

Gender and the Availability of Credit to Privately Held Firms: Evidence from the Surveys of Small Business Finances

Rebel A. Cole
DePaul University—Departments of Finance and Real Estate
1 E. Jackson Blvd., Chicago, IL 60604
Office: (312) 362-6887
Email: rcole@depaul.edu

Hamid Mehran
Federal Reserve Bank of New York—Research and Statistics Group
33 Liberty Street, New York, New York, USA
Office: (212) 720-6215
E-mail: hamid.mehran@ny.frb.org

Abstract

This study analyzes differences by gender in the ownership of privately held U.S. firms and examines the role of gender in the availability of credit. Using data from the nationally representative Surveys of Small Business Finances, which span a period of sixteen years, we document a series of empirical regularities in male- and female-owned firms. Looking at the differences by gender, we find that female-owned firms are 1) significantly smaller, as measured by sales, assets, and employment; 2) younger, as measured by age of the firm; 3) more likely to be organized as proprietorships and less as corporations; 4) more likely to be in retail trade and business services and less likely to be in construction, secondary manufacturing, and wholesale trade; and 5) inclined to have fewer and shorter banking relationships. Moreover, female owners are significantly younger, less experienced, and not as well educated. We also find strong univariate evidence of differences in the availability of credit to male- and female-owned firms. More specifically, female-owned firms are significantly more likely to be credit constrained because they are more likely to be discouraged from applying for credit, though not more likely to be denied credit when they do apply. However, these differences are rendered insignificant in a multivariate setting, where we control for other firm and owner characteristics.

Key Words: credit, discrimination, entrepreneurship, gender, SSBF

JEL Classification: G2, G21, G32, J15, J16, L11, L26

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1. Introduction

Entrepreneurs and their investments in new ideas and businesses are highly important to overall economic growth in the United States and other nations around the world. In a real sense, entrepreneurs represent the engine of growth for the U.S. economy. Furthermore, this growth is very much dependent on efficient allocation of human resources. Therefore, given a tight managerial/entrepreneurial labor market in the United States, it is critically important to understand the role of gender in entrepreneurship. A better understanding of what influences the entrepreneurial activities of women relative to men is of importance to investors, practitioners, academics, regulators, and policy makers.

As recently as 1985, the U.S. Small Business Administration stated, “There is no total count of female-operated businesses in the U.S.”¹ Although a growing number of studies examine various aspects of gender and entrepreneurship,² we are aware of no study that establishes a baseline of “stylized facts” about the role of gender in entrepreneurship. Our study is presumably the first to develop a comprehensive set of stylized facts about gender and entrepreneurship in the United States.

This study relies upon data on privately held businesses drawn from the Federal Reserve’s Surveys of Small Business Finances (SSBFs)—a set of four surveys covering the period 1987–2003.³ Each of these four surveys is representative of the population of small businesses in the United States as of a base year (1987, 1993, 1998, and 2003). The four surveys are used to provide snapshots of the role of women in U.S. small businesses over this period that spans 16 years. We believe our findings not only will provide nationally representative baselines for evaluating past studies, but also will motivate additional research in this area.

We analyze entrepreneurship participation by gender for the various organizational forms (e.g., sole proprietorships, partnerships, C corporations, and S corporations) and by size of firm as measured by

¹ See Report to the President 1985, p. 295.

² See, for example, Kallenberg and Leicht, 1991; Brush, 1992; Fischer, Reuber, and Dyke, 1993; Haynes and Haynes, 1999; Coleman, 2000; Robb, 2002; and Carrington, 2006.

³ The 2003 SSBF was one of the data sets presented at the 2007 Kauffman Symposium on Entrepreneurship and Innovation Data. See www.kauffman.org/datasymposium.

employment, sales, and assets. Anecdotal evidence suggests that women are predominantly involved in smaller firms; our research establishes nationally representative baselines.

We also document the degree of participation along many firm-level dimensions, including age, creditworthiness, industry, leverage, and profitability, and for entrepreneur-level characteristics, including age, creditworthiness, education, and experience. Furthermore, we examine how gender participation has changed over time.⁴

This study also focuses on the financial decisions made and outcomes realized by developing entrepreneurial firms, such as whether or not to apply for credit, whether or not the firm was extended credit by its prospective lender, which types of credit the firm sought (e.g., lines of credit versus loans, trade credit, and credit cards), and from how many financial institutions the firm sought financial services. These financial decisions reflect both the incentives of the entrepreneur, with her personal and financial stake in the success of the firm, and the incentives of other investors in the firm. Outcomes represent the evaluations of financial institutions regarding the prospects of these firms.

We find that, when compared to male-owned firms, female-owned firms are 1) significantly smaller as measured by sales, assets, and employment; 2) younger as measured by age of the firm; 3) more likely to be organized as proprietorships and less likely to be organized as corporations; 4) more likely to be in retail trade and business services and less likely to be in the construction, secondary manufacturing, and wholesale-trade industries; and 5) more inclined to have fewer and shorter banking relationships. Female owners are significantly younger, less experienced, and not as well educated.

Also examined here is the role of gender in the availability of credit to small privately held U.S. firms, and we find strong evidence of significant differences. Specifically, female-owned firms are significantly more likely to be credit-constrained because they are more likely to be discouraged from applying for credit, though not more likely to be denied credit when they do apply. However, these differences are rendered insignificant when we control for other firm and owner characteristics. This evidence suggests that observed gender

⁴ Cole (2008) reports that the percentage of privately held U.S. firms controlled by women rose from 14 percent in 1987 to 21 percent in 1993, to 24 percent in 1998, and to 26 percent in 2003. We explore in detail where, among privately held firms, this growth has occurred.

differences in credit availability are attributable to other differences in male-owned and female-owned firms, such as the firm's size and industry and the owner's age, experience, and educational attainment.

This study contributes to a number of different literatures, including that on entrepreneurship, relationship lending, and financial services. First, it establishes a set of stylized facts about female participation in entrepreneurship over time, about how female-owned firms differ from male-owned firms, and about how female owners differ from male owners. Second, it documents how the availability of credit differs across female-owned and male-owned firms. Third, it identifies important gender differences in the relationships between firms and creditors.

The findings of our research also can benefit policy makers. There is a large literature on the role of law and regulation in promoting employment and the availability of credit. Typically, state and federal governments intervene when there is evidence of economic structures that impede healthy competition. The starting point for any sound intervention is documentation of facts. Accordingly, we identify areas of entrepreneurship where women actively participate and then examine those areas where they are less active. We find, among other facts, that women are less likely to manage large organizations, which helps explain why women have fewer opportunities to manage listed companies.

2. Literature

Brush (1992) reviews fifty-seven of the earliest empirical studies on women-owned businesses, which primarily were descriptive statistics on cross-sectional survey data. She summarizes the results of these studies as a guide for future researchers, concluding that women-owned firms are similar to male-owned firms along numerous dimensions but differ across such owner characteristics as education, experience, and performance. She suggests that differences in male and female psychology play a major role in these differences.

The study by Kallenberg and Leicht (1991) is the first to rigorously explore whether differences in performance of entrepreneurial firms by gender are the result of discrimination or other factors. They analyze a sample of firms from selected industries in South Central Indiana over a three-year period, 1985-87, and find

that female-owned firms were no more likely to go out of business or to be less successful (as measured by gross earnings) than firms owned by men.

Fischer, Reuber, and Dyke (1993) examine a more comprehensive set of performance measures than do Kallenberg and Leicht. They find that women-owned firms are smaller, grow more slowly, and have lower sales revenues, and that their owners have less experience working in similar firms and less experience in start-up businesses. They also find that owner differences help explain differences in performance outcomes.

To assess the relative risk aversion of women versus men, Jianakoplos and Bernasek (1998) use data from the Federal Reserve System's 1989 Survey of Consumer Finances (SCF) to examine household holdings of risky assets. They find that, as wealth increases, the portion of risky assets increases by a smaller amount for women relative to men, a result they interpret as being consistent with the hypothesis that women are more risk-averse than men. They speculate that this may explain differences by gender in wealth endowments.

Sunden and Surett (1998) use data from the 1992 and 1995 SCFs to provide additional evidence on risk aversion for men versus women. They find that women make more conservative choices than men in their defined-contribution retirement plans.

Haynes and Haynes (1999) use data from the 1987 and 1993 SSBFs to examine the structure of debt held by small businesses that are owned by women and men. They find that, in 1987, women-owned firms relied more heavily on nontraditional debt instruments (i.e., lines of credit), but that this changed by 1993, when their access was similar to that of male-owned firms.

Coleman (2000) uses data from the 1993 SSBF to analyze access to capital and terms of credit. She finds that women-owned firms are less likely to use external financing and that lenders do not appear to discriminate against women in providing access to capital but do charge higher interest rates to women-owned firms, even though they are more likely to require collateral from women-owned firms.

Robb and Wolken (2002) use data from the 1998 SSBF to analyze how gender influences outcomes in the credit markets. Specifically, they look at five variables related to the use of credit. They find significant univariate differences by gender in each variable; however, in a multivariate analysis, these differences are explained by other factors, such as the age and size of the firm.

Robb (2002) compares business survival rates by gender and minority status. She finds that, after controlling for a firm's age, size, industry, location, and organizational form, businesses owned by women fared worse than those owned by men; however, among businesses owned by blacks, those owned by women did better than those owned by men.

Coleman (2003) uses data from the 1998 SCF in yet another study on risk aversion for women versus men. She finds that women overall expressed higher levels of risk aversion than men overall, but that there were no such differences between younger women and men overall.

Cole (2008) uses data from each of the four SSBFs to analyze capital structure at privately held firms. He finds that the proportion of women-owned firms in the U.S. population of privately held firms increased from 14 percent in 1987 to 21 percent in 1993, to 24 percent in 1998, and to 26 percent in 2003. He also finds that women-owned firms used significantly less leverage in 2003, which is consistent with previous studies finding that women are more risk-averse than men.

3. Data

This study uses data from four independent cross-sectional surveys of U.S. firms conducted by the Federal Reserve: the 1987, 1993, 1998, and 2003 Surveys of Small Business Finance (SSBF).⁵ The firms in each survey constitute a nationally representative sample of small businesses operating in the United States in those years. A "small business" is defined as a nonfinancial, nonfarm enterprise employing fewer than 500 full-time-equivalent employees. The survey data are broadly representative of the firms operating in the U.S. as of the year-end (approximately 3 million firms in 1987, 5 million in 1993 and 1998, and 6 million in 2003).

We impose a couple of restrictions on the SSBFs. In each survey, a very small number of firms had indicated that they were publicly traded. We exclude these firms so that our samples contain only privately held firms.⁶

⁵ See Cox, Elliehausen and Wolken (1989), Cole and Wolken (1995), Bitler, Robb, and Wolken (2001), and Mach and Wolken (2006) for detailed descriptions of the 1987, 1993, 1998, and 2003 surveys, respectively.

⁶ We exclude fifteen, thirty-two, ten, and nine publicly traded firms from the 1987, 1993, 1998, and 2003 SSBFs, respectively, in order to have clean samples of privately held firms.

In each survey, there also are some very large firms when measured by annual sales or total assets—some as large as \$250 million. The SSBFs are based on firms with fewer than 500 employees, but no restrictions are imposed on sales or assets. We exclude firms with more than \$10 million in annual sales or total assets (about 200 to 400 firms in each SSBF) in order to exclude what bankers refer to as “middle market” firms. This also helps mitigate the skewness in the distributions of financial variables.

