theory is tax.

<sup>34</sup>For example, for angel investment, Liu (2001) reports that there are some (fiscal) regulation differences with the United States.

ways, the system is also heavily influenced by market and international macroeconomic conditions. Investigating how the Canadian financial structure evolves throughout a financial cycle might prove useful to give a better assessment of the stance of the financial system (Greenspan 2002). This is left for future work.

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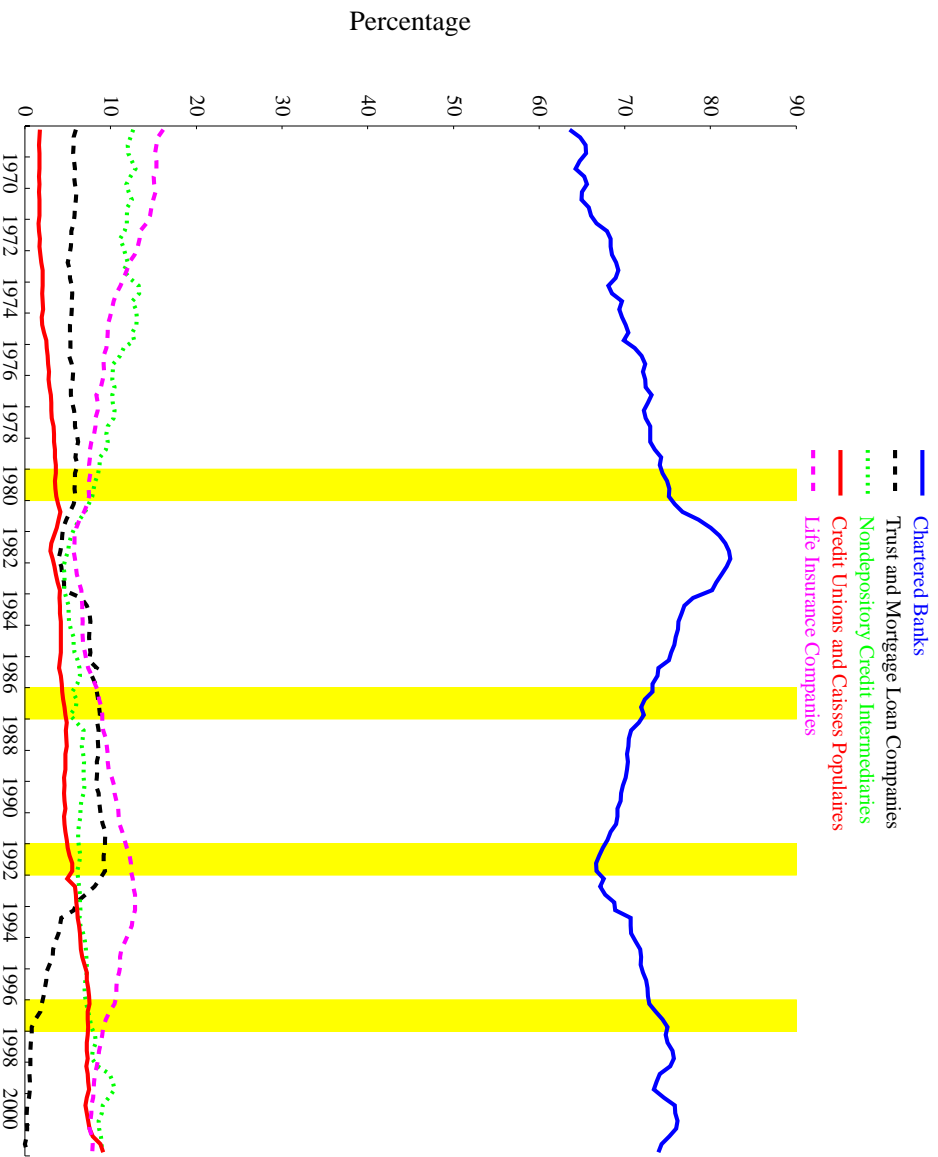
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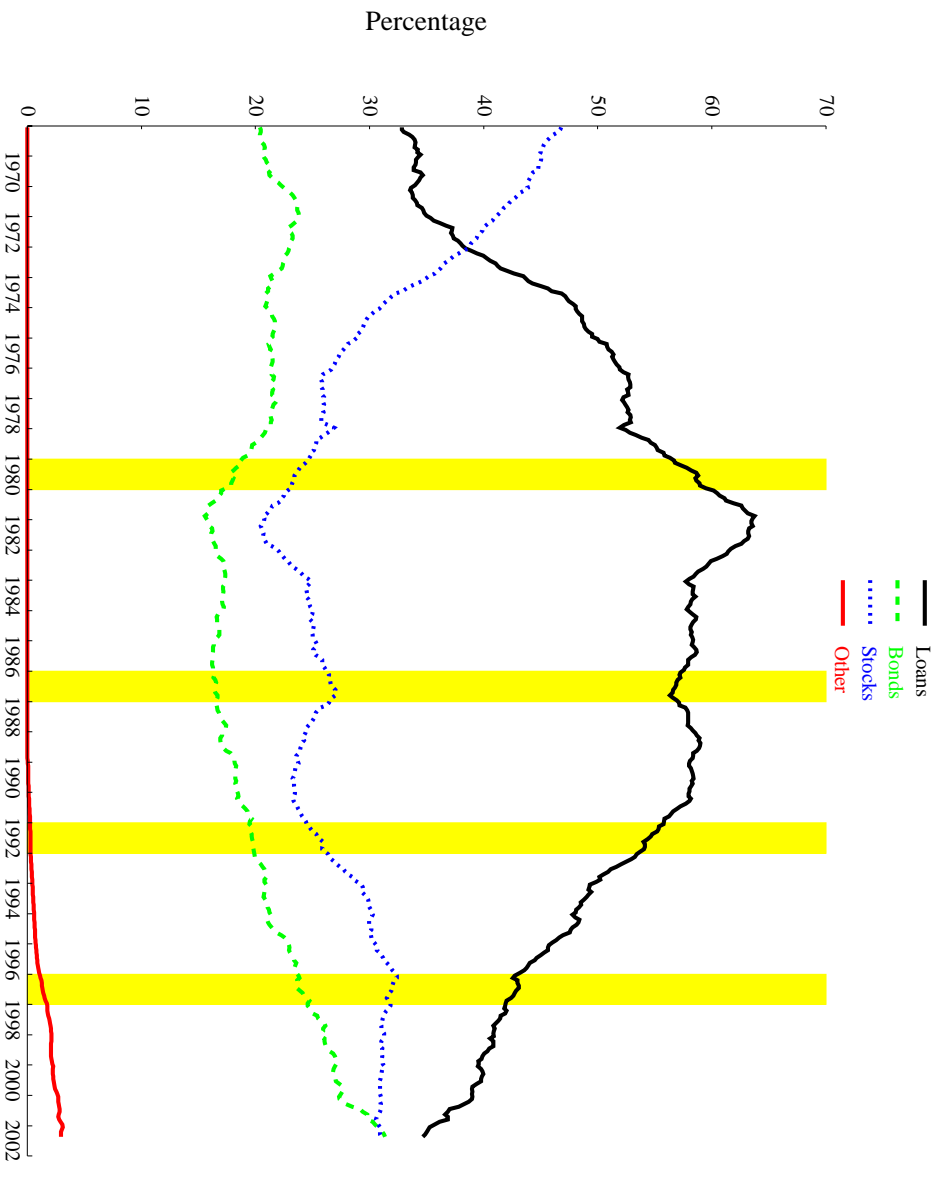


