Entrepreneurial Optimism, Credit Availability, and Cost of Financing: Evidence from U.S. Small Businesses

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Abstract

Does entrepreneurial optimism affect the financing decisions of small firms? Do financiers have better knowledge of entrepreneurs' unrealistic optimism and curtail lending to them? Using a large sample of U.S. small businesses and a new measure of optimism, we find that more optimistic entrepreneurs tend to use more short-term debt. We do not find evidence that banks curtail lending to more optimistic entrepreneurs. In fact, banks are more likely to approve loan applications by optimistic entrepreneurs, they do not charge an interest premium, and do not require more collateral. Our results are robust to alternative measures of optimism, alternative samples, and controls for private information.

Key words: Optimism; Small Business Financing; Credit Availability; Capital Structure

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1. Introduction

While the prevalence of entrepreneurial optimism and its importance is well-recognized, the potential implications of entrepreneurial optimism for small business financing and investment decisions have received little attention.[1] Do optimistic entrepreneurs borrow more? Do they tend to use more short-term debt? Are financial intermediaries able to screen optimistic entrepreneurs? Are banks and other financial institutions charging optimistic entrepreneurs higher rates? These are all important questions that have not been systematically studied. Our study aims to fill this gap in the literature. We explore the potential influence of entrepreneurial optimism on small business financing decisions from three perspectives: capital structure, credit availability, and the cost of capital.

The Achilles heel of any behavioral corporate finance study is the empirical measure of managerial bias. Toward this end, we design an innovative measure of optimism. In particular, we use the difference between the unbiased probability that the entrepreneur's application for loans will be denied given the firm characteristics and credit conditions and the entrepreneur's subjective assessment of this probability as our measure of optimism. We discuss our design in details in Section 3. To ensure our measure captures optimism, we ask if our measure correlates with entrepreneurs' various demographic characteristics, such as gender, race, education, and experience, in the way as established in the existing literature. We find that it does.

[1] The few exceptions are De Meza and Southey (1996), Cassar and Friedman (2007), and Landier and Thesman (2009).

Using our optimism measure, we first examine the effect of entrepreneurial optimism on small businesses' capital structure. The existing finance literature provides some empirical evidence (see, for instance, Malmendier and Tate (2005, 2008)) with regard to the effect of managerial optimism on capital structure of established public firms. Entrepreneurial optimism, however, may have a much more important impact on the capital structure of small businesses than big corporations because mechanisms that might constrain less-than-fully-rational managers of a big corporation into making rational decisions might not be available in small firms. For example, the external market for corporate control might not work well for tightly-held small firms. Furthermore, some internal corporate governance mechanisms, such as proxy fights, boards of directors, might not be available.

Because the predictions of behavioral capital structure models are similar to those derived from the traditional asymmetric information and agency cost theory of capital structure, in our analysis we control for the predictions of standard, non-behavioral capital structure models. Controlling for various firm characteristics such as firm age, firm size, percentage of tangible assets, etc., we find that more optimistic entrepreneurs use significantly more short-term debt than less optimistic entrepreneurs. Specifically, a small firm with the most optimistic entrepreneur has a ratio of short-term debt to long-term debt about 4% to 6% higher than a similar firm with the least optimistic entrepreneur.

Our second set of analyses examines the effect of entrepreneurial optimism on the availability and cost of credit. A large body of the small business lending literature examines how the credit availability and cost of lending change with the level of information asymmetry

associated with small businesses.[2] Nevertheless, very few studies focus on whether banks' lending decisions are conditional on entrepreneurs' behavioral attributes such as optimism. De Meza and Southey (1996) and De Meza (2002) argue that those unrealistically optimistic self-select to become entrepreneurs and the entrepreneurial optimism increases over-lending especially when financiers are not completely immune to over-optimism. The game-theoretic model by Manove and Padilla (1999) argues that banks cannot readily differentiate optimists from other agents. This feature consequently connects the fate of realists and optimists in the credit market and undermines efficiency for all agents. To the best of our knowledge, our paper is the first to empirically address this issue.

We do not find evidence that financiers respond to optimism by curtailing lending to more optimistic entrepreneurs. In fact, we show that optimistic entrepreneurs have better access to credit. Specifically, they are less likely to pay their trade credit late and their loan applications are more likely to be approved. For instance, the loan application by the most optimistic entrepreneur is 29% to 40% more likely to be approved by banks than that by the least optimistic entrepreneur. Furthermore, we find that optimistic entrepreneurs are not more frequently required to provide collateral for their loans, nor are they charged with higher interest rates compared to their less optimistic peers. Our findings are robust no matter whether we use the 2003 survey data or the 1998 survey data. Our findings are not conditional on alternative measures of optimism either. These findings suggest that financiers do not necessarily have better knowledge than entrepreneurs about their unrealistic optimism.

We realize that our optimism measure could be polluted by lenders' private information that may be difficult to observe in our data. While it is impossible to completely eliminate the

[2] For example, see Petersen and Rajan (1994), Cole (1998), Berger, Klapper, and Udell (2001), Petersen and Rajan (2002), Berger and Udell (2002), Cole, Goldberg, and White, (2004), Berger, Miller, Petersen, Rajan, and Stein (2005), Cole, (2009), among many others.

pollution due to unobserved factors, it is unlikely that this induces any systematic biases in our analysis. Nevertheless, we take a number of approaches to alleviate the effect of this potential pollution on our main findings. First, in relevant specifications, we control for lenders' private information on the borrower's quality by including the distance and the length of relationship between lenders and borrowers, as well as the communication method used for loan applications. These variables are found in the existing literature to correlate with lenders' private information. Second, we replicate our main findings by using residuals from regressions of our optimism measure on the above three proxies for the lenders' private information, which represent the part of optimism that cannot be explained by lenders' private information. We find our main findings in the paper carry through under this alternative approach.

In our opinion, our study makes contributions to the following fields in the finance and entrepreneurship literature. First, our paper adds to the literature on the impact of managerial optimism on decision-making in small private firms. Cassar and Friedman (2007) find that overconfidence increases the likelihood that an individual will begin pursuing startup activities. However, outside of entry decisions, they do not find overconfidence to be a significant determinant of the amount of financial and human capital the entrepreneur invests in the startup or the risk of the entrepreneurial investment. Landier and Thesmar (2009) is closest to our study. They model the effect of entrepreneurial optimism on financial contracting, particularly the choice of short-term debt and long-term debt and find supporting evidence using a France survey data. They measure optimism using entrepreneurs' demographic characteristics, such as their age, gender, and education. Our paper uses a unique measure of entrepreneurial optimism and extends their empirical findings by examining both the choice of debt versus equity and the choice of various debt contract characteristics using the US Federal Reserve Board's SSBF data.

Since US financial markets differ substantially from the French financial markets (for example, in terms of the availability of venture capital, the structure of the banking system, etc.), this study provides new and important evidence on the impact of managerial optimism on capital structure of small businesses.

Second, this study contributes to the literature on small business lending by showing empirical evidence, for the first time, regarding the relation between entrepreneurial optimism and banks' lending decisions. Specifically, we show financiers do not necessarily have better knowledge than entrepreneurs about their unrealistic optimism and do not curtail lending to more optimistic entrepreneurs, consistent with the theoretic predictions in De Meza and Southey (1996), Manove and Padilla (1999), and De Meza (2002). Our findings have important implications for small businesses' credit accessibility. One impact of the unrealistic optimism is that lower ability entrepreneurs are willing to apply for credit. This lowers banks' returns per loan as they are not able to screen overoptimistic entrepreneurs from realistic ones. Thus optimism causes banks to increase interest rates on loans to small businesses on average and to be more dependent on the personal wealth of entrepreneurs, which depresses the supply of credit to small businesses, particularly people with lower personal wealth. Our findings also lend an explanation to the credit availability we observe before and after the financial crisis of 2007. There was substantial overlending when the credit was cheap, or too many bad projects were financed. On the other hand, there is severe shortage of credit to small business during the financial crisis, where even the good projects are not financed.

The remainder of the paper is organized as follows: Section 2 reviews relevant literature and develops testable hypotheses; Section 3 introduces the method that we apply to measure entrepreneurial optimism; Section 4 summarizes the sample and data; Section 5 reports the

results of our empirical analysis; in Section 6, we discuss additional robustness checks; finally, Section 7 summarizes our primary conclusions.

2. Background and Hypotheses Development

In this section, we briefly review the existing literature on managerial optimism, capital structure and small business lending, and put forth several hypotheses regarding the effect of entrepreneurial optimism on small businesses' financing decision and credit availability.

2.1. Literature review

2.1.1. Managerial Optimism

The role of managerial optimism and overconfidence in a firm's investment and financing decisions has been a subject of an ongoing debate in the corporate finance literature. Following Roll's (1983) pioneering study on the role of managerial overoptimism in corporate acquisitions, the merits of managers' possible departure from full rationality, and behavioral corporate finance in general, have been examined in a number of theoretical and empirical studies.

Heaton (2002) is the first to introduce a behavioral capital structure model. He suggests that because optimistic managers systematically attach higher probabilities to good firm performance than the capital market, they believe that the capital market undervalues the firm's risky securities. Thus, in an efficient market, issuing a risky security is always perceived by optimistic managers as a negative net present value event. Heaton's model thus induces a pecking order capital structure preference, where managers prefer internal cash or risk-free debt to risky debt, and prefer risky debt to equity. Hackbarth (2008) develops a trade-off model of

capital structure with optimistic and overconfident managers. His model predicts that optimistic managers choose higher debt levels and issue new debt more often. On the other hand, the optimism has also a beneficial effect in his model since it restrains managers from wasting the funds of the corporation.

