DISCRIMINATION IN THE SMALL-BUSINESS CREDIT MARKET

David G. Blanchflower, Phillip B. Levine, and David J. Zimmerman*

Abstract—We use data from the 1993 and 1998 National Surveys of Small Business Finances to examine the existence of racial discrimination in the small-business credit market. We conduct an econometric analysis of loan outcomes by race and find that black-owned small businesses are about twice as likely to be denied credit even after controlling for differences in creditworthiness and other factors. A series of specification checks indicates that this gap is unlikely to be explained by omitted variable bias. These results indicate that the racial disparity in credit availability is likely caused by discrimination.

I. Introduction

Discrimination occurs whenever the terms of a transaction are affected by personal characteristics of the participants that are not relevant to the transaction. In credit markets, discrimination on the basis of race and/or gender exist if loan approval rates or interest rates charged differ across groups with equal ability to repay. Although conceptually this definition is rather straightforward, empirically it is often difficult to operationalize because the data requirements to make ceteris paribus comparisons across firms are extensive.

In this paper we use data from the 1993 and 1998 National Surveys of Small Business Finances to examine the existence of discrimination in the small-business credit market. We initially provide qualitative evidence consistent with the view that blacks are discriminated against in this market. For example, we find that black-owned firms are much more likely to report being seriously concerned with credit market problems and report being less likely to apply for credit because they fear the loan would be denied. Although this evidence is suggestive of discrimination, it certainly does not represent strong evidence on its own.

We then take advantage of the wealth of information available in these data sources to conduct an econometric exercise designed to statistically identify discrimination in credit markets. Both years of this survey provide great detail regarding which firms applied for loans and which firms were approved, along with the characteristics of the firm, its creditworthiness, and other factors. Data from 1998 go even further by providing firms' credit ratings from Dunn and Bradstreet and the personal housing and nonhousing net worth of the firms' owners that can be used as collateral to secure these loans. Although these factors go a long way towards creating ceteris paribus comparisons, we also provide a number of specification checks that enable us to further examine whether there are alternative explanations for our results.

We find that black-owned firms, in particular, are substantially more likely to be denied credit than other groups and are charged higher interest rates for those loans that are approved than are other firms that are otherwise comparable. All the specification checks we conduct support the view that these results are unlikely to be attributable to other factors. Overall, our findings support the view that black-owned firms are discriminated against in the small-business credit market.

II. Background

Although not much previous research has examined discrimination in small-business credit markets, there has been an active debate on the question of whether banks discriminate against minority applicants for mortgages. In an influential study in that area, researchers at the Federal Reserve Bank of Boston tried to collect any information that might be deemed economically relevant to whether a loan would be approved, along with the borrower's race (Munnell et al., 1996). In the raw data whites had 10% of their loans rejected, versus 28% for blacks and Hispanics. After controlling for the large number of variables collected to establish the creditworthiness of the borrowers (including the amount of the debt, debt/income ratio, credit history, and loan characteristics) blacks were still 8 percentage points less likely to be granted the loan.

A variety of criticisms have been launched at this study (see, for example, Horne, 1994; Day and Liebowitz, 1998; Harrison, 1998); responses to these criticisms are found in Browne and Tootell (1995). The most common critique indicates that we cannot make a determination of discrimination unless those blacks whose loans are approved have a greater likelihood of repayment. This argument rests critically upon an implied assumption that the distribution of repayment probabilities for blacks and whites is identical, as shown in figure 1. Panel A of this figure indicates that if this assumption is met and if firms discriminate against blacks by setting a higher bar for loan approval, then the mean rate of repayment among blacks *conditional upon loan approval* will be higher for blacks than for whites.

On the other hand, Panel B of figure 1 shows that if the distribution of loan repayment probabilities is different, then it is unclear what the difference will be in mean repayment probabilities conditional upon approval. In this panel, blacks collectively have a lower repayment probability; if lenders established a uniform cutoff in determining which loans get accepted, whites would be more likely to repay their loan. If lenders then chose to raise the bar for black-owned firms, the racial differential in loan repayment would depend upon the extent to which the bar was raised. This

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* Dartmouth College and NBER, Wellesley College and NBER, and Williams College, respectively.

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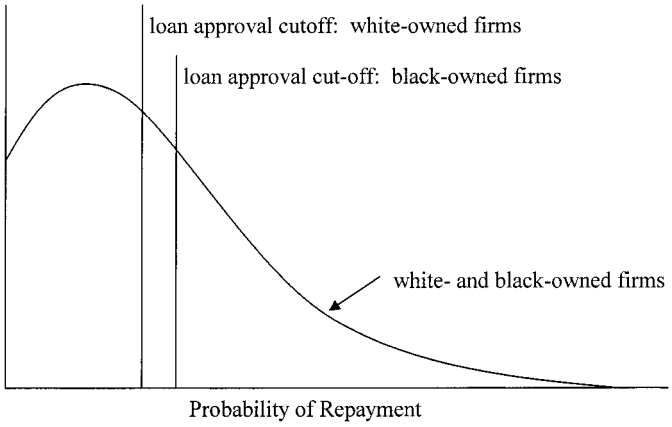
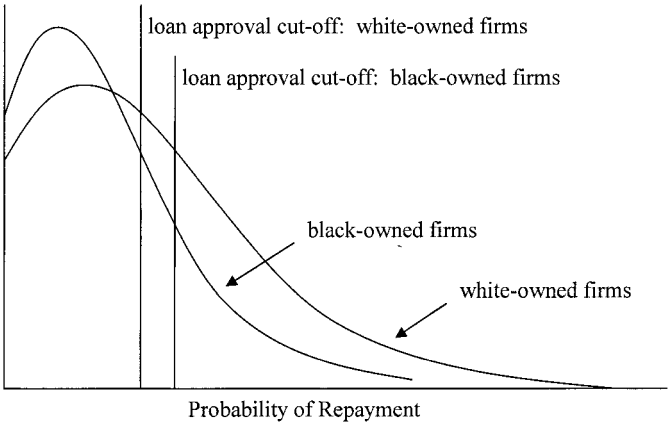
FIGURE 1.—HYPOTHETICAL EFFECTS OF DISCRIMINATION ON LOAN DEFAULT RATES FOR WHITE- AND BLACK-OWNED FIRMS



Panel A: Discrimination Reduces Default Rates for Black-Owned Firms



Panel B: Discrimination Has Ambiguous Impact on Default Rates

example would represent statistical discrimination on the part of firms. There will be some blacks who are denied loans despite being as likely as some whites to repay it, simply because the group of which they are a member has a lower repayment probability. For the purposes of this research, we apply a legalistic definition of discrimination that would encompass any disparity in loan denial rates between applicants of different races that is not attributable to differences in other characteristics besides race.[1] Therefore, differences in repayment probabilities are not necessary to prove discrimination.

We were only able to identify one published paper that has investigated the specific topic of racial differentials in access to credit among small businesses. Cavalluzzo and Cavalluzzo (1998) use data from the 1988–1989 National Survey of Small Business Finances (NSSBF), conducted by the Board of Governors of the Federal Reserve System, to analyze differences in application rates, denial rates, and other outcomes by race and gender in a manner similar to the econometric models reported in this study. This paper documents that a large discrepancy does exist in credit access between white-owned and minority-owned firms that cannot be explained by a handful of characteristics of firms. Unfortunately, the earlier NSSBF data did not oversample minority-owned firms and included limited information on credit histories of firms and owners, reducing its ability to provide a powerful test of the causal influence of race on loan decisions.