The SSBFs provide detailed information about the demographic characteristics of each firm's primary owner, including gender, race, and ethnicity. These characteristics enable us to identify and classify firms by gender. In addition, the SSBFs provide detailed information about each firm's 1) balance sheet and income statement; 2) credit history and use of financial services and institutions; and 3) characteristics, including standard industrial classification, organizational form (proprietorship, partnership, limited liability partnership, limited liability company, S corporation, or C corporation), and age. With the exception of the 1987 survey, the SSBFs also provide information on the primary owner's age, education, experience, and credit history. Balance sheet and income statement data are derived from the enterprise's year-end financial statements. Credit history, firm characteristics, and demographic characteristics of each firm's primary owner are taken as of year-end.

4. Methodology

To provide new evidence on the differences in male- and female-controlled firms, we employ both univariate and multivariate techniques.

4.1 Univariate tests of differences in male- and female-controlled firms

First, we calculate and analyze descriptive statistics (primarily the means and standard errors) for male- and female-owned firms by selected firm and owner characteristics. We then perform statistical tests for differences in means. These tests for each of the four SSBFs are performed in order to provide evidence on how the characteristics of these firms have changed over the sixteen years spanned by the four surveys. Because the surveys are stratified random samples rather than simple random samples, we employ special survey procedures that adjust for the nonrandom nature of the SSBFs. Specifically, we use the SAS procedures PROC

SURVEYMEAN and PROC SURVEYFREQ, which explicitly account for both the sampling weight and the sampling stratum of each observation.

4.2 Multivariate tests of differences in male- and female-controlled firms

Second, we estimate multivariate regression models to identify significant differences in male- and female-controlled firms. Because the dependent variable in this model is binary—i.e., it takes only two values, male or female—we use a univariate probit regression model to perform our analysis. Moreover, because of the nonrandom nature of the sample, we explicitly account for both the sampling weight of each observation. Our model takes the following form:

$$\text{Gender} = f(\text{Firm Characteristics, Market Characteristics, Owner Characteristics}) \quad (1)$$

where:

Gender is a binary variable equal to one if the firm is controlled by a female and zero otherwise.

Firm Characteristics is a vector of variables measuring characteristics of the firm.

Market Characteristics is a vector of variables measuring characteristics of the banking market in which the firm is located.

Owner Characteristics is a vector of variables measuring characteristics of the firm's controlling owner.

It is important to emphasize that the results of this analysis are simple correlations and that they say nothing about causality. Obviously, our explanatory variables do not determine the gender of the primary owner. However, this multivariate analysis enables us to disentangle and better understand the results from our univariate tests.

Theory offers us little guidance in choosing firm and owner characteristics that should vary by gender. Therefore, we rely upon policy-related considerations when choosing our set of explanatory variables.

Specifically, we look to the literature on the availability of credit to small firms for variables that are important in determining which types of firms and owners are more likely to receive credit.⁷

4.3 Multivariate tests of the availability of credit to male- and female-controlled firms

Third, we estimate univariate and bivariate probit regression models to identify significant differences in the determinants of the availability of credit to male- and female-controlled firms. Following Cole (2009), we estimate a series of three equations related to credit outcomes:

- (i) Did a firm need credit during the previous three years? We refer to firms that indicated a need for credit as *Need-Credit Firms* and to firms indicating no need for credit as *No-Need Firms*.
- (ii) Among the firms needing credit, did a firm apply for credit? We refer to firms that needed credit but did not apply for fear of rejection as *Discouraged Firms* and to firms that needed credit and did apply as *Applied Firms*.
- (iii) Among firms that applied for credit, was the firm successful in obtaining funds from its prospective lender? We refer to successful firms as *Approved Firms* and to unsuccessful firms as *Denied Firms*.

We estimate this three-step sequential model using a univariate probit model at step 1 and using a bivariate probit selection model (see Van de Ven and Van Pragg (1981) and Greene (1992) and (1996)) at steps 2 and 3. This selection model is an extension of the bivariate probit model, which itself is an extension of the univariate probit model. We use a probit model because our dependent variables are binary (i.e., they take on a value of zero or one), so that ordinary least squares is inappropriate. We use a bivariate probit selection model at steps 2 and 3 in order to account for a non-random selection mechanism operating on those firms that need credit and on those firms that applied for credit. We cannot use the standard Heckman (1979) selection model because our the dependent variable in our second equation is binary; in Heckman's model, the dependent variable in the second equation is continuous and can be estimated by ordinary least squares. The bivariate probit model consists of two equations

⁷ See Petersen and Rajan (1994), Berger and Udell (1995), Cole (1998), Cole, Goldberg, and White (2004), and Chakravarty and Yilmazer (2009) for general studies on the availability of credit to small firms. See Cole (1998), Cavalluzzo and Cavalluzzo (1998), and Blanchflower, Levine, and Zimmerman (2003) for studies that examine the role of minority ownership in the availability of credit to small firms.

$$y_1^* = \beta_1' x_1 + \epsilon_1, y_1 = \text{sign}(y_1^*) \quad (1)$$

and

$$y_2^* = \beta_2' x_2 + \epsilon_2, y_2 = \text{sign}(y_2^*) \quad (2)$$

where:

$$\epsilon_1, \epsilon_2 \sim \text{Bivariate Normal}(0,0,1,1,\rho)$$

In the bivariate probit selection model, $[y_1, x_1]$ are only observed when y_2 is equal to one, so the error terms in eq. (1) and eq. (2) must be re-specified as $\epsilon_j = \exp(\gamma_j, z_j) u_j$, where $[u_1, u_2]$ have the bivariate standard normal distribution. The estimated correlation coefficient ρ (the correlation between error terms ϵ_1 and ϵ_2) can be used to test for selection bias. If ρ is statistically significant, then we can reject the null hypothesis that selection bias is not present.

In our particular setting, our selection equation at step 2 is the *Need* equation, explaining who needs credit, and our primary equation of interest is the *Discouraged* equation. At step 3, our selection equation is the *Apply* equation and our primary equation of interest is the *Denied* equation. We estimate these models using the LIMDEP statistical package. Our model takes the following form:

$$\mathbf{DV} = \mathbf{f}(\text{Firm Characteristics, Market Characteristics, Owner Characteristics}) \quad (2)$$

where:

DV is one of three dependent variables: *Need*, *Applied*, and *Approved*.

Need is a binary variable that is equal to one if the firm indicated that, during the previous three years, it had a need for credit and is equal to zero otherwise.

Applied is a binary variable that is equal to one if the firm needed credit and applied for credit and is equal to zero if the firm needed credit but did not apply because it feared rejection. *Applied* is missing for firms that did not need credit.

Approved is equal to one if the firm applied for credit and was successful in obtaining credit and is equal to zero if the firm applied but was refused credit by its prospective lender. *Approved* is missing for firms that did not apply for credit.

Firm Characteristics, *Market Characteristics*, and *Owner Characteristics* are vectors as defined above for Equation (1).

4.4 Explanatory variables

For guidance in selecting our explanatory variables, we rely upon the literature on the availability of credit to small firms. In particular, we draw upon Cole, Goldberg, and White (2004). Table 1 summarizes the definitions of our analysis variables.

4.4.1. Firm characteristics

For firm characteristics, we analyze a firm's size, age, profitability, creditworthiness, organizational form, and industrial classification. Firm size influences the probability of financial distress. Larger firms are more diversified and have been shown to have lower probabilities of default. Both theory and empirical evidence suggest a positive relation between firm size and the availability of credit. However, anecdotal evidence suggests that firms controlled by women are smaller than those controlled by men.

Measuring the size of small privately held firms is problematic. Typically, three alternative variables are used in the finance literature to measure firm size: total assets, annual sales revenues, and total employment. Total assets are probably the most common measure of firm size in the literature; however, in our samples, this variable presents problems with respect to both missing values and outliers. First, many firms did not report total assets to SSBF interviewers, forcing Federal Reserve staff to impute these values. Second, many firms that did report total assets reported values that appear inconsistent with other measures of size. This is especially problematic for very small firms in the service industries that have few assets yet generate significant sales revenues and employ many workers. Sales revenues present similar but less severe problems. Many firms, especially very young ones, report zero or very small values of sales revenues.

Total employment presents the fewest problems in both of these respects. Almost all firms report employment, and outliers are uncommon because firm size is limited to 500 or fewer employees. However, the surveys had to deal with how to classify the firms reporting zero employees. The early surveys replaced zero

values with one-half of an employee, assuming the owner worked at least part time. The 2003 survey finally recognized that zero-employee firms are not unusual and that owners are not “employees” as defined by employment law. Because each of these size measures suffers problems, we test all three measures as proxies for firm size, but we focus on total assets because this is the measure most commonly used in the literature.

To measure firm age, we use information on length of time since the firm was founded, purchased, or acquired. Younger firms need capital to finance growth. Younger firms also tend to be less creditworthy, less profitable, and less diversified than older firms, so they have higher probabilities of financial distress. Moreover, younger firms have less of a track record than older firms, having had less time to establish a reputation. For all of these reasons, younger firms are less likely to receive credit. Anecdotal evidence suggests that firms controlled by women are likely to be younger than firms controlled by men. We include the natural logarithm of firm age to perform this test. The log transformation is used because we believe a one-year difference in age is more important to the availability of credit to a young firm than to an old firm.

To measure the riskiness of a firm, the SSBFs provide a wide variety of variables. These include the number of times the firm was sixty or more days delinquent on business obligations, the number of times the primary owner was sixty or more days delinquent on personal obligations, whether the primary owner has declared bankruptcy within the past seven years, whether the firm paid late on its trade credit accounts, and whether the firm had ever been denied trade credit by a supplier. The SSBF also provides information on the financial leverage of the firm, which recently has been analyzed by Cole (2008).

To measure profitability, we calculate return on assets (ROA) as net income divided by total assets. Firm profitability influences the probability of financial distress. The more profitable the firm, the less likely it is to default on its liabilities. Therefore, theory predicts a positive relation between profitability and the availability of credit. For a robustness test, we also construct a zero-one indicator variable for profitable firms, i.e., those firms reporting profits greater than zero. This measure is much simpler and cleaner than ROA because of the noise in the SSBF financial data.

To measure organizational form, we use a series of zero-one variables indicating whether the firm is organized as a C corporation, an S corporation, a partnership, or a proprietorship.⁸ The proprietorship is the simplest form of business organization, often chosen by the smallest and youngest firms. If firms controlled by women are disproportionately younger and smaller than firms controlled by men, then we would expect the former to be overrepresented among proprietorships and underrepresented among corporations.

To measure industrial classification, we use the SSBFs' two-digit industrial classification variable to construct a series of zero-one variables indicating the primary industry in which the firm is engaged. Certain industries are much more capital-intensive than others and as such may present obstacles to women seeking to start small businesses. If such is the case, then firms controlled by women will be underrepresented in these industries relative to firms controlled by men.

4.4.2 Credit market characteristics

Credit market characteristics are represented by three dummy variables for low, medium, and high concentration as measured by the banking industry *Herfindahl Index* and by a dummy for firms located in urban rather than rural areas. Previous research (e.g., Cole, 1998 and 2008) has found that both market concentration and urban location play a role in the availability of credit to privately held firms.

4.4.3. Owner characteristics

For owner characteristics, we analyze the age, creditworthiness, experience, education, ethnicity, and race of the primary owner, as well as whether the primary owner founded the firm. Little is known about how these demographic characteristics of firm owners differ by gender.

With respect to the availability of credit, theory predicts that firms with older, more experienced, and better educated owners should have greater access to credit. Empirical evidence suggests that minority-owned firms have less access to credit than do firms owned by Caucasians.

⁸ The 1998 and 2003 SSBFs also classify firms as limited liability companies, either partnerships or corporations. Because of their small numbers, we pool these with traditional partnerships and corporations.

5. Results

5.1 Univariate results

Table 2 presents some basic information about the distribution of our sample firms by gender and survey year. Panel A shows that the percentage of female-owned firms almost doubled from 1987 to 2003, rising from 14.02 percent in 1987 to 20.87 percent in 1993, to 24.13 percent in 1998, and to 26.27 percent in 2003.

