

**FINANCING GROWING FIRMS AND THE IMPORTANCE OF
BANKING RELATIONSHIPS**

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Abstract

This research has used a large and reliable data set to examine the contentions that it is rapidly growing firms that face the greatest difficulty in obtaining financing from financial institutions. The findings of this empirical study did not support this contention. Overall, this work has found that firms with records of relatively high rates of revenue growth did not appear to have any less access to either term or operating loans than did firms with more modest levels of historical sales growth. Establishing and nurturing a relationship with the firm's financial institution increases the availability of term loans, but has no impact on the accessibility to operating loans. The analysis suggests that collateral plays a role for lenders to reduce their exposure to moral hazard, rather than for borrowers to signal signaling credit worthiness.

Introduction

It is now generally accepted that the birth and growth of small- and medium-sized firms (SMEs) contribute substantively to Canadian economic welfare and job creation.¹ It is also widely believed that growing firms face particular difficulties with respect to raising the debt capital required for growth. This perceived financial constraint on the growth of small enterprises has led to pressure on governments to intervene with remedial measures. In the Canadian context, research by the Canadian Federation of Independent Business has asserted that

¹ The contribution to net private sector paid employment from small- (less than 100 employees) and medium-sized (100 to 499 employees) firms in Canada has in fact actually exceeded that of large firms in seven of the eight calendar quarters during 2001-

“it is the young, high performing businesses that are experiencing the greatest difficulty in obtaining financing from financial institutions” (Bruce, 2001, p. (i)). To the extent that growth-oriented small firms are systematically credit constrained, government intervention may be warranted. However, if this is not the case, intervention may do more harm than good.²

Accordingly, this paper reports on an empirical examination of the extent to which three factors may influence access to capital for growing firms. First, the work examines the impact of growth itself and attempts to determine the extent to which growing firms, on a *ceteris paribus* basis, face greater challenges with respect to borrowing from commercial lenders. Second, the work explores how access to capital for growing firms is mitigated or exacerbated by the nature of the relationships between borrower firms and lenders. Third, it also explores the role of collateral for such firms in accessing capital. These factors are investigated, in the Canadian setting, while controlling for other potential determinants of access to debt capital by taking advantage of a large-scale survey of financing experiences of SME owners.

To report on these issues, this paper is structured as follows. The next section briefly outlines previous research on these topics and outlines the, largely unresolved, theoretical arguments and attempts at empirical investigation of these topics. This is followed by a description of the methodologies and data employed here. The empirical findings are then presented. The paper closes with a discussion and suggestions for future research.

2002 (Industry Canada, 2004, p. 16).

² In the absence of independent rigorous research that specifies the nature and location of financing constraints, interventions may cause more harm than good. Brierley, (2001, p. 75) states the case as follows:

“Public sector initiatives to support the financing of ... small firms ... may be justified if market imperfections mean that the private sector does not provide capital to firms on competitive terms...[However] In the absence of market failure, such initiatives may themselves cause distortions by subsidizing, at considerable public cost, non-viable firms which are not attracting enough capital because they do not offer good investment opportunities.”

PREVIOUS RESEARCH

Financing Gaps and Credit Rationing

Many of the public policy issues related to the financing of SMEs revolve around the concept of “gaps” in financial marketplaces. As used in the popular media the word “gap” connotes the idea of a shortage: a sense that the supply of the commodity in demand is insufficient and that the demand cannot be satisfied because some imperfection in the marketplace prevents the market from clearing on the basis of price adjustment. According to economic theory, a shortage (surplus) exists when the price for the product/service is too low (high). In the case of a shortage, prices ought then to rise to the point that supply and demand clear. For a shortage to persist some form of imperfection must interfere with the ability of the market to clear.

The theoretical debate dates back to Arrow (1962) and Demsetz (1969) and is centred primarily on the assumption that information asymmetry between lender and borrower comprises an imperfection that prevents the market from clearing. Stiglitz and Weiss (SW, 1981), for example, argue that, if lenders cannot precisely discriminate between high- and low-risk borrowers because of asymmetric information, lenders would set a single interest rate for all observably identical applicants. Low risk applicants would then perceive that they are subsidizing high risk applicants and would exit the market. This process would initiate a vicious cycle such that all but the highest-risk borrowers to exit the market, the quality of the lenders’ portfolios would deteriorate, and market failure would ensue. Taken to its logical extreme, this argumentation leads to an inability for the market to clear based on price, a form of credit rationing. As Parker (2002, p. 163) states the case:

“Information about [small] firms may be limited and asymmetric, stacked on the side of the borrower at the lender’s hazard. This has led many influential academics and politicians to claim that these problems can be so severe that the supply of finance may disappear altogether. Banks, it is argued, may ration credit to new enterprises, strangling new, dynamic and innovative future industrial giants at birth.”

As conceived by SW, credit rationing occurs when “some observationally equivalent applicants are approved for credit while others are arbitrarily denied credit” (Hillier and Ibrahimo (1993, p 287)). In addition, however, the term “credit rationing” has also been applied to situations where lenders screen applicants based on observable risk characteristics. In this case of the latter definition, credit rationing could occur even when credit markets are not operating imperfectly and where intervention is not warranted. The debate is confused by the use of the term, credit rationing, for this situation. For the purposes of this study, the term ‘credit rationing’ relates to the former case, where some applicants are approved for credit while other observationally equivalent applicants are arbitrarily turned down. It is in this case that intervention may be justified.