However, the predictions of Heaton (2002) and Hackbarth (2008) are not novel, since they are also independently derived from the traditional agency and asymmetric information models of capital structure discussed in the previous sub-section. Thus, when testing the predictions of the behavioral capital structure models one has to control for the agency and asymmetric information explanations of the capital structure choice.

Several empirical studies examine the effect of managerial optimism on corporate investment decisions. For instance, Malmendier and Tate (2005, 2008) use the tendency of CEOs to delay the exercise of their stock options to proxy for optimism, and show that this measure correlates with the intensity of their firms' investments. Ben-David, Graham and Harvey (2007) and Sutner and Weber (2008) show that the overconfidence of top executives affects various corporate decisions using survey data. Liu and Taffler (2008) measure CEO overconfidence with formal content analysis of CEO statements, and document that CEO optimism is positively correlated with investment activity.

A few recent studies explore the role of optimism in entrepreneurs' and, in a broader sense, individuals' decision making. Puri and Robinson (2007) creates a measure of optimism using the Survey of Consumer Finance by comparing self-reported life expectancy to that implied by statistical tables. They find that optimism is related to numerous work/life choices. Cassar and Friedman (2007) find that overconfidence increases the likelihood that an individual will begin pursuing startup activities. However, outside of entry decisions, they do not find

overconfidence to be a significant determinant of the amount of financial and human capital the entrepreneur invests in the startup or the risk of the entrepreneurial investment. Landier and Thesmar (2009) model the effect of entrepreneurial optimism on financial contracting, particularly the choice of short-term debt and long-term debt and find supporting evidence using a France survey data. They measure optimism using entrepreneurs' demographic characteristics, such as their age, gender, and education.

2.1.2. Capital Structure

Over the years, numerous theories on why and how firms borrow money have been proposed. Among those, there are generally three explanations of a firm's capital structure decisions that have received the most attention from finance scholars: the Pecking Order Theory (Myers and Majluf, 1984; Myers, 1984), the Trade-Off Theory (Jensen and Meckling, 1976; Jensen, 1986; Hart and Moore, 1994), and the Market Timing Theory (Baker and Wurgler, 2002). The pecking order theory is based on asymmetric information arguments and predicts that firms turn to the sources of financing with the lowest degree of information asymmetry first. Thus, according to this theory firms utilize retained earnings first, then use debt financing (which has a smaller adverse selection premium than outside equity), and use outside equity as a last resort. On the other hand, the trade-off theory asserts that the decision to use debt is based on the trade-off between the benefits from debt (tax deductibility of interest payments, disciplining effect on managers) and costs associated with it (costs of financial distress, shareholder-debtholder conflicts). Lastly, the market timing theory, which is the newest of the three, argues that the firm issues equity in hot equity markets and debt in cold equity markets.

The voluminous empirical literature on capital structure has so far yielded mixed results on which theory best explains a firm's capital structure decision.[3] A recent study by Frank and Goyal (2008) documents six core factors that significantly affect capital structure decisions: mean industry leverage, market-to-book ratios, tangibility of assets, firm profits, firm size, and expected inflation.

While the overwhelming majority of empirical studies involve publicly traded firms, very few focus on small private firms. These limited studies typically focus on venture capital backed firms (Cumming, 2005). Most recently, Cole (2009) investigates the capital structure decisions of small private U.S. firms. He finds that firm size, age, and profitability are negatively related to firm leverage and firm liquidity, risk and tangibility of assets are positively related to firm leverage.

2.1.3. Small Business Lending

Despite the fact that they have few assets and cannot offer much collateral, small firms tend to borrow significant amount of money (for example, Berger and Udell (1998) report that roughly 50% of the small firms' financing comes in a form of debt), and concentrate their external borrowing from commercial banks (Petersen and Rajan, 1994; Berger and Udell, 1998). The asymmetric information problems that plague the relationship between small businesses and lenders (Stiglitz and Weiss, 1981) might prevent a good firm from obtaining much needed financing. These problems could be mitigated in several ways, such as relationship lending, collateral requirements, choice of loan terms and maturity, use of bank guarantees, etc.

[3] See Titman and Wessels (1988), Harris and Raviv (1991), Shyam-Sunder and Myers (1999), Graham and Harvey (2001), Frank and Goyal (2003), Mackay and Phillips (2005), Leary and Roberts (2005).

Probably the main way of alleviating the moral hazard and adverse selection issues generated by information asymmetry is by relying on relationship lending. The benefits of relationship lending are well-documented in the literature. For example, a number of studies find that building close ties with lenders results in larger availability of credit (Petersen and Rajan, 1994; Elsas and Krahnen, 1998; Scott and Dunkelberg, 1999; Machauer and Weber, 2000). Cole (1998) documents that a pre-existing relationship between a company and a lender (for example, savings accounts and financial management services) increases the likelihood that the lender will extend credit, but the length of the relationship does not play a significant role. Both Petersen and Rajan (1994) and Cole (1998) find that small firms with many banking relationships are less likely to obtain credit, suggesting that private information about a firm is less valuable when this firm uses multiple sources of credit. In addition, small firms with longer bank relationships pay lower rates (Berger and Udell, 1995; Harhoff and Korting, 1998; Scott and Dunkelberg, 1999; Degryse and van Cayseele, 2000), have to provide less collateral (Berger and Udell, 1995; Harhoff and Korting, 1998; Scott and Dunkelberg, 1999), and have greater protection against the interest rate cycle (Berlin and Mester, 1998; Ferri and Messouri, 2000).

The literature has also established that the distance between borrowers and lenders and the communication method (in person or not) matter in small business lending. For instance, Peterson and Rajan (2002) show that distance decreases with the borrowing cost while arm's length communication method (phone and mail) increases the borrowing cost. This is presumably because local banks are better at collecting "soft" or private information. Similarly, the in person communication method allows banks to better observe the true quality of the firm.

Bank type also plays a role in relationship lending. Berger, Saunders, Scalise, and Udell (1998) and Berger, Miller, Petersen, Rajan, and Stein (2005) show that smaller banks are better

at collecting soft information and dealing with informationally-opaque borrowers than larger banks. Cole, Goldberg, and White (2004) find that small banks rely on information from pre-existing relationships, while larger banks use more standard criteria obtained from financial statements when making lending decisions.

Again, like in the case with capital structure, very few studies have examined the role that entrepreneurial optimism plays in small business lending. With this study we try to shed more light on this issue.

2.2. Testable Hypotheses

With few exceptions (see, for example, Landier and Thesman (2009) and De Meza and Southey (1996)), the debate on the role of managerial optimism has so far mainly focused on established public firms. Even then, few attempts have been made to date to examine the effect of optimistic managers on a firm's financing decisions. Why is it interesting to study the effect of optimism on entrepreneurial ventures' financing decisions? First, financing policies undertaken at the early stages in a firm's lifecycle have significant impact on that firm's future development, performance, governance and ownership structure. Second, there is a growing strand of literature in economics that presents evidence that rewards from entrepreneurship tend to be small compared to the risks involved, and explains this finding with entrepreneurs' tendency to be overly optimistic about the potential returns from entrepreneurship.[4] It is interesting to examine whether optimism also affects startups' financing decisions. Third, in small businesses often entrepreneurs are the managers.[5] Mechanisms that might constrain less-than-fully-rational managers of a big corporation into making rational decisions might or might not be available.

[4] See Hamilton (2000) and Moskowitz and Vissing-Jorgensen (2003).
[5] For example, Berger and Udell (1998) report that this is the case in 86% of the firms included in the 1993 NSSFB.

For example, the external market for corporate control might not work well for tightly-held small firms. In addition, some internal corporate governance mechanisms, such as proxy fights, boards of directors, might not be available. Fourth, providing small business with an access to financing has for years been a subject of various government policies. Investigation of how entrepreneurial optimism affects small businesses' financing decisions might help policy makers and financial institutions with their decisions on how much capital and in what form to extend to small firms.

Heaton's model suggests that small firms run by optimistic entrepreneurs should prefer debt to outside equity financing. De Meza and Southey (1996) specifically model the capital structure of a startup as a result of managerial optimism. One of the main predictions of their model is that entrepreneurs prefer internal cash or risk-free debt to risky debt, and prefer risky debt to equity. Therefore, based on these predictions we test the following hypothesis:

H1: Optimistic entrepreneurs are more likely to prefer debt to equity financing. Thus, controlling for other determinants of capital structure, small firms with optimistic entrepreneurs are more likely to choose highly levered capital structure.

Standard bargaining-based models of capital structure (Berglöf and Thadden, 1994) predict that a firm will have both short-term and long-term debt claims. Bank loans to small businesses usually tend to be short-term (Gertler and Gilchrist, 1994; Chittenden, Hall, and Hutchinson, 1996; Berger and Udell, 1998). Landier and Thesmar (2009) model the effect of entrepreneurial optimism on the choice of short-term debt vs. long-term debt. They argue that optimists would self-select into short-term debt for two reasons: (1) it bridges the gap in beliefs by letting the entrepreneur take a bet on his project's success, and (2) it also lets the investor impose adaptation decisions in bad states. Thus, our second testable hypothesis is the following:

H2: Optimistic entrepreneurs are likely to use more short-term debt.