III. Empirical Framework and Description of the Data

Differences in loan denial rates or interest rates charged do not, in and of themselves, prove that discrimination exists. Evidence of discrimination would require a finding that these differences exist among firms that have the same risk of default. To this end, in the spirit of the Munnell et al. (1996), we study and estimate loan denial and interest rate models that include measures of a firm's creditworthiness, other firm characteristics, and the race/ethnicity and gender of the firm's ownership. Within this framework, evidence of discrimination would exist if the coefficients on race and/or gender are significantly greater than 0.

To estimate this model, we use national data available from the 1993 and 1998 National Survey of Small Business Finances (NSSBF). These data contain substantial information regarding credit availability on a nationally representative sample of small businesses. The *1993* survey was conducted during 1994–1995 for the Board of Governors of the Federal Reserve System and the U.S. Small Business Administration; the data relate to the years 1992 and 1993. The 1993 data file used here contains 4,637 firms with less than 500 employees.[2] Minority-owned firms were oversampled, but sampling weights are provided to generate nationally representative estimates.

The *1998* survey (conducted in 1999 and 2000 for firms in business in 1998) collected information on 3,561 firms in a similar manner to its predecessor. This survey provides two main advantages over the earlier survey. First, the 1998 survey contains a credit rating score for each firm in it, obtained from Dunn and Bradstreet, that can be used to help control for a firm's creditworthiness.[3] Dunn and Bradstreet is the leading provider of credit ratings in the country,

[1] For instance, the Equal Credit Opportunity Act prohibits discrimination in access to credit by race and would apply to both Becker-type and statistical discrimination.

[2] The median sizes were 5.5 and 5.0 and the mean sizes were 31.6 and 25.5 full-time equivalent employees in 1993 and 1998, respectively; 440 firms out of 4,637 in 1993 and 263 firms out of 3,561 in 1998 had 100 full-time equivalent employees or more. For further details regarding the 1993 NSSBF survey see the Data Appendix provided in Blanchflower, Levine, and Zimmerman (1998).

[3] Cavalluzzo, Cavalluzzo, and Wolken (1999) were able to incorporate Dun and Bradstreet credit ratings for each firm using the 1993 NSSBF because their connection to the Federal Reserve Board enabled them to access the confidential firm identifiers.

collecting information on 13 million firms nationwide from a multitude of sources, including a firm's past experiences with banks, public utility payment histories, and trade experiences with other firms. Second, the 1998 survey collected information on the housing and nonhousing net worth of firm owners. Since these forms of wealth may be used as collateral for small-business loans, the availability of this information enables us to control for this additional contributor to the likelihood a loan is repaid. One limitation of these data relative to the 1993 survey, however, is that information on loan applications was obtained for a smaller number of loans, somewhat reducing the sample size available.[4] This makes it difficult to conduct some of the additional specification checks that we are able to perform with the 1993 survey.

Table 1 presents weighted sample means from these data for all firms that applied for credit, by race/ethnicity.[5] The estimates indicate that black-owned firms are more than twice as likely to have a loan application rejected as white-owned firms (65.9% versus 26.9% in 1993, and 62.3% versus 28.8% in 1998).[6] Other minority groups are denied at rates higher than whites as well, but the magnitude of the black-white differential is especially striking. For those loans that were approved, black-owned firms also had to pay rates of interest that were 1 percentage point higher in 1993 and 1.7 percentage point higher in 1998. Minority-owned firms, however, do have characteristics that are different than those of white-owned firms that may have contributed to these differences. For instance, minority-owned firms were younger and smaller (whether measured in terms of sales or employment) than their white counterparts.

Black-owned firms, in particular, were also generally less creditworthy than firms owned by other racial groups measured by whether the owner had: (a) been bankrupt over the preceding 7 years, (b) had been delinquent for more than 60 days on personal obligations over the preceding 3 years, or (c) had legal judgments against him or her over the preceding 3 years; or (d) over the preceding three years, the firm had been delinquent for more than 60 days on business obligations. Moreover, data from the 1998 survey provide even better measures of a firm's creditworthiness, available from Dunn and Bradstreet. These data indicate that black-owned firms have a higher risk of loan default, according to their credit ratings. The 1998 data also indicates that black small-business owners have less personal wealth available that could be used as collateral for a business loan.

IV. Qualitative Evidence

Before moving on to the results of our multivariate analysis, we first report on what business owners themselves say are the main problems confronting them. This evidence, though obviously not conclusive in determining whether discrimination exists, does highlight firms' perceptions regarding discrimination in obtaining credit. To the extent that black-owned firms report greater difficulty in obtaining credit than white-owned firms, but report other types of problems no more frequently, it would suggest either that discrimination takes place or that perceptions of discrimination exist which are unwarranted. It therefore complements the econometric analysis provided below, which can distinguish between these two hypotheses.

Table 2 reports the results of asking specific questions about problems facing firms.[7] Different types of questions were asked in the two surveys, and this is reflected in each panel of this table. In the top panel we report the percentage of firms in the 1993 survey that report a particular problem was serious in the past 12 months. Blacks were much more likely to say that credit market conditions had been a serious problem (31%) than were Hispanics (23%), whites (13%) or those from other racial groups (13%). Regarding other problems, however, differences by race are much less pronounced.[8] The finding that black firms are largely indistinguishable from white firms in reporting a variety of problems, except for the case of credit, indicates that minority-owned firms perceive that credit availability really is a problem for them.

The remainder of table 2 reports more forward-looking problems that firms face. The middle panel reports the percentage of 1993 NSSBF respondents indicating that a particular issue is the most important that they were likely to confront over the 12-month period from the date of interview. The bottom panel reports firms' responses in the 1998 survey regarding the most important problem facing the firm today. In both cases, the ability to obtain a loan at

[4] The 1993 survey inquired about any loan applications made in the past 3 years, whereas the 1998 survey asked about "new" loans (those that do not serve as an extension of a previous loan). Along with the smaller sample size of the survey as a whole, the 1998 survey contains many fewer loan applications (927) than the 1993 survey (2,007).

[5] Differences in denial rates by gender are negligible. In 1993 28% of male-owned firms had their loan application denied, compared to 32% of female-owned firms. In 1998 29% of male-owned firms had their loan application denied, compared to 28% of female-owned firms. Likewise, differences in firm attributes by gender are observed, but they are not large.

[6] Cavalluzzo and Cavalluzzo (1998) examined these outcomes using the 1987 NSSBF and similarly found that denial rates (weighted) are considerably lower for minorities. White-owned firms had a denial rate for loans of 22% compared with 56% for blacks, 36% for Hispanics, and 24% for other races, which are broadly similar to the differences reported here. These estimates for minority groups are less precise, however, because of the relatively small number of minority-owned firms in the sample.

[7] Blanchflower et al. (1998) present similar evidence to that reported here from an additional data set, the 1992 Characteristics of Business Owners Survey, which was conducted by the Bureau of the Census. Results of analogous exercises to those in table 2, but restricted to the sample of firms that applied for loans, yield similar comparisons across firms distinguished by race/ethnicity and gender.

[8] We also estimated a series of ordered logit equations (available on request) to control for differences across firms in their creditworthiness, location, industry size, and the like. It is apparent from these regressions that blacks were more likely to report that credit market conditions were especially serious. Only in the case of the Family and Medical Leave Act were blacks significantly more likely to report a problem.