**Figure 1: Shares of Non-Financial Canadian Business Loans Extended by Financial Institutions (in Canadian Dollars)**



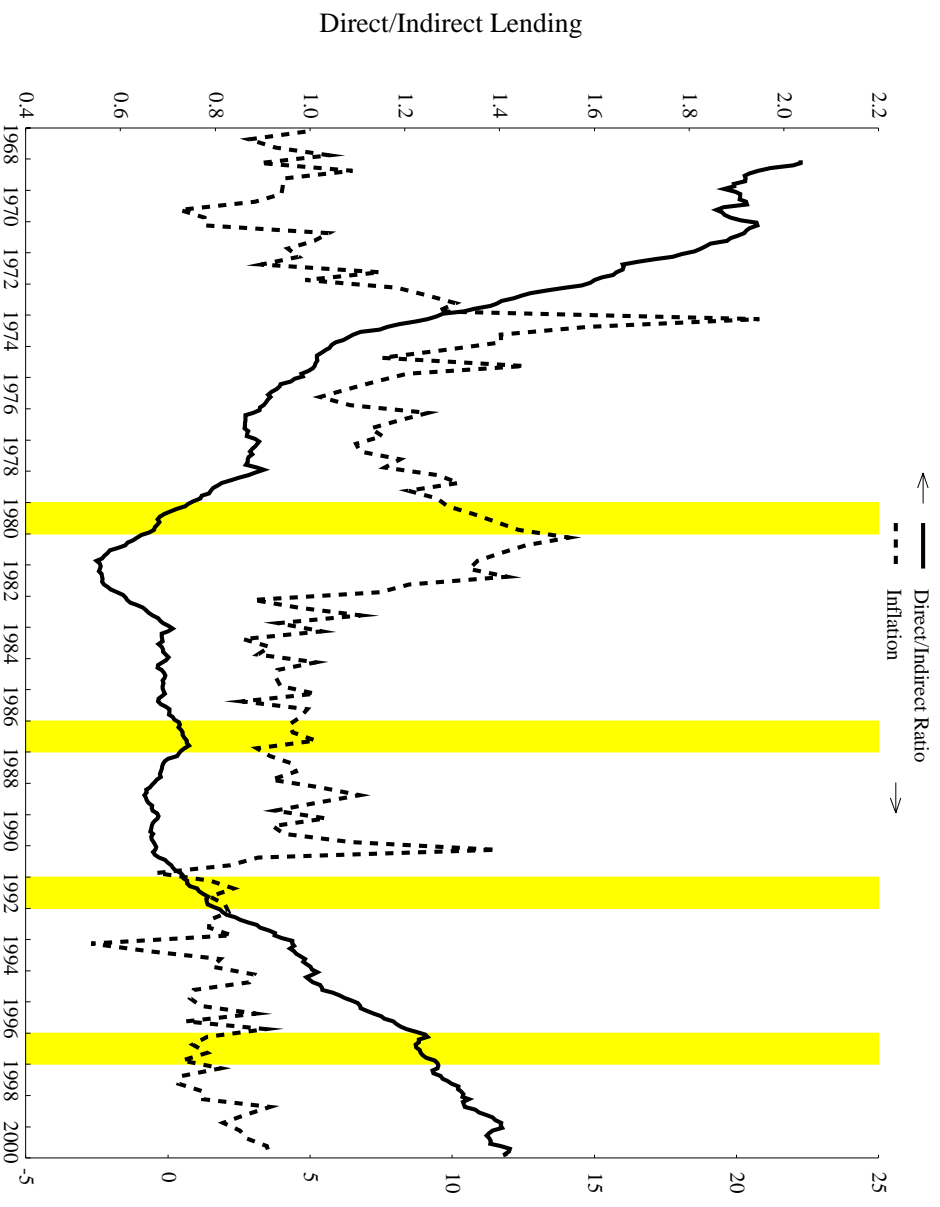
Note: The vertical lines represent the years in which significant revisions of the Bank Act were made.

Figure 2: Sources of External Funds for Canadian Non-Financial Businesses



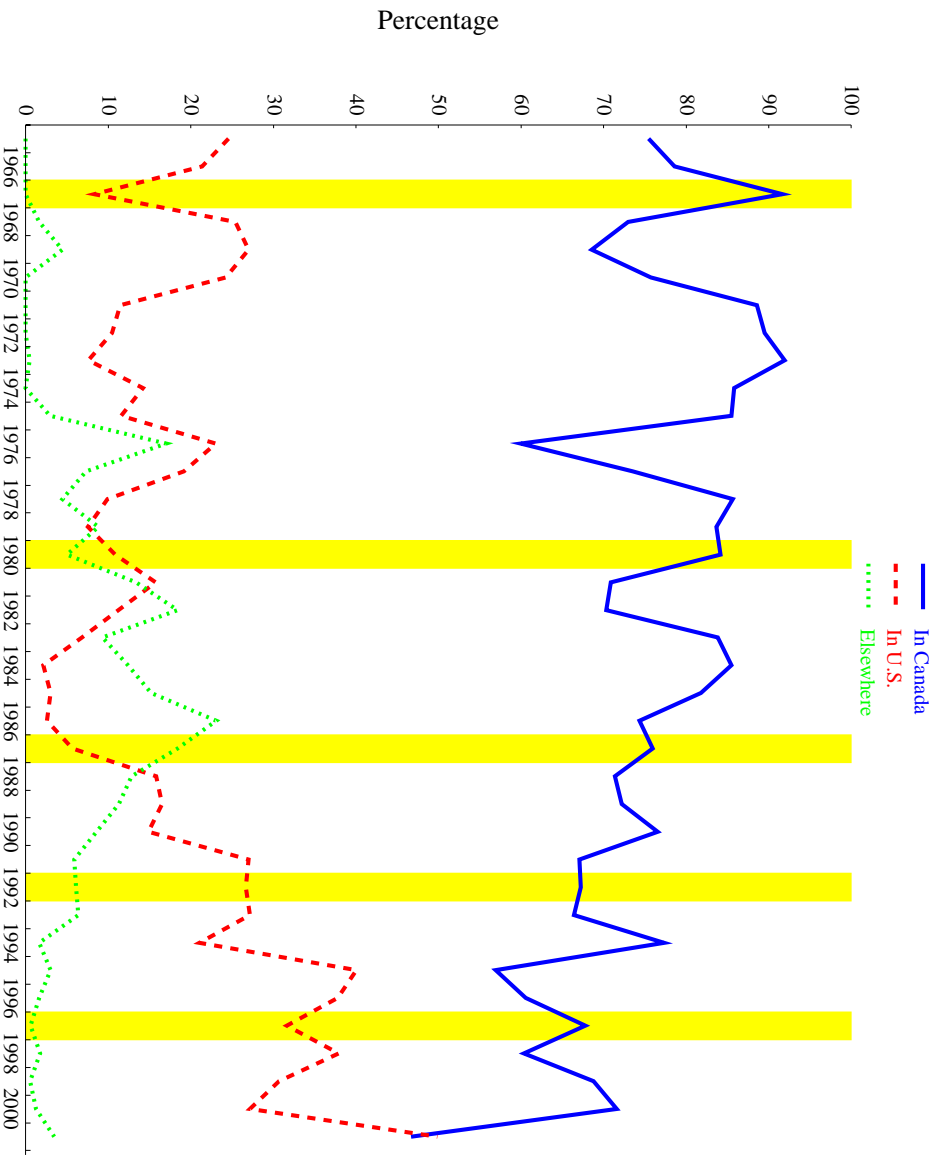
Note: The vertical lines represent the years in which significant revisions of the Bank Act were made.

