Are Loans to Minority Owned Firms Mispriced?

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I.   Introduction

Credit mispricing occurs when lenders adjust the terms for borrowers based on factors unrelated to their financial risk, such as the race of the business owner, rather than economic and creditworthiness indicators. This paper explores whether interest rate and collateral mispricing are evident across racial groups using survey data on small business loans granted in 2022 and 2023. Similar data has not been available since the Federal Reserve's 2003 Survey of Small Business Finances (SSBF).

This analysis is important because access to credit is crucial to the growth of small businesses; and within the small business sector, minority owned firms play an increasingly key role (Case et al., 2022). Research using the 2003 SSBF data indicated interest rates were inexplicably higher for some groups of minority borrowers (see Asiedu et al., 2012). Blanchard et al., 2008 provides a summary of studies on this topic using pre-2003 versions of SSBF. For this study, we collected data from 44 states on loans made to privately-owned businesses with 500 or fewer employees between January 2022 and June 2023 .

The contributions of this paper include first, we add to the sparse literature on this important topic. Second, we provide more extensive minority firm-white firm comparisons of collateral than

previous studies and increase the measures of collateral examined. Third, the number of observations of minority business loans in our sample is much larger than those in the 2003 SSBF, allowing us to draw more statistically robust inferences. The 2003 SSBF has data on 58 minority firms that received loans (Asiedu et al. 2012, Table 1) while our sample contains 1,792 minority firms.

Analyses

Since this study concerns credit provided to borrowers, it excludes both firms that wanted credit but did not apply and firms that applied but were rejected for credit. Exhibit I-A discusses the survey that provided the data used for this article. The following basic model provides the framework for the regressions that follow. I is the interest rate to be determined by a basic rate β_0, and there are N control variables that determine the shifts in I based on the amount of each control variable for that firm. Thus, there are N control variables considered that affect the interest rate, the β_i (i = 1 … N) represents the changes in the interest rate reflecting the value of the attributes affecting the rate, and β_R measures the effect of race of the firm's majority ownership on the interest rate.

$$I = \beta_0 + \sum_{i=1}^{N} \beta_i X_i + \beta_R X_R + \varepsilon \tag{1}$$

Mispricing occurs when the coefficient of race is statistically significant in the model that includes the N attributes measuring loan risk. When all the N attributes are included in the model, β_R should be zero. We cannot prove, of course, that we have controlled for every credit variable that lenders consider in evaluating applications for business loans. The information gathered in the survey makes it possible to control for a very wide range of such variables, however, thereby greatly lowering the probability that our estimates are affected by omitted variable bias. Our controls

included 17 firm characteristics, five loan characteristics, and four lender characteristics in Exhibit I-B. As a result, we believe that our findings provide credible estimates of mispricing.

Our approach is to separately compare each minority group to white owned firms. For each set of regressions, we include an indicator variable for the relevant minority group, which then captures the loan rate difference between the two groups. We then examine the estimated minority-white loan pricing difference as we sequentially add controls. Online Appendix Exhibit A-1 provides summary statistics on the sample firms. Exhibit II below reports the interest rates and collateral for the white owned firms and each minority group: Hispanic, Asian American, Black and Native American/Alaskan Native. The interest rate and collateral requirements are often co-determined. Online Appendix B examines the result of this endogeneity through Principal Component Analysis. The relationships found therein lead to our approach in analyzing interest rates and collateral.

Interest Rates: Exhibit III shows our analysis of interest rates on credit provided to our sample firms. Groups are defined based upon controlling ownership. At least 50% ownership belongs to that racial/ethnic group while all other racial/ethnic groups have less than 50% combined ownership. Model 5 is our preferred specification since it considers all available potentially relevant factors. We find that after controlling for creditworthiness and other firm attributes, the annual interest rate paid by Hispanic owned firms was 2.91 percentage points higher than that paid by white owned firms. Similarly, Black owned firms paid 3.09 percentage points higher rates, and Asian American owned firms paid 2.88 percentage points higher rates than white owned firms. The Native American owned firms indicator was not statistically significant in model 5. Asiedu et al. (2012), using the 2003 SSBF, found that only the Hispanic firms paid a higher rate than white firms, by 2.45 percentage points. The 2003 SSBF did not include a Native American group.

