PRELIMINARY AND NOT FOR QUOTATION

Who Needs Credit and Who Gets Credit? Evidence from the Surveys of Small Business Finances

Rebel A. Cole
Department of Finance and Real Estate
DePaul University
Chicago, IL 60604 USA
Email: rcole@depaul.edu

Abstract:

The availability of credit is one of the most fundamental issues facing a small business and therefore, has received much attention in the academic literature. However, many small firms indicate that they do not need credit ("non-borrowers") while others indicate that they need credit but did not apply for credit—so-called "discouraged borrowers." These firms have received much less attention and, those studies that have analyzed them usually combine them into potentially inappropriate groups. For example, "discouraged borrowers" are combined with "denied borrowers"—firms that actually applied for credit and were turned down. Yet many "discouraged borrowers" more closely resemble "successful borrowers"—firms that applied for and received credit—than "denied borrowers." In this study, we analyze these four groups of firms to shed new light upon how they differ. We utilize data from the Federal Reserve Board's 2003 Survey of Small Business Finances (SSBFs) to estimate a sequential set of logistic regression models where firms first decide if they need credit (non-borrowers versus all other firms), then decide if they will apply for credit (discouraged borrowers versus denied borrowers and successful borrowers), and finally try to obtain credit from a lender (denied borrowers versus successful borrowers). As the first rigorous evidence on the differences in these four groups of firms, this study will provide policymakers with new insights on how to tailor macroeconomic policy and regulations to help small businesses obtain credit when they need credit.

Key words: availability of credit, capital structure, entrepreneurship, small business, SSBF

JEL classification: G32

DRAFT: May 1, 2008

Who Needs Credit and Who Gets Credit?
Evidence from the Surveys of Small Business Finances

1. Introduction

Among small businesses, who needs credit and who gets credit? The answer to this question is of great importance not only to the small firms themselves, but also to prospective lenders to these firms and to policymakers interested in the financial health of these firms. The availability of credit is one of the most fundamental issues facing a small business and therefore, has received much attention in the academic literature (see, e.g., Petersen and Rajan 1994; Berger and Udell 1995; Cole 1998; Cole, Goldberg and White 2004; Berger *et al*. 2005). However, many small firms indicate that they do not need credit ("non-borrowers") while others indicate that they need credit but did not apply for credit—so-called "discouraged borrowers." These firms have received much less attention and the studies that have analyzed them usually combine them into potentially inappropriate groups. For example, "discouraged borrowers" are combined with "denied borrowers"—firms that actually applied for credit and were turned down. Yet many "discouraged borrowers" more closely resemble "successful borrowers"—firms that applied for and received credit—than "denied borrowers."

In this study, we analyze these four groups of firms to shed new light upon how they differ. We utilize data from the Federal Reserve Board's 2003 Surveys of Small Business Finances (SSBFs) to estimate a sequential set of logistic regression models where a firm first decides if it need credit (non-borrowers versus all other firms), then decide if it will apply for credit (discouraged borrowers versus denied borrowers and successful borrowers), and finally will try to obtain credit from a lender (denied borrowers versus successful borrowers). As the first rigorous evidence on the differences in these four groups of firms, results of this study will

provide policymakers with new insights on how to tailor macroeconomic policy and regulations to help small businesses obtain credit when they need credit.

Why is this issue of importance? According to the U.S. Department of Treasury and Internal Revenue Service, there are more than 35 million U.S. taxpayers who are "self-employed."[1] The small firms operated by these self-employed taxpayers are vital to the U.S. economy. According to the U.S. Small Business Administration, they account for half of all U.S. private-sector employment and produced 60% to 80% of net job growth in the U.S. each year during the past decade.[2] Therefore, a better understanding of who needs credit and who gets credit can help policymakers to take actions that will lead to more jobs and faster economic growth.

We contribute to the literature in at least three important ways. First, we provide the first rigorous analysis of the differences in our four types of firms: non-borrowers, discouraged borrowers, denied borrowers and successful borrowers. Our findings have important implications for interpreting previous research that has combined these groups in ways that our results suggest are inappropriate, such as pooling discouraged borrowers with denied borrowers in analyzing availability of credit.

Second, we provide an analysis of credit availability that properly accounts for the inherent self-selection mechanisms involved in the credit application process: who needs credit, who applies for credit conditional upon needing credit, and who receives credit, conditional upon applying for credit. Previous researchers have pooled firms that do not need credit with those

[1] The IRS defines a "self-employed" taxpayer as one filing a Schedule C, Schedule C-EZ, E, or F, or Form 2106. See Federal Register document FR Doc 05-18505.
[2] See, "Frequently Asked Questions," Office of Advocacy, U.S. Small Business Administration (2006). For research purposes, the SBA and Federal Reserve Board define small businesses as independent firms with fewer than 500 employees.

needing credit and have pooled discouraged borrowers with denied borrowers. Hence, our results shed new light upon the credit allocation process.

Third, we provide the first evidence from the 2003 SSBF on the availability of credit to small firms. This survey includes methodological improvements on the previous SSBFs (1987, 1993 and 1998) that enable us to better address the issue of availability of credit to small firms. One of the most important is the identification of applications to renew existing lines of credit, which enables us for the first time to differentiate the availability of new credit from renewals of existing credit.

In section 2, we briefly review the literature on the availability of credit, followed by a description of our date in section 3 and our methodology in section 4. Our results appear in section 5 and we provide a summary and conclusions in section 6.

2. Literature Review

The issue of availability of credit to small businesses has been studied by financial economists for at least sixty years, dating back at least to Wendt (1946), who examines availability of loans to small businesses in California. Since then, scores of articles have addressed this issue. We will limit our review of the literature to the most prominent studies using SSBF data that have appeared in the financial economics literature during the past two decades.

A large body of research has developed around the seminal work of Petersen and Rajan (1994) who were the first to analyze credit availability using data from the Survey of Small Business Finance. This body has focused on the importance of firm-lender relationships in the allocation of credit. Because of the relative opacity of small firms, those firms with stronger

relationships with their prospective lenders are more likely to receive credit. Petersen and Rajan (1994) use data from the 1987 SSBF to find that close ties with creditors lead to greater availability of credit at lower rates of interest.

Berger and Udell (1995) were the first to extend Petersen and Rajan, also using data from the 1987 SSBF. These authors focused their analysis only on lines of credit, a type of lending where relationships should be especially important. They find that loan rates are lower when firms have longer pre-existing relationships.

Cole (1998) was the first to analyze data from the 1993 SSBF. He focuses on the lender's decision whether or not to extend credit rather than on the rate charged by the lender and finds that it is the existence rather than the length of the firm-lender relationship that affects the likelihood a lender will extend credit.

Several studies have used SSBF data to analyze how race and gender influence the availability of credit. Cavalluzo and Cavalluzo (1998) use data from the 1987 SSBF to find little variation in credit availability by gender but significant differences by race. Cavalluzzo, Cavalluzzo and Wolken (2002) use data from the 1993 SSBF to find significant differences in availability of credit by race. Blanchflower *et al*. (2004) use data from the 1993 and also find significant differences by race. Also using data from the 1993 SSBF, Coleman (2003) finds that black small businesses were less likely to even apply for a loan because they expected to be turned down, i.e., that they were more likely to be a discouraged borrower as well as more likely to be a denied borrower. Most recently, Cavalluzo and Wolken (2005) use data from the 1998 SSBF, which provides information on personal wealth, an important omitted variable in earlier analysis, yet also find significant differences in credit availability by race.

Two recent articles have used the SSBF data to analyze how availability of credit differs at large and small banks. It is thought that small banks have a competitive advantage over large banks when lending to small firms because small banks enjoy stronger relationships with their borrowers. Hence, small banks should rely more upon relationship variables while banks should rely more upon financial variables. Both Cole, Goldberg and White (2004) and Berger *et al*. (2005) provide support for this idea.