It should be noted that ours is not the first study to look at small firms' debt maturity choice. For example, Scherr and Hulburt (2001) document that small firms are more likely to use short-term debt if their assets have shorter maturities and if they have very low or very high default probability. Landier and Thesmar (2009) test their model using French data and find that optimistic entrepreneurs tend to use more short-term debt. However, no study to date has examined the impact of entrepreneurial optimism on debt maturity for a large sample of U.S. small firms. Thus, with our study we hope to add some new evidence to the current literature on debt maturity of small firms.

The next set of predictions relate to whether lending institutions tend to curtail lending to optimistic entrepreneurs. De Meza and Southey (1996) and De Meza (2001) argue that the presence of overoptimistic entrepreneurs would result in generally lower quality of borrowers, excessive lending, and lower expected return per loan for lenders. Banks might have the incentives to limit credit to optimistic entrepreneurs in order to protect themselves from the entrance of lower quality borrowers to the current borrower pool and eventual decrease in their expected rates of return. Limitations on lending could also be manifested in credit rationing, charging higher interest rates, and requiring for more collateral (Manove and Padilla, 1999). Along those lines, Petersen and Rajan (1994) argue that stretching trade credit is a very expensive way to obtain finance, and a firm is likely to do so only when rationed by institutional lenders. If overoptimistic entrepreneurs are more likely to be rationed, then we expect a positive correlation between entrepreneurial optimism and the probability that trade credit is paid late.

If optimistic entrepreneurs indeed face tighter credit constraints, then we conjecture the following:

H3: Optimistic entrepreneurs are more likely to pay trade credit late, other things equal.

H4: Optimistic entrepreneurs' loan applications are more likely to be rejected, other things equal.

H5: Optimistic entrepreneurs are more often requested to provide collateral for the loans granted, other things equal.

H6: The interest rate of loans granted to optimistic entrepreneurs is higher, other things equal.

3. A New Measure of Entrepreneurial Optimism

One of the challenges incurred in empirical studies of behavioral corporate finance is measuring managerial behavioral biases. Without such an empirical measure, the optimistic managers approach is difficult to distinguish from traditional agency theory (Baker, Rubak and Wurgler, 2004) or models of costly external financing built on asymmetric information (Stein (2003)). In the spirit of Puri and Robinson (2007), here we use the difference between the realistic probability that the entrepreneur's application for loans will be denied given the firm characteristics and credit conditions and the entrepreneur's subjective assessment of this probability as our measure of optimism.

Let $E_U(d|x)$ be the unbiased probability that the entrepreneur will be denied a loan if she applies for it conditional on a vector of firm characteristics and credit conditions *x*. Similarly, let $E_S(d|x)$ be the expected value of entrepreneur *I's* assessment on the probability that she will be denied if she applies for a loan conditional on the same vector of firm characteristics and credit conditions *x*, taken under their subjective probability distribution, denoted by $E_S(\ )$. Our measure of optimism is the simply

$$Optimism_I = E_U(d|x) - E_S(d|x).$$

Both the 1998 and 2003 Federal Reserve Board surveys ask entrepreneurs the following question:

"During the last three years, were there times when [FIRM] needed credit, but did not apply because it thought the application would be turned down?" Entrepreneurs' answers to this question are impacted by the true credit condition of the firm and also the entrepreneurs' hubris or level of optimism.

We use the answer to this question as our value for $E_S(d|x)$. Specifically, it is equal to 1 if the entrepreneur's answer to the above question is "yes", and zero otherwise. We then use a logit regression to predict the realistic probability that entrepreneurs' application for loans will potentially be turned down. Empirically, we run a logit regression where the dependent variable is $E_S(d|x)$ and the explanatory variables include a number of firm characteristics and measures of credit conditions. The predicted probability based on this logit regression is our value of $E_U(d|x)$.

By construction the difference $E_U(d|x) - E_S(d|x)$ can take on values in the interval (-1, 1). It will be close to -1 when the model predicts that the entrepreneur would not be denied credit, but she is afraid to apply (i.e., she is "pessimistic"). For entrepreneurs without behavioral bias $E_U(d|x) - E_S(d|x)$ should be close to 0. On the other hand, its value will be close to 1 if the model

predicts that the entrepreneur should not be applying for credit because she will be denied, but she applies anyway (i.e., she is optimistic) because she overestimates the true state of the firm. Thus, $E_U(d|x)$- $E_S(d|x)$ increases the more optimistic the entrepreneur is. Lastly, it should be noted that $E_U(d|x)$ could also differ from $E_S(d|x)$ because of random errors that rational entrepreneurs make. Thus, $E_U(d|x)$- $E_S(d|x)$ could have two components: a bias and an error. However, the error is by assumption unpredictable with the information set *x* and its mean should be zero. As a robustness check, we use the fractional rank of the first optimism measure, from 0 to 1, as our second measure of optimism.

It should be noted that our measure of optimism is slightly different from the conventional concept of optimism. Because the survey question in SSBF is directly about entrepreneurs' self-assessment on the probability of getting new loans from financial institutions, instead of being a direct proxy for the overestimation of the likelihood of business success, our measure of optimism reflects entrepreneurs' underestimation of financing risks.[6] This underestimation, however, could be due to the fact that entrepreneurs consistently attach unrealistically higher probability of success to their projects. Thus, although here we focus on optimism regarding the financing of the business, our analysis is very relevant to the more general theme of entrepreneurial optimism.

We use the above-mentioned measures of entrepreneurial optimism to empirically test the hypotheses outlined in the previous section. We believe our measures of optimisms are superior to some of the demographic characteristics that previous studies rely on to measure optimism. The main reason is that demographic characteristics might proxy for a host of other things. Also, as often happens in the empirical analysis, a subset of the demographic characteristics might

[6] Nanda and Rhodes-Kropf (2010) define financing risk as the uncertainty that the project might not be funded in the future.

have insignificant coefficients or coefficients with opposite signs from those predicted. This makes it difficult to interpret whether managerial optimism has a significant impact or not. Using a single measure of optimism makes it easier to gauge statistical significance and interpret the coefficients.

Similar to the optimism measure in Puri and Robinson (2007), ours is also open to many potential alternative interpretations. The most obvious alternative is that it could be picking up the private information that may be difficult to observe rather than differences in entrepreneurs' expectations. While this is a potential criticism of any such econometric approach, we believe that our measure does not introduce any systematic biases. It is true that an entrepreneur that we classify as optimistic might be simply applying for a loan because the bank and the entrepreneur have positive private information that is not available to others (e.g., the bank believes the business will have positive NPV projects in the future). On the other hand, it is also conceivable that an entrepreneur who, according to our model, looks like she should get a loan might be reluctant to apply because she thinks the bank may turn her down (e.g., the bank, because of its expertise in and knowledge of the business, might deem the future prospects of the business to be rather weak). Such cases certainly introduce noise in our estimation, but not any systematic bias. Nevertheless, in the analysis that follows, we try to control for lenders' potential private information regarding borrower's quality using measures well documented in the literature to alleviate this concern. We address the alternatives in Section 6 in great detail.

4. Data and Summary Statistics

The primary source of data for this study is the Federal Reserve Board's 1998 and 2003 SSBF data. The firms surveyed constitute a nationally representative sample of about 7,800

small businesses operating in the U.S., where a small business is defined as a non-financial, non-farm enterprise employing fewer than 500 full-time equivalent employees.

The SSBF data provides information on each enterprise's balance sheet, income statement, its credit history, the firm's characteristics, including two-digit SIC code, organizational form, age, location, how the firm was established, and demographic characteristics of each firm's primary owner, including gender, age, business experience, and education. The surveyed data also provides detailed information about each firm's most recent borrowing experience. This includes whether the firm applied for credit and for firm that applied, whether the potential lender approved or denied the firm's credit application, and, if the lender extended credit, the terms of the loan.

Of the 7,801 firms surveyed by the 1998 and 2003 SSBF, we exclude firms that are inherited or acquired as a gift or publicly traded. We require that the primary owners of firms are responsible for daily management. Firm without assets information are also excluded. This leaves us 6,320 firms, where 2960 firms are from the 1998 survey and the other 3360 firms are from the 2003 survey. In the analysis of most recently approved loans, we exclude renews of credit lines and obtain 654 observation from the 2003 survey and 570 observations from the 1998 survey.

The majority of small U.S. firms in existence in 1998 remained in existence in 2003. Therefore, the target populations in the two surveys are not independent. "Double" counting these firms will seriously bias the empirical results. To address this concern, we conduct our analysis for the 2003 and 1998 surveys separately.[7] Our primary interest is on the 2003 survey since it includes more recent data. Results using 1998 survey data provide further robustness of our findings.

[7] We would like to thank Rebel Cole for this suggestion.

Table 1 summarizes selected characteristics of our sample. Small businesses exhibit high debt/assets ratio. For instance, the mean debt ratio of 1998 survey firms is 210%, with a median of 40%; the mean debt ratio of 2003 survey firms is 130%, with a median of 40%. Current liability on average accounts for 44.5% of total liability according to the 1998 survey. The similar measure is 42.6% based on the 2003 survey.

[Insert Table 1 here.]

The mean and median ages of entrepreneurs are around 50-52. Entrepreneurs on average have 17-20 years' business experience. Male entrepreneurs account for 73.2% and 77.9% of the 1998 sample and the 2003 sample, respectively. More than 50% of the entrepreneurs have college and graduate degrees.

About 44.9% of the 1998 sample and 40.2% of the 2003 sample had times when their trade credit is paid late. About 26.6% of the 1998 sample and 41.9% of the 2003 sample applied for credits from various financial institutions in last three years prior to each survey. The percentages of applied loans that were always approved are 72.5% and 87.4%, respectively, for the 1998 and 2003 sample. For about 17.9% of the 1998 sample and 8.5% of the 2003 sample, loans that they applied for over the past three years were always denied.