Figure 3: Direct/Indirect Private Lending



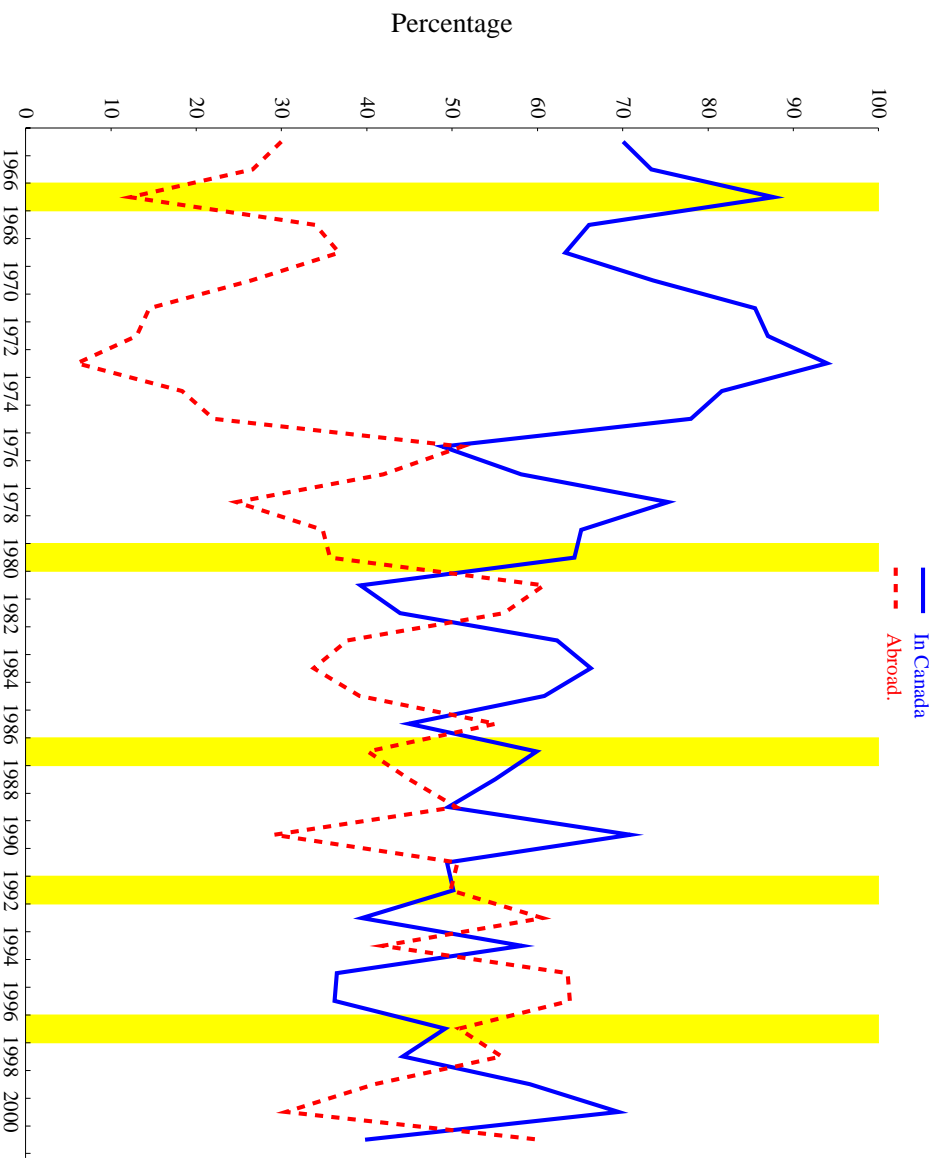
Note: The vertical lines represent the years in which significant revisions of the Bank Act were made.

**Figure 4: Gross New Issues of Bonds and Stocks by Canadian Non-Financial Businesses**



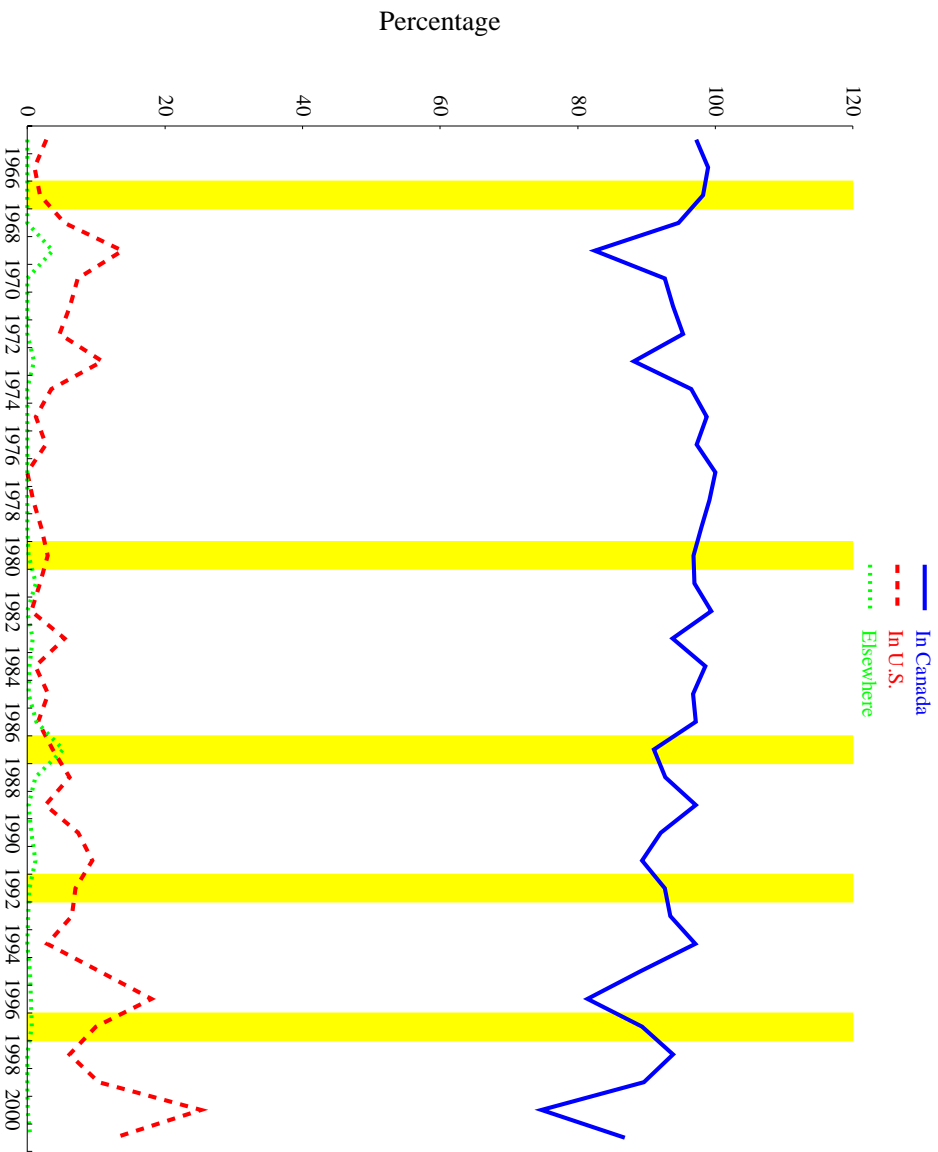
Note: The vertical lines represent the years in which significant revisions of the Bank Act were made.