Chakraborty and Hu (2006) use data from the 1993 SSBF to analyze how relationships affect lender's decision to secure lines of credit and other types of loans. They find that the length of relationship decreases the likelihood of collateral for a line of credit but not for other types of loans. Previously, Berger and Udell (1995) had shown that longer relationships reduced the likelihood of collateral being required for lines of credit, using data from the 1987 SSBF.

3. Data

To conduct this study, we use data from the Federal Reserve Board's 2003 Survey of Small Business Finance ("SSBF").[3] In this survey, the 4,240 firms surveyed constitute a nationally representative sample of small businesses operating in the U.S. as of December 2003 and at the time of the interviews, which took place during the second half of 2004, where a small business is defined as a non-financial, non-farm enterprise employing fewer than 500 employees. The 2003 survey data are broadly representative of approximately six million firms operating in the U.S. as of year-end 2003.

[3] See Elliehausen and Wolken (1990) for a detailed description of the 1987 survey, Cole and Wolken (1995) for a detailed description of the 1993 survey, Bitler, Robb and Wolken (2001) for a detailed description of the 1998 survey, and Mach and Wolken (2006) for a detailed description of the 2003 survey.

The SSBF provides detailed information about each firm's most recent borrowing experience. This includes whether or not the firm applied for credit and, if the firm did not apply, did it fail to apply because it feared its application would be rejected (discouraged borrowers). For firms that applied, the SSBF provides information on the identity and characteristics of the potential lender to which the firm applied, other financial services (if any) that the firm obtained from that potential lender, whether the potential lender approved or denied the firm's credit application, and, if the lender extended credit, the terms of the loan. The survey data also provide information on each firm's balance sheet and income statement; its credit history; the firm's characteristics, including standard industrial classification (SIC), organizational form, and age; and demographic characteristics of each firm's primary owner, including 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.

We impose a number of restrictions on the 2003 SSBF. First, we exclude nine firms reporting that they were publicly traded in order to focus exclusively on privately held firms. Second, we exclude 49 firms reporting that no owner controlled at least ten percent of the firm's shares because the SSBF does not collect information on the primary owner, such as age, education and personal wealth. Third, we exclude 29 firms reporting that another business is the primary owner of the firm because, again, the SSBF does not collect information about the primary owner of such firms. Fourth, we exclude 74 firms reporting zero assets, as we need a positive value of assets to scale our financial variables. Finally, we exclude 456 firms reporting assets or sales greater than $10 million (some as large as $200 million) because we wish to focus on truly "small" firms; we choose the $10 million threshold because this is the typical cut-off

used by bankers to differential "small" businesses from "middle-market" businesses. These restrictions leave us with our final sample of 3,623 firms.

4. Methodology

In order to provide new evidence on who needs credit and who gets credit among small businesses, we employ both univariate and multivariate tests. First, we classify firms into one of five categories of *Borrower Type* based upon their responses to questions regarding their most recent loan request during the previous three years.[4]

Non-Borrower: the firm did not apply for a loan during the previous three years because the firm did not need credit.[5]

Discouraged Borrower: the firm did not apply for a loan during the previous year because the firm feared rejection.

Denied Borrower: the firm did apply for a loan during the previous three years but always was denied credit by its prospective lender(s).

Denied&Approved Borrower: the firm did apply for multiple loans during the previous three years and was sometimes denied credit and sometimes granted credit by its prospective lender.

Approved borrower: the firm did apply for a loan during the previous three years and always was granted credit by its prospective lender(s).

[4] Each firm is asked about its most recent applications (approved and/or denied) during the previous three years, excluding applications for credit cards, loans from owners and trade credit with suppliers, as well as applications that were withdrawn or were pending at the time of the interview. Applications for renewals of credit lines were included. We test the impact of their inclusion in Table 5.

[5] Note that these firms may have borrowed funds more than three years before the survey so that they may have outstanding debt in their capital structure.

Once we have classified our sample firms, we calculate descriptive statistics for each group of firms and test for significant differences across categories.

We also conduct multivariate tests on the data, estimating a sequence of logistic regression models that explain the sequential selection of the loan application and approval process (Figure 1). First, a firm decides whether or not it needs credit. We include all five groups of firms in this analysis, and assign a value of zero to non-borrowers and a value of one to all other firms.

Need Credit = f (firm characteristics, owner characteristics, macro variables) (1)

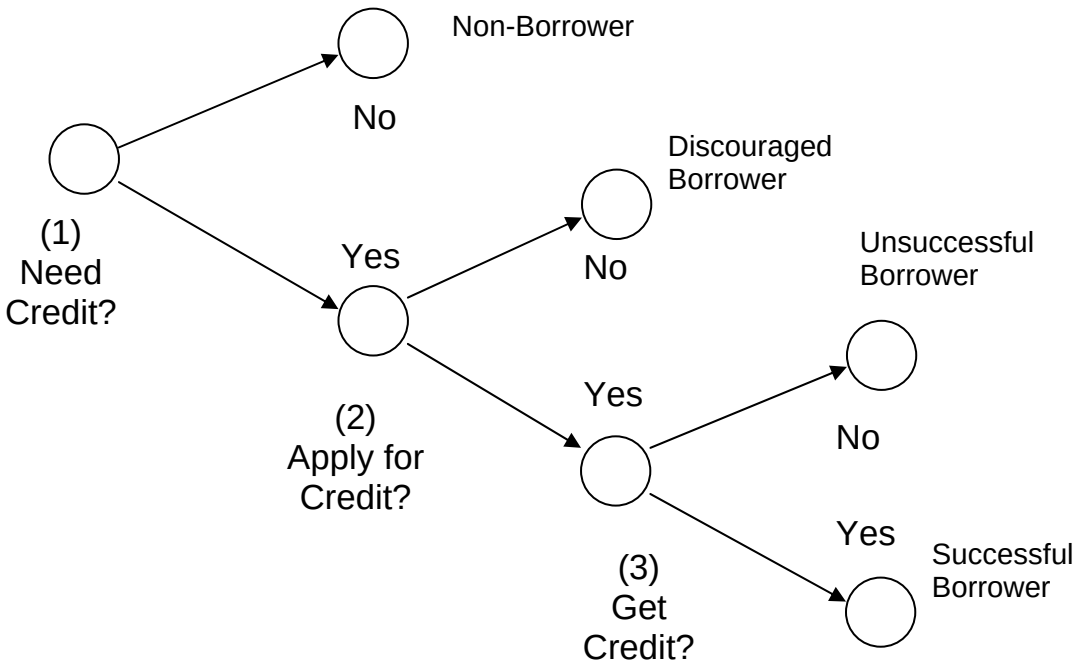
Second, a firm that needs credit decides whether or not to apply for credit. We exclude non-borrowers from this stage of the model and assign a value of one to discouraged borrowers and a value of zero to firms that applied for credit, including denied borrowers, denied&approved borrowers and approved borrowers.

Apply for Credit = f (firm characteristics, owner characteristics, macro variables) (2)

Third, a firm that decides to apply for credit is either successful or unsuccessful. In this stage of the model, we include only those firms that applied for credit and assign a value of zero to unsuccessful borrowers (both denied and denied&approved) and a value of one to successful borrowers.

Get Credit = f (firm characteristics, market characteristics, owner characteristics) (3)

Figure 1:
Who needs and who gets credit?
A sequential model



We estimate this three-step model using logistic regression models estimated in the SAS statistical package. For explanatory variables, we generally follow the existing literature. We include a vector of *firm characteristics* , a vector of *market characteristics* and a vector of *owner characteristics*. In addition, for firms that applied for credit, we include a vector of *firm-lender relationship characteristics*.

Firm characteristics include public reputation as proxied by *firm age*; firm size as measured by *annual sales*; firm leverage as measured by the ratio of *total liabilities to total assets*; firm profitability as measured by *return on assets*; firm tangible assets as measured by the

ratio of *cash to total assets*;[6] organizational form as measured by dummy variables for *C-Corporations, S-Corporations, Partnerships* and *Proprietorships*; firm credit quality as proxied by the *number of obligations on which the firm has been 60 or more days delinquent* during the previous three years, *whether the firm had declared bankruptcy in the past seven years, whether any judgments had been rendered against the firm* during the past three years, and a categorical representation of the *D&B credit score*;[7] and firm industry as measured by a set of *dummy variables for one- or two-digit SIC code*.