Panel D of Table 1 summarizes the characteristics of approved small business new loans. The mean and median sizes of loans granted for the 2003 sample are $620.8 million and $76.3 million, larger than the similar measures for the 1998 sample, which are $312.0 million and $41.7 million. The mean and median lengths of loans for the 2003 sample are 66 months and 48 months, longer than those for the 1998 sample, which are 54 months and 36 months. The average loan interest rate of the 2003 sample is 6.0%, 1.5% higher than the concurrent prime rate; while the average loan interest rate of the 1998 sample is 9.0%, 0.8% higher than the concurrent prime

rate. About 58.0% of the loans require certain type of collateral for the 2003 sample, lower than the same measure for the 1998 sample, which is 60.2%. The mean and median distances between the firm and the lender for the 1998 sample are 20.2 miles and 3.0 miles, while the same measures increases to 80.0 miles and 5 miles in the 2003 survey. On the other hand, the length of the relationship between the firm and the lender appear to be longer in the 2003 survey than in the 1998 survey. For instance, the mean length of the relationship is 70.5 months in the 1998 survey, while 89.3 months in the 2003 survey.

5. Empirical Analysis

5.1. Measures of Entrepreneurial Optimism

To measure entrepreneurial optimism, as described in Section 3, we start with a logit regression, where the dependent variable is a dummy equal to one if the entrepreneur did not apply for a loan because he or she is afraid that the application will be turned down, even though the firm needs credit, and zero otherwise. Our independent variables are categorized into three groups. The first group of variables includes the Dun & Bradstreet (DB) credit score rankings.[8] In the 2003 survey, the higher the ranking, the lower the credit risk of the firm. It is the opposite in the 1998 survey. Furthermore, the former has 6 ranks, while the latter only has 5 ranks. The second group of explanatory variables consists of selected characteristics of firms that potentially will impact whether financiers will grant the applier a loan or not. These variables include firm size, measured as the natural logarithm of assets, firm age, profit margin, the ratio of tangible assets to total assets, a dummy variable indicating whether the firm is organized as a corporation, and a dummy variable indicating whether the firm is located in the urban areas. The third group

[8] If the original Dun & Bradstreet credit scores fall in the range of 0-10, the SSBF DB score ranking is 1; if the score is 11-25, then the ranking is 2; if the score is 26-50, then the ranking is 3; if the score is 51-75, then the ranking is 4; if the score is 76-90, then the ranking is 5; if the score is 91-100, the ranking is 6.

of variables includes two indicator variables related to the bankruptcy history of the firm and the owner. If the firm or the owner had been bankrupt before, the indicator variables are set to equal to 1, and 0 otherwise. An additional control variable is the owners' other personal wealth, excluding the value of the small business. We also include industry dummies in all specifications.

[Insert Table 2 here.]

Regressions in Table 2 show that firm credit risk, firm size, firm age, and entrepreneur's other personal wealth are negatively associated with our dependent variables, while corporation, the percentage of tangible assets, and the bankruptcy history of the owner and the firm are positively correlated to our dependent variables. These findings are not conditional on whether we use the 2003 survey or the 1998 survey.

We then estimate the predicted likelihood that the firm's loan application will be denied using the coefficients estimated in specifications as reported in Table 2. This predicted likelihood indicates to what extent the entrepreneurs were discouraged to apply for a loan by objective factors such as the firm's credit risk and level of information asymmetry. The difference between the predicted likelihood and the actual value of our dependent variable, thus, measures the contribution of the entrepreneur's subjective assessment to the above-mentioned behavior.

5.2. The Demographics of Optimism

To check the robustness of our optimism measure, we relate it to various demographic characteristics of entrepreneurs. The existing literatures have shown that gender, race, education, and experience impact the level of optimism.[9] For instance, males are typically more optimistic

[9] See, for example, Frank (1988), Lundeberg, Fox, and Puncochar (1994), Barber and Odean (2001), Shane (2007), and Fraser and Greene (2008).

than females. White entrepreneurs are found to be more optimistic than entrepreneurs from other races. Education increases the level of optimism, while experience tends to reduce optimism because individuals learn from experience to achieve less biased subjective assessment.

[Insert Table 3 here.]

Consistent with the existing literature, we show in Table 3 that male and white entrepreneurs with higher level of education are more optimistic, while the experience of the entrepreneur is negatively associated with our optimism measure. These findings provide further robustness for our measure of optimism.

5.3. Entrepreneurial Optimism and Small Business Capital Structure

Both De Meza and Southey (1996) and Heaton (2002) suggest that optimistic entrepreneurs prefer debt to equity. Landier and Thesmar (2009) propose that optimists self-select into short-term debt. We empirically examine these two predictions using the 1998 and 2003 SSBF data in this section. The specifications are presented as following:

$$DebtRatio = \alpha + \beta_1 \times Optimism + \beta_2 \times InforAsymmetry + \beta_3 \times ControlVar + \varepsilon \quad (1)$$

$$CL/TL = \alpha + \beta_1 \times Optimism + \beta_2 \times InforAsymmetry + \beta_3 \times ControlVar + \varepsilon \quad (2)$$

where debt ratio is measured as the ratio of total debt to total assets, *CL* represents current liabilities and *TL* represents total liabilities. Our optimism measures include the one estimated in section 5.1 and its fractional rank. A major challenge of behavioral corporate finance is to distinguish the predictions of Heaton's model from those of the traditional capital structure models. In this regard, we use several control variables that account for agency and information asymmetry explanations of capital structure. These are: a measure of the size of the firm, *Ln(Firm Assets)*, a measure of the age of the firm, *Ln(Firm Age)*, a measure of firm profitability,

Profit Margin, and a measure of the tangible assets of the firm, *Percentage of Tangible Assets*. *Ln(Firm Assets)* and *Ln(Firm Age)* proxy for the level of information asymmetry associated with a firm. *Profit Margin* could be viewed as a proxy for the probability of financial distress (the more profitable the firm is, the lower the probability of financial distress). It can be also viewed as a proxy for the availability of tax shields and hence the tax benefits of debt. *Percentage of Tangible Assets* measures the availability of tangible assets that could be used as collateral. In addition, we also control for the firm's organization form (corporation or not), firm location (urban or not), and the entrepreneur's personal wealth (not including the value of the small business). All specifications also include industry dummies.

The results from the debt ratio regression are presented in Panel A of Table 4. As seen from the table, we do not find significant correlation between entrepreneurial optimism and debt ratio for the both samples. The coefficients on the *Optimism* variables are not significant in any of the specifications. Thus, the empirical analysis suggests that firms run by overoptimistic entrepreneurs not necessarily use more debt financing than other firms. This runs counter to our Hypothesis 1.

[Insert Table 4 here.]

In Panel B of Table 4, we investigate whether more optimistic entrepreneurs use more short-term debt. We find that optimism is significantly and positively correlated to the ratio of CL/TL, indicating that more optimistic entrepreneurs use more short-term debt. This is consistent with the findings in Landier and Thesmar (2009) who use French survey data. The impact of optimism on small firms' debt maturity structure is both statistically and economically significant. Specifically, a small firm with the most optimistic entrepreneur has a ratio of short-

term debt to long-term debt about 4-6% higher than one with the least optimistic entrepreneur assuming other aspects of the firms similar. Thus, we find empirical support for Hypothesis 2.

Our findings are robust to controlling for various firm characteristics. For example, we also find that older firms use more short-term debt, while firms with large fraction of tangible assets and firms organized as corporations tend to use more long-term debt claims.

5.4. Entrepreneurial Optimism and Credit Availability

In this section, we examine whether and how entrepreneurial optimism impacts credit availability. We use two proxies for credit availability. The first measure is a dummy variable which is equal to 1 if the firm had paid trade credit late, and 0 otherwise. Petersen and Rajan (1994) argue that stretching trade credit is a very expensive way to obtain finance, and a firm is likely to do so only when rationed by institutional lenders. The second measure is an indicator variable which is set to equal to one if the loan for which the firm most recently applied for is approved, and 0 otherwise.[10] If financiers curtail lending to optimistic entrepreneurs, we should observe a negative association between optimism and the probability of approval. Specifically, our regression models are the following:

$$TradeCreditPaidLate = \alpha + \beta_1 \times Optimism + \beta_2 \times InforAsymmetry + \beta_3 \times OtherControl + \varepsilon \quad (3)$$

$$Approval = \alpha + \beta_1 \times Optimism + \beta_2 \times InforAsymmetry + \beta_3 \times \mathrm{Pr}ivateInfor + \beta_4 \times OtherControl + \varepsilon \quad (4)$$

[Insert Table 5 here.]

[10] In both surveys, entrepreneurs reply whether their most recently applied loans have always been approved, sometimes approved, and always denied. If the entrepreneurs reply "always denied", then the dummy variable *Approval* is set to equal to 0. We also set *Approval* equal to 1 only when entrepreneurs reply "always approved". The empirical results are robust in the sense that loan applications of more optimistic entrepreneurs are more likely to be approved. We did not report this set of results for briefness. They are available upon request.

We run probit regressions on whether firms paid trade credit late in Panel A of Table 5.[11] We use firm size, measured as the natural logarithm of assets, percentage of tangible assets, and firm age as proxies for the level of information asymmetry. In addition, we also control for firm profit margin, organization form (corporation or not), firm location (urban or not), and the entrepreneur's personal wealth. All specifications also include industry dummies.

