ACCESS TO CREDIT: LENDING PRIORITIES AND SMEs

VOLUME I: ANALYSIS OF SECONDARY DATA

This document is the first of three reports based on the proposal l *"Access to Credit: Lending Priorities and SMES."* This document presents the findings of analyses of data that have already been collected by various agencies insofar as these data relate to the credit crunch question.

EXECUTIVE SUMMARY

The findings provide some initial insights about the decrease in the amount of bank lending since 1990. When bank lending during the two most recent recessions are compared it is found that the decrease in the amount of lending from 1990:I through 1991:I is commensurate with the decrease that had occurred during the recessionary period of 1981:IV through 1982:IV. Differences in the levels of lending that are recorded during the subsequent recovery periods are found: the level of bank lending during the recovery period 1991:I through 1993:II is less than that recorded during the 1982:IV - 1984:III recovery. This observation is not entirely clear because the 1982-84 period was one that was also characterized by the entry to commercial lending of offshore financial institutions.

While a decline in the level of small bank loans was recorded from 1990:I through 1993:III, this decline did not occur evenly across Canada in the most recent recession . A disproportionate part of the decline was concentrated in the province of Ontario.

Econometric analysis of the demand and supply of bank loans demonstrated clearly that there was an independent recessionary effect on the *demand* for loans but that no statistically significant shrinkage in the *supply* of loans could be attributed to the recessions. The econometric analysis also highlighted the need for accurate data on the cost of borrowing for small businesses. The analysis used here had to rely on the prime rate as such a measure. Therefore, while the econometric analysis is suggestive, it is not definitive. Accordingly, Volume II of this report will report on further investigation of the question of shrinkage of supply. Volume III will address issues related to the SBLA. These studies will be based on access to CFIB and bank loan file data on actual costs of borrowing and ease of access to bank credit.

INTRODUCTION

The new Liberal government has set as a priority that small- and medium-sized enterprises [SMEs] have adequate access to capital, particularly to debt capital. This is because growth of SMES is a principal mechanism in creation of new employment and prosperity. Capital is necessary to such expansion. Thus, access to capital is a requisite for economic development and job creation.

With the importance of Canadian lending institutions as suppliers of capital, these institutions find themselves under pressure from the media and from governments to ensure an appropriate supply of capital to SMEs. Data presented in the 1994 federal budget, however, points to a decline in the amount of small loans extended from Canadian banks. Figure 1 (graphs are found in the Appendix) charts the time series of business loans of less than $500,000 made by commercial banks from the first quarter of 1988 through the third quarter of 1993. The decline of almost $4 billion in this portfolio has been a cause of concern about the lending practices of chartered banks: that Canadian banks, in particular, are behind a "credit crunch".[1]

A second source of allegations that banks are unduly restricting credit to small business clients lies in the anecdotal evidence advanced by small business owners themselves. Some of these laments have been documented in the popular press; others have been brought forward by witnesses to hearings of the Federal Governments Standing Committee on Industry.[2]

To the extent that the *supply* of lending to SMEs has decreased, on a *ceteris paribus* basis, then the claim of a credit crunch would be sustained. However, the plain fact of a decrease in the *amount* of lending does not suffice to support the claim. This is because the amount of lending constitutes the confluence of both supply *and demand.* An alternative explanation of the decrease in the lending portfolio is that demand has reduced. This explanation is consistent with the fact that the much of the period charted in Figure 1 corresponds with what is generally agreed to be a recession, one in which considerable structural change to the Canadian economy has occurred.

Anecdotal evidence is also insufficient in and of itself. Descriptions of bank practices that appear to be unfair (however well founded) do not indicate whether such apparently unfair practices have increased or decreased over time. Previous research shows that the majority small business bank customers are satisfied with their relationship with their respective

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1 According to economic theory, a credit crunch is a reduction in the supply of credit assuming the quality of borrowers remains stable. In more practical terms, a reduction in the supply of credit entails changes in the behaviour of lending institutions. Such changes could involve increases in the price of credit (e.g., by charging higher fees or interest rates) or actions that, compared to past practice, makes credit more difficult to access (e.g., by declining more loan applications, requiring more collateral, etc.). Thanks to Charles Beach

2 See, for example, the Minutes of hearings of March 15,17,22,23,24.

bankers but that there have always been a significant number of dissatisfied customers.[3] Thus, a distinction must be made between the issue of a credit crunch and the ongoing question of the relationship between banks and their small businesses clients. This study focuses on the former issue: the extent to which the relationship - whatever its characteristics - has changed. Nonetheless, some comments about the ongoing form of the banking relationship are in order because the context of allegations of a credit crunch are rooted in this experience.

ISSUES ASSOCIATED WITH THE BANKING RELATIONSHIP

Owners of SMEs and lobby organizations have long been lamenting the shortage of capital available to Canadian small firms. This is not simply a shortage of debt. Indeed, firms that are seeking debt must first show an adequate investment of equity capital before an institutional lender will consider debt financing - and the lack of equity has been a chronic problem. It is therefore no surprise that firms that cannot demonstrate an adequate base of equity financing have difficulty obtaining business loans. However, this rationale is insufficient to explain why lobby organizations such as the CFIB note that as many as 40 percent of their members cite bank financing as a problem (particularly insofar as operating lines of credit are concerned).[4]

During the period from 1990 through 1993, however, there has been a decrease in the outstanding amount of small loans in the face of increases in the outstanding amounts of larger loans. This has prompted the sense that a chronic lack of capital is being worsened by increased stringency in the banking system. In response, it is noted that the 1990-1993 period has been one characterized by low levels of economic activity and banks submit that it is demand, not supply, of loans that has diminished. This response begs the question of why this diminution is specific to the SME sector.

Associated with the apparent decrease in lending are concerns about several government policies that relate to taxation and the reduced ability of lenders to use inventory as collateral. Bank policies have also been criticized, especially those that may relate to lending to firms in the new economy, and the perceived sense that small business lending has diminished as a priority. It is claimed that these issues represent a cultural issue within the banks such that provision of debt capital to SMEs has been reduced and with it, economic growth has been stifled.

The banking community is well aware of these issues. Bank spokespersons have acknowledged that the "banking industry in recent years has concentrated in the

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3 Larry Wynant, Minutes of The Standing Committee on Ind ustry, March 10, 1994, p2:34.

4 Brien Gray, Sr. Vice President, CFIB, Speech to IEE Conference, St. Catherines, Ontario, June 8 1994.

mid-market sector ... that's where all the action is".[5] Bankers have also recognized the struggles facing banks with respect to lending to firms in the knowledge-based sector and to micro businesses.[6] Bankers note the very high rates of business failures among micro firms and the limited amount of capitalization typically behind such firms; they recognize the need for better educated and more sophisticated loan account managers, but also note that such managers are more expensive. Given the low earning balance of many small business loans, account managers are often responsible for as many as 100 accounts. Banks also face a fiduciary responsibility to depositor clients and an agency responsibility to shareholders, a result of which is that small business loan losses are targeted at 0.5-1.0 percent.

To provide training to account managers, banks must rotate people through such jobs, yet this rotation means that frequent turnover of account managers leaves incumbents who are often unfamiliar with the clients and the community. The lack of familiarity can lead to inconsistent treatment of accounts over time. By comparison, the US. banking system is more of a community-based system, one that allows account managers better able to get to know clients and potential clients, often in a social context, and over a longer period of time. This permits better risk assessment and more stable customer-client relationships.

Term loans are less problematic than are operating loans, primarily because many term loans qualify for a guarantee under the terms of the SBLA. Nonetheless, there is also a concern that the considerable increase in the size of the SBLA portfolio constitutes a transfer of risk from the banking system to the public.

FOCUS OF THE RESEARCH

The purpose of the overall study is to bring to bear systematic and rigorous statistical treatment of the available primary and secondary data as these data pertain to a shift in the bank-small business client relationship. The study does not attempt to address all of the aspects of the relationship; however, the work recognizes the context of a relationship that is at times problematic. This particular report focuses exclusively on analysis of secondary data and what these data imply about a shift in the supply of loans to small firms. The findings to be presented here are intended to specify further the nature of the problem.

This analysis takes three forms. First, the time series of small business loans during the most recent recession is compared, to the extent possible, with its behavior in the previous recession. Second, the time series of small business loans is analyzed by geographic region. Third, econometric estimation of a simultaneous equation model of the supply and

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5 H. Kingston, CIBC, Speech to IEE Conference, St. Catherines, Ontario, June 8 1994.

6 D. Montieth, Bank of Nova Scotia, Speech to IEE Conference, St. Catherines, Ontario, June 8 1994.

demand for small business loans is carried out and the extent to which deviations from this model have occurred since 1990 are assessed. These steps are described subsequently but must first be placed in the context of previous work.

PREVIOUS WORK

Kelly Bordian, of the federal government Department of Finance addressed the question of a credit crunch in an analysis carried out at the end of 1992. Bordian examined the issue in two ways. Arguing that lenders might restrict capital by increasing price, Bordian examined the spreads between the rates which lenders pay for funds and the rates at which they lend funds. Bordian also suggested that lenders might ration credit through non-price mechanisms, leading to a lower growth rate in credit outstanding than would be consistent with underlying economic activity. From both perspectives, Bordian did not find evidence to support a credit crunch.

