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DISSERTATION ABSTRACT

GENDER, RACE AND CREDIT RATIONING OF SMALL BUSINESSES: EMPIRICAL EVIDENCE FROM THE 2003 SURVEY OF SMALL BUSINESS FINANCES

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ABSTRACT

Using data from the 2003 Survey of Small Business Finances, this study examines the extent of credit rationing. Women- and minority-owned businesses are studied to determine whether there is a significant difference in their loan denial (type 2 credit rationing) compared with male and white owners, and how this affects their likelihood of applying for a loan. Also, type 1 credit rationing as well as loan sizes are examined. We find, in general, that women and minorities are rationed more than male and white owners. The results are robust for minority owners which confirm findings from previous studies.

Executive Summary

of Dissertation on

Gender, Race, and Credit Rationing of Small Businesses: Empirical Evidence from the 2003 Survey of Small Business Finances

Naranchimeg Mijid, Colorado State University

Background

Credit rationing has been viewed as the main reason for capital market imperfections caused by adverse selection and moral hazard problems. To avoid these information asymmetry problems, lenders ration borrowers in two ways: either by granting smaller loan amounts than requested, known as type 1 rationing, or by declining the loan in its entirety, known as type 2 rationing. Using comprehensive measures of credit rationing that include discouraged borrowers, this study examines both types of credit rationing and loan sizes to determine whether banks exercise prejudicial lending practices based on the race and gender of the small business owners. Thus, the study contributes to the existing literature on discrimination and credit rationing by showing whether women and minority owners are rationed more than their male and white counterparts and whether credit rationing is the reason for their lower application rates.

One of the most striking trends in the U.S. small business sector has been the recent rapid growth of businesses owned by women and racial/ethnic minorities. However, their performances still lag behind men and white-owned firms. Women and minority-owned businesses tend to be smaller in size (measured in terms of the value of

sales or number of employees), more heavily concentrated in the services and retail sales sectors and less profitable than their white and male counterparts. An important topic of research is thus analyzing the performance of small businesses by the gender and race/ethnicity of their owners.

The importance of small businesses to the U.S. economy is clear. The U.S. Small Business Administration (SBA)'s Office of Advocacy reports the following for 2007; "Small firms represent 99.7 percent of all employer firms, employ half of all private sector employees, pay more than 45 percent of the total U.S. private payroll, have generated 60 to 80 percent of net new jobs annually over the last decade, create more than 50 percent of non-farm private GDP…"[1] (U.S. SBA FAQ).

Evidence suggests that a small business's success depends heavily upon access to credit, and particularly traditional bank loans. Commercial banks and depository institutions provided 65 percent of total traditional credit to small businesses in 2003 according to the U.S. SBA. Unlike larger businesses, small businesses are very heterogeneous, and they have information opacity problems that make it almost impossible for them to obtain external equity from private equity markets. Securing access to external funds represents one of the major challenges for small businesses.

It has been observed that women and minority-owned businesses do not have the same access to credit as men and white-owned businesses. Studies have found that women owned-firms have a higher loan denial rate, a lower application rate and if approved, they receive a smaller loan amount than men-owned firms. The evidence

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[1] U.S Small Business Administration's official website-Frequently Asked Questions. Retrieved July 23, 2007, from http://app1.sba.gov/faqs/faqindex.cfm?areaID=24

with respect to Black-owned firms shows even more pronounced differences. Such observations raise the question of whether or not bank provision of credit is a factor in the relative underperformance of women-owned and minority-owned firms.

Studies of gender and race differences in access to credit have utilized methodologies and/or data that include only firms that applied for credit in their analysis. Borrowers who did not apply for loans because of fear of rejection – discouraged borrowers – were not included in these studies. Data from the 2003 Survey of Small Business Finances (SSBF) show that the number of those borrowers is almost twice as large as those who were denied access to credit. The main contribution of this study is to include discouraged borrowers (as in Levenson and Willard 2000[2]) in an analysis of credit rationing to study women and minority-owned firms' access to credit.

Data and Methodology

This study utilizes the 2003 SSBF. There are 2820 firms with one individual owner who has more than 50 percent share in the firm. Women-owned firms represent 24 percent of the sample and minority-owned firms represent 13 percent. Minority-owned firms include Hispanic, Black, Asian, Hawaiian, and native-American-owned firms. We use three distinct methods to examine both types credit rationing.