Figure 5: Gross New Issues of Bonds by Canadian Non-Financial Businesses Issued in Canada with Issues Abroad



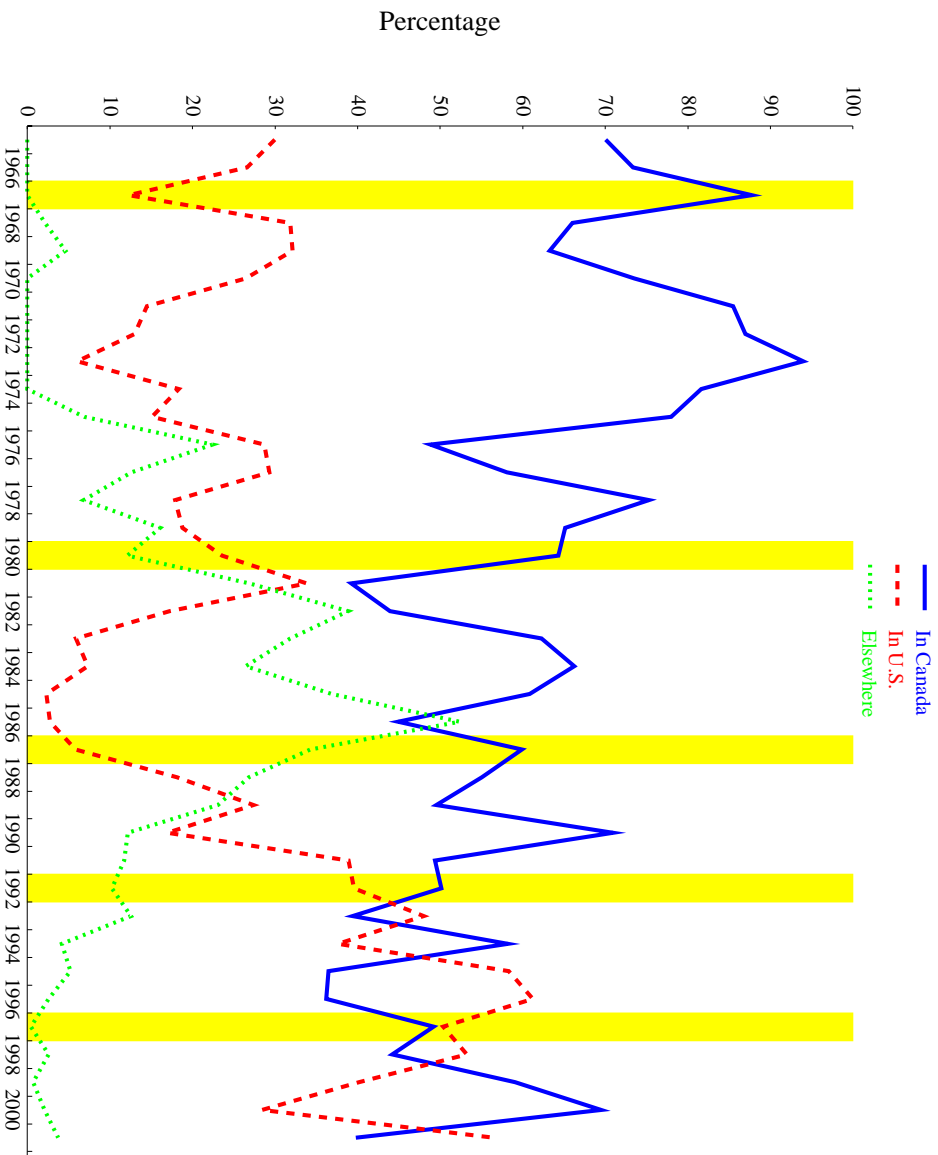
Note: The vertical lines represent the years in which significant revisions of the Bank Act were made.

Figure 6: Gross New Issues of Stocks by Canadian Non-Financial Businesses



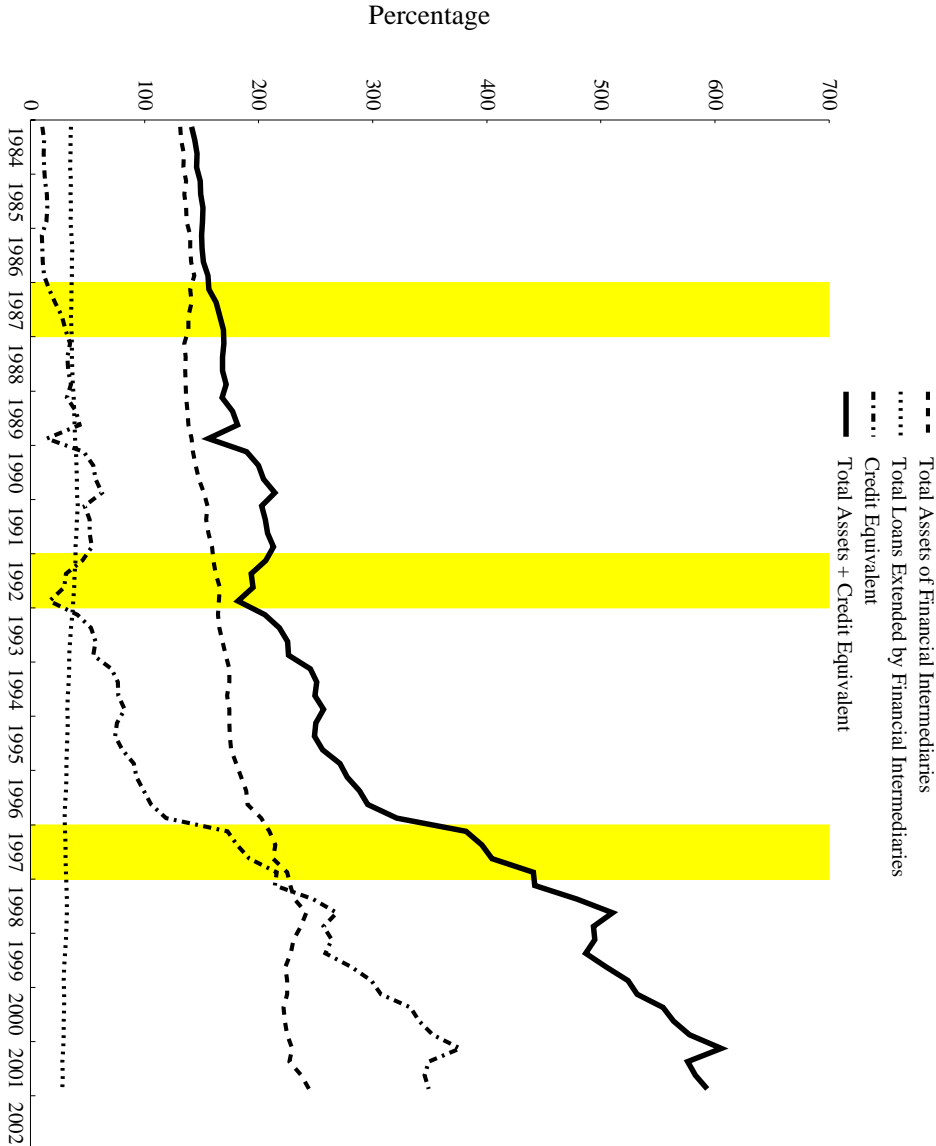
Note: The vertical lines represent the years in which significant revisions of the Bank Act were made.

Figure 7: Gross New Issues of Bonds by Canadian Non-Financial Businesses



Note: The vertical lines represent the years in which significant revisions of the Bank Act were made.

**Figure 8: Total Assets, Credit Equivalent, and Commercial Loans Extended by Financial Intermediaries as a Percentage of Nominal Gross Domestic Product**



Note: The vertical lines represent the years in which significant revisions of the Bank Act were made.