Market characteristics are as measured by three dummy variables for low, medium and high concentration as measured by a bank *Herfindahl Index* and a dummy for firms located in *Urban* rather than rural areas;

A vector of *owner characteristics* includes owner's reputation as measured by *age, years of business experience* and dummy variables for educational attainment (*high school, some college, college degree* or *graduate degree*); the race, ethnicity and gender of the primary (i.e., controlling) owner as measured by dummy variables for *Black-, Hispanic-, Asian-* and *Female-*owned firms; the primary owner's credit quality as measured by the *number of credit obligations on which the owner has been 60 or more days delinquent* during the past three years, a dummy indicating whether the owner had declared bankruptcy during the past seven years, and a dummy indicating whether a judgment had been rendered against the owner within the past three years; and two measures of the owner's personal wealth: the value of any *home equity* and the *net worth of the owner*, excluding home equity and equity in the firm.

[6] Financial ratios are winsorized at the 99th percentiles to mitigate the effects of large outliers on the results.
[7] Our variable for D&B Credit score ranges from 1 to 6, with higher numbers indicating better credit quality.

For firms that applied for credit, our vector of *firm-lender relationship characteristics* includes variables that measure the strength of the firm's relationship with the lender to which it most recently applied for credit: the *length of the relationship*, the *distance* between the firm and its prospective lender, the *size of the loan request*, a dummy variable indicating whether the firm *applied in person*, and a set of dummy variables indicating the types of pre-existing relationships with the prospective lender *checking account, savings account, line of credit, other loan* and *financial management services*). Finally, we include the *number of financial institutions* from which the firm obtains any of these financial services.

Our primary hypotheses relate to non-borrowers and discouraged borrowers. (Hypotheses regarding differences in successful and unsuccessful borrowers are well documented in the literature and relate to credit quality, reputation and strength of firm-lender relationships. See, e.g., Cole, Goldberg and White 2004)

The pecking-order theory of capital structure suggests that profitable firms, mature firms and firms in certain industries that require little in the way of tangible assets use less debt than other firms. Therefore, we expect that non-borrowers have higher return on assets, are older as measured by log of firm age, and are more likely to be in the service industries than are other types of firms.

Behavioral finance suggests that discouraged borrowers are acting on emotion rather than reason, as the overwhelming majority of firms applying for credit do receive a loan, and there is zero probability of receiving credit if one does not apply. Therefore, we expect that discouraged firms are more likely to be minority-owned, located in rural areas, and have younger owners with less experience and less education than other types of firms. We also expect discouraged firms to be older, more profitable and less levered than denied firms.

Discouraged firms decision not to apply for credit also may be shaped by their past experiences, so we expect them to have lower credit quality than accepted firms but better credit than denied firms.

5. Results

5.1 Descriptive Statistics

Table 1 presents weighted descriptive statistics for the full sample and separately non-borrower firms and all other firms, along with a t-test for differences in means of these two groups.

5.1.1 Firm Characteristics

The average firm had $624 thousand in annual sales, $307 thousand in total assets and seven employees; was profitable with return on assets of 76 percent, was highly levered with a ratio of total loans to total assets of 61 percent and total liabilities to total assets of 84 percent; held 26 percent of its assets in cash; had tangible assets (cash, inventory and accounts receivable) equal to 39 percent of assets; and had been in business for 14.2 years. The average number of business delinquencies was 0.385, and only 15.7 percent of firms reported any such delinquencies. Only 1 percent of firms reported prior bankruptcy and only 2.5 reported prior judgments against the firm. The average D&B score was 3.6, which would translate to a score between 51 and 75, where 50 is average. Twenty four percent of the firms reported paying late (after the due date) on trade credit. By industry, 25 percent of the firms are in business services, 21 percent in professional services and 19 percent in retail trade.

As shown in the last column of Table 1, almost all of the firm characteristics are significantly different for the subsamples of firms the need credit (discouraged, denied and

approved) and firms that don't need credit. Firms that don't need credit are much smaller by sales, assets and employment; more profitable; less highly levered; hold more cash; are older; are much more likely to be organized as proprietorships and less likely to be organized as S- or C-Corporations. They have superior credit quality on all measures.

5.1.2 Market Characteristics

Almost 80 percent of the firms are located in Urban areas and just under half are located in highly concentrated banking markets and also in medium-concentration banking markets. Firms that don't need credit are more likely to be located in Urban markets.

5.1.3 Primary Owner Characteristics

The average primary owner was 51.5 years old with 19.6 years of experience and had at least a college education. By race, ethnicity and gender, 3.9 percent of the primary owners were Black, 4.4 percent were Asian, 4.4 percent were Hispanic and 26.3 percent were female. Only 2.5 percent of the owners had declared bankruptcy during the previous seven years and only 2.3 percent reported a judgment against themselves during the previous three years. The average number of delinquent personal obligations was 0.29, which were reported by 12.1 percent of the firms. The average value of net worth excluding home equity and the value of the firm was $544 thousand and the average value of home equity was $218 thousand.

As with firm characteristics, most of the primary owner characteristics are significantly different for the groups of firms that need and don't need credit. Firms that don't need credit are significantly older, more experienced and better educated; and have significantly better credit quality by all measures. They also have significantly more home equity but not net worth. Finally, they are significantly less likely to be Black.

Table 2 presents expands upon the descriptive statistics presented in Table 1 by breaking the firms that need credit into four sub-groups: discouraged borrowers, denied borrowers, denied&accepted borrowers and approved borrowers. Based upon the means and standard errors in Table 2, Table 3 presents a series of t-test for differences in the means of the various groups of firms: Discouraged versus Denied; Denied&Approved versus Denied; Denied&Approved versus Discouraged; and Approved versus Denied.

When we compare Discouraged firms with Denied firms, we find that Discouraged firms are significantly smaller, less likely to be organized as corporations and more likely to be organized as proprietorships; are less likely to pay late on trade credit. Owners of Discouraged firms are significantly less likely to be Black, more likely to be Female, more likely to have declared bankruptcy and have less net worth and less home equity.

When we compare Denied&Approved firms with Denied firms, we find that Denied&Approved firms are significantly less profitable, less levered and less liquid, and have significantly fewer firm delinquencies. Owners of Denied&Approved firms have significantly more personal delinquencies.

When we compare Denied&Approved firms with Discouraged firms, we find that Denied&Approved firms are significantly larger, less profitable, less highly levered; less liquid; older; have fewer firm delinquencies but lower D&B scores. Owners of Denied&Approved firms have significantly fewer owner delinquencies, lower net worth and are significantly less likely to be female.

When we compare Approved firms with Denied firms, we find that approved firms are significantly larger, less highly levered, applied for smaller loans relative to their size, are older, report fewer firm delinquencies and higher D&B scores. Owners of Approved firms are

significantly older, more experienced and better educated. They report fewer owner delinquencies and higher values of home equity and net worth. They are significantly less likely to be Black.

5.2 Multivariate Analysis

Table 4 presents the results from estimating the three sequential logistic regression models described in Section IV: Firms that need credit versus firms that don't need credit; Discouraged firms versus firms that applied for credit; and Approved firms versus Denied Firms.

5.2.1 Firms that Don't Need Credit

In Panel A of Table 4 are the results from estimating a logistic regression model where the dependent variable equals one if the firm indicated that it did not need credit (Non-Borrowers) and equal to zero otherwise (including Discouraged, Denied, Denied&Approved and Approved firms). For each variable, the table shows the marginal effect and the associated t-statistic. This analysis reveals that Non-Borrowers are significantly smaller, more profitable, less highly levered, more liquid, less likely to be organized as corporations, report fewer firm delinquencies, and have higher D&B credit scores. In general, these findings are consistent with the Pecking-Order theory of capital structure. Owners of Non-Borrower firms are significantly older, have more home equity, are less likely to have been bankrupt or suffered a judgment, report fewer owner delinquencies and are less likely to be Black.