Empirical evidence regarding the extent of credit rationing is limited and ambiguous.³ As noted by Parker (2002), credit rationing is extraordinarily difficult to test in part because of the very definition of credit rationing according to which some loan applicants receive a loan and other identical applicants do not. In practice, it is virtually impossible to identify “observationally identical” applicants.

Nonetheless, several empirical studies have sought to investigate the prevalence and importance of credit rationing. Parker (2002) provides a comprehensive review of these studies

³ In addition to the lack of empirical support, theoretical objections to the theories attributing information asymmetry to credit rationing exists. That is: the validity is model-sensitive: other apparently reasonable models not only rule out the causal relationship between asymmetric information and credit rationing, but also suggest that asymmetric information results in too much lending (perhaps the best known model showing asymmetric information causes too

which include the works of Evans and Jovanovic (1989), Berger and Udell (1992, 1995), Guiso (1998), Perez (1998), and Levenson and Willard (2000). As Parker (2002, pp. 183-189) observes, most of these attempts to document credit rationing were indirect tests and Parker points out that explanations alternative to credit rationing are plausible. Overall, Parker concludes that there is little unambiguous empirical evidence that credit rationing is a significant problem. Cressy (2002) also provides a comprehensive review of the empirical literature on financing gaps, and comes to much the same conclusion. Nonetheless, there remains a widespread belief that credit gaps, especially for certain categories of SMEs, do exist and that they are problematic.

Credit Constraints and Lending to Growth Firms

The Canadian Federation of Independent Business (CFIB) has asserted the presence of gaps. Based on surveys of its members, the CFIB has concluded that “it is the young, high performing businesses that are experiencing the greatest difficulty in obtaining financing from financial institutions” (Bruce, 2001, p. (i)).⁴ Binks and Ennew (1996) also argue that the rate of growth of a firm may be a rationing criterion. They contend that high growth firms may be more informationally opaque than low growth businesses and may therefore face a greater degree of difficulty obtaining financing. In fact, they found that the UK small firms with higher expected growth were more likely to report credit constraint.

However, rapid growth can also be a source of significant financial and managerial stress for a firm (Eggers, Leahy, Mikalachki, 1997). Rapid growth often leads to expansion of the need

much investment is De Meza and Webb (1987)).

⁴ However, CFIB surveys are limited to its members and therefore include both selection and non-response biases. CFIB respondents tend to be survivors who are interested in the survey topic.

for financing in general and for working capital in particular, in turn generating a need for additional cash, while exacerbating risk. Hence, creditworthiness requires that good fiscal management accompany rapid growth. To further confound the debate, technology-based firms often anticipated relatively high rates of growth as well as relatively higher levels of uncertainty about expected performance (Guiso, 1998). Westhead and Storey (1994, 1997) provide some empirical evidence to this effect. They found that, in the UK context, firms with relatively high R&D expenditures, high proportions of scientists, and high proportions of patents were relatively more likely to report financing constraints. Likewise, they documented that firms located in science parks in the UK were more likely to identify financing constraints relative to those located outside science parks.

These findings pose the empirical challenge of distinguishing, the relative impacts on access to capital of traditional determinants of creditworthiness⁵ from growth-related information asymmetries. Further confounding the debate is the question of whether debt financing is the appropriate form of financing for many growth firms. For example, MacIntosh (1994), Berger and Udell (1998), and Black and Gilson (1998) advocate that equity financing is, in many instances, a more suitable source of financial capital than debt – especially for growth-oriented SMEs. Debt increases the systematic risk of firms that are already subject to relatively high levels of business risk stemming from uncertainties about the commercialization potential of the innovation, risk of obsolescence, the need for future injections of staged financing, etc. The higher systematic risk makes borrower firms yet more vulnerable to economic downturns.

The alternative to debt capital is equity financing from angels or venture capitalists.

⁵ These might include, *inter alia*, higher levels of uncertainty, risks associated with technologically-complex products and

Suppliers of risk capital tend to be more specialized in growth-oriented businesses than lenders' loan account managers. Typically, they also provide assistance with the commercialization process (Madill, Haines, Riding, 2003). As Brierly (2001, p. 67) notes, "venture capitalists may have greater information on the project's marketability and may be able to mitigate informational asymmetries". Berger and Udell (1998, p. 624) also note that it may be reasonable to expect that venture capitalists may have superior information (relative to the business founders) with respect to a project's marketability and operational implementation), a sort of reverse information asymmetry. If so, the well-known 'pecking order theory may also be reversed such that external equity is more attractive than external debt. This suggests that some growth firms seeking debt financing may be operating in the wrong segment of the capital market.

The Role of Lender-Borrower Relationships

To the extent that growing firms encounter relatively limited access to credit due to information asymmetry, efforts that alleviate information opacity should yield additional gains. One way in which borrower firms could reduce information asymmetry is to create and maintain long-term relationships with lender firms (Westhead and Storey 1997). Several studies have proposed theoretical models of "relationship lending", which consistently show that borrower-lender relationships provide valuable private information on the financial prospects of (potential) borrowers to lenders. If so, relationships would have a positive association with the availability of debt finance (Diamond 1991, Boot and Thakor 1994, Sharpe 1990, and Rajan 1992).⁶

The impact of long-standing bank-firm relationships on availability of credit has been

processes, and fiscal management ability.