We find that optimistic entrepreneurs are less likely to pay their trade credit late. This finding is not conditional on whether we use the 2003 survey or the 1998 survey. Specifically, a small firm with the most optimistic entrepreneur is roughly 18% less likely to pay trade credit late than the least optimistic entrepreneur, holding everything else equal. This finding suggests that more optimistic entrepreneurs in fact have better access to credit than less optimistic entrepreneurs. It calls into question the notion that optimistic entrepreneurs are rationed by financiers, and hence rejects Hypothesis 3.

In Panel B of Table 5, we run probit regressions to examine whether entrepreneurial optimism impacts the probability of loan approval. In addition to the control variables we use in Panel A, we also include dummies indicating the credit risk of the firm, such as owner bankrupt dummy, firm bankrupt dummy, and DB score ranking dummies. Furthermore, we include the distance between the lender and the borrower, the length of relationship, and the communication method as controls for the potential private information that lenders might have. The small business lending literature has shown that, typically, geographic proximity, long-term relationship, and in person communication method allow lenders to collect more private information. If our optimism measure is polluted by the unobserved factors related to firm quality, this shall, at least partly, alleviate the effect of the potential pollution on our findings. As

[11] We also ran tobit regressions on the fraction of trade credit paid late using the same set of independent variables. We find that optimism is significantly negatively associated with the fraction of trade credit paid late. This set of results are available upon request.

shown in Table 5, the coefficients of our optimism measures are all significantly positive no matter which survey we use, suggesting that the loan applications of optimistic entrepreneurs are more likely to be approved. Specifically, the loan application by the most optimistic entrepreneur is 29-40% more likely to be approved by banks than that by the least optimistic entrepreneur. This finding again indicates that financiers probably do not ration optimistic entrepreneurs, consistent with our finding from Panel A.

In addition, similar to Cole, Goldberg, and White (2004), we find that smaller and younger firms are more likely to be denied loans by financiers. Both the firms' bankruptcy history and the entrepreneur's bankruptcy history increases the likelihood that their loan applications will be denied. Furthermore, we show that if firms have too many short-term liabilities, their loan applications are more likely to be denied. Entrepreneur's personal wealth other than the small business they own is significantly and positively correlated with the probability of loan approval, suggesting financial institutions' lending to small business decisions are very much dependent on entrepreneurs' personal wealth.

Our analysis in this section shows that more optimistic entrepreneurs are not necessarily rationed by financial lenders as they are less likely to pay their trade credit late compared with their less optimistic counterparts. Furthermore, we find that financiers are more likely to approve more optimistic entrepreneurs' loan applications. Our findings raise the question on whether financial institutions can effectively screen overoptimistic entrepreneurs from realistic ones.

5.5. Entrepreneurial Optimism and Cost of Financing

In this section, we further analyze whether financial lenders curtail lending to optimistic entrepreneurs by, for instance, requesting more collateral, and charging a higher interest rate.

Specifically, if lenders curtail lending to optimistic entrepreneurs, then we expect that the loans granted to optimistic entrepreneurs are more often collateralized, and the loan interest rate is higher. Our specifications are summarized as follows:

$$Collateral = \alpha + \beta_1 \times Optimism + \beta_2 \times InforAsymmetry + \beta_3 \times \Pr ivateInfor + \beta_4 \times Loan + \beta_5 \times OtherControl + \varepsilon \quad (5)$$

$$Spread = \alpha + \beta_1 \times Optimism + \beta_2 \times InforAsymmetry + \beta_3 \times \Pr ivateInfor + \beta_4 \times Loan + \beta_5 \times OtherControl + \varepsilon \quad (6)$$

where *Collateral* is a dummy which is equal to 1 if collateral is required for a specific loan; S*pread* is measured as the difference between the actual interest rate charged and the concurrent prime rate. We use firm size, measured as the natural logarithm of assets, percentage of tangible assets, and firm age as proxies for the level of information asymmetry. To measure lenders' private information on firm quality, we include the distance between borrower and lender, and the length of their relationship and the *In Person* dummy, which is equal to 1, if the entrepreneur communicates with the lender in person and 0 otherwise. In addition, we control for characteristics of loans that potentially influence the cost of financing, such as loan size, loan length, whether the loan is fixed interest, and the type of loans. Other control variables include firm profit margin, organization form (corporation or not), firm location (urban or not), the entrepreneur's personal wealth, dummies indicating the credit risk of the firm, such as owner bankrupt dummy, firm bankrupt dummy, and DB score ranking dummies. All specifications also include industry dummies.

[Insert Table 6 here.]

In Panel A of Table 6 presents the results of probit regressions of whether collateral is requested. The coefficients of our optimism measures are significantly and negatively associated with the probability of collateral requirement when the 2003 sample is used, and negative but insignificant when using the 1998 sample. Therefore, the bottom line is that financiers do not

necessarily require that the optimistic entrepreneurs to provide collateral more often. Consistent with the existing literature (see, e.g., Chan and Kanatas (1985), Stiglitz and Weiss (1986), and Besanko and Thakor (1987)), we further show that the size and length of loans are positively associated with the requirement of collateral, while the length of the relationship between the borrower and the financier decreases the probability of collateral request.

We analyze the determinants of interest spread in Panel B of Table 6. We do not find evidence that optimistic entrepreneurs are charged an interest premium by financial lenders. In fact, we show that optimism is significantly and negatively associated with the spread between the actual interest rate and concurrent prime rate when using the 1998 sample. However, the coefficients are negative but not significant when the 2003 sample is used. Consistent with existing literature, we find that larger and older firms and collateralized loans are charged a lower spread. Moreover, the distance between the borrower and the financier increases the spread, while the length of relationship decreases interest spread.

In summary, we show that financiers do not require collateral from optimistic entrepreneurs more often than from the less optimistic ones; they also do not charge a higher interest premium on loans granted to more optimistic entrepreneurs. These findings do not support the notion that financiers respond to optimism by curtail lending. One possible explanation for our findings is that financiers do not necessarily have better knowledge about entrepreneurs' unrealistic prospects.

6. Additional Robustness Checks

6.1. A dichotomy measure of optimism

A potential criticism of our optimism measure is that even though it clearly identifies the most optimistic entrepreneurs and the most pessimistic ones, it becomes problematic when coming to rank entrepreneurs' optimism if they have no or little behavioral bias. For instance, if our model predicts an entrepreneur A has a low probability to be denied credit, and she is not afraid to apply, the optimism measure will be a slightly positive number. On the other hand, if our model predicts an entrepreneur B has a high probability to be denied credit, and she is afraid to apply, the optimism measure would be a slightly negative number. Our method ranks entrepreneur A as more optimistic than entrepreneur B while they actually are neither very optimistic nor very pessimistic. To address this concern, we design a dummy variable which differentiates the most optimistic entrepreneurs from the rest. In this section we repeat our analysis using this alternative measure of optimism.

As before, for each observation we calculate the predicted probability based on the coefficient estimates from the logit model in Table 2. Then, we apply the Receiver Operating Characteristics (ROC) analysis to identify an optimal cutoff point to classify observations into "predicted pessimistic" and "predicted optimistic". Specifically, if the predicted probability is greater than the optimal cutoff the observation is classified as pessimistic, and vice versa. After that, we compare classifications based on predicted probability to true response and create a table with four cells – predicted pessimistic and true response = 1 (afraid to apply), predicted pessimistic and true response = 0 (not afraid to apply), predicted optimistic and true response = 0, and predicted optimistic and true response = 1. All observations falling into the cell "predicted pessimistic and true response = 0" are labeled most optimistic entrepreneurs. Then we use a dummy for these observations in the regressions of capital structure, credit availability, and cost of financing to see how this group of entrepreneurs behave differently from the others.

[Insert Table 7 here.]

The regression results with this alternative optimism measure are presented in Table 7. Many results are very similar to our findings in Tables 4-6. For instance, we find that firms run by overoptimistic entrepreneurs are more likely to obtain loan approval, less likely to be asked to provide collateral for loans, and are charged lower interest rates on their loans. Likewise, we do not find any significant effect of optimism on debt ratio. In contrast to our previous findings, we do not find our alternative optimism measure is significantly related to the ratio of CL/TL. With the new measure, we do not document a significant effect of optimism on the probability of trade credit paid late. Most of the coefficients on the control variables (unreported in Table 7 for the sake of brevity) are qualitatively similar to those in Tables 4-6. In general, our results are robust to the alternative measure of optimism.

6.2. Alternative explanations

The previous sections establish an empirical relation between entrepreneurial optimism and small business financing decisions and banks' lending decisions. Optimistic entrepreneurs display different preferences to short-term and long-term debts. Financial institutions do not respond to optimists by curtailing lending potentially because they do not have better knowledge about entrepreneurs' unrealistic prospects. However, similar to the optimism measure in Puri and Robinson (2007), ours is also open to potential alternative interpretations. The most glaring alternative is that it could be picking up private information about business quality that may be difficult to observe rather than differences in entrepreneurs' expectations. In the analysis that follows, we employ a number of approaches to determine whether optimism or the private information drives our results.

As is well-established in the small business lending literature, the relationship between lenders and borrowers, the geographic proximity to lenders, and the in-person method communicating with lenders allow financers to collect more private information regarding the quality of the firms, which helps alleviating the moral hazard and adverse selection issues generated by information asymmetry. In our regressions on cost of financings, we include the length of the relationship between borrowers and lenders, the distance between them, and the method used to for communication (in person or not). This will, at least partly, help control for the private information that lenders have regarding the firm quality. In unreported regressions, we regress our optimism measure on the above-mentioned three proxies for private information, then replicate our main findings using the residuals of these regressions.[12] These residuals are the part of the optimism measures that cannot be explained by the common proxies for the lenders' private information. We find that the main results in the paper carry through under this alternative approach.