Panel B presents a cross-tabulation of gender by firm size. One of the most prominent anecdotal “facts” about female-owned firms is that they are significantly smaller than male-owned firms. The table confirms this. Furthermore, our analysis shows that the percentage of female-owned firms declines in each of the four sales quartiles in all four survey years and that the difference in the ownership percentages in the smallest and largest quartiles widens over time. In 1987, 19.55 percent of the smallest sales quartile and 9.43 percent of the largest sales quartile were female-owned. By 2003, 40.1 percent of the smallest sales quartile and 12.6 percent of the largest sales quartile were female-owned. Not shown in Table 2 are similar cross-tabulations based on total assets and total employment rather than annual size. Results from these cross-tabulations are broadly consistent with the findings in Table 2.

This evidence suggests that one explanation for the paucity of female CEOs at public firms is the paucity of female owners among the largest privately held firms. This explanation follows from the fact that the CEOs of most newly public firms are the primary owners of the firm prior to its going public.

5.1.1 Firm characteristics

Tables 3A, 3B, 3C, and 3D present descriptive statistics from the 2003, 1998, 1993, and 1987 SSBFs, respectively. Descriptive statistics are presented for all firms and separately for male- and female-controlled firms. We also calculate the difference in means of male-owned and female-owned firms along with a *t*-statistic for testing for significant differences in these means. We report only results that are consistent in sign and significance across the SSBFs for which a variable is available.

Female-owned firms are smaller than male-owned firms, as measured by annual sales, total assets, and total employment. By annual sales, female-owned firms are about half the size of male-owned firms (343,000 versus 724,000 in 2003). By total assets, female-owned firms are less than two-thirds the size of male-owned firms in each survey year except 1987 (350,000 versus 184,000 in 2003). By total employment, female-owned firms are about a quarter smaller than male-owned firms (7.6 versus 5.5 in 2003). Trend-wise, female-owned firms declined in size as measured by both annual sales and total assets from 1987 through 1993 and 1998, but then rose in 2003. The number of employees at female-owned firms ranged between 6.3 in 1987 and 5.2 in 1993.

We find no significant differences in firm profitability by gender. Over time, the ROA of female-owned firms ranged between 0.53 in 1987 and 0.88 in 1998.

Except for 2003, no years showed significant differences in the leverage ratios of female-owned and male-owned firms as measured by the ratio of total liabilities to total assets. In 2003, female-owned firms reported significantly lower leverage than did male-owned firms (0.73 versus 0.89).

Female-owned firms are more liquid as measured by the ratio of cash to total assets. Over time, the cash-to-assets ratio of female-owned firms rose monotonically between 1987 and 2003, to 0.29 from 0.18.

There are strong and persistent differences in the organizational form of female- and male-owned firms. In each year, female-owned firms are more likely to be organized as proprietorships and less likely to be organized as corporations than are male-owned firms. Among female-owned firms, proprietorships accounted for between 47 percent (1987) and 57 percent (1998) while corporations (both C and S) accounted for between 49 percent (1987) and 36 percent (1998). Within corporations, there was a significant switch from C corporations to S corporations: The percentage of C corporations fell each year and the percentage of S corporations rose each year.

The age of female-owned firms ranged between 10.3 years in 1987 and 12.4 years in 2003. In each survey year, female-owned firms are significantly younger than male-owned firms, with the difference ranging from 2.4 to 3.3 years. However, the difference has declined over time.

We look at four different measures of a firm's credit quality, but only one of these—trade credit paid late—is available across all four surveys. This measure indicates that female-owned firms were less risky in 1998 and 2003, but not significantly different from male-owned firms in 1987 and 1993. The number of business obligations on which the firm is sixty or more days delinquent is available for each SSBF survey year except 1987. Only in 1993 is there a significant difference, as female-owned firms reported significantly more delinquencies in that year. The Dun and Bradstreet credit score is available only from the 1998 and 2003 SSBFs and is coded from low to high in 2003 (lower values are more risky) but from high to low in 1998 (higher values are more risky). In both surveys, female-owned firms are significantly more risky than male-owned firms. An indicator for whether or not the firm had filed for bankruptcy during the previous seven years is available from the 1998 and 2003 surveys. By this measure, there are no significant differences in male- and female-owned firms.

Each of the SSBFs except for 1987 provides information on the use of personal and business credit cards for business expenses. Some observers have speculated that female-owned firms are forced to rely on credit cards for financing to a greater extent than are male-owned firms, but the data from the surveys do not support this speculation. There are no significant differences by gender in the use of business credit cards, and the significant differences in the use of personal credit cards show that men were more likely than women to use personal credit cards for business expenses in both 1998 and 2003. The reverse was true during 1993. In 2003, 49 percent of female-owned firms used business credit cards for business expenses and 45 percent used personal credit cards for business expenses.

We observe strong differences in male-owned and female-owned firms across industry. Across all four surveys, there are significantly fewer female-owned firms in construction, typically about eight-to-nine percentage points fewer; and there are significantly more female-owned firms in retail trade, and business services. The difference in retail trade has declines across each of the four surveys, falling from 13 percentage points in 1987 to only four percentage points in 2003. The difference in business services has been consistently in the range of seven-to-nine percentage points. In professional services, female-owned firms have gone from

significantly under-represented in 1987 by eight percentage points to significantly over-represented in 2003 by five percentage points.

5.1.2 Market characteristics

Most firms are located in urban areas. This portion ranged from 76 percent in 1987 to 80 percent in 1998. In no year was this percentage significantly different for women-owned firms than for male-owned firms.

Differences in banking market concentration could account for observed differences in the availability of credit to female- and male-owned firms. Each of the SSBFs provides categorical information on this measure. In both 1993 and 2003, female-owned firms were disproportionately located in concentrated banking markets.

5.1.3 Firm owner characteristics

Detailed information on owner characteristics is available from each SSBF except for 1987, when the only information available is on race and gender. Female owners are younger than male owners across the SSBFs, but this difference, while statistically significant, is only one to two years in magnitude and declines in each survey year. For female owners, the average age ranges from 47.8 in 1993 to 50.7 in 2003.

Greater differences are observed in owner experience. Female owners have from 4.5 to 5.2 fewer years of experience than male owners. Average experience for female owners ranges from 14.7 years in 1998 to 15.8 years in 2003.

We also observe significant differences in educational attainment. The portion of female owners with graduate degrees ranges from 14.2 percent in 1998 to 17.8 percent in 2003. This is significantly lower, by 4 to 6 percentage points, than the corresponding percentages for men. The portion of owners who attended college but did not graduate (referred to as *some college*) is 5 to 7 percentage points higher among female owners and accounts for between 30 and 32 percent of all female-owned firms.

In general, we find no significant differences by gender in race or ethnicity. The portions of owners who are Asian, black, and Hispanic are about the same for male-owned and female-owned firms, typically in the

range of 3 to 4 percent of all firms. Only in 2003 do we find a statistically significant difference: 5.2 percent of the firms are owned by black women, but only 3.5 percent are owned by black men.

We examine four measures of personal credit quality for 1993, 1998, and 2003—owner bankruptcy, owner delinquencies, owner judgments, and owner personal wealth—none of which are available from the 1987 SSBF. Owner personal wealth is available only for 1998 and 2003. Among these variables, the only statistically significant differences in male- and female-owned firms show up in 2003—for owner bankruptcy, owner delinquencies, and owner personal wealth. In that survey year, female owners, in comparison to male owners, were significantly more likely to have declared bankruptcy during the previous seven years (3.6 percent versus 2.1 percent), significantly more likely to be delinquent on personal obligations (14.5 percent versus 11.2 percent), and had significantly less personal wealth.

5.1.4 Firm-creditor relationship characteristics

Table 3 also presents information on a number of firm-creditor relationship variables that previous studies have found important in explaining the availability of credit to small firms. These include the type of financial institution that is the firm's primary source of financial services (commercial bank, savings institution, finance company, or some other type of source) as well as the duration of the firm's relationship with its primary source, the distance between the firm and its primary source, and the number of bank and nonbank sources from which the firm obtains any financial services.

The statistics in Table 3 show that a female-owned firm is consistently less likely to choose a commercial bank and consistently more likely to choose a savings institution (savings and loan, savings bank, or credit union) as its primary source for financial services. In 1998 and 2003, a female-owned firm was also less likely to choose a finance company as its primary source. Table 3 also shows that a female-owned firm consistently has a shorter relationship with its primary source of financial services, but this disparity with male-owned firms has narrowed over time—from twenty months in 1987 and 1993 to only five months in 2003. Female-owned firms were significantly closer to their primary sources of financial services in 1987 and 2003,

but were more distant in 1993 and 1998. Finally, female-owned firms obtained financial services from significantly fewer sources, especially bank sources, in each survey year except for 1987.

5.1.5 Credit market outcomes

Table 4 presents descriptive statistics for credit market outcomes: *NoNeed*, *Discouraged*, and *Denied*. Data are not available from the 1987 SSBF.

Female-owned firms are more likely to report no need for credit during the three years prior to the survey year, and this difference is significant in 1993 and 2003. In 1993, 51 percent of female-owned firms reported no need for credit; for 1998 and 2003, the figures were 61 percent and 58 percent, respectively.

Female-owned firms are disproportionately likely to report that they needed credit but that fear of rejection kept them from applying. These so-called discouraged firms accounted for 36 percent of female-owned firms reporting a need for credit in 1993; the portion rose to 48 percent in 1998 and then declined to 37 percent in 2003. These percentages are 6, 10, and 17 percentage points higher than the corresponding percentages for male-owned firms, respectively.

Of the female-owned firms that applied for credit, 25 percent were denied credit in 1993; this share increased to 26 percent in 1998 and then declined to 15 percent in 2003. In each year, these numbers were 2 to 7 percentage points higher than the denial rates for male-owned firms, but this difference is statistically significant only for 1993, when the gap was 6.9 percentage points.

5.2 Multivariate results

5.2.1 Gender

Tables 5A, 5B, 5C, and 5D present the estimates from a univariate probit regression model where the dependent variable is equal to one if the firm is controlled by a female and equal to zero if the firm is controlled by a male. The data used are from the 2003, 1998, 1993, and 1987 SSBFs, respectively. As noted previously, these are only correlations and they say nothing about causality. We conduct these tests to disentangle the pervasive effects of firm size on observed univariate differences in male- and female-owned firms. For example,

we know that larger firms are typically older, more creditworthy, and more likely to be organized as corporations.

The results in Table 5 indicate that firm size is behind many of the univariate differences in the male- and female-owned firms documented in Table 3. Among firm characteristics (excluding industry), the only variable that is consistently significant in explaining gender is firm size as measured by the natural log of annual sales. Similar results are obtained when we replace annual sales with either total assets or total employment.

We do see consistently significant differences in industrial classification in our multivariate analysis. Relative to the omitted category of construction and mining, a traditional male bastion, female-owned firms are significantly more likely to be classified as professional services, retail trade, business services, insurance and real estate, and primary manufacturing.

Among owner characteristics, we find a different story. The key variables that show significant differences between male- and female-owned firms in our univariate results also are significant in explaining the gender of the firm's owner. Compared to male owners, female owners are significantly more likely to have less experience and less education. Firm age, however, flips sign on us in our multivariate analysis: Older firms are significantly more likely to be female-owned (at least after controlling for owner experience and firm size).

Among the firm-creditor relationship variables, none is consistently positive or negative across the four surveys. The number of bank sources is negative and significant in 1998 and 2003, but positive in 1987 and 1993.