⁶ However, the theoretical literature is inconsistent on the impact of borrower-lender relationships on cost of credit. One party argued that such relationships reduce the cost, the other maintain that the benefits from the relationship are all extracted by the lender firms.

investigated in several countries, mainly in the context of small business finance. In the US, using the data from the National Survey of Small Business Finance, Peterson and Rajan (1994) find duration of relationship significantly increases credit availability, but has little impact on interest rates. They also report that older firms enjoy easier access to credit and lower interest rates and that borrower firms that attempt to widen the circle of relationships by borrowing from multiple lenders face higher prices as well as reduced availability of credit. Using the same data but examining only firms borrowing on lines of credit, Berger and Udell (1995) found that borrowers with longer banking relationships were more likely to obtain credit and pay lower interest rates. Cole (1998) provides evidence that a potential lender is more likely to extend credit to a firm with which it has pre-existing relationship (as a source of financial services), but that the length of the relationship is unimportant. Consistent with Peterson and Rajan (1994), Cole also documents that potential lenders are less likely to advance credit to firms with multiple sources of financial services. Weinstein and Yafeh (1998) observe, in the Japanese context, that when access to the capital market is limited, close bank-firm ties increase the availability of capital to borrowing firms, but the cost of capital of firms with close bank ties is higher than that of their peers. Their finding, as well as those of Peterson and Rajan (1994), indicate that longer borrower-lender relationship increases availability of credit but does not reduce the cost – most of the benefits from firm-bank relationships appear to be appropriated by the banks. This finding was confirmed for the Canadian setting by Nitani, Haines, and Riding (2004).

In summary, most of the theoretical literature suggests that closer lending relationships mitigates information asymmetry between the two parties, and thus potentially increases the availability of credit to borrowers. However, many of the existing empirical studies have been

criticized for failing to account for the often confounding effects of the various factors that jointly determine access to credit. In addition, the impact of borrower-lender relationship on the credit availability has not been investigated in the Canadian context. This study attempts to redress both of these situations, focusing on growing firms. It seems reasonable to expect that the duration of the lender-borrower relationship interacts with the growth posture of the firm to determine jointly access to capital. However, in doing so the role of collateral must also be addressed.

The Role of Collateral

As noted, one means of mitigating information opacity is by the cultivation of a relationship between borrower and lender. An alternative mechanism relates to the use of collateral. While there is a debate about the way in which collateral reduces information asymmetry,⁷ there is general agreement among theoretical positions (see Berger and Udell, 1998, pp. 639-642) that the presence of collateral should increase access to debt capital (as well as to equity capital). In general, the empirical literature finds that “more informationally opaque or riskier small businesses more often pledge collateral” (Berger and Udell, 1998, p. 642). In addition, Berger and Udell (1995) found that borrowers with longer banking relationships were less likely to pledge collateral.

In summary, there is an ongoing debate in the literature about whether or not certain classes of borrower firms may face relatively greater difficulty with access to credit. However, the empirical evidence is mixed and inconclusive, especially that which relates to access to debt

⁷ On the one hand, several researchers argue that collateral is a signaling mechanism that conveys to the lender that the borrower is of the low-risk variety (see, for example, Bester, 1985; Besanko and Thakor, 1987, and others). Others (see Berger and Udell, 1998, p. 640) take the position that collateral comforts the lender by helping the lender enforce optimal firm closure and enforce covenants or that collateral reduces the costs of monitoring, renegotiation of the loan, and information gathering.

financing for growing firms. This paper undertakes further empirical analysis of this question. Therefore the first hypothesis to be tested is:

Hypothesis 1: Firms having experienced growth in sales are less likely to obtain bank loans.

It examines this issue by estimating direct comparisons of access to credit for growing firms while taking into consideration other potential determinants of the lending decision and with particular reference to the duration of the lender-borrower relationship and to the role of collateral. The second and third hypotheses to be tested are:

Hypothesis 2: Firms with long-standing relationship with banks are more likely to obtain bank loans.

Hypothesis 3: Banks are more likely to require personal collateral from business owners whose firms are perceived to be riskier.

Unlike previous investigations where few control variables were employed, this paper tests the hypothesis while controlling various factors that influence firms' risk level and lenders' credit allocation. It also takes the difference in loan types into consideration. Moreover, it examines the existence of "gap" based on an objective measure, i.e., outcomes of loan applications, rather than using a subjective and indirect one, e.g., degree of credit constraint perceived by business owners.

Methodology and Data

Data Description

This empirical study was conducted by drawing on a survey regarding the financing

experiences of a large stratified sample of Canadian small firms, the *Survey of Financing of Small- and Medium-sized Enterprises*. This survey, conducted in 2001, polled the owners of more than 19,000 SMEs with respect to their financing experiences during the year 2000. It comprised two stages of data collection. The first stage sought information about SME owners' financing experiences along with extensive "tombstone" data on firm and owner demographics. Responses to this stage of data collection were received from 10,983 business owners. The second stage of the data collection sought to obtain financial statement information from these same (10,983) owners: 7,123 responses were received in the second stage of data collection. The survey was stratified so as to ensure a minimum number (among other criteria) of responses from owners of KBI businesses. The profile of survey respondents may be found elsewhere.⁸ The SME FDI data identified 3,225 respondents that reported that their firms had sought debt financing during 2000, respondents who replied in the affirmative to the following question:

"During 2000, did the business or its owners approach any type of credit supplier to request new or additional credit for business purposes?" (2001 FDI survey, Question C-1, p. 9).