5.2.2 Discouraged Borrowers

In panel B of Table 4 are the results from estimating a logistic regression model where the dependent variable equals one if the firm indicated that it needed credit but was discouraged and did not apply for credit (Discouraged) and equal to zero otherwise (including Denied,

Denied&Approved and Approved firms). This analysis reveals that discouraged firms are significantly smaller, younger, more liquid, marginally more profitable, are less likely to be organized as corporations. They report significantly more firm delinquencies and lower D&B credit scores. Owners of Discouraged firms are significantly more likely to have declared bankruptcy during the previous seven years, report more owner delinquencies, lower net worth and are more likely to be female.

5.2.3 Approved Borrowers

In panel C of Table 4 are the results from estimating a logistic regression model where the dependent variable equals one if the firm indicated that it applied for and was extended credit (Approved) and equal to zero otherwise (including Denied and Denied&Approved). This analysis reveals that Approved firms are significantly larger, less highly levered, more liquid, less likely to be organized as corporations. They are significantly less likely to report a judgment against the firm and have higher D&B credit scores. The owners of Approved firms report significantly more experience and education, fewer personal delinquencies, more home equity and more personal net worth. They are significantly less likely to have declared bankruptcy during the previous seven years and less likely to be Black.

Not shown in Table 4 are the results from a similar analysis to the one in panel C but where Denied&Approved firms are excluded. Those results are qualitatively unchanged from the results in panel C, in that each variable that is significant in panel C also is significant in this robustness test and each variable that is not significant in panel C also is not significant when the Denied&Approved firms are excluded.

5.2.4 The Importance of Relationships

Table 5 presents the results from estimating the final-stage logistic regression model where we only include firms that applied for credit. In addition to the variables included in Table 4, we also now include a series of variables that measure various aspects of the firm-lender relationship, including the length of relationship, distance to lender, whether or not the firm applied in person, the existence of pre-existing relationships (checking, savings, line of credit, other loan, financial management service) with the prospective lender, the size of the loan request relative to the size of the firm's assets and the number of sources of financial services.

Of primary interest are the results for the relationship variables. Five of these variables are statistically significant at the 0.05 level or better. Firms that obtain financial services from more sources are significantly less likely to be approved. This is supportive of the theory that lenders favor firms that obtain all of their services from that lender, and also with the theory that multiple services provide the lender with superior information with which to evaluate creditworthiness. Three of the dummy variables indicating that the firm obtained financial services from the prospective lender are significant, but only two have the expected positive sign. Firms that have a pre-existing line of credit and firms that have a pre-existing savings account are significantly more likely to be approved, but firms with a pre-existing checking account are significantly less likely to be approved. Finally, firms that apply for loans that are larger relative to the size of the firm are less likely to be approved.

5.2.5 Renewals of Credit Lines

A significant portion of loan applications are, in fact, applications to renew an existing line of credit. There are 573 such renewal applications, which make up almost 40 percent of the total applications, but only 8 percent of denials. In order to see if these renewal applications are

driving our results (and those of previous studies using the earlier SSBFs, which did not enable researchers to distinguish between renewal applications and new applications), we rerun our analysis, excluding these 573 renewal applications. (There are too few denials to perform a meaningful analysis of renewal applications by themselves.)

As shown in the final columns of Table 5, the results are qualitatively unchanged by the exclusion of the LC renewal applications. Each variable that is significant when they are included remains significant when they are excluded. In fact, significance levels often increase when the renewal applications are excluded.

6. Summary and Conclusions

In this study, we make at least three significant contributions to the literature on the availability of credit. First, we provide the first rigorous analysis of the differences in our four types of firms: non-borrowers, discouraged borrowers, denied borrowers and successful borrowers. Our findings have important implications for interpreting previous research that has combined these groups in ways that our results suggest are inappropriate, such as pooling discouraged borrowers with denied borrowers in analyzing availability of credit.

Second, we provide an analysis of credit availability that properly accounts for the inherent self-selection mechanisms involved in the credit application process: who needs credit, who applies for credit conditional upon needing credit, and who receives credit, conditional upon applying for credit. Previous researchers have pooled firms that do not need credit with those needing credit and have pooled discouraged borrowers with denied borrowers. Hence, our results shed new light upon the credit-allocation process.

Third, we provide the first evidence from the 2003 SSBF on the availability of credit to small firms. This survey includes methodological improvements on the previous SSBFs (1987, 1993 and 1998) that enable us to better address the issue of availability of credit to small firms. One of the most important is the identification of applications to renew existing lines of credit, which enables us for the first time to differentiate the availability of new credit from renewals of existing credit. One of the most disturbing findings from this analysis the that Black-owned firms are 15 to 30 percent more likely to be rejected than other firms, even after incorporating the extensive set of control variables available from the SSBF.

This study provides both academics and policymakers with new insights on how to tailor regulations to help small businesses obtain needed credit and reach their optimal capital structures. Of especial interest is the new evidence brought to light by the sequential model of the credit application process regarding why a significant percentage of firms choose not to borrow—the non-borrowers and the discouraged borrowers. This is critically important because evidence from the SSBFs reveals almost half of all firms do not appear to "need" credit and that as many as one out of seven small firms has a negative ratio of debt to equity because their debt exceeds their assets. Theory suggests that poorly capitalized firms are less likely to hire new employees or make new long-term investments that could improve economic growth, so policies that help these firms improve their capitalization should lead to higher growth in both employment and output (GDP). Our evidence suggests that a significant portion of the "discouraged" firms would be successful in obtaining credit if only they would apply.

REFERENCES

Ang, J., Cole, R., Lin, J. 2000. Agency costs and ownership structure. *The Journal of Finance* 55, 81-106

Berger, A., Udell, G. 1995. Relationship Lending and Lines of Credit in Small Firm Finance. *Journal of Business* 68, 351-381.

Berger, A., Frame, S., Miller, N. 2005. Credit scoring and the availability, price and risk of small business credit. *Journal of Money, Credit and Banking* 37(2), 191-222.

Berger, A., Miller, N., Rajan, R., Stein, J., Petersen, M. 2005. Does Function Follow Organizational Form? Evidence From the Lending Practices of Large and Small Banks." *Journal of Financial Economics* 76 (2): 237-269.

Berlin, M., Mester, L. 1999. Deposits and Relationship Lending. *Review of Financial Studies* 12(3), 579-607.

Bitler, M., Robb, A., Wolken, J. 2001. Financial Services Used by Small Businesses: Evidence from the 1998 Survey of Small Business Finances. *Federal Reserve Bulletin* 87 (April), 183-205.

Bitler, M., Moskowitz, T., Vissing-Jorgensen, A. 2005. Testing Agency Theory with Entrepreneur Effort and Wealth. *Journal of Finance* 60(2), 539-576.

Black, S., Strahan, P., 2002. Entrepreneurship and Bank Credit Availability. *Journal of Finance* 57(6), 2807-2833.

Blanchflower, D., Levine, P., Zimmerman, D. 2003. Discrimination in the Small Business Credit Market. *Review of Economics and Statistics* 84 (4), 930-943.

Carey, Mark, Mitch Post, and Steven Sharpe. "Does Corporate Lending by Banks and Finance Companies Differ? Evidence on Specialization in Private Debt Contracting." *Journal of Finance*, 53 (1998), 845-878.

Cavalluzzo, K., Cavalluzzo, L. 1998. Market Structure and Discrimination: The Case of Small Businesses. *Journal of Money, Credit and Banking* 30 (4), 771-92.

Cavalluzzo, K., Cavalluzzo, L., Wolken, J. 2002. Competition, Small Business Financing, and Discrimination: Evidence From a New Survey. Journal of Business 75(4), 641-679.