Various papers have shown that the demographic characteristics of entrepreneurs have important influence on their accessibility to credit (for instance, race). As shown in Table 3, our optimism measure is significantly correlated with entrepreneurs' demographic characteristics. To avoid collearity, we do not include these variables in regressions in Tables 4-6. In unreported regressions, we replicate our main findings using the residuals from specifications (4) and (8) of Table 3.[13] These residuals are the part of optimism that we cannot explain with entrepreneurs' demographics that might otherwise be correlated with the outcomes of interest. Again, we find that the main results in the paper do not change under this alternative measure of optimism.

[12] The results of this set of regressions are available upon request.
[13] The results of this set of regressions are available upon request.

Coupling our main findings that control for the private information that lenders potentially have (distance, length of relationship, and communication method) with our results on the unexplained optimism either by entrepreneurs' demographic characteristics or lenders' private information on unobserved firm quality, the bulk of the evidence seems to support the notion that banks do not curtail optimistic entrepreneurs presumably because they are not better informed about entrepreneurs' biased expectations.

7. Conclusion

We examine the impact of entrepreneurial optimism on small businesses' financing decisions using the 1998 and 2003 SSBF data. With this our study contributes to the current empirical literature on small business financing which has largely ignored managerial optimism as a factor in firms' financing decisions. To achieve this goal, we design an innovative measure of optimism: we use the difference between the realistic probability that the entrepreneur's application for loans will be denied given the firm characteristics and credit conditions and the entrepreneur's subjective assessment on this probability as our measure of optimism. If the latter is smaller than the former, we determine that the entrepreneur is more optimistic, and vice versa.

Using this optimism measure, we find that the heterogeneity of optimism among entrepreneurs influences their financing decision. Particularly, we show that more optimistic entrepreneurs self-select to use more short-term debt than less optimistic ones, supporting Heaton (2002) assertion that firm capital structure is a function of managerial optimism and Landier and Thesmar (2009) predictions that short-term debt is more appropriate for optimistic entrepreneurs. The impact of managerial optimism is both statistically and economically significant after controlling for factors that represent the level of information asymmetry of the

firm. Thus, our findings indicate that optimistic entrepreneurs are associated with higher financial risk, which may impact the success/failure of small businesses.

We further show that financiers do not curtail lending to more optimistic entrepreneurs and optimistic entrepreneurs do not have worse credit availability than their less optimistic peers. The results are robust to various measures we use to proxy for credit availability and cost of borrowing. They are also robust to alternative measures of optimism after controlling for the private information that lenders potentially have regarding the quality of the firms. These findings suggest that financiers may not have better knowledge than entrepreneurs about their unrealistic optimism. De Meza (2002) argue that asymmetric information creates a systematic opportunity for low-quality firms to free-ride on financial offers made to better firms and entrepreneurial over-optimism makes the over-lending even more pronounced. This is particularly true if financiers are not always immune to optimism. Thus, optimism could potentially cause banks to increase interest rates on loans to small businesses on average and to be more dependent on the personal wealth of entrepreneurs, which depresses the supply of credit to small businesses, particularly people with lower personal wealth. Our findings also lend an explanation to the credit availability we observe before and after the financial crisis of 2007. There was substantial overlending when the credit was cheap, or too many bad projects were financed. On the other hand, there is severe shortage of credit to small business during the financial crisis, or even the good projects are not financed (market crash). As discussed in Manove and Padilla (1999), when banks cannot necessarily differentiate optimists from other agents, the efficiency of the credit market is undermined for all agents. There are important pecuniary transfers across entrepreneur types (optimistic ones and realistic ones).

Appendix: Definition of Variables

A. Dependent Variables

Debt Ratio	the ratio of total debt (both trade credit and interesting bearing loans) to total assets
CL/TL	the ratio of current liabilities to total liabilities
Trade Credit Paid Late	a dummy variable, which is equal to one if the firm had paid its trade credit late, 0 otherwise
Approval	a dummy variable, which is equal to one if the firm's loan application is approved, 0 otherwise
Collateral	a dummy variable, which is equal to one if the firm is requested to provide collateral for the loan extended, 0 otherwise
Spread over prime-rate	the difference between the interest rate of a specific loan and the concurrent prime-rate

B. Independent Variables

Demographic characteristics of entrepreneurs	
Gender	a dummy variable, which is set to equal to one if the primary owner is male, 0 if female
Education	a dummy variable, which is set to equal to one if the entrepreneur is college graduate or have post-graduate degrees, and 0 otherwise
Experience	number of years of experience as managing or owning a business
White	a dummy variable, which is set to equal to one if the entrepreneurs is White, and 0 otherwise
Firm Information Asymmetry	
Ln(Assets)	natural logarithm of firm's total assets
Ln(Firm age+1)	natural logarithm of the length of ownership by the current owners plus one
Percentage of tangible assets	the ratio of tangible assets (net PPE and land) to total assets
Lenders' Private Information	
Ln(Distance)	natural logarithm of the geographic distance between the financial institution and small business
Ln(Relationship)	natural logarithm of the length of relationship between the financial institution and small business
In Person	a dummy variable, which is et to equal to one if the entrepreneur communicates with the lender in person, and 0 otherwise
Other control variables	
Profit margin	the ratio of net income to sales
Corporation	a dummy variable, which is set to equal to one if the business is organized as a corporation, 0 otherwise
Urban	a dummy variable, which is set to equal to one if the business is located in MSA, 0 otherwise
Ln(Wealth)	natural logarithm of the entrepreneur's other personal wealth, excluding the small business
Firm bankrupt	a dummy variable, which is set to equal to one if the firm was bankrupt before, and 0 otherwise
Owner bankrupt	a dummy variable, which is set to equal to one if the entrepreneur was bankrupt before, and 0 otherwise
DB score dummies	If the original Dun & Bradstreet credit scores fall in the range of 0-10, the SSBF DB score ranking is 1; if the score is 11-25, then the ranking is 2; if the score is 26-50,

	then the ranking is 3; if the score is 51-75, then the ranking is 4; if the score is 76-90, then the ranking is 5; if the score is 91-100, the ranking is 6.
Industry dummies	two digit SIC code
Year dummies	the year when the loan was applied
Loan Size	natural logarithm of the amount of loan granted
Loan Length	natural logarithm of the length of loans measured in months
Fixed Interest Rate	a dummy variable, which is equal to one if the loan is of fixed interest rate, 0 otherwise
Loan Type Dummies	Loan type includes new line of credit, capital lease, mortgage, vehicle loans, equipment loans, and other loans

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Table 1
Summary Statistics

The sample consists of 6,320 small businesses operating in the U.S. surveyed by the Federal Reserve Board's 1998 and 2003 SSBF. Panel A and Panel B summarize the characteristics of both the small businesses and the principal owners who are also responsible for the daily management of the business. Panel C summarizes measures of credit availability to small businesses. Panel D reports the characteristics of most recently approved new loans. Renews of line of credits are excluded.

Panel A: Firm characteristics

	2003		1998	
	Mean	Median	Mean	Median
Firm Age	15.3	13.0	13.9	11.0
Assets ($M)	1.5	0.1	1.2	0.1
Sales ($M)	3.3	0.3	2.8	0.2
Number of Employees	23.5	5.0	21.0	4.0
Tangible Assets/Total Assets	35.2%	25.0%	34.7%	24.4%
Profit Margin	-11.9%	10.0%	2.3%	13.3%
Debt Ratio	130.0%	40.0%	210.0%	40.0%
Current Liability/Total Liability	42.6%	31.2%	44.5%	36.9%
Percentage of Proprietorship	34.5%		43.1%	
Percentage of Partnership	7.8%		6.8%	
Percentage of Corporation	56.0%		50.0%	
Percentage of Urban Firms	79.6%		78.2%	
N	3360		2960	

Panel B: Entrepreneur characteristics

	2003		1998	
	Mean	Median	Mean	Median
Entrepreneur Age	52.2	52.0	50.4	50.0
Business Experience	20.8	20.0	18.7	17.0
Percentage of Male Entrepreneurs	77.9%		73.2%	
Education				
Percentage of High School Drop Out	1.9%		2.9%	
Percentage of High School Graduate	45.0%		46.5%	
Percentage of College Graduate	32.1%		31.8%	
Percentage of Post Graduate	21.0%		18.7%	
Percentage of Real Start-Up	78.5%		80.1%	
N	3360		2960	

Panel C: Credit availability to small business

	2003	1998
	Mean	Mean
Percentage of firms that trade credit is paid late	40.2%	44.9%
Percentage of firms applied for loans in last three years	41.9%	26.6%
Percentage of firms that were always approved	87.4%	72.5%
Percentage of firms that were always denied	8.5%	17.9%
N	3360	2960

Panel D: Characteristics of most recently approved loans

	2003		1998	
	Mean	Median	Mean	Median
Amount Applied ($000)	623.5	77.5	300.5	44.5
Amount Approved ($000)	620.8	76.3	312.0	41.7
Amount Approved/Assets	99.1%	25.2%	139.9%	18.6%
Loan Length (months)	66.0	48.0	53.8	36.0
Loan Interest Rate	6.0%	6.0%	9.0%	9.0%
Relationship with Lender (months)	89.3	48.0	70.5	36.0
Distance from lender (miles)	80.0	5.0	20.2	3.0
Collateralized	58.0%		60.2%	
Percentage of Fixed Interest Loans	60.5%		67.7%	
Loan Types				
Percentage of Line of Credit (new)	31.0%		31.4%	
Percentage of Capital Lease	1.8%		5.3%	
Percentage of Mortgage	17.6%		10.7%	
Percentage of Vehicle Loans	19.3%		18.2%	
Percentage of Equipment Loans	18.8%		19.3%	
Percentage of Other Loans	11.4%		15.1%	
N	654		570	

Table 2
Measure of Entrepreneurial Optimism – Logistics Regressions

The table presents the estimation results of a logit regression of the probability that entrepreneur's loan application will be turned down given a set of control variables The dependent variable is an indicator variable which is equal to one if over the last three years (prior to each /survey), the entrepreneur did not apply for credit because he/she was afraid of being turned down even though the firm needed funding, and 0 otherwise. The control variables are described in detail in Appendix B. In the 2003 survey, DB credit score is ranked from 1-6, where 1 denotes "most risky" and 6 denotes "least risky". In contrast, in the 1998 survey, DB credit score is ranked from 1-5, where 1 denotes "lowest risk" and 5 denotes "highest risk". The difference between the predicted probability from the logit regression and the entrepreneur's subjective assessment of this probability as our measure of optimism.***, **, and * denote statistical significance at 1%, 5%, and 10% confidence level, respectively.