Bordian's analysis, however, was not conclusive, particularly with respect to bank lending to SMES. This is so for three reasons. First, Bordian used only the prime rate as a measure of the lending rate. The average lending rates to borrowers would have been an appropriate measure of the cost because lenders could either increase risk premia or increase the number of clients who pay more than the prime rate. Second, Bordian's analysis of alternatives to debt financing was valid only for those firms that are sufficiently large to be able to use short term paper, bonds, and stocks as alternatives to bank lending. Finally, Bordian analysis was carried out at a high level of aggregation, using total levels of financing from all sources as the measure of the supply of credit. Consequently, the analysis did not speak to the special case of SMES. Yet Bordian observed for 1992 that demand loans of less than $5 million "have had a steady, albeit negative, growth rate for over a year" (p.15, emphasis added), a year in which larger loans had experienced positive growth rates in lending.

In examining the level of credit extended to SMES, however, it is necessary to distinguish supply-related factors from demand-based effects. By definition, the recession of the early 1990's has limited demand for products and reduced the scope for profitable business investment. This has thereby provided all businesses fewer attractive investment opportunities. Therefore, firms may not have needed as much capital as in the times of relative prosperity such as the 1988-1990 period. What appears to be a contraction of the total amount of lending to small firms could be a normal result of the business cycle.

To some extent, the appearance of a contraction in the supply of credit may also be an inflation-induced artifact. Since 1981, the level of lending to "small" firms was defined as the (nominal) dollar volume of loans that fall beneath a $500,000 (1981$) ceiling. Based on inflation as measured by the GNP deflator, the equivalent of this ceiling in $1994 would be of the order of $700,000. This begs the need for an alternative measure of the supply of credit to SMES.

Moreover, the definition of a credit crunch assumes the quality of borrowers remains stable. It is not clear that the latter assumption has obtained. The economic cycle affects SMEs in particular.[7] This is because the cost structures of SMEs tend to reflect higher degrees of operating and financial leverage than do larger firms.[8] That is, fixed costs (including the costs of debt servicing) tend to be proportionately higher for smaller firms than for large, other things being equal. That is, SMEs have higher levels of systematic risk. To the extent that SMEs are more risky, it would be logical for lending institutions to be more cautious about advancing loans to SMEs during recessions.

On the basis of existing published evidence arguments may be advanced both in favour and against the hypothesis of a credit crunch. Empirical evidence, therefore must address the contentions. The following sections report on the findings of three sets of analyses of secondary data, findings that help to narrow the issues and point to directions for future investigations for the two final aspects of this research.

RESEARCH AGENDA

1. Background Setting: Macro Data Analysis

In this section, trends in the level of aggregate lending and trends in the allocation of the aggregate among small, mid-market, and large loans are documented and evaluated. This step is primarily for background information, but it will point to the magnitude of shifts in credit that might require explanation by way of the other research tasks.

Traditionally, trends in the level of lending to small businesses have been measured by the size of the portfolio of loans of less than $500,000, as reported by the Bank of Canada. At the outset, it should be cautioned that this is an imperfect measure of lending. As noted, the ceiling to this time series is subject to distortion due to inflation. Moreover, there are likely a significant number of large firms that borrow less than $500,000. Notwithstanding these shortcomings, it can be employed to provide an historical perspective on the current situation. Figure 2 presents a time series perspective on the size of the portfolios of small (less than $500K), mid-market (from $500K to $25 million) and

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7 It is a well known tenet of basic finance that firms with high levels of operating and financial are more susecptible to the business cycles than firms that are not as highly levered. MacIntosh (1994) argues, on this basis, that SMEs tend to be more highly levered than larger firms and are therefore relatively more risky during economic downturns.

8 In contemporary finance, systematic risk is that component of total risk that an investor cannot shed through diversification strategies. It is that element of risk associated with the sensitivity of the firm's earnings to underlying economic factors. This sensitivity is increased the more the cost structure of a firm relies on fixed components of costs. Some very preliminary research shows that SME's tend to a rely on debt financing, with its fixed interest obligations, more than do larger firms.

large (more than $25 million) loans. It needs to be added that loans of less than $500K have increased since 1993:III, in part due to the expansion of eligibility for the SBLA.

The first step of the analysis is to express the time series that measures the level of small bank loans indexed to the start of the recession for the two most recent recessions. This provides a rough indication of the extent to which the recent reduction in the size of this portfolio mirrors that of the earlier recession. This indication is, of course, an approximation partly because of the structural differences between the two recession periods and because of the limitations of the time series itself.

The most recent period of recession comprises the period 1990:I through 1991:I, with a recovery that continues to be in progress. During the recession period Canadian real GDP decreased by 3.4 percent, compared with a decrease of 0.6 percent for the other G-7 countries over the same time. During the recovery period that began in 1991:I, and as of 1993II, real GDP increased 4.0 percent in Canada and 4.7 percent in the other G-7 nations. The comparable periods in the previous recession embrace the recession period of 1981:II through 1982:IV (real GDP down by 5.3 percent in Canada and 1.4 percent in the other G-7 countries) and the recovery that covered 1982:IV through 1984:III. Real Canadian GDP increased by 12.0 percent during this recovery while the corresponding increase for the other G-7 economies was 9.8 percent.[9]

Unfortunately, data on bank lending during these periods are not strictly comparable. Provisions of revisions to the Bank Act that enabled foreign-owned banks to participate more fully in commercial lending were coming into force during the 1981-82 recession/recovery. Therefore, bank loan data for this period contain confounding effects of the economic cycle and the entry of new sources of supply. With this caveat changes in the amounts of outstanding small business loans during these periods are tabulated below. (It should also be noted that bank lending data for these loans prior to 1981:IV were not available due to changes in the reporting format of Bank of Canada data..)

Rates of Change in Commercial Bank Lending: Cycles Compared

Dates	Cycle Phase	Change in Loans of Less Than $200K	Change in Loans of $200K to $500k
1981:IV- 1982:IV	Recession	-18.4%	-6.4%
1982:IV-1984:III	Recovery	15.0%	-11.8%
1990:I-1991:I	Recession	-15.7%	2.9%
1991:I-1993:II	Recovery	-10.2%	-3.1%

This table shows that the level of bank loans changed by similar amounts during the two recessions (indeed, loans of $200K to $500K increased during the 1990-91 recession). However, during the subsequent recovery periods the level of smaller loans decreased

9 Agatha Coté, International Department, Bank of Canada, "Current Account Developments: Comparison with the Previous Cycle", *Bank of Canada Review*, Winter, 1993-94, pp. 21-36.

during the 1991-1993 period whereas it had increased during the 1982-1984 recovery. It must be recalled, however that the latter period was one in which new sources of loans (from offshore banks) were first allowed.

It should also be noted that findings vary according to the choice of beginning and ending comparison dates. Figure 3, therefore, indexes the amounts of outstanding loans at the onset of the two recessions to 1.00 and then tracks the level of this loan portfolio over the 14 quarters following the onset. This charts the relative levels of loans of less than $500,000 for the two periods. On the basis of these data, it is difficult to identify, without equivocation, a way in which the lending patterns across the two recession/recoveries differ.

It is worth noting that a very strong geographic influence appears to be in effect. Figure 4 charts the decrease in the portfolio of loans of less than $500,000 from the onset of the 1990 recession through the most recent period for which data are available (1993:III) according to Canada's major economic regions. In absolute terms, it is clear from Figure 4 that the reduction in small commercial loans is largely centred in Ontario. Of the decrease in loans of less than $500,000, almost $2 billion was in Ontario. This decrease is greatest not only in absolute terms but in percentage terms as well.

This finding certainly begs the question of why bank lending to small firms has decreased to such an extent in Ontario but to lesser extents in other areas. One response might be afforded by the relative experience of business bankruptcies in Ontario relative to other regions. Figure 5 indexes business bankruptcy frequencies to 1.00 as of January 1990 and plots the relative frequencies through December 1992[10] for Ontario and for the rest of Canada. These findings clearly demonstrate that the number of business bankruptcies have increased by a disproportionate amount in Ontario relative to changes in the rest of the nation. This shift might well prompt greater caution on the part of lenders in Ontario. Moreover, such a shift might arguably cause a change in the nature of the demand for business loans. It is conceivable that borrowers may be seeking capital not so much to expand as to survive.

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10 This is the last month for which frequency data are available for business bankrupcies on the Cansim database

2. Estimation of Supply and Demand for Bank Lending to SMEs

2.1 Theoretical Background

This section is based upon the work of Jacques Melitz and Morris Pardue (1973), whose article, sets the theoretical and empirical basis for this analysis and provides a model that has been adapted to the Canadian setting.[11] Melitz and Pardue derive a model of the supply and demand for commercial bank loans from microeconomic foundations. Previous and much subsequent work has centred on large-scale models of the entire economy. Other attempts to model commercial bank lending introduced such arguments as components of investment or national income into models with little explanation or justification.[12] Melitz and Pardue, on the other hand, have advanced a strong theoretical foundation for their paradigm. The following is a brief summary of their arguments.