Figure 9: Non- and Net- Interest Income

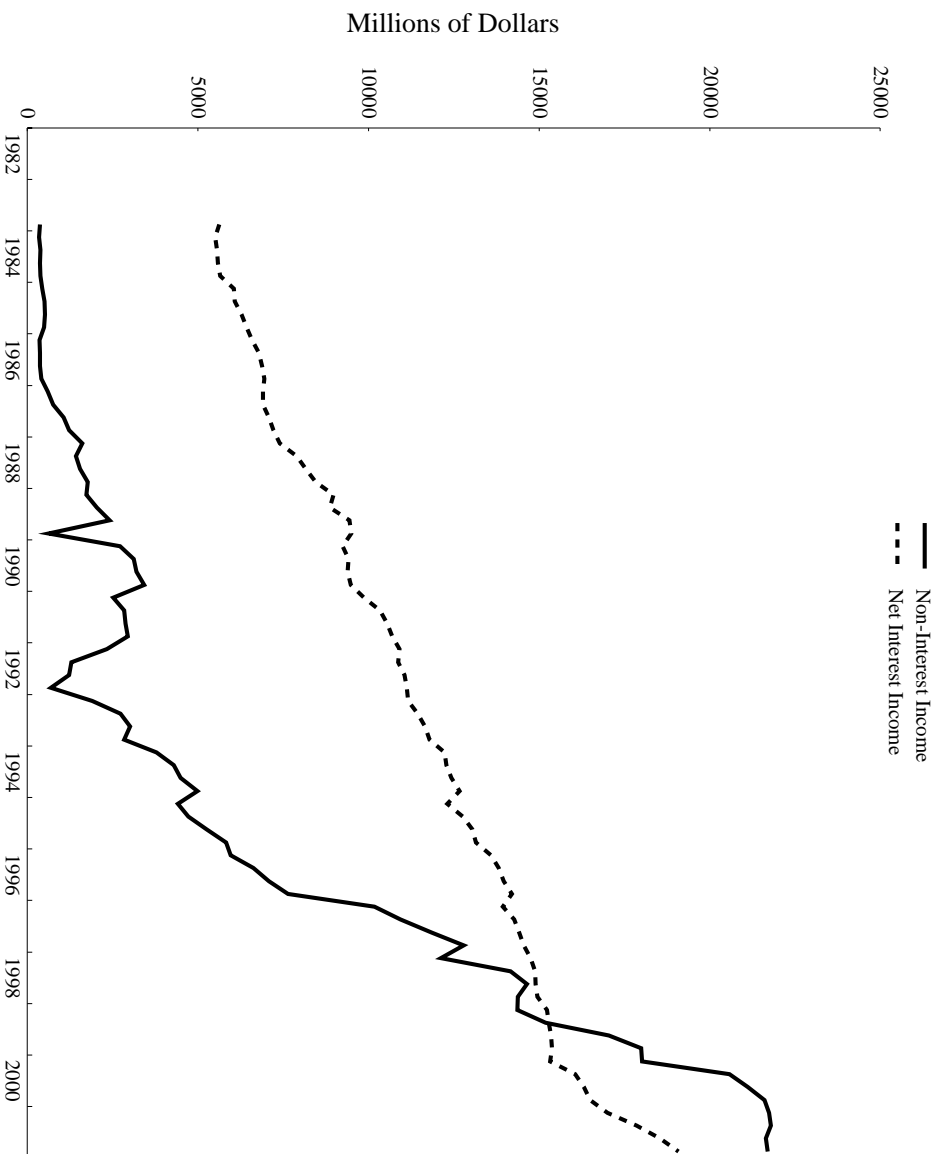


Figure 10: Short-term and Other Business Credit Securitization

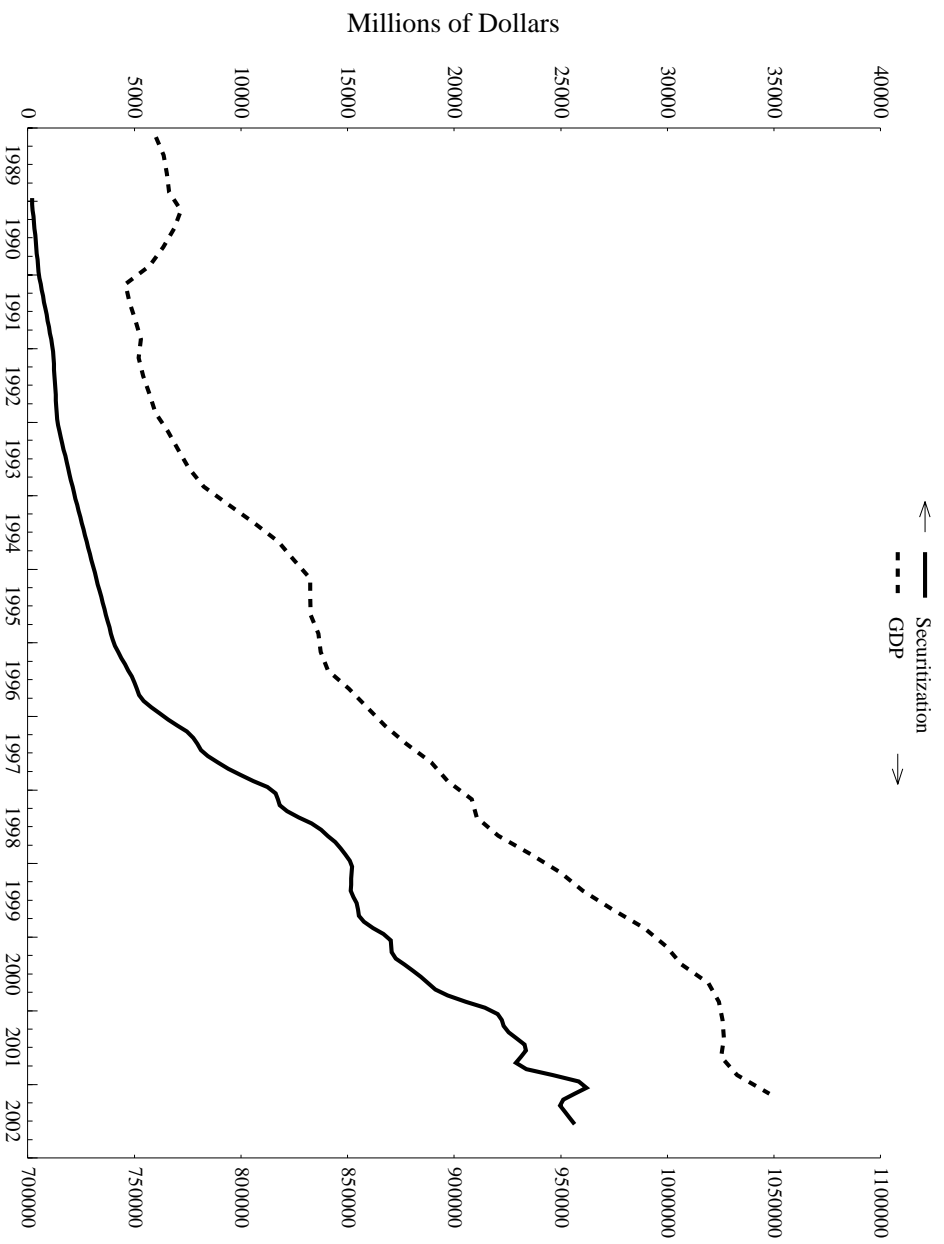
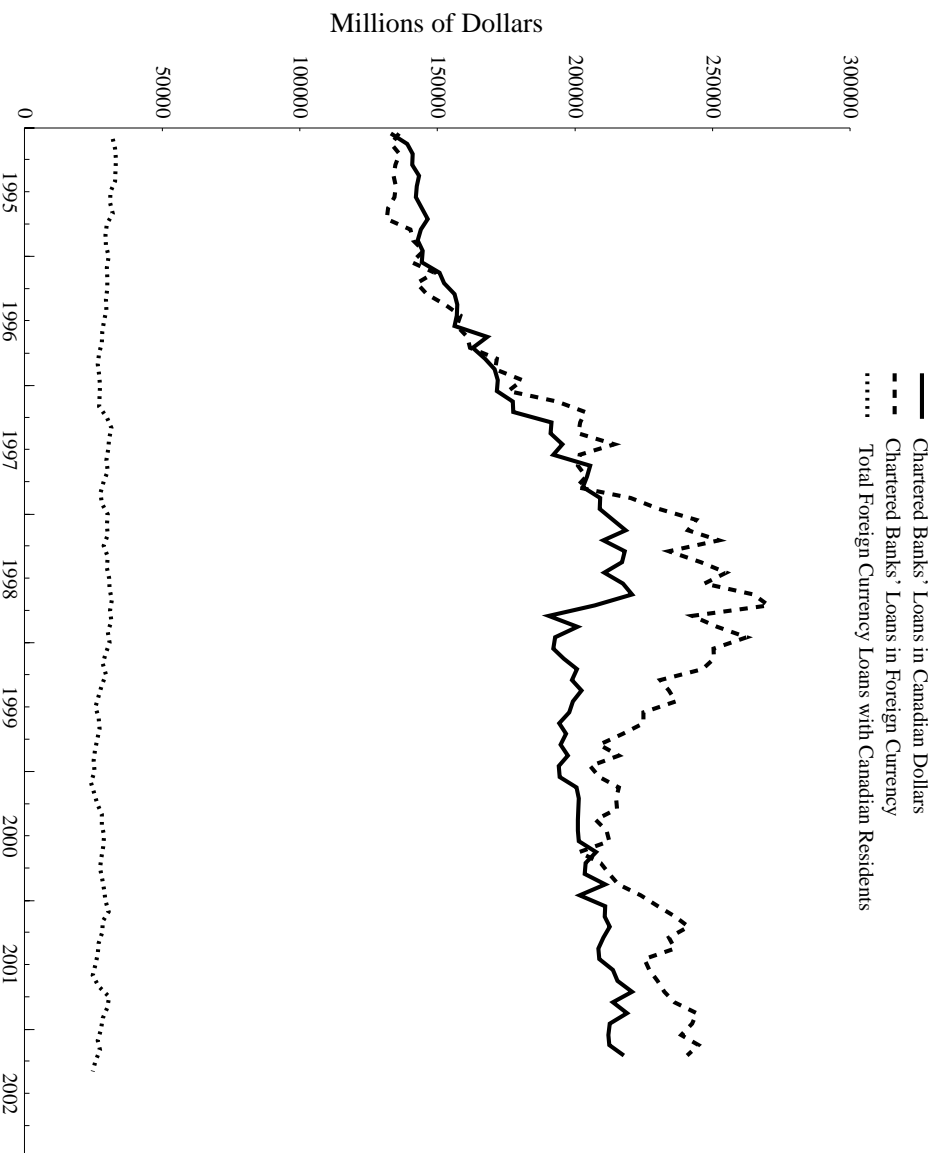