Cavalluzzo, K., Wolken, J. 2005. Small Business Loan Turndowns, Personal Wealth and Discrimination. *Journal of Business* 78(6): 2153-2178.

Chakraborty, A., Hu, C. 2006. Lending Relationships in Line-of-Credit and Non-Line-of-Credit Loans: Evidence from Collateral Use in Small Business. *Journal of Financial Intermediation.* 15 (1), 86-107.

Cole, R. 1998. The importance of relationships to the availability of credit. *Journal of Banking and Finance* 22, 959-997.

Cole, R., Goldberg, L. and White, L. 2004. Cookie-cutter versus character: The micro structure of small-business lending by large and small banks. *Journal of Financial and Quantitative Analysis* 39, 227-251.

Cole, R., Wolken, J., 1995. Financial Services Used by Small Businesses: Evidence from the 1993 National Survey of Small Business Finances. *Federal Reserve Bulletin* 81 (July), 630-67.

Cole, R., Wolken, J., Woodburn, L. 1996. Bank and non-bank competition for small business credit: Evidence from the 1987 and 1993 National Surveys of Small Business Finances. *Federal Reserve Bulletin* 82 (November), 983-995.

Coleman, S. 2002. The Borrowing Experience of Black and Hispanic-Owned Small Firms: Evidence from the 1998 Survey of Small Business Finances. *The Academy of Entrepreneurship Journal* 8 (1), 1-20.

Coleman, S. 2004. Access to Debt Capital for Small Women- and Minority-Owned Firms: Does Educational Attainment Have an Impact? *Journal of Developmental Entrepreneurship* 9 (2), 127-144.

Elliehausen, G., Wolken, J. 1990. Banking markets and the use of financial services by small and medium-sized businesses. *Federal Reserve Bulletin* 76 (October), 801-817.

Greene, W. 2003. *Econometric Analysis*, 5th Ed. Upper Saddle River, Prentice Hall.

Jen, F., 1964. The determinants of the degree of insufficiency of bank credit to small business. *The Journal of Finance* 18(4), 694-695.

Mach, T., Wolken, J. 2006. Financial services used by small businesses: Evidence from the 2003 Survey of Small Business Finance. Federal Reserve Bulletin Oct 2006, 167-195.

Petersen, M., Rajan, R. 1994. The benefits of lending relationships: Evidence from small business data. *Journal of Finance*, 46(1), 3-37.

Petersen, M., Rajan, R. 1995. The Effect of Credit Market Competition on Lending Relationships. *Quarterly Review of Economics*, 110, 407-443.

Petersen, M., Rajan, R. 2002. Does Distance Still Matter? The Information Revolution in Small Business Lending. *Journal of Finance* 57, 2533-2570.

Wendt, P. 1947. The Availability of Capital to Small Businesses in California. *The Journal of Finance* 2 (2), 43-54.

Table 1:
Descriptive Statistics

	All Firms		Need Credit		Don't Need Credit		Difference	t-test
	Obs. = 3,623		Obs. = 1,773		Obs. = 1,850		in	
	Mean	Std Error	Mean	Std Error	Mean	Std Error	Means	
Firm Characteristics								
Total sales ($000)	624.3	20.0	859.4	35.1	438.4	20.8	-421.0	-10.32 **a**
Total Assets ($000)	306.6	12.1	427.0	20.8	211.5	13.4	-215.5	-8.72 **a**
Total number of employees	7.0	0.2	9.1	0.4	5.4	0.2	-3.673	-8.23 **a**
Dummy for positive profits	0.755	0.007	0.744	0.010	0.764	0.010	0.020	1.38
Return on assets	0.764	0.019	0.623	0.025	0.875	0.028	0.252	6.72 **a**
Total loans to assets	0.610	0.027	0.836	0.042	0.432	0.034	-0.405	-7.50 **a**
Total liabilities to assets	0.845	0.032	1.130	0.051	0.619	0.040	-0.511	-7.96 **a**
Cash to assets	0.257	0.005	0.174	0.006	0.322	0.008	0.148	14.90 **a**
Tangible assets to assets	0.388	0.006	0.435	0.009	0.350	0.008	-0.085	-7.08 **a**
Dummy for C Corporations	0.140	0.006	0.167	0.009	0.118	0.008	-0.048	-4.14 **a**
Dummy for S Corporations	0.310	0.008	0.359	0.011	0.271	0.010	-0.088	-5.72 **a**
Dummy for partnerships	0.084	0.005	0.078	0.006	0.089	0.007	0.010	1.13
Dummy for proprietorships	0.452	0.008	0.384	0.012	0.505	0.012	0.121	7.37 **a**
Age of firm in years	14.190	0.181	13.198	0.245	14.975	0.261	1.778	4.96 **a**
Firm bankruptcy	0.010	0.002	0.016	0.003	0.004	0.001	-0.012	-3.64 **a**
Firm delinquent obligations	0.385	0.016	0.622	0.027	0.198	0.016	-0.424	-13.36 **a**
Dummy for firm delinquent	0.157	0.006	0.248	0.010	0.085	0.006	-0.163	-13.44 **a**
Firm judgments	0.025	0.003	0.047	0.005	0.008	0.002	-0.038	-7.05 **a**
Dummy for late on trade credit	0.245	0.007	0.360	0.011	0.155	0.008	-0.205	-14.46 **a**
D&B Credit Score	3.610	0.024	3.436	0.035	3.749	0.032	0.313	6.62 **a**
SIC 1 Construction	0.117	0.005	0.140	0.008	0.099	0.007	-0.040	-3.75 **a**
SIC 2 Primary Manufacturing	0.031	0.003	0.033	0.004	0.029	0.004	-0.004	-0.69
SIC 3 Other Manufacturing	0.040	0.003	0.049	0.005	0.032	0.004	-0.018	-2.66 **a**
SIC 4 Transportation	0.039	0.003	0.043	0.005	0.035	0.004	-0.008	-1.28
SIC 5 Wholesale trade	0.057	0.004	0.062	0.006	0.052	0.005	-0.010	-1.25
SIC 5 Retail Trade	0.187	0.006	0.188	0.009	0.185	0.009	-0.003	-0.22
SIC 6 Real Est and Insur.	0.067	0.004	0.053	0.005	0.079	0.006	0.026	3.14 **a**
SIC 7 Business Svcs	0.253	0.007	0.247	0.010	0.257	0.010	0.010	0.68
SIC 8 Professional Svcs	0.210	0.007	0.184	0.009	0.230	0.010	0.046	3.43 **a**

Table 1: (cont.)
Descriptive Statistics

	All Firms		**Need Credit**		**Don't Need Credit**		**Difference**	**t-test**	
	Obs. = 3,623		Obs. = 1,773		Obs. = 1,850		**in**		
	Mean	Std Error	Mean	Std Error	Mean	Std Error	**Means**		
Market Characteristics									
Dummy for urban location	0.793	0.007	0.778	0.010	0.806	0.009	0.028	2.06	**b**
Dummy for medium Herfindahl	0.461	0.008	0.463	0.012	0.459	0.012	-0.004	-0.21	
Dummy for high Herfindahl	0.479	0.008	0.477	0.012	0.481	0.012	0.004	0.24	
Primary Owner Characteristics									
Age of primary owner	51.506	0.190	49.584	0.259	53.026	0.270	3.441	9.21	**a**
Bus experience of primary owner	19.610	0.194	18.844	0.266	20.217	0.280	1.373	3.56	**a**
Dummy for grad education	0.208	0.007	0.178	0.009	0.232	0.010	0.054	4.05	**a**
Dummy for college education	0.291	0.008	0.270	0.011	0.307	0.011	0.036	2.42	**b**
Dummy for some college educ	0.267	0.007	0.300	0.011	0.241	0.010	-0.059	-4.02	**a**
Dummy for Black primary owner	0.039	0.003	0.051	0.005	0.030	0.004	-0.021	-3.16	**a**
Dummy for Asian primary owner	0.044	0.003	0.042	0.005	0.046	0.005	0.005	0.72	
Dummy for Hispanic primary owner	0.044	0.003	0.048	0.005	0.040	0.005	-0.008	-1.22	
Dummy for female primary owner	0.263	0.007	0.252	0.010	0.271	0.010	0.019	1.32	
Dummy for owner bankruptcy	0.025	0.003	0.038	0.005	0.015	0.003	-0.023	-4.34	**a**
Owner delinquent obligations	0.286	0.014	0.448	0.024	0.158	0.015	-0.290	-10.45	**a**
Dummy for owner delinquent	0.121	0.005	0.190	0.009	0.066	0.006	-0.124	-11.33	**a**
Dummy for judgments on owner	0.023	0.002	0.042	0.005	0.008	0.002	-0.034	-6.49	**a**
Owner home equity ($000)	217.8	5.2	187.5	6.7	241.8	7.7	54.3	5.31	**a**
Owner other net worth ($000)	544.0	20.8	525.8	31.6	558.4	27.6	32.6	0.78	

a and **b** indicate statistical significance at the 0.01 and 0.05 levels, respectively.

