

## IMMIGRATION, EMPLOYMENT, AND ENTREPRENEURSHIP<sup>‡</sup>

### Access to Credit by Small Businesses: How Relevant Are Race, Ethnicity, and Gender?<sup>†</sup>

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In credit markets, discrimination on the basis of race, ethnicity, or gender exists if, after controlling for relevant factors that influence loan decisions, an applicant's race, ethnicity, or gender has an independent impact on the decision to approve a loan, or on the interest rate charged on an approved loan. This paper employs data from the 1998 and 2003 Survey of Small Business Finances (SSBF) to analyze whether there is racial and/or gender discrimination in the credit market for small businesses.<sup>1</sup> Such an analysis is important because access to credit is crucial to the growth of small businesses (Beck, Demirgüç-Kunt, and Maksimovic 2005), and about 50 percent of US small businesses are owned by minorities and females. Furthermore, minority-owned and female-owned firms generated 5.9 million and 7.6 million jobs, respectively, in 2007 (Small Business Administration 2011).

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<sup>†</sup>To view additional materials, visit the article page at <http://dx.doi.org/10.1257/aer.102.3.532>.

<sup>1</sup>The SSBF is a nationally representative survey of about 4,000 small businesses in the United States conducted by the Board of Governors of the Federal Reserve. See [www.federalreserve.gov/pubs/oss/oss3/nssbftoc.htm](http://www.federalreserve.gov/pubs/oss/oss3/nssbftoc.htm) for a detailed description.

Following Blanchard, Zhao, and Yinger (2008), we classify business ownership into five mutually exclusive categories: Black, Hispanic, Asian/Native American/Pacific Islander (ANP), White female, and White male. A firm belongs to a group if more than 50 percent of the business is owned by individuals from that particular group. We dropped 3 observations where the firms were owned by two groups, with each group having exactly 50 percent ownership. Table 1 shows data on applications for new loans from the 1998 and 2003 SSBF for the various groups. There are four noticeable points. First, the denial rate is substantially higher for minority-owned firms than for firms owned by white males—41.6 percent versus 11.5 percent in 1998, and 37 percent versus 8.8 percent 2003. Second, in 2003, the denial rate for Black firms was considerably higher than the rate for all the other groups. About 66 percent of the loan applications from firms owned by Blacks were denied. This compares with a denial rate of 22 percent for Hispanics, 22 percent for ANPs, 16 percent for White females, and 9 percent for White males. Third, the denial rate for Black-owned business increased from 1998 to 2003, but declined for firms in the other groups. The denial rate increased by 12.8 percentage points for black firms, but decreased by 21.6 percentage points for Hispanic firms and 2 percentage points for ANP firms. The fourth point is that minority-owned firms paid a higher interest rate (about one percentage point higher) on approved loans than White male-owned firms. This paper examines whether the gap in loan denial rate and interest rate charged on approved loans between White male firms and the other groups can be explained by differences in creditworthiness, firm characteristics, and other observable factors that influence loan decisions.

TABLE 1—LOAN APPLICATIONS, 1998 AND 2003

Race/ethnicity	1998				2003			
	Number of firms	Percent applied	Percent denied	Interest rate	Number of firms	Percent applied	Percent denied	Interest rate
Black	274	26.3	52.8	10.495	113	28.3	65.6	6.202
Hispanic	245	27.3	43.3	9.494	130	17.7	21.7	7.456
ANP	245	20.8	23.5	9.569	193	19.2	21.6	7.298
White females	605	20.8	17.5	8.690	672	17.7	16.0	6.091
White males	2,190	25.7	11.5	8.928	3,005	26.1	8.8	5.677
All minorities	764	24.6	41.6	9.837	436	21.1	37.0	6.818
All races	3,561	24.7	18.9	9.044	4,113	24.2	12.3	5.815

Notes: The data are from the Survey of Small Business Finances (SSBF). ANP refers to Asians, Native Americans, and Pacific Islanders.

### I. Brief Literature Review

Most of the studies on access to credit have focused on information costs associated with lending to small businesses and how competition and changes in financial markets affect the availability of credit to small business (Berger and Udell 1995; Petersen and Rajan 1994). Recent studies have focused on racial, ethnic, and gender disparity in credit access among small businesses owners (Cavalluzo and Cavalluzo 1998; Blanchflower, Levine, and Zimmerman 2003; Blanchard, Zhao, and Yinger 2008). These studies employ data from the 1993 and/or the 1998 SSBF and they find significant racial/ethnic disparity in loan approval rates. Blanchard, Zhao, and Yinger (2008) outline some statistical and methodological enhancements to address potential biases in previous studies, specifically (i) omitted variable bias; (ii) specification issues; and (iii) selection bias. This paper employs data from the 1998 and the 2003 SSBF to estimate the extensive model in Blanchard, Zhao, and Yinger (2008).