Figure 11: Total Loans at Chartered Banks: Canadian Dollars versus Foreign Currency



**Figure 12: Total Liabilities at Chartered Banks: Canadian Dollars/Foreign Currency**

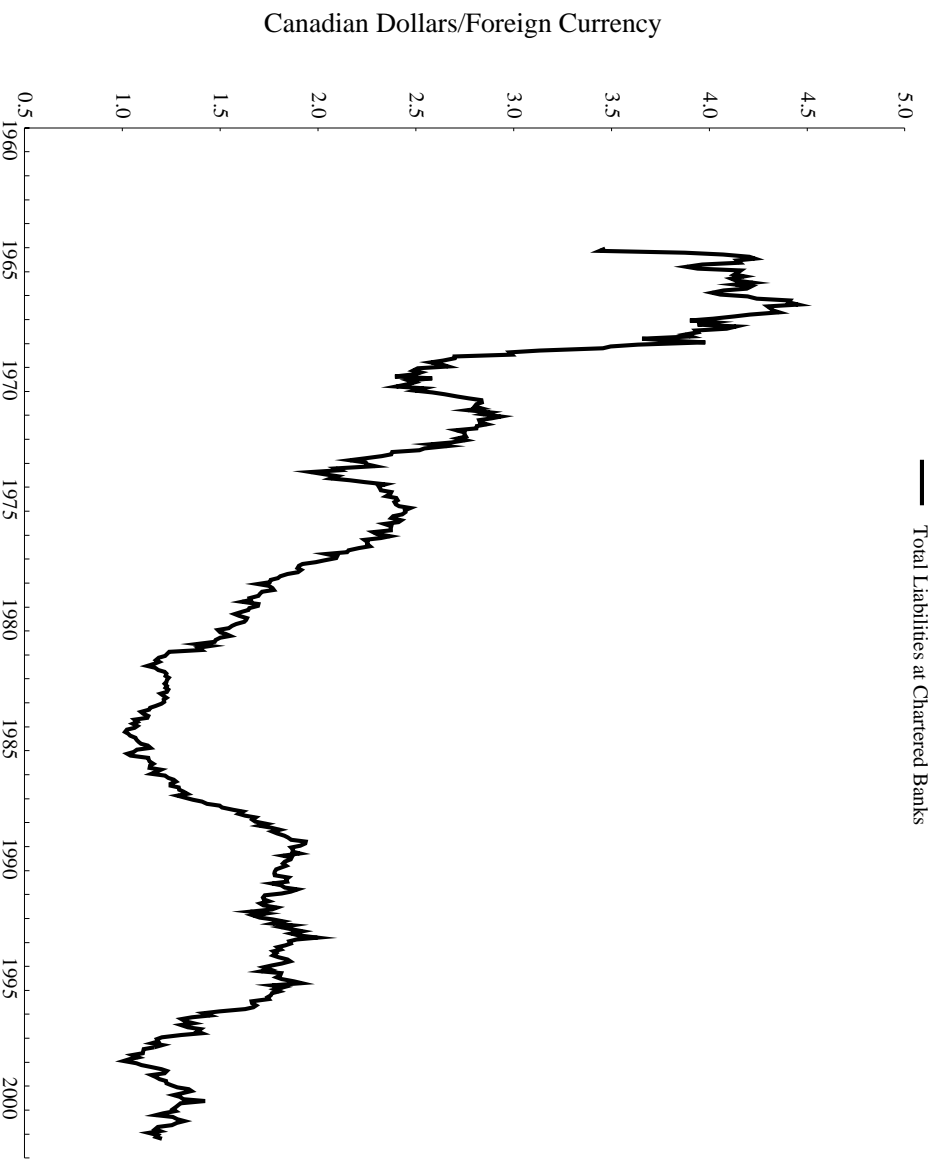
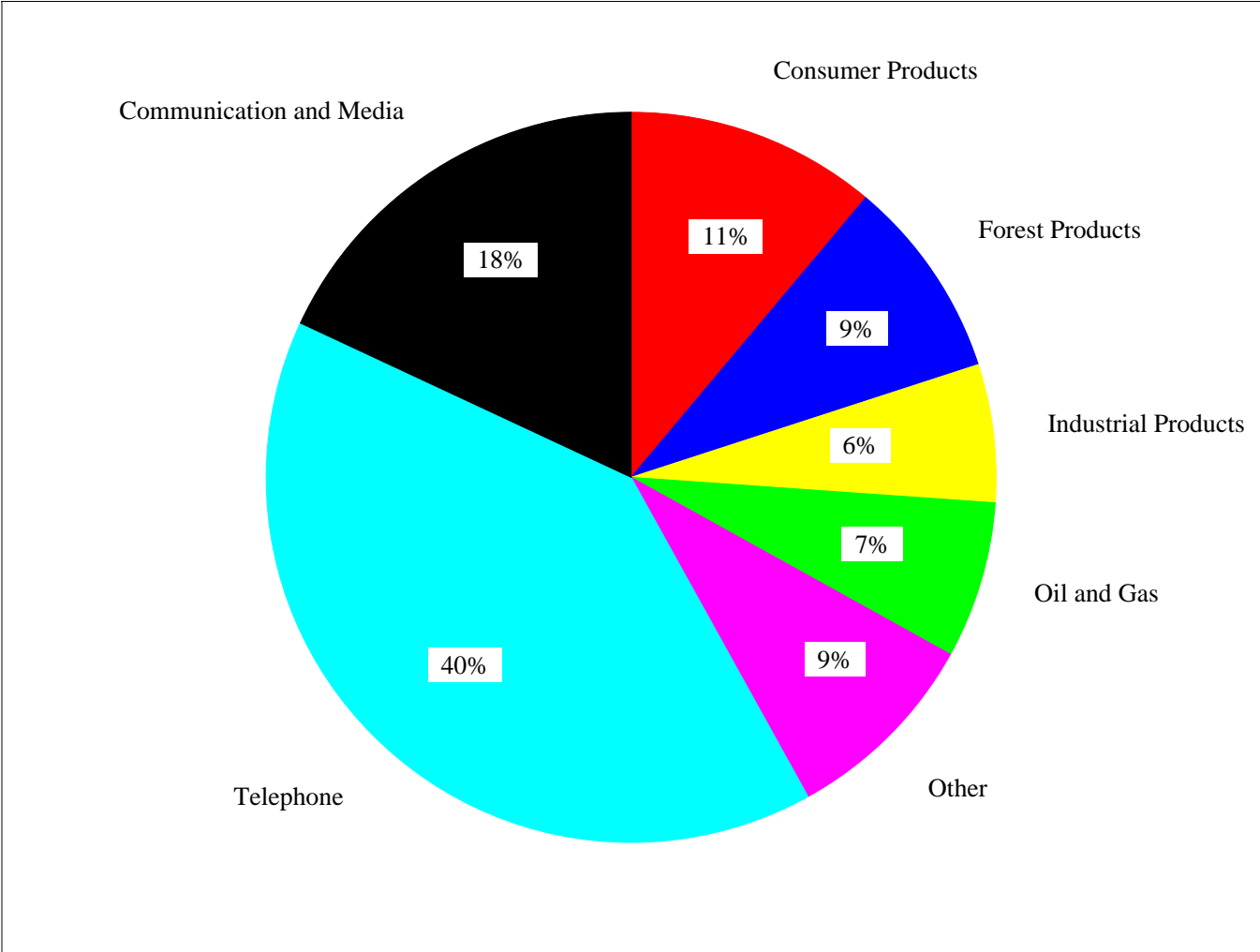