5.2.2 Availability of credit

Table 6 presents the results from estimating our three sequential credit outcome variables using the bivariate probit selection model: *NoNeed*, *Discouraged*, and *Denied*. Each model includes, as explanatory variables, all of the variables defined in Table 1, but, for brevity, we present only the parameter estimates, marginal effects, standard errors, and t-statistics for our primary variable of interest—*female-owned*, which takes on the value of one for female-owned firms and zero for all other firms.

Panel A shows the estimates from the model where the dependent variable is equal to one if the firm indicated no need for new credit during the previous three years and is equal to zero otherwise. In our univariate analysis (shown in Table 4), we find that female-owned firms were significantly more likely to be “NoNeed” firms than were male-owned firms in both 1993 and 2003. We also find a positive relation in our multivariate results for 1993, but a negative relation for 2003 (both were marginally significant at the 0.10 levels). Hence, our findings with respect to this variable are inconclusive.

Panel B presents the estimates from our model where the dependent variable is equal to one if the firm needed new credit during the previous three years but did not apply because it feared rejection (i.e., the prospective borrower was discouraged) and is equal to zero if the firm indicated it needed new credit during the previous three years and did apply. Our univariate analysis reveals that female-owned firms are consistently and significantly more likely to be discouraged than male-owned firms—a difference ranging from 6 to 17 percentage points. In our multivariate analysis, we still find positive coefficients, but none approaching traditional significance levels, and marginal effects range from 0.6 percent to 3.3 percent. Hence, our multivariate analysis refutes our univariate findings, suggesting that other differences in male- and female-owned firms were driving this univariate result.

Finally, in Panel C are the estimates from our model where the dependent variable is equal to one if the firm applied for credit and was turned down by its prospective lender and is equal to zero if the firm applied for credit and was successful in obtaining new credit. In our univariate analysis, we find that female-owned firms were more likely to be denied credit in 1993, 1998, and 2003, but that this difference was statistically significant only in 1993. Our multivariate results show small positive but insignificant coefficients in 1993 and 1998, but a negative and significant coefficient in 2003. The marginal effect associated with this coefficient is only 3.4 percent, which is relatively small. Overall, our multivariate results for this variable are mixed and inconclusive, as they were for our other two credit market outcomes.

In sum, our multivariate analysis shows no evidence of consistent and statistically significant differences in credit market outcomes of male-owned and female-owned firms.

6. Summary and conclusions

This study analyzes two decades of data from four nationally representative surveys of small privately held U.S. firms in order to establish a baseline of stylized facts about the role of gender in entrepreneurship.

We find that, when compared to male-owned firms, female-owned firms are 1) significantly smaller as measured by sales, assets, and employment; 2) younger as measured by the firm's age; 3) more likely to be organized as proprietorships and less likely as corporations; 4) more likely to be in retail trade and business services and less likely to be in construction, secondary manufacturing, and wholesale trade; and 5) and more inclined to have fewer and shorter banking relationships. Moreover, female owners are significantly younger, less experienced, and not as well educated.

Also examined here is the role of gender in the availability of credit to small privately held U.S. firms, and we find strong evidence of significant differences. Specifically, female-owned firms are significantly more likely to be credit-constrained because they are more likely to be discouraged from applying for credit, though not more likely to be denied credit when they do apply. However, these differences are rendered insignificant when we control for other firm and owner characteristics. This evidence suggests that observed gender differences in credit availability are attributable to other differences in male- and female-owned firms, such as the firm's size and industry and the owner's age, experience, and educational attainment.

This study contributes to a number of different literatures, including that on entrepreneurship, relationship lending, and financial services. First, it establishes a set of "stylized facts" about female participation in entrepreneurship over time, about how female-owned firms differ from male-owned firms, and about how female owners differ from male owners. Second, it documents how the availability of credit differs across female- and male-owned firms. Third, it identifies important gender differences in relationships between firms and creditors.

We expect our results to provide a new set of nationally representative baselines for researchers to use in assessing how gender affects entrepreneurship. We also believe our multivariate analysis establishes a new set of stylized facts about differences in female- and male-owned firms that can disentangle the effects of a firm's age and size from those truly attributable to gender.

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**Table 1:
Definitions of Analysis Variables**

Variable	
<i>Firm Characteristics</i>	
Sales	Annual sales (dollars)
Assets	Total assets (dollars)
Employment	Total employment
ln (assets)	Natural log of total assets
ROA	Net Income divided by total assets
Liabilities to assets	Total Liabilities divided by total assets
Cash to assets	Cash divided by total assets
C Corporation	Firm is organized as a C Corporation
S Corporation	Firm is organized as an S Corporation
Partnership	Firm is organized as a partnership
Proprietorship	Firm is organized as a proprietorship
Firm age	Age of firm under current management
Firm bankruptcy	Firm has declared bankruptcy during past seven years
Firm delinquencies	Number of business obligations where the firm has been 60 or more days delinquent
D&B credit score	Categorical representation of firm's D&B credit score
Business credit card	Firm uses business credit card for business expenses
Personal credit card	Firm uses personal credit card for business expenses
Paid late on trade credit	Firm paid trade credit after bill was due in full
<i>Market Characteristics</i>	
MSA	Firm is located in a Metropolitan Statistical Area
HHI high	Banking market concentration ratio is high ($>1,800$)
HHI medium	Banking market concentration ratio is medium ($1,000 < x < 1,800$)
<i>Owner Characteristics</i>	
Owner age	Age of primary owner
Owner experience	Years of experience of primary owner
Graduate degree	Primary owner has a graduate degree
College degree	Primary owner has a college degree
Some college	Primary owner attended college
Black	Primary owner is African-American
Asian	Primary owner is Asian
Hispanic	Primary owner is Hispanic
Owner bankruptcy	Primary owner has declared bankruptcy during previous seven years
Owner delinquency	Number of personal obligations where primary owner has been 60 or more days delinquent
Owner judgment	Judgment against the primary owner has been rendered during past three years
Owner personal wealth	Wealth of the primary owner, excluding value of the firm owned

**Table 1 (cont.):
Definitions of Analysis Variables**

Variable

Relationship Characteristics

Primary FI is comm bank	Firm's primary source of financial services is a commercial bank
Primary FI is sav inst	Firm's primary source of financial services is a thrift or credit union
Primary FI is finance co	Firm's primary source of financial services is a finance company
Primary FI is other	Firm's primary source of financial services is some other type of source
Months with primary FI	Length of relationship between the firm and its primary source of financial services
Distance to primary FI	Distance between the firm and its primary source of financial services
Number of bank sources	Number of banks from which the firm obtains financial services
Number of nonbank sources	Number of nonbank sources from which the firm obtains financial services

Industrial Classification

Construction	SIC 10 - 19
Primary manufacturing	SIC 20 - 29
Other manufacturing	SIC 30 - 39
Transportation	SIC 40 - 49
Wholesale trade	SIC 50 - 51
Retail trade	SIC 52 - 59
Insurance and real estate	SIC 64 - 69
Business services	SIC 70 - 79
Professional services	SIC 80 - 89

**Table 2:
Distribution of Female-Owned Firms by Survey Year and Firm Size**

Panel A: Female-Owned Firms in the Surveys of Small Business Finances				
	2003	1998	1993	1987
Weighted Number of Firms	5,969,096	5,069,096	4,884,636	3,222,041
Weighted Number of Female-Owned Firms	1,568,082	1,223,173	1,019,424	451,730
Female-Owned Firms, Percent of Total	0.2627	0.2413	0.2087	0.1402
Panel B: Female-Owned Firms by Sales Quartile (Q1 is smallest, Q4 is largest)				
Sales Quartile	2003	1998	1993	1987
Q1 Percentage of Quartile	0.4012	0.3379	0.2971	0.1955
Percentage of Total	0.1283	0.1006	0.0758	0.0553
Weighted Number of Firms	765,835	509,951	370,255	178,179
Q2 Percentage of Quartile	0.2348	0.2426	0.1997	0.136
Percentage of Total	0.0741	0.0696	0.049	0.035
Weighted Number of Firms	442,310	352,809	239,347	112,771
Q3 Percentage of Quartile	0.1823	0.1916	0.2099	0.1184
Percentage of Total	0.0465	0.052	0.0536	0.0323
Weighted Number of Firms	277,563	263,593	261,816	104,072
Q4 Percentage of Quartile	0.1258	0.1329	0.1241	0.0943
Percentage of Total	0.0138	0.0191	0.0303	0.0176
Weighted Number of Firms	82,374	96,820	148,004	56,708

Table 3A:

a, b, and c indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively

**Descriptive Statistics for Privately Held Firms, 2003
All Firms, Male-Owned Firms, and Female-Owned Firms**

Variable	All Firms		Male-Owned Firms		Female-Owned Firms		Difference	t-stat
	Mean	Std. Err	Mean	Std. Err	Mean	Std. Err		
Observations	3,623		2,776		847			
<i>Firm Characteristics</i>								
Sales	624,307	20,030	724,353	24,380	343,458	28,575	380,895	10.14 a
Assets	306,646	12,148	350,335	14,964	184,003	16,395	166,333	7.49 a
Employment	7.024	0.218	7.580	0.261	5.461	0.366	2.119	4.71 a
ln (assets)	11.042	0.033	11.287	0.036	10.353	0.077	0.935	11.05 a
ROA	0.607	0.014	0.601	0.016	0.624	0.033	-0.023	-0.63
Liabilities to assets	0.845	0.032	0.887	0.037	0.726	0.063	0.160	2.20 b
Cash to assets	0.257	0.005	0.245	0.006	0.290	0.012	-0.045	-3.35 a
C Corporation	0.140	0.006	0.152	0.007	0.105	0.011	0.047	3.64 a
S Corporation	0.310	0.008	0.327	0.009	0.263	0.016	0.064	3.50 a
Partnership	0.084	0.005	0.081	0.005	0.092	0.011	-0.010	-0.88
Proprietorship	0.466	0.005	0.440	0.005	0.541	0.011	-0.101	-13.62 a
Firm age	14.190	0.181	14.827	0.207	12.404	0.363	2.423	5.80 a
Firm bankruptcy	0.010	0.002	0.007	0.002	0.016	0.005	-0.008	-1.68 c
Firm delinquencies	0.157	0.006	0.154	0.007	0.163	0.013	-0.009	-0.57
D&B credit score	3.610	0.024	3.660	0.027	3.471	0.050	0.189	3.33 a
Business credit card	0.472	0.008	0.465	0.009	0.489	0.018	-0.024	-1.18
Personal credit card	0.482	0.008	0.495	0.009	0.447	0.018	0.048	2.36 b
Paid late on trade credit	0.245	0.007	0.255	0.008	0.217	0.015	0.038	2.23 b
<i>Market Characteristics</i>								
MSA	0.793	0.007	0.798	0.007	0.780	0.015	0.018	1.06
HHI high	0.479	0.008	0.468	0.009	0.509	0.018	-0.041	-2.01 b
HHI medium	0.461	0.008	0.466	0.009	0.447	0.018	0.019	0.91
<i>Owner Characteristics</i>								
Owner age	51.506	0.190	51.797	0.214	50.691	0.409	1.106	2.39 b
Owner experience	19.610	0.194	20.983	0.221	15.756	0.371	5.227	12.10 a
Graduate degree	0.208	0.007	0.219	0.008	0.178	0.014	0.041	2.57 b
College degree	0.291	0.008	0.298	0.009	0.268	0.016	0.030	1.66 c
Some college	0.267	0.007	0.250	0.008	0.316	0.017	-0.066	-3.54 a
Black	0.039	0.003	0.035	0.003	0.052	0.008	-0.017	-1.95 c
Asian	0.044	0.003	0.047	0.004	0.037	0.007	0.010	1.31
Hispanic	0.044	0.003	0.042	0.004	0.048	0.008	-0.006	-0.73
Owner bankruptcy	0.025	0.003	0.021	0.003	0.036	0.007	-0.015	-2.10 b
Owner delinquency	0.121	0.005	0.112	0.006	0.145	0.013	-0.033	-2.34 b
Owner judgment	0.023	0.002	0.023	0.003	0.024	0.006	-0.001	-0.19
Owner personal wealth	0.700	0.016	0.758	0.018	0.536	0.029	0.223	6.41 a