TABLE 1.—SELECTED SAMPLE MEANS OF LOAN APPLICANTS FROM 1993 AND 1998 NSSBF DATA

	All	White	Black	Hispanic	Other Race
1993 Data					
% of loan applications denied	28.8	26.9	65.9	35.9	40.0
Interest rate charged on approved loans (%)	8.8	8.7	9.7	9.2	8.7
Credit History of Firm/Owners					
% owners with judgments against them	4.8	4.1	16.9	5.2	15.2
% firms delinquent in business obligations	24.2	23.1	49.0	25.1	31.6
% owners delinquent on personal obligations	14.0	12.6	43.4	14.8	24.5
% owners declared bankruptcy in past 7 yr	2.4	2.4	5.3	2.0	0.8
Selected Other Firm Characteristics					
Sales (1,000s of 1992 $)	1795	1871	589	1361	1309
Profits (1,000s of 1992 $)	87	85	60	189	54
Assets (1,000s of 1992 $)	889	922	230	746	747
Liabilities (1,000s of 1992 $)	547	573	146	309	486
Total full-time employment in 1992	13.6	13.9	8.3	10.8	12.3
Firm age (years)	13.4	13.6	11.5	13.3	9.3
Characteristics of Loan Application					
Amount requested (1,000s of 1992 $)	289	299	122	172	298
% Loans to be used for working capital	49.5	48.4	62.5	62.3	51.6
% Loans to be used for equipment/machinery	15.2	14.9	15.2	16.0	21.7
% Loans to be used for land/buildings	11.6	11.9	3.7	10.5	11.9
% Loan to be backed by real estate	28.3	28.6	24.7	26.2	24.7
Sample size (unweighted)	2,007	1,648	170	96	93
1998 Data					
% of loan applications denied	28.8	24.4	62.3	54.5	47.0
Interest rate charged on approved loans (%)	9.4	9.3	11.0	9.6	10.2
Credit History of Firm/Owners					
% owners with judgments against them	3.8	3.3	9.7	6.6	5.0
% firms delinquent in business obligations	13.5	13.3	21.2	16.1	8.0
% owners delinquent on personal obligations	12.4	11.6	30.4	13.1	10.8
% owners declared bankruptcy in past 7 yr	2.5	2.2	6.0	4.6	2.0
Selected Other Firm Characteristics					
Sales (1,000s of 1998 $)	984	1066	279	391	674
Profits (1,000s of 1998 $)	131	138	106	35	105
Assets (1,000s of 1998 $)	413	449	78	142	290
Liabilities (1,000s of 1998 $)	248	265	77	118	210
Total full-time employment in 1998	8.6	9.0	5.1	6.1	7.1
Firm age (years)	13.3	13.8	11.0	11.3	10.1
Owner's home equity value (1,000s of 1998 $)	129	134	73	84	129
Owner's personal nonhousing net worth (1,000s of 1998 $)	476	513	156	236	320
Characteristics of Loan Application					
Amount requested (1,000s of 1998 $)	167	172	47	171	184
Dun & Bradstreet low risk	5.3	5.9	0.7	3.3	2.3
Dun & Bradstreet moderate risk	26.2	27.0	15.7	24.6	22.4
Dun & Bradstreet average risk	39.5	39.5	38.5	34.8	44.3
Dun & Bradstreet significant risk	21.8	20.8	34.5	24.9	25.1
Dun & Bradstreet high risk	7.2	6.8	10.6	12.4	6.0
Sample size (unweighted)	3,561	2,847	274	195	245

Sample weights are used to provide statistics that are nationally representative of all small businesses. Some variable means are computed from slightly smaller samples because of missing values.
Source: Authors' calculations from 1993 and 1998 NSSBF.

favorable interest rates appears to be an important concern for minority firms. Black-owned firms are three times more likely than whites to report financing and interest rates as the most important problem they face. Among the other responses provided, cash flow, in particular, appears to be a more common concern for blacks than for whites, but this may be endogenous to the credit available to them.

In addition, black-owned firms appear to behave in a manner consistent with these beliefs. Data indicate that black- and Hispanic-owned firms are much more likely to report that they did not apply for a loan, even though they needed credit, because they thought they would be rejected. Black- and Hispanic-owned firms are 40 and 23 percentage points, respectively, more likely to withhold an application

TABLE 2.—PROBLEMS FACING FIRMS

	All	White	Black	Hispanic	Other
1993 Data—Problems Experienced during Past 12 Months					
	(% Reporting Problem is Serious)				
Credit market conditions	14	13	31	23	13
Training costs	7	7	7	6	4
Worker's compensation costs	22	21	19	30	29
Health insurance costs	33	32	38	45	35
IRS regulation or penalties	12	12	17	17	14
Environmental regulations	8	8	6	7	11
Americans with Disabilities Act	3	3	4	3	4
Occupational Safety and Health Act	5	5	4	4	6
Family and Medical Leave Act	3	3	5	3	5
1993 Data—Problems Firms Expect to Face over the Next 12 Months					
	(% Reporting Problem)				
Credit availability	6	6	21	5	4
High interest rates	5	6	2	3	4
Health care, health insurance	21	22	12	14	15
Taxes, tax policy	6	6	3	8	4
General U.S. business conditions	12	11	9	14	17
Costs of conducting business	3	3	4	4	4
Labor force problems	3	3	4	6	4
Profits, cash flow, expansion, sales	10	10	20	10	12
Number of observations (unweighted)	4,388	3,383	424	323	258
1998 Data—Most Important Problem Facing Firm Today					
	(% Reporting Problem)				
Financing and interest rates	7	6	18	10	8
Taxes	7	7	2	5	3
Poor sales	8	7	6	12	7
Cost/availability of labor	4	4	3	2	4
Government regulations/red tape	7	7	3	6	8
Competition	11	11	11	9	18
Quality of labor	13	13	11	10	9
Cost and availability of insurance	2	2	1	1	0
Cash flow	5	4	11	8	4
Costs, other than labor	3	3	2	3	4
Seasonal/cyclical issues	1	1	1	1	1
Number of observations	3,561	2,743	274	245	195

Source: Authors' calculations from 1993 and 1998 NSSBF. Note that the sample sizes by race in 1998 do not sum to the total sample size, because firms where ownership is shared equally by members of different races were not assigned a category in this survey.

fearing denial than are white-owned firms in the 1993 survey, and 32 and 9 percentage points, respectively, more likely to do so in the 1998 survey.[9] Of course, some of the difference may be attributable to differences in creditworthiness across firms, in that firms that are bad credit risks should be afraid that their loan would be denied. In econometric models comparable to those reported below, we tested this alternative by holding constant differences in creditworthiness and other characteristics of firms. Although these factors do appear to explain some of this differential, we found that a gap of 26 (16) percentage points still exists between black-owned (Hispanic-owned) firms and white-owned firms, using data from 1993.[10] In 1998 these regression-adjusted differentials are 21% and 4%, respectively. In fact, when asked directly why they were afraid to apply for loans, minority-owned firms were more likely to report prejudice as the reason (18% for black-owned firms, 5% for Hispanic-owned firms, and 2% for white-owned firms in 1993; 8% for black-owned firms, 7% for Hispanic-owned firms, and 2% for white-owned firms in 1998).[11] We will attempt to determine whether these perceptions reflect actual discrimination in the econometric analysis to follow.

V. Econometric Evidence

Evidence presented to this point indicates that minority-owned firms are more likely to be denied loans and to be charged higher rates of interest for those loans approved.

[9] The actual percentages for each group are in 1993 are: 22.5% for white-owned businesses, 41.7% for Hispanic-owned businesses, and 60.8% for black-owned businesses. In 1998, they are: 21.5% for white-owned businesses, 30.1% for Hispanic-owned businesses, and 53.9% for black-owned businesses.

[10] More details regarding this analysis, along with tables presenting the results, are available in Blanchflower et al. (1998).

[11] The other reasons given, including too little collateral, poor credit history, and a poor balance sheet, are comparable across groups. (Firms could report more than one reason.)