Figure 13: Bonds Issuances on the High Yield U.S. Market



Source: Woodman et al. (2002)

## Appendix A: Data Sources and Equations

All the data discussed are provided by the Bank of Canada Banking and Financial Statistics.

The data refer to non-financial businesses (corporations) only. Each component or category under review is carefully determined by adding and/or subtracting all relevant parts. For example, in the case of sources of external funds for nonfinancial businesses (Figure 1), the *Loans* category is constructed by adding total short-term business credit minus total commercial paper issued by non-financial corporations plus other business credit and subtracting securitization, bonds, debentures, equity, and warrants. If necessary, the component *Other* is also constructed by subtracting all parts under review from the observed aggregate of all components (total), in order to ensure that all components add up to 100 per cent. The data is normally reported over the span of 37 or 33 years, beginning in 1965 or 1969 and ending in first quarter of 2002. The only two exceptions are the figures of securitization and non interest income, where the data is not available before 1990 and 1983, respectively.

In Figures 1 to 6, the shares in per centage terms of each presented parts are determined by using the following equation:

$$(Component\ Under\ Review / Total\ of\ All\ Components) \times 100$$

It should also be noticed that some of the series do not go all the way back to 1969. Those series are therefore backcasted as described in subsections below.

### **Figure 1: Shares of Non-Financial Business Loans Extended by Financial Institutions (In Canadian Dollars)**

#### **Chartered Banks:**

$$B2300 + B2312 + B2313 + B2303 + B2308$$

- B2300 - Business loans at chartered banks
- B2312 - Chartered bank foreign currency loans to residents

- B2313 - Banker's acceptances
- B2303 - Non-residential mortgages at chartered banks back (Backcasted series)
- B2308 - Leasing receivables at chartered banks (Backcasted series)

The backcast for B2303 is based on an average growth rate of 1.66 per cent computed from the initial date of the series up to December 1979.

The backcast for B2308 is constructed by using an average growth of 2.97 per cent (the average growth rates from the initial date of the series up to December 1979).

#### **Trust and Mortgage Loan Companies:**

Short-term business credit at trust and mortgage loan companies + B2304 + B2309

- Short-term business credit - provided by the Bank of Canada for internal use only
- B2304 - Non-residential mortgages at trust and mortgage loan companies (Backcasted series)
- B2309 - Leasing receivables at trust and mortgage loans companies (Backcasted series)

The backcast for B2304 is constructed by using an average growth of 1.67 per cent by observing the average growth rates over the period January 1973 - December 1979.

The backcast for B2309 is constructed by using an average growth of 2 per cent by observing the average growth rates over the period January 1984 - December 1989.

#### **Nondepository Credit Intermediaries:**

B2333 + B2334 + B2335

- B2333 - Business loans at non-depository credit
- B2334 - Non-residential mortgages at non-depository credit intermediaries
- B2335 - Leasing receivables at non-depository credit intermediaries (Backcasted series)

The backcast for B2335 is constructed by using an average growth of 0.84 per cent by observing the average growth rates over the period February 1976 - December 1979.

#### **Credit Unions and Caisses Populaires:**

Short-term business credit at credit unions and caisses populaires + B2305

- Short-term business credit - provided by the Bank of Canada for internal use only

- B2305 - Non-residential mortgages at credit unions and caisses populaires

**Life Insurance Companies:**

B2306

- B2306 - Non-residential mortgages at life insurance companies

**Figure 2: Sources of External Funds for Canadian Non-Financial Businesses**

**Loans:**

B2317 - B2329 - B2330 + B155 - B2318 - B2319 - B2332

- B2317 - Total short-term business credit
- B2329 - Total commercial paper issued by non-financial corporations
- B2330 - Special purpose corporations - securitization (Short-term business credit)
- B155 - Other business credit
- B2318 - Bonds and debentures
- B2319 - Equity and warrants
- B2332 - Special purpose corporations - securitization (Other business credit)

**Bonds:**

B2318 + B2329

- B2318 - Bonds and debentures
- B2329 - Commercial paper issued by non-financial corporations

**Stocks:**

- B2319 - Equity and warrants

**Other:**

B2320 - Loans - Bonds - Stocks

- B2320 - Total business credit

## Figure 3: Direct/Indirect Lending

### Direct:

B2318 + B2319

- B2318 - Bonds and debentures
- B2319 - Equity and warrants

### Indirect:

B2317 - B2329 + B155 - B2318 - B2319 - B2330 - B2332

- B2317 - Total short-term business credit
- B2329 - Total commercial paper issued by non-financial corporations
- B155 - Other business credit
- B2318 - Bonds and debentures
- B2319 - Equity and warrants
- B2330 - Special purpose corporations - securitization (Short-term business credit)
- B2332 - Special purpose corporations - securitization (Other business credit)

### TSE 300 Composite Index

Provided by the Bank of Canada

## Figure 4: Gross New Issues of Bonds and Stocks by Non-Financial Businesses

The series listed below are provided by the Bank of Canada for internal use only.

### In Canada:

- Non-financial corporate preferred shares issued in Canada
- Non-financial corporate common shares and warrants issued in Canada
- Non-financial corporate bonds issued in Canada

### In U.S.:

- Non-financial corporate preferred shares issued in U.S.

- Non-financial corporate common shares and warrants issued in U.S.
- Non-financial corporate bonds issued in U.S.

**Elsewhere:**

- Non-financial corporate preferred shares issued elsewhere
- Non-financial corporate common shares and warrants issued elsewhere
- Non-financial corporate bonds issued elsewhere

**Figure 5: The Substitution of Gross New Issues of Bonds by Canadian Non-Financial Businesses Issued in Canada with Issues Abroad**

The series listed below are provided by the Bank of Canada for internal use only.

**In Canada:**

- Non-financial corporate bonds issued in Canada

**Abroad:**

- Non-financial corporate bonds issued in U.S.
- Non-financial corporate bonds issued elsewhere

**Figure 6: Gross New Issues of Stocks by Non-Financial Businesses**

The series listed below are provided by the Bank of Canada for internal use only.

**In Canada:**

- Non-financial corporate preferred shares issued in Canada
- Non-financial corporate common shares and warrants issued in Canada

**In U.S.:**

- Non-financial corporate preferred shares issued in U.S.
- Non-financial corporate common shares and warrants issued in U.S.