	2003		1998	
	Coefficient	p-value	Coefficient	p-value
Intercept	0.169	0.655	-0.868**	0.048
DB Score				
DB_Score=2	-0.745***	0.000	0.352	0.249
DB_Score=3	-1.066***	0.000	0.654**	0.029
DB_Score=4	-1.247***	0.000	1.134***	0.000
DB_Score=5	-1.683***	0.000	1.686***	0.000
DB_Score=6	-1.862***	0.000		
Firm Characteristics				
Ln(Assets)	-0.016	0.576	-0.042	0.114
Ln(Firm Age)	-0.280***	0.000	-0.191***	0.003
Profit Margin	-0.015	0.337	-0.004	0.814
Tangible Assets	0.371**	0.016	0.507***	0.000
Corporation	0.295**	0.011	0.108	0.318
Urban	0.327**	0.016	0.148	0.206
Bankruptcy History				
Firm Bankrupt	0.489	0.277	3.277***	0.005
Owner Bankrupt	1.715***	0.000	1.608***	0.000
Owner Personal Wealth	-0.990***	0.000	-1.605***	0.000
Industry Dummies	Yes		Yes	
N	3360		2960	
Pseudo R-square (%)	13.43		11.51	

Table 3
The Demographics of Optimism

In this table, we relate this optimism measure to various demographics of entrepreneurs. The dependent variable is the optimism measure estimated based on specification 3 in Table 2. ***, **, and * denote statistical significance at 1%, 5%, and 10% confidence level, respectively.

	2003				1998			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	-0.041***	-0.137***	-0.153***	-0.117***	-0.013	-0.093***	-0.100***	-0.034
	(0.001)	(0.000)	(0.000)	(0.000)	(0.344)	(0.000)	(0.000)	(0.310)
Male	0.052***	0.051***	0.049***	0.054***	0.018	0.014	0.012	0.020
	(0.000)	(0.000)	(0.001)	(0.000)	(0.269)	(0.400)	(0.452)	(0.233)
White		0.106***	0.110***	0.113***		0.107***	0.107***	0.113***
		(0.000)	(0.000)	(0.000)		(0.000)	(0.000)	(0.000)
Education			0.025**	0.025**			0.017	0.016
			(0.031)	(0.032)			(0.250)	(0.277)
Ln(Experience)				-0.015				-0.028**
				(0.109)				(0.011)
N	3360	3360	3360	3360	2960	2960	2960	2960
Adjusted R-square (%)	0.38	1.07	1.18	1.22	0.01	1.25	1.26	1.44

Table 4
Entrepreneurial Optimism and Capital Structure

This table represents the regression analysis of the relation between entrepreneurial optimism and the capital structure of the small businesses. In Panel A, we examine whether optimism impacts the Total Debt/Total Assets ratio. In Panel B, we analyze whether optimism impacts the Current Liabilities/Total Liabilities ratio. ***, **, * denote statistical significance at 1%, 5%, and 10% confidence level, respectively.

A: Total Debt/Total Assets

	2003		1998	
	(1)	(2)	(3)	(4)
Intercept	9.908***	10.170***	24.780***	26.304***
	(0.000)	(0.000)	(0.000)	(0.000)
Optimism	-0.695		-1.074	
	(0.214)		(0.333)	
Optimism Fractional Rank		-0.356		-2.149
		(0.628)		(0.182)
Ln (Owner Wealth)	0.875**	0.820**	2.947**	2.626**
	(0.026)	(0.046)	(0.010)	(0.025)
Ln (Assets)	-0.856***	-0.857***	-2.021***	-2.039***
	(0.000)	(0.000)	(0.000)	(0.000)
Ln (Firm Age+1)	-0.240	-0.263	-0.321	-0.397
	(0.354)	(0.318)	(0.597)	(0.514)
Profit Margin	0.001	0.001	-0.019	0.022
	(0.992)	(0.981)	(0.916)	(0.904)
Percentage of Tangible Assets	-0.262	-0.237	-1.822	-1.685
	(0.660)	(0.692)	(0.185)	(0.222)
Corporation	2.283***	2.296***	1.856*	1.869*
	(0.000)	(0.000)	(0.067)	(0.065)
Urban	0.417	0.436	0.306	0.354
	(0.387)	(0.367)	(0.779)	(0.745)
Industry Dummies	Yes	Yes	Yes	Yes
N	3360	3360	2960	2960
Adjusted R-Square (%)	2.57	2.53	2.74	2.77

Panel B: Current Liability/Total Liability

	2003		1998	
	(1)	(2)	(3)	(4)
Intercept	0.555***	0.521***	0.360***	0.314***
	(0.000)	(0.000)	(0.000)	(0.000)
Optimism	0.062***		0.058***	
	(0.002)		(0.003)	
Optimism Fractional Rank		0.041		0.058**
		(0.130)		(0.043)
Ln (Owner Wealth)	0.042***	0.047***	0.001	0.008
	(0.004)	(0.002)	(0.992)	(0.688)
Ln (Assets)	-0.012***	-0.012***	0.005	0.005
	(0.002)	(0.004)	(0.330)	(0.250)
Ln (Firm Age+1)	0.054***	0.056***	0.045***	0.047***
	(0.000)	(0.000)	(0.000)	(0.000)
Percentage of Tangible Assets	-0.376***	-0.380***	-0.299***	-0.303***
	(0.000)	(0.000)	(0.000)	(0.000)
Profit Margin	0.001	0.001	0.002	0.002
	(0.128)	(0.141)	(0.605)	(0.601)
Corporation	-0.034**	-0.035**	-0.033*	-0.033*
	(0.039)	(0.035)	(0.060)	(0.060)
Urban	0.013	0.010	0.042**	0.041**
	(0.485)	(0.565)	(0.030)	(0.036)
Industry Dummies	Yes	Yes	Yes	Yes
N	2634	2634	2296	2296
Adjusted R-Square (%)	12.73	12.50	8.07	7.88

Table 5
Entrepreneurial Optimism and Credit Availability

Panel A summarizes the probit regressions of trade credit paid late. In Panel B, we use the probit regressions to analyze whether entrepreneurial optimism impacts the likelihood that a loan application is approved or denied. Renew of lines of credit are excluded. ***, **, and * denote statistical significance at the 1%, 5%, and 10% confidence level.

Panel A: Probability of trade credit paid late

	2003		1998	
	(1)	(2)	(3)	(4)
Intercept	-0.497**	-0.106	-0.572**	-0.214
	(0.036)	(0.661)	(0.026)	(0.411)
Optimism	-0.660***		-0.483***	
	(0.000)		(0.000)	
Optimism Fractional Rank		-0.408***		-0.383***
		(0.000)		(0.001)
Ln (Owner Wealth)	-0.247***	-0.296***	-0.105	-0.145*
	(0.000)	(0.000)	(0.150)	(0.054)
Ln (Assets)	0.063***	0.055***	0.027	0.017
	(0.000)	(0.001)	(0.172)	(0.388)
Ln (Firm Age+1)	-0.158	-0.086**	-0.040	-0.048
	(0.154)	(0.036)	(0.374)	(0.278)
Percentage of Tangible Assets	-0.207**	-0.189*	0.226**	0.249**
	(0.042)	(0.063)	(0.040)	(0.023)
Profit Margin	0.010	0.008	-0.002	-0.002
	(0.515)	(0.564)	(0.847)	(0.867)
Debt Ratio	0.002	0.002	-0.001	-0.001
	(0.279)	(0.277)	(0.592)	(0.569)
CL/TL	-0.053	-0.082	0.117	0.084
	(0.525)	(0.322)	(0.184)	(0.336)
Corporation	-0.055	-0.046	0.234***	0.231***
	(0.432)	(0.512)	(0.001)	(0.001)
Urban	0.041	0.062	0.068	0.083
	(0.570)	(0.389)	(0.390)	(0.292)
Industry Dummies	Yes	Yes	Yes	Yes
N	1967	1967	1662	1662
Pseudo R-Square (%)	4.42	2.56	2.96	1.86