TABLE 3.—MODELS OF LOAN DENIALS, 1993 AND 1998 NSSBF DATA (PROBIT DERIVATIVES; *t*-STATISTICS IN PARENTHESES)

Specification: Additional Variables Included	Black	Asian/Pacific Islander	Native American	Hispanic	Female	Sample Size
1993 Data						
(1) None	0.426	0.207	−0.051	0.113	0.073	
	(10.87)	(3.90)	(0.35)	(.073)	(2.54)	2,007
(2) Model 1 plus creditworthiness measures and owner's education	0.277	0.160	−0.153	0.061	0.039	
	(6.69)	(3.02)	(1.17)	(1.27)	(1.36)	2,007
(3) Model 2 plus other firm characteristics and characteristics of the loan	0.225	0.120	−0.109	0.064	0.037	
	(5.39)	(2.27)	(0.82)	(1.31)	(1.30)	1,997
(4) Model 3 plus region and industry fixed effects	0.226	0.101	−0.062	0.036	0.026	
	(5.12)	(1.87)	(0.43)	(0.72)	(0.88)	1,976
(5) Model 4 plus month/year of application and type of financial institution fixed effects	0.234	0.100	−0.092	0.033	0.025	
	(5.08)	(1.80)	(0.64)	(0.65)	(0.85)	1,964
1998 Data						
(1) None	0.382	0.162		0.314	0.032	927
	(6.81)	(2.64)		(4.67)	(0.85)	
(2) Model 1 plus other creditworthiness measures and 6 owner's education dummies	0.301	0.192		0.294	0.030	927
	(4.99)	(2.99)		(4.15)	(0.78)	
(3) Model 2 plus Dunn and Bradstreet credit rating	0.281	0.187		0.280	0.022	927
	(4.67)	(2.91)		(3.95)	(0.57)	
(4) Model 3 plus other firm characteristics and characteristics of the loan	0.250	0.155		0.240	0.000	927
	(4.18)	(2.42)		(3.40)	(0.01)	
(5) Model 4 plus owner's housing and nonhousing wealth	0.241	0.146		0.237	0.001	927
	(4.08)	(2.31)		(3.39)	(0.02)	
(6) Model 5 plus region and industry fixed effects	0.265	0.136		0.227	0.025	927
	(4.07)	(2.07)		(3.12)	(0.64)	
(7) Model 6 plus year of application	0.301	0.135		0.215	0.039	927
	(4.48)	(2.08)		(3.01)	(0.99)	

Each line of this table represents a separate regression with the specified regressors; "Creditworthiness measures" include whether or not the firm has been delinquent in a personal or business loan, whether the owner has declared bankruptcy in the past seven years, whether the owner has had any judgments against him/her, the firm's sales, profits, assets, and liabilities, and the owner's years of experience and share of the business. "Other firm characteristics" include for the 1993 data a dummy variable indicating whether the firm had a line of credit; 1990 employment; firm age; an MSA dummy variable; a new-firm-since-1990 dummy variable S-corporation, C-corporation, and partnership dummy variables; 1990–1992 employment change; a dummy variable for an existing long-run relation with the lender, dummy variables identifying if the firm's market was regional, national, or international; the value of the firm's inventory; the level of wages and salaries paid to workers; officers' cash holdings; and the value of land held by the firm. For the 1998 data "Other firm characteristics" include firm age, 1998 employment, five type-of-organization dummy variables, and four dummy variables identifying if the firm's market was regional, national, or international. "Characteristics of the loan" in 1993 include the size of the loan being applied for, a dummy variable indicating whether the loan was to be backed by real estate, and 11 dummy variables indicating the use of the loan. "Characteristics of the loan" in 1998 just includes the size of the loan being applied for. The dependent variable in all specifications is an indicator for whether or not a loan application was denied. Native Americans include American Indians and Alaskan Eskimo. In the 1998 data the categories "Asian/Pacific Islander" and "Native American" are combined due to small numbers of observations.

Source: Authors' calculations from 1993 and 1998 NSSBF.

Can these differences be explained by such things as differences in creditworthiness and other factors? To address this question we now turn to an econometric examination of loan denials and interest rates charged, holding constant differences across firms.

A. *Models of Loan Denials*

In the top panel of table 3 the results of estimating a series of loan denial probit models using data from the 1993 NSSBF are reported. We report estimated derivatives from these models that can be interpreted as the effect on the probability of loan denial of an infinitesimal change in each independent continuous variable and the discrete change in the probability for dummy variables. In row (1), which contains only race and gender indicators, for instance, the coefficient of 0.426 can be interpreted as indicating that the denial rate for black-owned businesses is 42.6 percentage points higher than that for those firms in the excluded category of white-owned firms.[12] Loan requests made by firms owned by Asian/Pacific Islanders, Hispanics, and women are also more likely to be denied, but the disadvantage for these groups is much smaller than that for black-owned small businesses.

The next four rows include additional sets of explanatory variables to hold constant differences in the characteristics of firms that may vary by race.[13] In row (2) a number of

[12] This estimate largely replicates the raw difference in denial rates between black- and white-owned businesses reported in table 1. The raw differential observed there (0.659 − 0.269 = 0.39) differs slightly from the 0.426 differential reported here because this specification also controls for whether the business is owned by a woman and because the regressions are unweighted whereas the descriptive statistics are weighted using the sample weights. When a full set of explanatory control variables are included, the unweighted estimates are insignificantly different from the weighted; hence in table 4 and subsequent tables we report only unweighted estimates.

[13] In preliminary analyses, we also estimated these models separately, focusing specifically on the differences in coefficient estimates between whites and blacks because of the large raw differentials between them. The *F*-test we conducted to determine whether parameter estimates were

controls are included that distinguish the creditworthiness of the firm and the owner.[14] Although not reported in the table, many are statistically significant on a two-tailed test at conventional levels of significance with the expected signs.[15] Even after controlling for these differences in creditworthiness, black-owned firms remain 28 percentage points more likely to have their loan request denied than white-owned firms. Firms owned by Asian/Pacific Islanders also are at a disadvantage, of 16 percentage points, in terms of loan denials, but the coefficients on Hispanic- and female-owned firms become smaller and insignificant after these controls are added.

The models reported in rows (3) through (5) control for a vast array of additional characteristics of firms. Row (3) adds a vector of 30 additional characteristics of the firm and the loan application, including such factors as level of employment, change in employment, the size of the loan request, and the use of the loan. Row (4) includes vectors of dummy variables to control for differences across regions of the country and the firm's industry. Row (5) appends dummy variables, indicating the month and year in which the loan was requested and the type of financial institution to which the firm applied.[16] In total these three rows append an additional 164 variables to the more parsimonious specification reported in row 2.

Nevertheless, the estimated disadvantage experienced by black-owned firms in obtaining credit falls by a relatively small amount. The estimate from each of the three additional rows indicates that black-owned firms are approximately 23 percentage points more likely to have their loan application denied than white-owned firms. The results also indicate that Asians/Pacific Islanders also had statistically significantly higher denial rates than whites (at the 10% level of significance). There is no evidence that denial rates for firms owned by other racial groups or women were significantly different from that of firms owned by whites or men.

The lower panel of table 3 presents a similar analysis of the 1998 NSSBF data, with the important differences that credit ratings from Dunn and Bradstreet and housing wealth and nonhousing net worth values of the owner are incorporated as control variables. The first two rows in this panel are designed to exactly replicate models estimated using the 1993 data and reported in the top half of the table. These models provide estimates of the effect of race and gender on loan denial rates with no other covariates and with a set of creditworthiness measures that are available in both surveys. Comparable results are obtained here regarding the disadvantage faced by black-owned firms. With no other controls, in the 1998 data blacks are 38 percentage points more likely to have their loan denied; adding measures of creditworthiness reduces this differential to 30 percentage points. The only important difference observed in these results between 1993 and 1998 is that Hispanics now appear to face greater difficulty getting their loan applications approved. In the more recent data, Hispanics face a disadvantage in the loan market similar to that of blacks.