The paper makes several contributions to the literature. First, it adds to the scant literature on this important topic. Second, the SSBF has been discontinued and the 2003 data is the most recent available. To the best of our knowledge, this is the first study to use the 2003 SSBF to examine the effect of race, ethnicity, and gender on loan decisions. Third, previous studies have used the 1993 and/or the 1998 SSBF, but these data are not easily comparable due to significant changes in the definition of key variables such as firm ownership and firm's credit history. As a consequence, these studies could not assess whether the influence of race/ethnicity/gender

on loan decisions changed during the five-year period between surveys. The 1998 and 2003 data are more comparable, and this permits us to make such a comparison. Another contribution of the paper is that it is the first study to analyze whether race/ethnicity/gender impact the denial rates for application for a renewal of an existing loan. Previous studies have focused on new loans because information on loan renewals was first collected in 2003. An analysis of the credit market for existing loans is important because a plausible explanation for the reason minorities may have a higher denial rate for new loans is information asymmetry. For example, it is possible that financial institutions face a higher cost of acquiring relevant information on minority-owned firms. If that is the case, then differences in the denial rate on new loans may reflect the degree of information asymmetry rather than discrimination. Presumably, information asymmetry would be less of a problem in loan renewal applications since the financial institution is privy to important information based on its relationship with the borrowing firm, and therefore the denial rate should be comparable across the group. The fourth contribution pertains to the methodology used in this study. The sample design of the 1998 and 2003 surveys is a systematic stratified random design with oversampling of firms with 20 or more employees. The dataset includes the original stratification variables as well as sample weights to account for disproportionate sampling and nonresponse. Clearly, these survey design features potentially affect the calculation of both population estimates and their variances. None of the previous studies, however, take into account the sample design of the data. This paper employs a

TABLE 2—ESTIMATES OF LOAN DENIALS AND INTEREST RATE CHARGED ON APPROVED LOANS, 1998 AND 2003

Variables	Loan denial, probit regression			Interest rate, OLS regression	
	New loans		Loan renewals	New loans	
	1998 (1)	2003 (2)	2003 (3)	1998 (4)	2003 (5)
Blacks	0.220*** (0.000)	0.369*** (0.000)	0.182*** (0.000)	0.002 (0.999)	1.055 (0.465)
Hispanics	0.278*** (0.000)	-0.015 (0.489)	0.170*** (0.000)	0.228 (0.570)	2.447** (0.028)
ANP	0.053*** (0.000)	0.081*** (0.003)	-0.070*** (0.000)	0.881 (0.140)	-0.279 (0.654)
White females	0.008 (0.398)	0.001 (0.943)	-0.006 (0.516)	-0.707** (0.023)	0.552 (0.181)
Number of firms	879	995	1,246	764	873

Notes: The control variables include only firm's credit history, firm characteristics, owner characteristics, region fixed effects, and the number of institutions that the firm used for all financial services. The coefficient estimates reported are the average partial effects. Robust  $p$ -values are in parentheses.

\*\*\*Significant at the 1 percent level.

\*\*Significant at the 5 percent level.

\*Significant at the 10 percent level.

survey-based estimation technique that makes use of the additional information about the survey design, population weights, and sampling stratification in constructing estimates. As a consequence, we obtain unbiased population estimates and standard errors for our estimations.

## II. Estimation Results

Following Blanchard, Zhao, and Yinger (2008), we estimate the probit model:

$$(1) \quad \Pr(D_i = 1) = \Phi(\alpha + \beta R_i + \gamma C_i),$$

where  $\Phi$  is the cumulative density function of a normal distribution,  $i$  refers to businesses,  $D_i$  takes the value one if an application was denied, and zero otherwise,  $R_i$  is an indicator for an applicant's race, and  $C_i$  is a set of control variables. The control variables include owners' characteristics (credit history and financial wealth of the owner), firm attributes (credit rating, net worth, organization type, and industry of the firm), characteristics of the loan and the lender (the type and the amount of loan, type of lender, and the length of the relationship with the lender), and region and application year fixed effects. For the interest rate equation, we include three more loan characteristics,  $L$ , namely, type of interest rate (fixed or variable),

the points paid at closing time, and whether collateral is required for the loan. We use ordinary least square (OLS) to estimate

$$(2) \quad I_i = \alpha + \beta R_i + \gamma C_i + \lambda L_i + \varepsilon_i,$$

where  $I$  is the interest rate charged on an approved loan. For both estimations, we employ the survey-based estimation techniques in STATA 12.