This work focuses on the 982 and 861 businesses that applied, respectively, for a term loan or a new line of credit.

Methodological Approach

The methodological challenge of this study is to isolate the extent to which growth of the firm, the duration of the lending relationship, and the use of collateral affect financing outcomes while controlling for factors that are traditional determinants of financing outcomes. Thus, an important task is to identify and measure factors that commercial lenders consider in their loan

⁸ <http://strategis.ic.gc.ca/epic/internet/insbrp-rppe.nsf/en/rd00731e.html>

decisions. Finance textbooks and bank training material stress the “5 C’s” of commercial lending as important determinants of lending decisions (see, for example, <http://www.smallbusinessfinancetips.com/establishing-business-credit.html>). According to this standard, credit outcomes depend on capacity (the firms’ ability to service the loan), capitalization (the firms reliance on debt), conditions (the firms’ sensitivity to economic factors), the “character” of the principal owner(s), and the borrower’s collateral.

Second, responses to the SME FDI survey also provide insights into why loans are turned down. Question D.8 of the survey asks those respondents whose loan applications were turned down to identify “*what reasons were given to the business by the credit supplier for refusing to provide [the loan]*”. The most frequently cited explanations owners received were:

- Insufficient income, revenues, or sales to service financing
- Insufficient collateral or security
- Poor credit experience or history
- Insufficient cash flows
- Insufficient equity

The SME FDI survey data allowed for measurement of most of these factors that influence lenders’ credit decisions. Table 1 lists these factors according to the various categories identified in the above discussion along with relevant summary statistics.

The analytical approaches used here are based on those of Guiso (1998) and Riding and Swift (1993). Specifically, logistic regression models of loan application outcomes (accepted or turned down) were estimated. The unit of analysis was the individual firm that had applied for credit during 2000. The dependent variable was a binary variable corresponding to whether or not the firm’s loan application had been turned down or not. Three sets of independent variables were employed. The first set comprised a series of dummy variables corresponding to the strata

used in the data collection process, an approach advocated by Thomas (1993).⁹ The second was a group of control variables corresponding to measures of traditional decision criteria available in the SME FDI data. These variables were selected from the listing of available measures as detailed in the next section of this paper but the selection was based on the variables listed in Table 1. The third category of potential explanatory variables were the variables of interest to this study: a variables that reported the length (in years) of the relationships between borrowers and lenders, a measure of the rate of growth of annual total revenues over the preceding five years, and variables that connoted lenders' requirements for collateral.

It also seems reasonable to expect that lending criteria differ across the type of loan application. Accordingly, this study investigates separately term loan applications and applications for operating loans. The analysis did not include those instances where the application was still under review or where the borrower firm had withdrawn its application. Early-stage firms, those founded after 1998 (777 firms, comprising 28.3 percent of the sample), were excluded from analysis.

Defining Control Variables: Dimensions of Creditworthiness

Potential explanatory variables were based on the strata variables and on the variables available from the SME FDI survey listed in Table 1. As displayed in Table 1, these variables encompassed ten logical dimensions of possible lending criteria, inclusive of the banking

⁹ It is important to note that Statistics Canada used post-stratification and weighting adjustments to improve survey accuracy and to correct for potential non-response biases. Therefore, additional variation from this source is incorporated into the survey weights. Whenever unequal survey weights are encountered, the analyst must decide whether to use the weights and perform a design-based weighted analysis, or to ignore the weights and perform a model-based analysis. There is an extensive literature on this (see the reviews by Thomas, 1993), and there are advantages and disadvantages to both approaches. To address this issue, the logistic regressions were expanded to inclusively test for possible strata effects. As suggested by Thomas (1993) this was done by using a series of dummy variables corresponding to the combinations of sizes and sectors according to which the sample strata were designed. Statistically significant strata variables were then retained. This procedure also avoids possible problems with collinearity as well as potential noise effects of including non-significant variables in a logistic regression (Thomas, 1993).

relationship and collateral measures employed here. In addition, inclusion of the strata variables resulted in a yet larger number of potential explanatory variables (more than 60). Many of these variables were collinear. Therefore, it seemed appropriate to use principal components analysis to reduce the number of variables in the data. Stevens (2002, p. 388) notes that this approach is “one way of attacking the multicollinearity problem and that this means of data reduction also makes it more likely that the regression model will hold up under cross-validation.” The use of principal components analysis also allows a determination of the extent to which the logical dimensions under which the variables are categorized in Table 1 hold up empirically.

The results of applying principal components analysis to the potential lending criteria in Table 1 are presented in Table 2. Inspection of the factor solution revealed nine principal components with eigenvalues in excess of 1.0; however, inspection of the Scree plot and of the factor loadings suggested that only the first eight of these added substantively to the data reduction.¹⁰ These eight factors collectively explained 60.3 percent of the underlying variance. As Table 2 demonstrates, the eight factors were intuitively consistent with received wisdom as it relates to lending decisions and include measures of each of the “5 C’s” along with additional measures. The factors roughly corresponded with dimensions pertaining, respectively, to: size, coverage, management experience and firm survival, business risk, legal status, relative scale of borrowing, financial risk, and productivity.