The third row of this panel adds credit rating data from Dunn and Bradstreet as an explanatory variable. The results indicate that incorporating this additional control on a firm's creditworthiness has a negligible effect on the results. Blacks are still 28 percentage points less likely to have their loan application approved than white-owned firms. This finding supports the use of the set of controls for creditworthiness that we are able to employ when using the 1993 data.

The fourth and fifth rows of this panel examine the additional impact of controlling for other characteristics of the owner and the loan. In the fourth row, covariates comparable to those available in 1993 are added. In this specification the coefficient on black-owned firms is slightly smaller than in models that omit these additional variables. In the fifth row, we also add the owner's wealth measures, which are also shown to have very little impact on the estimated disadvantage that black-owned firms face in the credit market. These findings also support the notion that the analysis using 1993 data, for which owner's wealth data are absent, are not biased by this omission. With all these covariates included in the regression, black-owned firms still face a 24-percentage-point disadvantage in getting their loan applications approved.

The remainder of this panel adds region and industry fixed effects along with fixed effects reflecting the year of application. Even after controlling for this extensive array of covariates, we still find that black-owned firms are about 30 percentage points more likely to have their loan application denied than white-owned firms. Similar to the analysis using 1993 data, Asian/Pacific Islanders are about 14% more likely than a white small business owner to have their loan application denied. Unlike 1993, however, Hispanics are found to be significantly more likely to have their loan application denied. They face a surplus of about 22 percentage points relative to the denial rate of whites.

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the same for blacks and whites rejected this null hypothesis. Then we used the estimates obtained by estimating the model separately by race and conducted an Oaxaca (1973) decomposition. The results from this analysis were similar to those obtained by restricting the coefficients to be the same between blacks and whites and using the coefficient on a black indicator variable to measure the gap between groups. We have chosen to report all the results in this simpler format for ease of exposition and interpretation.

[14] We have experimented with some combinations of variables (such as the ratio of debt to equity) as well as various other nonlinearities (such as quadratics in sales, profits, and employment) and found that the results were unaffected by these alternative functional forms.

[15] Parameter estimates for these variables have been excluded from this table for the purposes of brevity, but Blanchflower et al. (1998) report all of them for the loan denial models using 1993 data.

[16] In 1993, approximately four out of five (80.5%) of the firms who required a loan applied to a commercial bank. Overall 17 different types of financial institution were used, although only the following accounted for more than 1% of the total (weighted): credit unions (2.0%), savings banks (2.5%), savings & loans (2.3%), finance companies (4.9%), lease companies (2.1%), and other business firms (1.7%). Comparable information for 1998 is unavailable.

B. *Specification Checks*

Although the results provided so far strongly indicate that financial institutions treat black- and white-owned small businesses differently in lending, other considerations may limit our ability to interpret this finding as discrimination. Of perhaps greatest concern is the possibility that we may not have adequately controlled for differences in creditworthiness of firms. If black-owned firms are less creditworthy and we have failed to sufficiently capture the differences, even with our extensive set of control variables, then we would be inappropriately attributing the racial difference in loan denial rates and interest rates to discrimination.[17]

To address this potentially serious problem, our first approach was to identify the types of information that financial institutions collect in order to evaluate a loan application and compare that with the information available to us in the NSSBF. First, we went to some local banks and obtained small-business loan applications. Second, we searched the Internet and examined Web sites that provide general business advice to small firms, including a description of the loan application process and the information typically requested of applicants.[18]

We found that detailed information is requested of both the firm and its owner. Regarding the firm, banks typically request information like the following: (a) type of business, (b) years in business, (c) number of full-time employees, (d) annual sales, (e) organization type (corporation or proprietorship), (f) owner's share, (g) assets and liabilities, (h) whether the business is a party to any lawsuit, and (i) whether any back taxes are owed. Regarding the owner's personal finances, banks typically ask for: (a) assets and liabilities, (b) sources and levels of income, and (c) whether the owner has any contingent liabilities. Some applications ask explicitly if the firm qualifies as a minority-owned enterprise for the purposes of certain government loan guarantee programs. The race of the applicant, however, would be readily identifiable even in the absence of such a question, because most loans originate in face-to-face contact with a representative of the financial institution. The same would be true of the applicant's gender.

These criteria closely match the information available to us in the NSSBF, especially in 1998, when we have access to the owner's personal housing wealth and nonhousing net worth. The particular strength of the survey is the detail available on the firm, which covers virtually all of the information typically requested on loan application forms. Our creditworthiness measures provide us with extensive information regarding the financial condition of the firm, especially in 1998, when we have the firms' credit rating at our disposal.

A minor shortcoming in these data that we have identified is that lenders require additional information on the finances of the owner of the firm that is not available in the NSSBF data. We have some information on the firm owner's personal finances, particularly in 1998 when we have access to his/her housing and nonhousing wealth. However, we do not have direct information regarding other components of personal finance, like the owner's income and contingent liabilities. These factors would be necessary in addition to his/her housing and nonhousing wealth to identify whether the business owner has sufficient personal resources to draw upon should the business encounter difficulties and to further determine the personal collateral available should the firm default on its obligation. We do have measures of the owner's human capital in the form of education and experience, which likely captures at least some of the differential in available personal wealth across firm owners. Nevertheless, our potentially incomplete characterization of the business owner's personal financial condition may introduce a bias into our analysis if black business owners are less able to personally repay a loan if the business itself cannot.

To assess the possible effect of this problem on our results, we separately examined groups of firms that differ in the degree to which personal finances should influence the loan decision and compare the estimated disadvantage experienced by black-owned firms in the different groups. For completeness, we do the same for other racial/ethnic groups, as well as for women. First, we examine proprietorships/partnerships separately from corporations, for owners of an incorporated business are at least somewhat shielded from incurring the costs of a failed business. Second, we divide firms according to their size and age.[19] Both larger small businesses and those that have been in existence for some time are more likely to rely on the business's, rather than the owner's, funds to repay its obligations. Third, we consider firms that have applied for loans to obtain working capital separately from firms that seek funds for other purposes (mainly to purchase vehicles, machinery and equipment, and buildings/land). Loans made for one of these other purposes at least partially provide their own collateral because the financial institution could sell them, albeit at a somewhat reduced rate, should the business default. Unfortunately, we are only able to estimate these models for 1993, because the purpose of the loan is not included in the 1998 survey. For the remainder of this

[17] On the other hand, if financial institutions discriminate against black-owned firms, then the greater likelihood of denial for blacks in earlier years is likely to hurt the performance of those firms and make them look less creditworthy. Therefore, controlling for creditworthiness may work to understate the presence of discrimination.

[18] See Appendix B in Blanchflower et al. (1998) for an example of a typical application form.

[19] The mean and the median age of firms are 15 and 12 years, respectively, in the 1993 survey. In the 1998 survey, they are 14 and 11 years. Only 14.5% and 20.5% are less than five years old in 1993 and 1998, respectively, and only 4.1% and 8.0% are less than three years old, respectively. As reported in footnote 2, the mean and the median size of firms are 5.5 and 31.6 full-time equivalent workers, respectively, in the 1993 survey, and 5.0 and 25.5 workers, respectively, in the 1998 survey. Fourteen percent of firms have one or fewer employees, and 27% have two or fewer employees in 1993, whereas 35% of firms have one or fewer workers and 45% have two or fewer workers in 1998.

