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AN EMPIRICAL ANALYSIS OF CREDIT TERMS TO
FEMALE ENTREPRENEURS

by

LOLA FABOWALE, B. ADMIN (HONOURS)

A thesis submitted to

Faculty of Graduate Studies and Research

in partial fulfilment of

the requirements of the degree of

(Master of Management Studies)

School of Business

Carleton University

Ottawa, Ontario

October 4, 1991.

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AN EMPIRICAL ANALYSIS OF CREDIT TERMS
TO FEMALE ENTREPRENEURS

submitted by Olufunmilola Fabowale, B. Admin. (Hons.)
in partial fulfillment of the requirements for
the degree of Master of Management Studies

Thesis Supervisor

Chair, School of Business

Carleton University

October 18, 1991

ABSTRACT

This study used a logistic regression model to determine those measures of business-related attributes which are also associated with gender of the first owners of small businesses. The logistic regression model was also used to determine whether or not credit terms differ between women and men borrower groups prior to elimination of structural differences. Subclassification and logistic analysis of covariance using propensity scores were then employed to evaluate differences in credit terms between women and men small business borrower groups. As appropriate, either logistic regression model or multiple linear regression model was used to determine factors influencing each of five credit terms. The results indicate that gender-based differences in business attributes exist. Such differences seem to explain dissimilarities predicted and discovered in the borrowing experience of women and men entrepreneurs.

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Lola Fabowale

October 18, 1991.

DEDICATION

To my mother and women entrepreneurs everywhere.

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I.

INTRODUCTION

I.1

OVERVIEW OF THE STUDY

I.1.1

The Research Question

Do credit terms differ between women and men entrepreneurs? If so, what is the relevance of *structural differences in borrowers' eligibility* in accounting for any such differentials? Likewise, what role does *systematic gender discrimination* play in determining discrepancies in terms of credit? The aim of this study was to investigate these issues.

I.1.2

Research Objectives

This study had four main objectives. The first was to identify those measures of business risk or business attributes that are most closely associated with credit terms. The second was to determine which of those factors are also correlated with gender of the owner. The third objective was to investigate whether credit terms differ between female-owned and male-owned enterprises both prior to and after elimination of structural differences in business attributes. The fourth goal of the study was to determine the extent to which *structural differences in business attributes* account for gender-related differences in credit terms.

Business attributes include the form, size, industry and track record of an enterprise. They are measures of the risk associated with lending to a particular small business. Structural differences are gender-related disparities in business attributes which, quite independently of systematic gender discrimination, may lead to discrepancies in credit terms.

To achieve its aims, this study developed a model which included gender of owner, business attributes and credit terms. The model was tested using a variety of data analytical techniques on data collected from a survey the Canadian Federation of Independent Business conducted among its members in 1990. A logistic regression model was used to expose gender-related differences in credit terms prior to controlling for gender-based differences in business attributes. It was also used to examine structural differences in measures of business risk between women and men entrepreneurs. Specifically, the technique was employed to examine gender-related differences in financial and managerial background, training or experience. It was also a useful tool in determining whether female and male business owners differ in the nature and value of assets which might be used as collateral for their business loans. Furthermore, the method was utilized to explore gender-based differences in the perceptions of the role of the banker.

The logistic regression model was key to determining factors influencing each of four terms of credit: loan rejections, requests for spousal co-signature, ratio of collateral to loan and ratio of amount of loan received to amount

requested. However, multiple linear regression was the method adopted to analyze the association between measures of business risk and interest rates. Subclassification on propensity scores and logistic analysis of covariance on propensity scores were used to determine if gender-related differences in credit terms persisted once structural differences in business attributes are controlled.

I.1.3

Benefits of the Study

The findings of this research should prove beneficial to women-owners of small businesses, Canadian financial institutions, policy-makers, business schools and development agencies. The results indicate that women differ from men in terms of financial background, training and experience. These attributes were found to be closely associated with terms of credit. Hence, this provides empirical justification for initiating changes that would support the professional development of women entrepreneurs.

Universities should find the analyses presented here useful in developing programs that would help women entrepreneurs successfully conclude their search for capital. Governments and other institutions may want to expend some resources towards these aims. Gender-related differences were discovered in perceptions of the role of the banker. This finding may help financial institutions to serve female and male borrower groups more adequately. Financial institutions need to clarify their roles as suppliers of credit rather than venture capital. The responsibilities associated with the receipt of credit should also be made clear to all entrepreneurs. Furthermore, the model developed by the study

should provide researchers with a framework for identifying factors influencing access to credit capital.

Poapst (1986) has argued that just as banks in general may not have sufficient understanding of the concerns of owners of small businesses, entrepreneurs may lack sufficient appreciation of the criteria used in credit-decision-making. This study does not focus on women entrepreneurs alone. In its chapter on factors influencing credit terms, it addresses the concerns of men entrepreneurs as well.

I.1.4

Organization of the Thesis

This thesis is divided into five chapters. The remainder of this chapter provides practical and theoretical justification for the research thesis. The second chapter is a review of the pertinent literature. Not only does it discuss the achievements and limitations of past research, more precisely, it identifies issues that merit further investigation. The third chapter describes the research design which was used to achieve the stated research objectives. The fourth chapter presents the results of various statistical analyses pertinent to the study. It identifies major areas in which women and men entrepreneurs differ in business attributes. It also analyzes differences in credit terms both prior to and subsequent to elimination of structural factors. The fifth chapter summarizes overall findings, discusses the limitations of the study and charts directions for future research.

I.2

WORKING DEFINITIONS

I.2.1

Small Business and Entrepreneur

Statistics Canada (Stats-Can) defines small businesses as enterprises with an upper sales limit of \$5 million per year¹. However, this study defines small businesses as those whose annual sales volumes are below \$6 million, because its subjects are more established than the general small business population.

Various definitions of an entrepreneur or a small business owner exist². Wynant and Hatch (1991: 58) define a key principal of a business as someone who has an interest of at least 50 percent in the business and who is also recognized as such by the bank. This definition is unsatisfactory for two reasons. First, it becomes ambiguous when two owners each hold 50 percent interest in the business. Second, to the extent that it excludes principal owners who may be key decision-makers but who have less than fifty percent ownership in the business, the definition is too narrow. A more inclusive definition--the one adopted by this study--is that of Lavoie (1988: 2) who defines a small business owner as:

[someone] who has, alone or with one or more partners, started up, bought or inherited a business, is assuming the related financial, administrative and social risks and responsibilities, and is participating in the firm's day-to-day management.

¹Statistics Canada, Small Business in Canada: A Statistical Profile (1984-1986) p 7.

²In general, "Entrepreneurs" refer, not only to those who own and operate their own businesses but, also, to innovators and risk-takers who work for others (often referred to as "intrapreneurs"--Brockhaus (1986)). However, in this study, the word "entrepreneur" will be used interchangeably with "owner of a small business", "owner-manager", "small business owner", or "principal owner".

However, while this second definition allows an entrepreneur to be either an equal or an unequal partner in the business she/he owns, it does not identify the key decision-maker either. Thus, more precisely, in this study, a principal owner is defined as someone who has 20 percent or more of total ownership and who plays an active role in the management/direction of a business³.

1.2.2 Financial Institutions

Financial institutions may be defined as lending enterprises which make funds available to borrowers subject to certain financial terms and conditions (Main, 1981). As with small businesses, financial institutions differ in terms of size. For instance, credit unions and caisses populaires tend to be smaller than chartered banks and trust companies. Hence, it has been argued that small businesses may receive better terms of credit from smaller financial institutions such as credit unions, caisses populaires and trust companies than from banks or larger financial institutions (Fertuck, 1981: 185; Poapst, 1981: 208).

1.2.2 Terms of Credit

Terms of credit are supposed to reflect the risk and fixed costs associated with a particular lending decision. They may be unilaterally imposed by the lender as in the case where a financial institution charges a certain percentage above prime on a loan and/or line of credit without consultation with the

³In order to identify the key decision-maker, respondents were asked to provide information on up to three of their firms' principal owners in descending order of ownership.

borrower. They may also be consensual as when both borrower and lender bargain for optimal terms and conditions that would satisfy both. A primary objective of this thesis is to add to our knowledge about the factors which determine terms of credit.

Past research has identified six different terms of credit: loan rejections, interest rates above prime on loan, ratio of collateral to loan, ratio of amount received to amount requested (Thornton, 1988), demands for spousal co-signature (Riding and Swift, 1988) and, service charges or loan fees (Thornton, 1981; Wynant and Hatch, 1991). This study investigated five credit terms: loan turndowns, requests for spousal co-signature, ratio of collateral to line of credit; ratio of amount received to amount requested and interest rate above prime. It was not clear whether service charges or loan fees were fluctuating or lump-sum payments. This uncertainty about measurement led to the exclusion of loan fees from the investigation of this study.

The three loan types that previous research has examined are: term loans, new lines of credit and increases in lines of credit (Haines, Riding and Thomas, 1989; Riding and Swift, 1988). Previous research has tended to investigate each type of loan either separately (Haines, Riding and Thomas, 1989) or without distinguishing between them (Shwartz, 1976; Lavoie, 1988). On the one hand, statistical power decreases as sample size decreases and number of variables examined increases (Stevens, 1986; Hosmer and Lemeshow, 1989). Therefore, individual examination of each type of loan might reduce statistical power. On the other hand, credit terms are believed to vary with type of loan (Haines,

Riding and Thomas, 1989). As a result, the differences that could be attributed to loan type may be confounded with other factors. This research study examined the effect of each type of loan on credit term while ensuring adequate sample size.

1.2.2 Structural versus Systematic Biases

Two sets of factors may moderate differences in credit terms between women and men entrepreneurs. The first set of factors are structural differences in business risk. The second set of factors are unstandardized credit decision-making criteria. The *effects* of both sets of factors may be the same on loan rejections, higher demands for spousal co-signature, higher ratio of collateral to loan, lower ratio of amount of loan received to amount of loan requested and higher rates of interest. However, the implications of the two *causes* are quite different. Inequity in credit terms caused by inappropriate decision-making, will be regarded as systematic gender discrimination. Differences in credit terms which are caused by gender-based differences in measures of business risk constitute structural bias⁴.

As figure 1 shows, both types of biases have their origin in traditional sex roles. Each could also account for gender-related discrepancies in credit terms. However, while gender discrimination refers to inappropriate decision-making on the lending side, structural biases involve weaknesses on the borrowing side. The

⁴This term is used both in a statistical and political sense. In the statistical sense, it simply implies differences which are caused by a specific set of factors. As a political term, it refers to gender-based structural inequities. Sometimes, this type of bias is referred to as "systemic bias".

FIGURE 1: STRUCTURAL VERSUS SYSTEMATIC BIASES

concern of this research was to assess the relative relevance of these two sets of factors to analyses of differences in credit terms.

I.3. BACKGROUND TO THE STUDY

Two sets of factors motivated this study. The first spans the practical implications of the absence/presence of systematic bias against women entrepreneurs by Canadian financial institutions. The second is theoretical. The two sets of factors interrelate and impinge upon one another.

I.3.1 Practical Significance

There are two reasons why it is necessary to establish whether or not Canadian financial institutions are biased against women entrepreneurs. First, such a practice would be neither ethical (Buttner and Rosen, 1989) nor legal in Canada. Yet, there is widespread belief, based largely on anecdotal evidence, that unjustifiable gender bias in banking services is prevalent. If it does not exist, it is a serious charge from which the institutions should be absolved. If it does exist, it must be brought to public attention so that it can be redressed. As such, the issue has important ramifications.

Systematic gender discrimination is a workplace issue. It is an issue of equal pay for work of equal value. It is a crucial concern because access to credit

capital is critical to the performance of small businesses in Canada⁵. Hence, systematic biases that make credit capital unavailable or more costly for women business owners would result in lower rates of profitability and therefore lower personal incomes for female than for male small business owners.

Second, given the importance of credit capital, systematic biases could have further negative economic effects. Small businesses (firms with fewer than 100 employees) accounted for at least 93 per cent of new jobs created in Canada between 1978 and 1987⁶. Women now own 22 percent of all businesses with paid employees⁷. Furthermore, women entrepreneurs were responsible for more than half of the net increase in the number of owner-operated businesses during the 1980-1985 interval⁸. Thus, apart from being important bank customers, women play an important role in new job creation. Therefore, if they face greater difficulty in securing access to financing, this would not only limit their effectiveness, it would have a significant negative multiplier effect on the economy as a whole⁹.

⁵Competing in the New Global Economy: Report of the Premiers' Council, Volume II, Province of Ontario, 1989.

⁶Small Business in Canada: Growing to Meet Tomorrow, Industry, Science and Technology, Canada, 1989, p. 6.

⁷op. cit., page 12.

⁸op. cit., page 12.

⁹M. J. Grant, "Update: Small Business and the Banks" Canadian Banker, Volume 93, Number 2, 1986: page 12: Grant notes that the small business sector in Canada is not only significant for its role in "job creation" but that it is the backbone of the Canadian economy in "overall economic stimulation": page 12.

However, a caveat is in order: just as supply-side discrimination in lending decisions could make terms of credit more costly for women owners of small businesses, so could structural limitations on the demand-side. Such limitations could, also, affect the individual economic performance of these businesses and that of the national economy. Structural limitations include differences in financial and managerial background, personal asset structure, industrial sector, and newness of business. Whereas systematic gender discrimination in lending distorts the inputs of women entrepreneurs, structural biases detract from the eligibility of female applicants on sound financial grounds.

Therefore, in order to correct discrepancies in credit terms, the source of such inequity must be correctly identified. For instance, women owners of small businesses may perceive that they are being discriminated against when, in fact, they may not be equally qualified to receive similar credit terms as men entrepreneurs. Alternatively, loan officers may treat female and male small business owners differently; yet, no differences in eligibility may be evident.

In either case, differences in terms of credit should be properly recognized as symptoms of more entrenched or underlying structural problems. The agenda for research is to examine gender-related differences in credit terms; to control for prior structural differences; and to investigate whether or not credit decision-making is discriminatory.

I.3.2

Theoretical Significance

The issue of gender discrimination in credit decision-making is far from resolved. Works investigating the relationship between gender and credit terms are limited. Furthermore, the results of previous empirical research and reports in the popular press are at variance with one another. Previous research (Riding and Swift, 1988) reported differences in the terms of credit to women and men business owners. It also indicates that such discrepancies may be explained by gender-based differences in business characteristics (Riding and Swift, 1988; Buttner and Rosen, 1989; Wynant and Hatch, 1991). However, anecdotes and editorials published by the popular press assert the existence of gender discrimination.

While such reports may reflect underestimation of the conservatism underlying the credit decision-making process, real discrimination may persist. However, the differential can only be mitigated if its causes are known. Unfortunately, there is limited understanding of the exact relationship among gender of business owners, business risk and credit terms due to mixed findings, lack of controls and use of techniques which may not be appropriate for the statistical assumptions underlying them.

The next chapter consists of a critical synthesis of the research findings on the foregoing issues. Subsequent to outlining the agenda for research, it discusses the specific contribution of this study. Moreover, it discusses the multivariate model which the study tested.

II.

LITERATURE REVIEW

This chapter has three objectives. First, it aims to synthesize different but related aspects of the literature on credit decision-making and the role of gender. Second, it endeavours to identify gaps and constraints in the methodologies of past research. Finally, it presents a more comprehensive model of the credit decision-making process than has been used in the past.

This chapter is divided into three main sections. The first section reviews three segments of the literature in terms of their specific contribution to knowledge about factors influencing access to credit. Also, the section provides an overall summary of the state of research, and outlines the agenda for research. The second section focuses on the specific contribution of this study. The third section presents the multivariate model which this study tested.

II.1

PREVIOUS RESEARCH

Three segments of the literature on credit terms may be identified. These include: works which examine factors influencing credit terms to small businesses in general; research investigating determinants of credit terms for women entrepreneurs in particular; and studies which integrates both concerns.

II.1.1

The General Literature on Credit Terms

There has long been a perception that small businesses generally face more difficulty in securing access to credit-financing than their bigger counterparts. It was believed that insufficient funds and high costs of borrowing limit the ability of small businesses to procure credit at reasonable rates. Accordingly, the tendency of public policy has been to adopt measures which would make the supply-side more amenable to the needs of the small business sector (Thornton, 1981; Poapst, 1986).

However, ongoing difficulties which small businesses continue to face while seeking credit financing indicate that limitations on the demand side may also limit access to credit capital markets (Thornton, 1981; Poapst, 1986). A common theme in studies which have examined this possibility is that financial institutions are low risk lenders (Thornton, 1981; Poapst, 1986; Peterson and Shulman, 1987). While they aim to earn returns on their depositors' funds, they also have an obligation to secure those funds against default. To achieve these two aims, financial institutions employ certain criteria to guide credit decision-making. These criteria have been operationalized in various ways in previous studies. However, there is a general agreement that they are measures of the risk associated with lending to a particular business. A dominant premise of the general literature is that small businesses score lower than larger businesses on these credit decision-making criteria or measures of business risk. This difference in risk measures is used to explain any discrepancy in credit terms between small and medium-sized to large businesses.

For instance, using discriminant analysis as a tool, Thornton (1981) examined the impact of size, age, scope, financial position and earnings record, industrial sector, depth of financial management, goals of the enterprise, average annual growth rate in sales and geographical location on the credit experience of entrepreneurs. He found that firms that have full-time financial or accounting managers are less likely to report problems with financing than their counterparts. He also discovered strong correlations between having a full-time financial manager and other measures of business risk. Therefore, he concluded that small businesses encounter difficulty with credit financing because they are considered more risky than bigger firms.

Thornton's work is limited in three respects. First, some of the measures he investigated, particularly the dummy variables, violated the normality assumption underlying the method of discriminant analysis. Second, Thornton examined only two terms of credit: the likelihood of loan rejections and ratio of amount received to amount requested. He hypothesized about, but did not examine the effect of his independent variables on interest rates. Ratio of collateral to loan and request for spousal co-signature are also key dependent variables that were missing from his study. Equally importantly, the domain of the structural factors he examined was limited. For example, he did not consider gender as a potential determinant of credit terms.

A key thrust in Thornton's work seemed to be that the credit decision-making process is relatively standardized. An implicit assumption is that the same criteria are used to evaluate small business loan applications. Even though

he acknowledges that financial institutions may need to become more familiar with the operations of small businesses, he stressed that problems with credit financing resides less with financial institutions than with small businesses themselves.

Several studies (Poapst, 1981; Fertuck, 1981) indicate that credit decision-making may not be standardized from one institution to another. For instance Fertuck (1981) argues that small businesses may receive more favourable credit terms from small financial institutions such as credit unions and caisses populaires because the scale of operations of such institutions are better suited to the needs of small businesses. However, Thornton did not examine the impact of type of financial institution on credit terms.

Jankowitz and Hisrich (1987) considered that, in spite of the apparent objectivity of the loan decision-making process, subjective factors may influence credit terms. On the basis of interviews with loan officers, they deduced that five sets of factors influence terms of credit: capital, collateral, conditions, capacity and character¹⁰. They also suggested that the factors may be reduced further into two distinct categories: objective and subjective characteristics. They hypothesized that subjective characteristics play a role in determining terms of credit and that the credit decision-making process may not be standardized.

Jankowitz and Hisrich (1987) were concerned with the effect of systematic biases in general. Moreover, they theorized only about the effect of the five sets of factors on the loan turndown decision. That is, they were not concerned

¹⁰Each of the variables used in Thornton's study may thus be subsumed under at least one of the 5 C's.

about other credit terms such as interest rates, ratio of collateral to loan, ratio of amount received to amount requested and request for spousal co-signature.

Haines, Thomas and Riding (1989) used the logistic regression model, a technique which is more flexible and robust to the normality assumption, to identify factors involved in the loan turndown decision. They found that across the three different loan types, a history of financial distress was the most parsimonious variable that could be used to predict the resolution of loan applications. However, they did not report the role played by the personal attributes of the owner, particularly gender. In addition, although they used univariate analysis to examine rates of interest charged on loans, they concentrated mainly on loan rejections. The impact of structural factors on credit terms such as ratio of collateral to line of credit, ratio of amount received to amount requested and requests for spousal signature was not reported either.

A myriad of techniques has been used in this first stream of literature to investigate the relationship between measures of business risk and credit terms. While univariate techniques have been employed, multivariate analyses such as discriminant analysis and logistic regression constitute the main legacy of the first stream of literature to the resolution of factors influencing credit terms. However, the contribution of the literature to our understanding about women, business risk and credit terms have been limited by three factors. First, only a narrow range of credit terms have been examined within any one study. Second, empirical studies have focused mainly on the effects of a limited range of elements of business risk on credit terms. Furthermore, the impact of other

structural factors besides measures of business risk on credit terms have not been subjected to empirical investigation. For example, type of financial institution has been cited but not investigated as a potential determinant of credit risk (Fertuck, 1981). Finally, gender has not been part of the focus of this stream of literature.

II.1.2 The Literature on Women Entrepreneurs

The singular increase in women-owned businesses in recent years has also given rise to a burgeoning literature on business problems that are specific to women. Legal status, age of business, industrial sector, level of sales and average annual sales growth have been identified as some of the factors which may influence credit terms to women entrepreneurs. It has been recognized that gender-based differences on these factors may account for part of the financial difficulties that women entrepreneurs often claim to encounter (Schwartz, 1977; Hisrich and Brush, 1986; Lavoie, 1988).

However, some of the women entrepreneurs who are subjects in these studies do not seem to believe that all of their borrowing difficulties are caused solely by structural limitations. Various studies indicate that a sizeable percentage of women respondents attribute some of the difficulties they encounter to systematic gender discrimination (Lavoie, 1988; Schwartz, 1976). In one study by Schwartz (1976) 17 out of 20 women entrepreneurs interviewed cited credit discrimination as one of the problems that they encountered at start-up. Also, Hisrich and Brush (1982) reported that 27 percent of the women entrepreneurs they surveyed identified gender discrimination as an obstacle to the successful

operation of their businesses.

Certain researchers also seem to consider the possibility that gender of owner might influence credit terms (Litton cited in Riding and Swift, 1988: 3; Collom cited in Lavoie, 1988: 19). Lavoie (1988: 19) reports that, although Collom found no evidence of gender discrimination in his 1984 study of loan rejections in urban areas, he was not as optimistic about the credit experience of women in rural areas.

It is remarkable that, in all of these studies, weak collateral position, lack of business experience, and inadequate managerial and financial background are also frequently cited as barriers to the successful operation of women-owned businesses as well (Lavoie, 1988; Schwartz, 1976). These are factors which are generally believed to be barriers to credit financing. The period at which women entrepreneurs seem to encounter most of their credit-related problems is at the start-up phase. Yet, gender discrimination continues to be one of the reasons women entrepreneurs give for their credit-related difficulties. (Schwartz, 1976; Lavoie, 1988: 19).

In the 1976 study by Schwartz, women reported fewer difficulties once they had become established. Also, Lavoie (1988: 19) reported that, after controlling for age of business, the number of women entrepreneurs in her sample whose loans were accepted increased by 8.9 percent from the 11.7 percent rate recorded at start-up. Consequently, she notes:

It seems that, as with their male counterparts, these women owner-managers had to show their mettle and build up their financial credibility before being considered a good risk (Lavoie, 1988: 19).

However, this stream of literature could not determine whether or not the credit experience of women and men entrepreneurs actually differ. Key methodological weaknesses of these studies include the tendency to ask leading questions and the lack of male controls. Furthermore, they were also largely based on the subjective perceptions of women entrepreneurs. The first methodological weakness may have resulted in biased results¹¹. Although the literature indicates that credit financing is most problematic for women at start-up, it is ambiguous whether the perceived or actual gender discrimination disappear once women entrepreneurs are established.

This second segment of literature, as the first, has tended to focus only on factors affecting loan rejections. Other credit terms such as interest rates, ratio of collateral to loan, ratio of amount received to amount requested have not been subjected to empirical analyses. Yet, certain conjectures indicate that, ceteris paribus, gender-related differences would be found on these credit terms (Kryzanowski and Bertin-Boussu cited in Riding and Swift, 1988: 4).

Furthermore, this literature has tended to rely on univariate analyses. For instance, the study by Lavoie only examined the relationship between age and loan rejections; the potential influence of structural factors such as legal status, level of sales and industrial sector on loan rejections were not considered. In addition, terms of credit other than loan rejections were not investigated.

¹¹For instance, Schwartz (1986) asked her respondents to cite problems that were unique to them as female entrepreneurs. Such a method is akin to leading the respondents. Also, the approach makes it difficult to compare the business characteristics of women with those of men.

Unlike the general literature, the literature on women entrepreneurs identifies gender as a potential determinant of credit terms. It has borrowed extensively from a literature which shows that women who work for others may be the victims of systematic discrimination. However, the second stream of literature has not been able to determine whether the experience of female corporate executives as employees may be generalized to female entrepreneurs as the clients of financial institutions. The contribution of this stream would have been enhanced with the introduction of statistical controls, multivariate analysis and empirical investigation of more credit terms and structural factors than has been examined.

II.1.3

The Integrated Literature

Unlike the general literature on credit terms, the third segment of the literature identifies gender as a potential determinant of credit terms. Also, the third stream of literature has attempted to control for factors which may confound differences in the credit experience of women and men entrepreneurs. To this extent, this segment of the literature also differs from the literature on women entrepreneurs. One of its key aims has been to establish whether or not terms of credit differ between women and men after controlling for prior differences.

On the basis of consistent reports that some women entrepreneurs feel that they are discriminated against because of their gender in credit decision making, Buttner and Rosen (1987) conducted an experiment among 106 loan officers to

determine whether or not the latter hold sex stereotypes. The researchers anticipated that if loan officers perceive that entrepreneurship is a masculine occupation, it would be seen as requiring more of the attributes typically associated with men than those associated with women. Furthermore, they projected that if entrepreneurship is viewed as a masculine undertaking, men-owned ventures may receive more favourable considerations from loan officers than women-owned ventures.

To test their conjectures about whether or not loan officers hold sexual stereotypes, Buttner and Rosen (1989) divided the sample of 106 loan officers into three groups. Each group was asked to rate a series of test items on the characteristics of only one of women, men or successful entrepreneurs. Univariate analysis of variance indicated that while the rating of the characteristics of women and those of successful entrepreneurs were weakly correlated, the rating of men and those of successful entrepreneurs were strongly associated.

In a subsequent study, Buttner and Rosen (1989) attempted to discover whether or not sex stereotypes actually influence loan rejections. They used a univariate analysis of variance to determine the actual role that is played by gender, type of respondent and presentation format on the likelihood of granting a loan. Their results indicate that none of these independent variables played a role in accounting for the likelihood of getting a loan.

However, univariate techniques are limited in two important respects: first, they ignore the interrelationship among the independent variables. Second, while

individual univariate analyses may not prove significant, a single multivariate analysis might (Stevens, 1986; Hosmer and Lemeshow, 1989). This is because multivariate techniques consider linear combinations of the independent variables which univariate tests ignore.

Riding and Swift (1988) used a matching technique to analyze the results of a survey conducted by the Canadian Federation of Independent Business on the credit experience of its members in 1987. Each woman respondent was matched with male respondents who resembled her in terms of business size, geographical location, age, sector and form of business. They found that after controlling for such prior differences, there was no statistically significant difference in five out of six terms of credit between women and men-owned firms. However, they found that 50 percent of the women in their working sample were required to provide over 300 percent of their loan as collateral, compared to 20 percent of the men.

Structural factors such as years of managerial experience, asset structure and financial background which were not included in their research were possible explanations for this discrepancy. It was also possible that it was a statistical anomaly. Nonetheless, it was interpreted in the popular media, not as a *potential* but, as an *actual* evidence of gender discrimination in lending (Languedoc, 1988; Belcourt, 1991).

The 1988 study by Riding and Swift did not report the individual relationship between the independent variables and the outcome of the loan decision. Moreover, univariate analysis was used to determine the impact of each

structural factor on each credit term. Consequently, correlations among the independent variables were not taken into account. Had multivariate analysis been used, either of two events could have occurred. Linear combinations of the variables might have resulted in an overall difference in credit terms between women and men entrepreneurs. Alternatively, correlations among the dependent variables might have explained any residual difference. However, the sample used in the 1988 study by Riding and Swift was too small to justify multivariate analyses. Accordingly, to improve on the work by Riding and Swift, there is a need for multivariate analyses assuming adequate sample size.

In 1990, the Canadian Bankers' Association commissioned an investigation into systematic gender discrimination at the Western University School of Business (Wynant and Hatch, 1991). The conclusion reached by this study is that terms of credit do not differ between women and men entrepreneurs after elimination of prior differences. However, three serious research weaknesses limit the validity of its results. First, the sample selection process was not random. This weakness could have led to biased results. Second, as the majority of previous studies, it relied extensively on univariate analysis such as chi-square tests. Since multiple tests were conducted, it was surprising that the researchers tested their various null hypotheses at levels of significance as high as 10 percent (1991: 53). Consequently, the overall alpha rate was considerably high and might have led to the finding of more differences in structural factors between women and men entrepreneurs than actually existed.

Third, some of the independent variables used in the study by Wynant and Hatch (1991) do not seem to qualify for the term 'objective measures of business risk'. The study considered certain objective measures of "character" (such as: formal business plans, pro-forma statements, and years of experience of principal owner). However, perceptions of the loan officers about the capabilities of a firm's management team was also treated as a measure of character:

The banker's assessment of management is categorized as poor if the account manager made any of the following negative comments in describing management: "poor financial skills", "weak interpersonal skills", "makes unreasonable requests", "poor operations skills" or "weak marketing skills". (Wynant and Hatch, 1991: 221).

Buttner and Rosen (1987) suggest that the perceptions of loan officers could be subject to gender discrimination. If so, subjective judgements could have confounded the effects of objective measures of business risk and gender in the study by Wynant and Hatch (1991).

II.1.4

Summary of the Literature

While methodological weaknesses are not uniform across the literature, jointly, they have limited our understanding of the relationship among measures of business risk, gender of entrepreneur and credit terms. For instance, while the general literature has left a legacy of multivariate analyses, it has tended to ignore gender as a potentially explanatory variable. Whereas, the second stream of literature has focused on gender, its contribution has been mitigated by the use of univariate analyses and lack of statistical controls.

Neither the first nor the second stream of literature investigated a comprehensive range of credit terms. While the third stream of literature has examined a more comprehensive list of credit terms. However, it has been limited by its use of univariate analyses as well. Previous studies have also differed in the number and type of measures of business risk they investigated. In some cases, subjective variables could have confounded the results of an otherwise useful contribution.

II.1.5

The Research Agenda

Research has five challenges to meet in resolving the issue of gender discrimination. First, it must determine whether differences actually exist in the terms of credit received between women and men entrepreneurs. Second, it must investigate whether such differences can be accounted for by differences in the characteristics of the two groups of borrowers. Third, research must examine the extent to which lending criteria are standardized or consistently applied in evaluating credit applications for women and men entrepreneurs. Fourth, contingent on these findings, research should explore the plausibility that women and men entrepreneurs may view the role of the banker differently¹².

Finally, multiple criterion measures are needed for a comprehensive investigation. Therefore, to minimize the likelihood of spurious results, tests should either be conducted at low levels of significance. Otherwise, multivariate

¹²Buttner and Rosen (1989) have argued that there is a discrepancy between anecdotal and empirical evidence concerning credit discrimination against women entrepreneurs. They suggest that unrealistic expectations on the part of women entrepreneurs about the difficulty associated in obtaining credit financing in general may account for such discrepancy.

analyses should be considered. To meet this research agenda, the credit experience of both groups of entrepreneurs, female and male, should be evaluated under identical research conditions. That is, the two groups should be investigated within the same study to facilitate comparisons. Such an agenda provides rationale for the stated objectives of this study.

II.2 THE CONTRIBUTION OF THIS STUDY

The present study is an attempt to enhance our knowledge about women and banking. It differs from previous research in three areas. First, it developed a relatively comprehensive model of potential determinants of credit terms. This model distinguishes between subjective and objective measures of business risk. Hence, it avoids the potential research biases inherent in such studies as that of Wynant and Hatch (1991). Furthermore, while the model does not include all possible domain of measures of business risk, it includes more measures of business attributes than any previous study. Its range of credit terms is at the least, comparable to if not more extensive than, that of any previous study.

Also, the model does not assume that the credit decision-making process is standardized. It recognizes that both structural factors and systematic gender discrimination *may* determine credit terms. Furthermore, the model is multivariate: the simultaneous association of gender, credit terms and business risk are judged to be of interest.

Second, the study employs powerful and easily interpretable techniques

which are robust against statistical assumptions. As appropriate, either one of the logistic regression model or the multiple linear regression model was used to determine factors influencing credit terms. Logistic regression was also used to identify structural differences between women and men entrepreneurs. Subclassification on propensity score was used to determine whether differences in credit terms remained after structural differences are controlled¹³.

Third, this study is based on the largest sample of lending experiences of women entrepreneurs to date. Inadequate number of female subjects had limited the extent to which previous studies could conduct multivariate analyses. The large sub-sample of women entrepreneurs available to this study, together with the use of the logistic regression model permits an examination of the relationship between structural factors and credit terms.

Overall, the study sought to combine the strengths of previous research while introducing innovations wherever applicable. Mixed findings should be minimized through the inclusion of many variables, the exclusion of subjective variables, the use of robust, statistical techniques and an unprecedentedly large sub-sample of women entrepreneurs. The following section describes the multivariate model.

¹³Each of these techniques is discussed at some length in the chapter on research design.

II.3 A MODEL OF CREDIT DECISION-MAKING

Systematic gender discrimination has defied resolution primarily because previous investigation into the issue has been empirically-based rather than model-driven. The literature lacks an explicit model or set of theories that would act as a guide for research. Clearly, the first task that must be accomplished in model-building relates to definitions--both connotative and denotative. What are the dependent variables? What are the conditioning factors? What are the independent variables? How may each of these be operationalized?

II.3.1 The Dependent Variables

In the literature on women entrepreneurs, it was indicated that there is a belief that gender discrimination would lead to differences on five specific terms of credit. Krypanowski and Bertin-Boussu (cited in Riding and Swift, 1988) suggested that women entrepreneurs would experience greater loan rejections, more frequent requests for spousal co-signature, higher ratio of collateral to line of credit, lower ratio of amount received to amount requested and higher interest rates than would experience their male counterparts. Hence, rate of loan rejections, rate of requests for co-spousal signature, ratio of collateral to line of credit, ratio of amount received to amount applied for and interest rates were selected as the pertinent dependent variables which this study should explore.

II.3.2

The Independent Variables

Traditional financial wisdom suggests that five sets of structural factors are used to measure the risk associated with loan applications. These five sets of factors, often referred to as the five C's of commercial lending, include: capacity, capital, character, collateral and conditions.

Capacity is the extent to which an organization is able to meet its obligations as they fall due. Cash flow projections of the firm, ratio of current assets to current liabilities, inventories, accounts receivables, turnover of accounts receivables and inventories, quick ratio have been suggested as possible measures of capacity (Kao and Knight, 1987; Jankowitz and Hisrich, 1987; Poapst, 1986). However, in survey studies, it is often difficult to obtain accurate financial records of small businesses. In addition, there are severe definitional problems. For instance, for a sole proprietorship, should the proceeds of a loan which was 1) secured by a home mortgage and 2) reinvested in the business be counted as *debt* or *equity*?