Panel B: Probability of loan approval

	2003		1998	
	(1)	(2)	(3)	(4)
Intercept	-0.569	-1.718***	0.169	-1.173
	(0.383)	(0.008)	(0.826)	(0.123)
Optimism	1.247***		1.631***	
	(0.000)		(0.000)	
Optimism Fractional Rank		1.693***		2.436***
		(0.000)		(0.000)
Ln (Owner Wealth)	0.542***	0.719***	0.302	0.540**
	(0.005)	(0.000)	(0.217)	(0.023)
Ln (Assets)	0.084*	0.092**	0.132***	0.141***
	(0.068)	(0.043)	(0.005)	(0.003)
Ln (Firm Age+1)	0.159*	0.213**	0.125	0.153
	(0.082)	(0.020)	(0.281)	(0.183)
Percentage of Tangible Assets	-0.103	-0.131	-0.441*	-0.501**
	(0.654)	(0.551)	(0.060)	(0.031)
Profit Margin	-0.169	-0.199	0.108	0.108
	(0.342)	(0.277)	(0.219)	(0.212)
Debt/Assets	-0.002	-0.003	-0.005	-0.006
	(0.800)	(0.750)	(0.283)	(0.252)
Current Liability/Total Debt	-0.178	-0.123	-0.782***	-0.774***
	(0.421)	(0.572)	(0.000)	(0.000)
Corporation	-0.255	-0.315	0.330**	0.314**
	(0.113)	(0.048)	(0.041)	(0.049)
Urban	-0.204	-0.261	-0.271	-0.282
	(0.224)	(0.127)	(0.155)	(0.132)
Owner Bankrupt	0.287	0.688	-1.980***	-1.721***
	(0.580)	(0.202)	(0.000)	(0.000)
Firm Bankrupt	-1.444**	-1.352*		
	(0.039)	(0.059)		
Ln (Distance+1)	0.059	0.047	0.062	0.056
	(0.189)	(0.290)	(0.194)	(0.229)
Ln (Relationship+1)	0.026	0.011	-0.032	-0.033
	(0.500)	(0.785)	(0.465)	(0.440)
In Person	-0.147	-0.167	0.037	0.010
	(0.350)	(0.281)	(0.850)	(0.959)
DB Score Dummies	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes
N	796	796	728	728
Pseudo R-Square (%)	29.02	27.76	38.41	36.10

Table 6
Entrepreneurial Optimism and Cost of Borrowing

In Panel A, we examine whether financial lenders curtail lending to optimistic entrepreneurs by require collateral more often using probit regressions. The dependent variable is equal to one if collateral is required for a specific loan, and 0 otherwise. In Panel B, we analyze whether financial lenders curtail lending to optimistic entrepreneurs by charging a higher interest rate. The dependent variable is the spread between the actual interest rate charged on the most recently applied loans and the concurrent prime rate. ***, **, and * denote statistical significance at the 1%, 5%, and 10% confidence level.

Panel A: Collateral

	2003		1998	
	(1)	(2)	(3)	(4)
Intercept	-3.052***	-2.579***	-1.501**	-1.342*
	(0.000)	(0.000)	(0.030)	(0.054)
Optimism	-0.342**		-0.189	
	(0.048)		(0.234)	
Optimism Fractional Rank		-0.610**		-0.216
		(0.013)		(0.350)
Control Variables				
Ln (Owner Wealth)	-0.111	-0.209*	-0.007	-0.033
	(0.336)	(0.088)	(0.953)	(0.800)
Ln (Assets)	0.021	0.018	0.023	0.019
	(0.662)	(0.705)	(0.613)	(0.661)
Ln (Firm Age+1)	0.138*	0.106	-0.002	-0.008
	(0.093)	(0.205)	(0.978)	(0.928)
Percentage of Tangible Assets	0.067	0.110	0.107	0.119
	(0.732)	(0.578)	(0.606)	(0.564)
Profit Margin	-0.103	-0.104	0.047	0.047
	(0.353)	(0.343)	(0.595)	(0.596)
Debt/Assets	0.071	0.071	-0.007	-0.007
	(0.124)	(0.124)	(0.566)	(0.561)
Current Liability/Total Debt	-0.154	-0.150	0.082	0.085
	(0.432)	(0.444)	(0.673)	(0.661)
Corporation	-0.020	0.002	0.107	0.109
	(0.887)	(0.986)	(0.453)	(0.445)
Urban	-0.232*	-0.195	-0.098	-0.095
	(0.092)	(0.158)	(0.499)	(0.513)
Owner Bankrupt	0.608	0.617		
	(0.269)	(0.270)		
Firm Bankrupt	-0.813	-0.980		
	(0.474)	(0.407)		
Loan Size	0.280***	0.281***	0.156***	0.156***
	(0.000)	(0.000)	(0.004)	(0.004)
Loan Length	0.044	0.045	0.155**	0.154**
	(0.505)	(0.500)	(0.024)	(0.025)
Ln (Distance)	-0.012	-0.011	-0.054	-0.053
	(0.734)	(0.749)	(0.129)	(0.135)
Ln (Relationship)	-0.107***	-0.104***	-0.064*	-0.064*
	(0.002)	(0.002)	(0.073)	(0.072)
In Person	0.242*	0.248**	0.123	0.120
	(0.051)	(0.046)	(0.417)	(0.429)
DB Score Dummies	Yes	Yes	Yes	Yes
Loan Type Dummies	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes
N	654	654	570	570
Pseudo R-Square (%)	20.38	20.65	16.47	16.40

Panel B: Spread over prime-rate

	2003		1998	
	(1)	(2)	(3)	(4)
Intercept	6.878***	7.385***	5.606***	6.856***
	(0.000)	(0.000)	(0.000)	(0.000)
Optimism	-0.405		-1.292***	
	(0.195)		(0.000)	
Optimism Fractional Rank		-0.654		-2.069***
		(0.141)		(0.000)
Control Variables				
Ln (Owner Wealth)	-0.270	-0.372*	-0.240	-0.503**
	(0.196)	(0.095)	(0.210)	(0.011)
Ln (Assets)	-0.165*	-0.168*	-0.129*	-0.144**
	(0.056)	(0.051)	(0.053)	(0.029)
Ln (Firm Age+1)	-0.293**	-0.329**	-0.234*	-0.300**
	(0.050)	(0.031)	(0.087)	(0.028)
Percentage of Tangible Assets	0.049	0.096	-0.069	0.022
	(0.895)	(0.732)	(0.826)	(0.944)
Profit Margin	-0.010	-0.012	0.249*	0.248*
	(0.657)	(0.595)	(0.089)	(0.089)
Debt/Assets	0.021	0.022	-0.009	-0.009
	(0.343)	(0.328)	(0.208)	(0.236)
Current Liability/Total Debt	-0.264	-0.264	0.127	0.135
	(0.469)	(0.469)	(0.669)	(0.647)
Corporation	0.032	0.056	0.007	0.011
	(0.899)	(0.822)	(0.975)	(0.958)
Urban	-0.167	-0.131	-0.176	-0.168
	(0.499)	(0.597)	(0.421)	(0.441)
Owner Bankrupt	0.601	0.556	3.169**	2.946**
	(0.533)	(0.565)	(0.012)	(0.017)
Firm Bankrupt	2.342	2.216		
	(0.262)	(0.289)		
Ln (Distance)	0.091	0.090	-0.049	-0.047
	(0.163)	(0.164)	(0.364)	(0.381)
Ln (Relationship)	-0.014	-0.012	-0.121**	-0.119**
	(0.818)	(0.846)	(0.021)	(0.023)
In Person	-0.227	-0.220	-0.093	-0.100
	(0.326)	(0.339)	(0.684)	(0.661)
Loan Size	-0.085	-0.084	-0.130	-0.130
	(0.399)	(0.406)	(0.110)	(0.107)
Loan Length	-0.049	-0.048	-0.015	-0.017
	(0.682)	(0.689)	(0.887)	(0.872)
Fixed Interest Rate	0.851***	0.860***	-0.563**	-0.532**
	(0.001)	(0.001)	(0.012)	(0.017)
Collateralized	-0.472**	-0.482**	-0.363*	-0.356*
	(0.045)	(0.041)	(0.074)	(0.078)
DB Score Dummies	Yes	Yes	Yes	Yes

Loan Type Dummies	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes
N	654	654	573	573
Pseudo R-Square (%)	10.34	10.41	14.38	15.20

Table 7
Robustness Check: Using a Dichotomy Measure of Optimism

The table presents the analyses of capital structure, credit availability, and cost of capital using an alternative measure of optimism. Optimism is a dummy variable equal to one for entrepreneurs who are expected not to apply for credit (based on the predicted values of the logit model in Table 2), but they apply anyway, and zero otherwise. The dependent variables and model specifications are the same as those in Tables 4-6. ***, **, and * denote statistical significance at the 1%, 5%, and 10% confidence level.

	2003						1998					
	Total Debt/Total Assets	Current Liability/Total Liability	Probability of trade credit paid late	Probability of loan approval	Collateral	Spread over prime-rate	Total Debt/Total Assets	Current Liability/Total Liability	Probability of trade credit paid late	Probability of loan approval	Collateral	Spread over prime-rate
Optimism	0.253	0.002	0.087	0.884***	-0.541***	-0.179	-0.995	0.012	0.068	1.172***	-0.183	-1.262***
	(0.604)	(0.926)	(0.247)	(0.001)	(0.001)	(0.549)	(0.354)	(0.550)	(0.398)	(0.001)	(0.242)	(0.001)
Control variables	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
N	3360	2634	1967	796	654	654	2960	2296	1662	728	570	573
Adj. R-square	2.53%	12.43%	2.10	20.83	20.77	10.16	2.74%	7.73%	1.43	26.39	15.88	14.13