TABLE 4.—ALTERNATIVE SPECIFICATIONS OF LOAN DENIAL MODELS, 1993 NSSBF DATA (PROBIT DERIVATIVES, *t*-STATISTICS IN PARENTHESES)

Specification	Black	Asian/Pacific Islander	Native American	Hispanic	Female	Sample Size
Organization type						
(1) Proprietorships and Partnerships	.253	.209	.404	.072	−.0196	539
	(3.41)	(2.04)	(0.95)	(0.87)	(0.37)	
(2) Corporations	.193	.095	—	.056	.0570	1,450
	(3.83)	(1.51)	—	(0.90)	(1.68)	
Age of firm						
(3) 12 years or under	.250	.178	−.105	.030	.0002	1,071
	(4.41)	(2.55)	(0.61)	(0.43)	(0.00)	
(4) Over 12 years	.175	−.010	—	.105	.121	920
	(2.88)	(0.13)	—	(1.51)	(2.67)	
1990 firm size						
(5) Fewer than 10 employees	.199	.100	−.035	.033	−.015	962
	(3.89)	(1.41)	(0.17)	(0.53)	(0.42)	
(6) 10 or more employees	.244	.146	—	.148	.088	1,027
	(3.38)	(1.77)	—	(1.78)	(2.05)	
Use of loan						
(7) Working capital	.247	.051	—	−.006	.034	1,082
	(4.67)	(0.76)	—	(0.09)	(0.86)	
(8) Other use	.157	.243	−.073	.138	.046	912
	(2.31)	(2.75)	(0.48)	(1.85)	(1.10)	
Sales market						
(9) Local	.140	.138	—	−.006	.020	871
	(2.24)	(1.98)	—	(0.10)	(0.50)	
(10) Regional, national, or international	.291	.067	−.105	.155	.049	1,124
	(5.19)	(0.84)	(0.76)	(1.93)	(1.21)	
Creditworthiness						
(11) No past problems	.213	.167	—	.026	.060	1,380
	(4.04)	(3.04)	—	(0.57)	(2.11)	
(12) One past problem	.256	−.071	—	.202	.044	374
	(2.67)	(0.46)	—	(1.44)	(0.54)	
(13) More than one problem	.266	.266	.145	−.059	−.197	231
	(2.56)	(1.75)	(0.38)	(0.33)	(1.70)	

Each row of this table represents a separate regression with the same control variables as row (3) of the top panel of table 3. The dependent variable in each specification represents an indicator for whether or not a loan application was denied. Native Americans include American Indians and Alaskan Eskimos.

Source: Authors' calculations from 1993 NSSBF.

discussion, for brevity we focus our attention on the results for black- versus white-owned firms, for it is differences between these groups that have been (and will be) largely robust to alternative specifications.

Results from these analyses are reported in rows (1) through (8) of table 4 and rows (1) through (6) of table 5, using the 1993 and 1998 data, respectively. They provide little indication that omitting some characteristics of the owner's personal finances biases the results presented earlier.[20] Estimates indicate that black-owned small businesses are significantly more likely to have their loan applications rejected in virtually all categories of firms considered. In particular—with the exception of larger firms in 1998—corporations, older firms, larger firms, and firms seeking credit for uses other than working capital are between 13 and 25 percentage points more likely to have the loan application rejected if black-owned, even though personal resources should be less important in these categories. Moreover, in each group of two firm types (large versus small, etc.), the estimates are not significantly different from each other.

Another issue that needs to be considered in interpreting the results presented so far is whether or not the ceteris paribus differential by race in loan denial rates is attributable to differences in the geographic location of black- and white-owned firms. If, for example, black-owned firms are more likely to locate in the central city, and a central city location is negatively correlated with profitability and the ability to repay debt, then financial institutions may be acting optimally. Here, we present a limited analysis to address whether or not this type of behavior takes place.

To identify whether lenders' behavior is consistent with this hypothesis, we distinguish those firms that self-classified their sales market as being local versus regional, national, or international. A central city location should have a greater effect on future profit expectations for those firms that operate on a local level. If minority-owned firms are more likely to locate in the central city, racial differences in

[20] The estimates we present in these specifications are obtained from models comparable to those in rows (3) and (5) using the 1993 and 1998 data, respectively, from table 3. These specifications include all the credit history measures, other firm characteristics, and characteristics of the loan, but not the complete set of control variables included in the rows 4 and 5 of these tables. We have chosen to report the more parsimonious specification because the evidence indicates that those models which include the full set of control variables do not fit any better and provide virtually identical estimates of the disadvantage faced by black-owned firms in obtaining credit. Estimates from the more parsimonious specification improve the precision of our estimates, which is particularly useful given the smaller samples in each category of firms.

TABLE 5.—ALTERNATIVE SPECIFICATIONS OF LOAN DENIAL MODELS, 1998 SSBF DATA (PROBIT DERIVATIVES, *t*-STATISTICS IN PARENTHESES)

Specification	Black	Asians/Pacific Islander	Hispanic	Female	Sample Size
Organization type					
(1) Proprietorships and partnerships	.370	.214	.419	−.022	346
	(3.87)	(1.75)	(3.46)	(0.31)	
(2) Corporations	.134	.080	.089	.021	569
	(1.97)	(1.23)	(1.19)	(0.51)	
Age of firm					
(3) 12 years or under	.232	.150	.222	−.023	542
	(2.87)	(1.76)	(2.44)	(0.42)	
(4) Over 12 years	.248	.145	.231	.044	378
	(2.95)	(1.69)	(1.92)	(0.94)	
1998 firm size					
(5) Fewer than 10 employees	.343	.240	.282	.009	456
	(4.28)	(2.29)	(2.68)	(0.15)	
(6) 10 or more employees	.027	.001	.143	−.003	454
	(0.42)	(0.02)	(1.88)	(0.08)	
Sales market					
(7) Local	.292	.179	.329	−.040	449
	(3.49)	(1.91)	(3.11)	(0.81)	
(8) Regional, national, or international	.201	.123	.190	.044	468
	(2.40)	(1.50)	(1.99)	(0.83)	
Creditworthiness					
(9) No past problems	.210	.078	.187	−.003	627
	(3.37)	(1.44)	(2.64)	(0.09)	
(10) One or more past problems	.304	.178	.217	.056	289
	(2.71)	(1.21)	(1.63)	(0.63)	
Dunn & Bradstreet credit rating					
(11) Low, moderate, or average risk	.224	.116	.133	−.000	591
	(3.14)	(1.71)	(1.60)	(0.01)	
(12) Significant or high risk	.265	.168	.376	.003	321
	(2.60)	(1.39)	(3.17)	(0.04)	

Each row of this table represents a separate regression with the same control variables as row (5) of the middle panel of table 3. The dependent variable in each specification represents an indicator for whether or not a loan application was denied. Asian/Pacific Islanders includes Asians, Pacific Islanders, American Indians, and Alaskan Eskimos.

Source: Authors' calculations from 1998 SSBF.

loan approval rates and interest rates charged should be greater in the firms that sell in the local marketplace. The results of this test are reported in rows (9) and (10) of table 4 and rows (7) and (8) of table 5 for 1993 and 1998, respectively. They reject the hypothesis that observed differences can be attributable to different propensities to locate in the center of a city. Estimates indicate that black-owned firms operating both in local sales markets and elsewhere face a sizable increase in the likelihood their loan application will be denied in both surveys. The estimates are all significantly different from zero, but not significantly different from each other across sales markets within a survey year.

We also estimate models that address a potential weakness in the specific functional form with which we control for differences in credit history across firms. As shown in table 1, black-owned firms are considerably more likely to have had troubles in the past in the form of judgments against them, late payments by the firm or its owner, or past bankruptcies, and their credit ratings are lower than those of white-owned firms. The model specifications reported so far implicitly assume that these past problems are linear in their effects, and one might suspect the marginal impact would rise as credit problems rise. Therefore, we separate firms by the number of types of past problems experienced and, in 1998, an indicator of high risk based on a firm's credit rating. The results are reported in rows (11) to (13) in table 4 and rows (9) to (12) in table 5 for 1993 and 1998, respectively. They suggest that even black-owned firms with clean credit histories and at a lower risk of default are at a significant disadvantage in getting their loans approved, holding constant their other characteristics.