Consequently, the practice of past research has been to use size as a proxy for capacity (Thornton, 1981; Riding and Swift, 1988; Wynant and Hatch, 1991). Size is usually measured by the annual volume of sales and the number of full-time equivalent workers employed by the firm.

Riding and Swift (1988) used annual volume of sales and number of full-time equivalent employees as measures of size. While Wynant and Hatch (1991) recognized that number of full-time equivalent employees could be an alternative

measure of size, they examined only the effect of sales in their study. However, they indicated that there was a strong correlation between value of assets and level of sales.

Capital is a measure of the amount of equity investment available to the borrower. Although, legal status was not subjected to any empirical investigation, Lavoie (1988) indicated that it might play a role in determining credit terms. She states that corporations are often eligible for certain tax benefits which may be funnelled back into the business as equity. In their 1988 study, Riding and Swift included legal status (possibly as proxy for capital) among their measures of business risk. However, their mixed findings indicate that alternative measures of capital would be valuable. The number of owners a firm has may also be indicative of its capital structure. While partnerships and corporations may be expected to behave differently from sole proprietorships, it is also plausible that those corporations with sole owners may not be substantially different from the majority of sole proprietorships. Consequently, this study included number of owners among its measures of **capital**.

Collateral involves the amount of assets available to secure the loanable funds against liquidation or default. Poapst (1986) and Bates (1971) have also used market value of assets and debt to assets ratio as proxies for collateral. While such measures would seem to be more objective measures of collateral (Jankowitz and Hisrich, 1987; Kao and Knight, 1987), they may not always be available for most firms. Consequently, various other studies have used industrial sector as proxy for collateral. This is because firms in certain sectors such as

manufacturing are believed to possess more pledgable assets than firms in sectors such as retailing and services (Thornton, 1981). Industrial sector was one of the variables used to represent collateral in this study. However, the types of assets available to a firm may be associated with structural factors other than industrial sector. This explains the inclusion of types of assets among the measures of collateral and capital in this study.

Firms that have bonds and securities as collateral may pay lower ratio of collateral to loan than firms that used personal or real estate, because bonds and securities are more liquid than real estate. Thus, while a loan may be secured by its equivalent in bonds and securities, real estate of more value may be used to secure the same amount of loan. Should asset structure differ between women and men entrepreneurs, this could explain why about 50 percent of the women in the study by Riding and Swift as opposed to only 20 percent of the men were requested to provide over 300 percent of their loan as collateral.

Personal assets are more likely to be shared between spouses than business assets. Therefore, the likelihood of requests for spousal co-signature may be higher for business owners who have personal assets available as collateral than for business owners who have business assets available as collateral. Consequently, this study collected information on two types of assets, business and personal, available for use as collateral to the owners of small business firms.

Character includes the track record of the business and its owners. Age of business, years of managerial experience of owners and level of financial management and expertise are among the variables that have been used to

measure character in the past. Lee (Personal Contact, 1989) suggests that years of education completed and professional status of owners may be used to assess their character as well. He also indicate that the credit record of owners and their businesses may influence the terms on which credit is granted. The literature suggests that a strong association may exist between gender of the owners and each of these measures of character. Since many firms have principal owners who are also their financial managers, it may be expected that gender of the financial manager is also correlated with the foregoing and relatively objective measures of character. Consequently, this study included age of business, years of managerial experience of owners, level of financial management and expertise and credit record of the firm to model the effect of character on credit terms. Gender of the owners and gender of the financial manager were also included in the theoretical model.

Conditions refers to the proprietary nature of the product/service, size of market and industrial climate. Previous studies (Haines, Riding and Thomas, 1989) used average annual rate of sales growth as proxy for general business conditions. Kao and Knight (1987) also included industrial sector among their measures of conditions. Geographical location has also appeared as a measure of business risk in various studies (Riding and Swift, 1988; Thornton, 1981; Haines, Riding and Thomas, 1989)¹⁴. However, the reasons for such inclusion are not always made clear. Quite possibly, geographical location was used as proxy for size of market. However, it could also be a measure of access to financial

¹⁴A dummy variable which expresses rural versus urban location is dominant throughout past research.

markets (Riding, Personal Contact, 1991). For instance, irrespective of capacity, firms in rural areas may tend to have access largely to credit unions and this may affect the conditions on which credit is given to them. However, Collon (cited in Lavoie, 1988) has argued that gender may condition the effect of geographical location on credit terms. This study examined the average annual growth rate of sales and geographical location as proxies of general business conditions.

II.3.3 The Multivariate Nature of the Model

A priori, the five C's of commercial lending may be interrelated. For instance, the number of owners a firm has (capital) may have an impact on its asset structure (collateral) and its access to various skills. The education and experience the owner has had may have an impact on the equity (capital) invested in the business. Also, some of the elements of the five C's may qualify as measures of two or more categories. While industrial sector was used as a measure of conditions in certain studies, it was used to express collateral or capital in other works. Similarly, age could serve as a measure of either capacity or character. This underscores the need for multivariate analyses which will distinguish among the various sets of variables while addressing the problem of multicollinearity.

Figure 2 is a diagrammatic representation of the model developed in this study. It identifies the five C's of commercial lending as the potential determinants of credit. However, it also includes demand-side features which

FIGURE 2: A MODEL OF FACTORS INFLUENCING CREDIT TERMS

may moderate measures of business risk. The black box represents a myriad of system-wide economic, political and social forces which are responsible for gender-related differences in business attributes. Potential gender discrimination is represented by a glass prism. If gender bias is absent, only structural differences in business attributes would account for any gender-related differences in credit terms. However, just as white light is fragmented into different colours when it passes through a prism, so may credit terms differ between women and men entrepreneurs if systematic gender discrimination exists. The overlapping boxes of measures of business risk and credit terms respectively are meant to represent the multivariate nature of the model.

II.3.1.4 Structural Differences as Moderating Variables

There is a general agreement within the literature that several characteristics of women-owned businesses may make it more difficult for them to secure access to credit-financing than for their male counterparts. First, there is a consensus within the literature that women-owned businesses are on the average younger than those of men (Schwartz, 1976; Lavoie, 1988; Riding and Swift, 1988; Wynant and Hatch, 1991). Young firms are usually perceived as risky by financial institutions (Peterson and Shulman, 1987).

Firms that are less than five years old also often have relatively low volume of sales. Their smallness in size is often reflected in the comparatively smaller size of their loan requests. The literature indicate that administrative costs are proportionately higher for small loans than for bigger loans (Thornton, 1981;

Grant, 1986; Wynant and Hatch, 1991). It is possible that women accredit most of the problems they encounter with credit financing to systematic gender discrimination rather than to such structural factors as age, smallness of firm and size of loan.

Women-owned businesses also tend to be registered as sole proprietorships to a greater extent than those of men. It seems reasonable to expect that sole proprietorships may be under-capitalized relative to their counterpart partnerships and corporations. This is because capital tends to be contributed largely by one person. Of course, not all corporations have more than one owner. However, incorporation involves considerable expense. As such, those corporations with sole owners may be expected to have more capital than sole proprietorships. Besides, Lavoie (1988:8) remarks that sole proprietorships may not be eligible for similar tax benefits as are corporations and partnerships. Such tax benefits may be funnelled back into the business as equity. Poapst (1986) has argued that firms with limited access to equity financing are prone to more stringent terms of credit if not outright refusal.¹⁵

Several studies (Riding and Swift, 1988; Haines, Riding and Thomas, 1989) have examined the impact of legal status on credit terms. However, none has examined the simultaneous impact of form of business and number of owners on the credit decision-making process. Such examination will be useful to determine the extent to which women are either sole proprietors or sole owners relative to

¹⁵Of course, sole proprietors can also obtain start-up capital from family and friends. However, *ceteris paribus*, it would seem that the resource base of several owners would be more substantive than that of only one owner.

men entrepreneurs¹⁶.

Third, women small business owners frequently report lack of managerial skills, weak collateral position and lack of credit record as the other barriers to the successful operation of their businesses. As the discussion on the independent variables show, experience of the business owner is a measure of business risk. Yet, lack of managerial skills seems to be a problem that plagues small businesses in general and not just those of women entrepreneurs. Poapst (1986) found that for various reasons, small businesses in general devote very little time to the financial function (Poapst, 1986). Likewise, Thornton (1981) found that owners of small businesses with considerable experience and a full-time financial manager report less difficulty with credit financing than others who do not possess such characteristics.

However, few studies have investigated the extent to which lack of managerial skills and experience is more problematic for women than for men entrepreneurs. There are even fewer studies that have investigated residual differences in terms of credit after these various structural factors have been controlled. Wynant and Hatch (1991) examined various measures of character of owner. However, as the discussion under the literature section indicates, the validity of their research design is questionable. Furthermore, the attribute of the financial enterprises on credit terms have not been investigated by any study to date. Yet, there is considerable speculation that the type of financial institution

¹⁶While all sole proprietors are sole owners, not all sole owners are sole proprietors. To the extent that a corporation has only one owner, it is said to have a sole owner.

may affect credit terms (Poapst, 1981; Fertuck, 1981). The careful selection of the variables used in this study lends authority to its conclusions.

II.3.1.5 Systematic Gender Discrimination as a Conditioning Variable

It has been shown that prior differences may moderate the eligibility of women entrepreneurs for credit financing even in the absence of either conscious or unconscious gender discrimination on the part of loan decision-makers. An alternative view is advanced in this section: that even after structural gender-based differences have been controlled for, terms of credit may still differ between men and women entrepreneurs because of systematic gender discrimination.

Entrepreneurship--the creation, ownership and development of new ventures--is a risk-taking and innovative activity which, until recently, seemed to be a male prerogative (Schwartz, 1977). As Merton has argued, an occupation can become 'sex-typed' when the majority of its members "...are of one sex and there is an associated normative expectation that this is how it should be" (Merton cited in Schein, 1973: 95). Research has shown that such sex stereotypes are not only prevalent but actually influence decisions in the corporate workplace. Schein found that top and middle managers tend to attribute the characteristics of successful managers to male rather than female managers (Schein, 1973; 1975). This may explain the consistent finding that male candidates are usually hired and promoted to managerial positions over otherwise

equally qualified female candidates (Shaw, 1972: 333-338; Terborg and Ilgen, 1975: 235-376).

Buttner and Rosen (1988) have found that loan officers in the United States believed that women possess fewer entrepreneurial attributes than men. However, to date no study has shown, in a definitive way, the magnitude and direction of the influence of sex stereotypes on the lending decisions of Canadian financial institutions.

III.

RESEARCH DESIGN

This chapter presents the research design that was used to accomplish the objectives of this study. While the first section focuses on sampling design, the second section is concerned with questionnaire design. The third section discusses the procedures that were followed in administering the questionnaire, and the fourth section provides rationale for the variables that were used. A comprehensive list of these variables is in Appendix III.C. The fifth section presents the techniques that were adopted for analyzing the data.

III.1

THE POPULATION

III.1.1

The Sampling Frame

The results of this study are based on data collected from a national survey conducted by the Canadian Federation of Independent Business of its members in 1990. It is recognized at the outset that this population may not be representative of the population of all Canadian small business owners. The population of CFIB members probably includes a survivorship bias as firms which join the CFIB have reached a point in their development such that they are able and interested in joining this organization.

The credit experience of established and new businesses may differ from each other. However, it is uncertain whether gender discrimination, if it exists,

persists once a business has become established. Therefore, examination of the credit experience of the CFIB membership may help to resolve the issue of gender discrimination for established businesses, at the least.

III.1.2

The Sample Size

Two reasons make a larger sample crucial for the proposed study. The study by Riding and Swift (1988) generated both controversy and misinterpretation. It has already been noted that the findings of the study were mixed. Therefore, it was inconclusive on whether or not systematic gender discrimination exists. However, the popular media and certain researchers concluded that these mixed findings were enough "proof" of systematic gender discrimination in lending decisions (Languedoc, 1988:59; Belcourt, 1991: 53)¹⁷. As Stevens (1986) has argued, a larger sample would increase the power of the statistical tests.

The second reason is also methodological. The proportion of women to men entrepreneurs in past research has been low. Past research (Thornton, 1981; Riding and Swift, 1989) indicates that an overall response rate of about 20 and 30 percent should be expected. Although women constitute about 22 percent of

¹⁷While Belcourt's observation was right, the conclusion she reached was somewhat hasty. According to her:

Differential treatment by bankers has been frequently reported and lately *objectively documented*. In a survey done for the Canadian Federation of Independent Business, Swift and Riding compared a matched sample of business owners who had applied to the banks for credit, and concluded that banks required at least 300 per cent collateral on lines of credit for women, while only one-quarter of the men were subjected to such stringent requirements [emphasis added] (Belcourt, 1991:53).

small business owners, only 5 percent of the respondents in the 1988 study by Riding and Swift were women. A larger sample of women entrepreneurs would facilitate comparison of female business owners with male counterparts. This explains the decision to send questionnaires to all the women entrepreneurs in the sampling frame.

III.2 THE QUESTIONNAIRE

The questionnaire used for data collection was similar to the earlier one on which the works of Riding and Swift (1988) and Haines, Riding and Thomas (1989) were based¹⁸. However, it included several variables which its predecessor lacked. Among such variables are years of managerial experience of owner, credit track record and professional status of the financial manager.

In keeping with its research objectives, the questionnaire was divided into five sections. The aim of the first section was to collect background information on each business. To this end, the section included questions on geographical location, age of business, legal status, number of owners, nature of ownership, average annual sales growth, number of employees nature of products/services provided and nature of the process of production. The second section gathered information on 1) up to three of the principal owners and 2) the financial manager of the enterprise. For each owner, it featured questions on the size of

¹⁸A copy of each of the questionnaires may be accessed in appendix III.A. and appendix III.B respectively.

ownership, level of education, type of degree obtained (if any) and managerial experience. The second section also investigated the gender, identity, employment status and training of the financial manager.

The third section helped to gather data on credit terms. Specifically it inquired into the month and year of the loan application reported, interest rate charged on loan, ratio of collateral to loan; loan turndowns; and demand for spousal co-signature. This section was used to collect information on types of securities available as collateral. This was useful in determining whether personal/business asset structure differed between women and men entrepreneur. The section also asked explicit questions about the type and amount of collateral that was requested by the banks to determine whether or not banks differ in the requests of collateral between men and women entrepreneurs. While previous studies (Poapst 1981; Fertuck, 1981) seem to recognize that type of financial institution approached for lending may play a role in term of credit received, none has examined the direct impact of this variable on the credit decision-making process. Consequently, a decision was made to include this variable among the measures investigated by the study.

The third section also inquired into the bank-shopping behaviour of entrepreneurs. Bank shopping behaviour was formerly intended to determine the extent to which entrepreneurs are loyal towards a particular financial institution. It was supposed to be a measure of their track record or character. It was expected that loyal bank customers would receive better credit terms than firms that shopped regularly for banks. This was because financial institutions would

be more familiar with regular customers. Consequently, the risk that was associated with loyal businesses might be reduced. Bank-shopping by itself was expected to involve extensive costs. However, it should be noted bank-shopping could be the effect rather than cause of loan rejections or stringent credit terms.

The ambivalence inherent in this construct led to its exclusion from the measures of business risk examined here.

The fourth section was concerned with the perceptions of entrepreneurs about services provided by financial institutions. Buttner and Rosen (1989) hypothesized that women may underestimate the conservatism associated with the credit decision-making process. That is, they may perceive that financial institutions are supposed to be a good source of venture capital rather than low risk financiers. Accordingly, the fourth question of the questionnaire inquired into the perceptions held by respondents about the roles of financial institutions. However, these variables were not included among measures of business risk. Rather, they were meant to act as a potential explanatory variable for the dissatisfaction with credit lending reported for women entrepreneurs, especially, in the event that gender discrimination does not exist.

The fifth section of the questionnaire featured a short-form income statement and a short-form balance sheet. The aim of the financial statements was to gather personal and business financial data. The income statement was meant to aid in assessing the cash flow of each firm while the balance sheet was aimed at collecting information about the nature and value of securities

possessed. However, few respondents filled out the financial statements¹⁹.

III.3

PROCEDURE

The questionnaire was mailed on July 1, 1990 with a cut-off date of September 15, 1990. A total of 14,980 questionnaires were sent. The sampling procedure was a stratified one. To assure greater representativeness of women and to facilitate comparisons, questionnaires were sent to all 5,246 women-owned businesses in the CFIB sampling frame. Also, 9,734 men-owned businesses were selected randomly. Previous research (Thornton 1981; Riding and Swift, 1988: 4) suggests that a response rate of 20-30 percent should be anticipated. In total 2763 (759 female and 1974 male) responses were received. Thus, the response rate was 18.44 percent overall, 14.47 percent for women and 20.28 percent for men. Past research indicates that firms in the agricultural, farming and fishing sector differ from firms in the other sectors because of government involvement in their banking activities (Wynant and Hatch, 1991). Consequently, in keeping with previous studies (Thornton, 1981; Riding and Swift, 1988; Haines, Riding and Thomas, 1989), firms in the agricultural sector were excluded from this study. Their deletion yielded an overall working sample of 2672, 758 female and 1907 male, responses.

To minimize non-response bias (Davis and Cosenza, 1985: 271-272), three

¹⁹Reluctance or inability to provide financial information is often associated with poor managerial skills and, consequently, stringent credit terms. Therefore, non-response bias would severely limit any conclusions based on those respondents who did provide financial information.

measures were taken. First, prior to mailing, the questionnaire was pre-tested on ten small business owners in the Ottawa area. Second, a week after the first questionnaire was sent, one "reminder letter" (and additional questionnaire) was mailed. Third, since it is difficult, if not impossible to achieve a 100 percent response rate (Davis and Cosenza, 1985: 272), efforts were made to compare the characteristics of respondents and the general small business population. Out of the 10 pre-test questionnaires, seven questionnaires were received. Two of the questionnaires were only partially filled out. Their owners indicated that they had just started up. The remaining six questionnaires led to several revisions to the final questionnaire.

To address the issue of non-response bias, the working sample was compared to the small business population in terms of industrial sector and level of sales. The comparison reveals differences between the working sample and the general small business population. As table III.1 indicates, about 86 percent of the general small business population, compared to about 42 percent in the CFIB sample reported annual sales volume below \$500,000 a year. This may be an indication that the respondents in the working sample are comparatively older or more established than the general small business population. However, it could also be an indication that the respondents differ from the non-respondents as well.

Differences by industrial sector were also found. Both the general small business population and the CFIB sample are relatively homogeneous in their distribution by mining, wholesaling service and other sectors. However, as Table

Table III.1 DISTRIBUTION OF SMALL BUSINESSES BY
ANNUAL SALES VOLUME

<u>Annual Sales Volume</u>	<u>Number of Firms</u>		<u>Percentage of Total</u>	
	<u>Stats</u> <u>Can</u> <u>(1986)</u>	<u>Survey</u> <u>Data</u> <u>(1990)</u>	<u>Stats</u> <u>Can</u> <u>(1986)</u>	<u>Survey</u> <u>Data</u> <u>(1990)</u>
TOTAL	846786	2667	100.0%	100.0%
\$10,000 - 99,999	466294	317	55.1%	11.9%
\$100,000 - 499,999	260146	939	30.7%	35.2%
\$500,000 - 1,999,999	96629	998	11.4%	37.4%
\$2,000,000 - 4,999,999	23717	263	2.8%	9.9%
\$5,000,000 or more	-----	150	-----	5.6%

Table III.2 DISTRIBUTION OF SMALL BUSINESSES BY
INDUSTRIAL SECTOR

<u>Industrial Sector</u>	<u>Number of firms</u>		<u>Percentage of Total</u>	
	<u>Statistics</u> <u>Canada</u> <u>(1986)</u>	<u>Survey</u> <u>Data</u> <u>(1990)</u>	<u>Statistics</u> <u>Canada</u> <u>(1986)</u>	<u>Survey</u> <u>Data</u> <u>(1990)</u>
TOTAL	846786	2667	100.0%	100.0%
MINING	6063	19	0.7%	0.7%
MANUFACTURING	53035	341	6.3%	12.8%
CONSTRUCTION	156912	23	18.5%	9.0%
TRANSPORTATION	83926	76	9.9%	2.8%
WHOLESALE	59124	193	7.0%	7.2%
RETAIL	195736	936	23.1%	35.1%
SERVICES	214745	671	25.4%	25.2%
OTHER	77246	192	9.1%	7.2%

III.2 should indicate, the CFIB working sample, relative to the general population, is over-represented in manufacturing and retailing sector by a factor of 7% and 10% respectively. In contrast, the Stats-Can database features more firms in the construction and transportation sectors than the CFIB working sample²⁰.

III.4 OPERATING DEFINITIONS

III.4.1 Credit Terms

Five credit terms are of interest to this study. These include loan rejections, ratio of collateral to loan, ratio of amount of loan received to amount of loan requested, interest rates and requests for spousal co-signature. In the section on factors influencing terms of credit, these variables are treated as dependent variables while measures of business risk and gender are treated as independent variables. However, methodological considerations led to the treatment of credit terms as independent variables in certain cases²¹.

Four of the credit terms described here were treated as dummy variables. The loan turndown decision is a dichotomous variable: ultimately, either a loan

²⁰Subsequent to this study, further analysis of non-responses will be undertaken by two Carleton University researchers--A. Riding and R. Thomas.

²¹Ordinarily, credit terms would constitute the dependent variables of this study, gender and structural factors would be the independent variables. However, in analyses involving structural gender-based differences in business attributes for instance, gender was treated as a dependent variable while measures of business risk were treated as independent variables. Similarly, gender was used as dependent variable in analyses involving initial differences in credit terms prior to elimination of prior differences. Gender of owner was also used as dependent variable in logistic analysis of covariance with propensity scores.

gets rejected or accepted. A request for spousal co-signature is also a binary variable: spousal co-signature was either required or it was not. It was anticipated that interest rates, ratio of amount received to amount applied for and ratio of collateral to loan would be continuous variables which are more or less normally distributed. However, while all these variables are continuous, only interest rates demonstrated any affinity towards normality. Both ratio of amount received to amount requested and ratio of collateral to loan were sharply skewed. Their skewness, which proved immune to any transformation indicated that they are in fact or at least should be treated as categorical variables. Riding and Swift (1988) found that 50 percent of the women in their sample, as contrasted with only 20 percent of the men, were requested to provide over 300 percent of their loan as collateral. Consequently, a decision was made to treat ratio of collateral to loan as a binary variable. COL was assigned a value of zero if a firm was requested to provide up to 300 percent of its loan as collateral. Otherwise, if more than 300 percent of a firm's loan was requested as collateral, COL was coded as one.

Thornton (1981) found that 75 percent of the firms in his sample got either as much as or more than the amount of loan they requested for. Accordingly, in this study, REC was assigned a value of one if a firm got less than 90 percent of the loan it applied for and a value of zero otherwise. Interest rates had a relatively normal distribution.

From an operational perspective, loan rejections had to be examined separately from the other credit terms. Not every loan application was accepted; hence, measures of loan rejections would be excluded from any multivariate

analysis. However, it seemed reasonable to expect that the four remaining credit terms: requests for spousal co-signature, interest rates, ratio of collateral to line of credit and ratio of amount received to amount applied for were interrelated. Therefore, these were studied jointly.

A theoretical basis exists for examining loan turndowns separately. Terborg and Ilgen (1975) distinguish between *access* discrimination and *treatment* discrimination:

Access discrimination refers to nonjob-related limitations placed on an identifiable subgroup at the time a position is filled. Rejections of subgroup applicants for nonjob-related reasons.... [is a form] of access discrimination. ...[T]reatment discrimination refers to invalid differential treatment of subgroup members once they have gained access....(Terborg and Ilgen, 1975: 352-353).

Rejecting a loan application outright solely on the basis of gender may be seen as a type of access discrimination--the inability of women to secure access to credit on the same basis as their male counterparts. Gender-related differences in the remaining terms of credit: requests for spousal co-signature, rate of interest, ratio of collateral to loan and ratio of amount received to amount requested may be seen as treatment discrimination; that is, experiencing differential treatment though access was secured. Therefore, in this study, the dummy variable which expresses loan turndowns may be referred to as an *access* credit term. In contrast, the four remaining terms of credit (ratio of collateral to loan, ratio of amount received to amount requested, request for spousal co-signature and interest rates) may be referred to as *treatment* credit terms.

III.4.2

Structural Factors

Five sets of factors were used to represent business risk. They correspond to the five C's of commercial lending. Four of these: capacity, capital, collateral and conditions were corporate variables. Character had three separate subsets. One subset of measures of character represented the attributes of the financial manager. The second subset comprised attributes of the principal owner. The third subset included certain corporate attributes.

III.4.2.1

Capital

Capital is the amount of owners' equity investment in the business (Kao and Knight, 1987: 137). The higher the owner's personal investment in the business, the more favourable would be the terms and conditions of credit received. This is because the owner's investment is believed to reflect the faith that the entrepreneur has in the business. A high level of investment is indicative of the extent to which the owner is committed to running the business successfully. For it is clear that if the business fails, the owner likewise would lose the investment. Amount of initial liquid and marketable assets the owner injected into the business and ratio of owner's withdrawals or income relative to sales or retained earnings may serve as proxies for measuring capital (Lee, Personal Contact, 1989). Difficulty with obtaining precise financial data accounted for the use of form of business, number of owners and type of ownership as measures of capital in this study.

Form of Business

In her study of women entrepreneurs, Lavoie (1988) suggested that the legal status of a firm may affect its chances of obtaining a loan. Partnerships and corporations are believed to have a larger capital base than sole proprietorships. Consequently, partnerships and corporations are expected to receive better terms of credit than sole proprietorships. Hence, **PROP** was assigned a value of zero if a firm was a sole proprietorship and was assigned a value of one otherwise. If a firm was a corporation, **CORP** was assigned a value of zero; otherwise, it was assigned a value of one. Consequently, **PROP** and **CORP** were coded as one if the firm happens to be a partnership.

Number of Owners

Number of owners may be used to represent capital. **SOLE** was assigned a value of 0 if a firm has only one owner. Otherwise it was assigned a value of 1. Wynant and Hatch (1991) indicate that financial institutions have preference for firms with more than 2 owners and high growth rates. Accordingly, this study assigned a code of 0 to **OWNG2** if a firm has more than 2 owners and a value of 1 if the number of owners are less than 3.

Type of Ownership

Respondents were asked to indicate whether or not their firm was equally owned. However, the ratio of firms who provided such information to those who did not was rather low. Since Rosenbaum and Rubin (1986) had argued that the logistic regression model is capable of balancing even missing values. Therefore, to ensure adequate sample size, two dummy variables were used to express type of ownership. **YEQUAL** was coded as 0 if the firm had an equal ownership and as one either if the ownership is unequal or if the information was not available for the firm. **NEQUAL** was coded as 0 if the unequal ownership was reported for the firm or if not information about equality/inequality of ownership was given. This was meant to distinguish between first owners of unequally owned firms and first owners of equally owned firms.

III.4.2.2

Capacity

Capacity refers to the ability of the enterprise to generate enough cash flow towards the repayment of the requested funds (Kao and Knight, 1987: 137). In this study, annual level of sales and number of full-time equivalent workers were used as proxies for size. They were measures of the extent to which a firm was capable of repaying the loan demanded.

SALES represented the annual sales level of the firm. It had nine categories and was treated as a pseudo-continuous variable. **WRKR**, the logarithmic transformation of number of full-time equivalent workers, was the

alternative measure of size. Unlike sales, it was a continuous variable.

III.4.2.3

Conditions

Conditions refer to the proprietary nature of the product/services of the business, the extent to which the products/services are diversified, the size of the market and the overall economic climate. The proprietary nature of a business may be measured by the number of competitors the business has. The greater the number of competitors, the more non-proprietary would be the products/services offered by the business, the higher would be the assessment of risk and the worse would be the terms of financing. Three sets of variables were used to represent conditions in this study. These include: the average rate of annual growth in sales, the industrial sector and the geographical location.

Riding and Swift (1988) found that women-owned firms grew less quickly than those of men. Also, Haines, Riding and Thomas (1989) found that rates of loan rejections was highest for those firms with declining growth rates. Using the logistic regression model of loan rejections by Haines, Riding and Thomas (1989) it should be useful to determine whether loan rejections still differ between women and men after rate of growth has been controlled for. Jankowitz and Hisrich (1987) indicated that loan officers prefer stable, conformist behaviour. At the same time Wynant and Hatch (1991: 128) found that loan officers seek to expand their share of the small business financing market among those firms with more than two owners, large volume of sales and a high growth rate. Therefore, it will be determined whether there is a variation in the credit experience of firms

with different rates of growth.

Consequently, the average rate of annual growth was represented by four dummy variables. **DECLIN** was assigned a coding of zero if the firm has experienced a declining rate of growth that is less than -5 percent; otherwise it was assigned a coding of one. **GREW** was coded as zero if the firm has experienced a moderate rate of growth of between 6 and 20 percent; otherwise it was coded as one. **GREWM** was coded as 0 if the firm has experienced substantial growth of greater than 20 percent. Otherwise it was coded as one. **DECLIN**, **GREW** and **GREWM** were coded as one if the average rate of annual growth has been relatively stable (between -5 and +5 percent).

Several studies indicate that industrial sector play a role in determining credit terms (Riding and Swift, 1988; Lavoie, 1988; Haines, Riding and Thomas, 1989; Wynant and Hatch, 1991). For example, Haines, Riding and Thomas (1989) found for instance that the likelihood of loan rejection was lower for firms that are in the manufacturing sector. Wynant and Hatch (1991) also found that bankers are reluctant to lend to firms in the retailing and service sectors, sectors which have few pledgable assets.

Thornton (1981), and Wynant and Hatch (1990) argue that firms in the manufacturing sector differ on several dimensions from those in other sectors. At the same time, past research indicates that firms in the retailing and service sectors are different from those in manufacturing and other sectors (Riding and Swift, 1988; Lavoie, 1988; Wynant and Hatch, 1991). Therefore, to examine manufacturing alone as a dummy variable could obscure the effect of being in

different sectors.

Consequently, three dummy variables were used to approximate distribution by industrial sector in reality. **MFG** was coded as zero if the firm is in the manufacturing sector. Otherwise, **MFG** was coded as one. Women business owners are believed to be concentrated in the retail and services sectors - sectors with few pledgable assets. Consequently, **RETAIL** was coded as zero if a firm was in the retail sector and was coded as one otherwise. **SERVE** was coded as zero if a firm was in the service sector and was coded as one otherwise. In all, a coding of one was assigned to firms in mining, construction, wholesaling, forestry and transportation²².

Collom argued that women business owners in rural areas may receive less favourable credit terms than their counterparts in cities. Geographical location has also been used as a proxy for market size (Thornton, 1981). It was thus of tremendous importance whether an interaction effect between gender and credit terms would be found and/or whether geographical location would be a good indicator of market size. Moreover, economic conditions differ from one area in Canada to another. Inclusion of the geographical location variables was used to measure this variety. **S_TOWN** was coded as zero if the firm was located in a rural area or small town (less than 10,000 people). Otherwise, it was coded as one. **S_CITY** was coded as zero if the firm was located in a small city (between 10,000 and 100,000 people).

²²Initially, a dummy variable was used to express each of eight different industries. However, empty cells created serious error problems. Moreover, as per Stevens (1986), scientific parsimony encouraged the inclusion of as few number of variables as is needed.

Otherwise it was coded as one. CITY was assigned a coding of zero if the firm was located in a medium sized city (between 100,000 and 500,000 people and was assigned a coding of one otherwise. Therefore, a coding of one was assigned to all three of S_TOWN, S_CITY, and CITY if the firm is located in a big city (more than 500,000 people).

Lee (1989) has argued that loan officers often face difficulty in assessing the riskiness of high technology firms. Given the high volatility of the high technology industry, he projects that firms in such sectors may be assessed similarly as firms in the retailing and service sectors. To determine the extent to which this perception is true, two variables which express the high technology nature of the firm were included in the regression models. Respondents were asked to rate on a scale of one to nine, the extent to which their process of production is dependent on high technology. They were also asked to indicate on a similar scale of one to nine, the extent to which their product or service is of the genre of high technology. **PROD** is an interval scaled variable which was used to measure the extent to which the product or service of a business is of high technology genre. **PROC** is used to represent the rating of respondents on the extent to which the process of production of their business is based on high technology.

III.4.2.4Character

Character is usually used to refer to the financial and managerial background, training and skills of the entrepreneur (Jankowitz and Hisrich, 1987; Kao and Knight, 1987: 137). However, Wynant and Hatch (1991) indicates that it may be used to refer to corporate attributes as well. They suggest that age of business, may be used to measure the track record of the enterprise. The questionnaire requested information about age of the business. However, the raw distribution of age was skewed to the right. Therefore, to meet the assumptions of the statistical techniques used, the logarithmic transformation of age was used in this study.

Financial background refers to the credit track record of the entrepreneur. The better the credit rating of the entrepreneur, the more favourable would be the assessment of her/his character. Consequently, the better the terms of credit that would be received. Track record may be measured by the amount of times the entrepreneurs have gone over the limit of the line of credit or has failed to pay back loans on time.

On the questionnaire, to collect information about track record, respondents were asked to indicate whether or not they have ever exceeded the limit of their line of credit. They were also asked to indicate whether or not (for any reason) they had not paid back their loans on time. **EXCEED** was assigned a value of one if the owners of the enterprise had ever exceeded the limit of their line of credit. Otherwise it was assigned a value of zero. **DEFAULT** was assigned

a value of one if the owner(s) had ever defaulted on a term loan. It was expected that firms that had exceeded the limits of their lines of credit and/or that had defaulted on previous loans would receive more stringent terms of credit than their counterparts.

Managerial background refers to the experience the owner has had in running the business or similar types of businesses. The literature suggests that the more experience the entrepreneur has had, the stronger is the perception that the business is unlikely to fail, the less would be the assessment of risk and the better would be the terms of credit financing. If, however, the entrepreneurs have not had sufficient experience in running the business or others similar to it, the higher would be the perceived risk associated with the credit application and the more stringent would be the conditions of credit financing. Thus, it is vital to examine the impact of years of managerial experience on credit terms. More so, given that past research indicates that women entrepreneurs are generally not as experienced as their male counterparts.

On the questionnaire, up to three principal owners were asked to give an indication of the number of years of managerial experience that they had. However, for ease of analysis, only the number of years of managerial experience that the first owner has had was considered. The distribution of this continuous variable was somewhat skewed. Among various transformations, the square root of years of managerial experienced was the closest to a normal distribution; therefore, it was adopted in this study.

YEARS1 represents the years of managerial experience of owner in subsequent analyses. Managerial experience has been noted as a potential predictor of credit terms. In previous studies, age has often been used as proxy for managerial experience. It would seem that age of business and years of managerial experience are strongly correlated. Still, it would be of interest to determine whether the two variables have differing impact on credit term.