The analysis drew on the results of the factor analysis to select potential control variables for the logistic regression. This was accomplished by including as explanatory variables in the

¹⁰ As Stevens (2002, p. 389-390) notes, blind use of the eigenvalue criterion “can lead to retaining factors which may have no practical significance ... [yet] blind use [of the scree test] might lead to not retaining factors which, although they account for a smaller amount of variance, might be practically significant.”

logistic regression the single variable within each factor with the highest loading on that factor. For example, the logarithm of the number of employees was used to incorporate the size dimension, the ratio of EBIT to loan requested was used to incorporate the coverage dimension, and so on.

To determine which firms were growth firms, the rate of growth of annual revenues for the preceding five-year period was calculated. High-growth firms were defined as those businesses that reported an average annual rate of growth in total sales revenues in excess of 15 percent (26.4 percent of the sample).¹¹ Firms with negative average annual growth rates (13.8 percent of the sample) were categorized as declining-growth firms, and those with growth rates greater than or equal to 0 percent and less than or equal to 15 percent (60.0 percent of sample) were defined as slow growth firms. From this starting point, the analytical procedure continued as follows:

1. The base case logistic regression was run for each type of loan application separately (applications for term loans or new lines of credit). On the basis of this regression, statistically insignificant strata variables were deleted as per Thomas (1993), for the sake of retaining statistical power of the analysis.
2. The logistic regression was then expanded by incorporating the eight potential control variables. Non-significant control variables were deleted sequentially, primarily for the sake of retaining statistical power of the analysis, until a parsimonious model of lending decisions was obtained. The removal criterion was whether or not inclusion of each given variable significantly (p-value of 0.05 or less) improved the goodness-of-fit of the model (the significance of the coefficient estimate was a less reliable indicator because collinearity among control and strata variables often increased the standard errors of the coefficient estimates of the control variables).
3. The measures of length of relationships with the lender, growth categories, and collateral requirements were then introduced to the model. The degree to which inclusion of each of these variables improved the goodness-of-fit was assessed

¹¹ Often, annual revenue growth rates of more than 30 percent are used to define high-growth businesses; however, use of this higher cut-off point would not yield a sufficiently large number of observations for analysis.

using the significance of the change in the log-likelihood of the logistic model as well as by inspection of the statistical significance of the coefficient estimates. Non-significant variables were removed from the model.

Empirical Findings

The final logistic regression model comprised:

- A dependent variable designating whether or not the loan application was approved (=0) or declined (=1);
- binary variables that significantly (at the univariate level) capture the effects of the stratification in the sampling scheme;
- control variables that significantly (at the univariate level) influence firms' risk level and thus jointly determine access to credit;
- additional variables corresponding to the history of revenue growth for the firm, the length of the relationship with the firm's lending institution, and the lender's requirements for collateral.

This modeling was applied to applications for term loans and separately to applications for new operating loans with the results as described presently.

Findings: Applications for Term Loans

Of the 982 applications for term loans in the data file, 292 were retained for analysis. The remaining cases were eliminated either because the applications were of the informal variety, because the loan decision was pending at the time of the survey, because the applicant had withdrawn the application, because the firm was less than three years old, or because the Canada Small Business Financing Program (or some other unspecified government initiative) guaranteed the loans. Of these 292 applications, 48 (16.4 percent) were firms that were experiencing a high growth in sales and 43 firms (14.7 percent) of these were firms that had reported declines in sales. Among the 292 firms, 39 (13.4 percent) had had their loan application turned down.

As noted, the first stage of estimating the logistic regression model of outcomes of term

loan applications employed four strata variables (that significantly capture the effects of the stratification in the sampling scheme), the eight control variables, and the three variables of interest (i.e., growth, length of banking relationship, collateral). The resulting model (the base model) is presented in the left panel of Table 3. It is a statistically significant model (p -value < 0.000) with Cox & Snell pseudo- $R^2 = 0.217$; Nagelkerke pseudo- $R^2 = 0.398$).¹² The model shows that high historical rates of sales growth (or of sales declines) did not appear to have any statistically significant impact whatsoever on the lending decision outcome. Lenders were more likely to have sought personal collateral from among the firms whose loan applications were turned down (it would appear that borrowers' inability or unwillingness to provide the sought-for collateral may have led to the loan turndown).¹³ Duration of lender-borrower relationships decreases the probability of rejection to term loan applications (at the five percent significance level). Size (number of employees) has a significant positive impact to the availability to term loans. Firms' intension to use proceeds of their term loans to finance working capital or R&D investment marginally increase the probability for loan applications to be turned down.

The final regression model, reported in the centre panel of Table 3, is the result of the systematic elimination of non-significant variables in the base model. As noted, the removal criterion was whether or not inclusion of each given variable significantly (p -value of 0.05 or less) improved the goodness-of-fit of the model. This procedure reduces the level of significance

¹² In the interests of brevity, the values of parameter estimates and statistical properties of strata variables are suppressed from this display.