Finally, we consider whether black-owned firms are treated differently from white-owned firms when requesting credit from other sources. If minority-owned firms really are less creditworthy, then other types of creditors also may be reluctant to provide them with credit. On the other hand, if they are able to obtain other kinds of credit at roughly the same rate regardless of the owner's race, then perhaps the disadvantage that black-owned firms face when they apply for loans from financial institutions is more likely attributable to discrimination.

The source of credit we examine is credit-card use. Such an analysis provides a unique advantage because credit-card applications are more likely to be filled out and mailed in, so it is quite likely that the race of the applicant is unknown to the financial institution.[21] The NSSBF asked respondents

[21] In fact, it is our understanding that it is illegal for creditors to ask an applicant about his/her race on a credit application. Lenders to small businesses appear to be exempt from this restriction, from what we can determine, so long as they are asking whether the entity is a certified

TABLE 6.—MODELS OF CREDIT CARD USE (PROBIT DERIVATIVES, *t*-STATISTICS IN PARENTHESES)

Specification	Black	Asian/Pacific Islander	Native American	Hispanic	Female	Sample Size
			1993 Data			
(1) Business credit card	.032	−.102	.072	.029	−.005	4,618
	(1.26)	(3.51)	(0.86)	(0.95)	(0.27)	
(2) Personal credit card	.015	−.028	−.004	−.045	.024	4,618
	(0.58)	(0.96)	(0.05)	(1.50)	(1.26)	
			1998 Data			
(1) Business credit card	−.014	−.053	—	−.024	−.042	3,457
	(0.42)	(1.54)	—	(0.62)	(1.97)	
(2) Personal credit card	−.016	.040	—	−.050	.023	3,457
	(0.49)	(1.17)	—	(1.31)	(1.11)	

Each row of this table represents a separate regression with the same control variables as row (3) of table 4, but excluding the loan characteristics. The dependent variable indicates whether the firm used business or personal credit cards to finance business expenses. In all specifications, the sample size is all firms. Native Americans include American Indians and Alaskan Eskimos.

Source: Authors' calculations from 1993 and 1998 NSSBF.

whether they used either a business or personal credit card for business purposes. Although our analysis of use of credit cards does not condition on application, a finding that black- and white-owned small businesses are equally likely to use credit cards may still provide evidence supporting discrimination in small-business lending. In fact, if financial institutions discriminate against blacks in obtaining small-business loans, we may even expect to see them use credit cards more often than whites, because they have fewer alternatives. Even though many institutions may offer both types of credit, they may only be aware of the race of the applicant in a small-business loan.

In table 6 we examine the probability that a firm uses either a business credit card or a personal credit card to finance business expenses in the 1993 and the 1998 data, holding constant other differences across firms.[22] In neither case could we find any evidence that black-owned firms were less likely to have access to such cards. We also had information available on the maximum amount that could be billed to these accounts and found no significant difference by race in regression models of the amount that could be charged. No racial differences were observed when we modeled the typical balance remaining on these cards at the end of a typical month (results not reported).

C. *Models of Interest Rates Charged*

Although most of our analysis has addressed whether minority- and white-owned firms are treated equally in terms of their probability of denial, another way that differential treatment may emerge is through the interest rate charged for approved loans. Discrimination may be apparent if banks approve loans to equally creditworthy minority- and white-owned firms, but charge the minority-owned firms a higher rate of interest.[23] Therefore we estimated model specifications analogous to those reported previously for loan denials, but now the dependent variable represents the interest rate charged for firms whose loans were approved. Along with the control variables included in our earlier analysis, in these models we also control for loan characteristics, including whether the loan carried a fixed or variable interest rate, the loan amount, the length of the loan, whether the loan was guaranteed, whether the loan was secured by collateral, and a set of variables identifying the type of collateral used if the loan was secured.

The results of this analysis are reported in table 7. The top two panels provide the results of specifications comparable to those in table 3 for loan denials and represent our main specifications. Here we see that in both 1993 and in 1998, black-owned firms are charged interest rates that are 1.5 percentage points higher than white-owned firms before controlling for other factors.[24] Models that include an extensive array of controls (including Dunn and Bradstreet's credit rating and the owner's housing wealth and nonhousing net worth in 1998) still indicate that blacks are charged about a full percentage point higher rate of interest than equally creditworthy white-owned firms. Depending upon the specification, the year, and the group considered, other racial groups are sometimes found to face higher interest rates that whites, but none of these findings are consistent enough to draw strong conclusions.

We also have estimated similar specification checks with interest rates that we conducted in the loan denial models earlier. In the present context, however, the smaller sample of loans in the 1998 survey than in 1993 led to an even smaller sample of approved loans, which prevented us from conducting an analogous exercise with the more recent data. The third panel of table 7 presents these specification checks

minority-owned small business for the purpose of determining eligibility for Small Business Administration loan guarantees. In either case, it is illegal to use race as a factor in determining whether or not to grant a loan.

[22] On average, in the 1993 survey 29% of all firms use business credit cards and 41% use personal credit cards for business use. The comparable statistics for 1998 are 34% and 46%. These levels vary only modestly by race/ethnicity.

[23] The sizes of the loans requested by, or granted to, white- and minority-owned firms are not statistically significantly different.

[24] These differences are not the same as those observed in table 1, which just reports sample means, mainly because we use sample weights in calculating means, but we do not do so in the regression models.

TABLE 7.—MODELS OF INTEREST RATE CHARGED (OLS COEFFICIENTS, *t*-STATISTICS IN PARENTHESES)

Specification	Black	Asian/Pacific Islander	Native American	Hispanic	Female	Sample Size
Main Specifications—1993 Data						
Additional variables included:						
(1) None	1.505	.757	−.192	.987	.333	1,455
	(5.54)	(2.50)	(0.27)	(3.78)	(2.10)	
(2) Model 1 plus creditworthiness measures and owner's education	1.402	.829	−.291	.910	.230	1,455
	(5.10)	(2.74)	(0.41)	(3.50)	(1.45)	
(3) Model 2 plus other firm characteristics and characteristics of the loan	1.031	.505	−.550	.543	−.055	1,448
	(3.80)	(1.71)	(0.79)	(2.10)	(0.35)	
(4) Model 3 plus region and industry fixed effects	1.033	.411	−.488	.471	−.103	1,448
	(3.72)	(1.34)	(0.69)	(1.75)	(0.64)	
(5) Model 4 plus month/year of application and type of financial-institution fixed effects	.984	.350	−.445	.515	−.110	1,448
	(3.57)	(1.18)	(0.66)	(1.96)	(0.70)	
Main Specifications—1998 Data						
Additional variables included:						
(1) None	1.549	.699	—	.356	−.150	768
	(4.10)	(2.00)	—	(0.80)	(0.68)	
(2) Model 1 plus creditworthiness measures (including credit rating) and owner's education	1.447	.826	—	0.073	−.184	768
	(3.79)	(2.36)	—	(0.16)	(0.83)	
(3) Model 2 plus other firm characteristics (including personal wealth) and characteristics of the loan	1.243	.761	—	−.091	−.300	768
	(3.30)	(2.19)	—	(0.21)	(1.36)	
(4) Model 3 plus region and industry fixed effects	1.204	.833	—	−.320	−.125	768
	(2.97)	(2.26)	—	(0.70)	(0.52)	
(5) Model 4 plus year of application	1.224	.846	—	−.333	−.099	768
	(2.99)	(2.29)	—	(0.72)	(0.41)	
Alternative Specifications—1993 Data						
Organization type:						
(6) Proprietorships and partnerships	1.677	.771	.016	.312	−.509	362
	(2.84)	(1.19)	(0.01)	(0.58)	(1.44)	
(7) Corporations	.657	.540	−.687	.586	.112	1,086
	(2.12)	(1.61)	(0.99)	(1.90)	(0.64)	
Age of firm:						
(8) 12 years or under	1.106	.299	−.627	.141	.010	719
	(2.90)	(0.73)	(0.72)	(0.38)	(0.05)	
(9) Older than 12 years	.814	.778	−.218	1.090	−.048	729
	(2.01)	(1.77)	(0.16)	(2.89)	(0.20)	
1990 firm size:						
(10) Fewer than 10 employees	1.361	.453	−.818	.583	−.163	640
	(3.44)	(0.97)	(0.68)	(1.53)	(0.66)	
(11) 10 or more employees	.271	.815	−.336	.804	.060	808
	(0.64)	(2.07)	(0.41)	(2.02)	(0.29)	
Sales market:						
(12) Local	.644	−.117	1.492	.530	.152	631
	(1.48)	(0.25)	(1.00)	(1.48)	(0.61)	
(13) Regional, national, or international	1.419	1.069	−1.332	.549	−.260	817
	(4.00)	(2.67)	(1.73)	(1.36)	(1.23)	
Creditworthiness:						
(14) No past problems	1.548	.448	.618	.521	−.050	1,133
	(4.46)	(1.32)	(0.74)	(1.89)	(0.28)	