The literature suggests that level of education completed may have an influence on how character is assessed. Women entrepreneurs are generally believed to have completed more years of education than their male counterpart. At the same time, there is a perception that this education tend to be in the liberal arts rather than the professions. This study examined the number of years of education which the entrepreneur completed as one of the measures of attributes of first owner. **EDUC_1** had six categories according to the level of education completed. On the questionnaire, the principal owners were asked to indicate whether they had some high school, had obtained high school diploma, had completed some university or college, had obtained a college degree, had obtained an undergraduate degree or had obtained a graduate degree. This six categories of items were treated as a pseudo-continuous variable.

If a loan applicant has experience in financial management, the risk of the business failing would be reduced even further. Not only would the loan applicant be more conversant with lending procedures, loan officers would also anticipate that the requested funds would be well managed. Thornton (1981) found that firms with full-time financial managers are less likely to have their

loans rejected than firms without. Depth of financial management was also included in this study as a measure of character. **FMGR** was coded as one if at least one principal owner or a financial manager had professional accounting designation. Respondents were also asked to indicate the employment status of their financial manager. **FULL** was coded as zero if the respondent indicates that their financial manager is engaged on a full-time basis. **PART** was coded as zero if a respondent reports that the financial manager is part-time. Otherwise it was coded as one. A number of respondents indicated that they had alternative employment arrangements. A value of one was assigned to both **FULL** and **PART** in such cases.

Since most owners are often full-time workers for their firms, the identity of the financial manager was felt to be of crucial importance. Owners who may be engaged with several managerial functions may report on the questionnaire that they manage the financial function on a full-time basis when in fact, they do so on a part-time basis. A value of zero was assigned to **OWNFG** if the financial manager also happens to be an owner. Otherwise a value of one was assigned. A value of zero was assigned to **OUTFG** if the firm contracts out its services to an outside accounting firm. Otherwise, **OUTFG** was coded as one. Both **OWNFG** and **OUTFG** were coded as one if the financial manager is an employee who is not an owner.

It was important to include these foregoing variables for several reasons. If the number of owners that a firm has are many, then some benefits may

be reaped if one owner concentrates mainly on the financial function. However, to the extent that an owner who has other functions (marketing, selling, production and human resources management), performs also the financial function, the latter may receive inadequate attention. This could have an adverse effect on credit terms. FULL was assigned a value of zero if whoever performs the financial function does so on a full-time basis and was assigned a value of one if the financial manager is hired on a part-time basis or if the firm had an alternative arrangement. PART was assigned a value of zero if the financial manager is engaged on a part-time basis and as one if the firm had an alternative arrangement or if the financial manager is full-time. Ordinarily, only one dummy variable would have been used to model employment status. However, given that about 212 firms indicated that they had alternative financial arrangement, another dummy variable was added to express having neither full-time or part-time status but an alternative financial arrangement.

Previous research indicates that the size of small firms often make it impossible for them to hire a professional financial manager especially if they themselves do not have sufficient familiarity with the financial function. In the cases in which an owner is also a financial manager, the gender of the manager becomes just as relevant as the gender of a principal owner. Consequently, gender of the financial manager was included among the potential determinants of credit terms.

Perceptions about the Role of the Banker

Eighteen variables, each on an interval scaled from one to three, were used to measure the perceptions of entrepreneurs about the functions of financial institutions. Whereas, each of nine variables rated the importance of a particular function to entrepreneurs, each of the remaining nine variables rated the extent to which entrepreneurs were satisfied with the performance of an expected role. Thus, there were nine pairs of variables on: knowledge of business, provision of helpful business advice, provision of credit capital, range of services, approachability of the account manager, being made comfortable, being treated with respect and provision of venture capital²³.

III.4.2.5

Collateral

Among the other specific objectives of this study is to determine the extent to which collateral and capital differ between women and men borrower groups. In their 1988 study, Riding and Swift found that fifty percent of the women entrepreneurs as compared to only twenty percent of the men were requested to provide over 300 percent of their line of credit as collateral. None of the variables in their model: level of sales, annual rate of growth, legal status, geographical location, industrial sector and number of workers could explain this particular gender-related difference.

²³Given the narrow scaling of the independent variables and the binary nature of the dependent variable, logistic regression seemed again the propitious technique for estimation.

There are two possible explanations for the finding: either it was a statistical anomaly or it hints at gender-based differences in asset structure. Women entrepreneurs have been found to concentrate in retailing and services, sectors with few pledgable assets. While the inventories carried by such businesses may have high purchase value assuming on-going concern, they may not be as valuable in the event of liquidation or business failure. That is, the book value could differ substantially from their market value. Thus, a high volume of such assets may be needed to meet the associated risk. Consequently, it may appear that women face a higher ratio of collateral to loan than men entrepreneurs. Moreover, women entrepreneurs may tend to depend highly on personal assets as collateral because of the newness and smallness of their businesses as indicated by past research. To the extent that such personal assets are shared, they may be viewed as more risky than business collateral. Therefore, not only may more of such assets be requested as security, the associated riskiness may result in an expectation for spousal co-signature.

Although, asset structure may be correlated with industrial sector, size and age, it may also be mitigated by other factors. Such factors as capital base (number of owners) were not controlled for in the study by Riding and Swift (1988)²⁴. This makes it valuable to investigate whether asset structure differ substantially between women and men entrepreneurs, especially, in the case that

²⁴Riding and Swift controlled for legal status of a business with the understanding that corporations and partnerships tend to have a larger capital base than sole proprietorships. However, sole ownership is not restricted to sole proprietorships alone; some incorporated businesses could be sole owners as well. Thus, among other factors, the effect of legal status could have been confounded with the number of owners in the study by Riding and Swift. This could be an additional reason why 50 percent of the women, in contrast to 20 percent of the men were required to provide over 300 percent of their loan as collateral.

a significance difference in ratio of collateral to loan is discovered once again.

On the questionnaire, respondents were asked to indicate whether or not twelve assets were available to them as collateral. Eight of these assets are business assets while the remaining four are personal assets. The business assets include: accounts receivable, inventory, office equipment, machinery, bonds and securities, real estate, automobile and other assets. The four types of personal assets are: automobile, real estate and bonds and securities. The null hypothesis that was tested was that the number and type of assets owned would be similar for men and women entrepreneurs. The alternative hypothesis was that women-owned firms would have a less diversified asset structure than men-owned firms.

Multivariate analyses presuppose adequate sample sizes. The original intention of this study was to examine gender-related differences in each type of assets available while controlling for other types of assets. However, the ratio of respondents to non-respondents was relatively low. While this would seem to make multivariate analyses irrelevant, it offered interesting possibilities. Rosenbaum and Rubin (1986) have argued that the logistic regression model has the capacity to balance covariates for which a large number of subjects in a study have missing values. A decision was made therefore to treat each non-response as a missing value rather than to eliminate it from the analysis. This coding structure has the capacity not only of identifying differences in types of assets available to women versus men owned firms, it can also determine the extent to which women entrepreneurs tend to be non-respondents than men entrepreneurs. Provision of financial information has been argued to have an effect on terms of

credit. If women are more reluctant to provide financial information about their businesses, this may affect the terms of credit they receive as well.

A value of zero was assigned to **YACCT** ($Yacct=0$) if the firm had accounts receivable as collateral and was assigned a value of one otherwise ($Yacct=1$). In contrast, **NACCT** was assigned a value of zero if the firm does not have accounts receivable as collateral. **YACCT** and **NACCT** were both assigned a value of one if the firm did not indicate whether it had accounts receivable as collateral or not. A value of zero was assigned to **YINV** if the firm had inventory as collateral and was assigned a value of one otherwise. A value of zero was assigned to **NINV** if the firm does not have inventories available as collateral. Both **YINV** and **NINV** were assigned values of zero if the firm did not indicate whether it had inventories available as collateral or that it did not. **YOFEQ** was assigned a value of zero if the firm had office equipment as collateral and was assigned a value of one otherwise. **NOFEQ** was assigned a value of zero if the firm indicated that it did not have office equipment available as collateral. **YMACH** was assigned a value of zero if the firm indicated that had machinery available as collateral and was coded as one otherwise. **NMACH** was assigned a value of zero if the firm indicated that it did not have machinery available as collateral and was assigned a value of one otherwise. **YBREA** was assigned a value of zero if the business had business real estate available as securities and a value of one otherwise. **NBREA** was assigned a value of zero if the firm indicated that it did not have business real estate available as collateral. **YBBON** was assigned a value of zero if the business indicated that it had business bonds

and securities available as collateral. Otherwise it was assigned a value of one. **NBBON** was assigned a value of zero if business bonds and securities were not available as collateral. **YBELS** was assigned a value of zero if the firm reported having other business assets available as collateral and a value of one otherwise. **NBELS** was assigned a value of zero if the firm did not have other business assets available as collateral. **YBAUT** was assigned a value of zero if the firm had business automobile available as collateral, otherwise it was assigned a value of one. **NBAUT** was assigned a value of zero if the firm did not have business automobile available as collateral. **YPAUT** was assigned a value of zero if the owners of the firm had personal automobile available as collateral; otherwise it was assigned a value of one. **NPAUT** was assigned a value of zero if the owners did not have personal automobile available as collateral and was assigned a value of one otherwise. Similarly, **YPREA** was assigned a value of zero if the firm had personal real estate as collateral and was assigned a value of one otherwise. **NPREA** was assigned a value of zero if the firm did not have personal real estate available as collateral. A coding of zero was assigned to **YPBON** if the firm did not have personal bonds and securities; otherwise it was assigned a value of one. **NPBON** was assigned a value of zero if the firm did not have personal bonds and securities available as collateral. Otherwise, it was assigned a value of one. A value of zero was assigned to **YPELS** if other personal assets were available as collateral and a value of one otherwise. A value of zero was assigned to **NPELS** if the firm did not have other personal assets available as collateral. Therefore, overall, a coding of one was assigned if no indication is given that a firm had a

particular asset or that it did not. In all cases, a value of one was assigned to each of the 24 dummy variables enumerated above if the respondent gave no response to the question asking about the type of asset it represents.

Type of Financial Institution

The literature suggests that the type of financial institution approached for lending may affect the term of credit received. Yet, no study to date has actually investigated the impact of type of financial institution on credit terms. This could be because type of financial institution approached may be correlated with age and size of business. Younger and smaller firms may be more likely to approach young financial institutions for their credit needs as well. However, such association has not been subjected to empirical investigation in the past. Moreover, even if type of financial institution, age and size are correlated, each may still affect terms of credit differently after other factors have been controlled for. This study collected information on type of financial institution approached for lending. **CDNC** was coded as zero if the owners of a firm filed their application with a Canadian chartered bank. Otherwise, it was coded as one. **OCHA** was coded as zero if the firm had approached a non-Canadian chartered bank for its loan. Otherwise it was coded as one. It was included to determine whether foreign chartered banks offer different terms of credit from Canadian financial institutions. **TRUST** was coded as zero if the loan application was filed with a trust company. Otherwise, **TRUST** was coded as one. **CRED** was coded as zero if the owners approached a credit union or a caisses populaires for their

credit needs. **CDNC**, **OCHA**, **TRUST**, and **CRED** were all coded as one if the owners approached friends or relatives for their credit needs. It would be of interest to compare the credit terms obtained under such circumstances to those obtained from financial institutions.

Each of the three samples of firms served two distinct but related functions. Their first purpose is that of cross-validation: the time resources available to this study did not permit a thorough cross-validation of each of the regression equations obtained. Performing the same analyses on three related but different subsets of the data served as a crude measure of the extent to which the variables that proved significant are stable. The second function to be served by the three types of firms is related to the first: it was essential to determine whether or not different variables would prove to be significant with each group of firms.

Gender of the Owner

Three different types of firms were of interest to this study. The first type included all firms irrespective of the type of ownership. Since this type of firm extends to practically all small businesses, it would seem to guarantee adequate power for this study. The second group excludes firms that are jointly and equally owned by women and men. The first owners of this second group conform most closely to the term 'principal owners' as has been used in previous research. Thus, to ensure consistency with past research, this second group should be investigated. The third group of firms excluded all firms that are

jointly owned by women and men. That is, involved only those firms whose owners are all of the same gender. This sample would seem to be the one most pertinent to this study as it obviates any confounding effect of joint female and male ownership. However, predictably, the size of its membership would be smaller than that of each of the other two groups of firms.

Type of Loan

Haines, Riding and Thomas (1989) argue that credit terms may vary according to type of loan. Consequently, this study included loan type among its analysis. **TERM** was coded as zero if the loan involved is a term loan. Otherwise, **TERM** was coded as one. **INCRE** was coded as zero if the loan application involved an increase to an existing line of credit. Otherwise **INCRE** was coded as one. Both **TERM** and **INCRE** were coded as one if a firm had applied for a new line of credit. To ensure adequate sample sizes, both **TERM** and **INCRE** were treated as covariates almost all of the analysis which follow. Only in the case of analyses involving initial gender-based differences in credit terms was each type of loan considered separately.

Variables Forced into the Regression Models

Variables which were forced into the different models for logistic regression and multiple linear regression include those which have been investigated by past research as pertinent. Such variables include depth of financial management, whether or not the firm is equally owned, type of loan, average annual rate of growth, type of loan, industrial sector, level of sales, number of full-time equivalent workers, form of business, geographical location and age of business²⁵.

III.5. METHODOLOGY

The original intention of this study was to use traditional multiple linear analysis of variance or multivariate linear regression to determine factors influencing terms of credit. Multivariate linear regression could simultaneously consider the correlations among credit terms and measures of business risk. Consequently, it could eliminate redundancies. At the same time, it is based on the concept of linear combinations. Therefore, the role that is played by each factor of business risk in credit decision-making could be more readily determined. Multivariate analyses of variance demand, not only that all the variables be normally distributed but that they should also be multivariate normal (Stevens, 1986). While it is true that such assumptions cannot be adhered to

²⁵A list of all variables used is in Appendix III.C.

completely in reality, the categorical nature of four of the dependent variables in this study limit the relevance of a traditional multivariate analysis of variance.

Multivariate techniques which may be used to test the association between a binary dependent variable and a set of independent variables include multiple regression analysis and multivariate discriminant analysis. However, as Norusis (1990) has argued, both are unsuitable for analyzing four of the five credit terms outlined above. In the case of multiple linear regression, when the dependent variable is a binary or a dichotomous variable, the distribution of errors are not normal. Likewise, 'predicted values cannot be interpreted as probabilities'. (Norusis, 1990: 45)²⁶.

While multivariate discriminant analysis can use a binary dependent variable as a grouping variable, it is sensitive to the normality assumption central to its model (Stevens, 1986; Hosmer and Lemeshow, 1989; Norusis, 1990). As has been shown in a previous section, several independent variables influence credit terms). However, while, some of these variables are continuous, the majority are categorical. Clearly, to determine the association between them and the loan turndown decision, a technique which was robust against the normality assumption was required.

Furthermore, even if a technique which is robust against the normality assumption could be found, loan rejections had to be examined separately from

²⁶Flury and Riedwyl (1985) have argued that the multiple regression function is proportional to the linear discriminant function. This somehow tempers Norusis' argument that the distribution of errors with multiple linear regression is not normal. Nonetheless, linear discriminant function would be sub-optimal if the normality assumption is not met. Being only proportional to the linear discriminant function, the multiple linear regression would be even less reliable.

the other dependent variables. This is because firms whose loans were rejected did not report values for ratio of collateral to loan, ratio of amount received to amount requested, request for spousal co-signature and interest rates. However, the technique which the literature indicates is most robust against the normality assumption--the logistic regression model--can only predict one dependent variable from a set of independent variables. Consequently, in determining factors influencing terms of credit, it makes intuitive sense to conduct a separate multivariate analysis for each credit term. However, through the use of two sets of propensity scores, efforts were also made to conduct a complete multivariate analysis.

This study used four different techniques to investigate the association of gender, business risk and credit terms. The four methods include logistic regression, multiple linear regression, subclassification on propensity score, and logistic regression analysis of covariance with propensity scores. To an extent, logistic regression, subclassification on propensity scores and logistic analysis of covariance on propensity scores share many similarities. How they differ will be discussed in subsequent sections.

Logistic regression was used to achieve three specific objectives. First, it was used to examine initial differences in credit terms between women and men borrower groups. Second, it was the method employed to identify structural gender-based differences in business attributes. In these two respects, it was also instrumental in calculating propensity scores--which are central to this study. Third, logistic regression was used to determine factors influencing loan

rejections, ratio of collateral to loan, ratio of amount received to amount requested and requests for spousal co-signature. However, multiple linear regression was utilized to analyze the association between interest rates and measures of business risk. Subclassification and logistic regression analysis of covariance were used to determine whether or not gender-based differences in credit terms persist after structural differences have been eliminated.

III.5.1

Logistic Regression

Logistic regression is a multivariate technique which may be used to determine the association between a binary dependent variable and several independent variables which are measured on different scales. It is robust against the normality assumption and permits the use of independent variables on different scales. Also, it takes correlations among the independent variables into account. Therefore, it satisfies a basic requirement of a complete multivariate model, namely, it employs the principle of linear combinations where association among several variables are considered. Hence, it has the potential of emerging with a more realistic analysis of credit terms. A detailed discussion of the general formula of a logistic regression model is in Appendix III.D. Also included are details of the specific equations of the logistic regression models on which this study is based.

Unlike multivariate analysis of variance, logistic regression can only consider one dependent variable rather than several dependent variables. This makes it the analogue of multiple linear regression, for binary data. However, as

Hosmer and Lemeshow (1989) have argued, it has the same capabilities as multivariate linear analysis of covariance. This is because, other dependent variables can be treated as the covariates or independent variables of a particular dependent variable.

Logistic regression was used to achieve three specific objectives. First, it was used to examine initial differences in credit terms between women and men borrower groups. Second, it was the method employed to identify prior differences between women and men borrower groups. In these two respects, it was also instrumental in calculating propensity scores--a central tool of this study. Third, it was used to determine factors influencing loan rejections, ratio of collateral to loan, ratio of amount received to amount requested and requests for spousal co-signature. However, multiple linear regression was utilized to examine the association between interest rates and measures of business risk.

III.5.2

The Propensity Score

Subclassification on propensity scores and logistic analysis of covariance are techniques which are closely related to the logistic regression model. As defined by Rosenbaum and Rubin (1986), the propensity score is the expected probability of assignment to a particular treatment group given an observed set of covariates. Two different sets of propensity scores were calculated in this study. The first propensity score is the probability that the first owner of a firm is female given certain measures of *business risk or business attributes*. The second propensity score is the probability that the first owner of a firm is female

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improvement of patients after prior differences had been eliminated. To this end, first, the logistic regression model was used to estimate the propensity scores on 74 initial characteristics of the two groups of patients. Second, the probabilities of survival and functional improvement were estimated²⁷. Third, surgical and medical patients were divided into five classes using the quintiles of the propensity score of the 74 initial characteristics. Fourth, the means of the estimated probabilities for each of survival and functional improvement were calculated for each group within each subclass. Fifth, the overall average treatment effect for each of survival and functional improvement were compared.

Similarly, in this study, the logistic regression model was used to calculate two separate sets of propensity scores. The first set of propensity score was based on measures of business risk, business attributes or *initial characteristics*. It was this set of propensity score that was divided into five subclasses. The subclassification was based on the quintiles of the propensity scores of business attributes. Two borrower groups, female and male, were represented in each subclass. This study aimed to test the effect of gender of owner(s) on credit terms. Consequently, the second set of propensity scores involved credit terms. It has been shown that the effect of gender on loan turndowns has to be determined separately from the effect of gender on the four *treatment* credit terms. Therefore, one subset of the second set of propensity scores on credit

²⁷ Rosenbaum and Rubin did not specify the method that they used to calculate the estimated probabilities for each of survival and functional improvement. However, it is possible that they used the logistic regression model. This guess may be justified because 1) the other name for the propensity score is estimated probability and 2) the logistic regression model is most suitable for estimating probabilities of a large number of subjects.

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terms was restricted to rejections of new lines of credit²⁸. The other subset of propensity scores on credit terms included ratio of collateral to loan, ratio of amount of credit received to amount of credit requested, interest rates and requests for spousal co-signature. The differences in the unweighted means of the propensity scores of each of loan turndowns and the four treatment credit terms were then pooled and examined for significance using the two-tailed Z-score test.

It should be noted that Rosenbaum and Rubin (1986) treated survival and functional improvement as two separate variables. Thus, their analysis was akin to two separate multiple linear regression models. This study also considered the *access* and the four *treatment* variables separately; therefore, the analysis of the likelihood of rejections of new lines of credit was an analogue of multiple linear regression. However, the analysis of the four *treatment* variables was similar to multivariate analysis of variance because four variables were examined *jointly rather than separately*.

The function performed by subclassification on the propensity score in this study is similar in intent to that of randomization in experimental studies. The propensity score should balance identifiable prior differences between the treatment and control group on the covariates in the model developed here. However, unlike randomization, it cannot control for covariates that are not included in the working model--unless these happen to be correlated with the

²⁸As the chapter on results would show, gender-based differences in the likelihood of loan rejections were significant only for new lines of credit. No gender-based differences were found in loan turndowns when no distinction was made among loan type, and when term loans and increases in lines of credit were examined individually. Therefore, only rejections of new lines of credit were considered for the technique of subclassification.

observable covariates (Rosenbaum and Rubin, 1984: 516).

III.5.4 Logistic Analysis of Covariance with Propensity Score

Subclassification on propensity scores is akin to multivariate analysis of variance. However, since it involves the comparison of group means as opposed to actual scores, its results are not always optimal. Rosenbaum and Rubin (1986), the initiators of the technique suggest five groups as the ideal subclassification of the propensity scores. However, in this study, such subclassification resulted in inadequate proportions in certain cases. As the results section would show, in some cases only one woman could be compared to 60 or more men. This made it impossible to determine the standard errors for the female borrower group and therefore, defeated the intended purpose of subclassification. In fact, in some cases, no conclusion could be drawn from subclassification because standard errors could not be calculated. It would have been prudent to use fewer number of subclasses (based on quartiles or tritiles) to compare female versus male borrower groups. However, the results of the comparison would be poorer in such a case, because markedly different classes of firms may be grouped together.

Therefore, in this study, logistic analysis of covariance of credit terms *and* the propensity scores of business attributes or initial characteristics was deemed a more reliable technique. The method controlled for gender-based differences on measures of business risk because the propensity score of business attributes was treated as a single variable. Moreover, the technique involved the actual scores on credit terms directly. Therefore, unlike subclassification on propensity

score, logistic regression analysis of covariance is not restricted by unequal proportions. Finally, since it is a variation of the logistic regression model, there is a sound theoretical basis for its use.

III.5.5 Multiple Linear Regression Analysis

The objective of using a multivariate linear regression model is to predict or explain several dependent variables from a set of independent variables. An initial aim of this study was to use multivariate analysis to determine how women and men borrower groups differ on credit terms using measures of business risk as determinants. After all, low scores on one independent variable may be offset by high scores on other independent variables. Likewise, a stringent term of credit may balance a more favourable term. For instance, a first owner may be required to provide spousal co-signature (an unfavourable credit term) however, she may also be charged a lower interest rate (a favourable credit term). Hence, the need to consider independent and dependent variables in one single multivariate analysis.

However, many of the variables in this study violated some of the basic assumptions of traditional multivariate analysis. As a consequence, each credit term was examined separately rather than jointly while determining factors influencing terms of credit. The variable representing rates of interest met the normality assumption of the multiple linear regression model. Therefore, multiple linear regression was used to analyze factors influencing rates of interest charged on loans. In contrast, logistic regression was used to determine factors

influencing the remaining four credit terms: loan turndowns, ratio of collateral to loan, ratio of amount of loan requested to amount received, and requests for spousal co-signature.

IV.

RESULTS

This chapter is divided into four sections. The first section discusses the results of structural gender-based differences in business attributes. The second section focuses on gender-related differences in credit terms prior to the elimination of structural differences. The third section discusses the results of two separate approaches which used propensity scores to control for structural differences while analyzing credit terms. The fourth section is also concerned with the elimination of structural differences. However, it focuses largely on factors influencing each term of credit. Appendix IV.A contains summary tables to aid with interpretation of each of the sections.

IV.1 DIFFERENCES IN BUSINESS ATTRIBUTES

The results of analyses of structural gender-based differences in business attributes are summarized in Tables IV.1.1 to IV.1.3. Tables IV.1.1 and IV.1.2 are similar in all but two respects. They both involve the results of the logistic regression model of the relationship between gender and structural factors. However, the analyses on which the results of Table IV.1.1 are based did not include dummy variables which express the different types of assets available as collateral. Moreover, the analyses outlined in Table IV.1.1 involved all loan applicants. In contrast, the analyses of the results which are presented in Table

IV.1.2 considered types of assets among other structural factors. Furthermore, these second set of analyses on structural differences considered only those firms whose loans were accepted. This is because information on types of assets was not available for those firms whose loans were rejected. Table IV.1.3 presents the results of analyses involving perceptions of the role of the banker.

Both of the techniques of subclassification and logistic analysis of covariance depend on the results that are presented in tables IV.1.1 and IV.1.2 of this section. The variables which proved to be most closely associated with gender of owner(s) were used to estimate the propensity scores of structural factors or business attributes. The propensity scores of structural factors (*without the asset variables*) were instrumental in analyzing residual differences in loan turndowns. The propensity scores on structural factors (*with the asset variables*) were used to explain multivariate residual differences in credit terms.

IV.1.1 Structural Differences (Without Asset Variables)

As shown in Table IV.1.1, the structural factors which seemed to be associated with gender included: type of loan, level of sales, industrial sector, level of education, years of managerial experience, identity of the financial manager, number of owners and number of workers, prior to inclusion of dummy variables expressing types of assets available as collateral.

Table IV.1.1 demonstrates that women were more likely than men to have applied for term loans, to report low volume of sales, to be concentrated in the retail sector, to have had more education, to have had fewer years of managerial

Table IV.1.1 Structural Differences (Without Asset Variables)

Variable	First Sample (N = 1289) (Female = 324; Male = 965) (Frating = 37.04%) ²⁷ (Mrating = 92.85%) (Overall = 78.82%) (-2LL = 0.9941) ²⁸ (Model = 0.0000) (Improve = 0.0094) (Goodness = 0.0086) (Residual = 0.1824)			Second Sample (N = 934) (Female = 250; Male = 684) (Frating = 45.60%) (Mrating = 91.08%) (Overall = 78.91%) (-2LL = 0.9816) (Model = 0.0000) (Improve = 0.0184) (Goodness = 0.0797) (Residual = 0.4309)			Third Sample (N = 864) (Female = 237; Male = 627) (Frating = 47.68%) (Mrating = 90.43%) (Overall = 78.70%) (-2LL = 0.9862) (Model = 0.0000) (Improve = 0.0237) (Goodness = 0.3111) (Residual = 0.6615)		
	Beta (Log of Odds)	S.E.	Exp (B) (Odds Ratio)	Beta (Log of Odds)	S.E.	Exp (B) (Odds Ratio)	Beta (Log of Odds)	S.E.	Exp (B) (Odds Ratio)
Constant	4.09	0.57		2.10	0.58		2.21	0.66	
TERM	-0.31	0.15	0.73	-0.40	0.18	0.67	-0.35	0.19	0.71
SALES	-0.13	0.06	0.88	-0.21	0.05	0.81	-0.24	0.06	0.79
RETAIL	-0.79	0.21	0.45	-0.50	0.18	0.61	-0.53	0.18	0.59
EDUC_1	0.12	0.05	1.13	0.17	0.06	1.19	0.14	0.06	1.15
YEARS1	-0.53	0.07	0.59	-0.58	0.08	0.56	-0.60	0.08	0.55
OWNFG	-0.65	0.21	0.52	-0.65	0.24	0.52	-0.68	0.25	0.51
SOLE	-0.73	0.15	0.48	-0.50	0.21	0.61	-0.52	0.23	0.59
PROD	-0.15	0.04	0.86	-0.19	0.05	0.83	-0.22	0.05	0.80
OWNG2				1.01	0.39	2.75	1.28	0.49	3.59
WRKR	-0.53	0.23	0.59						
MFG	-0.62	0.28	0.54						
SERVE	-0.52	0.23	0.60						

experience, to be their own financial managers, to be sole owners, to have products or services that were not of the genre of high technology, to have fewer than three owners and to have fewer workers. The odds ratios for **MFG** and **SERVE** in the first equation, indicate that besides retailing, women were more likely to be found in manufacturing and services than in other sectors.

²⁷Frating, Mrating and Overall refers to the number of female, male and overall cases that were correctly predicted by the logistic regression model.

²⁸Each of 1) -2LL, 2) Model, 3) Improvement, 4) Goodness and 5) Residual refers to the respective level of significance of

- 1) -2 Log Likelihood chi square,
- 2) the Model chi square,
- 3) the Improvement chi square,
- 4) the Goodness-of-fit chi square and
- 5) the Residual chi square respectively.

Apparently, women were under-represented in traditionally masculine sectors. However, they had increased their involvement in the manufacturing sector.

Across the three different samples examined, the variable which seemed to be most closely associated with gender was years of managerial experience, significant at the 0.00001 level. Other factors which proved consistent across the three different definitions of gender were: type of loan, level of sales, whether the firm is in the retail sector, level of education completed, whether or not the financial manager was an owner, whether or not the firm had only one owner and the extent to which the product(s)/service(s) of the firm could be classed as high technology. Also, whether the firm had more than two owners proved significant in the second and third equations. This indicated that gender-based differences in **capital** was more acute in these two cases. Only in the case of the first sample was it found that gender was also related to the number of full-time equivalent workers, whether the firm was in the manufacturing sector and whether the firm was in the service sector.

IV.1.2 Structural Differences (With Asset Variables)

Table IV.1.2 reveals similar patterns of structural differences, following inclusion of variables which expressed the type of assets available as collateral. Overall, the variables which seemed to be related to gender were: type of loan, level of sales, industrial sector, years of managerial experience, identity of the financial manager, type of assets available as collateral, extent to which product was of the genre of high technology, level of education, number of owners and

average annual rate of growth.

Table IV.1.2 **Structural Differences (With Asset Variables)**

	First Sample (N = 1189) (Female = 297; Male = 892) (Frating = 43.77%) (Mrating = 93.16%) (Overall = 80.82%) (-2LL = 0.9991) (Model = 0.0000) (Improve = 0.0406) (Goodness = 0.0087) (Residual = 0.4744)			Second Sample (N = 866) (Female = 229; Male = 637) (Frating = 50.22%) (Mrating = 90.89%) (Overall = 80.14%) (-2LL = 0.9986) (Model = 0.0000) (Improve = 0.0356) (Goodness = 0.0642) (Residual = 0.8762)			Third Sample (N = 800) (Female = 217; Male = 583) (Frating = 49.31%) (Mrating = 91.08%) (Overall = 79.75%) (-2LL = 0.9972) (Model = 0.0000) (Improve = 0.0000) (Goodness = 0.5096) (Residual = 0.5339)		
<u>Variable Entered</u>	<u>Beta</u> <u>(Log of</u> <u>Odds)</u>	<u>S.E.</u>	<u>Exp (B)</u> <u>(Odds</u> <u>Ratio)</u>	<u>Beta</u> <u>(Log of</u> <u>Odds)</u>	<u>S.E.</u>	<u>Exp (B)</u> <u>(Odds</u> <u>Ratio)</u>	<u>B</u> <u>(Log of</u> <u>Odds)</u>	<u>S.E.</u> <u>(Odds</u> <u>Ratio)</u>	<u>Exp (B)</u>
Constant	4.44	0.89		1.40	0.24	1.75	0.71		
TERM	-0.57	0.17	0.56	-0.53	0.20	0.59	-0.46	0.21	0.63
SALES	-0.25	0.05	0.78	-0.18	0.06	0.83	-0.23	0.06	0.80
RETAIL	-0.43	0.16	0.65	-0.46	0.19	0.63	-0.47	0.20	0.63
YEARS1	-0.54	0.07	0.58	-0.59	0.08	0.55	-0.61	0.09	0.54
OWNFG	-1.11	0.35	0.33	-0.60	0.26	0.55	-0.58	0.26	0.56
YMACH	0.65	0.21	1.92	0.64	0.25	1.89	0.78	0.26	2.18
YBREAL	0.46	0.18	1.58	0.51	0.22	1.66	0.45	0.22	1.57
PROD	-0.15	0.04	0.86	-0.20	0.05	0.82	-0.21	0.05	0.81
EDUC_1	0.13	0.05	1.14	0.15	0.06	1.16			
SOLE	-0.77	0.16	0.46	-0.48	0.23	0.62			
NPAUT	-0.80	0.38	0.45	-1.10	0.47	0.33			
NPREAL	1.65	0.52	5.18	1.86	0.62	6.40			
OWNG2				0.88	0.40	2.41	1.50	0.46	4.49
YACCTA				0.44	0.20	1.56	0.52	0.21	1.69
YPBOND				-0.63	0.26	0.53	-0.81	0.28	0.44
OUTFG	-0.86	0.43	0.42						
DECLIN	-0.86	0.29	0.42						
GREW	-0.44	0.21	0.64						
GREWM	-0.57	0.26	0.57						
YBBON	-0.54	0.24	0.59						

Table IV.1.2 indicates that women were more likely than men to have applied for term loans. Furthermore, women were more likely to be found in retailing than in any other sector, compared to men. In addition, the financial managers of women-owned firms were more likely to be principal owners. As the literature suggests, women were more likely to have completed more years

of education than their male counterparts²⁹. However, women were more likely to have fewer owners than men were. Furthermore, women business owners were more likely than men to indicate that they had personal real estate available as collateral. Women were also more likely than men to indicate that they had personal bonds and securities available as collateral.

Women-owned businesses tended to have lower volume of sales than their men-owned counterparts. Female principal owners were also more likely to have had fewer years of managerial experience than their male counterparts. In contrast with men, women business owners were less likely to have reported having either business real estate or machinery available as collateral. Moreover, women were less likely to report that their products or services are of the genre of high technology. Women were less likely than were men to report having personal automobile available as collateral. Also, women were less likely than men to report having accounts receivable available as collateral. In those cases where the financial manager was not an owner, women business owners were less likely to have an employee rather than an outside accounting firm perform the financial function. The entry of all the dummy variables which expressed average rate of growth indicated that women were less likely than men to report stable growth rates (between -5 and +5 percent).

Again, years of managerial experience was the variable which was most

²⁹Analysis of attributes of first owners show that female principals are under-represented in the professions compared to their male counterparts. No significant difference was found between women and men entrepreneurs in the extent to which they have access to professional financial management after controlling for other factors. However, access to professional management is strongly associated with those business attributes that proved significant. Among such variables are identity of the financial manager and employment status of the financial manager.

closely associated with gender of owner(s) irrespective of the sample considered. Other variables that were common to the three equations were: whether the firm applied for a term loan, level of sales, whether the firm was in the retail sector, whether the financial manager was also an owner, whether machinery was available as collateral, whether business real estate was available as collateral and whether or not the product of the firm was of the genre of high technology.

In the first and second equations, gender was also associated with: years of education completed, whether the firm had only one owner, whether personal automobile was available as collateral and whether real estate of owners was available as collateral. For the second and third sample of firms, other variables which were related with gender were: whether the firm had three or more owners, whether accounts receivable were available as collateral and whether personal bonds and securities were available as collateral. Gender was associated with the variables which expressed whether the financial manager was an outside accounting firm, average annual rate of growth and whether or not business bonds and securities only in the equation of the first sample of firms.