2.1.1 Demand for Commercial Bank Loans

The theory behind the demand for commercial small business loans is built from micro foundations. It is set up to explain the activities of the rational profit and utility maximizing borrowing agent. Thus, the factors for inclusion must be those that reflect relative circumstances from the perspective of a potential borrower. Broadly, these factors can be divided into three sections.

Income Effects. Melitz and Pardue argue that a change in income has potentially two effects on the demand for commercial bank loans. The effects accord with Milton Friedman's decomposition of income into permanent and transitory components. If the lifetime prospects of an individual improve (i.e. permanent lifetime income increases or the potential permanent income increases), then a greater impetus for earlier borrowing will also increase dramatically. This is essentially due to a perceived low risk incurred by borrowing against future income. However, if the individual experiences a one-time windfall (i.e. a transitory increase in income), the basis for greater borrowing is not secure. Indeed, the rational action would seem to be to reduce indebtedness with the transitory increase in income. Thus it is argued that permanent income will have a positive relation with commercial loan demand, and transitory income, a negative relation. It is this reasoning that makes the use of a simple measure of income inappropriate.

Costs of Credit. This argument is the incorporation of a price variable into the model. As such, it would be measured by the interest rate on commercial small business loans. The connection with demand is simple. As the interest rate increases, it is expected that a decline in the demand for credit would result.

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11 Jacques Melitz and Morris Pardue, "The Demand and Supply of Commercial Bank Loans", Journal of Money, Credit and Banking, 1973, p. 669-692.

12 Ibid., p. 669.

Factors affecting commercial loan demand relative to total credit demand. While income effects will change demand for overall credit, there must be some differentiation between overall credit and demand specifically for small business loans. In order to determine this proportion of the demand, factors which affect the desired ratio of commercial bank loans to total credit need to be employed. These factors would include items which would disproportionately affect the business sector versus the whole economy.

Melitz and Pardue attempted to employ several variables to capture this aspect of relative demand for credit. Previous studies had used business inventories to estimate the demand for commercial bank loans.[13] Further, financing of fixed investment also had been shown to be an important impetus for credit demand.[14] As well, a cyclical competent of credit demand seems reasonable to capture the possibility that the level of business loan activity may at least in part reflect of the overall state of the economy.

2.1.2 Supply of Commercial Bank Loans

Melitz and Pardue argue that the supply of commercial bank loans can be divided into four theoretical factors: a scale constraint; the yield on commercial bank loans; the yield on alternative commercial bank earning assets; and the cost per dollar of bank deposit liabilities.

Scale Constraint. This is often omitted when addressing the issue of credit supply, under the assumption that the firm can obtain an indefinite supply of credit. This seems an unsatisfactory assumption, as chartered banks do operate within the constraint of protecting the assets of their depositors and thus an upward bounds on lending should be considered.

The yield on commercial bank loans. Similar to the demand side of the model, this again is the price variable, but has the opposite relationship with supply. As the yield increases, it seems rational that lending institutions would increase the supply of credit.

The yield on alternative commercial bank earning assets. This aspect of the model serves to measure the opportunity cost of commercial lending, as it represents the substitute investment decisions that a bank faces. Here, a negative relationship is expected.

The cost per dollar of bank deposits. Melitz and Pardue argue that as this cost increases, the return to total commercial bank activity decreases. Thus, as this cost increases, banks

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13 See: Stephen Goldfeld, Commercial Bank Behavior and Economic Activity. Amsterdam: North Holland Publishing Co., 1966; and Patrick Hendershott, "Recent Development of the Financial Sector of Econometric Models", Journal of Finance, 23 (March, 1968), p. 41-66.

14 George Budzeika, "Commercial Banks as Suppliers of Capital Funds to Business", in Federal Reserve Bank of New York, Essays in Money and Credit, p. 67-71.

will desire to substitute high-yielding, high-risk assets for others, or alternatively, to switch out of securities and excess legal reserves and into loans.

The theoretical model, as such, is set up to reflect the interaction of agent-based decision-making from both the borrower and lender perspective. It seems reasonable that this system reflects the interaction of supply and demand factors in determining the level of credit in the economy for small businesses.

2.2 Data Compilation

The sources and, where applicable, manipulation of all variables used in the estimation are described presently. It should be noted that all variables were expressed in real terms (1986=100). For most variables, this simply involved dividing the nominal value by the GDP implicit price deflator. However, for the interest rate variables, this involved subtracting the annualized inflation rate of that quarter. In addition, any variables that were available monthly, but not quarterly, were averaged to come up with proxies for quarterly observations.

Dependent Variables

i) Small Business Loans: **(LOAN)**

Source: Cansim series B517

This variable was chosen as the right-hand-side dependent variable for the analysis. From the Bank of Canada Review, it is defined as Canadian dollar authorized loans with a limit of less than $200,000. This variable is not a perfect reflection of small business loan activity, as a small business could borrow more than $200,000, or a medium or large business could require less than $200,000. The variable should, nonetheless, serve as a reasonable proxy. The availability of this data from the fourth quarter of 1981 to the fourth quarter of 1992 is what defined the sample period.

ii) Interest rate on commercial loans: **(RCOM)**

Source: Cansim series B14020

This is the other dependent variable. While Melitz and Pardue are able to use a Federal Reserve index of the interest rate paid on short-term business loans, such data are not available in Canada. Instead, the chartered banks prime business loan rate had to be employed. This represents an errors in variables problem, as this is not necessarily the rate

offered to the banks' borrowers. Thus the dynamics of the upper risk end of small business loan activity may not be accurately captured by this variable. Such errors in variables causes an upward bias in the estimate of the standard error of the coefficient.[15] This is certainly an area where definite improvement in data collection could occur.

Credit Demand Variables

i) Permanent and Temporary Income: **(APERM and ATEMP)**

Source: Cansim series D10056

These variables were computed from Friedman's decomposition of GDP into its permanent and temporary components. The actual equation used was taken from de Leeuw. It is a distributed lag of the previous 19 quarters of GNP. The formula for permanent income is as follows:

$$(1)\ Y_{pi} = 0.119\sum_{i=0}^{19}(GNP_i)^i$$

The residual of GNP_i and Y_{pi} is the temporary income (Y_{ti}) component.

This variable was also adjusted so as to remove the capital formation and inventory components of GNP. This is because the sum of Y_{ti} and Y_{pi} equal GNP_i. This sum must also include capital formation and inventories. Thus, because capital formation and inventories are also theoretically included in the regression equations, in addition to Y_{pi} and Y_{ti}, an adjustment is required.[16]

ii) Inventories: **(INV)**

Source: Cansim series D10460

This variable measured business inventories, and was included so as to give an indication of business credit demand relative to overall credit demand.

iii) Gross Fixed Capital Formation: **(CAP)**

Source: Cansim series D15042

Similar to inventories, this variable was included to decompose overall credit demand.

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15 Albert Madansky, "The Fitting of Straight Lines When Both Variables are Subject to Error", Journal of the American Statistical Association, Vol. 54, No. 285, March 1959, p. 173-205.

16 Eventually, the inventory variable (INV) had to be excluded due to non-stationarity after first differencing. Nonetheless, this was the original decomposition. After the omission of the inventory variable, the decomposition was changed to reflect this.

iv) Seasonal Dummy variables: **(DWIN, DSP, DSU)**

Due to the quarterly frequency of the data, seasonal dummies were included as indices of tastes for, and the relative profitability of, credit over the course of a year.

v) Recessionary Dummy variables: **(D81, D90)**

These variables were included specifically for this paper, whereas all other variables come from the work of Melitz and Pardue. They were included to account for the cyclical component of the demand for business credit. While this effect is also prevalent in the adjusted income variables, this is a direct attempt to isolate the effect that the two most recent recessions had on credit demand.[17]

Credit Supply Variables

i) Chartered Bank Assets: **(ASS)**

Source: Cansim series B1611

This variable served as the scale measure of credit availability. However, pure bank assets would primarily reflect movements in the legal reserve requirements.[18] This is problematic since any rise (fall) in legal reserve requirements would cause commercial bank reserves to move up (down) and commercial bank loans to move down (up), whereas the theoretical relationship between the scale variable and commercial credit is positive. Thus this variable was adjusted to try to reflect this and minimize collinearity difficulties. The adjusted asset variable was:

(2) ASS = Chartered Bank Total Major Assets - Legally Required Reserves - Commercial Bank Loans

That is:

(3) ASS = B1611 - B810 - B1623

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17 It should be noted that these variables were also eventually included on the supply side of the model, instead of the demand side. This was to serve as a check on the correctness of the findings. The results of including these variables in the supply equation indicated that this would be a misspecification. This issue is more fully addressed later in the paper.