Each row of this table represents a separate regression with all of the control variables as row (3). The specific covariates are reported in the notes to table 4, except that loan characteristics also include an indicator variable for whether the request was for a fixed-interest-rate loan, the length of the loan, the size of the loan, whether the loan was guaranteed, whether the loan was secured by collateral, and seven variables identifying the type of collateral used if the loan was secured. The sample consists of firms that had applied for a loan and had their application approved. "No credit problems" means that neither the firm nor the owner had been delinquent on payments over 60 days, there had been no judgments against the owner for the preceding 3 years, and the owner had not been bankrupt in the preceding 7 years. Native Americans include American Indians and Alaskan Eskimos. In the 1998 data the categories Asian/Pacific Islander and Native American are combined due to small numbers of observations.

Source: Authors' calculations from 1993 NSSBF.

for the 1993 survey. Among both corporations and older firms, black-owned businesses are still found to face sizable differences in interest rates charged. Firms that sell in the local market face a smaller interest-rate disadvantage than firms that sell to a broader market, although the estimated difference is not statistically significant. Even among a sample of firms with no past credit problems, black-owned firms pay significantly higher interest rates. The only piece of contradictory evidence is that among larger firms, those owned by blacks pay higher interest rates, but the difference is not significant. Taken collectively, however, the evidence presented here supports the notion that black-owned firms

pay higher interest rates than otherwise comparable white-owned firms, and this difference does not appear to be related to problems of model specification.

VI. Caveats

The results presented indicate that black-owned firms, in particular, face obstacles in obtaining credit that are unrelated to their creditworthiness. We are unable to find any consistent evidence that other racial/ethnic groups or women are similarly disadvantaged. Although one explanation for these findings is that black-owned firms are discriminated against, we raise a few additional factors worth considering before one can draw definitive conclusions.

First, as in any regression-based study, our analysis hinges upon the proposition that all the factors that are related to loan denial rates by race have been included in our statistical model. If, for example, blacks possess some unobservable characteristic that makes them less creditworthy, then our statistical finding would overstate the extent of discrimination. To reduce this possibility, the models we have estimated include an extensive array of factors that could conceivably affect loan decisions. Using the 1998 NSSBF data, we have also included each firm's credit rating and the owner's personal housing and nonhousing wealth as additional control variables. Models including these additional variables provide virtually identical results to those that use the set of firm and owner characteristics available in both survey years. Moreover, we have also estimated several alternative specifications that might identify the effect of such a bias. Throughout, we have consistently found that blacks are disadvantaged in the small-business credit market and that our specification tests support the interpretation of discrimination. Nevertheless, we acknowledge that a bias in that direction may remain.

Offsetting this potential bias is the fact that those minority-owned firms that actually apply for credit may represent a selected sample of the most creditworthy. More marginal minority-owned firms whose loans might have been accepted had they been owned by whites may not even be in the pool of loan applicants. First, these firms may have gone out of business or may not have had the opportunity to commence operations because of their inability to obtain capital. Second, some existing firms may have chosen not to apply for credit because they were afraid their application would be rejected due to discrimination. Therefore, the results reported above may be biased toward finding too small a disparity between white- and black-owned firms.

Another potential criticism is that this study has examined loan denial rates rather than loan default rates. We discussed this criticism with regard to home mortgage lending earlier in the paper, but an analogous argument can be made in the context of small-business loans as well. Yet our earlier discussion indicated that this argument rests critically upon the assumption that the distribution of loan repayment probabilities among white- and black-owned firms is identical, suggesting that such evidence would be sufficient, but not necessary, to prove the existence of discrimination. From a more practical standpoint, such an analysis of default rates requires longitudinal data, tracking firms for a few years following loan origination, which do not exist. Although there are important limitations on such an analysis, we believe that it would be fruitful for this sort of longitudinal data collection to take place and for future research to investigate this question more fully.

In addition, many of the criticisms levied against Munnell et al. (1996) may be relevant here as well. Yet these criticisms appear to have been effectively countered by some of the authors (see Browne & Tootell, 1995; Tootell, 1996). What is important to keep in mind in comparing our work with theirs is the magnitude of the estimated racial disparity. The absolute sizes of the raw racial differences found in the mortgage study are considerably smaller than those observed in this study regarding business credit.[25] Some of the difference in denial rates between the races in both studies appears to be due to differences in the characteristics of the applicants. Even after controlling for these differences, however, the gap in denial rates in the small-business credit market is considerably larger than that found in the mortgage market.[26] The larger size and significance of the effects found in our analyses reduce the possibility that the observed differences can be explained away by some quirk of the econometric estimation procedure.

VIII. Conclusions

Our analysis finds significant evidence that black-owned businesses face impediments to obtaining credit that go beyond observable differences in their creditworthiness. These firms are more likely to report that credit availability was a problem in the past and expect it to be a problem in the future. In fact, these concerns prevent more black-owned firms from applying for loans, because they fear being turned down due to prejudice or discrimination. We also found that loan denial rates are significantly higher for black-owned firms than for white-owned firms even after taking into account differences in an extensive array of measures of creditworthiness and other characteristics. This result appears to be largely insensitive to changes in econometric specification. Similar findings are presented regarding interest rates charged on approved loans. Overall, the evidence is consistent that black-owned firms are disadvantaged in the market for small-business credit, which would traditionally be attributed to discrimination. We find no consistent evidence of similar disadvantages for other racial/ethnic groups or for women.

[25] In the Boston Fed study 10% of whites' mortgage applications were rejected, and 28% of blacks'. The differential in loan denial rates for business credit is much greater, as shown in table 1.

[26] The ceteris paribus gap between black- and white-owned firms is about 25 percentage points in denial rates in both survey years in the small-business credit market, compared with 8 percentage points in the mortgage market.

The magnitude of the black-white differential in small-business loan approval rates is substantial, even after controlling for observed differences in creditworthiness, and considerably larger than that found in the analysis of discrimination in mortgage markets. Why do the results for small-business loans differ so markedly from those for mortgage loans? First, many mortgages are sold in the secondary market, and a substantial fraction of mortgage lenders have little intention of keeping the loans they make. This added "distance" in the transaction might reduce the likelihood of discrimination. No such sophisticated secondary market for loans to small firms exists. Second, the presence of special programs and regulatory incentives to encourage banks and others to increase their mortgage lending to minorities gives these groups some advantages in obtaining a mortgage. Additional research might seek to provide alternative explanations.

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