Following previous studies, we start by estimating a probit model that includes only the race indicators, and successively add the control variables. To conserve space, we report only the regressions that include all the explanatory variables in Table 2. The results from the step by step estimations are reported in the online Appendix. We report the average partial effect for the probit regressions (Blanchard, Zhao, and Yinger 2008). We first discuss the application for new loans. For 1998, the estimated average partial effect,  $\hat{\beta}$ , is positive and significant at the 1 percent level for Black, Hispanic, and ANP firms, but not significant for White female-owned firms. Thus, all minority groups faced discrimination in obtaining loans. Column 1 of Table 2 also shows that  $\hat{\beta}$  for Blacks and Hispanics is very high. The probability of a loan denial is about 22 percentage points higher for Black firms and 27.8 percentage points higher for Hispanic firms than for

TABLE 3—PROBIT AND BIVARIATE PROBIT WITH SAMPLE SELECTION, 2003

	Blacks	Hispanics	Other races	White women
<i>Probit (N = 995)</i>				
Denial	1.519*** (0.000)	-0.092 (0.821)	0.415 (0.260)	0.004 (0.981)
<i>Bivariate probit with sample selection (N = 3,322)</i>				
Denial	1.481*** (0.000)	-0.054 (0.896)	0.447 (0.202)	-0.036 (0.866)
Apply	0.117 (0.488)	-0.251 (0.140)	-0.247 (0.105)	-0.136 (0.125)
Correlation between estimation equations	-0.026 (0.902)			

Notes: The specification of the loan denial equation is the same as reported in Table 2. Robust *p*-values are in parentheses.

\*\*\*Significant at the 1 percent level.

\*\*Significant at the 5 percent level.

\*Significant at the 10 percent level.

White male-owned firms. Our result is qualitatively similar to that of Blanchard, Zhao, and Yinger (2008). The  $\hat{\beta}$  from our regressions are higher, however. A plausible explanation for the difference in estimated values is that our estimations take into account the sample design of the survey, whereas Blanchard, Zhao, and Yinger (2008) does not. For 2003,  $\hat{\beta}$  is significant for Black and ANP firms but not significant for firms owned by Hispanics and White females. The probability of a loan denial is about 36.9 percentage points higher for Black firms and 8.1 percentage points higher for ANP firms compared to White male firms, while the denial rate for Hispanic and White female firms is comparable to that of White male-owned firms. A comparison of the 1998 and 2003 results shows that the denial gap declined considerably for Hispanic firms (by 27.8 percentage points), increased substantially for Black firms (by 14.9 percentage points), and increased marginally for ANP firms (by 2.8 percentage points). The estimations for applications for loan renewals show a significant denial gap, 18.2 percentage points and 17 percentage points, respectively, for Black-owned and Hispanic-owned firms.

We now discuss the interest rate estimations. For 1998,  $\hat{\beta}$  is negative and significant at the five percent level for White females, but not significant for any of the racial/ethnic minority groups—the interest rate paid by Black, Hispanic, and ANP firms was comparable to

that paid by White male firms, and the rate paid by White women firms was about 0.71 percentage points lower. This result is consistent with that obtained by Blanchflower, Levine, and Zimmerman (2003) and Blanchard, Zhao, and Yinger (2008). For 2003,  $\hat{\beta}$  is significant only for Hispanics—thus, Hispanic firms are the only group that faced discrimination in 2003. The rate paid by Hispanic firms was about 2.45 percentage points higher than the rate paid by White male firms. Columns 4 and 5 also show that Hispanics faced discrimination in terms of being charged higher interest rates in 2003 but not in 1998.

### III. Robustness Regressions

Following Blanchard, Zhao, and Yinger (2008), we perform three robustness exercises. First, applying for a loan is voluntary, and therefore firm owners self-select into the loan applicant pool. This introduces a potential selection bias. Second, it is possible that there are nonlinearities in underwriting standards. For example, the impact of some of the control variables may be systematically different for applicants with strong credentials than for those with weaker credentials (Blanchflower, Levine, and Zimmerman 2003; Blanchard, Zhao, and Yinger 2008). Third, loan underwriting standards may differ across lenders (e.g., commercial banks versus credit unions) or there may be different underwriting standards for