¹³ To confirm those results, an alternative approach to the determination of the role of the factors of interest (growth, collateral, and length of banking relationship) was conducted by estimating a logistic regression model in much the same way as described above but using data only for those firms whose sales revenue had declined or had grown relatively slowly (that is, high-growth firms were excluded). The resulting model was then compared to that estimated using all firm. The analysis using this approach was conducted for both term loans and operating loans, and no statistical significance of the differences between the two sets of coefficient estimates was detected.

for the coefficient of the size variable, from five percent level (in the base case) to ten percent level, and that of the personal collateral variable in lesser extent. At the same time, it improves the level of significance for the coefficient of “use of proceeds to finance working capital or R&D” variable to five percent (from ten percent in the base case). The effect of lender-borrower relationship is significant at five percent level in both models. Confirming this point, it should be noted that addition of a measure of the length of the lending relationship significantly improved the goodness of fit of the regression model. Firms with longer relationships were relatively less likely to have term loan applications turned down, other things being equal.

To make sure that the growth variable has no impact on accessibility to term loans, that variable is added to the final model, and the resulted model is reported in the right column of Table 3. The model suggests that firms that reported growth in sales are not disadvantaged in accessing term loans.

Findings: Applications for Operating Loans

Of the 861 applications for new operating loans in the data file, 236 were retained for analysis. The remaining cases were eliminated either because the applications were of the informal variety, because the loan decision was pending at the time of the survey, because the applicant firm was a new business, or because the applicant had withdrawn the application. Of these 236 applications, 44 (18.6 percent) were turned down.

As was the case for term loan applications, the first stage of estimating a logistic regression model of outcomes of operating loan applications was to use all potential explanatory variables: one strata variable (that significantly capture the effects of the stratification in the sampling scheme), the eight control variables, and the three variables of interest (i.e., growth,

length of banking relationship, collateral). The resulting base model is presented at the leftmost panel of Table 4. Unlike the case for term loan application, size of firm was not a significant determinant of loan request outcome. Rather, higher likelihoods of having loan applications approved were marginally associated with firms with high coverage ratios (at ten percent level). Firms with high expenditures on R&D are relatively less likely to have loan applications approved. High debt-to-asset ratios are marginally positively associated with the probability of rejection to operating loan application. “Lender requires business collateral” variable also has a marginal effect on the probability for loan applications to be turned down in the case of operating loans, whereas it has no impact on it in the case of term loans. It may suggest that business collateral is more often required from firms whose loan requests had been approved. As was true for term loans, lenders were more likely to have required personal collateral from among firms whose applications were eventually turned down. However, the model shows that growth in sales has no statistically significant impact whatsoever on the lending decision outcome (whereas history of declines sales has somewhat marginal impact on it). Similarly, it appears in the model that longer the length of banking relationship is not associated with easier access to operating loans.

As was the case for term loan applications, the base model was then systematically reduced by elimination of non-significant variables, resulting in the final model shown in the centre panel of Table 4 (the removal criterion was whether or not inclusion of each given variable significantly (p-value of 0.05 or less) improved the goodness-of-fit of the model. a history of declining revenues). The impact of history of declined sales is now at ten percent level. The significance for other variables’ coefficients remains in a similar level.

As it was the case for the analysis of term loans, to further confirm no effect of the growth and length of banking relationship variables on the availability of operating loans (which was found in the base model), those two variables are added to the final model creating the “Final model + growth and relationship variables”, reported in the right column of Table 4. The model verifies that growth in sales does not hinder firms from obtaining operating loans, and having a long relationship with lenders does not improve borrower firms’ accessibility to operating loans.

Discussion and Conclusions

This research has used a large and reliable data set to examine the degree to which growing firms face particular difficulty with access to term and operating loans from Canadian commercial lenders. In particular, this study sought to examine the contentions that it is “young, high performing businesses that are experiencing the greatest difficulty in obtaining financing from financial institutions” (Bruce, 2001, p. (i)), and Binks and Ennew’s (1996) theoretical arguments that growth firms are relatively more likely to be turned down. The findings of this empirical study did not support these contentions. Overall, this work has found that, whereas declined sales may have a marginal effect to lower the probability of operating loan approval, firms with records of relatively high rates of revenue growth did not appear to have any less access to either term or operating loans than firms with more modest levels of historical sales growth. This suggests that a review of interventions to the credit markets based on the above contentions might be necessary.¹⁴

¹⁴ it is possible that growing firms tend to require largewr amount ot loans than non-growing firms and firms with low coverage ratios (e.g., EBIT to amount of loan requested ratio) are more likely to be rejected their loan applications, thus business owners of growing firms are more likely to perceive financial constraint. However, whereas the significant positive association between

However, it should be noted that an alternative explanation to this finding, no significant negative impact of high growth record on loan availability, could be possible. That is: not the historical record of high growth, but the expected future growth, might be the factor hindering lenders to provide credit. This makes sense since the source of uncertainty lies in the future rather than past. Binks and Ennew (1996) have found the positive association between future expected growth and financial constraint (both variables are based on business owners' perceptions). If this is the case, such a tendency of commercial bankers could discourage firms from investing in risky but profitable projects, and thus obstruct the entire economic growth of the country. One of the areas for future research remains here.

The findings suggest that SMEs may face a "size gap" in the market for term loans, such that smaller businesses have a higher relative frequency of being turned down for this type of loans. This may be mitigated by establishing and nurturing a relationship with the firm's financial institution. Lenders also recognize that use of the proceeds of term loans for working capital or R&D financing is risky, and are less likely to approve loan applications for these purposes. For operating loans, R&D expenditure as the proportion of total investment is an important criterion for lenders' loan approval decision making. Again, this type of tendency might put firms off taking R&D projects, impacting negatively on the economy. Or, as discussed in the "previous study" section, debt financing might not be appropriate for firms involving R&D projects: those firms may be searching capital in the wrong segment of the financial markets.