**Elsewhere:**

- Non-financial corporate preferred shares issued elsewhere
- Non-financial corporate common shares and warrants issued elsewhere

## Figure 7: Gross New Issues of Bonds by Non-Financial Businesses

The series listed below are provided by the Bank of Canada for internal use only.

### In Canada:

- Non-financial corporate bonds issued in Canada

### In U.S.:

- Non-financial corporate bonds issued in U.S.

### Elsewhere:

- Non-financial corporate bonds issued elsewhere

## Figure 8: Total Assets, Credit Equivalent, and Commercial Loans Extended by Financial Intermediaries as a Percentage of Nominal Gross Domestic Product

### Assets:

We subtract the two financial institutions (MBNA and AMEX) in order to avoid double counting. Those two institutions are already reported in the total assets of non-depository credit intermediaries.

$(B20 - (MBNA + AMEX) + B672 + B4054 + B2150 + B4027 + B4046 + \text{Total assets of investment funds})/D14816$

- B20 - Total assets of non-depository credit intermediation
- MBNA + AMEX
- B672 - Total assets of chartered banks
- B4054 - Total assets of trust and mortgage loan companies
- B2150 - Total assets of local credit unions and caisses populaires
- B4027 - Total assets of life insurers (including accident and sickness branches)
- B4046 - Total assets of segregated funds
- Total assets of investment funds - provided by the Bank of Canada for internal use only
- D14816 - Gross domestic product at market prices

**Loans:**

$$(B2317 - B2329 + B155 - B2318 - B2319 - B2330 - B2332)/D14816$$

- B2317 - Total short-term business credit
- B2329 - Total commercial paper issued by non-financial corporations
- B155 - Other business credit
- B2318 - Bonds and debentures
- B2319 - Equity and warrants
- B2330 - Special purpose corporations - securitization (Short-term business credit)
- B2332 - Special purpose corporations - securitization (Other business credit)
- D14816 - Gross domestic product at market prices

**Credit Equivalent:**

Non-interest income / (Total interest income including dividends - Total interest expense - Charge for Impairment)

- Non-interest income - From Consolidated Statement of Income provided by the Bank of Canada.
- Total interest income including dividends - From Consolidated Statement of Income provided by the Bank of Canada.
- Total interest expense - From Consolidated Statement of Income provided by the Bank of Canada.
- Charge for Impairment - From Consolidated Statement of Income provided by the Bank of Canada.

**Figure 9: Non- and Net- Interest Income**

The series listed below are from Consolidated Statement of Income provided by the Bank of Canada.

**Non Interest Income:**

Provided by the Bank of Canada

### **Net Interest Income:**

Provided by the Bank of Canada

### **Figure 10: Short-term and Other Business Credit Securitization**

B2330 + B2332

- B2330 - Special purpose corporations - securitization (Short-term business credit)
- B2332 - Special purpose corporations - securitization (Other business credit)

### **Figure 11: Total Loans at Chartered Banks: Canadian Dollars vs Foreign Currency**

The series listed in the first two categories below are from Consolidated Monthly Balance Sheet provided by the Bank of Canada for internal use only.

#### **Chartered Banks' Loans in Canadian Dollars:**

(Total leasing receivables from non-mortgage loans - Foreign currency leasing receivables from non-mortgage loans) + (Total non-mortgage loans to individuals and others for business purpose - Foreign currency non-mortgage loans to individuals and others for business purpose) + (Total reversed repurchased agreements form non-mortgage loans - Foreign currency reversed repurchased agreements form non-mortgage loans) + (Total non-residential mortgages - Foreign currency non-residential mortgages)

#### **Chartered Banks' Loans in Foreign Currency:**

Foreign currency leasing receivables from non-mortgage loans + Foreign currency non-mortgage loans to individuals and others for business purpose + Foreign currency reversed repurchased agreements form non-mortgage loans + Foreign currency non-residential mortgages

#### **Total Foreign Currency Loans to Canadian Residents:**

- B498 - Total foreign currency loans to Canadian residents

### **Figure 12: Total Liabilities at Chartered Banks: Canadian Dollars/Foreign Currency**

(B650 - B692 - B693 - B694 - B696) / B675

- B650 - Total Chartered Banks Liabilities

- B692 - Common capital stock of shareholders' equity
- B693 - Preferred capital stock of shareholders' equity
- B694 - Contributed surplus of shareholders' equity
- B696 - Retained earnings of shareholders' equity
- B675 - Total foreign currency liabilities

## **Appendix B: Definitions**

### **Swap:**

Contractual agreement in which two counterparts agree to exchange streams of payments over time.

(Source: Klein and Lederman. 1994. "The Handbook of Derivatives and Synthetics", Probus Publishing Company.)

### **Currency Swap:**

The counter parties exchange specific amounts of two different currencies at the outset and repay over time according to a predetermined rule that reflects both interest payments and amortization of principal.

(Source: Klein and Lederman. 1994. "The Handbook of Derivatives and Synthetics", Probus Publishing Company.)

### **Non-interest income:**

Non interest income covers all sources of revenue other than interest charges. Examples include revenue from brokerage and other securities services, credit services, net investment securities gains and losses, trading income, deposit and payment service charges, mutual fund management, card services, foreign exchange non-tading, insurance, securitization revenues, trans-sectoral income other than interest and earnings or loss from the sale of assets.

(Source: Statistics Canada. 2001. "Reporting Guide - Chartered Banks, Trust Companies, Caisses Populaires and Credit Unions", Statistics Canada.)

### **Loan loss provisions:**

A loan loss provision is essentially the recognition by a financial institution that it is unlikely to receive all the money owed to it by a specific customer or customers. In Canada, The Office of the Superintendent of Financial Institutions (OSFI) monitors institutions to ensure they maintain sufficient provisions to recognize likely losses. (Source: OSFI. 2002. "What it

Means to be Regulated”, The Office of the Superintendent of Financial Institutions. Available at: <http://www.osfi-bsif.gc.ca/eng/how/what/index.asp>)

## Appendix C: The Generating Process of the Credit Equivalent Series

In order to determine the financial health of Canadian banks, it is customary to analyse the evolution of their assets in the balance sheet. If assets are increasing, income derived from them also must be increasing.

The caveat of using balance sheet assets as a measurement of bank profitability is that it underestimates their “true value” since it does not account for off balance sheet activities. Thus, in order to get a clear picture of the banks, the noninterest income associated with these off balance sheet assets must be accounted for. This is done by transforming this income into an asset equivalent that would have generated such revenues on the balance sheet.

To account for the off-balance sheet activities, we adjust our measure of banks’ assets by adding the credit equivalent component. Following the methodology of Boyd and Gertler (1994), bank profits  $\pi$  can be expressed as a function of interest income  $I_b$ , interest expense  $E_b$ , loan loss provision  $P_b$ , total assets  $A$ , noninterest income  $Y_o$ , and noninterest expense  $N_o$ :

$$\pi = (I_b - E_b - P_b) + (Y_o - N_o). \quad (\text{C.1})$$

Where the subscript  $o$  stands for off-balance sheet and  $b$  stands for on-balance sheet. Now assume that the income flow  $Y_o - N_o$  is generated by some unknown asset  $A_o$  which has the same properties as  $A_b$ . We want to compute the unknown  $A_o$  as a credit equivalent of  $Y_o - N_o$ . Since these assets are generated by the same sources of capital, then we can assume that  $A_b$  and  $A_o$  generate the same average profit and returns. That is, their profit ratios are  $\pi_b/A_b = \pi_o/A_o$ .

$$A_o = A_b * (Y_o - N_o)/(I_b - E_b - P_b). \quad (\text{C.2})$$

$A_o$  is the credit equivalent series for off-balance sheet items. It is the level of on-balance-sheet-like assets that would have generated a net interest income  $(Y_o - N_o)$ , the actual

non-interest income generated.