18 An exception, of note for the Canadian situation, is the acquisition of other financial institutions by the chartered banks, which was witnessed in the 1980's.

ii) Cost of Deposits: (CD)

Source: Cansim series B14019

Melitz and Pardue found the best measure of this variable was the maximum legal interest rate on savings times the ratio of savings to total deposits. Since no such "maximum legal interest rate" exists for Canada, this paper employed the following equation to proxy the cost of deposits to the banks:

$$(4)\ \text{CD} = \text{Savings Deposit Rate} \bullet \frac{\text{CDN \$ Personal Savings}}{\text{Total CDN \$ Deposits}}$$

That is:

$$(5)\ \text{CD} = B14019 \bullet \frac{B654}{B651}$$

iii) Interest Rate on Government Securities: (RGOV)

Source: B14009

This variable is included to measure the opportunity cost of small business lending for the banks. Melitz and Pardue use 3-5 year government security rates as this proxy. This paper attempted to follow this, but for reasons of non-stationarity, as discussed later, 1-3 year Government of Canada average bond yields were used.

3. Estimation Results

The model employed was a simultaneous equation system, with the level of small business loans and the prime interest rate on those loans being jointly determined dependent variables. The supply and demand equations for estimation were specified as follows:

$$(6)\ LOAN_{si} = \beta_0 + \beta_1 ASS_i + \beta_2 CD_i + \beta_3 RCOM_i + \beta_4 RGOV_i + \varepsilon_{si}$$

$$(7)\ LOAN_{di} = \alpha_0 + \alpha_1 APERM_i + \alpha_2 ATEMP_i + \alpha_3 RCOM_i + \alpha_4 CAP_i + \alpha_5 INV_i + \alpha_6 DWIN + \alpha_7 DSP + \alpha_8 DSU + \alpha_9 D81 + \alpha_{10} D90 + \varepsilon_{di}$$

a) Cointegration and Stationarity

The variables were all investigated for their stationarity properties, as the first stage of analysis. Not surprisingly, the augmented Dickey-Fuller (ADF) tests indicated that the null hypothesis of the variables each having a unit root could not be rejected (see Table 1).

The residuals were then also tested for stationarity. This test rejected the null hypothesis (test statistic = -4.1665, asymptotic critical value (10%) = -3.13). This lends evidence to the argument that the variables as a group are cointegrated.

To address the non-stationarity issue, all of the variables were expressed in log first-differenced terms, when possible. Otherwise, the variables were put into percentage change terms.

The ADF tests were then conducted on the first differenced variables. It was at this point that the selection of the variables had to differ from that of Melitz and Pardue. Their paper used the average interest rate paid on 3-5 year government securities as RGOV. However, for the Canadian data, this variable was still non-stationary after first -differencing. Thus, this study employed 1-3 year average Government of Canada bond yields. This data series was stationary after first -differencing. The inventories variable (INV) was also non-stationary after first -differencing. The issue with this variable was more problematic. Unlike the government bond variable, there were no appropriate substitutes available, and thus the variable had to be removed from the regression equations.

Two sets of equations were actually tested. This paper originally analyzed the supply and demand equations in the same time period. However, Melitz and Pardue employed a lagged demand equation in their estimates. This necessarily requires an assumption of asymmetry of information on the behalf of the borrowers. The argument is that borrowers base present period demand upon the previous period's information. Lenders, however, are assumed to have perfect information and thus base decisions on present period information. This does not seem like an unreasonable assumption, and thus both sets of results; the model of perfect information (regular specification) and the model of asymmetric information (lagged demand specification) are reported in the tables.[19]

The asymmetric specification model was as follows:

$$(8)\ LOAN_{si} = \beta_0 + \beta_1 ASS_i + \beta_2 CD_i + \beta_3 RCOM_i + \beta_4 RGOV_i + \varepsilon_{si}$$

$$(9)\ LOAN_{di} = \alpha_0 + \alpha_1 APERM_{i-1} + \alpha_2 ATEMP_{i-1} + \alpha_3 RCOM_{i-1} + \alpha_4 CAP_{i-1} + \alpha_5 INV_{i-1} + \alpha_6 DWIN + \alpha_7 DSP + \alpha_8 DSU + \alpha_9 D81 + \alpha_{10} D90 + \varepsilon_{di}$$

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19 See also Robert E. Krainer, "Structural Estimates of Supply and Demand in the USA Short Term Bank Loan Market", *Bulletin of the Oxford University Institute of Economics and Statistics*, Vol. 31, No. 1, p. 39-46). Krainer also reported differences in the speed of adjustment of banks and borrowers. However, Krainer argued that "firms adjust faster than banks".

b) Single Equation Estimation

i) Ordinary Least Squares (OLS) Estimation

While it is evident that the market for small business loans is a simultaneous system, OLS estimates were obtained for completeness. As Maddala argues, although the simultaneity problem results in inconsistent estimators of the parameters, this does not mean that OLS estimates are useless when dealing with a simultaneous equation model.[20] If for nothing else, the OLS results may give an indication of the robustness of the later regression results. The OLS results are reported in Table 2.

In general, the results show no statistically significant coefficients. The signs of the coefficients seem accurate for the supply equation, with the exception of the asset variable (ASS). The demand equations are both fairly inaccurate in estimating the expected signs, regardless of specification. Thus, these results are of limited value, but are nonetheless presented for completeness.

ii) Serial Correlation Detection in OLS Estimates

Due to the time series nature of the data, it would not be surprising to find evidence of serially correlated residuals. Thus a Lagrangian multiplier (LM) test was performed on the OLS residuals to test for autoregressive error processes (AR) of order 1 to 4. It was expected that AR(4) would be evident due to the quarterly frequency of the data.

The results indicate evidence of an AR(1) process in the supply equation. The demand equation, however, showed the existence of AR(1), AR(2), AR(3), and AR(4) processes. This presented a dilemma. To account for an AR(4) process would lead to a large decline in the number of available observations for estimation and degrees of freedom of the parameter estimates. Thus it was decided that in the next section of the regressions, that the AR(1) process would be addressed exclusively. It was felt that this would mitigate the serial correlation issue sufficiently so as to make the findings reasonable, while also minimizing the degrees of freedom problem.

iii) AR(1) Corrected OLS Estimates

The results after the accounting for AR(1) process were still not very satisfying. A lack of statistically significant coefficients exists, as was evident in the original results. In

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20 G. Maddala, *Introduction to Econometrics*, Toronto: Maxwell Macmillan Canada, 1992, p. 383.

addition, the ability of the model to yield reasonable signs on the coefficients was limited. While the supply equation performed reasonably well, the demand equations were not satisfactory. Indeed, even the price variable (RCOM) had a positive sign. Thus, these findings are also of limited value. Nonetheless, due to the simultaneity of the system, unsatisfactory results are not surprising, indeed they are somewhat anticipated.

c) Instrumental Variable Estimation

i) Two Stage Least Squares (2SLS)

The next section deals with instrumental variable methods of estimation for the system. The first method employed was 2SLS, with the first-differenced small business loans (LOAN), and the prime rate on commercial loans (RCOM) as jointly determined dependent variables. Both the supply and demand equations were over identified.

The first results were not satisfying (see Table 5). The signs on the supply equations were wrong except for the RGOV variable, and the demand equation did not perform much better. For the asymmetric information specification, only the capital formation variable had the anticipated sign. The perfect information model yielded better results, but still the permanent income variable (APERM) and 1981-2 and 1990-2 (D81, D90) Recessionary dummies had incorrect signs. In addition, the same issue of relatively large standard errors prevailed in both sets of regressions.

ii) Serial Correlation Detection

It was reasonable to assume that if AR errors existed in the OLS estimates, they would exist here. Thus a set of LM tests were conducted, similar to those conducted on the OLS regressions. However, instead of the residuals being regressed against the actual variables, the predicted values of the exogenous variables had to be employed.

The test results showed evidence of AR(1) errors in the supply equation of both model specifications (see Table 6). This finding was consistent with those of the OLS residual tests. For the demand equations, the perfect information model displayed evidence of AR(1) and AR(2) errors. However, the lagged demand specification showed no AR processes. Nonetheless, given the results of the OLS residual tests, and the perfect information specification, it was felt that the accounting for an AR(1) process still seemed appropriate for both demand specifications.

iii) Non-linear Two Stage Least Squares (NL2SLS)

To account for AR(1) processes involves the estimation of a simultaneous equation model which is non-linear in its parameters. This is essentially because the model can be characterized in general terms as follows:

$$(10)\ Y_i = x_i'\beta + \varepsilon_i$$

where x_t is a matrix of first differenced exogenous variables.

The AR(1) error terms imply an equation of the following form:

$$(11)\ \rho Y_{i-1} = \rho x_{i-1}'\beta + \rho\varepsilon_{i-1}$$

ρ is estimated by an artificial regression of the residuals of (10) regressed upon themselves lagged one observation. Once (11) is subtracted from (10), the resulting non-linear regression equation is:

$$(12)\ Y_i = \rho Y_{i-1} + x_i'\beta - x_{i-1}'\delta + \upsilon_i$$

where $\delta \equiv \rho\beta$, and $\upsilon_i = (1-\rho)\varepsilon_{i-1}$.

The non-linear 2SLS regression results were the most encouraging of all. For the perfect information regression results, all variables in both the supply and demand equations had the anticipated signs, except for the bank asset variable (ASS).

The imperfect information specification model did not perform as well. While it improved from previous findings, both of the income variables and the price variable in the lagged demand equation had the wrong signs. This was a consistent finding whenever the lagged demand equation specification was employed. In addition, the asset variable also had an unanticipated coefficient sign.