IV.1.3 Perceptions about the Role of the Banker

Table IV.1.3 is a summary of the findings of the perceptions of women versus men about the roles of the banker. Women were compared with men on two critical dimensions: 1) on the importance they assigned to certain functions they expect of financial institutions and 2) the extent to which they perceived that financial institutions were meeting those expectations.

Table IV.1.3 Perceptions of the Role of the Banker

	IMPORTANCE		SATISFACTION	
	Female	Male ³⁰	Female	Male
KNOWS YOU AND YOUR BUSINESS	Same	Same ³⁰	Same	Same
PROVIDES HELPFUL BUSINESS ADVICE	More	Less	Less	More
OFFERS CHEAPEST MONEY AVAILABLE	Same	Same	Same	Same
RELIABLE SOURCE OF CREDIT	Same	Same	Same	Same
PROVIDES WIDE RANGE OF SERVICES	More	Less	Less	More
EASY TO TALK TO ACCOUNT MANAGER	Same	Same	Less	More
MAKES YOU COMFORTABLE	More	Less	Less	More
TREATS YOU WITH RESPECT	More	Less	Less	More
GOOD SOURCE OF VENTURE CAPITAL	More	Less	Same	Same

The literature suggests that small business owners in general usually complain that financial institutions often lack sufficient knowledge about small business and their owners. In this study, no statistically significant gender-related difference was found in the ratings of the importance of this concern. Moreover, women and men borrower groups did not differ appreciably on their level of satisfaction with the performance of financial institutions in this respect.

Furthermore, it did not seem more important to women than to men that financial institutions should offer the cheapest money available. Although the concern had a score statistic of 2.07 in the case of the first sample, its association with gender was not statistically significant for any of the three samples. Likewise, no statistically significant difference was found between women and men in the extent to which they were satisfied that banks provide the cheapest

³⁰Same indicates that women and men entrepreneurs rate a particular role similarly. Less in a cell under IMPORTANCE indicates that the borrower group involved does not consider that a particular role is an important one that financial institutions should play. Less in a cell under SATISFACTION indicates that the borrower group involved is not satisfied with the performance of a particular role by financial institutions. More under IMPORTANCE indicates that a particular group considers a given role important. More under SATISFACTION indicates that a particular group is more satisfied than the other with the performance of a given role by financial institutions.

money available.

Furthermore, in none of the three cases was gender-based differences in the rating of the bank as an important source of credit capital found. Women and men also did not seem to differ in the extent to which they were satisfied with the performance of financial institutions as suppliers of credit capital.

However, women were more likely than men to consider provision of helpful business advice an important role of financial institutions. The Wald statistics of 47.29, 39.10 and 38.62 suggests that this association was considerable. Yet, women tend to be less satisfied than men about the achievements of the banks in this regard. The association between gender and this rating of satisfaction was significant at the 0.01 level in all of the three equations examined.

Apparently, women considered it more important than men that the bank should provide a wide range of services. Yet, women were more likely than men to perceive that the range of services provided by financial institutions was less than satisfactory. This difference was significant at the 0.005 level in the first equation and at the 0.01 level in the second and third equations. The Wald statistics were comparatively large, being 8.30, 7.09 and 6.23 in the first, second and third equations respectively.

No difference was found between women and men in their ratings of the importance of having an approachable accounts manager. However, women were less likely than men to rate their accounts managers high on approachability. The Wald statistic of 17.91, 14.81, 12.50 indicated that this gender-related difference was profound. Besides, the difference was significant at the 0.00001, 0.0001 and

0.0004 levels respectively.

Women were also more likely than men were to believe that they should be made comfortable by their financial institutions. However, women tended to be less satisfied than men with the extent to which financial institutions made them comfortable. The variable which expressed this concern did not enter into the third equation; however, it had a high score statistic of 3.67 that was significant at the 0.0554 level.

It was discovered that being treated with respect was of particular importance to women entrepreneurs. However, women were more likely than men to perceive that they were treated with less respect than they should receive from financial institutions. It would seem erroneous to view financial institutions as sources of venture capital than of credit capital. However, women were more likely than men were to perceive that financial institutions should be good sources of venture capital. Had it been found that women were less satisfied than men with financial institutions as providers of venture capital, then one could have surmised, as did Buttner and Rosen (1989), that most of the problems women reported with financing might be related to this misconception. Remarkably, in all the three cases examined, no statistically significant gender-related difference was found in the extent to which entrepreneurs were satisfied with financial institutions as sources of venture capital³¹.

³¹Details and tables on results of the analyses on perceptions of the role of the banker are available in appendix IV.B.

IV.1.4 Summary: Structural Gender-Based Differences in Business Attributes

The preceding discussion has shown that gender-based differences in business attributes exist between women and men-owned firms. First, women-owned firms tended to have lower levels of sales than their male counterparts. Second, female principals had fewer years of managerial experience than their male counterparts. Third, as the literature suggests, women tended to have completed more years of education than their male counterparts³². Fourth, the financial managers of women-owned enterprises were more often principal owners than were financial managers of men-owned businesses. Fifth, there was a higher incidence of sole owners or single owners among women-owned firms than among men-owned firms. Other factors considered, women were heavily concentrated in the retail industry. Moreover, women owners were less likely than their counterparts to report having machinery available as collateral. While women were more likely to report having bonds and securities available as collateral, they were less likely to report having accounts receivable as collateral.

As the literature suggests, smaller firms were deemed to have lesser capacity than bigger firms to service their loans. Therefore, *ceteris paribus*, the smaller a firm is, compared to its counterparts, the higher the likelihood that 1) it would be charged higher rates of interest, 2) be requested more frequently to provide spousal co-signature, 3) be faced with a high ratio of collateral to loan

³²However, as appendix IV.C should testify, women entrepreneurs were under-represented in the professions.

and 4) be given less credit than it requested, 5) assuming, that its loan is not rejected outright. Consequently, more stringent terms of credit may be expected for women-owned businesses because of their comparative smaller sizes.

The literature also suggests that managerial experience and access to professional financial management is appreciated by credit decision-makers. The findings of this study confirmed the expectation that women entrepreneurs had completed more years of education, in contrast with men entrepreneurs. Nonetheless, female entrepreneurs tended to have had fewer years of managerial experience than their counterparts. Furthermore, their degrees were often in non-professional fields. This could have an adverse effect on how their **character (or track record)** is assessed by loan officers.

Women entrepreneurs were more likely than men to be sole owners if not sole proprietors. The literature suggests that such firms would tend to lack adequate **capital** relative to firms with two or more owners. By "capital", reference may be made not only to the material resources invested in a business but to intangible components such as skills and talents as well. In firms with multiple owners, the skills which one owner lacks may be compensated for by the background of the other owners. For example, an engineer, an accountant and a marketing professional may combine to operate a dynamic if small company. However, in a firm with one owner, such complementarity is absent.

Some entrepreneurs may compensate for sole ownership by contracting out managerial and financial functions which they are not able to perform adequately. However, that is contingent on their ability to pay for such services. This study

found that women owned firms had a joint tendency to have only a financial manager who was also a principal owner. This could be an indication that women-owned firms did not have sufficient resources to devote to the financial function and, possibly, to other managerial tasks.

Two factors indicated that **collateral** requirements could be more problematic for women than for men owners. Across the three different samples examined, women appeared to be heavily concentrated in the retail sector--a sector that is reputed to have few pledgable assets. Women also reported fewer business assets than men entrepreneurs. Lack of business assets might explain higher rates interest, more frequent requests for spousal co-signature, higher ratio of collateral to loan and lower ratio of credit received to credit requested for women than for men owned firms.

With respect to **conditions**, the results obtained were far from stable. However, in the case of the largest sample of firms, it appeared that women were less likely than men to report more stable growth rates. However, this finding could not be generalized to the other two samples where the effect size was expected to be greater and, therefore, offset the reduced sample sizes.

Statistically significant differences were found in terms of perceptions about the role of the banker. Women entrepreneurs tended to think that provision of helpful business advice is an important role of the banker. At the same time, they also seemed to be less satisfied than men about the performance of financial institutions in this regard. Women entrepreneurs were also more likely than men entrepreneurs to perceive that provision of a wide range of

services is an important function of financial institutions. At the same time, women were also more likely than men to perceive that the range of services provided by financial institutions was narrower than it should be.

Furthermore, women entrepreneurs considered it more important that they should be treated with respect and be made comfortable by financial institutions than men did. Yet, women were less satisfied with financial institutions on these two dimensions than men were. While no difference was found between women and men on the expectation that the accounts manager should be approachable, the results presented in this chapter indicated that women were more likely than men to rate their accounts managers lower on approachability.

In addition, women were more likely than men to perceive that provision of venture capital should be an important role of financial institutions. However, they did not appear to differ from men on their level of satisfaction with financial institutions as good sources of venture capital.

Financial institutions should reassess their marketing strategies *vis-à-vis* women, to address some of the concerns that have been reported by women entrepreneurs. There is a need for studies that will examine areas through which the institutions could cater to the needs of women entrepreneurs more adequately. For instance, it needs to be made clear what kind of helpful business advice women would like to receive from the banks. If such services could be and were provided, relations between financial institutions and their clients might be improved. At the same time, if provision of certain services are beyond the scope of financial institutions, this should be made clear to their clients. It would

seem that provision of venture capital is not part of the mandate of financial institutions as low-risk lenders. In this respect, advertisements that are geared to attract small business clients should be sensitive to possible misconceptions about the role of financial institutions.

Of particular concern were the findings that women perceived: 1) that their accounts managers were not approachable, 2) that they were not made comfortable by financial institutions and 3) that they were not treated with sufficient respect. These results were similar to those reported by past research and would seem to merit review. Women entrepreneurs are a growing force within the business community. Therefore, financial institutions that can address the needs of women entrepreneurs should have a competitive advantage over their counterparts.

Having exposed these differences however, three pertinent questions remained. First, did credit terms differ between women and men entrepreneurs even prior to elimination of structural differences? Second, to what extent did credit terms still differ between the two borrower groups after adjusting for structural factors? Third, what role did each structural factor actually play in accounting for credit terms? The aim of the next sections is to address these questions.

IV.2 INITIAL DIFFERENCES IN CREDIT TERMS

It was shown in the last section that gender-based differences in business attributes exist. Therefore, structural differences may explain gender-related discrepancies in credit terms. Nonetheless, it is of interest to determine whether or not terms of credit differ between women and men entrepreneurs before controlling for gender-related differences in business attributes. Accomplishment of this task is a key objective of this study. This section presents the results of analyses that examined the initial relationship between gender of owner(s) and credit terms.

Five terms of credit were considered. These included: loan rejections, request for spousal co-signature, ratio of collateral to loan and ratio of amount received to amount requested. The relationship between gender and loan rejections was examined separately in a univariate logistic regression analysis. This is because no data was available on the remaining four terms of credit for those firms whose loans were rejected. Hence, if the variable which expressed loan rejections were included in multivariate analyses, it would be a constant, making its association with gender indeterminable. Requests for spousal co-signature, ratio of amount received to amount applied for, ratio of collateral to line of credit and rate of interest were examined jointly in multivariate logistic regression analyses.

This section is subdivided into two parts. The first part discusses the

results of the logistic regression analyses which examine the relationship between gender and rate of loan rejections--the *access* credit term. The second part explores the multivariate association of gender with ratio of collateral to loan, ratio of amount received to amount requested, requests for spousal co-signature and interest rates--the four *treatment* credit terms. The latter set of analyses allow for an examination of correlations among those terms of credit.

IV.2.1 Gender-Related Differences in Loan Turndowns

Only in the case of new lines of credit was a significant association between gender and loan rejections found³³. When no distinction was made among loan types, the likelihood of loan rejections did not seem to differ significantly between women-owned and men-owned firms. Similarly, no appreciable gender-related difference was found in the rejections of term loans or of requests for increases in existing lines of credit.

For new lines of credit, level of significance seemed to vary with sample size. This is not unexpected. It was predicted that any difference in the likelihood of loan rejections would be more sharply defined for those businesses that were governed solely by owners of the same gender. However, it was also expected that the power of the logistic regression test would decrease with the number of firms considered. While the level of significance was about one percent when all firms were examined, it was six percent and four percent for the

³³ Even then, this difference applied only to the first and the third samples. No statistically significant gender-based difference was found in the likelihood of loan turndowns for firms that either are unequally owned and/or are governed by owners of the same gender.

second and third samples. Therefore, significant differences in rejections of

Table IV.2.1 **New Lines of Credit: Turndowns**

First Sample (N = 536) (Female = 149; Male = 387) (Frating = 0.00%) (Mrating = 100.00%) (Overall = 72.02%) (-2LL = 0.0032) (Model = 0.0125) (Improve = 0.0125) (Goodness = 0.4675)				Third Sample (N = 376) (Female = 114; Male = 262) (Frating = 0.00%) (Mrating = 100.00%) (Overall = 69.68%) (-2LL = 0.0020) (Model = 0.0487) (Improve = 0.0497) (Goodness = 0.4612)		
<u>Variable Entered</u>	<u>Beta</u> (Log of Odds)	<u>S.E.</u>	<u>Exp (B)</u> (Odds Ratio)	<u>Beta</u> (Log of Odds)	<u>S.E.</u>	<u>Exp (B)</u> (Odds Ratio)
Rejected	0.81	0.32	2.44	0.77	0.39	2.15
Constant	-2.67	0.21		-2.73	0.26	

new lines of credit applied only to the first and the third samples. It is possible that the reduction in the level of power accounted for these discrepancies.

However, it is also possible that firms that were jointly owned by women and men behaved differently from firms whose owners were strictly of the same gender.

IV.2.2 Gender and the *Treatment* Credit Terms

Four stepwise logistic regression analyses were run to determine the relationship between gender and the four *treatment* credit terms³⁴. The first set of analyses did not distinguish among the three different types of loans. The remaining analysis considered only one of either term loans, new lines of credit

³⁴These *treatment* credit terms were: ratio of collateral to loan, ratio of amount received to amount requested, requests for spousal co-signature and rates of interest (see chapter III).

or increases in lines of credit. All four analyses were valuable for two reasons. First, they considered the correlations among the four credit terms. Second, they involved linear combinations of the four treatment terms of credit. Consequently, they met the multivariate requirements of this study. As in preceding analyses, three different samples of firms were examined. The first sample included all firms. The second sample consisted only of firms that were unequally owned or that were governed by owners of the same gender. The third sample included only those firms whose owners were all of the same gender.

Table IV.2.2a All Types of Loan:
Gender and the Treatment Credit Terms

	First Sample (N=1007) (Female=236; Male=771) (Frating=0.42%) (Mrating=99.61%) (Overall=73.37%) (-2LL=0.0429) (Model=0.0003) (Improve=0.0003) (Goodness=0.4941) (Residual=0.8254)			Second Sample (N=745) (Female=189; Male=556) (Frating=1.06%) (Mrating=99.10%) (Overall=74.23%) (-2LL=0.0122) (Model=0.0007) (Improve=0.0007) (Goodness=0.4962) (Residual=0.9136)			Third Sample (N=699) (Female=184; Male=515) (Frating=1.09%) (Mrating=99.03%) (Overall=73.25%) (-2LL=0.0059) (Model=0.0008) (Improve=0.0008) (Goodness=0.4947) (Residual=0.8417)		
<u>Variable Entered</u>	<u>Beta</u> <u>(Log of Odds)</u>	<u>S.E.</u>	<u>Exp (B)</u> <u>(Odds Ratio)</u>	<u>Beta</u> <u>(Log of Odds)</u>	<u>S.E.</u>	<u>Exp (B)</u> <u>(Odds Ratio)</u>	<u>Beta</u> <u>(Log of Odds)</u>	<u>S.E.</u> <u>(Odds Ratio)</u>	<u>Exp (B)</u>
Interest	0.32	0.09	1.37	0.31	0.09	1.37	0.32	0.10	1.37
Constant	-1.63	0.15		-1.50			-1.46	0.16	

Table IV.2.2a indicates that, when all three types of loans were considered jointly, for all three samples, interest rates was the only credit term that was related with gender. The odds ratios of 1.37 for interest suggests that women were charged higher rates of interest than were men, before structural differences were considered. In the cases of new lines of credit and increases in lines of credit, a significant association was found between the set of *treatment* credit

terms and gender.

Table IV.2.2b demonstrates that women were charged higher rates of interests on their new lines of credit than were men, prior to the elimination of structural differences. Similarly, table IV.2.2c depicts that rates of interest on

Table IV.2.2b New Lines of Credit:
The Treatment Credit Terms

Variable Entered	First Sample (N = 299) (Female = 68; Male = 231) (Frating = 1.47%) (Mrating = 99.13%) (Overall = 76.92%) (-2LL = 0.2343) (Model = 0.0122) (Improve = 0.0122) (Goodness = 0.4911) (Residual = 0.9227)			Second Sample (N = 233) (Female = 59; Male = 174) (Frating = 1.69%) (Mrating = 98.85%) (Overall = 74.25%) (-2LL = 0.1058) (Model = 0.0190) (Improve = 0.0190) (Goodness = 0.4785) (Residual = 0.5172)			Third Sample (N = 214) (Female = 57; Male = 157) (Frating = 1.75%) (Mrating = 98.73%) (Overall = 72.90%) (-2LL = 0.0697) (Model = 0.0272) (Improve = 0.0272) (Goodness = 0.4733) (Residual = 0.4019)		
	Beta (Log of Odds)	S.E.	Exp (B) (Odds Ratio)	Beta (Log of Odds)	S.E.	Exp (B) (Odds Ratio)	Beta (Log of Odds)	S.E.	Exp (B) (Odds Ratio)
Interest	0.33	0.14	1.39	0.41	0.17	1.50	0.39	0.18	1.47
Constant	-1.76	0.26		-1.67	0.30		-1.57	0.31	

increases in lines of credit were higher for women than for men before adjusting for structural factors. Table IV.2.2c also indicates that women were less likely

Table IV.2.2c Increases in Lines of Credit:
The Treatment Credit Terms

Variable Entered	First Sample (N = 326) (Female = 62; Male = 265) (Frating = 2.33%) (Mrating = 98.88%) (Overall = 80.09%) (-2LL = 0.59) (Model = 0.0427) (Improve = 0.0427) (Goodness = 0.4987) (Residual = 0.6929)			Second Sample (N = 236) (Female = 45; Male = 191) (Frating = 2.22%) (Mrating = 99.48%) (Overall = 80.93%) (-2LL = 0.6358) (Model = 0.0443) (Improve = 0.0443) (Goodness = 0.4962) (Residual = 0.4859)			Third Sample (N = 221) (Female = 43; Male = 191) (Frating = 2.33%) (Mrating = 98.33%) (Overall = 80.00%) (-2LL = 0.5900) (Model = 0.0427) (Improve = 0.0427) (Goodness = 0.4982) (Residual = 80.09%)		
	Beta (Log of Odds)	S.E.	Exp (B) (Odds Ratio)	Beta (Log of Odds)	S.E.	Exp (B) (Odds Ratio)	Beta (Log of Odds)	S.E.	Exp (B) (Odds Ratio)
Interest	0.28	0.14	1.33	0.30	0.15	1.35	0.31	0.15	1.36
Co-sign	-0.83	0.41	0.44						
Constant	-1.67	0.25		-1.83	0.27		-1.85	0.28	

than men were to be requested for spousal co-signature as security for increases in lines of credit. Nonetheless, this particular difference was only applicable to the equation involving the first sample of firms.

Initial Differences: Term Loans

For term loans, none of the four terms of credit seemed to be related with gender. Thus, a key observation made in this study is that for term loans, gender is not related with any of loan turndowns, interest rates, requests for spousal co-signature, ratio of collateral to loan and ratio of amount of credit received to amount of credit requested.

IV.2.5 Summary: Initial Differences in Credit Terms

A significant gender-related difference was found in the rejections of new lines of credit. However, when all firms, term loans and increases in lines of credit were considered, the relationship between gender and rejection rates was not significant. Interest rates emerged as the term of credit that was most closely associated with gender. Request for spousal co-signature proved significant only when all firms that applied for increases in lines of credit were examined. No gender-related difference was found on the four treatment credit terms for term loans. The next two sections will present the results of three different methods that were used to determine whether gender-related differences in credit terms persisted after eliminating structural differences.

IV.3 CONTROLLING FOR STRUCTURAL BIASES

In the previous section, three gender-related differences were found in terms of credit prior to controlling for structural biases. First, women were more likely than men were to have had their requests for new lines of credit rejected. Second, women entrepreneurs were charged higher rates of interest than their male counterparts were, except in the case of term loans. Third, women entrepreneurs were less likely to be requested to provide spousal co-signature for increases in lines of credit when the first sample of firms was considered. However, women and men entrepreneurs differed on certain key factors which could influence terms of credit. Consequently, differences in business attributes might explain differences in credit terms.

This section presents the results of analyses which examined residual gender-related differences in credit experience after controlling for structural differences. Two innovative techniques were used to analyze rejections of new lines of credit while adjusting for differences in business attributes. The methods were also instrumental in testing multivariate differences in the four *treatment* credit terms. The first procedure involved subclassification on the propensity scores of structural factors. The second method, a logistic regression model of covariance, was also concerned with the propensity scores of business attributes.

IV.3.1 Subclassification on Propensity Scores

For each of the analyses described here, two separate sets of propensity scores were calculated. The first set of propensity scores was the expected probability that a firm would have a first female owner based on its vector of scores on the structural factors $P(G=1|\text{Structural factors})$. The second set of propensity scores was the expected probability that a firm would have a female first owner based on its vector of scores on credit terms $P(G=1|\text{Credit terms})$.

Two subsets of propensity scores of credit terms were calculated. The first subset concerned the *access*³⁵ credit term--loan turndowns. The propensity score for the *access* credit term was the expected probability that the first owner of a firm would be a woman, given that its loan was turned down, given by $P(G=1|\text{Rejected}=1)$. The second subset of credit terms included the four *treatment* terms of credit: ratio of collateral to loan, requests for spousal co-signature, ratio of amount received to amount requested and interest rates. Therefore, the propensity score for the four treatment terms was the expected probability that the first owner of a firm would be a woman given a certain combination of scores on ratio of collateral to loan, ratio of amount received to amount requested, requests for spousal co-signature and interest rates $P(G=1|\text{Treatment Credit Terms})$.

Five subclasses were then created using the quintiles of the first set of propensity scores representing measures of business risk. The means and

³⁵See Chapter III for a discussion of loan turndowns as an *access* credit term and the remaining four terms of credit as the four *treatment* credit terms.

standard errors of the propensity scores which represented terms of credit were then calculated for women and men entrepreneurs within each of the subclasses. Subsequently, the average gender-related differences in the propensity scores of credit terms were then tested for statistical difference.

In the first section, it was shown that women entrepreneurs differed from men entrepreneurs on certain measures of business risk. The propensity score of business attributes was the expected probability that the first owner of a firm would be a woman given a vector of scores on measures of business attributes. Therefore, in general, women should have higher scores on measures of business risk than their male counterparts. Consequently, they would tend to concentrate in upper subclasses. That is, women and highly risky firms should be found in the upper quintiles of the propensity scores on measures of business attributes.

Initial findings indicated that women were more likely than men to have had their requests for new lines of credit rejected. The propensity score on loan rejection was the expected probability that the first owner of a firm would be a woman given that its loan was turned down. Consequently, women in general and firms whose loans were turned down should have higher propensity scores than men or firms whose loans were not turned down.

It has been shown that women were charged higher rates of interest than men were before controlling for structural factors. Therefore, the propensity scores of the four *treatment* credit terms should be higher for women and firms that were charged higher rates of interest than for men or firms whose rates of interest were low.

IV.3.1.1 Turndowns of New Lines of Credit:
Subclassification using Propensity Scores

As table IV.3.1a shows, relatively few women were found on the lower quintiles of the propensity scores of measures of business risk. The majority of women were found in the upper quintiles³⁶. It is noteworthy that in the case of the first, second and fourth quintiles, the likelihood of loan rejections was higher for men than for women. In contrast, the likelihood of loan rejections was higher

Table IV.3.1a Likelihood of Turndowns of
New Lines of Credit:
Subclassification on Propensity Scores

<u>Subclass</u>	<u>Borrower Group</u>	<u>First Sample (N=496)</u>			<u>Third Sample (N=347)</u>		
		<u>Number</u>	<u>Mean</u>	<u>S. E.</u>	<u>Number</u>	<u>Mean</u>	<u>S. E.</u>
		<u>in Group</u>			<u>in Group</u>		
1.	Female	4	0.263	0.000	4	0.289	0.000
	Male	95	0.270	0.004	66	0.297	0.005
2.	Female	9	0.263	0.000	7	0.314	0.025
	Male	87	0.273	0.005	60	0.301	0.006
3.	Female	19	0.291	0.016	21	0.314	0.014
	Male	84	0.276	0.005	50	0.303	0.007
4.	Female	45	0.279	0.008	33	0.294	0.005
	Male	53	0.283	0.008	37	0.308	0.009
5.	Female	59	0.297	0.009	39	0.325	0.012
	Male	41	0.276	0.007	30	0.289	0.000

³⁶As subsequent discussions should show, such unequal proportions sizes placed serious constraints on the conclusions that could be drawn from the technique of subclassification, particularly, in the analyses of residual differences on the four treatment credit terms.

IV.3.1b

Likelihood of Turndowns of
New Lines of Credit:
Pooled Differences

Subclass	First Sample (N=496)			Third Sample (N=347)		
	Number in Group	Between Group Difference	Variance	Number in Group	Between Group Difference	Variance
1.	99	-0.007	0.000016	70	-0.008	0.000025
2.	96	-0.010	0.000025	67	0.013	0.000661
3.	103	0.015	0.000281	71	0.011	0.000245
4.	98	-0.004	0.000128	70	-0.014	0.000106
5.	100	0.021	0.000130	69	0.036	0.000144

Table IV.3.1.1c

Likelihood of Turndowns of
New Lines of Credit:
Residual Statistics

	First Sample (N=496)	Third Sample (N=347)
Average Difference	0.015	0.038
Standard Error	0.005	0.007
Z-score	3.000	5.430

for female entrepreneurs in the third and fifth quintiles than for their male counterparts. However, when these various differences were pooled together, significant differences were found in the likelihood of loan rejections for new lines of credit. In the case of the first sample of firms, the likelihood of loan rejection was significant at the 0.0002 level. In the case of the third sample of firms, the level of significance was even lower: below the 0.0000001 level. The error rate of each test was set at the 0.002 level. Therefore, it is highly unlikely that these results are spurious ones.

For both the first and third sample of firms, an association was found between gender and turndowns of new lines of credit. The second sample of firms is traditionally the one that has been considered in previous research. *If* systematic gender discrimination is part of reality, quite possibly, the effect of

joint female and male ownership might have been confounded with the effect of gender in previous research. This may explain why previous research does not report such a relationship.

Table IV.3.1c suggests that women were more likely to have their requests for new lines of credit rejected even after structural differences had been controlled. Although it had the smaller sample size, the residual gender-based difference in loan rejections was strongest for the third sample. As table IV.3.1c shows, the Z-score of the mean difference for the third sample of firms is 5.430. This is significant at the 0.000001 level! The finding seems to support the conjecture that effect size of gender would be strongest when firms that are controlled solely by women are compared with those that are controlled solely by men. Although the effect of female and male joint ownership might also have been confounded with the effect of gender in the case of the first sample, its larger sample size might explain why a residual gender-related difference remains in loan rejections even after structural differences have been eliminated.

However, before interpreting these findings as evidence of systematic gender discrimination, two important caveats are in order. Information on types of assets available to the business was not available for firms examined in this study. A preceding section reported that gender-based differences in asset structure existed among firms whose loans were accepted. If this result could be generalized to firms whose loans were rejected, not controlling for asset structure might explain residual gender-based differences in turndowns of new lines of credit.

Second, the technique of subclassification on propensity scores was limited in two respects. Subclassifying on the propensity scores of structural factors to evaluate residual differences in the means of the propensity scores of credit terms is analogous to conducting a traditional multivariate analysis of variance. However, the results of subclassification would be sub-optimal compared to the results that could be obtained with logistic analysis of covariance. This is because subclassification on propensity scores involved a comparison of the mean difference between women and men borrower groups. However, logistic analysis of covariance involved a comparison of actual scores. In the next section, this possibility was examined to reduce the domain of factors that could explain the residual gender-based difference in new lines of credit.

IV.3.2

Four Terms of Credit Subclassification on Propensity Scores

A previous section revealed that women entrepreneurs were charged higher rates of interest 1) on new lines of credit 2) on increases in lines of credit and 3) when no distinction was made among loan type. Significant gender-related differences were also found when new lines of credit and increases in existing lines of credit were considered. However, no significant association was found between the set of credit terms and gender of owner in the case of term loans. This section discusses whether the gender-related differences in credit terms that were found endured, after subclassifying women and men on the propensity score of their business attributes.

Table IV.3.2a: All Three Loan Types:
The Four Treatment Credit Terms

<u>Subclass</u>	<u>Borrower Group</u>	<u>First Sample (N=1218)</u>			<u>Second Sample (N=924)</u>			<u>Third Sample (N=890)</u>		
		<u>Number in Group</u>	<u>Mean</u>	<u>S.E.</u>	<u>Number in Group</u>	<u>Mean</u>	<u>S.E.</u>	<u>Number in Group</u>	<u>Mean</u>	<u>S.E.</u>
1.	Female	13	0.219	0.010	6	0.252	0.011	2	0.255	0.015
	Male	230	0.219	0.004	178	0.235	0.004	175	0.242	0.004
2.	Female	16	0.232	0.013	22	0.261	0.012	20	0.262	0.012
	Male	225	0.226	0.002	163	0.248	0.004	159	0.261	0.004
3.	Female	41	0.236	0.007	30	0.262	0.009	35	0.267	0.008
	Male	206	0.231	0.003	156	0.254	0.004	143	0.257	0.004
4.	Female	70	0.238	0.005	67	0.264	0.005	64	0.272	0.006
	Male	174	0.245	0.004	118	0.260	0.004	115	0.267	0.004
5.	Female	156	0.250	0.005	123	0.267	0.006	120	0.280	0.007
	Male	87	0.254	0.007	61	0.278	0.011	57	0.298	0.011

Table IV.3.2b All Three Loan Types:
Pooled Multivariate Differences

<u>Subclass</u>	<u>First Sample (N=1218)</u>			<u>Second Sample (N=924)</u>			<u>Third Sample (N=890)</u>		
	<u>Number in Group</u>	<u>Between Group Difference</u>	<u>Variance</u>	<u>Number in Group</u>	<u>Between Group Difference</u>	<u>Variance</u>	<u>Number in Group</u>	<u>Between Group Difference</u>	<u>Variance</u>
1.	243	0.000	0.000116	184	0.015	0.000137	177	0.013	0.000241
2.	241	0.006	0.000173	185	0.013	0.000160	179	0.001	0.000160
3.	247	0.005	0.000058	186	0.008	0.000097	178	0.010	0.000080
4.	244	-0.007	0.000041	185	0.004	0.000041	179	0.005	0.000052
5.	243	-0.004	0.000074	184	-0.011	0.000157	179	-0.018	0.000170

Subclassification on the propensity scores of business attributes revealed certain differences in credit terms. When all loan types were considered jointly, no residual difference was found in the four credit terms between women and men entrepreneurs in the cases of the first and the third samples. However, a significant difference remained when the principal owners of unequally owned firms and/or firms that are controlled by owners of the same gender (second-sample) were considered. As Table IV.3.2c indicates, the Z-score for the second

sample of firms was 5.80.

Table IV.3.2c All Three Loan Types:
Multivariate Differences:
Residual Statistics

	First Sample (N=1218)	Second Sample (N=924)	Third Sample (N=890)
Average Difference	0.000	0.029	0.011
Standard Error	0.004	0.005	0.005
Z-score	0.000	5.800	2.200

IV.3.2.2 Increases in Existing Lines of Credit

When each type of loan was considered separately, a significant difference was found in the case of the first sample of firms for increases in lines of credit. As table IV.3.2f indicates, the Z-score for the residual difference for the first sample is 6.70. However, subclassification could not be applied to the other two samples for increase in lines of credit. This is because in one subclass, only one

Table IV.3.2d Increases in lines of credit:
Subclassification on Propensity Scores:
The Four Treatment Credit Terms

Subclass	Borrower Group	First Sample (N=375)			Second Sample (N=311)			Third Sample (N=300)		
		Number in Group	Mean	S. E.	Number in Group	Mean	S. E.	Number in Group	Mean	S. E.
1.	Female	5	0.179	0.009	1	0.174	0.000	1	0.177	Missing
	Male	68	0.181	0.008	61	0.178	0.008	57	0.178	0.008
2.	Female	7	0.187	0.016	7	0.180	0.010	5	0.186	0.015
	Male	67	0.187	0.006	57	0.181	0.004	58	0.189	0.005
3.	Female	8	0.187	0.014	7	0.182	0.008	6	0.179	0.005
	Male	70	0.188	0.006	54	0.188	0.006	54	0.187	0.004
4.	Female	17	0.203	0.007	13	0.193	0.007	15	0.186	0.006
	Male	58	0.183	0.007	49	0.192	0.005	44	0.194	0.006
5.	Female	33	0.229	0.016	33	0.213	0.015	33	0.221	0.015
	Male	42	0.194	0.012	29	0.212	0.012	27	0.216	0.013

Table IV.3.2e **Increases in Existing Lines of Credit:
Pooled Multivariate Differences**

<u>First Sample (N=375)</u>				<u>Second Sample (N=311)</u>				<u>Third Sample (N=300)</u>			
<u>Subclass</u>	<u>Number</u>	<u>Between</u>	<u>Variance</u>	<u>Number</u>	<u>Between</u>	<u>Variance</u>	<u>Number</u>	<u>Between</u>	<u>Variance</u>	<u>Number</u>	<u>Between</u>
	<u>in Group</u>	<u>Group</u>		<u>in Group</u>	<u>Group</u>		<u>in Group</u>	<u>Group</u>		<u>in Group</u>	<u>Group</u>
1.	73	-0.002	0.000145	62	-0.004	Missing	58	-0.001	Missing		
2.	74	0.000	0.000292	64	-0.001	0.000116	63	-0.003	0.000250		
3.	78	-0.001	0.000232	61	-0.006	0.000100	60	-0.008	0.000041		
4.	75	0.020	0.000098	62	0.001	0.000074	59	-0.008	0.000072		
5.	75	0.035	0.000400	62	0.001	0.000369	60	0.005	0.000394		

Table IV.3.2f **Increases in Lines of Credit:
Residual Statistics**

	<u>First Sample (N=375)</u>	<u>Second Sample (N=311)</u>	<u>Third Sample (N=300)</u>
Average Difference	0.047	-0.009	-0.015
Standard Error	0.007	Not Applicable	Not applicable
Z-score	6.714	Not Applicable	Not applicable

woman could be compared to about 60 or more men. This meant that the standard error for the female borrower group in that subclass could not be estimated. Therefore, the results for the first sample could not be compared with the results for the second and third samples.