Table 2

Descriptive Statistics by Borrower Status: Non-Borrower, Discouraged, Denied, Denied & Approved or Approved

	Non-Borrower		**Discouraged**		**Denied**		**Denied & Approved**		**Approved**	
	Obs. = 1,850		Obs. = 317		Obs. = 126		Obs. = 58		Obs. = 1,272	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
Firm Characteristics										
Total sales	438.4	20.8	213.9	25.6	581.6	92.2	532.1	120.0	1,149	47.5
Total assets	211.5	13.4	122.7	17.6	266.8	45.7	494.3	152.0	555.3	27.9
Total number of employees	5.4	0.2	4.4	0.4	7.5	1.6	9.7	3.2	10.9	0.5
Profit is positive	0.76	0.01	0.68	0.03	0.72	0.04	0.63	0.06	0.78	0.01
Return on assets	0.87	0.03	0.76	0.07	0.68	0.10	0.34	0.09	0.58	0.03
Loans to assets	0.43	0.03	1.01	0.13	1.32	0.24	0.73	0.07	0.72	0.04
Liabilities to assets	0.62	0.04	1.41	0.15	1.90	0.30	0.86	0.08	0.95	0.05
Cash to assets	0.32	0.01	0.23	0.02	0.14	0.02	0.08	0.02	0.16	0.01
Tangible assets to assets	0.35	0.01	0.37	0.02	0.43	0.03	0.58	0.04	0.45	0.01
Loan size to assets	n/a	n/a	n/a	n/a	1.69	0.29	1.43	0.30	0.88	0.06
C-Corporation	0.12	0.01	0.08	0.02	0.16	0.03	0.14	0.05	0.20	0.01
S-Corporation	0.27	0.01	0.26	0.02	0.44	0.04	0.32	0.06	0.39	0.01
Partnership	0.09	0.01	0.07	0.01	0.07	0.02	0.06	0.03	0.08	0.01
Proprietorship	0.51	0.01	0.57	0.03	0.29	0.04	0.48	0.07	0.32	0.01
Age of firm	14.98	0.26	9.11	0.44	10.93	0.80	12.92	1.46	15.00	0.30
Bankruptcy of firm	0.00	0.00	0.04	0.01	0.03	0.01	0.03	0.02	0.01	0.00
Firm delinquent obligations	0.20	0.02	0.90	0.07	0.98	0.12	0.54	0.14	0.48	0.03
Firm delinquent dummy	0.08	0.01	0.36	0.03	0.38	0.04	0.24	0.06	0.19	0.01
Judgement against firm	0.01	0.00	0.07	0.01	0.09	0.03	0.13	0.04	0.03	0.00
Late on trade credit	0.16	0.01	0.32	0.03	0.45	0.04	0.40	0.06	0.36	0.01
D&B Credit Score	3.75	0.03	2.92	0.07	2.81	0.12	2.42	0.19	3.76	0.04
SIC 1 Construction	0.10	0.01	0.11	0.02	0.14	0.03	0.03	0.02	0.16	0.01
SIC 2 Primary Manufacturing	0.03	0.00	0.02	0.01	0.01	0.01	0.07	0.03	0.04	0.01
SIC 3 Other Manufacturing	0.03	0.00	0.03	0.01	0.10	0.03	0.01	0.01	0.05	0.01
SIC 4 Transportation	0.04	0.00	0.03	0.01	0.06	0.02	0.08	0.04	0.04	0.01
SIC 5 Wholesale trade	0.05	0.01	0.05	0.01	0.03	0.02	0.04	0.03	0.07	0.01
SIC 5 Retail Trade	0.19	0.01	0.19	0.02	0.18	0.03	0.41	0.07	0.17	0.01
SIC 6 Real Est and Insur.	0.08	0.01	0.03	0.01	0.04	0.02	0.04	0.03	0.06	0.01
SIC 7 Business Svcs	0.26	0.01	0.35	0.03	0.25	0.04	0.17	0.05	0.21	0.01
SIC 8 Professional Svcs	0.23	0.01	0.18	0.02	0.18	0.03	0.16	0.05	0.19	0.01

Table 2: (cont.)
Descriptive Statistics by Borrower Status: Non-Borrower, Discouraged, Denied, Denied & Approved or Approved

	Non-Borrower Obs. = 1,850		**Discouraged** Obs. = 317		**Denied** Obs. = 126		**Denied & Approved** Obs. = 58		**Approved** Obs. = 1,272	
Label	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
Market Characteristics										
Urban area	0.81	0.01	0.85	0.02	0.88	0.03	0.75	0.06	0.74	0.01
Medium banking concentration	0.46	0.01	0.43	0.03	0.48	0.04	0.46	0.07	0.47	0.01
High banking concentration	0.48	0.01	0.51	0.03	0.46	0.04	0.54	0.07	0.46	0.01
Primary Owner Characteristics										
Age of owner	53.03	0.27	46.96	0.60	47.70	0.95	46.25	1.52	50.97	0.30
Business Experience	20.22	0.28	15.21	0.59	16.82	0.92	17.00	1.54	20.53	0.31
Graduate degree	0.23	0.01	0.14	0.02	0.10	0.03	0.11	0.04	0.20	0.01
College degree	0.31	0.01	0.24	0.02	0.27	0.04	0.29	0.06	0.28	0.01
Some college	0.24	0.01	0.36	0.03	0.37	0.04	0.34	0.06	0.27	0.01
Black	0.03	0.00	0.10	0.02	0.19	0.03	0.11	0.04	0.01	0.00
Asian	0.05	0.00	0.05	0.01	0.04	0.02	0.04	0.02	0.04	0.01
Hispanic	0.04	0.00	0.06	0.01	0.06	0.02	0.04	0.03	0.04	0.01
Female	0.27	0.01	0.39	0.03	0.28	0.04	0.21	0.05	0.20	0.01
Bankruptcy of owner	0.01	0.00	0.11	0.02	0.04	0.02	0.07	0.03	0.01	0.00
Owner delinquent obligations	0.16	0.01	1.01	0.07	0.85	0.11	0.37	0.11	0.20	0.02
Owner delinquent dummy	0.07	0.01	0.41	0.03	0.36	0.04	0.20	0.05	0.09	0.01
Judgement against owner	0.01	0.00	0.06	0.01	0.08	0.02	0.06	0.03	0.03	0.00
Owner home equity	241.83	7.74	95.24	9.14	133.81	15.49	111.43	21.77	232.30	8.95
Owner other wealth	558.38	27.55	162.83	30.93	273.04	39.97	335.76	82.21	701.19	44.24