Another interesting finding in the perfect information specification was the statistical significance of the 1990-92 recessionary dummy variable (D90). This would seem to indicate that the cyclical movement of demand in the economy plays the single most important role in determining the level of small business loans.

The next stage was to test the inclusion of the two recessionary dummies on the supply equations. The findings, however, indicated that such an inclusion would result in a misspecification. An LM test reached that conclusion.[21] This finding would support the hypothesis that the recent decline in small business loans is a result of a decline in demand

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21 LM test: $(n-k)R^2$

Perfect information model = (43-2)(0.0649) = 2.6609

$\chi^2_2 = 5.991$ at 5%, with 2 degrees freedom.

Asymmetric information model = (42-2)(0.0838) = 3.3538.

Thus one accepts the null hypothesis that the new regression coefficients are all zero. This implies that the two recessionary variables should not be included in the supply equations.

for credit, and that the anecdotal arguments of a decline the supply of chartered bank credit are inaccurate: it represents an illusion due to misspecification. In other words, the decline in bank loan levels has been attributed inaccurately to a credit supply contraction. The analysis supports the reason for the decline in bank loan levels as being a cyclical decline in demand for commercial loans.

Finally, a comparison was sought between the small business credit market and the rest of the market. Thus, the same model was analyzed using authorized loans greater than $200,000 as a dependent variable, to see whether the same effects are evident in the upper end of the credit market. The models all showed the same stationarity and AR processes, and thus were accounted for in a similar fashion. The non-linear regression results are presented in Table 8.

For these models, the asymmetric model seemed to perform better, as a greater number of the estimated coefficients had their expected signs. However, there does not appear to be any reason why it would be concluded that small businesses determine demand for credit without any asymmetry, yet the upper end of the credit market does.

Nonetheless, there are two key findings. First, the same demand driven effects are observed in the recessionary dummies. Indeed, both recessionary dummies have statistically significant coefficients. Secondly, there is evidence that the inclusion of these dummy variables in the supply equation would constitute a misspecification. Both of these results are consistent with those found for in small business loan results. It can be concluded that the observed decline in bank loan levels is a result of both markets experiencing a cyclical decline in the demand for commercial loans.

SUMMARY

These findings provide initial insights about the $4 billion decrease in bank lending that occurred from 1990 to mid-1993.

When bank lending during the two most recent recessions are compared it is found that the decrease in the amount of lending from 1990:I through 1991:I is commensurate with the decrease that had occurred during the previous recession, the period of 1981:IV through 1982:IV. However, differences in the levels of lending during the subsequent recovery periods were found: bank lending during the recovery period 1991:I through 1993:II was less than that recorded during the 1982:IV - 1984:III time of recovery. This observation is equivocal because the 1982-84 period was one that was also characterized by the entry to commercial lending of offshore financial institutions, an increase in supply.

While a decline in the level of small bank loans was recorded from 1990:I through 1993:III, this decline did not occur evenly across Canada in the most recent recession . A disproportionate part of the decline was concentrated in the province of Ontario.

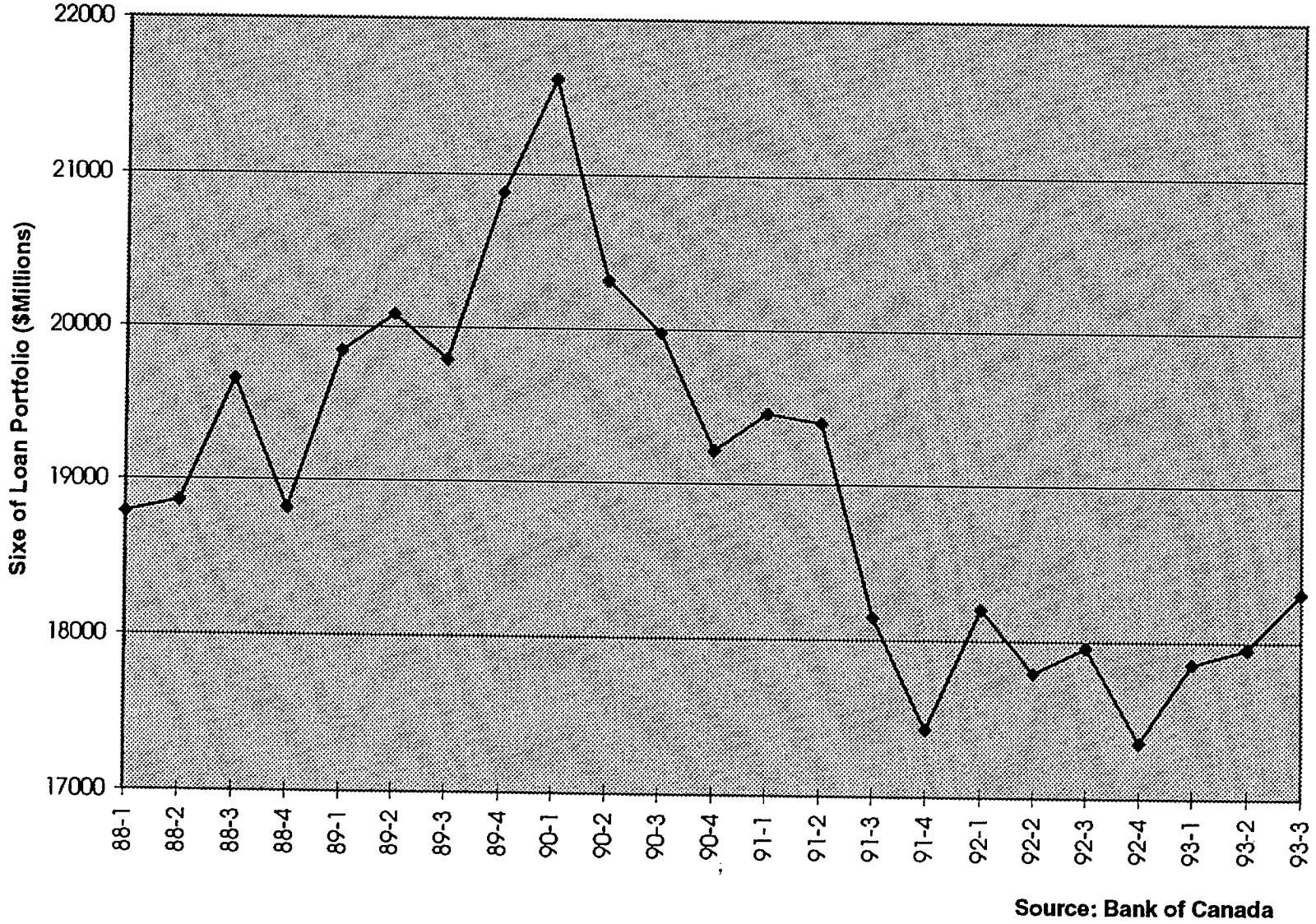
Econometric analysis of the demand and supply of bank loans demonstrated that there was an independent recessionary effect on the *demand* for loans; however, no statistically significant shrinkage in the *supply* of loans could be attributed to the recessions. The econometric analysis also highlighted the need for accurate data on the cost of borrowing for small businesses. The analysis used here had to rely on the prime rate as such a measure. Therefore, while the econometric analysis is suggestive, it is not definitive.

In view of these results, Volume II of this report will, at a later date, report on further investigation of the question of shrinkage of supply. Volume III will address issues related to the SBLA. These studies will be based on access to CFIB and bank loan file data on actual costs of borrowing and ease of access to bank credit.