IV.3.2.3 New Lines of Credit

Similar inconsistency of results was revealed when subclassification on propensity scores was used to analyze residual differences in the four terms of credit for new lines of credit. As table IV.3.2g indicates, there was only one

Table IV.3.2g New Lines of Credit:
Subclassification using Propensity Scores:
The Four Treatment Credit Terms

Subclass	Borrower Group	First Sample (N=375)			Second Sample (N=311)			Third Sample (N=300)		
		No	Mean	S. E.	No	Mean	S. E.	No	Mean	S. E.
1.	Female	2	0.213	0.017	1	0.256	Missing	2	0.242	0.026
	Male	77	0.217	0.010	61	0.227	0.007	56	0.238	0.008
2.	Female	6	0.180	0.008	9	0.237	0.014	7	0.263	0.018
	Male	73	0.212	0.005	53	0.248	0.012	53	0.263	0.010
3.	Female	12	0.223	0.013	12	0.246	0.011	14	0.279	0.022
	Male	66	0.225	0.008	50	0.255	0.009	44	0.273	0.012
4.	Female	29	0.235	0.012	22	0.269	0.016	21	0.267	0.009
	Male	51	0.220	0.008	40	0.240	0.006	39	0.248	0.006
5.	Female	43	0.254	0.012	35	0.286	0.014	33	0.300	0.015
	Male	36	0.258	0.015	27	0.298	0.019	25	0.315	0.019

woman to 61 men in the first subclass for the second sample of firms. Hence, as tables IV.3.2h to IV.3.2i depicts, the standard error for the female borrower group in that subclass could not be calculated. That is, the technique could only be

Table IV.3.2h New Lines of Credit:
Pooled Multivariate Differences

Subclass	Number	First Sample (N=395)		Number	Second Sample (N=310)		Number	Third Sample (N=291)	
		Between Group Difference	Variance		Between Group Difference	Variance		Between Group Difference	Variance
1.	79	-0.004	0.000389	62	0.029	Missing	58	0.004	0.000740
2.	79	-0.032	0.000089	62	-0.011	0.000340	60	0.000	0.000424
3.	78	-0.002	0.000233	62	-0.009	0.000202	58	0.006	0.000628
4.	80	0.015	0.000208	62	0.029	0.000292	60	0.019	0.000117
5.	79	-0.004	0.000369	62	-0.012	0.000557	55	-0.015	0.000586

used on the first and third samples of firms. Consequently, the purpose of subclassification was thwarted, at the least, for the second sample.

However, the results of subclassification was not reliable for the first and third samples either. For the first sample, the Z-score of -3.857 indicates that

women receive better treatment credit terms than men after structural factors have been considered. However, in the case of the third sample, the difference discovered in the treatment credit terms deviated both in its direction and magnitude from that of the first sample of firms. The Z-score of 1.40 for the third sample was not significant; though it indicated that women receive more stringent credit terms than men.

Table IV.3.2i **New Lines of Credit:** **Residual Statistics**

	<u>First Sample</u>	<u>Second Sample</u>	<u>Third Sample</u>
Average Difference	-0.027	0.026	0.014
Standard Error	0.007	Not applicable	0.010
Z-score	-3.857	Not applicable	1.400

Perhaps if fewer than five subclasses had been used, the problems of disparate cell sizes could have been reduced. However, subclassification on the tritiles or the quartiles of the propensity scores would have led to unreliable standard errors. This might have seriously biased eventual results. Hence, a decision was made to employ a technique which was not so limited by small cell sizes as subclassification on the propensity score.

IV.3.3

Logistic Analysis of Covariance

Logistic analysis of covariance is a variation of logistic regression. In this study, it involved the use of the propensity scores of measures of business risk. Gender of the owner, credit terms and the propensity scores on measures of business risk were the covariates examined.

IV.3.3.1 **Turndowns of New Lines of Credit:**
Logistic Analysis of Covariance

Logistic analysis of covariance with propensity scores was also used to determine whether or not the gender-related difference in the turndowns of new lines of credit persisted after structural differences have been eliminated. However, when gender was used as dependent variable only the propensity score on measures of business risk seemed to be strongly associated with gender. The dummy variable which expressed the loan turndown decision did not prove significant.

Table IV.3.3.1 **Turndowns of New Lines of Credit**
Logistic Analysis of Covariance

			First Sample (N = 496) (Female = 136; Male = 360) (Frating = 38.97%) (Mrating = 90.00%) (Overall = 76.01%) (-2LL = 0.8636) (Model = 0.0000) (Improve = 0.0000) (Goodness = 0.8256) (Residual = 0.2877)			
			Third Sample (N = 347): (Female = 104; Male = 243) (Frating = 36.54%) (Mrating = 88.07%) (Overall = 72.62%) (-2LL = 0.3207) (Model = 0.000) (Improve = 0.000) (Goodness = 0.6640) (Residual = 0.1824)			
<u>Variable</u>	<u>Beta</u>	<u>S.E.</u>	<u>Exp (B)</u>	<u>Beta</u>	<u>S.E.</u>	<u>Exp (B)</u>
G1STLR	5.84	0.61	343.13	4.34	0.58	76.97
Constant	-2.74	0.23		-2.22	0.24	

Key

G1STLR refers to the propensity scores of business attributes without asset variables.

IV.3.3.2 Multivariate Differences in the Four *Treatment* Credit Terms

Logistic analysis of covariance was also used to examine residual differences in credit terms after eliminating the effect of structural difference in business attributes. When all loans were examined jointly, only the propensity score on measures of business risk remained closely associated with gender. Interest rates ceased to be significant as a covariate of gender. Similar results were observed in the case of new lines of credit for all the three samples examined. The same tendency was replicated for increases in lines of credit. However, in this latter case, the variable which expressed requests for spousal co-signature proved to be also associated with gender in the first equation. However, the odds of 0.29 for CO_SIGN indicates that, women were less likely than men to have been requested for spousal co-signature, after taking other terms of credit and measures of business risk into account!

IV.3.3.2a All Three Loan Types: The Four *Treatment* Credit Terms

First Sample (N=878) (Female=206; Male=672) (Frating=47.57%) (Mrating=93.45%) (Overall=82.69%) (-2LL=1.000) (Model=0.000) (Improve=0.000) (Goodness=0.7064) (Residual=0.1219)			Second Sample (N=669) (Female=175; Male=494) (Frating=53.71%) (Mrating=90.89%) (Overall=81.17%) (-2LL=0.9998) (Model=0.0000) (Improve=0.0000) (Goodness=0.8239) (Residual=0.6637)			Third Sample (N=645) (Female=173; Male=472) (Frating=52.62%) (Mrating=90.25%) (Overall=80.00%) (-2LL=0.9977) (Model=0.0000) (Improve=0.0000) (Goodness=0.8512) (Residual=0.6959)			
<u>Variable</u>	<u>Beta</u>	<u>S.E.</u>	<u>Exp (B)</u>	<u>Beta</u>	<u>S.E.</u>	<u>Exp (B)</u>	<u>Beta</u>	<u>S.E.</u>	<u>Exp (B)</u>
G1SAWT	5.91	0.44	357.35	5.78	0.46	323.73	5.56	0.46	258.68
Constant	-3.05	0.18		-3.05	0.21		-2.94	0.21	

Key

G1SAWT is the propensity score: of structural differences *with* asset variables.

IV.3.3.2b New Lines of Credit: The Four *Treatment* Credit Terms

First Sample (N = 269) (Female = 59; Male = 210) (Frating = 38.29%) (Mrating = 94.29%) (Overall = 82.16%) (-2LL = 0.9864) (Model = 0.0000) (Improve = 0.0000) (Goodness = 0.7545) (Residual = 0.8038)			Second Sample (N = 221) (Female = 55; Male = 166) (Frating = 41.82%) (Mrating = 91.57%) (Overall = 79.19%) (-2LL = 0.8652) (Model = 0.0000) (Improve = 0.0000) (Goodness = 0.6160) (Residual = 0.8883)			Third Sample (N = 205) (Female = 54; Male = 151) (Frating = 42.59%) (Mrating = 91.39%) (Overall = 78.54%) (-2LL = 0.7026) (Model = 0.0000) (Improve = 0.0000) (Goodness = 0.5838) (Residual = 0.6928)			
<u>Variable</u>	<u>Beta</u>	<u>S.E.</u>	<u>Exp (B)</u>	<u>Beta</u>	<u>S.E.</u>	<u>Exp (B)</u>	<u>Beta</u>	<u>S.E.</u>	<u>Exp (B)</u>
G1SAWT	5.79	0.82	327.68	4.93	0.77	137.85	4.52	0.75	91.92
Constant	-3.01	0.33		-2.70	0.33		-2.53	0.33	

Key

G1SAWT is the propensity scores of structural differences *with* asset variables.

IV.3.3.2c Increases in lines of credit: The Four *Treatment* Credit Terms

First Sample (N=299) (Female = 54; Male = 245) (Frating = 27.78%) (Mrating = 96.73%) (Overall = 84.28%) (-2LL = 0.9979) (Model = 0.000) (Improve = 0.0075) (Goodness = 0.3442) (Residual = 0.6552)				Second Sample (N=219) (Female = 43; Male = 176) (Frating = 32.56%) (Mrating = 93.75%) (Overall = 81.74%) (-2LL = 0.9886) (Model = 0.0000) (Improve = 0.0000) (Goodness = 0.6677) (Residual = 0.5657)				Third Sample (N=212) (Female = 42; Male = 170) (Frating = 33.33%) (Mrating = 94.12%) (Overall = 82.08%) (-2LL = 0.9757) (Model = 0.000) (Improve = 0.0000) (Goodness = 0.7229) (Residual = 0.5992)			
Variable	Beta	S.E.	Exp (B)	Beta	S.E.	Exp (B)	Beta	S.E.	Exp (B)		
COSIGN	-1.25	0.52	0.29								
G1SAWT	5.13	0.83	168.90	5.55	0.92	256.65	5.16	0.90	173.48		
Constant	-2.55	0.28		-2.82	0.33		-2.71	0.32			

Key

*G1SAWT: refers to the propensity scores of business attributes *including* asset variables

IV.3.4 Summary: Residual Differences in Credit Terms

Subclassification with propensity scores proved to be a sub-optimal tool in analyzing residual differences in credit terms. Therefore, even though certain differences in credit terms persisted after adjusting for structural factors with the technique, no definite conclusion could be drawn from the results yielded.

The results of logistic regression models of covariance revealed no appreciable difference in credit terms after structural factors are controlled. In one isolated instance, it was found that women were less likely than men to have been requested for spousal co-signature. The likelihood that this result is a spurious one is high. Therefore, overall, credit terms did not seem to differ between those women and men entrepreneurs whom this study investigated.

IV.4 FACTORS INFLUENCING CREDIT TERMS

In this section, the nature of the relationship between each of the five credit terms and a set of structural factors are explored. Logistic regression analysis was used to examine the association between each of loan rejections, ratio of collateral to loan, ratio of amount received to amount requested and requests for spousal co-signature. However, multiple linear regression was used to determine the structural factors influencing interest rates.

IV.4.1 Factors Influencing Loan Rejections

With little variation, across the three different samples of firms, variables which proved to be most closely associated with loan turndowns included depth of financial management, age of business and average annual rate of growth in sales. No main effect of gender was found. As Table IV.4.1 indicates, the likelihood of loan rejections was highest for those firms that lacked professional financial management, that were relatively young and whose annual rate of growth had declined by more than five percent.

Although industrial sector and geographical location proved to be somewhat associated with the loan turndown decision, they did not yield stable results. For instance, while **MFG** (the dummy variable which expressed the manufacturing sector) entered into the equation for the first sample of firms, it

Table IV.4.1 Loan Turndowns

	First Sample (N=1262) (A=1171; R=91)			Second Sample (N=914) (A=854; R=60)			Third Sample (N=846) (A=789; R=57)		
Variable	Beta	S.E.	Exp (B)	Beta	S.E.	Exp (B)	Beta	S.E.	Exp (B)
FMGR	-0.86	0.31	0.42	-0.82	0.37	0.44	-0.81	0.38	0.45
AGE	-0.84	0.27	0.43	-0.76	0.32	0.47	-0.91	0.34	0.40
DECLIN	-0.98	0.26	0.38	-1.08	0.30	0.34	-0.99	0.32	0.37
MFG	-0.59	0.28	0.56						
S_TOWN							0.63	0.37	1.89
Const	-0.24	0.45		-0.86	0.42		-1.20	0.49	

was absent from the second and third logistic regression equations. Moreover, **MFG** had low score statistics of 0.23 and 0.05 among the variables which were excluded from the equations for the second and the third samples respectively.

In contrast, although, **S_TOWN** (the dummy variable which expresses location in a small city of up to 10,000 people), entered into the third logistic regression equation, it was missing from the first and second equations. Nonetheless, **S_TOWN** had high score statistics of 3.38 and 2.12 among the variables that did not enter the second and third equations.

As the first equation suggests in table IV.4.1, firms that were located in the manufacturing sector were about 0.45 times more likely than non-manufacturing firms to have had their loans rejected. This finding was at variance with past results which showed that manufacturing firms had better access to credit than non-manufacturing firms (Haines, Riding and Thomas, 1989). The low score statistics of **MFG** (in the cases of the second and third samples of firms), suggested that its entry into the first logistic regression equation might have had more statistical than practical significance.³⁷ However, **S_TOWN** had high score statistics in the cases of the first and the second sample of firms. Moreover, it entered into the equation of the smallest sample considered. This could be an indication that the effect size of **S_TOWN** (location in a small town or rural area) was considerable. Other variables which were potential determinants of loan turndowns, but which did not enter the equation because of redundancies or correlations with actual entrants, were: average annual level of sales and type of financial institution approached for credit.

³⁷Stevens (1986) argues that statistical significance is contingent on three factors, effect size, sample size and level of significance. The first sample in whose logistic regression equation the manufacturing sector proved significant is comparatively larger than the other two samples. Given the low score statistics of the manufacturing sector in the cases of the second and third equations, its practical significance seems doubtful.

IV.4.2 Factors Influencing Ratio of Collateral to Loan

Factors which seemed to influence ratio of collateral to loan were types of loan, level of sales and two types of assets. Other variables that were related with ratio of collateral to loan were: employment status and professional designation of the financial manager, average annual rate of growth, type of financial institution approached for credit, and various types of assets. However, the impact of these variables appeared minimal because they appeared in fewer than three of the logistic regression equation examined.

The results presented in Table IV.4.2 indicated that firms that were least likely to be requested to provide over 300 percent of their loan as collateral were those that applied for term loans, that had high volume of sales, that had business assets such as bonds, securities and or machinery available as collateral, that approached non-Canadian chartered banks for credit, that reported having personal automobiles available as collateral, that had professional financial

Table IV.4.2 Ratio of Collateral to Loan

	First Sample (N=932) (LT3=750; GT3=182)			Second Sample (N=679) (LT3=552; GT3=127)			Third Sample (N=630) (LT3=511; GT3=119)		
Variable	Beta	S.E.	Exp (B)	Beta	S.E.	Exp (B)	Beta	S.E.	Exp (B)
Const	-2.99	1.17		-2.63	0.78		-2.69	0.72	
TERM	0.66	0.21	1.93	0.64	0.26	1.91	0.75	0.26	2.11
SALES	-0.15	0.05	0.86	-0.13	0.06	0.88	-0.13	0.06	0.88
YINVA	-0.89	0.19	0.41	-0.74	0.22	0.48	-0.83	0.23	0.44
YPREAL	-0.56	0.21	0.57	-0.45	0.22	0.63	-0.45	0.22	0.64
PART	0.61	0.25	1.85	0.77	0.31	2.16			
YBBON				1.01	0.35	2.73	0.85	0.36	2.35
NBELSE				1.30	0.55	3.65	1.29	0.55	3.63
OCHA	1.64	1.03	5.18						
NMACHI	0.75	0.32	2.13						
YBREAL	-0.35	0.19	0.71						
YBELSE	-0.68	0.26	0.51						
YPAUTO	0.84	0.26	2.32						
DECLIN				-0.52	0.28	0.60			
RETAIL							-0.45	0.22	0.64
FMGR							-0.41	0.24	0.66
GREW							0.41	0.22	1.50

managers and that reported moderate average annual rate of growth (between 6 and 20 percent). However, ratio of collateral to loan was higher for firms that reported having full-time financial managers, that indicated having inventories, personal and business real estate and other business assets available as collateral, whose annual rates of growth were on the decline and that were in the retail sector.

With one exception, the above findings on factors influencing ratio of collateral to loan conformed to prior expectations. Real estate assets have more market value than most other assets; therefore, when they are used to secure a loan, the ratio of collateral to loan may be relatively high. While inventories may have high book value, their market value especially upon liquidation tends to be low. This could explain why ratio of collateral to loan was especially higher for firms with inventories (particularly, if the book value of the assets is what respondents cited). In contrast, it was not surprising that ratio of collateral to loan was lower for firms that had business bonds and securities than for their counterparts. Bonds and securities are more liquid than assets such as real estate and inventories. Therefore, it was anticipated that firms with bonds and securities would be less likely to be requested for more than 300 percent of their loan as collateral than firms that had no bonds and securities, *ceteris paribus*.

The most startling finding was that firms that reported having full-time financial managers were more likely to have been requested to provide more than 300 percent of their loan as collateral. It was expected that firms with full-time

financial managers would be expected to receive better terms of credit than their counterparts. However, firms that reported full-time employment status for their financial managers tended to have single owners who also acted as financial managers. Consequently, the majority of firms that indicated that they were full-time were essentially part-time. Moreover, few of such firms (where the sole owner was also the financial manager) reported professional status for their financial managers. Essentially, firms that claimed to have full-time financial managers might have been requested to provide more than 300 percent of their loan as collateral because 1) their financial managers were actually employed on a part-time rather than full-time basis and 2) their financial managers had no professional financial designation. The sole owner/manager/no designation status of such firms probably indicated that they lacked sufficient capacity that could lower the ratio of collateral to loan required of them than of other firms.

The entry of, **FMGR** (the dummy variable that represented the professional financial status of the financial manager in the third equation) lent credence to the premise that it was the professional designation of the financial manager rather than the employment status which affected the ratio of collateral to loan. The odds ratio of 0.62 for **FMGR** suggested that firms with professional financial managers were about 40 percent less likely than their counterparts to have been charged more than 300 percent of their loan as collateral.

IV.4.3 Ratio of Amount Received to Amount Requested

In the cases of all the three different samples examined, the variables which seemed to be associated with ratio of amount of credit received to amount of credit requested were number of owners and type of assets available as collateral. As table 4.3 indicates, firms that were most likely to receive less than 90 percent of the amount of credit they requested were: those with more than two owners and those that cited having other business assets available as collateral. In the equation involving the first sample of firms, firms whose owners had personal automobile as collateral were more likely to have received at least 90 percent of the amount of loan that they had requested, in contrast with their counterparts.

It was surprising that firms with fewer than three owners were more likely than their counterparts to be given 90 percent or more of the amount of credit that they had requested. This seemed to contradict the suggestion of past research (Thornton, 1981; Wynant and Hatch, 1991) that banks would be more willing to provide credit to firms with three or more owners than to sole owners or firms that exhibit the characteristics of 'Ma and Pa' stores. The log odds of -3.01, -1.54 and -1.49 for the intercept coefficient (constant) indicated that a substantial proportion of firms in all the three samples received at least 90 percent of the amount of the loans that they had requested.

Other variables which seemed to be correlated with the ratio of amount received to amount requested were type of loan, average annual rate of growth,

Table IV.4.3 Ratio of Amount Received to Amount Requested

<u>Variable</u>	<u>First Sample (N = 1270)</u> <u>(GT0.9 = 1230; LT0.9 = 40)</u>			<u>Second Sample (N = 921)</u> <u>(GT0.9 = 891; LT0.9 = 30)</u>			<u>Third Sample (N = 852)</u> <u>(GT0.9 = 823; LT0.9 = 29)</u>		
	<u>Beta</u>	<u>S.E.</u>	<u>Exp (B)</u>	<u>Beta</u>	<u>S.E.</u>	<u>Exp (B)</u>	<u>Beta</u>	<u>S.E.</u>	<u>Exp (B)</u>
OWNG2	-1.04	0.33	0.35	-1.10	0.40	0.33	-1.21	0.42	0.30
YBELS	-1.08	0.41	0.34	-1.19	0.45	0.30	-1.04	0.48	0.35
YPAUT	1.41	0.73	4.10						
Constant	-3.01	0.81		-1.54	0.50		-1.49	0.54	

geographical location, type of financial institution approached for credit, credit record, types of assets owned, industrial sector assets owned and managerial experience. The variables had high score statistics but did not enter into the three logistic regression equations examined.

IV.4.4 Requests for Spousal Co-signature.

Factors which seemed to influence requests for spousal co-signature were: employment status of the financial manager, type of financial institution approached for credit, whether personal real estate was available as collateral and, whether other business assets were available as collateral. These factors were relatively stable across the three logistic regression models examined.

To a more limited extent, age of business, type of ownership, level of education of first owner, whether other personal assets were available as collateral, average annual rate of growth, identity of the financial manager and number of full-time equivalent workers seemed to have had an effect on term of credit. However, their role was limited because they appeared in fewer than three of the logistic regression equations. They might not have entered because

of redundancies with significant variables.

Table IV.4.4 **Requests for Spousal Co-signature**

Variable	First Sample (N=1054) (R = 228; NR = 826)			Second Sample (N=776) (R = 149; NR = 627)			Third Sample (N=720) (R = 135; NR = 585)		
	Beta	S.E.	Exp (B)	Beta	S.E.	Exp (B)	Beta	S.E.	Exp (B)
Const	2.93	0.83		1.12	1.15		1.50	1.01	
PART	-0.48	0.19	0.62	-0.91	0.26	0.40	-0.66	0.25	0.52
CDNC	-0.78	0.24	0.46	-0.82	0.30	0.44	-0.92	0.32	0.40
TRUST	-1.59	0.57	0.20	-2.00	0.66	0.14	-1.93	0.69	0.15
YPREAL	-1.14	0.16	0.32	-1.26	0.20	0.28	-1.28	0.21	0.28
NPREAL	-0.76	0.34	0.47	-1.78	0.51	0.17	-1.80	0.50	0.17
AGE	-1.01	0.21	0.36	-0.88	0.25	0.41			
EDUC_1	-0.15	0.05	0.86	-0.13	0.06	0.87			
NBELS	0.93	0.38	2.54	0.97	0.56	2.65			
NPELS				1.44	0.65	4.23	1.72	0.60	5.59
NEQUAL				0.90	0.43	2.45	1.01	0.43	2.75
GREW	-0.31	0.16	0.74						
OUTFMGR				0.91	0.43	2.48			
WRKR							-0.61	0.22	0.54

As table IV.4.4 portrays, requests for spousal co-signature were more likely for firms that reported having part-time financial managers, that approached either Canadian chartered banks or Trust Companies for credit, that reported having personal real estate, other personal assets and other business assets available as collateral, that were unequally owned, that had grown moderately and that reported having an employee or a principal owner as financial manager. However, the older a firm was, the more education its owner has had, and the more number of full-time equivalent workers it had, the less likely it was that it would be requested to provide spousal co-signature.

IV.4.5Factors Influencing Interest Rates

Across the three different samples of firms examined, variables which seemed to be closely associated with interest rates were number of full-time equivalent workers, average annual rate of growth and level of sales. None of the other variables seemed to be related with interest rates.

As table 4.5 indicates, rates of interest and measures of capacity were inversely related. The more full-time equivalent workers a firm had, the lower the rate of interest that was charged on its loan. Likewise, the higher the volume of sales of a firm, the lower the rate of interest it was charged. However, firms with declining rate of growths were charged higher rates of interest than their counterparts. These results concur with past research findings which indicated that capacity, as represented by size, had a strong influence on rates of interest charged on loans.

Table IV.4.5Rates of Interest

<u>Variable</u>	<u>First Sample (N=1074)</u>			<u>Second Sample (N=783)</u>			<u>Third Sample (N=721)</u>		
	<u>B</u>	<u>SE B</u>	<u>Sig T</u>	<u>B</u>	<u>SE B</u>	<u>Sig T</u>	<u>B</u>	<u>SE B</u>	<u>Sig T</u>
WRKR	-0.3772	0.0714	0.0000	-0.4067	0.0874	0.0000	-0.3972	0.0921	0.0000
GREW	-0.0215	0.0641	0.7370	-0.0592	0.0798	0.4588	-0.0464	0.0832	0.5769
NEQUA	0.0012	0.0848	0.9883	0.0390	0.1189	0.7429	0.0472	0.1228	0.7009
RETAIL	-0.0409	0.0637	0.5209	-0.0154	0.0808	0.8488	-0.0281	0.0849	0.7406
TERM	0.0648	0.0608	0.2871	0.1353	0.0757	0.0742	0.1883	0.0784	0.0166
YEQUA	-0.0324	0.0868	0.7094	-0.0301	0.0974	0.7572	0.0226	0.1371	0.8594
FMGR	-0.0214	0.0548	0.6967	-0.0248	0.0681	0.7163	-0.0564	0.0709	0.4266
MFG	-0.0386	0.0820	0.6377	-0.0356	0.1020	0.7272	-0.0305	0.1065	0.7750
DECLIN	-0.2237	0.0885	0.0116	-0.2453	0.1072	0.0223	-0.1917	0.1120	0.0873
CORP	-0.1492	0.1048	0.1548	-0.1465	0.1337	0.2733	-0.1275	0.1561	0.4143
AGE	-0.1046	0.0672	0.1199	-0.1266	0.0834	0.1296	-0.1444	0.0983	0.1024
INCRES	-0.0517	0.0603	0.3918	-0.0240	0.0743	0.7466	-0.0054	0.0770	0.9444
SERVE	0.0275	0.0707	0.6974	0.0630	0.0888	0.4780	0.0430	0.0921	0.6403
GREWM	-0.0622	0.0796	0.4346	-0.1029	0.1014	0.3106	-0.0920	0.1061	0.3862
SALES	-0.0741	0.0214	0.0006	-0.0657	0.0267	0.0141	-0.0628	0.0278	0.0242
PROP	-0.0397	0.1262	0.7530	-0.0471	0.1557	0.7622	-0.0304	0.1756	0.8626
Const	2.6297	0.3196	0.0000	2.5566	0.3990	0.0000	2.3898	0.4503	0.0000

IV.5

DISCUSSION

It should be noted that the structural factors which proved significant in predicting credit terms were not necessarily the only relevant ones. Other structural factors may not have entered the various equations because of correlations with significant variables. The same argument applies to the equations involving gender and structural factors. This caveat about multicollinearity is crucial to understanding of the relationship between gender, structural factors and credit terms.

In some cases, the factors which were significant predictors of credit terms were also directly associated with gender. For instance, rates of interest charged on loans were lower, the higher the annual sales volume and the larger the number of workers. Relative to men, women tended to report lower annual sales volume and fewer workers. This structural factor might explain why interest rates charged on loans tended to be higher for women than for men, at a first glance. Two reasons make this inference plausible: 1) gender was not among the significant predictors of interest rates and 2) the initial differences in rates of interest charged on loans disappeared when structural differences were controlled.

In other cases, variables which were associated with credit terms were indirectly associated with gender. For example, the likelihood of loan turndowns was lower for older firms and for firms with access to professional financial management. It was found that women entrepreneurs tended to have less managerial experience than men entrepreneurs. Women entrepreneurs were also

likely to be their own financial managers. When age of business was deleted from any of the equations in which it proved significant, years of managerial experience entered. Thus, age of business and years of managerial experience could be treated as substitutes.

In addition, firms that reported having access to professional financial management were more likely to indicate that their financial managers were employed on a part-time basis. Firms that reported lack of access to professional financial management were also likely to indicate that their financial managers were also principal owners. Therefore, women-owned businesses tended to be younger and to lack access to professional financial management, relative to those of men. Such structural difference might account for the initial differences in the likelihood of rejections of new lines of credit.

IV.6. SUMMARY OF RESULTS

Initial analyses indicated that gender was associated with turndowns of new lines of credit and with interest rates in general. However, after using several techniques which eliminated the effects of measures of business risk, neither gender of the owners nor gender of the financial manager proved to be related with credit terms. Rather, certain measures of business attributes which were strongly associated with credit terms were also closely associated with gender. Perceptions about the role of financial institutions were also found to differ between women and men entrepreneurs.

V. CONCLUSION

This chapter reviews the findings of this study in light of certain practical limitations. Against this backdrop, it outlines recommendations to various stakeholders: women entrepreneurs, governments, financial institutions and educational institutions. Finally, it maps future research directions. The chapter is divided into four sections. The first section presents a summary of overall findings. The second section discusses the limitations associated with the study. While the third section focuses on recommendations, the fourth section suggests a research agenda for future studies.

V.1 SUMMARY OF STUDY

V.1.1 Initial Differences in Credit Terms

Initial analyses showed that credit terms differ between women and men entrepreneurs. It was found that the likelihood of rejections of new lines of credit was twice as high for women as for men before structural differences were controlled. When all loan types were jointly considered, no difference was found in the rate of loan rejections. Likewise, no gender-based difference was found in the likelihood of rejections of either one of term loans or increases to existing lines of credit.

Also, for term loans, no multivariate gender-related difference was found in ratio of collateral to loan, ratio of amount received to amount requested, interest rates and requests for spousal co-signature. However, rates of interest tended to be higher for women than for men when all loan types were considered jointly. Women were also more likely than men to be charged higher rates of interest on their new lines of credit and increases to their existing lines of credit. In one peculiar instance, it was found that women were less likely than men to be asked for spousal co-signature.

V.1.2 Controlling for Structural Differences: Residual Differences in Credit Terms

It would be erroneous to deduce that these initial differences in credit terms were evidence of systematic gender discrimination without taking gender-based differences in business attributes into account. Therefore, three different approaches were taken to separate the effects of structural factors from that of gender in analyzing credit terms. The first two methods are subclassification using propensity scores and logistic analysis of covariance with propensity scores. The third approach aimed to determine whether gender was among the structural factors that proved to be significantly associated with five credit terms.

V.1.2.1 Subclassification on Propensity Scores

The technique of subclassification indicated that the gender-related differences in credit terms endured even after structural differences were controlled. However, three considerations made the results obtained with the

technique less than reliable. Foremost, in the case where differences in credit terms were found, factors other than gender discrimination might have been at work. For instance, it was found that women were more likely than men were to have had their requests for new lines of credit rejected even after certain structural differences were considered. Information on asset structure was not available for those firms whose loans were rejected. Yet, differences in asset structure may explain such differences in likelihood of loan rejections.

Second, inadequate sample size placed serious constraints on the technique of subclassification in some cases. This study examined the largest sample of women entrepreneurs to date. Moreover, the technique of subclassification is supposed to be robust against insufficient sample size (Rosenbaum and Rubin, 1986). However, in certain cases, there was only one woman to compare with as many as sixty men.

Third, the results obtained with subclassification were at variance with those obtained with the other two techniques. Logistic analysis of covariance indicated that differences in credit terms did not endure after considering structural differences in business attributes. Moreover, gender of owner(s) did not prove significant among the factors that seemed to influence each credit term.

V.1.2.2

Factors influencing Credit Terms

This study has been able to show that certain business attributes were closely associated with credit terms. The likelihood of **loan turndowns** was higher for firms that lacked access to professional financial management, that were new

and that reported declining growth rates. To a limited extent, firms in the manufacturing sector and in cities with populations above 10,000 people were also more likely to have had their loans rejected.

Ratio of collateral to loan tended to be lower for firms that had applied for term loans, that had high volume of sales, and that did not report having inventories or personal real estate available as collateral. Less reliably, **ratio of collateral to loan** was lower for firms that reported having part-time financial managers, that had business bonds and securities, that did not report unclassified business assets, that bank with non-Canadian chartered banks, that had machinery available as collateral, that reported having personal automobile of owners available as collateral, that were not in the retail sector, that had access to professional financial management, and that reported average annual rates of growth greater than five percent.

Rates of interest charged on loans were lower, the higher the annual sales volume, the larger the number of workers and the higher the average annual rate of growth. Women-owned businesses tended to have lower annual sales volume and fewer workers than those of men. These structural differences in measures of size would seem to explain initial gender-related discrepancies in rates of interest charged on loans.

Ratio of amount of loan received to amount of loan requested tended to be higher for firms that had fewer than three owners and, that did not report having unclassified business assets as collateral. In one instance, firms that reported having personal automobile available as collateral were more likely than

their counterparts to be granted over 90 percent of the amount of loans that they had requested.

The likelihood of **requests for spousal co-signature** was lower for firms that had part-time financial managers, that banked with financial institutions other than Canadian chartered banks or trust companies that did not report having personal real estate as collateral, that were older, whose first owners were highly educated, that indicated having other business or personal assets as collateral, that are equally owned, that did not report moderate annual rate of growth (between 6 and 20 percent), whose financial managers are either principal owners or employees and that had a large number of workers.

To an extent, the nature of the association found between credit terms and structural factors concur with prior expectations. However, there were some notable deviations. Surprisingly, firms in the manufacturing sector were more likely than other firms to have had their loans rejected, other factors constant. Firms in manufacturing were expected to receive better terms of credit than firms in retailing and services, because manufacturing firms are believed to have more pledgable assets than firms in retailing and services.

It was also startling that firms with fewer than three owners were more likely to receive over 90 percent of the amount of loan that they had requested. Firms with fewer than three owners were supposed to evince characteristics of low-growth, "Ma and Pa" stores. Consequently, firms with three or more owners should have received over 90 percent of the amount of loan that they had requested, relative to their counterparts.

These two discrepancies could raise questions about the extent to which the criteria employed in credit decision-making are standardized. In addition, the anomalies could be bellying potential interaction effects. The SPSSX package that was used was supposed to automatically calculate interaction effects (Norusis, 1990). However, it is not clear if such calculation actually took place. Moreover, how such interactions should be interpreted from the output was not clear. Future studies may need to specify potential interaction effects, particularly those that could involve gender.

Another deviation was not so startling: ratio of collateral to loan and the likelihood of requests for spousal co-signature were lower for firms that reported having part-time financial managers than for their counterparts. However, firms that reported that their financial managers were employed on a part-time basis were also likely to report that they had access to professional financial management. Such correlations may account for why credit terms seem to be more favourable for firms with part-time financial managers than for their full-time counterparts.

V.1.2.3 Structural Differences in Business Attributes

Relative to those of men, women-owned enterprises were more likely to be in retailing, to be sole proprietorships, to have fewer than three owners, to have few workers, to report low annual sales volumes, to have applied for term loans and to report having personal rather than business assets available as collateral. Women tended to have completed more years of education than men;

however, men tended to have had more managerial experience. Years of managerial experience had a strong positive association with age of business. Thus, it would seem that businesses owned by women tend to be younger than those owned by men. In addition, women entrepreneurs were also more likely to be their own financial managers, probably because their businesses are smaller than those of men. In the discussion section of the preceding chapter, it was suggested that firms whose owners are their financial managers are more likely than their counterparts to report lack of access to professional financial management. Hence, it appeared that women-owned businesses were more likely than their counterparts to lack access to professional financial management.