In the first (and second) paper, we adapt Levenson and Willard's two-stage model to measure type 2 credit rationing. Using logit method, we first estimate the probability of loan denial for those firms that applied for credit. Then the estimated parameters are used to predict the probability of denial for all firms including

[2] Alec R. Levenson and Kristen L. Willard, "Do Firms Get the Financing They Want? Measuring Credit Rationing Experienced by Small Businesses in the U.S," Small Business Economics 14.2 (2000).

discouraged borrowers. This method ensures that the need for credit for these discouraged borrowers is not zero. In the second stage, the probability of denial is used to estimate the probability of applying. Using logistic regression, we run this two-stage process for women, men, minorities and white owners separately and compare women with men-owned firms and minority owners with white owners. We use the bootstrap method with 200 replications for all 2nd stage estimates since the predicted probability of denial adds extra randomness in the 2nd stage. In addition, we use the two-sample t-test as well as the delta method to test hypotheses on the differences in the predicted probabilities between women and men owners and between minority and white owners.

In the second paper, we first apply the above two-stage model to both those firms that applied for credit and those that did not apply because of fear of rejection. By excluding those firms that would not have applied anyway, we investigate whether a higher probability of denial is a factor that explains more discouragement for women and minority owners. Then we utilize an econometric model developed by Mushinski[3] (1999) which measures credit rationing that arises from the probabilistic nature of banks' loan offers. Here we first estimate the banks' conditional loan approvals and use the predicted values of approval to estimate firms' likelihood to apply for a loan. We estimate the bank and the firm's joint decision using the bivariate probit model.

In the third paper, we examine type 1 rationing using probit estimates. Here we again calculate the conditional probability of type 1 rationing for firms that applied for a loan and then using the estimated parameters, we calculate the probability for all firms.

[3] D. W. Mushinski, "An Analysis of Offer Functions of Banks and Credit Unions in Guatemala," Journal of Development Studies 36.2 (1999).

In addition, we examine the loan sizes using the 2 Stage Least Square (2SLS) method adapted from Hanley and Girma[4] (2006), where loan approval, interest rate and loan sizes are determined simultaneously.

Hypotheses

In the first paper, type 2 rationing is examined to determine whether women and minority owners are denied more often than their counterparts (hypotheses H1-H2), after controlling the set of explanatory variables. Hypotheses H3-H4 test whether banks use the same criteria when assessing loan applications, and hypotheses H5-H8 test whether loan denial rates affect borrowers' application decision.

In the second paper, discouraged borrowers are examined in detail. More specifically, by excluding those firms that did not apply for a loan and did not have fear of rejection, we reexamine the probability of loan denial for women and minorities and how it in turn affects their probability of applying. The above 8 hypotheses are tested. Then in bivariate probit models, we test again the same 8 hypotheses to see whether the results from the first paper change. Here we estimate a lender's and a borrower's joint decision, which is conditional probability.

The third paper examines type 1 credit rationing to determine whether women and minorities are more likely to be granted smaller loan amounts than they request (hypotheses H9-H10). This paper also examines how loan amounts are determined: whether women and minorities obtain smaller loan amounts than men and white-owned firms (hypotheses H11-H12).

[4] A. Hanley and S. Girma, "New Ventures and Their Credit Terms," Small Business Economics 26.4 (2006).

Overall findings

We find women and minority-owned firms indeed have higher loan denial rates and lower application rates than their male and white-owned counterparts. This result suggests credit rationing is not gender and race neutral. Using a series of robustness checks, the difference in the probability of denial between women and men disappears in some cases, but the difference between minority and white-owners persists, suggesting prejudicial lending practices from the banks' point of view.

Highlights

The results of the analysis from the first paper show that

- Women-owned firms have 3.7 percent higher probability of denial than men-owned firms. The average probability of denial is 17.2 and 13.5 percent for women and men, respectively. The difference between minority- and white-owned firms is even higher (23.7 percent). Minority owners face 35.1 percent average denial rates, whereas white owned-firms average denial rate is only 11.4 percent.
- Banks pay attention to different characteristics when they evaluate the loan applications of women and minority-owned businesses when compared with male and white-owned firms. There exist asymmetries in a sense that banks treat women and minority-owned firms less favorably than male and white-owned firms. For example, a credit score of 2 would increase the probability of loan

denial for both women and men, but it increases the probability more for women (by 3.2%) than men (by 0.1%).