APPENDIX A: CHARTS

Figure 1

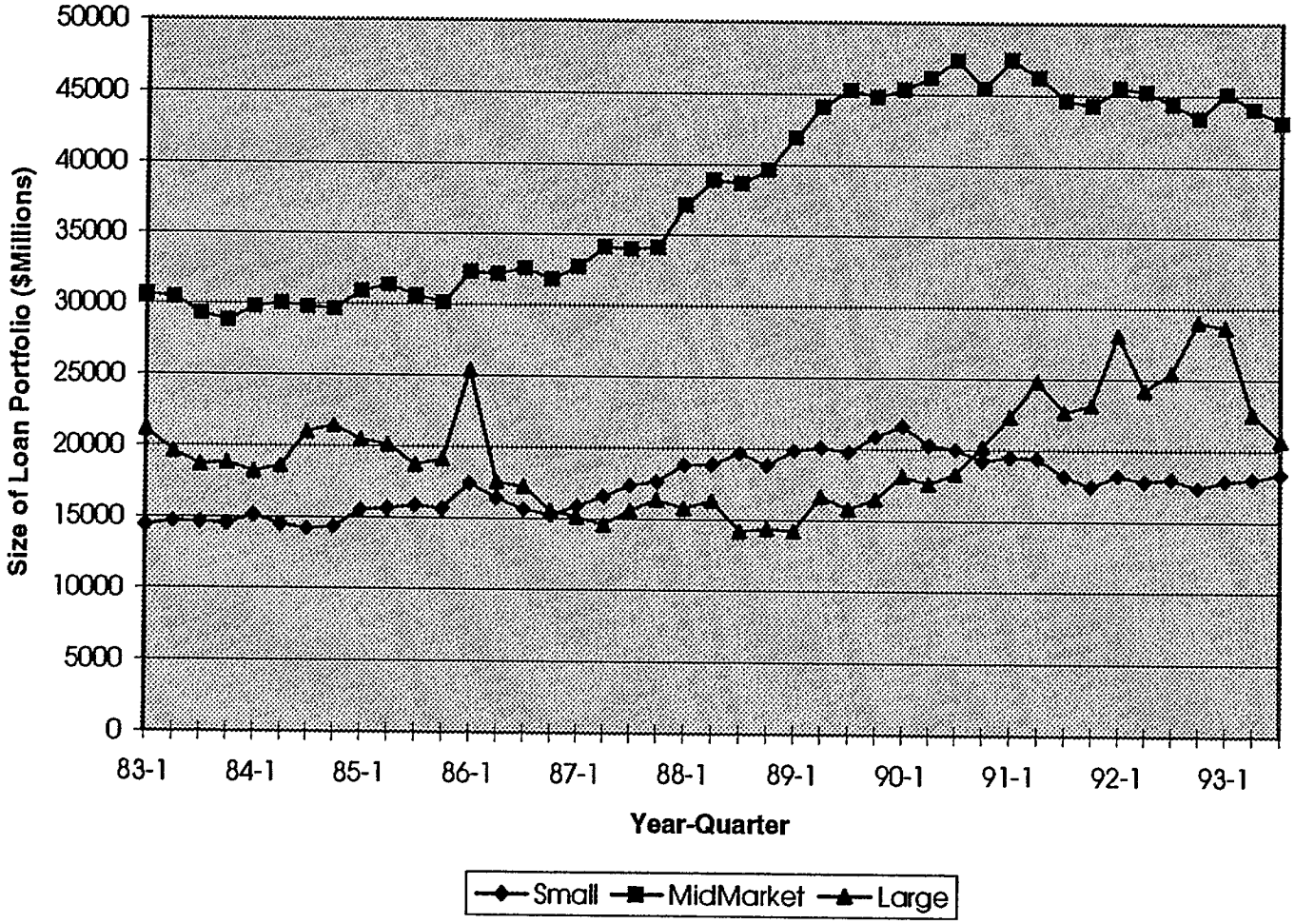
Chartered Bank Loans of Less Than $500,000: 1988:1 to 1993:3