Table 3A (cont.):

a, b, and c indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively

Variable	All Firms		Male-Owned Firms		Female-Owned Firms		Difference	t-stat
	Mean	Std. Err	Mean	Std. Err	Mean	Std. Err		
<i>Relationship Characteristics</i>								
Primary FI is comm bank	0.801	0.007	0.811	0.007	0.772	0.015	0.039	2.30 b
Primary FI is sav inst	0.128	0.006	0.121	0.006	0.146	0.013	-0.024	-1.71 c
Primary FI is finance co	0.010	0.002	0.012	0.002	0.004	0.002	0.008	2.43 b
Primary FI is other	0.035	0.003	0.038	0.004	0.027	0.006	0.011	1.59
Months with primary FI	123.792	1.863	125.248	2.137	119.705	3.803	5.543	1.27
Distance to primary FI	32.911	3.134	36.256	3.819	23.521	4.795	12.735	2.08 b
Number of bank sources	1.229	0.013	1.276	0.015	1.099	0.027	0.176	5.73 a
Number of nonbank sources	1.142	0.020	1.185	0.023	1.021	0.042	0.164	3.42 a
<i>Industrial Classification</i>								
Construction	0.117	0.005	0.137	0.006	0.061	0.009	0.076	7.05 a
Primary manufacturing	0.031	0.003	0.033	0.003	0.025	0.006	0.007	1.11
Other manufacturing	0.040	0.003	0.047	0.004	0.018	0.005	0.029	4.64 a
Transportation	0.039	0.003	0.045	0.004	0.022	0.005	0.023	3.44 a
Wholesale trade	0.057	0.004	0.062	0.005	0.041	0.007	0.021	2.50 b
Retail trade	0.187	0.006	0.175	0.007	0.219	0.015	-0.044	-2.64 a
Insurance and real estate	0.067	0.004	0.071	0.005	0.057	0.008	0.014	1.41
Business services	0.253	0.007	0.232	0.008	0.310	0.017	-0.078	-4.18 a
Professional services	0.210	0.007	0.197	0.007	0.246	0.016	-0.049	-2.81 a

Table 3B:

a, b, and c indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively

Descriptive Statistics for Privately Held Firms, 1998								
All Firms, Male-Owned Firms, and Female-Owned Firms								
Variable	All Firms		Male-Owned Firms		Female-Owned Firms		Difference	t-stat
	Mean	Std. Err	Mean	Std. Err	Mean	Std. Err		
Observations	3,185		2,444		741			
<i>Firm Characteristics</i>								
Sales	528,900	19,592	597,056	24,007	314,650	27,198	282,406	7.78 a
Assets	249,056	10,815	277,474	13,183	159,722	16,019	117,752	5.68 a
Employment	7.092	0.277	7.478	0.302	5.877	0.654	1.602	2.225 b
ln (assets)	10.803	0.036	10.989	0.039	10.221	0.080	0.768	8.569 a
ROA	0.882	0.024	0.882	0.027	0.879	0.053	0.003	0.050
Liabilities to assets	0.759	0.020	0.753	0.022	0.778	0.046	-0.025	-0.486
Cash to assets	0.246	0.005	0.239	0.006	0.266	0.012	-0.027	-2.018 b
C Corporation	0.188	0.007	0.198	0.008	0.156	0.014	0.042	2.674 a
S Corporation	0.241	0.008	0.253	0.009	0.203	0.015	0.050	2.841 a
Partnership	0.067	0.004	0.068	0.005	0.065	0.009	0.003	0.264
Proprietorship	0.496	0.009	0.474	0.010	0.567	0.019	-0.093	-4.420 a
Firm age	13.193	0.191	13.841	0.218	11.154	0.382	2.688	6.107 a
Firm bankruptcy	0.023	0.003	0.023	0.003	0.023	0.006	0.000	-0.018
Firm delinquencies	0.137	0.006	0.138	0.007	0.132	0.013	0.005	0.377
D&B credit score	2.993	0.018	2.972	0.020	3.058	0.034	-0.086	-2.159 b
Business credit card	0.468	0.009	0.464	0.010	0.483	0.019	-0.020	-0.933
Personal credit card	0.337	0.008	0.351	0.010	0.292	0.017	0.060	3.060 a
Paid late on trade credit	0.266	0.008	0.274	0.009	0.241	0.016	0.033	1.798 c
<i>Market Characteristics</i>								
MSA	0.798	0.007	0.796	0.008	0.804	0.015	-0.008	-0.483
HHI high	0.039	0.003	0.041	0.004	0.033	0.007	0.008	1.052
HHI medium	0.063	0.004	0.064	0.005	0.061	0.009	0.003	0.307
<i>Owner Characteristics</i>								
Owner age	50.072	0.198	50.403	0.225	49.032	0.412	1.371	2.920 a
Owner experience	18.058	0.201	19.131	0.230	14.684	0.387	4.447	9.887 a
Graduate degree	0.184	0.007	0.197	0.008	0.142	0.013	0.055	3.604 a
College degree	0.300	0.008	0.306	0.009	0.283	0.017	0.023	1.186
Some college	0.279	0.008	0.268	0.009	0.314	0.017	-0.046	-2.358 b
Black	0.041	0.003	0.037	0.004	0.051	0.008	-0.013	-1.454
Asian	0.043	0.004	0.042	0.004	0.046	0.008	-0.004	-0.447
Hispanic	0.057	0.004	0.059	0.005	0.052	0.008	0.007	0.775
Owner bankruptcy	0.006	0.001	0.006	0.002	0.005	0.003	0.001	0.440
Owner delinquency	0.126	0.006	0.124	0.007	0.133	0.013	-0.008	-0.588
Owner judgment	0.038	0.003	0.039	0.004	0.033	0.007	0.006	0.794
Owner personal wealth	0.524	0.019	0.537	0.021	0.481	0.041	0.057	1.228

Table 3B (cont.):

a, b, and c indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively

Variable	All Firms		Male-Owned Firms		Female-Owned Firms		Difference	t-stat
	Mean	Std. Err	Mean	Std. Err	Mean	Std. Err		
<i>Relationship Characteristics</i>								
Primary FI is comm bank	0.823	0.007	0.838	0.007	0.777	0.016	0.061	3.514 a
Primary FI is sav inst	0.097	0.005	0.093	0.006	0.112	0.012	-0.019	-1.473
Primary FI is finance co	0.018	0.002	0.021	0.003	0.011	0.004	0.010	2.034 b
Primary FI is other	0.036	0.003	0.032	0.004	0.045	0.008	-0.013	-1.491
Months with primary FI	95.063	1.782	97.985	2.051	85.876	3.574	12.110	2.939 a
Distance to primary FI	32.480	3.573	27.647	3.385	47.672	10.537	-20.025	-1.809 c
Number of bank sources	1.215	0.014	1.249	0.016	1.108	0.027	0.141	4.466 a
Number of nonbank sources	0.819	0.019	0.829	0.022	0.787	0.041	0.042	0.898
<i>Industrial Classification</i>								
Construction	0.118	0.006	0.138	0.007	0.056	0.009	0.082	7.429 a
Primary manufacturing	0.037	0.003	0.035	0.004	0.043	0.008	-0.008	-0.907
Other manufacturing	0.046	0.004	0.052	0.004	0.028	0.006	0.024	3.157 a
Transportation	0.037	0.003	0.037	0.004	0.036	0.007	0.002	0.210
Wholesale trade	0.068	0.004	0.078	0.005	0.038	0.007	0.040	4.393 a
Retail trade	0.193	0.007	0.178	0.008	0.238	0.016	-0.060	-3.399 a
Insurance and real estate	0.064	0.004	0.067	0.005	0.056	0.009	0.011	1.094
Business services	0.249	0.008	0.231	0.008	0.305	0.017	-0.074	-3.840 a
Professional services	0.185	0.007	0.182	0.008	0.192	0.015	-0.010	-0.595

Table 3C:

a, b, and c indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively

**Descriptive Statistics for Privately Held Firms, 1993
All Firms, Male-Owned Firms, and Female-Owned Firms**

Variable	All Firms		Male-Owned Firms		Female-Owned Firms		Difference	t-stat
	Mean	Std. Err	Mean	Std. Err	Mean	Std. Err		
Observations	4,162		3,357		805			
<i>Firm Characteristics</i>								
Sales	566,103	17,300	620,969	20,131	358,094	29,687	262,874	7.33 a
Assets	277,707	10,989	308,403	13,069	161,333	15,358	147,070	7.29 a
Employment	6.780	0.219	7.208	0.249	5.159	0.445	2.049	4.02 a
ln (assets)	11.058	0.028	11.200	0.031	10.518	0.067	0.682	9.23 a
ROA	0.709	0.021	0.718	0.023	0.674	0.050	0.044	0.81
Liabilities to assets	0.599	0.009	0.597	0.009	0.609	0.021	-0.012	-0.52
Cash to assets	0.197	0.004	0.195	0.004	0.201	0.009	-0.006	-0.60
C Corporation	0.279	0.007	0.289	0.008	0.241	0.016	0.048	2.77 a
S Corporation	0.201	0.006	0.203	0.007	0.193	0.014	0.010	0.60
Partnership	0.080	0.004	0.079	0.005	0.084	0.010	-0.005	-0.42
Proprietorship	0.440	0.004	0.429	0.005	0.482	0.010	-0.053	-7.53 a
Firm age	14.114	0.183	14.668	0.209	12.015	0.360	2.653	6.38 a
Firm bankruptcy	n/a							
Firm delinquencies	0.191	0.006	0.184	0.007	0.221	0.015	-0.037	-2.26 b
D&B credit score	n/a							
Business credit card	0.286	0.007	0.288	0.008	0.278	0.016	0.010	0.54
Personal credit card	0.411	0.008	0.402	0.008	0.445	0.018	-0.042	-2.11 b
Paid late on trade credit	0.362	0.007	0.360	0.008	0.369	0.018	-0.009	-0.46
<i>Market Characteristics</i>								
MSA	0.786	0.006	0.786	0.007	0.787	0.015	-0.001	-0.03
HHI high	0.487	0.008	0.478	0.009	0.520	0.018	-0.042	-2.07 b
HHI medium	n/a							
<i>Owner Characteristics</i>								
Owner age	49.295	0.177	49.701	0.197	47.755	0.399	1.947	4.37 a
Owner experience	18.702	0.170	19.664	0.191	15.055	0.345	4.609	11.69 a
Graduate degree	0.202	0.006	0.214	0.007	0.154	0.013	0.061	4.07 a
College degree	0.260	0.007	0.255	0.007	0.280	0.016	-0.025	-1.40
Some college	0.255	0.007	0.243	0.007	0.302	0.017	-0.059	-3.21 a
Black	0.030	0.003	0.029	0.003	0.032	0.006	-0.003	-0.37
Asian	0.036	0.003	0.034	0.003	0.041	0.007	-0.007	-0.86
Hispanic	0.043	0.003	0.041	0.003	0.050	0.008	-0.009	-1.01
Owner bankruptcy	0.027	0.003	0.027	0.003	0.027	0.006	0.000	0.06
Owner delinquency	0.137	0.005	0.131	0.006	0.157	0.013	-0.026	-1.80 c
Owner judgment	0.051	0.003	0.051	0.004	0.051	0.008	0.000	0.01
Owner personal wealth	n/a							