V.1.3 Covariates of both Gender and Credit Terms

Gender was either directly or indirectly related with most if not all of the factors influencing credit terms. For example, interest rates tended to be lower, the higher the annual sales volume and the greater the number of workers. Women were more likely than men to report lower annual sales volume and to have fewer employees. This structural difference in size may account for why women were charged higher rates of interest than were men.

As another example, the likelihood of loan turndowns was higher for young firms and firms that lack access to professional financial management. By taking collinearity into account, one may argue that women-owned businesses tend to be younger and to lack access to professional financial management. These two attributes may thus explain why the likelihood of rejections of new

lines of credit was higher for women than for men.

V.2. LIMITATIONS OF THE STUDY

If the measures of business attributes examined in this study sufficed as criteria for sound credit decision-making, then structural differences in business attributes might seem to explain initial gender-related discrepancies in credit terms between women and men entrepreneurs. However, several caveats must temper the foregoing observations about the association among gender, structural factors and credit terms. Only then could appropriate recommendations be made to the relevant stakeholders: women entrepreneurs, financial institutions and governments.

The first injunction touches on potential interaction effects between gender and significant variables. The second caveat relates to the limited number of variables investigated. The third concern is that of non-response bias. The fourth concern revisits multicollinearity from a different perspective. The fifth caution discusses the complexity of the relationship between women and financial institutions. The sixth concern is a discussion of the limitations imposed by the cross-sectional research design of this study.

V.2.1 Interaction Effects

The SPSSX package that was used for logistic regression was supposed to automatically calculate interaction effects (Norusis, 1991). However, the procedure for specifying and interpreting the relevant interactions was not clear.

Moreover, potential interaction effects were not considered for rates of interest charged on loans. Therefore, while the absence of gender in the equations for the various credit terms may indicate that gender is not a significant predictor by itself, potential interaction with significant variables should not be ruled out.

One possible interaction effect is that between manufacturing and gender for loan turndowns³⁷. The likelihood of loan rejections was higher for firms in manufacturing than for firms in any other sector. This result deviates from the findings of previous research which indicates that manufacturing firms would have easier access to credit than firms in other sectors (see Thornton, 1981; Haines, Riding and Thomas, 1989). In this study, relative to men, women tended to concentrate in retailing, services and manufacturing than in other sectors. It has been suggested that financial institutions may be more willing to lend to women in traditionally feminine sectors such as retailing and services than to women in traditionally masculine fields such as manufacturing, construction, mining and transportation (Buttner and Rosen, 1989). Could the entry of manufacturing into the first equation for loan turndowns be indicating potential interaction effects between gender and the manufacturing sector?

³⁷ The dummy variable which expressed the manufacturing sector was stable neither for the equations involving structural differences in business attributes nor for those involving loan turndowns; however, in both cases, the manufacturing variable appeared in the equations involving the largest sample of firms.

V.2.2Missing Variables

Second, not all the structural factors and credit terms that have been identified as relevant were investigated. For example, although a large number of structural factors were investigated, others such as quality of business plan and detailed financial history were not included. Likewise, while six terms of credit were identified as relevant, only five of these were considered. Specifically, the association between gender, various structural factors and *service charges or loan fees* are not known. It is not certain whether gender-related differences in credit terms would remain significant after controlling for structural differences in business attributes.

V.2.3A fully multivariate model?

The third limitation of this study is related to the second, for methodological reasons, the correlations among all the credit terms could not be taken into account. Data on the treatment credit terms was not available for those firms whose loans were rejected. In consequence, loan turndowns had to be examined separately from the four treatment credit terms. Furthermore, the categorical nature or non-normality of some of the credit terms did not permit a joint examination of the factors influencing credit terms. The results of this study could be different if such a complete multivariate model could be realized.

V.2.4Non-Response Bias

Fourth, in terms of non-response, of the 14,980 questionnaires that were sent out 2,763 were received. This entailed a response rate of about 18.44 percent. Respondents may differ from non-respondents, not only in terms of business attributes but, also, in terms of credit experience. Specifically, business owners who have had negative experiences with financial institutions may not have responded to the questionnaire.

V.2.5The Complexity of Women-Banking Relationship

Sixth, not all the aspects of the model on credit experience is quantifiable. It is remarkable that in spite of empirical evidence, women continue to believe that they are the victims of systematic gender discrimination. Hence, the examination of the relationship between gender of owner(s) and perceptions about the roles of financial institutions in this study.

It is particularly striking that women were more likely than men to believe that they were not treated with enough respect, that they were not made comfortable, and that their accounts managers were not approachable. Of course, respondents and non-respondents may differ on these dimensions as well. However, if these findings could be generalized, they may be indicators of differential treatment, in process if not in outcome.

V.2.5.1Risk

Risk, defined here as the potential loss inherent in lending to a particular small business, has been evaluated primarily from the perspective of financial institutions. Yet, it is possible that some of the criteria used by financial institutions to evaluate the risk associated with small businesses may be inappropriate. The criteria may also ignore the strengths of female-owned businesses.

Female entrepreneurship is relatively new (Schwartz, 1976). Hence, some of the criteria used by financial institutions may be relevant to men-owned firms but not female businesses. Buttner and Rosen (1987) found that male loan officers were more likely than female loan officers to rate women lower on the entrepreneurial scale. Aldrich (1988) indicates that women are still under-represented in key decision-making position in banking, finance and accounting professions. Hence, the criteria that are used in credit-financing may reflect a strong male bias.

For instance, banks seem to value size as an indicator of ability to repay; yet, although women owned businesses are smaller, their survival rates are equal to, if not higher than men's businesses (Kalleberg and Leicht, 1991:150). Apparently, in spite of the systemic difficulties that women face, they seem to be performing as well as, if not better than men.

Another potentially unsuitable criterion relates to access to professional financial management. Professional financial designation may be an adequate measure for assessing access to professional financial management for large

businesses; however, it may too austere a measure for small businesses. Given the scope of small businesses, their financial managers may need to have taken only a few courses to become familiar with the financial function. A more flexible definition of professional financial management could have mitigated some of the structural differences in business attributes reported by this study.

V.2.5.2

Weighting of Criteria

In this mode, an important concern relates to whether or not each criterion should be given identical weights as its counterparts. For instance, should the credit record be weighted on the same basis as annual sales volume or industrial sector? Women-owned enterprises may not be as quickly growing as those of men; however, previous research reported low loan default rates of between 0.5 and 5 percent for women (Walmsley, 1991:79). Differential weighting of factors might reveal that structural differences in business attributes between women and men entrepreneurs are in fact minimal.

V.2.6

Cross-sectional versus longitudinal research design

In this study, it was assumed that structural differences in business attributes were independent of systematic gender discrimination. However, in the long-term, the effects of systematic gender discrimination may coalesce into structural differences in business attributes. Hence, the structural differences revealed in this study could be in part, if not whole, the products of systematic

gender discrimination that might have taken place in the past. For example, if a woman found it easier to obtain a loan for a flower shop rather than for a manufacturing concern, business attributes such as annual sales volume and ability to afford access to professional financial management cannot but be affected.

V.2 RECOMMENDATIONS

The foregoing caveats suggest that the results of this study may, in fact, raise more questions than they answered about the nature of the relationship between women entrepreneurs and financial institutions. However, having qualified the observations of this study, some recommendations may now be made to the relevant stakeholders.

Women operate within a given social context. Therefore, their efforts at self-advancement may be enhanced or thwarted by the type of support they receive from various social institutions. This section presents alternative ways in which a concerted approach can be taken by women, governments, universities and financial institutions to promote the professional development of women entrepreneurs.

V.3.1Women Entrepreneurs and
Self-Development

Women entrepreneurs, both future and present, have a crucial role to play in correcting certain structural biases³⁸ to which their businesses could be subject. To the extent possible, women entrepreneurs should obtain adequate training in financial management. This will enable them to be familiar with the conditions under which financial institutions will grant them credit and to prepare accordingly.

Wherever possible, women should also seek to be joint rather than sole owners in firms where diverse skills and talents are represented. To avoid situations in which they are *silent* but *working* owners, they should ensure that their rights are well-protected. This presupposes adequate business, financial and/or legal training³⁹.

V.3.2.The Role of Governments
in Entrepreneurial Development

This study has shown that structural differences in business attributes may account for some of the difficulties which women encounter with credit-financing. However, it has also been argued that the criteria currently used in credit

³⁸It needs to be stressed here that structural biases do not have the same meaning as systematic gender discrimination; rather, they are systemic differences which could mitigate credit terms to women on financial grounds.

³⁹This is one of the areas in which women support groups can be of assistance. A recent study by Campbell (1990) suggests that some women entrepreneurs, particularly, those who work with their spouses, often do not take enough measures to protect their own interests. That is, they often are working rather than legal partners. Thus, they may not share in the success of the enterprise they helped to create, especially, if their marriage should terminate.

decision-making may not *always* be relevant for assessing the risk associated with women-owned businesses. To the extent that such criteria remain unchanged, government programs may be a key resort for women entrepreneurs seeking credit.

Women entrepreneurs are not a homogeneous group. Therefore, the type of assistance that each group of entrepreneurs may desire from governments may differ depending on their business background. Governments could assist women entrepreneurs by commissioning studies which will first investigate *ways in which women entrepreneurs want governments to assist them*. Thus, women would become active participants in their own professional development. However, it needs to be stressed that women entrepreneurs should not be studied in isolation from men entrepreneurs. Only then can the particular needs of each group of entrepreneurs be sharply defined. This is not to say that there should not be programs which would target women entrepreneurs in particular. However, the specific problems faced by women should be made clear before special programs could be relevant.

More specifically, governments could assist women entrepreneurs by funding financial and management development programs. Two examples of such programs are the Small Business Consulting Services that are being promoted by the Ministry of Industry and Technology at various universities and the start-up training provided by the Ottawa Small Business Association. These programs are valuable to the extent that they train small business owners to prepare business plans, to budget and to bank. However, anecdotal evidence

suggests that such programs are beset with problems such as lack of funding, limited number of consultants and lack of follow up. Government support may be critical in all three of these areas.

Rather than simply subsidizing the costs of training programs, governments could treat them as loans to be repaid. The term of such loans may vary depending on the specific needs of each group of entrepreneurs. This would minimize the costs that governments themselves incur. At the same time, it should secure the commitment of entrepreneurs to their own development without undue hardship.

The design of such programs is also critical. The funding allotted should be enough to secure sufficient staff and to ensure follow-up. It may be true that there is no better teacher than hard-earned experience. However, entrepreneurs need professional advisors they can approach during critical periods of development. They also need to learn from the success as well as failure of other entrepreneurs. This presupposes adequate planning, staffing and implementation of training programs. However, the realization of these aspects of training presupposes adequate funding.

V.3.3

Financial Institutions and Women Entrepreneurs

This study has shown that women consider certain functions to be important roles of financial institutions. For instance, it was found that women are more likely than men to perceive that financial institutions are sources of venture rather than credit capital. However, no gender-related difference was

found in the satisfaction ratings of financial institutions as suppliers of venture capital. Consequently, women may be perceiving financial institutions as sources of venture capital because this is the manner in which the institutions advertise themselves. There is a clear need for financial institutions to clarify their role as providers of credit rather than venture capital.

Of particular concern are the findings that women 1) are more likely than are men to perceive that they are not given enough respect by financial institutions, 2) do not think that their accounts manager are easy to talk to and 3) are more likely than men to report that they are not made comfortable by financial institutions. To improve relations with their female business clients, financial institutions may need to reassess their marketing strategies, and the attitudes and behaviour of their loans staff *vis-à-vis* women.

V.3.4 Educational Institutions and Women Entrepreneurs

The role played by educational institutions in the professional development of women entrepreneurs is, for better or worse, a crucial one. Universities can help women in their career planning by promoting their involvement in all disciplines. Business programs should also be geared towards managing not only corporate businesses but small business enterprises as well. There is need for research that will focus not only on the symptoms but the causes of the problems faced by women entrepreneurs. This is one of the areas in which both universities and governments can provide valuable assistance to women entrepreneurs.

V.4 DIRECTIONS FOR FUTURE RESEARCH

Scope and time constraints did not permit an examination of the relationship between certain perceptions held about the role of financial institutions and business attributes. Such an investigation would be crucial if financial institutions are to cater to the needs of all entrepreneurs adequately. Whereas, some women may be dissatisfied with their treatment by financial institutions, other women be quite satisfied. The same possibility applies to male entrepreneurs. Several studies indicate that women do not want special treatment from financial institutions. They simply want to be treated as men are. This is an additional reason why it is important to chart the respective effect of gender and structural factors on perceptions about the role of the banker.

This study has the largest sample of women entrepreneurs versus men entrepreneurs to date. However, insufficient cell sizes of female borrowers created methodological problems when subclassification on propensity scores was used as a technique for eliminating the effects of structural differences on credit terms. This seriously limited the interpretability of the findings with subclassification. For instance, in some cases, there was only one woman to compare with about 71 men. In such a case, the standard error could not be calculated for the female borrower group. This meant that no conclusion could be drawn from subclassification. Future studies may profit from the technique of subclassification by using fewer number of subclasses. However, this may lead to large standard errors within each group.

Comparison of the working sample and the general small business population suggests that the sample may not be representative of Canadian small businesses in general. There would seem to be a need to study younger firms whose experience may not be the same as the more established firms examined here.

There is also a need to examine the extent to which the experience of non-respondents differ from those of respondents within the CFIB sampling frame. A proposal has been made (Riding and Thomas, Personal Contact, 1990) to study this aspect of the problem in particular.

It is possible that in the long run, former effects of systematic gender discrimination coalesce into structural gender-based differences in business attributes. Such structural differences may then mitigate credit terms for women relative to men. The static nature of this study does not allow an investigation of this possibility. Efforts to guard against bias of this nature was made by controlling for age of business and years of managerial experience of owner. Nonetheless, longitudinal studies that will compare the credit experience of female and male small business borrower groups from start-up to consolidation may be beneficial.

The original intention of this study was to consider all credit terms simultaneously. It has been shown that there are both practical and theoretical grounds for examining loan turndowns as an access credit term separately from ratio of collateral to loan, ratio of amount received to amount requested, interest rates and requests for spousal co-signature as treatment credit terms. However,

practical or methodological limitations made it impossible to verify the factors influencing the treatment credit terms jointly in one single analysis as could be done with multivariate analyses of variance. LISREL structural models are particularly suited for overcoming such methodological limitations. However, time constraints did not permit the use of the LISREL technique in addition to the methods employed here.

Information on asset structure was not available for those firms whose loans were rejected. Future work may want to focus on gender-based differences with respect to measures of capital in particular. Moreover, it would be useful to examine the association among various measures of capital such as the number of owners, form of business, and type of assets available as collateral.

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**APPENDIX III.A:
CFIB 1988 QUESTIONNAIRE**

[illegible]

Bank Competition

11. If you noticed any change in competition for your firm it business among banks or bank the institutions here (Complete the chart below):

1. No change	2. No change	3. Much less competition
4. Slightly more competition	5. No response	6. No response

12. Within the last 12 years have you experienced any changes in the following (check the letter(s) of the bank or banks that institution your firm has dealt with most often):

1. Failure	2. No change	3. Worse
4. More	5. Same	6. Less
7. Better	8. No change	9. Worse
10. Consistency of institutional	11. No change	12. Worse
13. Consistency of account manager	14. No change	15. More variable
16. Lending criteria	17. No change	18. More variable

13. Within the last 5 years have you ever actively shopped for a different bank (or banks) for bank(s) in bank's your business needs?

1. Yes	2. No
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14. If "Yes," why not? (Check only one listed reason.)

1. Poor bank reputation with bank	2. No real difference in bank
3. Satisfied with current bank	4. Only one bank in the area
5. None thought about it	6. Other

15. Within 12 years or more you changed bank(s) for bank(s) in bank's your business needs? (Check one)

1. One	2. Two	3. Three	4. Four	5. Five or more
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16. When was the last time you changed a principal bank(s) in bank's your business needs?

1. Never or more than 5 years ago	2. 2 to 3 years ago	3. 3 to 4 years ago	4. 4 to 5 years ago	5. 5 years or less
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	Very important		Important		Not important	
	1	2	3	4	5	6
17. Below are listed a number of characteristics for a bank or a bank-like institution. How important is each one to you in deciding your use of a banking business? (Mark—please once per year)						
a. Knows you and your business	10	21	2	1	2	17
b. Provides helpful business suggestions, advice and/or assistance	10	20	2	1	2	17
c. Offers the "best" deposit money available	10	21	2	1	2	17
d. One person always handles your credit needs	10	20	2	1	2	17
e. Convenient for all use	10	20	2	1	2	17
f. Flexible nature of credit	11	21	2	1	2	17
g. Knows your industry	10	20	2	1	2	17
h. Speed of decisions and service	10	21	2	1	2	17
i. Easy access to loan officer	11	21	2	1	2	17
j. Offers a wider range of loans, services	11	21	2	1	2	17
k. Knows the local area or community	11	21	2	1	2	17

	1990	1991	1992
f. Available source of credit	25	25	26
g. Known your industry	19	20	20
h. Spend of decisions and service	16	16	16

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19a) Over the last 12 months, has the per unit size of loans	1 Decreased substantially
2 Decreased slightly
3 Stayed the same
4 Increased slightly
5 Increased substantially	101
19b) Other "no increase" - does the additional cost reflect a comparable increase in the amount or number of services received?	1 Yes
2 No	102
20 Do you do your personal banking at your firm's principal bank or bank like a customer?	1 Yes, try credit
2 No	103
21 What is your principal bank for bank like institutions that you use for most of your business banking? (Mark one only)	1 Canadian Imperial Bank of Commerce
2 Bank of Montreal
3 Royal Bank of Canada
4 Fleet Bank of Canada
5 Other Chartered bank (describe)
6 Other (describe)	104
22 At which location of your bank do you conduct your business banking?	1 Headquarters location
2 Specialized small business branch
3 General branch	105
23 In what province/territory is your principal business located?	1 N.S.
2 Nn	106
24 In the past three years, has your firm experienced no market or financial difficulties?	1 Yes
2 No	107
25a) Within the period, would you describe your bank's approach to your business as	1 Very supportive
2 Supportive
3 Unchanged
4 Not helpful	108
25b) Other (describe)		109
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- Attach additional sheets if necessary.

**APPENDIX III.B:
CFIB 1990 QUESTIONNAIRE**

CFIB Banking Survey

July, 1990

14

The CFIB Banking Survey is a very effective tool. Your responses to the questionnaire will provide us with valuable data needed to act on your behalf. As is our rule, the information you provide will remain confidential.

Your Business

- 1) Where is your firm located? (Circle one only)
1. Small town or rural area (up to 10,000 people)	3. City (100,001 to 500,000 people)	8
2. Small city (10,001 to 100,000 people)	4. Large city (more than 500,000 people)	
- 2) For how long has your business been established? (If less than one year, please round up to one year.)
- _____ years 10-12
- 3a) What is the legal status of your business organization? (Circle one only)
1. A sole proprietorship (Go to Q. 4)	2. A partnership	3. A corporation	13
- 3b) If your business is a partnership or a corporation, how many owners does it have?
- _____ owners 14-15
- 3c) If your business is a partnership, is it an equal partnership? (Circle one only)
1. Yes	2. No	16
- 4) How, on average, have your gross sales revenues changed over the past three years? (Circle one only)
1. Declined (more than 5%)	3. Grew (6 to 20%)	17
2. No change (-5% to +5%)	4. Grew rapidly (more than 20%)	
- 5) How many people does your business organization employ? (Include any owner who works for the business in your response.)
- _____ employee(s) of which _____ is/are part-time (less than 30 hours per week) 18-24
- 6) Please evaluate the extent to which your organization's FINAL PRODUCT/SERVICE is "high tech" in nature by circling the appropriate number on the scale below. (A rating of 1 means that your final product is not "high tech" at all; 9 means that your final product or service is exclusively "high tech". High technology or "high tech" in this context refers to such industries as semiconductors and related silicon technology, biotechnology, pharmaceuticals, aerospace/satellite communications, telecommunications and computers. For instance, if your firm produces cookies, you may wish to assign a rating of 1; however, if your firm produces semiconductors, you may wish to assign a rating of 9. These two examples represent extremes and you may assign other ratings based on your perception of what the nature of your product/service is.)
Not "high tech" at all							Very "high tech"		
1	2	3	4	5	6	7	8	9	25
- 7) On the scale below, please indicate the extent to which your organization EMPLOYS HIGH TECHNOLOGY to produce its final products or to provide its services. (A rating of 1 means that your organization does not use high technology at all in production; a rating of 9 means that you use only high technology in production. For instance, though your firm may produce a non-high technology product, it may nonetheless employ high technology such as computers in production. If a plant for producing cookies is completely automated, for instance, one may assign a rating of 9. On the other hand, if the cookies are produced traditionally, you may want to assign a rating of 1.)
Not "high tech" at all							Very "high tech"		
1	2	3	4	5	6	7	8	9	26

Background of Owner(s)

A principal owner of a business is a person who owns a substantial portion of the total equity of that business enterprise (usually 20% or more of total ownership) and who plays an active role in the management/direction of the business. Below, please provide information on up to three of your principal owners.

- 8) Please identify the gender of each of the principal owners of your business in descending order of percentage of ownership; that is, principal owner I should have more (or an equal share) of total equity than (as) principal owner II AND principal owner II should have more (or equal) percentage of total ownership than (as) principal owner III. (Circle 1 if the principal owner is male and circle 2 if the principal owner is female.)

Principal Owner I	Principal Owner II	Principal Owner III	Gender of Owner
1	1	1	Male
2	2	2	Female

27-29

SURVEY CONTINUED INSIDE

9a) What is the highest level of formal education that each of the principal owners of your business has completed? (Please circle one only for each owner.)

Principal Owner I	Principal Owner II	Principal Owner III	Highest Level of Education Completed by Owner	
1	1	1	Some high school	30-32
2	2	2	High school diploma	
3	3	3	Some university/college	
4	4	4	College degree	
5	5	5	Undergraduate degree	
6	6	6	Graduate degree	

If none of your principal owner(s) has a college or university degree, skip to Question 10.

9b) If an owner has a college or university degree, please indicate the type of degree below. (Circle 1 if the owner has a financial degree, circle 2 if the owner has another professional degree and 3 if the owner has a non-professional degree.)

Principal Owner I	Principal Owner II	Principal Owner III	Type of Degree Owner holds	
1	1	1	A financial professional degree (e.g. B.Com., M.B.A. or Ph.D. in Finance, Accounting or Economics)	33-36
2	2	2	Other professional degree (e.g. medical doctor, engineer, lawyer, etc.)	
3	3	3	Other degree	

10) In your industry sector, how many years of managerial experience does each of up to three of your principal owners have?

Principal Owner I	Principal Owner II	Principal Owner III	
_____ years	_____ years	_____ years	36-41

11) Who is the formal/informal financial manager of your business? (Circle one only)

1. A principal owner	3. An outside accounting firm	42
2. An employee who is not an owner	4. Other (Please specify) _____	

12) Is your financial manager a financial professional (that is, is your financial manager a Chartered Accountant, CMA, CCA, etc.)? (Circle one only)

1. Yes	2. No	43
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13) Is your financial manager employed on a full time or part time basis? (Circle one only)

1. Full-time	2. Part-time	3. Other (Please specify) _____	44
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14) What is the gender of your financial manager or the person who heads your finance department? (Circle one only)

1. Male	2. Female	45
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Debt Financing Experience

In this section, please provide details about the most recent occasion on which your firm sought credit from a financial institution. Most often, such credit takes the form of a term loan, a line of credit or an increase in an existing line of credit. We define these terms as follows:

Line of credit. A line of credit is defined here as a loan which is usually made to finance the day-to-day operations of the business.

Term Loan. A fixed term loan is defined here as a loan which is usually a lump sum and which is expected to be paid either as a lump sum with interest after a specified period of time or in periodic installments over a specified period of time.

15) Has your firm sought a line of credit, an increase in a line of credit or a term loan from a financial institution since 1987? (Circle one only)

1. Yes	2. No (Go to Q.31a)	46
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16) When was the last time you applied for a line of credit, an increase in a line of credit or a term loan?

Month _____ Year _____	47-50
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17) Did this most recent experience involve a term loan, a line of credit or an increase in a line of credit? (Circle one only)

1. Term loan	2. Line of credit	3. Increase in line of credit	51
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18) From which of the following financial institutions did you seek the form of credit you desired? (Circle one only)

1. Canadian Imperial Bank of Commerce	6. National Bank of Canada	52
2. Bank of Nova Scotia	7. Other chartered bank (Please describe) _____	
3. Bank of Montreal	8. Trust/finance company (Please describe) _____	
4. Royal Bank of Canada	9. Credit union, co-op, caisse populaire (Please describe) _____	
5. Toronto-Dominion Bank	10. Other (Please describe) _____	

19) What is the amount of the line of credit, increase in line of credit or term loan you applied for?

\$ _____ (in nearest thousand)	53-57
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20a) Was your application accepted or rejected by the financial institution? (Circle one only)

1. The application was accepted	3. The application was rejected outright (Go to Q.28a)	58
2. No decision has yet been reached (Go to Q.31a)		

20b) If your application was accepted, what is the FINAL amount of line of credit, increase in line of credit or term loan the financial institution was willing to approve?

\$ _____ (in nearest thousand)	59-63
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- 21) What is the FINAL rate of interest the financial institution was willing to charge on the line of credit, increase in line of credit or term loan?
Interest rate = Prime rate + _____ percentage points above prime 64-66
- 22) What is the approximate value of the collateral the financial institution FINALLY required to secure the line of credit, increase in line of credit or term loan?
\$ _____ (in nearest thousand) 67-71
- 23) Who was required to co-sign or guarantee the line of credit, line of credit increase or term loan? (Circle one only)
1. Not required to supply a co-signer 3. Other (Please specify) _____ 72
2. My (our) spouse(s)
- 24a) Please indicate below which of the following were demanded of you as collateral and which of these were available to your business as collateral at that time for the line of credit, increase in line of credit or term loan (Circle 1 if the relevant response is "Yes" and circle 2 if the appropriate response is "No". You may circle more than one response if more than one asset was requested of you and/or was available to you as collateral.)
Business Assets	Demanded As Collateral		Available As Collateral		
	Yes	No	Yes	No	
1. Accounts receivable	1	2	1	2	73-88
2. Inventory	1	2	1	2	
3. Automobile	1	2	1	2	
4. Office equipment	1	2	1	2	
5. Machinery	1	2	1	2	
6. Real estate	1	2	1	2	
7. Bonds and securities	1	2	1	2	
8. Other _____
(Please specify)	1	2	1	2	
- 24b) If personal assets were also requested of available to you, please provide the following information as in the preceding case
Personal Assets	Demanded As Collateral		Available As Collateral		
	Yes	No	Yes	No	
1. Automobile	1	2	1	2	89-96
2. Real estate	1	2	1	2	
3. Bonds and securities	1	2	1	2	
4. Other _____
(Please specify)	1	2	1	2	
- 25) Did the financial institution require changes to your normal management/operating procedures as a condition of the loan? (Circle one only)
1. Yes (Please specify) _____ 2. No 97
- 26) Were the size, terms and transaction satisfactory?
Very Unsatisfactory 1 2 3 4 5 6 7 8 9 Very Satisfactory 98
- 27a) Which aspects of the loan did you negotiate? (Circle as many as apply)
1. Interest rate	6. Type of collateral required	99-106
2. Amount approved	7. Changes required in your management/operating procedures	
3. Maturity (payback period)	8. Changes required in your marketing strategies	
4. Service charges	9. Not applicable - did not negotiate	
5. Amount of collateral requested	10. Other (Please specify) _____	
- 27b) After all negotiations (if any) were completed, which aspects of the final offer made to you by the financial institution could have been improved? (Circle as many as apply)
1. Interest rate	6. Type of collateral required	109-118
2. Amount approved	7. Changes required in your management/operating procedures	
3. Maturity (payback period)	8. Changes required in your marketing strategies	
4. Service charges	9. None, all aspects were satisfactory	
5. Amount of collateral requested	10. Other (Please specify) _____	
- 27c) Did you accept the final terms and conditions of the financial institution? (Circle one only)
1. Yes (Go to Q.29) 2. No (Go to Q.29) 119
- 28a) If your application was rejected, did you negotiate with the financial institution for a reconsideration? (Circle one only)
1. Yes 2. No 120
- 28b) What was the primary reason the financial institution gave for the turnaround? (Circle one only)
1. Too new in business	5. Firm's geographic or neighbourhood location	121
2. Too much outstanding debt	6. No reason given	
3. Insufficient equity	7. Other (Please specify) _____	
4. Poor industry conditions		
- 28c) If no reason was given, did you ask for a reason (Circle one only)
1. Yes 2. No 122
- 28d) What do you think the primary reason was for the turnaround? (Circle one only)
1. Too new in business	4. Poor industry conditions	123
2. Too much outstanding debt	5. Firm's geographic or neighbourhood location	
3. Insufficient equity	6. Other (Please specify) _____	

SURVEY CONTINUED ON OTHER SIDE

29) Have you ever gone over the limit of your line of credit? (Circle one only)

1. Yes 2. No 124

30) Have you ever been unable to pay back any previous business loans on time? (Circle one only)

1. Yes 2. No 125

31a) Within the last three years, have you ever actively shopped for a different financial institution to service your business needs? (Circle one only)

1. Yes 2. No (Go to Q.31c) 126

31b) If yes, why? (Circle one only)

1. Not satisfied with current financial institution 3. Shopping can lead to better terms of credit 127
 2. Different banks provide different services 4. Other (Please describe) _____

31c) If you did not shop for another financial institution, why not? (Circle as many as apply)

1. Satisfied with current bank 5. Only one bank in the area 128-134
 2. Never thought about it 6. Possible repercussions from current bank
 3. Too busy 7. Other (Please describe) _____
 4. No real difference in banks

32) When was the last time you changed your financial institution? (Circle one only)

1. Never 4. 2-3 years ago 135
 2. More than 5 years ago 5. Less than 2 years ago
 3. 4-5 years ago

Bank Services

33) Below are listed a number of characteristics for a financial institution. First please rate how important each characteristic is to you in conducting your business. Second, please rate the financial institution you deal with most often in terms of how satisfied you are with its performance on each of these characteristics

	Importance			Satisfaction			
	Not Important	Very Important		Not Satisfied	Very Satisfied		
1. Knows you and your business	1	2	3	1	2	3	136-153
2. Provides helpful business advice	1	2	3	1	2	3	
3. Offers the cheapest money available	1	2	3	1	2	3	
4. Reliable source of credit	1	2	3	1	2	3	
5. Provides wide range of services	1	2	3	1	2	3	
6. Account manager is easy to talk to	1	2	3	1	2	3	
7. Makes you feel comfortable	1	2	3	1	2	3	
8. Treats you with respect	1	2	3	1	2	3	
9. Good source of venture capital	1	2	3	1	2	3	

34) On the whole, how satisfied are you with the financial institution you deal with? (Circle one only)

1. Highly satisfied 3. Somewhat dissatisfied 154
 2. Reasonably satisfied 4. Strongly dissatisfied

Financial Statements

35) Please complete the following short form income and balance sheet statements of your business past fiscal year. This information will remain strictly confidential. Please round off amounts to the nearest thousand.

Income Statement				
Gross Sales	\$ _____	Taxes	\$ _____	155-164
Operating expenses	\$ _____	Owners' (owners') withdrawals/salary		165-169
Interest expenses	\$ _____	(salaries) (as a percentage of sales)	% _____	170-174
Lease obligations	\$ _____			175-182

Balance sheet statement				
<u>Assets</u>	<u>Liabilities</u>			
Accounts receivable	\$ _____	Accounts payable	\$ _____	183-192
Inventories	\$ _____	Long term debt	\$ _____	193-202
Bonds/securities	\$ _____			203-207
Fixed assets	\$ _____			208-212

Comments: _____

(Attach additional sheets if necessary)

Thank you for completing this survey

APPENDIX III.C. LIST OF VARIABLES

**This appendix contains a detailed description of the variables
that were used in this study.**

The credit terms were treated as dependent variables in analyses of factors influencing credit terms. However, they were treated as independent variables in analyses of initial and final differences in credit terms (also, see appendix III.D).

T₀:	REJECTED:	expressed loan turndowns; was coded as one if a loan was rejected and coded as zero otherwise.
T₁:	COL:	expressed ratio of collateral to loan; was coded as one if more than 300 percent of collateral was required as collateral; coded as zero otherwise.
T₂:	REC:	expressed ratio of amount of loan received to amount of loan requested; was coded as one if less than 90 percent of the loan request was granted; was coded as zero otherwise.
T₃:	COSIGN:	expressed whether or not spousal co-signature was required. Coded as one if spousal co-signature was required and coded as zero otherwise.
T₄:	INTEREST:	expressed rates of interest; a continuous variable.

C.2.

STRUCTURAL FACTORS

C.2.1

STRUCTURAL FACTORS THAT ARE NOT PART OF THE TRADITIONAL FIVE C'S

C.2.1.1

Type of Loan

The literature indicates that assessment of risk varies with type of loan. If this is true, then, terms of credit will also vary with each type of loan. Past research was not specific about the nature of influence of type of loan on credit terms. However, it is possible that the five factors would be evaluated differently depending on the type of loan. This explains the inclusion of dummy variables which expressed the three different types of loans (that have been investigated in previous research) in the theoretical model which this study tested. Given their theoretical importance, these three dummy variables were forced into 1) the regression equations for analyzing structural differences and 2) factors influencing credit terms.

- X1: TERM: coded as zero if firm applied for term loan; coded as one otherwise. That is:
- ```
IF firm applied for term loan,
 TERM=0
ELSE IF
```



firm applied for a *new line of credit* or requested for *increase to an existing line of credit*,  
**TERM=1.**

X2: INCRE: coded as zero if a firm applied for increase to an existing line of credit; coded as one otherwise. That is:  
           IF                      firm applied for an *increase to an existing line of credit*,  
                                     THEN  
                                     INCRE=0,  
           ELSE IF                firm applied for a term loan or a new line of credit  
                                     INCRE=1

X3: NEWLIN: coded as zero for both X1 and X2 if firm applied for a new line of credit.

#### C.2.1.2

#### Type of Financial Institution

X4: CDNC: coded as zero if loan application was filed with a Canadian chartered bank; coded as one otherwise

X5: OCHA: coded as zero if loan application was filed with a non-Canadian chartered bank; coded as one otherwise.

X6: TRUST: coded as zero if loan application was filed with a trust company.

X7: CREDIT: coded as zero if loan application was filed with a credit union or caisses populaire.

X8: OBANK: coded as zero for X4 to X7 if sources other than a financial institution was approached for funding.

#### **C.2.2**

#### **THE FIVE C'S OF COMMERCIAL LENDING**

##### C.2.2.1

##### CAPACITY

##### Size

X9: WRKR: the logarithmic transformation of number of workers was chosen because of its relatively normal distribution compared to the skewed distribution of the latter prior to transformation.

X10: SALES: Nine categories of annual level of sales volume; treated as a pseudo-continuous variable.