Source: Bank of Canada

Figure 2

Commercial Loans Outstanding: 1983-1993



Bank Loans of Less Than $500,000: Indexed to Recessions

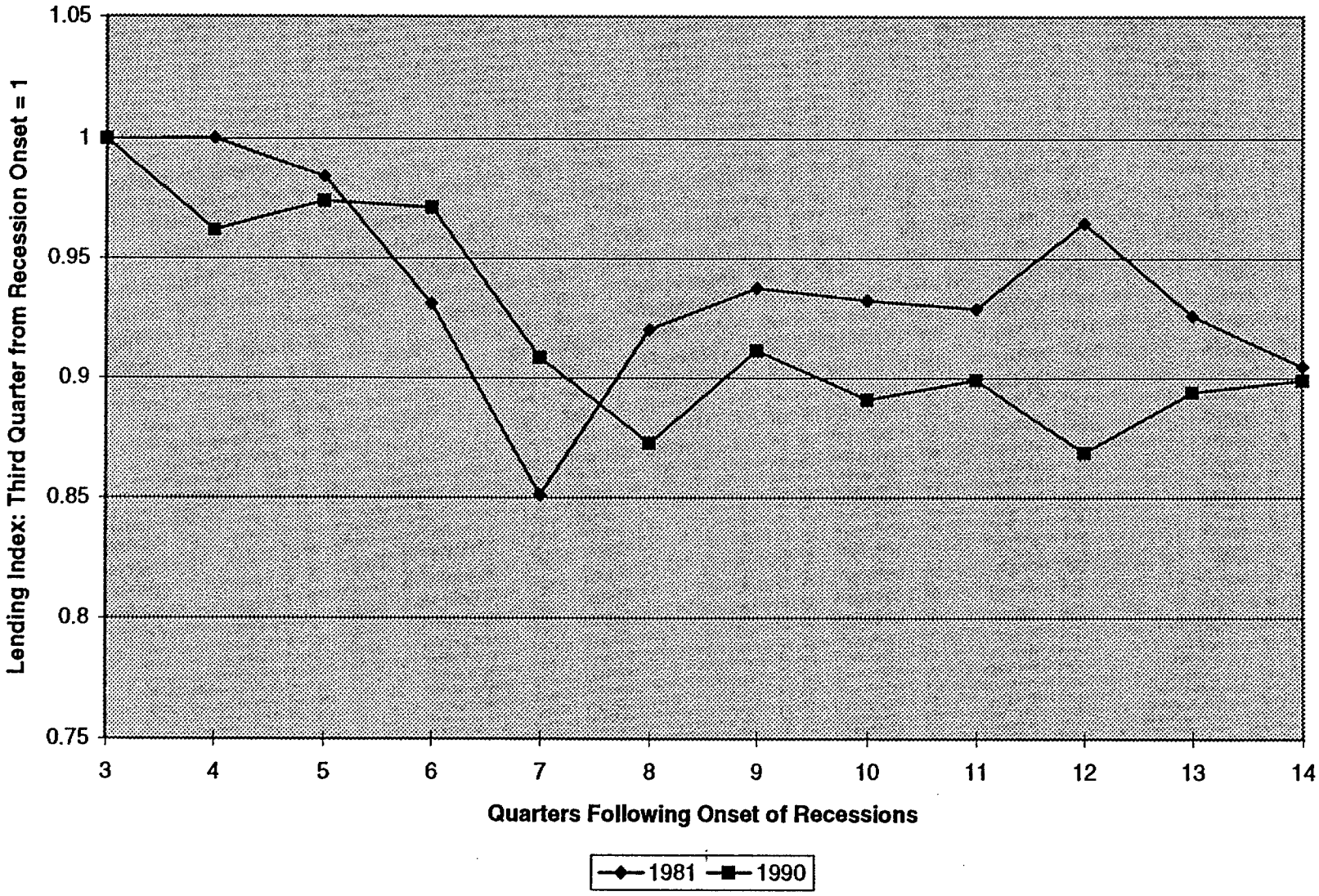


Figure 3

Figure 4

Changes in Commercial Loans of Less than $500000, 1990I to 1993III: By Region

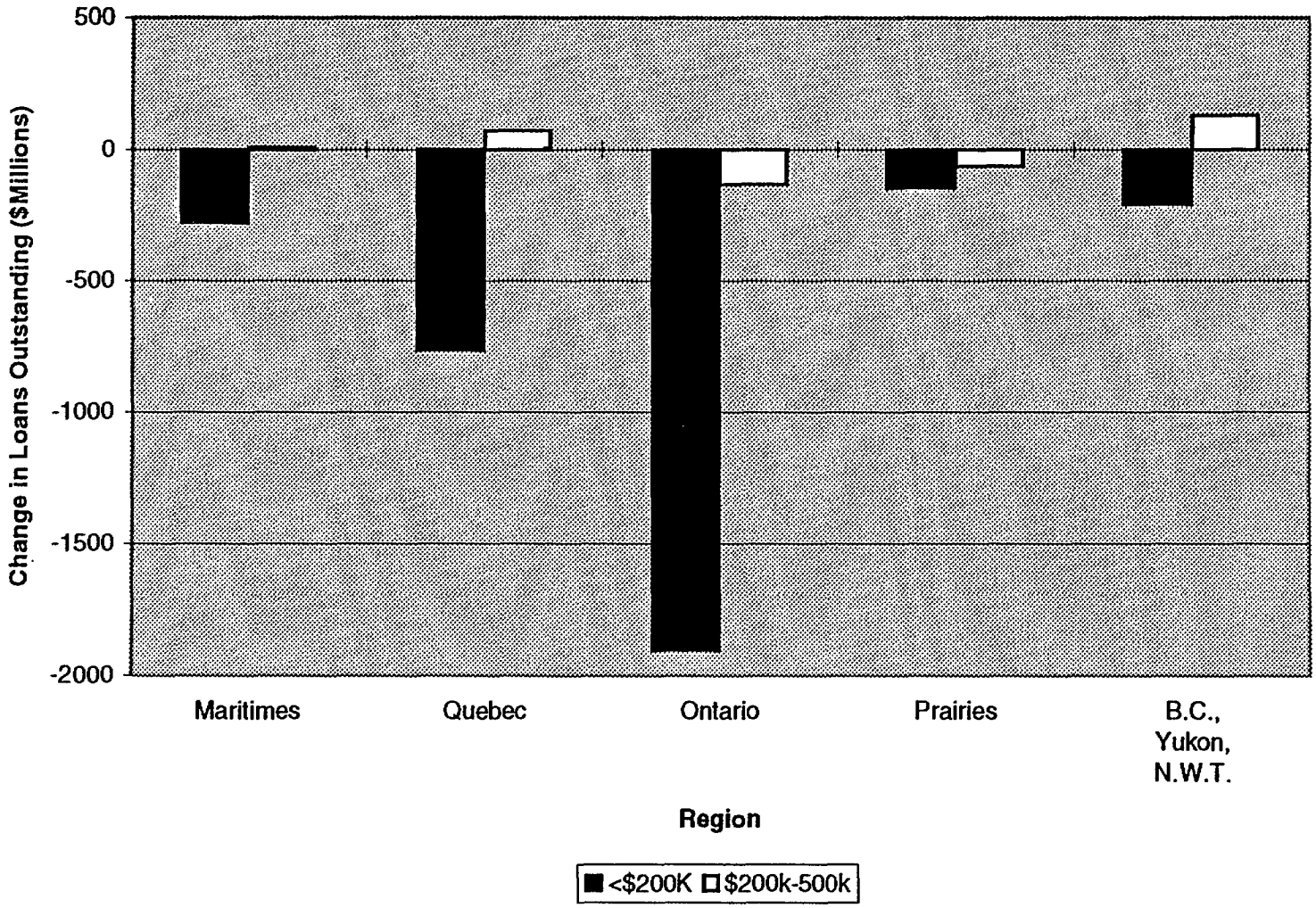
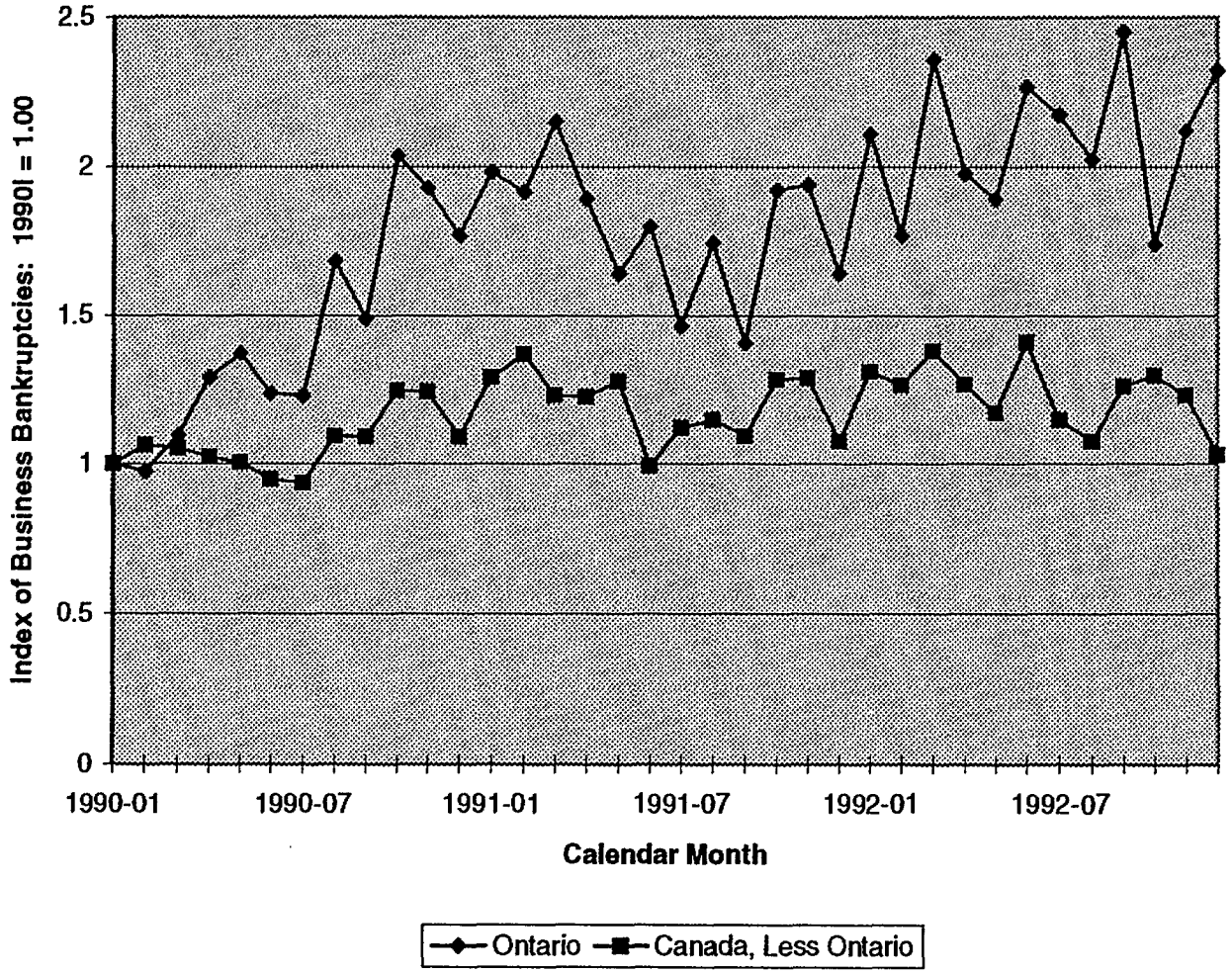


Figure 5

Business Bankruptcies, Ontario vs. the Rest of Canada: 1990:1-1992:12



APPENDIX B

STATISTICAL TABLES

Table 1: Unit Roots and Cointegration

Level Variables

Regular Specification			Lagged Demand Specification		
Variable	Test Statistic	Critical Value	Variable	Test Statistic	Critical Value
loan	-1.70	-3.13	loan	-1.70	-3.13
aperm	-2.92	-3.13	aperm	-2.92	-3.13
atemp	-2.50	-3.13	atemp	-2.50	-3.13
rcom	-2.13	-3.13	srcom	-2.13	-3.13
cap	-1.63	-3.13	drcom	-1.77	-3.13
inv	-2.71	-3.13	cap	-1.63	-3.13
cd	-1.96	-3.13	inv	-2.71	-3.13
rgov	-2.41	-3.13	cd	-1.96	-3.13
ass	-0.39	-3.13	rgov	-2.41	-3.13
			ass	-0.39	-3.13

Unit Roots and Cointegration

First Differenced Variables

Regular Specification			Lagged Demand Specification		
Variable	Test Statistic	Critical Value	Variable	Test Statistic	Critical Value
loan	-195.40	-3.13	loan	-204.10	-3.13
aperm	-320.70	-3.13	aperm	-6.75	-3.13
atemp	-4.32	-3.13	atemp	-3.87	-3.13
rcom	-199.57	-3.13	srcom	-14.02	-3.13
cap	-35.25	-3.13	drcom	-9.26	-3.13
inv	-365.77	-3.13	cap	-6.42	-3.13
cd	-11.05	-3.13	inv	-23.59	-3.13
rgov	-3.73	-3.13	cd	-13.11	-3.13
ass	-365.77	-3.13	rgov	-3.99	-3.13
			ass	-358.32	-3.13

Table 2: OLS Supply Equation
No AR Correction

Regular Specification				Lagged Demand Specification			
Variable	Coefficient	Standard Error	T-Statistic	Variable	Coefficient	Standard Error	T-Statistic
ass	-0.3643	0.4072	-0.8948	ass	-0.3643	0.4072	-0.8948
cd	-0.0052	0.0803	-0.0651	cd	-0.0052	0.0803	-0.0651
rcom	0.0634	0.1232	0.5143	srcom	0.0634	0.1232	0.5143
rgov	-0.0743	0.0717	-1.0370	rgov	-0.0743	0.0717	-1.0370
constant	0.0013	0.0108	0.1247	constant	0.0013	0.0108	0.1247

OLS Demand Equation
No AR Correction

Regular Specification				Lagged Demand Specification			
Variable	Coefficient	Standard Error	T-Statistic	Variable	Coefficient	Standard Error	T-Statistic
aperm	-1.1849	1.9760	-0.5996	aperm	-1.1788	1.8710	-0.6301
atemp	-0.0011	0.0009	-1.2690	atemp	0.0005	0.0009	0.5534
rcom	0.0096	0.0542	0.1776	drcom	0.0304	0.0598	0.5086
cap	0.1818	0.1871	0.9716	cap	0.1229	0.1935	0.6351
dwin	-0.0130	0.0269	-0.4820	dwin	0.0336	0.0550	0.6120
dsp	-0.1524	0.0834	-1.8270	dsp	0.0237	0.0666	0.3552
dsu	-0.0581	0.0492	-1.1810	dsu	-0.0697	0.0572	-1.2190
d81	-0.0284	0.0335	-0.8491	d81	0.0106	0.0382	0.2772
d90	-0.0217	0.0244	-0.8898	d90	-0.0120	0.0234	-0.5125
constant	0.0617	0.0332	1.8560	constant	0.0065	0.0381	0.1714

Table 3: OLS Supply Equation

Serial Correlation Detection

	Regular Specification		Lagged Demand Specification	
	Test Statistic	Critical Value	Test Statistic	Critical Value
AR(1)	3.8808	3.8415	3.8808	3.8415
AR(2)	3.7800	5.9915	3.7800	5.9915
AR(3)	5.8976	7.8147	5.8976	7.8147
AR(4)	4.8276	9.4877	4.8276	9.4877