Table 3
Differences in Means by Borrower Status

	Discouraged minus Denied		Denied&Approved minus Denied		Denied&Approved minus Discouraged		Approved minus Denied	
	Difference	t-test	Difference	t-test	Difference	t-test	Difference	t-test
Firm Characteristics								
Total sales	-367.7	-3.84 **a**	-49.5	-0.33	318.2	2.59 **a**	567.91	5.48 **a**
Total assets	-144.1	-2.94 **a**	227.5	1.43	371.6	2.43 **b**	288.47	5.39 **a**
Total number of employees	-3.1	-1.92	2.2	0.62	5.3	1.65	3.42	2.09 **b**
Profit is positive	-0.04	-0.83	-0.09	-1.23	-0.1	-0.76	0.05	1.28
Return on assets	0.08	0.63	-0.34	-2.48 **b**	-0.4	-3.61 **a**	-0.10	-0.96
Loans to assets	-0.30	-1.13	-0.59	-2.37 **b**	-0.3	-1.97 **b**	-0.60	-2.46 **b**
Liabilities to assets	-0.49	-1.45	-1.04	-3.33 **a**	-0.5	-3.21 **a**	-0.95	-3.13 **a**
Cash to assets	0.09	3.19 **a**	-0.06	-2.18 **b**	-0.2	-6.61 **a**	0.02	0.80
Tangible assets to assets	-0.06	-1.45	0.16	2.96 **a**	0.2	4.59 **a**	0.03	0.74
Loan size to assets			-0.26	-0.64			-0.82	-2.76 **a**
C-Corporation	-0.08	-2.17 **b**	-0.03	-0.45	0.1	1.11	0.03	1.00
S-Corporation	-0.19	-3.70 **a**	-0.13	-1.70	0.1	0.89	-0.06	-1.20
Partnership	0.00	0.08	-0.01	-0.22	0.0	-0.31	0.01	0.48
Proprietorship	0.28	5.65 **a**	0.19	2.46 **b**	-0.1	-1.21	0.03	0.67
Age of firm	-1.82	-1.99 **b**	1.99	1.19	3.8	2.50 **b**	4.07	4.74 **a**
Bankruptcy of firm	0.01	0.57	0.00	0.13	0.0	-0.26	-0.02	-1.48
Firm delinquent obligations	-0.07	-0.54	-0.44	-2.37 **b**	-0.4	-2.29 **b**	-0.50	-4.08 **a**
Firm delinquent dummy	-0.02	-0.32	-0.14	-1.99 **b**	-0.1	-2.00 **b**	-0.19	-4.17 **a**
Judgement against firm	-0.03	-0.84	0.03	0.64	0.1	1.25	-0.07	-2.51 **b**
Late on trade credit	-0.13	-2.45 **b**	-0.05	-0.59	0.1	1.14	-0.09	-1.90
D&B Credit Score	0.11	0.77	-0.40	-1.77	-0.5	-2.54 **b**	0.95	7.24 **a**
SIC 1 Construction	-0.03	-0.70	-0.11	-2.94 **a**	-0.1	-3.07 **a**	0.02	0.48
SIC 2 Primary Manufacturing	0.01	0.73	0.05	1.56	0.0	1.30	0.03	2.30 **b**
SIC 3 Other Manufacturing	-0.07	-2.50 **b**	-0.09	-3.12 **a**	0.0	-1.36	-0.04	-1.53
SIC 4 Transportation	-0.03	-1.44	0.01	0.29	0.0	1.27	-0.02	-0.92
SIC 5 Wholesale trade	0.01	0.70	0.01	0.32	0.0	-0.14	0.04	2.11 **b**
SIC 5 Retail Trade	0.01	0.23	0.23	3.09 **a**	0.2	3.18 **a**	-0.01	-0.26
SIC 6 Real Est and Insur.	-0.01	-0.49	0.00	-0.01	0.0	0.34	0.02	0.89
SIC 7 Business Svcs	0.10	2.19 **b**	-0.08	-1.31	-0.2	-3.30 **a**	-0.03	-0.82
SIC 8 Professional Svcs	0.00	0.09	-0.02	-0.35	0.0	-0.46	0.01	0.24

Table 3: (cont.)
Differences in Means by Borrower Status

	Discourage - Denied		enied&Approved - Denie		ed&Approved - Discour		Approved - Denied	
	Difference	t-test	Difference	t-test	Difference	t-test	Difference	t-test
Market Characteristics								
Urban area	-0.04	-1.10	0.14	2.12 **b**	-0.10	-1.60	-0.14	-4.63 **a**
Medium banking concentration	-0.05	-0.95	0.03	0.35	0.02	0.31	-0.01	-0.25
High banking concentration	0.05	0.96	-0.08	-0.97	0.03	0.37	0.01	0.11
Primary Owner Characteristics								
Age of owner	-0.74	-0.66	1.45	0.81	-0.71	-0.43	3.27	3.27 **a**
Business Experience	-1.61	-1.47	-0.18	-0.10	1.79	1.09	3.71	3.82 **a**
Graduate degree	0.04	1.05	0.00	-0.05	-0.03	-0.73	0.10	3.38 **a**
College degree	-0.03	-0.56	-0.03	-0.35	0.05	0.79	0.01	0.31
Some college	-0.02	-0.30	0.03	0.45	-0.02	-0.28	-0.11	-2.39 **b**
Black	-0.09	-2.36 **b**	0.07	1.34	0.02	0.40	-0.17	-4.91 **a**
Asian	0.00	0.18	0.01	0.21	-0.01	-0.38	0.00	-0.08
Hispanic	0.00	-0.05	0.03	0.76	-0.02	-0.84	-0.02	-0.97
Female	0.11	2.35 **b**	0.07	1.03	-0.18	-3.03 **a**	-0.07	-1.79
Bankruptcy of owner	0.07	2.77 **a**	-0.02	-0.60	-0.05	-1.29	-0.03	-1.89
Owner delinquent obligations	0.16	1.20	0.48	3.00 **a**	-0.64	-4.74 **a**	-0.65	-5.72 **a**
Owner delinquent dummy	0.05	0.99	0.16	2.37 **b**	-0.21	-3.55 **a**	-0.27	-6.17 **a**
Judgement against owner	-0.02	-0.66	0.02	0.47	0.00	-0.02	-0.05	-2.05 **b**
Owner home equity	-38.6	-2.14 **b**	22.38	0.84	16.2	0.69	98.49	5.51 **a**
Owner other wealth	-110.2	-2.18 **b**	-62.72	-0.69	172.9	1.97 **b**	428.15	7.18 **a**

a and **b** indicate statistical significance at the 0.01 and 0.05 levels, respectively.

Table 4:
Logisitic Regression to Explain Non-Borrowers, Discouraged Borrowers and Approved Borrowers

The Non-Borrowers model includes all 3,623 firms with the 1,850 non-borrowers coded as one and all other firms coded as zero. The Discouraged Borrowers model excludes the 1,850 non-borrowers and codes the 317 discouraged borrowers as one and all other fir firms as zero. The Approved Borrowers model excluded the 1,850 non-borrowers and 317 discouraged borrowers and codes the 1,272 approved firms as one and the 126 denied and 58 approved&denied firms as zero. For each variable in each model, the table presents marginal effects and the associated t-statistic.