Table 3C (cont.):

a, b, and c indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively

Descriptive Statistics for Privately Held Firms, 1993								
All Firms, Male-Owned Firms, and Female-Owned Firms								
Variable	All Firms		Male-Owned Firms		Female-Owned Firms		Difference	t-stat
	Mean	Std. Err	Mean	Std. Err	Mean	Std. Err		
<i>Relationship Characteristics</i>								
Primary FI is comm bank	0.821	0.006	0.826	0.006	0.803	0.015	0.023	1.44
Primary FI is sav inst	0.096	0.005	0.090	0.005	0.115	0.012	-0.025	-1.93 c
Primary FI is finance co	0.014	0.002	0.015	0.002	0.010	0.004	0.005	1.28
Primary FI is other	0.041	0.003	0.041	0.003	0.043	0.007	-0.002	-0.26
Months with primary FI	110.128	1.573	114.369	1.784	94.051	3.219	20.318	5.52 a
Distance to primary FI	13.862	1.500	12.688	1.481	18.314	4.692	-5.626	-1.14
Number of bank sources	1.244	0.012	1.259	0.013	1.189	0.029	0.070	2.20 b
Number of nonbank sources	0.822	0.017	0.831	0.019	0.790	0.040	0.041	0.93
<i>Industrial Classification</i>								
Construction	0.143	0.003	0.162	0.003	0.071	0.007	0.092	19.97 a
Primary manufacturing	0.039	0.003	0.038	0.003	0.039	0.007	-0.001	-0.12
Other manufacturing	0.041	0.003	0.044	0.004	0.028	0.006	0.017	2.38 b
Transportation	0.027	0.003	0.027	0.003	0.030	0.006	-0.003	-0.49
Wholesale trade	0.082	0.004	0.085	0.005	0.071	0.009	0.014	1.37
Retail trade	0.217	0.006	0.203	0.007	0.269	0.016	-0.066	-3.74 a
Insurance and real estate	0.068	0.004	0.073	0.004	0.049	0.008	0.025	2.74 a
Business services	0.215	0.006	0.197	0.007	0.282	0.016	-0.085	-4.75 a
Professional services	0.168	0.006	0.170	0.006	0.162	0.014	0.008	0.51

Table 3D:

a, b, and c indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively

**Descriptive Statistics for Privately Held Firms, 1987
All Firms, Male-Owned Firms, and Female-Owned Firms**

Variable	All Firms		Male-Owned Firms		Female-Owned Firms		Difference	t-stat
	Mean	Std. Err	Mean	Std. Err	Mean	Std. Err		
Observations	3,004		2,614		390			
<i>Firm Characteristics</i>								
Sales	663,645	22,366	702,739	24,926	423,959	39,892	278,781	5.93 a
Assets	293,539	12,932	294,917	12,495	285,091	54,055	9,826	0.18
Employment	8.826	0.320	9.234	0.357	6.327	0.572	2.907	4.32 a
ln (assets)	11.427	0.029	11.493	0.030	11.024	0.088	0.470	5.03 a
ROA	0.565	0.015	0.571	0.016	0.532	0.045	0.038	0.81
Liabilities to assets	0.476	0.009	0.476	0.009	0.474	0.027	0.002	0.07
Cash to assets	0.163	0.004	0.161	0.004	0.178	0.012	-0.017	-1.36
C Corporation	0.385	0.009	0.390	0.009	0.356	0.025	0.033	1.23
S Corporation	0.120	0.006	0.119	0.006	0.130	0.018	-0.011	-0.57
Partnership	0.082	0.005	0.088	0.006	0.049	0.011	0.039	3.07 a
Proprietorship	0.412	0.009	0.404	0.010	0.465	0.026	-0.061	-2.19 b
Firm age	13.164	0.211	13.624	0.227	10.349	0.557	3.275	5.44 a
Firm bankruptcy	n/a							
Firm delinquencies	n/a							
D&B credit score	n/a							
Business credit card	n/a							
Personal credit card	n/a							
Paid late on trade credit	0.419	0.009	0.417	0.010	0.428	0.026	-0.011	-0.39
<i>Market Characteristics</i>								
MSA	0.757	0.008	0.757	0.008	0.757	0.023	-0.001	-0.03
HHI high	0.168	0.007	0.164	0.007	0.192	0.021	-0.027	-1.25
HHI medium	0.324	0.009	0.326	0.009	0.313	0.024	0.013	0.51
<i>Owner Characteristics</i>								
Owner age	n/a							
Owner experience	n/a							
Graduate degree	n/a							
College degree	n/a							
Some college	n/a							
Black	0.023	0.003	0.022	0.003	0.029	0.009	-0.007	-0.75
Asian	0.030	0.003	0.027	0.003	0.046	0.011	-0.019	-1.64
Hispanic	0.020	0.003	0.018	0.003	0.029	0.009	-0.011	-1.19
Owner bankruptcy	n/a							
Owner delinquency	n/a							
Owner judgment	n/a							
Owner personal wealth	n/a							

Table 3D (cont.):

a, b, and c indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively

Descriptive Statistics for Privately Held Firms, 1987								
All Firms, Male-Owned Firms, and Female-Owned Firms								
Variable	All Firms		Male-Owned Firms		Female-Owned Firms		Difference	t-stat
	Mean	Std. Err	Mean	Std. Err	Mean	Std. Err		
<i>Relationship Characteristics</i>								
Primary FI is comm bank	0.902	0.005	0.907	0.006	0.869	0.018	0.038	2.01 b
Primary FI is sav inst	0.063	0.004	0.058	0.005	0.093	0.015	-0.034	-2.15 b
Primary FI is finance co	0.007	0.001	0.007	0.002	0.008	0.005	-0.001	-0.27
Primary FI is other	0.016	0.002	0.016	0.002	0.014	0.006	0.002	0.25
Months with primary FI	142.0	2.521	144.9	2.711	124.3	6.773	20.55	2.82 a
Distance to primary FI	8.511	1.704	9.214	1.951	4.048	0.582	5.166	2.54 b
Number of bank sources	1.296	0.013	1.304	0.014	1.245	0.036	0.059	1.55
Number of nonbank sources	0.713	0.018	0.704	0.019	0.768	0.053	-0.065	-1.14
<i>Industrial Classification</i>								
Construction	0.131	0.006	0.143	0.007	0.056	0.012	0.087	6.24 a
Primary manufacturing	0.041	0.004	0.041	0.004	0.046	0.011	-0.006	-0.50
Other manufacturing	0.048	0.004	0.049	0.004	0.038	0.010	0.011	0.98
Transportation	0.029	0.003	0.029	0.003	0.024	0.008	0.005	0.56
Wholesale trade	0.095	0.005	0.099	0.006	0.067	0.013	0.032	2.22 b
Retail trade	0.267	0.008	0.249	0.008	0.378	0.026	-0.130	-4.82 a
Insurance and real estate	0.069	0.005	0.068	0.005	0.080	0.014	-0.012	-0.78
Business services	0.186	0.007	0.175	0.007	0.256	0.023	-0.081	-3.37 a
Professional services	0.134	0.006	0.147	0.007	0.053	0.012	0.094	6.87 a

**Table 4:
Availability of Credit to Female-Owned and Male-Owned Firms**

No Need is equal to one if the firm reported no need for credit during the previous three years and zero otherwise. *Discouraged* is equal to one if the firm reported that it needed credit but did not apply because it feared rejection and is equal to zero if the firm reported that it needed credit and did apply. *Denied* is equal to one if the firm applied for credit and was turned down and is equal to zero if it applied and was successful. Results are reported separately for female-owned and male-owned firms, along with a t-test for significant differences in the two groups. a, b, and c indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

	<u>Female-Owned</u>	<u>Male-Owned</u>	<u>Difference</u>
No Need			
	1993		
Obs.	805	3,357	
Mean	0.540	0.509	0.031 b
Std. Error	0.018	0.009	0.01
	1998		
Obs.	741	2,444	
Mean	0.613	0.608	0.005
Std. Error	0.018	0.010	0.01
	2003		
Obs.	847	2,776	
Mean	0.577	0.552	0.025 c
Std. Error	0.017	0.009	0.01
Discouraged			
	1993		
Obs.	425	1,859	
Mean	0.356	0.294	0.062
Std. Error	0.023	0.011	0.02 a
	1998		
Obs.	299	1,014	
Mean	0.479	0.376	0.104
Std. Error	0.029	0.015	0.02 a
	2003		
Obs.	384	1,389	
Mean	0.368	0.195	0.174
Std. Error	0.025	0.011	0.02 a
Denied			
	1993		
Obs.	270	1,382	
Mean	0.250	0.181	0.069
Std. Error	0.026	0.010	0.017 a
	1998		
Obs.	164	667	
Mean	0.259	0.235	0.024
Std. Error	0.034	0.016	0.024
	2003		
Obs.	274	1,389	
Mean	0.148	0.126	0.023
Std. Error	0.022	0.011	0.014

Table 5A:
Multivariate Differences in Male-Owned and Female-Owned Firms
a, b, and c indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively
Probit Regression (Female-Owned=1, Male-Owned=0)
2003 SSBF

Variable	Parameter Estimate	Marginal Effect	Standard Error	t-stat
Intercept	-0.790		0.408	-1.94 c
<i>Firm Characteristics</i>				
Log of sales	-0.130	-0.020	0.020	-6.53 a
ROA	0.083	0.013	0.051	1.63
Liabilities to assets	-0.058	-0.009	0.023	-2.48 b
Cash to assets	0.261	0.041	0.137	1.91 c
C Corporation	0.162	0.025	0.145	1.11
S Corporation	0.056	0.009	0.106	0.53
Partnership	0.147	0.023	0.152	0.96
Firm age	0.008	0.001	0.006	1.31
Firm bankruptcy	0.892	0.140	0.424	2.10 b
Firm delinquencies	0.330	0.052	0.139	2.37 b
D&B credit score	0.014	0.002	0.032	0.43
Business credit card	0.139	0.022	0.085	1.65
Personal credit card	0.056	0.009	0.089	0.63
Paid late on trade credit	0.024	0.004	0.112	0.22
<i>Market Characteristics</i>				
MSA	-0.129	-0.020	0.110	-1.17
HHI high	0.420	0.066	0.198	2.12 b
HHI medium	0.313	0.049	0.195	1.61
<i>Owner Characteristics</i>				
Owner age	0.023	0.004	0.005	4.86 a
Owner experience	-0.065	-0.010	0.006	-10.74 a
Graduate degree	-0.720	-0.113	0.147	-4.91 a
College degree	-0.353	-0.055	0.121	-2.92 a
Some college	0.030	0.005	0.115	0.26
Black	-0.012	-0.002	0.201	-0.06
Asian	-0.192	-0.030	0.210	-0.91
Hispanic	0.031	0.005	0.194	0.16
Owner bankruptcy	-0.003	0.000	0.268	-0.01
Owner delinquency	0.077	0.012	0.140	0.55
Owner judgment	-0.027	-0.004	0.275	-0.10
Owner personal wealth	-0.050	-0.008	0.055	-0.91

Table 5A (cont.):
Multivariate Differences in Male-Owned and Female-Owned Firms
a, b, and c indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively
Probit Regression (Female-Owned=1, Male-Owned=0)
2003 SSBF

Variable	Parameter Estimate	Marginal Effect	Standard Error	t-stat
<i>Relationship Characteristics</i>				
Primary FI is sav inst	-0.166	-0.026	0.145	-1.15
Primary FI is finance co	-1.072	-0.168	0.568	-1.89 c
Primary FI is other	-0.275	-0.043	0.252	-1.09
Months with primary FI	0.001	0.000	0.000	2.72 a
Distance to primary FI	0.000	0.000	0.000	-1.27
Number of bank sources	-0.145	-0.023	0.065	-2.23 b
Number of nonbank sources	0.014	0.002	0.041	0.35
<i>Industrial Classification</i>				
Primary manufacturing	0.640	0.101	0.288	2.22 b
Other manufacturing	-0.132	-0.021	0.306	-0.43
Transportation	0.187	0.029	0.286	0.66
Wholesale trade	0.597	0.094	0.244	2.45 b
Retail trade	1.154	0.181	0.175	6.61 a
Insurance and real estate	0.862	0.135	0.226	3.82 a
Business services	1.029	0.162	0.167	6.16 a
Professional services	1.328	0.209	0.183	7.27 a