It was also seen that lenders are more likely to specify requirements for personal collateral from business owners whose loan applications are most likely to be rejected. This

low coverage ratio and probability of loan rejection, this paper does not find the evidence that growing firms tend to require

finding suggests that collateral is not a means of signaling credit worthiness; rather, it would appear that collateral provides a means by which lenders can reduce their exposure to moral hazard.

Why doesn't the duration of lender-borrower relationship have positive impact on the availability of operating loans, while it does on the accessibility of term loans? It has been evidenced by Nitani, Haines, and Riding (2004) that commercial lenders carry out more thorough due diligence in allocating operating loans than term loans, since operating loans give greater discretion to borrowers once granted; thus they are more likely to be subject to moral hazard and other problems associated with information asymmetry. However, the above evidence cannot explain the difference in impact of lender-borrower relationship between the two types of loan. If information asymmetry and moral hazard are more serious problems for operating loans, then the length of borrower-lender relationship ought to be a more important factor in allocating operating loans. One possible explanation for this is that bankers gather information on loan applicant firms more extensively in the case of operating loans, and reflect the information gathering costs in the fees. If this is the case, duration of lender-borrower relationship has an impact not on the availability, but on the cost (fees) of the operating loans. Shockley and Thakor (1997) observed multiple-fee contracts of commitment loans are more frequent for commitment loans sold to firms who are not well known to borrowers, and firms whose credit quality is poor. Unfortunately, the detailed operating loan contracts (including pricing structure of fees) are not available in the data for this study. The analysis of the impact of information availability and length of bank-firm relationships on various contract and pricing

larger amount of loans.

structure of operating loans are, therefore, left for further research.

It is possible that in spite of the large number of potential explanatory and control variables employed here, an important variable (or variables) that is (are) systemically correlated with the measures of interest (growth, collateral, duration of lender relationship) has been omitted. If so, future research on improving models of credit decision-making and data collection are warranted.

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Table 1: Measures of Lending Criteria

Variable	Sample Means	Weighted, Estimates for Means of Sampling Frame
BUSINESS RISK		
R&D expenditure as % of business investment	2.7	2.5
Expenditure on technology as % of business investment	2	1.4
Loan purpose: working capital or R&D (%)	21.40%	26.00%
Turned down by supplier (%)	2.60%	1.40%
CONDITIONS/INDUSTRY PREFERENCE		
Rural location	29.50%	34.90%
Exporter firm (%)	22.40%	16.30%
AGE OF FIRM		
Legal status: Incorporated (%)	75.20%	65.20%
Legal status: Partnership (%)	9.50%	7.30%
Legal status: Sole Proprietorship (%)	15.00%	26.70%
Early-Stage Firm**	25.00%	33.70%
Age of Firm (Years)**	6.76	6.31
COLLATERAL REQUIRMENTS		
Personal collateral as% of loan requested*	14.79	5.39
Business collateral as% of loan requested*	4.85	2.06
Total collateral as% of loan requested**	19.64	7.45
Ratio of Assets to Loan Request**	43.7	11.52
CREDIT HISTORY		
Majority owner < 35 (%)	12.80%	14.70%
< 5 years of managerial experience (%)**	10.70%	15.40%
Years of experience of CEO	15.4	14.7
CASH FLOW/INCOME		
Revenues per \$ of loan request	\$41.18	\$37.52
Revenues per employee	\$891,332	\$1,125,315
Ratio of EBIT to loan requested	2.36	1.37
Ratio of Net Income to loan requested	1.91	1.04
CAPITALIZATION		
Debt/Asset Ratio	1.09	0.85
PERSONAL NET WORTH		
Number of owners	3.05	1.96
Woman-owned firms	7.80%	9.10%
Home based business (% female-owned)	29.10%	43.70%
LENDER RELATIONSHIP		
Number of years associated with lender	9.9	9.2
Owner's personal banking institution (%)**	61.00%	66.60%
OTHER		
Number of employees	25.55	7.98
Annual gross revenues	\$4,891,004	\$3,009,257
Size of loan request	\$366,257	\$163,175

* converted to a dummy variable.

** not included in the subsequent analysis due to the apparent correlation with the other variable(s).

Table 2: Principal Components Analysis of Potential Lending Criteria

Variable	Component	1	2	3	4	5	6	7	8	9
LN (Number of employees)		0.714								
Home based business		-0.667								
Sole Proprietorship		-0.623				0.318				-0.501
Number of owners		0.421			0.355					
Rural location		-0.404							-0.329	0.377
Ratio of EBIT/Loan Request			0.995							
Ratio of Net Income/Loan Request			0.995							
Owner > 45 Years of age				0.801						
Years of Management Experience				0.734						
Owner <35 Years of age				0.732						
R&D expenditure as Proportion of Total Investment					0.790					
Technology Expenditure as Proportion of Total Investment					0.720					
Exporter firms		0.307			0.504					
Partnership						0.859				
Incorporated Business		0.427				-0.832				
Ratio of Revenues to Loan Request							0.844			
Annual gross revenues							0.837			
Use of proceeds to finance working capital or R&D								0.654		
Debt/Asset Ratio								0.481		
Amount of Loan Request		0.393						-0.475	0.345	
Majority Female Ownership										-0.714
Productivity (Revenues per employee)									0.838	
Eigenvalues		2.81	2.06	1.79	1.66	1.53	1.30	1.10	1.09	1.04

*EBIT: Earnings before interest and taxes.