The impact of number of workers and level of sales on credit experience have been subjected to previous investigation. To determine the extent to which other variables make additional contribution to our knowledge of women and banking, the above measures of size were forced into the regression equations involving structural gender-based differences in business attributes and factors influencing credit terms.

#### C.2.2.2

#### CONDITIONS:

##### Average annual sales growth:

- X11: DECLIN: coded as zero if the firm average annual sales growth was less than -5 percent.
- X12: GREW: coded as zero if the firm has experienced a moderate rate of growth in sales volume (between 6 and 20 percent); otherwise, coded as one.
- X13: GREWM: coded as zero if the firm has experienced substantial growth (greater than 20 percent); coded as one otherwise.
- X14: SAME: coded as zero for X11 to X13 if the firm has experienced no growth (between -5 percent and 5 percent).

Past research shows that history of financial distress may have a bearing on credit terms (Haines, Riding and Thomas, 1989). This is why the dummy variables which expressed average annual rate of growth in sales were forced into the relevant regression equations.

##### Industrial Sector<sup>1</sup>:

- X15: MFG: coded as zero if the firm is in the manufacturing sector; coded as one otherwise.
- X16: RETAIL: coded as zero if the firm is in retailing; coded as one otherwise.
- X17: SERVE: coded as zero if the firm is in the services sector, coded as one otherwise.
- X18: O\_SECTOR: coded as zero for X15 to X17 if the firm is in none of the sectors defined by X11 to X12.

---

<sup>1</sup>Initially, eight different variables were used to model industrial sector. However, this resulted in empty cells and consequently, large errors in certain cases. Consequently, the dummy variables which expressed the industrial sector were reduced to four.

Previous research demonstrated a strong association between credit terms and industrial sector. Consequently, the variables which expressed industrial sector were forced into the pertinent regression equations.

#### Geographical Location

- X19: S\_TOWN: coded as zero if the firm is located in a small town of up to 10,000 people; coded as one otherwise.
- X20: S\_CITY: coded as zero if the firm is located in a small city of between 10,000 and 100,000 people; coded as one otherwise.
- X21: CITY: coded as zero if the firm is located in a city of between 100,000 and 500,000 people; coded as one otherwise.
- X22: B\_CITY: coded as zero for X19 to X21 if the firm is located in a city of more than 500,000 people.

Past research indicates that geographical location may play a role in determining terms of credit. However, previous works also indicated that there geographical location and age of business were often correlated (Thornton, 1981; Haines, Riding and Thomas, 1988). This explains why geographical location was not forced into the pertinent logistic regression equations.

#### C.2.2.3

#### CAPITAL

##### Legal Status of Business:

- X23: PROP: coded as zero if the firm is a sole proprietorship; coded as one otherwise.
- X24: CORP: coded as zero if the firm is a corporation; coded as one otherwise.
- X25: PARTNER: coded as zero for both X23 and X25 if the firm is a partnership.

Previous research indicates that form of business may affect credit terms. This is why the three dummy variables expressing legal status of business were forced into the regression equations for the analyses of structural gender-based differences in business attributes and factors influencing credit terms.

##### Number of Owners.

- X26: SOLE: coded as zero if the firm has only one owner; coded as one otherwise.
- X27: OWNGT2: coded as zero if the firm has more than 2 owners; coded as one otherwise.

### Type of Ownership

Firms that are equally owned may be managed differently from firms that are unequally owned. This may be even truer simply because the principal owner of an equally-owned firm cannot be readily identified. Hence, dummy variables which expressed equal or unequal ownership were included in the analysis described here as measures of capital or equity available to the firm.

- X28: YEQUA: coded as zero if the firm reported an equal ownership; coded as one otherwise.
- X29: NEQUA: coded as zero if the firm reported an unequal ownership; coded as one otherwise.
- X30: MEQUA: coded as 0 for both X28 and X29 if the firm did not report the pattern of ownership.

### C.2.2.4

### COLLATERAL

The following 24 dummy variables which express the different types of assets were not included in certain analyses. They were excluded from all the analyses involving loan turn downs.

### Business Assets

- X31: YACCT: coded as zero if the firm has accounts receivable as security; coded as one otherwise.
- X32: NACCT: coded as zero if the firm does not have accounts receivable as collateral; coded as one otherwise.
- X33: MACCT: coded as zero for both X31 and X32 if the response for accounts receivable is missing.
- X34: YINV: coded as zero if the firm have inventory available as collateral; coded as one otherwise.
- X35: NINV: coded as zero if the firm does not have inventory available as collateral; coded as one otherwise.
- X36: MINV: coded as zero for both X34 and X35 if the response to the question about accounts receivable is missing.
- X37: YBAUT: coded as zero if the firm had automobile available as collateral; coded as one otherwise.
- X38: NBAUT: coded as zero if the firm did not have automobile available as collateral; coded as one otherwise.

3 of/de 3

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NBS 1010a ANSI/ISO #2 EQUIVALENT

|      |        |                                                                                                                                   |
|------|--------|-----------------------------------------------------------------------------------------------------------------------------------|
| X39: | MBAUT: | coded as zero for X37 and X38 if the firm did not report whether or not it had business automobile available as collateral.       |
| X40: | YOFEQ: | coded as zero if the firm had office equipment as collateral; coded as one otherwise.                                             |
| X41: | NOFEQ: | coded as zero if the firm did not have office equipment as collateral; coded as one otherwise.                                    |
| X42: | MOFEQ: | coded as zero for both X40 and X41 if the firm did not report whether or not it had office equipment as collateral.               |
| X43: | YMACH: | coded as zero if the firm had machinery available as collateral; coded as one otherwise.                                          |
| X44: | NMACH: | coded as zero if the firm did not have machinery available; coded as one otherwise.                                               |
| X45: | MMACH: | coded as zero for both X43 and X44 if the firm did not report whether or not it had machinery available as collateral.            |
| X46: | YBBON: | coded as zero if the firm had business bonds and securities available as collateral; coded as one otherwise.                      |
| X47: | NBBON: | coded as zero if the firm did not have business bonds and securities available as collateral; coded as one otherwise.             |
| X48: | MBBON: | coded as zero for both X46 and X47 if the firm had business bonds and securities available as collateral; coded as one otherwise. |
| X49: | YBREA: | coded as zero if the business firm had business real estate available as collateral; coded as one otherwise.                      |
| X50: | NBREA: | coded as zero if the business firm had business real estate available as collateral; coded as one otherwise.                      |
| X51: | MBREA: | coded as zero for both X49 and X50 if the firm did not report whether or not it had business real estate available as collateral. |
| X52: | YBELS: | coded as zero if the firm had other business assets available as collateral; coded as one otherwise.                              |
| X53: | NBELS: | coded as zero if the firm did not have other business assets available as collateral.                                             |
| X54: | MBELS: | coded as zero for both X52 and X53 if the firm did not report whether or not it had business assets available as collateral.      |

#### Personal Assets

|      |        |                                                                                                                      |
|------|--------|----------------------------------------------------------------------------------------------------------------------|
| X55: | YPAUT: | coded as zero if the firm had the personal automobile of its owners available as collateral; coded as one otherwise. |
|------|--------|----------------------------------------------------------------------------------------------------------------------|

|      |         |                                                                                                                                                              |
|------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| X56: | NPAUT:  | coded as zero if the firm did not have the personal automobile of its owners available as collateral; coded as one otherwise.                                |
| X57: | MPAUT:  | coded as zero for both X55 and X56 if the firm did not report whether or not it had a personal automobile available as collateral.                           |
| X58: | YPBON:  | coded as zero if the firm had the personal bonds and securities of its owners available as collateral; coded as one otherwise.                               |
| X59: | NPBON:  | coded as zero if the firm did not have the personal bonds and securities of its owners available as collateral; coded as one otherwise.                      |
| X60: | MPBON:  | coded as zero for both X58 and X59 if the firm did not report whether or not it had the personal bonds and securities of its owners available as collateral. |
| X61: | YPREAL: | coded as zero if the firm had the personal real estate of its owners available as collateral; coded as one otherwise.                                        |
| X62: | NPREAL: | coded as zero if the firm did not have the personal real estate of its owners available as collateral; coded as one otherwise.                               |
| X63: | MPREAL: | coded as zero for both X61 and X62 if the firm did not report whether or not it had the personal real estate of its owners available as collateral.          |
| X64: | YPELS:  | coded as zero if the firm had other personal assets of its owner(s) available as collateral; coded as one otherwise.                                         |
| X65: | NPELS:  | coded as zero if the firm did not have other personal assets of its owners available as collateral; coded as one otherwise.                                  |
| X66: | MPELS:  | coded as zero for both X64 and X65 if the firm did not report whether or not it had other personal assets of its owners available as collateral.             |

### CHARACTER

Character as used in this study has three different categories: character or track record of the firm, financial and/or managerial background of the owner and track record of the financial manager:

#### Track Record of the Business

|      |      |                                                                                                                                                                                                     |
|------|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| X67: | AGE: | logarithm of age of business to the base 10. This transformation was selected because of its closer affinity to the normal distribution compared to the skewed distribution of the age of business. |
|------|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Numerous previous works (Peterson and Shulman, 1987; Thornton, 1981; Riding and Swift, 1988; Lavoie, 1988) have investigated the impact of age of business on credit experience. This explains why the continuous variable which expressed age of business was forced into the equations

involving structural gender-based differences and factors influencing credit terms.

#### Gender of the First Owner:

This is a correlational study. As such, a particular factor could serve as both independent and dependent variable. In this study, gender of owner was used in this dual sense. Gender was used as a dependent variable in analyses of structural gender-based differences in business attributes, initial and final differences in credit terms (see appendix III.D). However, gender was used as an independent variable in analyses of factors influencing credit terms.

Three definitions of gender were considered:

X68

- |    |            |                                                                                                                                        |
|----|------------|----------------------------------------------------------------------------------------------------------------------------------------|
| a) | GENDER1:   | Gender of the first owner (both equally and unequally owned firms are included)                                                        |
| b) | GENDERL:   | Gender of the governing owner: this is the first owner of the firm with owners of similar gender or of a firm that is unequally owned. |
| c) | OWNER_SEX: | This is the gender of the first owner of a firm that is controlled by owners of the same gender. This is the strictest definition.     |

#### Managerial Experience of owner:

X69: YEARS1: the square root transformation of years of managerial experience; it was selected both because of its relative normality and because it yielded better predictive results.

#### Depth of Financial Management:

X70: FMGR: coded as one if at least one of the owners or the financial manager has a professional financial degree.

Previous research (Thornton, 1981) indicates that depth of financial manager can affect assessment of business risk. Consequently, this variable was forced into the regression equations involving structural gender-based differences and factors influencing credit terms.

#### Attributes of the Financial Manager:

X71: OWNFG: coded as zero if the firm's financial manager is also an owner; coded as one otherwise.



- X82: **SERVE\_I:** the extent to which the owner deemed it important that the banker should provide a wide range of services.
- X83: **EASY\_I:** the extent to which the owner deemed it important that the account manager should be approachable.
- X84: **COMFORT\_I:** the extent to which the owner deemed it important that the account manager should make the loan applicant feel comfortable.
- X85: **RESPECT\_I:** the extent to which the owner deemed it important that the banker should treat her/him with respect.
- X86: **VENTURE\_I:** the extent to which the owner considered it important that the financial institution should be a good source of venture capital.

#### Ratings of Satisfaction

- X87: **KNOWS\_S:** extent to which owner was satisfied that the financial institution should be familiar with the business
- X88: **ADVICE\_S:** the extent to which the owner was satisfied that the financial provided helpful business advice
- X89: **CHEAP\_S:** the extent to which the owner was satisfied that the financial institution offered the cheapest money available
- X90: **CREDIT\_S:** the extent to which the owner was satisfied that the financial institution was a reliable source of credit.
- X91: **SERVE\_S:** the extent to which the owner was satisfied that banker provided a wide range of services.
- X92: **EASY\_S:** the extent to which the owner was satisfied that the account manager was approachable.
- X93: **COMFORT\_S:** the extent to which the owner was satisfied that the banker made her/him comfortable.
- X94: **RESPECT\_S:** the extent to which the owner was satisfied that the financial institution treated her/him with respect.
- X95: **VENTURE\_S:** the extent to which the owner was satisfied that the financial institution was a good source of venture capital.

- X82: **SERVE\_I:** the extent to which the owner deemed it important that the banker should provide a wide range of services.
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- X91: **SERVE\_S:** the extent to which the owner was satisfied that banker provided a wide range of services.
- X92: **EASY\_S:** the extent to which the owner was satisfied that the account manager was approachable.
- X93: **COMFORT\_S:** the extent to which the owner was satisfied that the banker made her/him comfortable.
- X94: **RESPECT\_S:** the extent to which the owner was satisfied that the financial institution treated her/him with respect.
- X95: **VENTURE\_S:** the extent to which the owner was satisfied that the financial institution was a good source of venture capital.

## **APPENDIX III.D. LOGISTIC REGRESSION EQUATIONS**

**This appendix contains both of the general and  
the specific logistic regression equations  
that were used in this study.**

### D.1. THE GENERAL LOGISTIC REGRESSION EQUATION

The general logistic regression equation is given by:

$$\text{Probability}(Y=1) = \frac{e^{F(X)}}{1+e^{F(X)}}$$

where,

**Y** = a particular event; and

**F(X)** = a linear combination of covariates of **Y** (Hosmer and Lemeshow, 1989; Norusis, 1990).

The purpose of the logistic regression models is to identify those variables whose linear combinations comprise **F(X)**.

---

### D.2. STRUCTURAL DIFFERENCES IN BUSINESS ATTRIBUTES

In the cases of analyses involving structural gender-based differences in business attributes, **Y** refers to gender of owner(s), **Probability (Y)** refers to the propensity score of business attributes while **F(X)** denotes a linear combination of measures of business attributes<sup>1</sup>.

That is, for structural differences:

$$\text{Probability}(Y=1) = \text{Probability}(\text{FIRST OWNER}=\text{FEMALE}) =$$

$$\text{Probability}(\text{GENDER}=1) = \frac{e^{F(X)}}{1+e^{F(X)}}$$

and,

$$F(X) = B_0 + B_1S_1 + B_2S_2 + \dots + B_iS_i$$

where,

$$S_i = \text{the } i\text{th structural factor or measure of business risk } ^2.$$


---

<sup>1</sup>Chapter four details the three subsets of business attributes or structural factors which were explored.

<sup>2</sup>A list of structural factors with indication of the analyses in which they were used is given in appendix III.C.

### D.3. INITIAL DIFFERENCES IN CREDIT TERMS

#### D.3.1. Loan Turndowns

For the initial analyses of gender-related differences in loan turndowns, **Y** also refers to gender of owners; however, **F(X)** is a function of loan turndowns while **Probability (Y=1)** is the propensity score of loan turndowns:

$$\text{Probability}(Y=1) = \text{Probability}(\text{FIRST OWNER}=\text{FEMALE})=$$

$$\text{Probability}(\text{GENDER}=1) = \frac{e^{F(X)}}{1+e^{F(X)}}$$

where,

$$F(X) = B_0 + B_1 \text{REJECTED}$$

$$B_0 = \text{intercept;}$$

$$\text{REJECTED} = \text{whether or not a loan was rejected.}$$


---

#### D.3.2. The Four Treatment Credit Terms

For the analyses involving initial gender-related differences in *treatment* credit terms **Y** refers to gender of the owners, **Probability (Y=1)**, is the propensity score on the four treatment credit terms while **F(X)** is a linear combination of ratio of collateral to loan, ratio of amount received to amount requested, interest rates and requests for spousal co-signature:

$$\text{Probability}(Y=1) = \text{Probability}(\text{FIRST OWNER}=\text{FEMALE}) =$$

$$\text{Probability}(\text{GENDER}=1) = \frac{e^{F(X)}}{1+e^{F(X)}}$$

and,

$$F(T) = B_0 + B_1 T_1 + B_2 T_2 + B_3 T_3 + B_4 T_4$$

where,

$$B_0 = \text{the intercept}$$

$$T_1 = \text{ratio of collateral to loan}$$

$$T_2 = \text{ratio of amount of credit received to amount of credit requested}$$

$$T_3 = \text{requests for spousal co-signature and}$$

$$T_4 = \text{rate of interest.}$$


---

#### D.4. FINAL DIFFERENCES IN CREDIT TERMS

For the analyses involving final gender-related differences in credit terms, **Y** refers to gender of owners, **Probability (Y=1)** is the propensity score of credit terms given the propensity scores on business attributes. **F(X)** is a linear combination of propensity scores and credit terms:

##### D.4.1. Loan Turndowns

In the case of loan turndowns,

$$\text{Probability}(Y=1) = \text{Probability}(\text{FIRST OWNER}=\text{FEMALE}) =$$

$$\text{Probability}(\text{GENDER}=1) = \frac{e^{F(X)}}{1+e^{F(X)}}$$

and,

$$F(X) = B_0 + B_1F(S_a) + B_2\text{REJECTED}$$

where,

$$B_0 = \text{the intercept}$$

$$F(S_a) = \text{the propensity scores of structural factors prior to inclusion of the asset variables}$$

$$\text{REJECTED} = \text{whether or not a loan was turned down.}$$


---

##### D.4.2. The Four Treatment Variables

In the case of the four treatment variables,

$$\text{Probability}(Y=1) = \text{Probability}(\text{FIRST OWNER}=\text{FEMALE}) =$$

$$\text{Probability}(\text{GENDER}=1) = \frac{e^{F(X)}}{1+e^{F(X)}}$$

and,

$$F(X) = B_0 + B_1(F(S)_b) + B_2T_1 + B_3T_2 + B_4T_3 + B_5T_4$$

where,

$$B_0 = \text{the intercept;}$$

- $F(S)_0$  = the propensity scores of structural factors (including the variables which expressed the types of assets available as collateral);
- $T_1$  = ratio of collateral to loan;
- $T_2$  = ratio of amount of credit received to amount of credit requested;
- $T_3$  = requests for spousal co-signature; and
- $T_4$  = rate of interest.
- 

## D.5. FACTORS INFLUENCING CREDIT TERMS

### D.5.1. Loan Turndowns

For the analyses of factors influencing each of loan rejections, ratio of collateral to loan, ratio of amount of credit received to amount requested and requests for spousal co-signature,  $Y$  refers to each credit term whereas  $F(X)$  refers to a specific set of structural factors.

Probability ( $Y=1$ ) = Probability (**LOAN WAS REJECTED**)=

$$\text{Probability (REJECTED=1)} = \frac{e^{F(X)}}{1+e^{F(X)}}$$

and,

$$F(X) = B_0 + B_1X_1 + B_2X_2 + \dots + B_iX_i$$

where,

$B_0$  = the intercept;

REJECTED = whether or not a loan was rejected; and

$X_i$  = the  $i$ th structural factor prior to inclusion of the asset variables.

---

### D.5.2. Ratio of Collateral to Loan

Probability( $Y=1$ ) = Probability(**OVER 300% OF LOAN WAS REQUESTED AS COLLATERAL**)=

$$\text{Probability(COL=1)} = \frac{e^{F(X)}}{1+e^{F(X)}}$$

and,

$$F(X) = B_0 + B_1X_1 + B_2X_2 + \dots + B_iX_i$$

where,

$B_0$  = the intercept;

COL = expressed whether or not over 300 percent of a loan was requested as collateral; and

$X_i$  = the  $i$ th structural factor after the inclusion of the asset variables.

---

#### D.5.3. Ratio of Amount Received to Amount Requested

Probability( $Y=1$ ) = Probability(**LESS THAN 90 PERCENT OF THE AMOUNT OF LOAN REQUESTED WAS RECEIVED**) =

Probability(**REC=1**) = 
$$\frac{e^{F(X)}}{1+e^{F(X)}}$$

and,

$F(X)$  =  $B_0 + B_1X_1 + B_2X_2 + \dots + B_iX_i$   
where,

$B_0$  = the intercept;

REC = whether or not under 90% of the amount of loan requested was received; and

$X_i$  = the  $i$ th structural factor after the inclusion of the asset variables.

---

#### D.5.4. Requests for Spousal Co-signature

Probability( $Y=1$ ) = Probability(**SPOUSAL CO-SIGNATURE WAS REQUESTED**) =  
Probability(**COSIGN=1**) = 
$$\frac{e^{F(X)}}{1+e^{F(X)}}$$

and,

$F(X)$  =  $B_0 + B_1X_1 + B_2X_2 + \dots + B_iX_i$

where,

$B_0$  = the intercept;

COSIGN = whether or not spousal co-signature was required; and



$X_i$  = the  $i$ th structural factor after the inclusion of the asset variables.

---

## **APPENDIX IV.A. INTERPRETATION OF RESULTS**

This appendix contains five tables which are meant to help with the interpretation of the results presented in the fourth chapter of this study. Table A.4.1 is a guide to the interpretation of the results of analyses involving structural gender-based differences in business attributes. Respectively, tables A.4.2 to A.4.5 are aid tables for interpreting the results of analyses of factors influencing loan turndowns, of collateral to loan, ratio of amount received to amount requested, requests for spousal co-signature and rates of interest. Tables A.4.1 to A.4.4 are based on the logistic regression model. However, table A.4.6 is based on the multiple linear regression model.

Table IV.A.1      Gender-Based Differences in Business Attributes

|                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Attribute is a continuous variable                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                  |
| i) If odds ratio is greater than one (e.g. <b>EDUC_1</b> )                                                                                | Female entrepreneurs tend to have <i>more</i> of the attribute than male entrepreneurs. For example, <b>EDUC_1</b> has odds ratios that are greater than one. This indicates that women tend to have completed more years of education, compared to men.                                                                                                                                         |
| ii) If odds ratio is less than one (e.g. <b>YEARS_1</b> , <b>SALES</b> )                                                                  | Females entrepreneurs tend to have <i>less</i> of the attribute than male entrepreneurs. For instance, the odds ratios for <b>YEARS_1</b> are less than one. This is an indication that women have less managerial experience than men. Similarly, the odds ratios for <b>SALES</b> are less than one. This shows that women-owned firms have lower levels of sales than men-owned counterparts. |
| 2. A dummy variable is coded as one if an attribute is present and as zero otherwise (e.g. <b>FMGR</b> , <b>DEFAULT</b> , <b>EXCEED</b> ) |                                                                                                                                                                                                                                                                                                                                                                                                  |
| i) If the odds ratio is greater than one                                                                                                  | Women entrepreneurs are <i>more</i> likely to possess the attribute in question, in contrast with men entrepreneurs.                                                                                                                                                                                                                                                                             |
| ii) If the odds ratio is less than one                                                                                                    | Women entrepreneurs are <i>less</i> likely to possess the attribute in question, in contrast with men entrepreneurs.                                                                                                                                                                                                                                                                             |
| 3) A dummy variable is coded as zero if an attribute is present and as one otherwise                                                      |                                                                                                                                                                                                                                                                                                                                                                                                  |
| i) If the odds ratio is greater than one (e.g. <b>YMACH</b> , <b>YBREAL</b> )                                                             | Women entrepreneurs are <i>less</i> likely to have the attribute in question, in comparison with men entrepreneurs.                                                                                                                                                                                                                                                                              |
| ii) If the odds ratio is less than one (e.g. <b>RETAIL</b> )                                                                              | Women entrepreneurs are more likely to possess the attribute in question, in contrast with men entrepreneurs. For example, the odds ratios for <b>RETAIL</b> are less than one. This means that a greater proportion of women, than men, are to be found in retailing.                                                                                                                           |

**Table IV.A.2                      Factors Influencing Loan Turndowns**

---

1.      Attribute is a continuous variable

- |                                                   |                                                                                                                                                                                     |
|---------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| i)      If odds ratio is greater than one         | Firms that had <i>more</i> of the attribute were proportionately <i>more likely</i> to have had their loans rejected than firms that had <i>less</i> of the attribute.              |
| ii)     If odds ratio is less than one (e.g. AGE) | Firms that had <i>less</i> of the attribute were proportionately <i>more likely</i> to have had their loans rejected, in contrast with firms that had <i>more</i> of the attribute. |

2.      A dummy variable is coded as *one* if an attribute is present and as *zero* otherwise (e.g. FMGR, DEFAULT and EXCEED)

- |                                               |                                                                                                                                                        |
|-----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| i)      If the odds ratio is greater than one | Firms that <i>had</i> the attribute are <i>more likely</i> to have had their loans rejected, in contrast with firms that <i>lacked</i> the attribute.  |
| ii)     If the odds ratio is less than one    | Firms that <i>had</i> the attribute were <i>less likely</i> to have had their loans rejected, in contrast with firms that <i>lacked</i> the attribute. |

3)      A dummy variable is coded as zero if an attribute is present and as one otherwise

- |                                                          |                                                                                                                                           |
|----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| i)      If odds ratio is greater than one (e.g. S_TOWN)  | Firms that <i>had</i> the attribute were <i>less likely</i> to have had their loans rejected than firms that <i>lacked</i> the attribute. |
| ii)     If the odds ratio is less than one (e.g. DECLIN) | Firms that <i>had</i> the attribute were <i>more likely</i> to have had their loans rejected than firms that <i>lacked</i> the attribute. |
-

Table IV.A.3. Ratio of Collateral to Loan

---

|                                                                                                         |                                                                                                                                                                                                                                           |
|---------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Attribute is a continuous variable                                                                   |                                                                                                                                                                                                                                           |
| i) If odds ratio is greater than one                                                                    | Firms that had <i>more of</i> the attribute were proportionately <i>more likely</i> to have been requested to provide <i>over 300 percent</i> of their loans as collateral, in contrast with firms that had <i>less of</i> the attribute. |
| ii) If odds ratio is less than one (e.g. <b>SALES</b> )                                                 | Firms that had <i>less of</i> the attribute were proportionately <i>more likely</i> to have been requested to provide <i>over 300 percent</i> of their loan as collateral, in contrast with firms that had <i>more of</i> the attribute.  |
| 2. A dummy variable is coded as one if a <b>particular attribute</b> is present and as zero otherwise.  |                                                                                                                                                                                                                                           |
| i) If odds ratio is greater than one                                                                    | Firms that <i>had</i> the attribute were proportionately <i>more likely</i> to have been requested to provide over 300 percent of their loans as collateral, in contrast with firms that <i>lacked</i> the attribute.                     |
| ii) If the odds ratio is less than one                                                                  | Firms that <i>had</i> the attribute were proportionately <i>less likely</i> to have been requested to provide over 300 percent of their loans as collateral, in contrast with firms that <i>lacked</i> the attribute.                     |
| 3) A dummy variable is coded as zero if a <b>particular attribute</b> is present and as zero otherwise. |                                                                                                                                                                                                                                           |
| i) If the odds ratio is <i>greater than one</i>                                                         | Firms that <i>had</i> the attribute were proportionately <i>less likely</i> to have been requested to provide over 300 percent of their loans as collateral, in contrast with firms that <i>lacked</i> the attribute.                     |
| ii) If the odds ratio is <i>less than one</i>                                                           | Firms that <i>had</i> the attribute were proportionately <i>more likely</i> to have been requested to provide over 300 percent of their loans as security than, in contrast with firms that <i>lacked</i> the attribute.                  |

---

**Table IV.A.4**                      **Ratio of Credit Received to Credit Requested**

---

|    |                                                                                                                                           |                                                                                                                                                                                                                       |
|----|-------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. | Attribute is a continuous variable                                                                                                        |                                                                                                                                                                                                                       |
|    | i) If odds ratio is greater than one                                                                                                      | Firms that had <i>more of</i> the attribute were <i>less likely</i> to have received over 90 percent of the amount of credit they had requested, in contrast with firms that had <i>less of</i> the attribute.        |
|    | ii) If odds ratio is less than one                                                                                                        | Firms that had <i>less of</i> the attribute are <i>less likely</i> to receive over 90 percent of the amount of credit they had requested, in contrast with firms that have less of the attribute.                     |
| 2. | A dummy variable is coded as one if a particular attribute is present and as zero if a particular attribute is absent.                    |                                                                                                                                                                                                                       |
|    | i) If odds ratio is greater than one                                                                                                      | Firms <i>with</i> the attribute were <i>less likely</i> to have received more than 90 percent of the amount of loan they had requested, in contrast with firms <i>without</i> the attribute, <i>ceteris paribus</i> . |
|    | ii) If odds ratio is less than one                                                                                                        | Firms <i>with</i> the attribute were <i>more likely</i> likely to have received over 90 percent of the amount of loan they had requested, in contrast with firms <i>without</i> the attribute.                        |
| 3) | The attribute is a dummy variable. The dummy variable is coded as zero if the attribute is present and as one if the attribute is absent. |                                                                                                                                                                                                                       |
|    | i) If odds ratio is greater than one                                                                                                      | Firms <i>with</i> the attribute were <i>more likely</i> to have received over 90 percent of the amount of loan they had requested, compared to firms <i>without</i> the attribute.                                    |
|    | ii) If odds ratio is less than one                                                                                                        | Firms that <i>have</i> the attribute are <i>less likely</i> to be given more than 90 percent of the amount of loan they requested than firms <i>without</i> the attribute.                                            |

---

Table IV.A.5                      Requests for Spousal Co-signature

|    |                                                                                                                                                        |                                                                                                                                                                                   |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. | Attribute is a continuous variable                                                                                                                     |                                                                                                                                                                                   |
|    | i)      If odds ratio is greater than one                                                                                                              | Firms that had <i>more</i> of the attribute are <i>more likely</i> to be requested to provide spousal co-signature, in contrast with firms that had <i>less</i> of the attribute. |
|    | ii)     If odds ratio is less than one                                                                                                                 | Firms that had <i>less of</i> the attribute were <i>more likely</i> to have had requests for spousal co-signature, in contrast with firms that had <i>more of</i> attribute.      |
| 2. | Attribute is expressed by a dummy variable. The dummy variable is coded as one if the attribute is present. Otherwise, the attribute is coded as zero. |                                                                                                                                                                                   |
|    | i)      If the odds ratio is greater than one                                                                                                          | Firms <i>with</i> the attribute were <i>more likely</i> to have had requests for spousal co-signature, in contrast with firms that <i>lacked</i> the attribute.                   |
|    | ii)     If the odds ratio is less than one                                                                                                             | Firms <i>with</i> the attribute were <i>less likely</i> to have had requests for spousal co-signature, in contrast with firms that <i>lacked</i> the attribute.                   |
| 3) | The attribute is a dummy variable. The dummy variable is coded as zero if the attribute is present and is coded as one otherwise.                      |                                                                                                                                                                                   |
|    | i)      If the odds ratio is greater than one                                                                                                          | Firms that <i>had</i> the attribute are <i>less likely</i> to have had requests for spousal co-signature, compared to firms <i>without</i> the attribute.                         |
|    | ii)     If the odds ratio is less than one                                                                                                             | Firms that had the attribute were <i>more likely</i> to have had requests for spousal co-signature, in contrast with firms that <i>lacked</i> the attribute.                      |

**Table IV.A.6** **Rates of Interest**

---

1. Attribute is expressed by continuous variable
    - i) If coefficient is greater than zero
 

The more of the attribute a particular firm has, the higher the rate of interest that is charged on its loan.
    - ii) If coefficient is less than zero
 

The more of the attribute a particular firm has, the lower the rate of interest that is charged on its loan.
  
  2. Attribute is expressed by a dummy variable. The dummy variable is coded as one if the attribute is present. Otherwise, the attribute is coded as zero.
    - i) If the coefficient is greater than zero
 

Firms with the attribute tend to be charged higher rates of interest than firms without the attribute.
    - ii) If the coefficient is less than zero
 

Firms with the attribute tend to be charged lower rates of interest than firms with the attribute.
  
  - 3) The attribute is a dummy variable. The dummy variable is coded as zero if the attribute is present and as one if the attribute is absent.
    - i) If the coefficient is greater than zero
 

Firms that have the attribute tend to be charged lower rates of interest than firms without the attribute.
    - ii) If the coefficient is less than zero
 

Firms that have the attribute are charged higher rates of interests than their counterparts.
-



## **APPENDIX IV.B**

### **PERCEPTIONS OF ENTREPRENEURS ABOUT THE ROLE OF FINANCIAL INSTITUTIONS**

Overall, there were eighteen variables which measured the perceptions of the two gender groups about the role of financial institutions. Nine of these variables were ratings of the importance that entrepreneurs assigned to certain functions expected of financial institutions. The remaining nine variables were ratings of the extent to which entrepreneurs perceived that financial institutions had fulfilled these expectations adequately.

Three different sets of logistic regression analyses were run. The first set of analyses examined the association of gender with each one of the eighteen variables. The second set of analysis considered the association of gender with the ratings of perceived expected roles. The third set of analyses considered the association of gender and ratings of the extent to which entrepreneurs were satisfied with the performance of certain expected roles by financial institutions.

The univariate analyses were run with the assumption that they each measured unique constructs which are not strongly associated. They aimed to identify clear differences in the perceptions of women and men borrower groups.

The multivariate analyses assumed that the variables could be correlated. At the same time, linear combinations could have led to overall differences. The intent was to identify salient differences and to eliminate redundancies.

## IV.B.1

## UNIVARIATE ANALYSES

The literature suggests that some entrepreneurs believe that financial institutions may not have adequate knowledge about small businesses and their owners. Below, table I1 indicates that no gender-based differences were found with relation to this concern.

**I1: IMPORTANT: KNOWLEDGE OF OWNER AND BUSINESS**

|          | First Sample (N = 2500)<br>(F = 707; M = 1793)<br>(Frating = 0.00%)<br>(Mrating = 100.00%)<br>(Overall = 71.72%) |      |         | Second Sample (N = 1846)<br>(F = 555; M = 1291)<br>(Frating = 0.00%)<br>(Mrating = 100.00%)<br>(Overall = 69.93%) |      |         | Third Sample (N = 1723)<br>(F = 527; M = 1196)<br>(Frating = 0.00%)<br>(Mrating = 100.00%)<br>(Overall = 69.41%) |      |         |
|----------|------------------------------------------------------------------------------------------------------------------|------|---------|-------------------------------------------------------------------------------------------------------------------|------|---------|------------------------------------------------------------------------------------------------------------------|------|---------|
| Variable | Beta                                                                                                             | S.E. | Exp (B) | Beta                                                                                                              | S.E. | Exp (B) | Beta                                                                                                             | S.E. | Exp (B) |
| Constant | -0.93                                                                                                            | 0.04 |         | -0.84                                                                                                             | 0.05 |         | 0.82                                                                                                             | 0.05 |         |

**S1: SATISFIED: KNOWLEDGE OF OWNER AND BUSINESS**

|          | First Sample (N = 2359)<br>(F = 683; M = 1676)<br>(Frating = 0.00%)<br>(Mrating = 100.00%)<br>(Overall = 71.05%) |      |         | Second Sample (N = 1622)<br>(F = 508; M = 1114)<br>(Frating = 0.00%)<br>(Mrating = 100.00%)<br>(Overall = 68.68%) |      |         | Third Sample (N = 1622)<br>(F = 508; M = 1114)<br>(Frating = 0.00%)<br>(Mrating = 100.00%)<br>(Overall = 68.68%) |      |         |
|----------|------------------------------------------------------------------------------------------------------------------|------|---------|-------------------------------------------------------------------------------------------------------------------|------|---------|------------------------------------------------------------------------------------------------------------------|------|---------|
| Variable | Beta                                                                                                             | S.E. | Exp (B) | Beta                                                                                                              | S.E. | Exp (B) | Beta                                                                                                             | S.E. | Exp (B) |
| Constant | -0.90                                                                                                            | 0.05 |         | -0.79                                                                                                             | 0.05 |         | -0.79                                                                                                            | 0.05 |         |

As table S1 shows, no statistically significant gender-related differences were found in the extent to which entrepreneurs were satisfied that their financial institutions are familiar with their businesses and themselves.