Table 5B:
Multivariate Differences in Male-Owned and Female-Owned Firms
a, b, and c indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively

Probit Regression (Female-Owned=1, Male-Owned=0)				
1998 SSBF				
Variable	Parameter Estimate	Marginal Effect	Standard Error	t-stat
Intercept	-0.582		0.421	-1.38
<i>Firm Characteristics</i>				
Log of sales	-0.097	-0.016	0.021	-4.54 a
ROA	-0.011	-0.002	0.035	-0.32
Liabilities to assets	0.046	0.007	0.040	1.15
Cash to assets	0.157	0.025	0.155	1.02
C Corporation	-0.017	-0.003	0.134	-0.13
S Corporation	-0.102	-0.016	0.121	-0.84
Partnership	-0.073	-0.012	0.185	-0.40
Firm age	0.003	0.001	0.006	0.50
Firm bankruptcy	-0.151	-0.024	0.311	-0.49
Firm delinquencies	0.104	0.017	0.158	0.66
D&B credit score	-0.002	0.000	0.048	-0.03
Business credit card	0.099	0.016	0.091	1.08
Personal credit card	-0.024	-0.004	0.103	-0.23
Paid late on trade credit	-0.006	-0.001	0.115	-0.05
<i>Market Characteristics</i>				
MSA	0.018	0.003	0.124	0.14
HHI high	-0.237	-0.038	0.251	-0.94
HHI medium	0.011	0.002	0.191	0.06
<i>Owner Characteristics</i>				
Owner age	0.014	0.002	0.005	2.83 a
Owner experience	-0.050	-0.008	0.006	-7.93 a
Graduate degree	-0.807	-0.130	0.161	-5.01 a
College degree	-0.317	-0.051	0.127	-2.50 b
Some college	-0.001	0.000	0.120	-0.01
Black	-0.020	-0.003	0.211	-0.10
Asian	0.028	0.005	0.212	0.13
Hispanic	-0.327	-0.053	0.194	-1.69 c
Owner bankruptcy	-0.233	-0.038	0.635	-0.37
Owner delinquency	0.018	0.003	0.150	0.12
Owner judgment	-0.195	-0.032	0.246	-0.79
Owner personal wealth	0.099	0.016	0.042	2.34 b

Table 5B (cont.):
Multivariate Differences in Male-Owned and Female-Owned Firms
a, b, and c indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively
Probit Regression (Female-Owned=1, Male-Owned=0)
1998 SSBF

Variable	Parameter Estimate	Marginal Effect	Standard Error	t-stat
<i>Relationship Characteristics</i>				
Primary FI is sav inst	-0.169	-0.027	0.166	-1.02
Primary FI is finance co	-1.062	-0.172	0.424	-2.50 b
Primary FI is other	-0.073	-0.012	0.249	-0.29
Months with primary FI	0.000	0.000	0.001	0.66
Distance to primary FI	0.001	0.000	0.000	2.56 b
Number of bank sources	-0.147	-0.024	0.071	-2.08 b
Number of nonbank sources	0.031	0.005	0.046	0.68
<i>Industrial Classification</i>				
Primary manufacturing	1.058	0.171	0.268	3.94 a
Other manufacturing	0.222	0.036	0.290	0.77
Transportation	0.812	0.131	0.283	2.86 a
Wholesale trade	0.268	0.043	0.261	1.03
Retail trade	1.175	0.190	0.186	6.33 a
Insurance and real estate	0.781	0.126	0.245	3.19 a
Business services	1.047	0.169	0.179	5.86 a
Professional services	1.173	0.190	0.200	5.87 a

Table 5C:
Multivariate Differences in Male-Owned and Female-Owned Firms
a, b, and c indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively
Probit Regression (Female-Owned=1, Male-Owned=0)
1993 SSBF

Variable	Parameter Estimate	Marginal Effect	Standard Error	t-stat
Intercept	-0.632		0.395	-1.60
<i>Firm Characteristics</i>				
Log of sales	-0.171	-0.025	0.026	-6.51 a
ROA	-0.025	-0.004	0.031	-0.80
Liabilities to assets	-0.010	-0.001	0.073	-0.14
Cash to assets	0.032	0.005	0.179	0.18
C Corporation	0.116	0.017	0.111	1.04
S Corporation	0.022	0.003	0.117	0.19
Partnership	0.044	0.006	0.154	0.29
Firm age	0.008	0.001	0.005	1.64
Firm bankruptcy	n/a			
Firm delinquencies	0.225	0.032	0.118	1.91 c
D&B credit score	n/a			
Business credit card	0.092	0.013	0.095	0.97
Personal credit card	0.106	0.015	0.084	1.27
Paid late on trade credit	0.141	0.020	0.094	1.51
<i>Market Characteristics</i>				
MSA	0.132	0.019	0.109	1.22
HHI high	0.232	0.033	0.087	2.69 a
HHI medium	n/a			
<i>Owner Characteristics</i>				
Owner age	0.019	0.003	0.005	3.86 a
Owner experience	-0.054	-0.008	0.006	-9.06 a
Graduate degree	-0.424	-0.061	0.141	-3.00 a
College degree	0.086	0.012	0.114	0.75
Some college	0.245	0.035	0.109	2.25 b
Black	-0.191	-0.027	0.234	-0.82
Asian	0.015	0.002	0.208	0.07
Hispanic	0.012	0.002	0.189	0.06
Owner bankruptcy	-0.083	-0.012	0.248	-0.33
Owner delinquency	-0.026	-0.004	0.131	-0.19
Owner judgment	-0.019	-0.003	0.190	-0.10
Owner personal wealth	n/a			

Table 5C (cont.):
Multivariate Differences in Male-Owned and Female-Owned Firms
a, b, and c indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively
Probit Regression (Female-Owned=1, Male-Owned=0)
1993 SSBF

Variable	Parameter Estimate	Marginal Effect	Standard Error	t-stat
<i>Relationship Characteristics</i>				
Primary FI is sav inst	0.209	0.030	0.150	1.39
Primary FI is finance co	-0.328	-0.047	0.404	-0.81
Primary FI is other	0.004	0.001	0.209	0.02
Months with primary FI	-0.001	0.000	0.001	-0.86
Distance to primary FI	0.000	0.000	0.000	1.25
Number of bank sources	0.005	0.001	0.059	0.09
Number of nonbank sources	-0.041	-0.006	0.043	-0.94
<i>Industrial Classification</i>				
Primary manufacturing	0.928	0.133	0.245	3.78 a
Other manufacturing	0.425	0.061	0.267	1.59
Transportation	1.108	0.159	0.270	4.10 a
Wholesale trade	0.744	0.107	0.204	3.65 a
Retail trade	1.156	0.166	0.162	7.15 a
Insurance and real estate	0.573	0.082	0.228	2.51 b
Business services	1.099	0.158	0.160	6.86 a
Professional services	1.032	0.148	0.184	5.60 a

Table 5D:
Multivariate Differences in Male-Owned and Female-Owned Firms
a, b, and c indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively
Probit Regression (Female-Owned=1, Male-Owned=0)
1987 SSBF

Variable	Parameter Estimate	Marginal Effect	Standard Error	t-stat
Intercept	0.403	6.000	0.605	0.67
<i>Firm Characteristics</i>				
Log of sales	-0.273	-0.033	0.047	-5.86 a
ROA	-0.046	-0.006	0.073	-0.63
Liabilities to assets	-0.117	-0.014	0.130	-0.90
Cash to assets	0.457	0.056	0.280	1.63
C Corporation	0.191	0.023	0.145	1.32
S Corporation	0.216	0.026	0.191	1.14
Partnership	-0.657	-0.080	0.254	-2.59 a
Firm age	-0.030	-0.004	0.007	-4.08 a
Firm bankruptcy				
Firm delinquencies				
D&B credit score				
Business credit card				
Personal credit card				
Paid late on trade credit	0.127	0.014	0.119	1.06
<i>Market Characteristics</i>				
MSA	0.115	0.026	0.166	0.69
HHI high	0.213	0.000	0.193	1.10
HHI medium	0.003	0.034	0.134	0.02
<i>Owner Characteristics</i>				
Owner age				
Owner experience				
Graduate degree				
College degree				
Some college				
Black	0.275	0.051	0.334	0.82
Asian	0.418	0.052	0.290	1.44
Hispanic	0.430	0.019	0.346	1.24
Owner bankruptcy				
Owner delinquency				
Owner judgment				
Owner personal wealth				

Table 5D (cont.):
Multivariate Differences in Male-Owned and Female-Owned Firms
a, b, and c indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively
Probit Regression (Female-Owned=1, Male-Owned=0)
1987 SSBF

Variable	Parameter Estimate	Marginal Effect	Standard Error	t-stat
<i>Relationship Characteristics</i>				
Primary FI is sav inst	0.153	0.060	0.229	0.66
Primary FI is finance co	0.491	0.014	0.641	0.77
Primary FI is other	0.118	0.000	0.601	0.20
Months with primary FI	0.001	0.000	0.001	0.95
Distance to primary FI	-0.002	0.007	0.002	-0.87
Number of bank sources	0.058	0.017	0.090	0.64
Number of nonbank sources	0.135	0.154	0.060	2.25 b
<i>Industrial Classification</i>				
Primary manufacturing	1.263	0.105	0.341	3.71 a
Other manufacturing	0.857	0.097	0.352	2.43 b
Transportation	0.794	0.098	0.406	1.96 c
Wholesale trade	0.800	0.168	0.305	2.62 a
Retail trade	1.376	0.134	0.243	5.66 a
Insurance and real estate	1.097	0.140	0.308	3.56 a
Business services	1.145	-0.012	0.251	4.56 a
Professional services	-0.098		0.328	-0.30

**Table 6:
Multivariate Differences in the Availability of Credit to Female-Owned and Male-Owned Firms**

Results from estimating a bivariate probit selection model where the dependent variable is one of three measures of the availability of credit to small firms—*NoNeed*, *Discouraged*, or *Denied*—and the explanatory variables are as defined in Table 1. For brevity, only the results for the explanatory variable *Female-owned* are presented. *NoNeed* is equal to one if the firm reported no need for credit during the previous three years and is zero otherwise. *Discouraged* is equal to one if the firm reported that it needed credit but did not apply because it feared rejection and is equal to zero if the firm reported that it needed credit and did apply. *Denied* is equal to one if the firm both applied for credit and denied credit and is equal to zero if the firm both applied for credit and was successful in obtaining credit. *Female-owned* is an indicator variable that is equal to one if a firm is controlled by a female owner and is equal to zero otherwise. Results are presented separately for the 1993, 1998, and 2003 SSBFs. (These outcome variables are not available from the 1987 SSBF).
a, b, and c indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

		Female-Owned			
		Parameter	Marginal	Standard	
		Estimate	Effect	Error	t-statistic
NoNeed					
	1993	0.155	0.029	0.090	1.71 c
	1998	0.038	0.007	0.102	0.37
	2003	-0.177	-0.033	0.095	-1.86 c
Discouraged					
	1993	0.042	0.006	0.135	0.32
	1998	0.191	0.033	0.157	1.22
	2003	0.211	0.018	0.165	1.27
Denied					
	1993	0.143	0.016	0.187	0.76
	1998	0.024	0.003	0.284	0.09
	2003	-0.570	-0.034	0.267	-2.13 b