	Non-Borrowers		**Discouraged Borrowers**		**Approved Borrowers**	
Parameter	**Marginal Effect**	**t-statistic**	**Marginal Effect**	**t-statistic**	**Marginal Effect**	**t-statistic**
Intercept	0.0914	1.15	0.172	2.57	0.044	0.56
Characteristics of Firm						
log of Sales	-0.0351	-7.64 **a**	-0.024	-6.81 **a**	0.008	1.98 **b**
Return on Assets	0.0305	4.09 **a**	0.011	1.76	-0.003	-0.39
Liabilities to Assets	-0.0321	-7.36 **a**	0.002	0.58	-0.007	-2.79 **a**
Cash to Assets	0.2602	8.87 **a**	0.066	2.61 **a**	0.059	2.25 **b**
C-Corporation	-0.0673	-2.61 **a**	-0.045	-1.86	-0.037	-2.12 **b**
S-Corporation	-0.0549	-2.82 **a**	-0.046	-2.81 **a**	-0.034	-2.65 **a**
Partnership	-0.0138	-0.47	-0.061	-2.14 **b**	-0.012	-0.64
Age of Firm	0.0014	1.33	-0.005	-4.96 **a**	0.000	0.22
Bankruptcy of Firm	-0.1743	-1.72	0.033	0.61	-0.021	-0.48
Delinquencies of Firm	-0.0467	-4.84 **a**	0.016	2.38 **b**	0.006	1.38
Judgement against Firm	-0.1223	-1.92	-0.021	-0.64	-0.049	-2.83 **a**
D&B Credit Score	0.0130	2.24 **b**	-0.010	-1.96 **b**	0.016	5.69 **a**
SIC 2 Primary Manufacturing	0.0360	0.72	-0.013	-0.28	-0.003	-0.13
SIC 3 Other Manufacturing	-0.0307	-0.7	-0.036	-0.91	-0.029	-1.82
SIC 4 Transportation	0.0397	0.9	0.009	0.24	-0.042	-2.72 **a**
SIC 5 Wholesale trade	0.0220	0.56	0.052	1.51	0.005	0.29
SIC 5 Retail Trade	0.0821	2.85 **a**	0.015	0.63	-0.030	-2.72 **a**
SIC 6 Real Est and Insur.	0.0436	1.13	-0.025	-0.62	-0.020	-1.22
SIC 7 Business Svcs	0.0400	1.45	0.037	1.63	-0.002	-0.20
SIC 8 Professional Svcs	0.0348	1.13	0.000	0.02	-0.012	-1.04

Table 4: (cont.)
Logisitic Regression to Explain Non-Borrowers, Discouraged Borrowers and Approved Borrowers

	Non-Borrowers		Discouraged Borrowers		Approved Borrowers	
Parameter	**Marginal Effect**	**t-statistic**	**Marginal Effect**	**t-statistic**	**Marginal Effect**	**t-statistic**
Characteristics of Market						
MSA	0.0409	1.99 **b**	0.075	3.93 **a**	-0.018	-2.42 **b**
HHI Medium	0.0138	0.41	-0.006	-0.19	-0.022	-1.78
HHI High	0.0275	0.81	0.019	0.65	-0.028	-2.32 **b**
Characteristics of Primary Owner						
Age of Owner	0.0046	4.93 **a**	-0.001	-0.81	0.000	1.36
Experience of Owner	-0.0007	-0.68	0.002	1.94	0.000	-0.01
Graduate Degree	0.0208	0.78	-0.015	-0.62	0.019	2.12 **b**
College Degree	0.0220	0.99	-0.010	-0.49	-0.001	-0.21
Some College	-0.0364	-1.69	-0.002	-0.11	-0.005	-0.93
Black	-0.1179	-2.91 **a**	-0.027	-0.99	-0.053	-5.93 **a**
Asian	0.0118	0.32	0.024	0.74	-0.001	-0.10
Hispanic	-0.0056	-0.15	-0.013	-0.43	0.005	0.51
Female	-0.0252	-1.36	0.036	2.44 **b**	0.000	0.02
Bankruptcy of Owner	-0.1717	-3.06 **a**	0.117	3.34 **a**	-0.036	-2.31 **b**
Delinquencies of Owner	-0.0368	-3.3 **a**	0.048	6.82 **a**	-0.009	-3.89 **a**
Judgement against Owner	-0.1960	-3.05 **a**	-0.024	-0.72	0.003	0.27
Home Equity of Owner	0.0001	3.55 **a**	-0.0001	-1.93	0.00002	2.05 **b**
Other Wealth of Owner	-0.00001	-1.46	-0.0001	-3.34 **a**	0.00001	2.02 **b**

a and **b** indicate statistical significance at the 0.01 and 0.05 levels, respectively.

Table 5
Effect of Credit Line Renewals on Loan Approval Decision

Effect of including or excluding loan applications for renewals of existing lines of credit on the probability of loan approval by the lender. Including renewals, there are 1272 approvals and 184 denials. Excluding renewals, there are 714 approvals and 169 denials.

	Renewals Included		Renewals Excluded	
	Marginal Effect	t-statistic	Marginal Effect	t-statistic
	0.130	1.77	0.150	1.36
Firm Characteristics				
log of Sales	0.009	2.21 **b**	0.021	3.24 **a**
Return on Assets	-0.005	-0.71	-0.020	-1.71
Liabilities to Assets	-0.002	-0.61	-0.006	-1.12
Cash to Assets	0.105	2.96 **a**	0.229	3.78 **a**
C-Corporation	-0.049	-2.10 **b**	-0.100	-2.77 **a**
S-Corporation	-0.044	-2.40 **b**	-0.106	-3.79 **a**
Partnership	-0.010	-0.32	-0.040	-0.87
Age of Firm	0.000	-0.43	-0.001	-0.85
Bankruptcy of Firm	-0.055	-0.67	-0.182	-1.42
Delinquencies of Firm	0.014	1.86	0.014	1.26
Judgement against Firm	-0.089	-2.69 **a**	-0.233	-3.84 **a**
D&B Credit Score	0.028	5.23 **a**	0.045	5.44 **a**
SIC 2 Primary Manufacturing	-0.002	-0.05	-0.003	-0.05
SIC 3 Other Manufacturing	-0.085	-2.60 **a**	-0.113	-2.27 **b**
SIC 4 Transportation	-0.085	-2.48 **b**	-0.130	-2.63 **a**
SIC 5 Wholesale trade	-0.016	-0.41	-0.080	-1.37
SIC 5 Retail Trade	-0.045	-1.78	-0.067	-1.77
SIC 6 Real Est and Insur.	-0.043	-1.12	-0.039	-0.64
SIC 7 Business Svcs	-0.003	-0.10	0.008	0.22
SIC 8 Professional Svcs	-0.041	-1.41	-0.066	-1.53

Table 5: (cont.)
Effect of Credit Line Renewals on Loan Approval Decision

Market Characteristics				
MSA	-0.040	-1.92	-0.071	-2.25 **b**
HHI Medium	-0.056	-1.74	-0.100	-2.09 **b**
HHI High	-0.081	-2.42 **b**	-0.133	-2.71 **a**
Primary Owner Characteristics				
Age of Owner	0.001	1.47	0.001	0.97
Experience of Owner	0.001	0.50	0.002	1.44
Graduate Degree	0.073	2.68 **a**	0.114	2.84 **a**
College Degree	0.010	0.51	-0.015	-0.49
Some College	-0.009	-0.50	-0.028	-0.98
Black	-0.175	-5.87 **a**	-0.302	-6.13 **a**
Asian	0.013	0.37	-0.001	-0.02
Hispanic	0.022	0.69	0.030	0.50
Female	0.017	1.03	0.039	1.54
Bankruptcy of Owner	-0.082	-1.33	-0.070	-0.82
Delinquencies of Owner	-0.038	-4.35 **a**	-0.046	-3.36 **a**
Judgement against Owner	0.030	0.86	0.062	1.16
Home Equity of Owner	0.000	2.15 **b**	0.000	2.89 **a**
Other Wealth of Owner	0.000	1.74	0.000	0.86
Relationship Characteristics				
Length of relationship	-0.00005	-0.58	-0.00018	-1.40
Distance from lender	-0.00002	-0.64	-0.00004	-1.14
Applied in person	-0.030	-1.88	-0.051	-2.07 **b**
Checking relationship	-0.054	-2.92 **a**	-0.071	-2.50 **b**
Savings relationship	0.053	1.96 **b**	0.111	2.49 **b**
Line of credit relationship	0.149	7.32 **a**	0.099	2.74 **a**
Loan relationship	-0.002	-0.13	-0.007	-0.25
Fin'l Svc relationship	-0.014	-0.82	-0.034	-1.30
Loan amount to assets	-0.009	-2.66 **a**	-0.018	-3.38 **a**
Number of sources	-0.034	-7.79 **a**	-0.050	-7.27 **a**

a and **b** indicate statistical significance at the 0.01 and 0.05 levels, respectively.