OLS Demand Equation

Serial Correlation Detection

	Regular Specification		Lagged Demand Specification	
	Test Statistic	Critical Value	Test Statistic	Critical Value
AR(1)	12.9486	3.8415	12.5747	3.8415
AR(2)	12.1600	5.9915	11.3763	5.9915
AR(3)	11.0500	7.8147	11.9510	7.8147
AR(4)	10.4004	9.4877	11.1405	9.4877

Table 4: OLS Supply Equation

AR(1) Correction

Regular Specification				Lagged Demand Specification			
Variable	Coefficient	Standard Error	T-Statistic	Variable	Coefficient	Standard Error	T-Statistic
ass	-0.4219	0.3947	-1.0690	ass	-0.4219	0.3947	-1.0690
cd	-0.0075	0.0655	-0.1152	cd	-0.0075	0.0655	-0.1152
rcom	0.0290	0.1035	0.2805	srcom	0.0290	0.1035	0.2805
rgov	-0.0108	0.0632	-0.1716	rgov	-0.0108	0.0632	-0.1716
constant	0.0045	0.0092	0.4596	constant	0.0045	0.0092	0.4596

OLS Demand Equation

AR(1) Correction

Regular Specification				Lagged Demand Specification			
Variable	Coefficient	Standard Error	T-Statistic	Variable	Coefficient	Standard Error	T-Statistic
aperm	1.0323	0.9696	1.0650	aperm	-0.1340	0.9507	-0.1409
atemp	-0.0007	0.0007	-1.0450	atemp	0.0000	0.0007	0.0461
rcom	0.0066	0.0445	0.1479	drcom	0.0003	0.0454	0.0065
cap	0.0390	0.0554	0.7044	cap	0.0332	0.5510	0.6020
dwin	n/a	n/a	n/a	dwin	n/a	n/a	n/a
dsp	n/a	n/a	n/a	dsp	n/a	n/a	n/a
dsu	n/a	n/a	n/a	dsu	n/a	n/a	n/a
d81	n/a	n/a	n/a	d81	n/a	n/a	n/a
d90	-0.0203	0.0147	-1.3810	d90	-0.0211	0.0139	-1.5180
constant	-0.0066	0.0097	-0.6840	constant	0.0002	0.0094	0.0202

Table 5: 2SLS Supply Equation

No AR Correction

Regular Specification				Lagged Demand Specification			
Variable	Coefficient	Standard Error	T-Statistic	Variable	Coefficient	Standard Error	T-Statistic
ass	-0.3968	0.4027	-0.9855	ass	-0.2460	0.3987	-0.6169
cd	0.0282	0.1433	0.1968	cd	0.0145	0.2265	0.0640
rcom	-0.0066	0.2801	-0.0237	srcom	-0.0008	0.4763	-0.0017
rgov	-0.0438	0.1298	-0.3377	rgov	-0.0318	0.2203	-0.1444
constant	0.0024	0.0109	0.2181	constant	0.0009	0.0115	0.0770

2SLS Demand Equation

No AR Correction

Regular Specification				Lagged Demand Specification			
Variable	Coefficient	Standard Error	T-Statistic	Variable	Coefficient	Standard Error	T-Statistic
aperm	-2.1666	8.3800	-0.2585	aperm	-12.8540	32.3100	-0.3978
atemp	-0.0017	0.0017	-0.9853	atemp	0.0007	0.0026	0.2613
rcom	-0.0099	0.1262	-0.0783	drcom	1.1047	2.9370	0.3762
cap	0.1539	0.9287	0.1657	cap	0.4879	1.1410	0.4277
dwin	-0.0185	0.0946	-0.1960	dwin	0.2610	0.6402	0.4076
dsp	-0.1672	0.2467	-0.6777	dsp	0.1743	0.4536	0.3844
dsu	-0.0522	0.2109	-0.2475	dsu	-0.4844	1.1430	-0.4236
d81	0.0689	0.1847	0.3729	d81	0.0979	0.2624	0.3732
d90	-0.1271	0.2186	-0.5812	d90	0.0348	0.1442	0.2410
constant	0.0819	0.0544	1.5060	constant	0.0816	0.2322	0.3512

Table 6: 2SLS Supply Equation

Serial Correlation Detection

	Regular Specification		Lagged Demand Specification	
	Test Statistic	Critical Value	Test Statistic	Critical Value
AR(1)	5.9340	3.8415	5.7120	3.8415
AR(2)	4.8134	5.9915	7.5440	5.9915
AR(3)	6.3648	7.8147	7.6646	7.8147
AR(4)	6.6119	9.4877	6.9300	9.4877

2SLS Demand Equation

Serial Correlation Detection

	Regular Specification		Lagged Demand Specification	
	Test Statistic	Critical Value	Test Statistic	Critical Value
AR(1)	6.1824	3.8415	1.1760	3.8415
AR(2)	7.7800	5.9915	1.4240	5.9915
AR(3)	5.2516	7.8147	2.1546	7.8147
AR(4)	6.0804	9.4877	4.4136	9.4877

Table 7: Small Business Commercial Loans: Non-Linear 2SLS Supply Equation

AR(1) Correction

	Regular Specification				Lagged Demand Specification		
Variable	Coefficient	Standard Error	T-Statistic	Variable	Coefficient	Standard Error	T-Statistic
loan(t-1)	-0.1535	0.2321	-0.6614	loan(t-1)	0.3931	0.3118	1.2608
ass	-0.0967	0.3592	-0.2693	ass	-0.4665	0.4833	-0.9653
cd	-0.0193	0.1066	-0.1812	cd	-0.0722	0.1201	-0.6007
rcom	0.0698	0.1913	0.3647	srcom	0.1978	0.2290	0.8637
rgov	-0.0446	0.0917	-0.4870	rgov	-0.1626	0.1101	-1.4770
constant	-0.0035	0.0106	-0.3297	constant	0.0030	0.0098	0.3070

Non-Linear 2SLS Demand Equation

AR(1) Correction

	Regular Specification				Lagged Demand Specification		
Variable	Coefficient	Standard Error	T-Statistic	Variable	Coefficient	Standard Error	T-Statistic
loan(t-1)	-0.4910	0.2533	-1.9384	loan(t-1)	0.0259	0.0115	-0.0591
aperm	0.4336	0.7776	0.5577	aperm	-0.1700	0.1875	0.1381
atemp	-0.0004	0.0007	-0.5368	atemp	0.0005	0.9846	-0.1726
rcom	-0.0119	0.0387	-0.3088	drcom	0.0144	0.0007	0.7335
cap	0.0013	0.0446	0.0283	cap	0.0176	0.0514	0.2804
dwin	n/a	n/a	n/a	dwin	n/a	n/a	n/a
dsp	n/a	n/a	n/a	dsp	n/a	n/a	n/a
dsu	n/a	n/a	n/a	dsu	n/a	n/a	n/a
d81	-0.0444	0.0297	-1.4917	d81	-0.0197	0.0593	0.2972
d90	-0.0383	0.0186	-2.0612	d90	-0.0152	0.0338	-0.5838
constant	-0.0015	0.0112	-0.1323	constant	-0.0007	0.0211	-0.7230

Table 8: Total Commercial Loans: Non-Linear 2SLS Supply Equation
AR(1) Correction

Regular Specification				Lagged Demand Specification			
Variable	Coefficient	Standard Error	T-Statistic	Variable	Coefficient	Standard Error	T-Statistic
loan(t-1)	-0.2665	0.2108	-1.2646	loan(t-1)	0.3496	0.3209	1.0895
ass	-0.0545	0.3336	-0.1722	ass	-0.4321	0.4790	-0.9020
cd	0.0025	0.1114	0.0227	cd	-0.0794	0.1196	-0.6639
rcom	0.0094	0.2163	0.0434	srcom	0.2130	0.2281	0.9338
rgov	-0.0022	0.1116	-0.0193	rgov	-0.1660	0.1099	-1.5111
constant	-0.0050	0.0106	-0.4706	constant	-0.0026	0.0099	0.2643

Non-Linear 2SLS Demand Equation
AR(1) Correction

Regular Specification				Lagged Demand Specification			
Variable	Coefficient	Standard Error	T-Statistic	Variable	Coefficient	Standard Error	T-Statistic
loan(t-1)	-0.7756	0.2043	-3.7960	loan(t-1)	-0.5829	0.2941	-1.9817
aperm	-0.3296	0.1666	-1.9782	aperm	-0.2803	0.0178	-1.5778
atemp	-0.0003	0.0006	-0.6066	atemp	-0.0002	0.0006	-0.3294
rcom	0.0107	0.0349	0.3056	drcom	-0.0098	0.0407	-0.2402
cap	-0.0295	0.0235	-1.2524	cap	0.0424	0.0238	1.7827
dwin	n/a	n/a	n/a	dwin	n/a	n/a	n/a
dsp	n/a	n/a	n/a	dsp	n/a	n/a	n/a
dsu	n/a	n/a	n/a	dsu	n/a	n/a	n/a
d81	-0.0764	0.0296	-2.5845	d81	-0.0517	0.0314	-1.6438
d90	-0.0534	0.0183	-2.9178	d90	-0.0384	0.0196	-1.9580
constant	0.0097	0.0079	1.2260	constant	0.0014	0.0071	0.1949