**I2 IMPORTANT: PROVIDES HELPFUL BUSINESS ADVICE**

|          | First Sample (N = 2424)<br>(F = 691; M = 1733)<br>(Frating = 0.00%)<br>(Mrating = 100.00%)<br>(Overall = 71.49%) |      |         | Second Sample (N = 1785)<br>(F = 541; M = 1244)<br>(Frating = 0.00%)<br>(Mrating = 100.00%)<br>(Overall = 69.69%) |      |         | Third Sample (N = 1664)<br>(F = 513; M = 1151)<br>(Frating = 0.00%)<br>(Mrating = 100.00%)<br>(Overall = 69.17%) |      |         |
|----------|------------------------------------------------------------------------------------------------------------------|------|---------|-------------------------------------------------------------------------------------------------------------------|------|---------|------------------------------------------------------------------------------------------------------------------|------|---------|
| Variable | Beta                                                                                                             | S.E. | Exp (B) | Beta                                                                                                              | S.E. | Exp (B) | Beta                                                                                                             | S.E. | Exp (B) |
| ADVICE   | 0.41                                                                                                             | 0.06 | 1.51    | 0.43                                                                                                              | 0.07 | 1.54    | 0.44                                                                                                             | 0.07 | 1.56    |
| Constant | -1.83                                                                                                            | 0.14 |         | -1.78                                                                                                             | 0.16 |         | -1.78                                                                                                            | 0.17 |         |

In all the three cases, it was found that women found provision of helpful business advice more of an important role of financial institutions than men did. The Wald statistics of 47.29, 39.10 and 38.62 suggests that this association was a very important one. The association was also significant at the 0.00001 level.

**S2: SATISFIED: PROVIDES HELPFUL BUSINESS ADVICE**

|          | First Sample (N = 2204)<br>(F = 631; M = 573)<br>(Frating = 0.00%)<br>(Mrating = 100.00%)<br>(Overall = 71.37%) |      |         | Second Sample (N = 1618)<br>(F = 496; M = 1122)<br>(Frating = 0.00%)<br>(Mrating = 100.00%)<br>(Overall = 69.34%) |      |         | Third Sample (N = 1509)<br>(F = 468; M = 1041)<br>(Frating = 0.00%)<br>(Mrating = 100.00%)<br>(Overall = 68.99%) |      |         |
|----------|-----------------------------------------------------------------------------------------------------------------|------|---------|-------------------------------------------------------------------------------------------------------------------|------|---------|------------------------------------------------------------------------------------------------------------------|------|---------|
| Variable | Beta                                                                                                            | S.E. | Exp (B) | Beta                                                                                                              | S.E. | Exp (B) | Beta                                                                                                             | S.E. | Exp (B) |
| ADVICE   | -0.17                                                                                                           | 0.07 | 0.84    | -0.18                                                                                                             | 0.08 | 0.83    | -0.19                                                                                                            | 0.08 | 0.82    |
| Constant | -0.59                                                                                                           | 0.13 |         | -0.49                                                                                                             | 0.15 |         | -0.45                                                                                                            | 0.16 |         |

Although women seem to deem it more important than men that banks should provide helpful business advice, women tend to be less satisfied than men about the achievements of the banks in this regard. The level of significance of satisfaction in the three cases examined was 0.0107, 0.0226 and 0.0179 respectively. The Wald statistics were 6.51, 5.20 and 5.60 respectively.

**I3. IMPORTANT: OFFERS THE CHEAPEST MONEY AVAILABLE**

|          | First Sample (N = 2386)<br>(F = 677; M = 1709)<br>(Frating = 0.00%)<br>(Mrating = 100.00%)<br>(Overall = 71.63%) |      |         | Second Sample (N = 1754)<br>(F = 532; M = 1222)<br>(Frating = 0.00%)<br>(Mrating = 100.00%)<br>(Overall = 69.67%) |      |         | Third Sample (N = 1635)<br>(F = 505; M = 1130)<br>(Frating = 0.00%)<br>(Mrating = 100.00%)<br>(Overall = 69.11%) |      |         |
|----------|------------------------------------------------------------------------------------------------------------------|------|---------|-------------------------------------------------------------------------------------------------------------------|------|---------|------------------------------------------------------------------------------------------------------------------|------|---------|
| Variable | Beta                                                                                                             | S.E. | Exp (B) | Beta                                                                                                              | S.E. | Exp (B) | Beta                                                                                                             | S.E. | Exp (B) |
| Constant | -0.93                                                                                                            | 0.05 |         | -0.83                                                                                                             | 0.05 |         | -0.81                                                                                                            | 0.05 |         |

In none of the three cases examined did it seem more important to women than to men that the financial institutions should offer the cheapest money available. The concern had a score statistic of 2.07 in the case of the first sample, however, it was neither statistically significant for

any of the three samples.

**S3. SATISFIED: OFFERS THE CHEAPEST MONEY AVAILABLE**

|          | First Sample (N = 2202)<br>(F = 617; M = 1585)<br>(Frating = 0.00%)<br>(Mrating = 100.00%)<br>(Overall = 71.98%) |      |          | Second Sample (N = 1614)<br>(F = 484; M = 1130)<br>(Frating = 0.00%)<br>(Mrating = 100.00%)<br>(Overall = 70.01%) |      |          | Third Sample (N = 1502)<br>(F = 458; M = 1044)<br>(Frating = 0.00%)<br>(Mrating = 100.00%)<br>(Overall = 69.51%) |      |          |
|----------|------------------------------------------------------------------------------------------------------------------|------|----------|-------------------------------------------------------------------------------------------------------------------|------|----------|------------------------------------------------------------------------------------------------------------------|------|----------|
| Variable | Beta                                                                                                             | S.E. | Exp. (B) | Beta                                                                                                              | S.E. | Exp. (B) | Beta                                                                                                             | S.E. | Exp. (B) |
| Constant | -0.94                                                                                                            | 0.05 |          | -0.85                                                                                                             | 0.05 |          | -0.82                                                                                                            | 0.06 |          |

No statistically significant difference was found between women and men in the extent to which they are satisfied that banks provide the cheapest money available.

**14. IMPORTANT: IMPORTANT SOURCE OF CREDIT CAPITAL**

|          | First Sample (N = 2393)<br>(F = 674; M = 1719)<br>(Frating = 0.00%)<br>(Mrating = 100.00%)<br>(Overall = 71.83%) |      |          | Second Sample (N = 1751)<br>(F = 529; M = 1222)<br>(Frating = 0.00%)<br>(Mrating = 100.00%)<br>(Overall = 69.79%) |      |          | Third Sample (N = 1633)<br>(F = 502; M = 1131)<br>(Frating = 0.00%)<br>(Mrating = 100.00%)<br>(Overall = 69.26%) |      |          |
|----------|------------------------------------------------------------------------------------------------------------------|------|----------|-------------------------------------------------------------------------------------------------------------------|------|----------|------------------------------------------------------------------------------------------------------------------|------|----------|
| Variable | Beta                                                                                                             | S.E. | Exp. (B) | Beta                                                                                                              | S.E. | Exp. (B) | Beta                                                                                                             | S.E. | Exp. (B) |
| Constant | -0.94                                                                                                            | 0.05 |          | -0.84                                                                                                             | 0.05 |          | -0.81                                                                                                            | 0.05 |          |

In none of the three cases was gender-based differences in the rating of the bank as an important source of credit capital found.

**S4. SATISFIED: IMPORTANT SOURCE OF CREDIT CAPITAL**

|          | First Sample (N = 2223)<br>(F = 619; M = 1604)<br>(Frating = 0.00%)<br>(Mrating = 100.00%)<br>(Overall = 72.15%) |      |          | Second Sample (N = 1623)<br>(F = 485; M = 1138)<br>(Frating = 0.00%)<br>(Mrating = 100.00%)<br>(Overall = 70.12%) |      |          | Third Sample (N = 1510)<br>(F = 457; M = 1053)<br>(Frating = 0.00%)<br>(Mrating = 100.00%)<br>(Overall = 69.74%) |      |          |
|----------|------------------------------------------------------------------------------------------------------------------|------|----------|-------------------------------------------------------------------------------------------------------------------|------|----------|------------------------------------------------------------------------------------------------------------------|------|----------|
| Variable | Beta                                                                                                             | S.E. | Exp. (B) | Beta                                                                                                              | S.E. | Exp. (B) | Beta                                                                                                             | S.E. | Exp. (B) |
| Constant | -0.95                                                                                                            | 0.05 |          | -0.85                                                                                                             | 0.05 |          | -0.83                                                                                                            | 0.06 |          |

No statistically significant difference was found between women and men as to extent to which they are satisfied that financial institutions are an important source of credit capital.

**15. IMPORTANT: PROVIDES WIDE RANGE OF SERVICES**

|                  | First Sample (N = 2384)<br>(F = 682; M = 1702)<br>(Frating = 0.00%)<br>(Mrating = 100.00%)<br>(Overall = 71.39%) |             |                | Second Sample (N = 1746)<br>(F = 534; M = 1212)<br>(Frating = 0.00%)<br>(Mrating = 100.00%)<br>(Overall = 69.42%) |             |                | Third Sample (N = 1628)<br>(F = 507; M = 1121)<br>(Frating = 0.00%)<br>(Mrating = 100.00%)<br>(Overall = 68.86%) |             |                |
|------------------|------------------------------------------------------------------------------------------------------------------|-------------|----------------|-------------------------------------------------------------------------------------------------------------------|-------------|----------------|------------------------------------------------------------------------------------------------------------------|-------------|----------------|
| <u>Variable</u>  | <u>Beta</u>                                                                                                      | <u>S.E.</u> | <u>Exp (B)</u> | <u>Beta</u>                                                                                                       | <u>S.E.</u> | <u>Exp (B)</u> | <u>Beta</u>                                                                                                      | <u>S.E.</u> | <u>Exp (B)</u> |
| Provide Services | 0.28                                                                                                             | 0.07        | 1.33           | 0.31                                                                                                              | 0.08        | 1.36           | 0.32                                                                                                             | 0.08        | 1.37           |
| Constant         | -1.59                                                                                                            | 0.17        |                | -1.55                                                                                                             | 0.19        |                | -1.54                                                                                                            | 0.20        |                |

It was found that women consider it more important than men that the bank should provide a wide range of services.

**S5. SATISFIED: PROVIDES WIDE RANGE OF SERVICES**

|                   | First Sample (N = 2212)<br>(F = 628; M = 1584)<br>(Frating = 0.00%)<br>(Mrating = 100.00%)<br>(Overall = 71.61%) |             |                | Second Sample (N = 1624)<br>(F = 495; M = 1129)<br>(Frating = 0.00%)<br>(Mrating = 100.00%)<br>(Overall = 69.52%) |             |                | Third Sample (N = 1511)<br>(F = 467; M = 1044)<br>(Frating = 0.00%)<br>(Mrating = 100.00%)<br>(Overall = 69.09%) |             |                |
|-------------------|------------------------------------------------------------------------------------------------------------------|-------------|----------------|-------------------------------------------------------------------------------------------------------------------|-------------|----------------|------------------------------------------------------------------------------------------------------------------|-------------|----------------|
| <u>Variable</u>   | <u>Beta</u>                                                                                                      | <u>S.E.</u> | <u>Exp (B)</u> | <u>Beta</u>                                                                                                       | <u>S.E.</u> | <u>Exp (B)</u> | <u>Beta</u>                                                                                                      | <u>S.E.</u> | <u>Exp (B)</u> |
| Satisfied:        |                                                                                                                  |             |                |                                                                                                                   |             |                |                                                                                                                  |             |                |
| Provides Services | -0.22                                                                                                            | 0.08        | 0.80           | -0.24                                                                                                             | 0.09        | 0.79           | -0.24                                                                                                            | 0.09        | 0.80           |
| Constant          | -0.42                                                                                                            | 0.18        |                | -0.29                                                                                                             | 0.21        |                | -0.29                                                                                                            | 0.21        |                |

Women are more likely than men to believe that banks do not offer a wide range of services. In the case of the first sample this difference was statistically significant at the 0.005 level. In the case of the second sample, it was significant at the 0.01 level. In the case of the third sample, the level of significance was 0.0126. The Wald statistics were comparatively large, 8.30, 7.09 and 6.23 respectively.

**16. IMPORTANT: ACCOUNTS MANAGER IS APPROACHABLE**

|          | First Sample (N = 2442)<br>(F = 690; M = 1752)<br>(Frating = 0.00%)<br>(Mrating = 1752%)<br>(Overall = 71.74%) |      |         | Second Sample (N = 1791)<br>(F = 542; M = 1249)<br>(Frating = 0.00%)<br>(Mrating = 100.00%)<br>(Overall = 69.74%) |      |         | Third Sample (N = 1670)<br>(F = 515; M = 1155)<br>(Frating = 0.00%)<br>(Mrating = 100.00%)<br>(Overall = 69.16%) |      |         |
|----------|----------------------------------------------------------------------------------------------------------------|------|---------|-------------------------------------------------------------------------------------------------------------------|------|---------|------------------------------------------------------------------------------------------------------------------|------|---------|
| Variable | Beta                                                                                                           | S.E. | Exp (B) | Beta                                                                                                              | S.E. | Exp (B) | Beta                                                                                                             | S.E. | Exp (B) |
| Constant | -0.93                                                                                                          | 0.04 |         | -0.83                                                                                                             | 0.05 | -0.81   | 0.05                                                                                                             |      |         |

No gender-based difference was found in the importance rating of having an approachable accounts manager.

**S6. SATISFIED: ACCOUNTS MANAGER IS APPROACHABLE**

|                 | First Sample (N = 2283)<br>(F = 650; M = 1633)<br>(Frating = 0.00%)<br>(Mrating = 100.00%) |      |         | Second Sample (N = 1671)<br>(F = 507; M = 1164)<br>(Frating = 0.00%)<br>(Mrating = 100.00%) |      |         | Third Sample (N = 1557)<br>(F = 479; M = 1078)<br>(Frating = 0.00%)<br>(Mrating = 100.00%) |      |         |
|-----------------|--------------------------------------------------------------------------------------------|------|---------|---------------------------------------------------------------------------------------------|------|---------|--------------------------------------------------------------------------------------------|------|---------|
| Variable        | Beta                                                                                       | S.E. | Exp (B) | Beta                                                                                        | S.E. | Exp (B) | Beta                                                                                       | S.E. | Exp (B) |
| Satisfied:      |                                                                                            |      |         |                                                                                             |      |         |                                                                                            |      |         |
| Easy to talk to | -0.27                                                                                      | 0.06 | 0.77    | -0.28                                                                                       | 0.07 | 0.76    | -0.27                                                                                      | 0.08 | 0.77    |
| Constant        | -0.30                                                                                      | 0.15 |         | -0.18                                                                                       | 0.18 |         | -0.19                                                                                      | 0.18 |         |

Women are more likely than men to give low satisfaction ratings on approachability to their accounts managers. That is, women are more likely than men to perceive that their accounts managers are not approachable. This gender-based differences was highly significant as indicated by the Wald statistics of 17.91, 14.81, 12.50 and significant levels beyond the 0.01 level.

**17. IMPORTANT: MAKES YOU COMFORTABLE**

|             | First Sample (N = 2437)<br>(F = 693; M = 1744)<br>(Frating = 0.00%)<br>(Mrating = 100.00%)<br>(Overall = 71.56%) |      |         | Second Sample (N = 1791)<br>(F = 545; M = 1246)<br>(Frating = 0.00%)<br>(Mrating = 100.00%)<br>(Overall = 69.57%) |       |         | Third Sample (N = 1671)<br>(F = 518; M = 1153)<br>(Frating = 0.00%)<br>(Mrating = 100.00%)<br>(Overall = 69.00%) |      |         |
|-------------|------------------------------------------------------------------------------------------------------------------|------|---------|-------------------------------------------------------------------------------------------------------------------|-------|---------|------------------------------------------------------------------------------------------------------------------|------|---------|
| Variable    | Beta                                                                                                             | S.E. | Exp (B) | Beta                                                                                                              | S.E.  | Exp (B) | Beta                                                                                                             | S.E. | Exp (B) |
| Important:  |                                                                                                                  |      |         |                                                                                                                   |       |         |                                                                                                                  |      |         |
| COMFORTABLE | 0.35                                                                                                             | 0.08 | 1.41    | 0.40                                                                                                              | 0.09  | 1.49    | 0.37                                                                                                             | 0.10 | 1.45    |
| Constant    | -1.84                                                                                                            | 0.22 | -1.88   | 0.26                                                                                                              | -1.79 | 0.26    |                                                                                                                  |      |         |

Women also seem to consider it more important that they should be made comfortable by their financial institution than men do.

**S7: SATISFIED: MAKES YOU COMFORTABLE**

|                 |                                                                                                                  |             |                |                                                                                                               |             |                |                                                                                                                  |             |                |
|-----------------|------------------------------------------------------------------------------------------------------------------|-------------|----------------|---------------------------------------------------------------------------------------------------------------|-------------|----------------|------------------------------------------------------------------------------------------------------------------|-------------|----------------|
|                 | First Sample (N = 2296)<br>(F = 658; M = 1638)<br>(Frating = 0.00%)<br>(Mrating = 100.00%)<br>(Overall = 71.34%) |             |                | Second Sample (1685)<br>(F = 517; M = 1168)<br>(Frating = 0.00%)<br>(Mrating = 100.00%)<br>(Overall = 69.32%) |             |                | Third Sample (N = 1568)<br>(F = 489; M = 1079)<br>(Frating = 0.00%)<br>(Mrating = 100.00%)<br>(Overall = 68.81%) |             |                |
| <u>Variable</u> | <u>Beta</u>                                                                                                      | <u>S.E.</u> | <u>Exp (B)</u> | <u>Beta</u>                                                                                                   | <u>S.E.</u> | <u>Exp (B)</u> | <u>Beta</u>                                                                                                      | <u>S.E.</u> | <u>Exp (B)</u> |
| Important:      |                                                                                                                  |             |                |                                                                                                               |             |                |                                                                                                                  |             |                |
| COMFORTABLE     | -0.17                                                                                                            | 0.06        | 0.85           | -0.18                                                                                                         | 0.07        | 0.84           |                                                                                                                  |             |                |
| Constant        | -0.53                                                                                                            | 0.15        |                | -0.41                                                                                                         | 0.18        |                | -0.79                                                                                                            | 0.05        |                |

Women tend to be less satisfied than men about the extent to which they are made comfortable by the financial institution. Although this variable did not enter into the equation in the case of the third sample, it had a high score statistic of 3.67 and was significant at the 0.0554 level.

**18. IMPORTANT: TREATS YOU WITH RESPECT**

| First Sample (N = 2449)<br>(F = 699; M = 1750)<br>(Frating = 0.00%)<br>(Mrating = 100.00%)<br>(Overall = 71.46%) |       |      | Second Sample (N = 1798)<br>(F = 550; M = 1248)<br>(Frating = 0.00%)<br>(Mrating = 100.00%)<br>(Overall = 69.41%) |       |      | Third Sample (N = 1678)<br>(F = 524; M = 1154)<br>(Frating = 0.00%)<br>(Mrating = 100.00%)<br>(Overall = 68.77%) |       |      |         |
|------------------------------------------------------------------------------------------------------------------|-------|------|-------------------------------------------------------------------------------------------------------------------|-------|------|------------------------------------------------------------------------------------------------------------------|-------|------|---------|
| Variable                                                                                                         | Beta  | S.E. | Exp (B)                                                                                                           | Beta  | S.E. | Exp (B)                                                                                                          | Beta  | S.E. | Exp (B) |
| Important:                                                                                                       |       |      |                                                                                                                   |       |      |                                                                                                                  |       |      |         |
| RESPECT                                                                                                          | 0.44  | 0.09 | 1.56                                                                                                              | 0.55  | 0.11 | 1.73                                                                                                             | 0.55  | 0.11 | 1.73    |
| Constant                                                                                                         | -2.13 | 0.26 |                                                                                                                   | -2.32 | 0.31 |                                                                                                                  | -2.30 | 0.32 |         |

In all the three cases examined, it was discovered that being treated with respect was of particular importance to women entrepreneurs.

**S8. SATISFIED: TREATS YOU WITH RESPECT**

|            | First Sample (N = 2305)<br>(F = 661; M = 1644)<br>(Frating = 0.00%)<br>(Mrating = 100.00%)<br>(Overall = 71.32%) |      |         | Second Sample (N = 1693)<br>(F = 520; M = 1173)<br>(Frating = 0.00%)<br>(Mrating = 100.00%)<br>(Overall = 69.29%) |      |         | Third Sample (N = 1576)<br>(F = 492; M = 1084)<br>(Frating = 0.00%)<br>(Mrating = 100.00%)<br>(Overall = 68.78%) |      |         |
|------------|------------------------------------------------------------------------------------------------------------------|------|---------|-------------------------------------------------------------------------------------------------------------------|------|---------|------------------------------------------------------------------------------------------------------------------|------|---------|
| Variable   | Beta                                                                                                             | S.E. | Exp (B) | Beta                                                                                                              | S.E. | Exp (B) | Beta                                                                                                             | S.E. | Exp (B) |
| Satisfied: |                                                                                                                  |      |         |                                                                                                                   |      |         |                                                                                                                  |      |         |
| RESPECT    | -0.18                                                                                                            | 0.07 | 0.84    | -0.18                                                                                                             | 0.08 | 0.84    | -0.16                                                                                                            | 0.86 |         |
| Constant   | -0.49                                                                                                            | 0.17 |         | -0.38                                                                                                             | 0.19 |         | -0.42                                                                                                            | 0.20 |         |

Women tend to perceive that they are treated with less respect than they should receive.

**I9. IMPORTANT: GOOD SOURCE OF VENTURE CAPITAL**

|            | First Sample (N = 2287)<br>(F = 649; M = 1638)<br>(Frating = 0.00%)<br>(Mrating = 100.00%)<br>(Overall = 71.62%) |      |         | Second Sample (N = 1680)<br>(F = 506; M = 1174)<br>(Frating = 0.00%)<br>(Mrating = 100.0%)<br>(Overall = 69.88%) |      |         | Third Sample (N = 1563)<br>(F = 479; M = 1084)<br>(Frating = 0.00%)<br>(Mrating = 100.00%)<br>(Overall = 69.35%) |      |         |
|------------|------------------------------------------------------------------------------------------------------------------|------|---------|------------------------------------------------------------------------------------------------------------------|------|---------|------------------------------------------------------------------------------------------------------------------|------|---------|
| Variable   | Beta                                                                                                             | S.E. | Exp (B) | Beta                                                                                                             | S.E. | Exp (B) | Beta                                                                                                             | S.E. | Exp (B) |
| Important: |                                                                                                                  |      |         |                                                                                                                  |      |         |                                                                                                                  |      |         |
| CREDIT     | 0.23                                                                                                             | 0.06 | 1.26    | 0.23                                                                                                             | 0.07 | 1.25    | 0.22                                                                                                             | 0.07 | 1.25    |
| Constant   | -1.42                                                                                                            | 0.13 |         | -1.32                                                                                                            | 0.15 |         | -1.29                                                                                                            | 0.16 |         |

In all the three cases examined, it was found that women business owners consider access to venture capital very important.

**S9. SATISFIED: GOOD SOURCE OF VENTURE CAPITAL**

|          | First Sample (N = 1975)<br>(F = 555; M = 1420)<br>(Frating = 0.00%)<br>(Mrating = 100.00%)<br>(Overall = 71.90%) |      |         | Second Sample (N = 1454)<br>(F = 431; M = 1023)<br>(Frating = 0.00%)<br>(Mrating = 100.00%)<br>(Overall = 70.36%) |      |         | Third Sample (N = 1350)<br>(F = 405; M = 945)<br>(Frating = 0.00%)<br>(Mrating = 100.00%)<br>(Overall = 70.00%) |      |         |
|----------|------------------------------------------------------------------------------------------------------------------|------|---------|-------------------------------------------------------------------------------------------------------------------|------|---------|-----------------------------------------------------------------------------------------------------------------|------|---------|
| Variable | Beta                                                                                                             | S.E. | Exp (B) | Beta                                                                                                              | S.E. | Exp (B) | Beta                                                                                                            | S.E. | Exp (B) |
| Constant | -0.94                                                                                                            | 0.05 |         | -0.86                                                                                                             | 0.06 |         | -0.85                                                                                                           | 0.06 |         |



In all the three cases examined, no statistically significant gender difference was found in the extent to which entrepreneurs are satisfied with financial institutions as sources of venture capital.

#### IV.B.2

#### MULTIVARIATE ANALYSES: EXPECTATIONS OF ENTREPRENEURS ABOUT FINANCIAL INSTITUTIONS

|                         | First Sample (N = 2165)<br>(F = 613; M = 1552)<br>(Frating = 0.0%)<br>(Mrating = 100%)<br>(Overall = 71.69%) |      |         | Second Sample (N = 1588)<br>(F = 475; M = 1113)<br>(Frating = 0.21%)<br>(Mrating = 99.82%)<br>(Overall = 70.03%) |      |         | Third Sample (N = 1475)<br>(F = 449; M = 1026)<br>(Frating = 0.45%)<br>(Mrating = 99.81%)<br>(Overall = 69.56%) |      |         |
|-------------------------|--------------------------------------------------------------------------------------------------------------|------|---------|------------------------------------------------------------------------------------------------------------------|------|---------|-----------------------------------------------------------------------------------------------------------------|------|---------|
| Variable                | Beta                                                                                                         | S.E. | Exp (B) | Beta                                                                                                             | S.E. | Exp (B) | Beta                                                                                                            | S.E. | Exp (B) |
| Constant                | -2.20                                                                                                        | 0.34 |         | -2.38                                                                                                            | 0.39 |         | -2.50                                                                                                           | 0.39 |         |
| Advice                  | 0.31                                                                                                         | 0.07 | 1.36    | 0.36                                                                                                             | 0.08 | 1.43    | 0.38                                                                                                            | 0.06 | 1.47    |
| Easy to talk            | -0.21                                                                                                        | 0.11 | 0.81    | -0.23                                                                                                            | 0.13 | 0.79    | -0.31                                                                                                           | 0.12 | 0.74    |
| Treats you with respect | 0.36                                                                                                         | 0.12 | 1.44    | 0.57                                                                                                             | 0.14 | 1.77    | 0.61                                                                                                            | 0.14 | 1.83    |
| Cheap Money             | -0.16                                                                                                        | 0.10 | 0.85    | -0.20                                                                                                            | 0.11 | 0.82    |                                                                                                                 |      |         |
| Wide Range of Service   | 0.14                                                                                                         | 0.08 | 1.15    | 0.15                                                                                                             | 0.09 | 1.16    |                                                                                                                 |      |         |
| Venture                 | 0.13                                                                                                         | 0.07 | 1.14    |                                                                                                                  |      |         |                                                                                                                 |      |         |

When all the variables that express the extent to which entrepreneurs consider certain functions to be important roles of financial institutions, it was found that provision of helpful business advice, ability to talk easily with accounts manager and being treated with respect were among the expectations most closely associated with gender. In the case of the first and second samples, being offered the cheapest money available and provision of a wide range of services seems to be also related to gender. In the case of the first sample, being good source of venture capital also emerged as a significant covariate of gender.

It was found that women consider provision of helpful business advice more important than men entrepreneurs. However, surprisingly, women are less likely to consider being able to

talk easily with the accounts manager a valuable role that financial institutions could play. Women are more likely to value being treated with respect than men entrepreneurs. Less reliably, it seems that provision of a wide range of service is more valued by women than men entrepreneurs. However, women are less likely than men to consider availability of the cheapest money available an important role of financial institutions. It was found in one isolated instance that women are more likely than men to view provision of venture capital an important role of financial institutions.

#### IV.B.3

#### MULTIVARIATE ANALYSES: SATISFACTION OF ENTREPRENEURS WITH PERFORMANCE OF FINANCIAL INSTITUTIONS

|                | First Sample (N=1802)<br>(Female=506; Male=1296)<br>(Frating=0.00%)<br>(Mrating=100.00%)<br>(Overall=71.92%) |      |         | Second Sample (N=1324)<br>(Female=393; Male=931)<br>(Frating=0.00%)<br>(Mrating=100%)<br>(Overall=70.32%) |      |         | Third Sample (N=1225)<br>(Female=368; Male=857)<br>(Frating=0.00%)<br>(Mrating=100.00%)<br>(Overall=69.96%) |      |         |
|----------------|--------------------------------------------------------------------------------------------------------------|------|---------|-----------------------------------------------------------------------------------------------------------|------|---------|-------------------------------------------------------------------------------------------------------------|------|---------|
| Variable       | Beta                                                                                                         | S.E. | Exp (B) | Beta                                                                                                      | S.E. | Exp (B) | Beta                                                                                                        | S.E. | Exp (B) |
| Knows Business | 0.23                                                                                                         | 0.09 | 1.25    |                                                                                                           |      |         |                                                                                                             |      |         |
| Easy talk      | -0.35                                                                                                        | 0.09 | 0.71    | -0.24                                                                                                     | 0.08 | 0.79    | -0.23                                                                                                       | 0.09 | 0.80    |
| Constant       | -0.62                                                                                                        | 0.19 |         | -0.31                                                                                                     | 0.20 |         | -0.32                                                                                                       | 0.21 |         |

When the variables which express satisfaction with the role of bankers were examined, it was found in the case of the first sample that women entrepreneurs are satisfied with the extent to which bankers are familiar with their industry and with their businesses. However, women are more likely than men to indicate that their accounts managers are not approachable.

## **APPENDIX IV.C**

### **DIFFERENCES IN FINANCIAL AND MANAGERIAL BACKGROUND**

This appendix discusses the results of initial analyses that were used to explore gender-based differences in financial and managerial background. Although the variables are similar to the ones used in the analyses presented in the first section of chapter IV, certain differences may be noted. Ten covariates were used as proxies for the financial and managerial background of the owner. The first independent variable **YEARS1** was the square root transformation of the number of years of managerial experience the first owner has had in the industrial sector of the firm. The literature review indicates that the more experience an owner-manager has, the fewer would be the barriers she encounters with credit- financing.

The second covariate **EDUC\_1** had six categories representing the number of years of education that a first owner has had. It was treated as a pseudo-continuous variable. The literature review suggests that women tend to be more highly educated than their male counterparts (Aldrich, 1988). However, the impact of level of education on terms of credit is yet to be investigated. It is of interest to determine which of either years of managerial experience or level of education would be most related with gender of first owner.

The next four covariates, **PROF\_D**, **OPRO\_D**, **O\_DEG** AND **NO\_DEG** are measures of the type of degree held by owner. **PROF\_D** was coded as zero if the first owner had a professional degree and as one otherwise. **OPRO\_D** was coded as zero if the owner had a professional degree and as one otherwise. **O\_DEG** was coded as zero if the owner had a professional financial degree or as one otherwise. Lee (Personal Contact, 1989) suggests that the type of degrees obtained by principal owners may have an influence on their credit experience. Therefore, he projected that owners with professional financial degree and those with professional but non-financial degree would receive better terms of credit than would their counterparts.

The seventh covariate **PROF\_F** measured the professional financial status of the financial manager of the firm. It was coded as zero if the firm has a professional manager and as one

otherwise. Its purpose was to determine the extent to which the finances of the firm are managed by a professional. It owes its inclusion to the expectation that firms with professional financial managers would receive better terms of credit than firms without professional financial managers. For instance, Thornton (1981) found that firms with full-time professional managers reported fewer problems with credit financing than their counterparts.

The eighth, ninth, and tenth covariates were used to represent the identity of the financial manager. The eighth covariate **OWNFG** was coded as zero if the firm has a financial manager who is also a principal owner. Otherwise, it was coded as one. The ninth variable **OUTFG** was coded as zero if the firm employs the services of an outside accounting firm and as one otherwise. The tenth covariate **EMPFG** was coded as one if the financial manager is an employee who is not an owner.

Three separate logistic regression analyses were run. All three examined the association of each of the ten covariates with gender of the first owner. However, each used a different sample of firms. The first analysis considered all firms. The second test examined only enterprises that were either unequally owned or that were governed exclusively by owners of the same gender. The third examination investigated only those firms that were controlled by owners of the same gender.

With but minor variation, results obtained from all three analyses were identical. As table C.1 indicates, the odds ratios for **YEARS1**, a continuous variable was less than one. This suggests that women have less experience managerial experience than men entrepreneurs. The odds ratios of **PROF\_D**, a categorical attribute coded as zero, were greater than one, demonstrating that women were less likely than men to hold professional financial degrees. However, the odds ratios of **O\_DEG**, were less than one, suggesting that women were more likely than men to hold non-professional degrees are men. Also, it seems that women are more likely than men to be their own financial managers because the odds ratio of **OWNFG** is less than one. Likewise, the odds ratios for **OUTFG** were less than one for **OUTFG** in the two equations that it entered. This indicates that women are more likely than men to employ the services of an outside financial manager.

What the joint entry of both **OWNFG** and **OUTFG** really means is that women are more likely to be their own financial managers or to employ the services of an outside financial manager than to have an employee who is not an owner as financial manager. These characteristics may be reflections of the smaller sizes of women-owned firms relative to those of men.

**Table C.1**                      Structural Gender-Based Differences in  
Financial and Managerial Background of  
Principal Owners

|                 | First Sample (N=2221) |             |                | Second Sample (N=1635) |             |                | Third Sample (N=1521) |             |                |
|-----------------|-----------------------|-------------|----------------|------------------------|-------------|----------------|-----------------------|-------------|----------------|
| <u>Variable</u> | <u>Beta</u>           | <u>S.E.</u> | <u>Exp (B)</u> | <u>Beta</u>            | <u>S.E.</u> | <u>Exp (B)</u> | <u>Beta</u>           | <u>S.E.</u> | <u>Exp (B)</u> |
| Constant        | 1.92                  | 0.40        |                | 2.10                   | 0.46        |                | 1.50                  | 0.35        |                |
| YEARS1          | -0.67                 | 0.04        | 0.51           | -0.69                  | 0.05        | 0.50           | -0.72                 | 0.05        | 0.49           |
| PROF_D          | 0.64                  | 0.22        | 1.90           | 0.64                   | 0.26        | 1.89           | 0.74                  | 0.27        | 2.10           |
| O_DEG           | -0.36                 | 0.15        | 0.70           | -0.41                  | 0.17        | 0.67           | -0.35                 | 0.17        | 0.70           |
| OWNFG           | -0.95                 | 0.21        | 0.39           | -0.93                  | 0.23        | 0.39           | -0.72                 | 0.17        | 0.49           |
| OUTFG           | -0.65                 | 0.27        | 0.52           | -0.61                  | 0.30        | 0.54           |                       |             |                |

**END**

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**FIN**