- Credit rationing is found to have a discouraging effect, negatively affecting the owner's probability of applying for a loan for the lowest 10th percentile of women-owned firms and highest 10th percentile of minority-owned firms.
- The mean probability of applying for loans for women and men is 32.2 percent and 44.6 percent, respectively. This indicates that women apply for a loan at a 12.4 percent lower rate than men do. The mean application rate is 37 percent and 42.5 percent for minority and white-owned firms, respectively. So minority owners apply at a 5.5 percent lower rate than white-owned firms.
- We extend the above two-stage analysis for certain subsamples that have the characteristics of women-owned firms. Our findings suggest that women owners still have higher denial rates in some subsamples, while in other subsamples, where they have the same denial rate as men-owned firms; women may be rationing themselves by not applying at the same rate as men-owned firms. The results for minority-owned firms are robust in a sense that they still face significantly higher loan denial rates in all subsamples even when applying for loans at the same rate as white-owned firms.

In the second paper, the results for discouraged borrowers from the two-stage process reveal even more pronounced evidence:

- Women-owned firms have much higher denial rate than men-owned firms and the gap between women and men increased to 5.3 percent and remained

significant. Minority-owned firms also face 22.3 percent higher probability of denial, on average, than white-owned firms.

- The higher probability of denial, though, does not negatively affect the probability of applying for women and minority-owned firms.
- Despite this fact, women and minority owners have significantly lower application rates (16 and 13.2 percent lower, respectively) than male- and white-owned firms. This is explained by other variables such as lower credit scores, lower sales and equity, which are the main reasons for their lower application rates.

The regression results from the bivariate probit model suggest that

- Women-owned firms still have a lower loan approval than men-owned firms, but the difference is insignificant. Women-owned firms' decision to apply is positively affected by banks' rate of approval decisions, which indicates a discouraging effect: the lower the approval rate, the less likely women are to apply. Despite this fact, women-owned firms have 4 percent higher application rates, on average, than men-owned firms (here we estimate a lender's and a borrower's joint decision, which is conditional probability, whereas in the first paper we estimate the unconditional probability).
- On the other hand, minority-owned firms have a significantly higher approval rate than white-owned firms. That is, minority-owned firms that apply for a loan have a higher chance that the loan will be approved than white-owned firms. Banks' loan approval decisions seem to have a discouraging effect for minority-owned firms;

however, we find that there is, on average, no difference in the application rate between minority and white-owned firms.

The third paper results show that

- On average, women owners have 3.2 percent higher probability of type 1 rationing than men, and minority owners face an even higher, 14 percent, probability than white owners. This result confirms findings from previous literature that find strong evidence for prejudice against black-owned firms.
- For those who were approved, the amount of loan obtained by women-owned firms is half that of men-owned firms. The same result can be found when we examine the services and retail industries only. On the other hand, there is no significant difference in estimated loan amounts between minority and white-owned firms.

Conclusions

The results suggest that credit rationing for women-owned businesses may have more to do with the characteristics of these businesses and women business owners rationing themselves rather than the result of prejudicial lending on the part of banks. This is consistent with previous research. Future research will need to focus on why women choose not to apply for credit at the same rate as men. It is possible that women are more risk averse than men (Jianakoplos & Bernasek 1998[5]) or women are less interested than men in relationship banking and women are more likely to say they

[5] N. A. Jianakoplos and A. Bernasek, "Are Women More Risk Averse?," Economic Inquiry 36.4 (1998).

prefer using their credit cards to having to deal with a bank (Sullivan et al. 1998[6]). From a public policy perspective, finding ways to improve women's access to business credit under reasonable terms and conditions could be important for improving the success and growth rates of those businesses.

The results for minority-owned businesses are also consistent with previous research and suggest that credit rationing has less to do with the characteristics of firms and more to do with prejudicial lending practices of banks. Despite their higher probability of loan denial, minority business owners applied for loans at similar rates to white business owners, suggesting that they were not self-rationing but rather were being rationed by lenders and the rationing was discriminatory. The magnitude of the difference in loan denial rates of minority-owned firms compared with white-owned firms is striking. From a public policy perspective understanding lending practices and whether or not some are more or less discriminatory could help increase access to credit for minority-owned businesses.

[6] R. J. Sullivan, R. D. Johnson, R. J. Phillips and K. R. Spong, "Small Business Lending by Commercial Banks in Colorado, 1994 to 1996," (1998).