Appendix Table 1:
Summary of Univariate Differences in Male-Owned and Female-Owned Firms
a, b, and c indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively

Variable	2003		1998		1993		1987	
	Difference	t-stat	Difference	t-stat	Difference	t-stat	Difference	t-stat
Observations								
<i>Firm Characteristics</i>								
Sales	380,895	10.14 a	282,406	7.78 a	262,874	7.33 a	278,781	5.93 a
Assets	166,333	7.49 a	117,752	5.68 a	147,070	7.29 a	9,826	0.18
Employment	2.119	4.71 a	1.602	2.225 b	2.049	4.02 a	2.907	4.32 a
ln (assets)	0.935	11.05 a	0.768	8.569 a	0.682	9.23 a	0.470	5.03 a
ROA	-0.023	-0.63	0.003	0.050	0.044	0.81	0.038	0.81
Liabilities to assets	0.160	2.20 b	-0.025	-0.486	-0.012	-0.52	0.002	0.07
Cash to assets	-0.045	-3.35 a	-0.027	-2.018 b	-0.006	-0.60	-0.017	-1.36
C Corporation	0.047	3.64 a	0.042	2.674 a	0.048	2.77 a	0.033	1.23
S Corporation	0.064	3.50 a	0.050	2.841 a	0.010	0.60	-0.011	-0.57
Partnership	-0.010	-0.88	0.003	0.264	-0.005	-0.42	0.039	3.07 a
Proprietorship	-0.101	-13.62 a	-0.093	-4.420 a	-0.053	-7.53 a	-0.061	-2.19 b
Firm age	2.423	5.80 a	2.688	6.107 a	2.653	6.38 a	3.275	5.44 a
Firm bankruptcy	-0.008	-1.68 c	0.000	-0.018				
Firm delinquencies	-0.009	-0.57	0.005	0.377	-0.037	-2.26 b		
D&B credit score	0.189	3.33 a	-0.086	-2.159 b				
Business credit card	-0.024	-1.18	-0.020	-0.933	0.010	0.54		
Personal credit card	0.048	2.36 b	0.060	3.060 a	-0.042	-2.11 b		
Paid late on trade credit	0.038	2.23 b	0.033	1.798 c	-0.009	-0.46	-0.011	-0.39
<i>Market Characteristics</i>								
MSA	0.018	1.06	-0.008	-0.483	-0.001	-0.03	-0.001	-0.03
HHI high	-0.041	-2.01 b	0.008	1.052	-0.042	-2.07 b	-0.027	-1.25
HHI medium	0.019	0.91	0.003	0.307			0.013	0.51
<i>Owner Characteristics</i>								
Owner age	1.106	2.39 b	1.371	2.920 a	1.947	4.37 a		
Owner experience	5.227	12.10 a	4.447	9.887 a	4.609	11.69 a		
Graduate degree	0.041	2.57 b	0.055	3.604 a	0.061	4.07 a		
College degree	0.030	1.66 c	0.023	1.186	-0.025	-1.40		
Some college	-0.066	-3.54 a	-0.046	-2.358 b	-0.059	-3.21 a		
Black	-0.017	-1.95 c	-0.013	-1.454	-0.003	-0.37	-0.007	-0.75
Asian	0.010	1.31	-0.004	-0.447	-0.007	-0.86	-0.019	-1.64
Hispanic	-0.006	-0.73	0.007	0.775	-0.009	-1.01	-0.011	-1.19
Owner bankruptcy	-0.015	-2.10 b	0.001	0.440	0.000	0.06		
Owner delinquency	-0.033	-2.34 b	-0.008	-0.588	-0.026	-1.80 c		
Owner judgment	-0.001	-0.19	0.006	0.794	0.000	0.01		
Owner personal wealth	0.223	6.41 a	0.057	1.228				

Appendix Table 1 (cont.):
Summary of Univariate Differences in Male-Owned and Female-Owned Firms
a, b, and c indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively

Variable	2003		1998		1993		1987	
	Difference	t-stat	Difference	t-stat	Difference	t-stat	Difference	t-stat
<i>Relationship Characteristics</i>								
Primary FI is comm bank	0.039	2.30 b	0.061	3.514 a	0.023	1.44	0.038	2.01 b
Primary FI is sav inst	-0.024	-1.71 c	-0.019	-1.473	-0.025	-1.93 c	-0.034	-2.15 b
Primary FI is finance co	0.008	2.43 b	0.010	2.034 b	0.005	1.28	-0.001	-0.27
Primary FI is other	0.011	1.59	-0.013	-1.491	-0.002	-0.26	0.002	0.25
Months with primary FI	5.543	1.27	12.110	2.939 a	20.318	5.52 a	20.55	2.82 a
Distance to primary FI	12.735	2.08 b	-20.025	-1.809 c	-5.626	-1.14	5.166	2.54 b
Number of bank sources	0.176	5.73 a	0.141	4.466 a	0.070	2.20 b	0.059	1.55
Number of nonbank sources	0.164	3.42 a	0.042	0.898	0.041	0.93	-0.065	-1.14
<i>Industrial Classification</i>								
Construction	0.076	7.05 a	0.082	7.429 a	0.092	19.97 a	0.087	6.24 a
Primary manufacturing	0.007	1.11	-0.008	-0.907	-0.001	-0.12	-0.006	-0.50
Other manufacturing	0.029	4.64 a	0.024	3.157 a	0.017	2.38 b	0.011	0.98
Transportation	0.023	3.44 a	0.002	0.210	-0.003	-0.49	0.005	0.56
Wholesale trade	0.021	2.50 b	0.040	4.393 a	0.014	1.37	0.032	2.22 b
Retail trade	-0.044	-2.64 a	-0.060	-3.399 a	-0.066	-3.74 a	-0.130	-4.82 a
Insurance and real estate	0.014	1.41	0.011	1.094	0.025	2.74 a	-0.012	-0.78
Business services	-0.078	-4.18 a	-0.074	-3.840 a	-0.085	-4.75 a	-0.081	-3.37 a
Professional services	-0.049	-2.81 a	-0.010	-0.595	0.008	0.51	0.094	6.87 a

Appendix Table 2:
Summary of Multivariate Differences in Male-Owned and Female-Owned Firms
a, b, and c indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively

Logistic Regression (Female-Owned=1, Male-Owned=0)									
Variable	2003 SSBF		1998 SSBF		1993 SSBF		1987 SSBF		
	Marginal Effect	t-stat	Marginal Effect	t-stat	Marginal Effect	t-stat	Marginal Effect	t-stat	
Intercept		-1.94 c		-1.38		-1.60		0.67	
<i>Firm Characteristics</i>									
Log of sales	-0.020	-6.53 a	-0.016	-4.54 a	-0.025	-6.51 a	-0.033	-5.86 a	
ROA	0.013	1.63	-0.002	-0.32	-0.004	-0.80	-0.006	-0.63	
Liabilities to assets	-0.009	-2.48 b	0.007	1.15	-0.001	-0.14	-0.014	-0.90	
Cash to assets	0.041	1.91 c	0.025	1.02	0.005	0.18	0.056	1.63	
C Corporation	0.025	1.11	-0.003	-0.13	0.017	1.04	0.023	1.32	
S Corporation	0.009	0.53	-0.016	-0.84	0.003	0.19	0.026	1.14	
Partnership	0.023	0.96	-0.012	-0.40	0.006	0.29	-0.080	-2.59 a	
Firm age	0.001	1.31	0.001	0.50	0.001	1.64	-0.004	-4.08 a	
Firm bankruptcy	0.140	2.10 b	-0.024	-0.49					
Firm delinquencies	0.052	2.37 b	0.017	0.66	0.032	1.91 c			
D&B credit score	0.002	0.43	0.000	-0.03					
Business credit card	0.022	1.65	0.016	1.08	0.013	0.97			
Personal credit card	0.009	0.63	-0.004	-0.23	0.015	1.27			
Paid late on trade credit	0.004	0.22	-0.001	-0.05	0.020	1.51	0.014	1.06	
<i>Market Characteristics</i>									
MSA	-0.020	-1.17	0.003	0.14	0.019	1.22	0.026	0.69	
HHI high	0.066	2.12 b	-0.038	-0.94	0.033	2.69 a	0.000	1.10	
HHI medium	0.049	1.61	0.002	0.06			0.034	0.02	
<i>Owner Characteristics</i>									
Owner age	0.004	4.86 a	0.002	2.83 a	0.003	3.86 a			
Owner experience	-0.010	-10.74 a	-0.008	-7.93 a	-0.008	-9.06 a			
Graduate degree	-0.113	-4.91 a	-0.130	-5.01 a	-0.061	-3.00 a			
College degree	-0.055	-2.92 a	-0.051	-2.50 b	0.012	0.75			
Some college	0.005	0.26	0.000	-0.01	0.035	2.25 b			
Black	-0.002	-0.06	-0.003	-0.10	-0.027	-0.82	0.051	0.82	
Asian	-0.030	-0.91	0.005	0.13	0.002	0.07	0.052	1.44	
Hispanic	0.005	0.16	-0.053	-1.69 c	0.002	0.06	0.019	1.24	
Owner bankruptcy	0.000	-0.01	-0.038	-0.37	-0.012	-0.33			
Owner delinquency	0.012	0.55	0.003	0.12	-0.004	-0.19			
Owner judgment	-0.004	-0.10	-0.032	-0.79	-0.003	-0.10			
Owner personal wealth	-0.008	-0.91	0.016	2.34 b					

Appendix Table 2 (cont.):
Summary of Multivariate Differences in Male-Owned and Female-Owned Firms
a, b, and c indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively

Logistic Regression (Female-Owned=1, Male-Owned=0)									
Variable	2003 SSBF		1998 SSBF		1993 SSBF		1987 SSBF		
	Marginal Effect	t-stat	Marginal Effect	t-stat	Marginal Effect	t-stat	Marginal Effect	t-stat	
<i>Relationship Characteristics</i>									
Primary FI is sav inst	-0.026	-1.15	-0.027	-1.02	0.030	1.39	0.060	0.66	
Primary FI is finance co	-0.168	-1.89 c	-0.172	-2.50 b	-0.047	-0.81	0.014	0.77	
Primary FI is other	-0.043	-1.09	-0.012	-0.29	0.001	0.02	0.000	0.20	
Months with primary FI	0.000	2.72 a	0.000	0.66	0.000	-0.86	0.000	0.95	
Distance to primary FI	0.000	-1.27	0.000	2.56 b	0.000	1.25	0.007	-0.87	
Number of bank sources	-0.023	-2.23 b	-0.024	-2.08 b	0.001	0.09	0.017	0.64	
Number of nonbank sources	0.002	0.35	0.005	0.68	-0.006	-0.94	0.154	2.25 b	
<i>Industrial Classification</i>									
Primary manufacturing	0.101	2.22 b	0.171	3.94 a	0.133	3.78 a	0.105	3.71 a	
Other manufacturing	-0.021	-0.43	0.036	0.77	0.061	1.59	0.097	2.43 b	
Transportation	0.029	0.66	0.131	2.86 a	0.159	4.10 a	0.098	1.96 c	
Wholesale trade	0.094	2.45 b	0.043	1.03	0.107	3.65 a	0.168	2.62 a	
Retail trade	0.181	6.61 a	0.190	6.33 a	0.166	7.15 a	0.134	5.66 a	
Insurance and real estate	0.135	3.82 a	0.126	3.19 a	0.082	2.51 b	0.140	3.56 a	
Business services	0.162	6.16 a	0.169	5.86 a	0.158	6.86 a	-0.012	4.56 a	
Professional services	0.209	7.27 a	0.190	5.87 a	0.148	5.60 a		-0.30	