TABLE 4—ESTIMATES OF DISCRIMINATION IN LOAN APPLICATIONS ON SPLIT SAMPLES, 2003 DATA

	Black	Hispanic	Asian, Native American, and Pacific Islander	White women	Sample size
<i>Panel A. Nonlinearities in underwriting standards</i>					
Firm net worth					
Net worth ≤ \$50,000	0.311*** (0.000)	0.038 (0.380)	0.045 (0.306)	−0.016 (0.381)	394
Net worth > \$50,000	0.393*** (0.000)	−0.046*** (0.003)	0.075*** (0.000)	−0.035*** (0.001)	601
Owner's housing wealth					
Housing wealth ≤ \$75,000	0.306*** (0.000)	−0.061** (0.038)	0.191*** (0.000)	0.072*** (0.000)	278
Housing wealth > \$75,000	0.415*** (0.000)	0.002 (0.912)	0.026 (0.225)	−0.023** (0.016)	717
Owner's nonhousing wealth					
Nonhousing wealth ≤ \$150,000	0.512*** (0.000)	−0.032 (0.387)	0.501*** (0.000)	−0.036** (0.015)	306
Nonhousing wealth > \$150,000	0.439*** (0.000)	−0.025 (0.215)	−0.047*** (0.006)	0.022* (0.093)	689
Length of relation with the lender					
≤ 3 years	0.132*** (0.000)	−0.046 (0.580)		−0.079*** (0.000)	220
> 3 years	0.465*** (0.000)	−0.043 (0.163)	0.112*** (0.001)	0.016 (0.385)	775
Purpose of loan					
New line of credit	0.562*** (0.000)	0.096** (0.018)	0.113*** (0.003)	0.025 (0.266)	329
Other purpose	0.281*** (0.000)	0.005 (0.830)	0.073*** (0.003)	−0.015 (0.104)	666
Loan amount requested					
Loan ≤ \$50,000	0.332*** (0.000)	0.032 (0.467)	0.211*** (0.000)	0.023 (0.194)	420
Loan > \$50,000	0.149*** (0.000)	−0.086*** (0.000)	−0.130*** (0.000)	0.033* (0.056)	575
<i>Panel B. Differences in underwriting standards across applicant pools</i>					
Type of lender					
Commercial bank	0.555*** (0.000)	0.120*** (0.001)	0.133*** (0.001)	0.046** (0.028)	586
Other type of lender	0.149*** (0.000)	−0.109*** (0.000)	0.071** (0.046)	−0.032** (0.038)	409
Firm industry					
Service industry	0.261*** (0.000)	−0.091*** (0.000)	0.123*** (0.000)	−0.023** (0.040)	346
Nonservice industry	0.612*** (0.000)	0.144*** (0.000)	0.097*** (0.005)	0.020 (0.238)	649

Note: Each row represents a survey-based probit regression with the same control variables as in Table 2.

\*\*\*Significant at the 1 percent level.

\*\*Significant at the 5 percent level.

\*Significant at the 10 percent level.

firms in manufacturing than in service or retail industries. Blanchard, Zhao, and Yinger (2008) employ the 1998 SSBF to estimate a bivariate

probit model to test for selection bias and run regressions for split samples to analyze whether nonlinearities and differences in underwriting

standards have an impact on the main result. We estimate the models in Blanchard, Zhao, and Yinger (2008) using an estimation technique that takes into account the sample design of the survey. To conserve on space, we discuss the robustness regressions for only loan denials and the data for 2003. The Probit and bivariate regressions are reported in Table 3 and the regressions for the split samples are reported in Table 4.

The  $\beta$  for the probit and bivariate probit regressions are not significantly different. Furthermore, the estimated correlation between the loan denial and application equations is not statistically significant, suggesting the absence of a selection bias. Table 3 also shows that, all else equal, the probability of applying for a loan is similar across groups. We now examine whether our main result is robust to nonlinearities in underwriting standards and differences in underwriting standards across applicant pools. We run a total of 16 (split sample) regressions and report the results in Table 4. Panel A reports the results for nonlinearities in underwriting standards and panel B shows the estimations for differences in underwriting standards across applicants. We find significant discrimination against Black-owned firms in each of the regressions. Specifically, for Black firms,  $\beta$  is positive and significant at the 1 percent level in all the regressions, with values ranging from 13.2 percent to 61.2 percent. In contrast,  $\hat{\beta}$  is sometimes positive but insignificant or negative for the other groups, suggesting that Hispanics, ANPs, and white women firms do not always face discrimination in obtaining loans. The robustness estimations clearly demonstrate that our results are robust.

#### IV. Conclusion

We now summarize our main results. First, Black-owned firms faced more discrimination in obtaining credit in 2003 than in 1998. The opposite is true for Hispanic firms—they faced discrimination in 1998 but none in 2003. Nonetheless, both Black- and Hispanic-owned businesses faced discrimination in obtaining loan renewals in 2003. On a much smaller magnitude, ANP-owned firms experienced discrimination in obtaining credit in both 1998 and 2003. Second, the interest rate paid by Black firms on approved

loans was comparable to the rate paid by White male firms in both 1998 and 2003. There was no interest rate gap for Hispanic firms in 1998, but one existed in 2003. This suggests that although Hispanic firms made progress (relative to White males) in obtaining access to credit from 1998 to 2003, they fared worse with regards to the interest rate charged on approved loans during that period. Third, White women firms did not face discrimination in terms of access to loans, and paid a lower interest rate than White male firms in 1998. The main results are robust to alternative estimation and specifications that account for selection bias, nonlinearity in underwriting standards, and differences in underwriting standards across the loan applicant pool.

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