Table 3: Logistic Regression Estimates, Term Loans

Variable	Base Model			Final Model			Final Model + Growth Variable		
	Coefficient Estimate	p-value.	Exp(B)	Coefficient Estimate	p-value.	Exp(B)	Coefficient Estimate	p-value.	Exp(B)
LN(Number of Employees)	-0.529	0.017	0.59	-0.317	0.090	0.73	-0.304	0.108	0.74
Ratio of EBIT to Loan Request	-0.009	0.922	0.99						
Years of Management Experience	0.030	0.162	1.03						
R&D expenditure as Proportion of Total Investment	0.033	0.271	1.03						
Incorporated Business	0.481	0.383	1.62						
Ratio of Revenues to Loan Request	-0.018	0.312	0.98	-0.024	0.162	0.98	-0.024	0.156	0.98
Use of proceeds to finance working capital or R&D	1.054	0.055	2.87	1.080	0.017	2.95	1.070	0.018	2.92
Productivity (Revenues per employee)	0.000	0.212	1.00	0.000	0.366	1.00	0.000	0.376	1.00
History of decreasing sales	-0.828	0.222	0.44						
High sales growth	-0.092	0.872	0.91				0.056	0.910	1.06
Lender requires personal collateral	0.920	0.034	2.51	0.791	0.052	2.20	0.827	0.046	2.29
Lender requires business collateral	-0.144	0.753	0.87				-0.232	0.581	0.79
Length of banking relationship (years)	-0.084	0.050	0.92	-0.083	0.040	0.92	-0.081	0.047	0.92
Constant	-0.798	0.842	0.45	-0.436	0.495	0.65	-0.356	0.608	0.70
Cox & Snell R square		0.217			0.196			0.196	
Nagelkerke R Square		0.398			0.359			0.361	

* For all logistic regression models, dependent variable is the outcomes of term loan applications.

** In the interests of brevity, the values of parameter estimates and statistical properties of strata variables are suppressed from this display

*** The base model includes, as independent variables, four strata variables (that significantly capture the effects of the stratification in the sampling scheme), the eight control variables, and the three variables of interest (i.e., growth, length of banking relationship, collateral).

**** The final model is the result of the systematic elimination of non-significant variables in the base model. The removal criterion was whether or not inclusion of each given variable significantly (p-value of 0.05 or less) improved the goodness-of-fit of the model.

***** “Final Model + Growth Variable” model is created by adding growth variable to the final model. This is to confirm the result obtained in the base model, i.e., the growth variable has no impact on accessibility to term loans.

Table 4: Logistic Regression Estimates, Operating Loans

Variable	Base Model			Final Model			Final Model + Growth and Length of Banking Relationship Variables		
	Coefficient Estimate	p-value.	Exp(B)	Coefficient Estimate	p-value.	Exp(B)	Coefficient Estimate	p-value.	Exp(B)
LN(Number of Employees)	-0.261	0.153	0.770	-0.247	0.142	0.78	-0.257	0.126	0.77
Ratio of EBIT to Loan Request	-0.125	0.065	0.882	-0.117	0.053	0.89	-0.125	0.049	0.88
Years of Management Experience	-0.043	0.158	0.958						
R&D expenditure as Proportion of Total Investment	0.076	0.001	1.079	0.068	0.001	1.07	0.072	0.001	1.07
Incorporated Business	0.340	0.502	1.406						
Ratio of Revenues to Loan Request	0.000	0.535	1.000						
Use of proceeds to finance working capital or R&D	-0.417	0.355	0.659						
Debt/Asset Ratio	0.052	0.071	1.053	0.046	0.079	1.05	0.050	0.064	1.05
Productivity (Revenues per employee)	0.000	0.673	1.000						
History of decreasing sales	0.824	0.115	2.280	0.806	0.077	2.24	0.611	0.217	1.84
High sales growth	-0.615	0.194	0.541				-0.469	0.311	0.63
Lender requires personal collateral	0.897	0.023	2.452	0.883	0.020	2.42	0.866	0.023	2.38
Lender requires business collateral	-0.745	0.089	0.475	-0.686	0.109	0.50	-0.682	0.113	0.51
Length of banking relationship (years)	0.010	0.721	1.010				0.001	0.970	1.00
Constant	-0.796	0.278	0.451	-1.673	0.000	0.19	-1.499	0.004	0.22
Cox & Snell R square		0.185			0.164			0.168	
Nagelkerke R Square		0.298			0.265			0.272	

* For all logistic regression models, dependent variable is the outcomes of operating loan applications.

** In the interests of brevity, the values of parameter estimates and statistical properties of strata variable is suppressed from this display

*** The base model includes, as independent variables, one strata variable (that significantly capture the effects of the stratification in the sampling scheme), the eight control variables, and the three variables of interest (i.e., growth, length of banking relationship, collateral).

**** The final model is the result of the systematic elimination of non-significant variables in the base model. The removal criterion was whether or not inclusion of each given variable significantly (p-value of 0.05 or less) improved the goodness-of-fit of the model.

***** “Final Model + Length of Banking Relationship” model is created by adding relationship variable to the final model. This is to confirm the result obtained in the base model, i.e., length of lender=borrower relationship has no impact on accessibility to operating loans.