We also use split samples to analyze nonlinearities and differences in underwriting in Exhibit IV. It reports analyses for the following: years of relationship with lender, type of credit (loan vs. line of credit), new credit vs. credit renewal, borrowing purpose of debt consolidation yes vs. no, and bank vs. nonbank lender. It shows that Black-, Hispanic-, and Asian American-owned firms paid consistently higher rates for regular loans, for both large and small loan sizes, and to both bank and nonbank lenders. For the credit rating in the previous regressions, we used the self-reported credit scores of the firm. We obtained the Duns credit scores for 937 of the sample firms. When using the Duns credit scores instead of the self-reported scores, we obtain the results in Online Appendix Exhibit A-2. Those results are consistent with the findings in Exhibit IV.

Collateral: We use OLS to examine the required collateral relative to the loan amount. Probit regressions are used when there is a "yes" or "no" for various forms of collateral. We estimated OLS and Probit regressions using all the control variables, to determine if, after considering the control variables, minority group membership had any impact on the collateral associated with the credit. Exhibit V reports the analyses of collateral. We find that for all minority groups, co-signatures from third parties are demanded more frequently for minority firms than is justified by our economic analysis. For Hispanic owned firms, the value of the collateral is higher than the loan amount more often than white owned firms. Blanket liens (all the borrowing firm's assets are collateral) are used more often for Black owned firms than white owned firms.

Robustness Tests Using Weights: While the more populated states tend to have more firms in our sample, our 2,784 firms do not fully mirror the U.S. distribution of minority and white owned firms by state and industry. We include two separately weighted analyses of the relationships examined in the basic analysis. In both, weights are applied that mirror the national distribution of white owned and minority owned firms across the various states. Online Appendix Exhibits A-3

and A-4 use state-based weights, and state and industry weights, respectively. Both report results for interest rates and collateral that are similar to those above.

Conclusions

We find that in 2022-2023, Hispanic-, Black- and Asian American-owned firms paid higher interest rates than comparable white owned firms. Asiedu et al. (2012), using the 2003 SSBF (the most recent comparable data), found that only the Hispanic owned firms paid a higher rate than white owned firms. The 2003 SSBF did not contain a Native American group. Concerning collateral, we find that for all minority groups, co-signatures from third parties are required more frequently than for white owned firms. This result is similar to that of Blanchflower et al. (2008) using the 1998 SSBF. Asiedu et al (2012) did not consider collateral using the 2003 SSBF.

Disparities in borrowing experiences can have far-reaching implications beyond the economic sphere, contributing to broader inequalities and perpetuating historical patterns of discrimination and exclusion. When such disparities exist, addressing these disparities requires concerted efforts from policymakers, regulators, lenders, and other stakeholders to improve access to credit and reduce discrimination in lending.

<div align="center">References</div>

Asiedu, Elizabeth, James A. Freeman, and Akwasi Nti-Addae. 2012. Access to Credit by Small Businesses: How Relevant Are Race, Ethnicity, and Gender? American Economic Review, 102 (3): 532-37.

Blanchard, Lloyd, Bo Zhao, and John Yinger. 2008. Do Lenders Discriminate against Minority and Woman Entrepreneurs? Journal of Urban Economics 63 (2): 467–97.

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Exhibit I-A Survey of Firms

Supplier.IO is a private firm that provides small firms with connections to firms and organizations that seek to hire diverse suppliers, while concurrently providing firms seeking diverse suppliers with access to its list of small firms. Supplier.IO provided the authors with a nationwide list of over 300,000 firms to which we sent an internet survey. These small firm have or seek to supply governments or businesses, and some also sell to consumers. The survey collected firm/owner/lender information on non-government guaranteed borrowing by small firms (< 500 employees) from January 2022 through May 2023. Duns credit score information was added for a subset of firms that completed the survey. To be eligible for the survey, a business must be operating at the time of the survey and a for-profit firm with employees. It must have borrowed during the specified period through a line of credit or loan. Following previous studies, firms in the finance industry were ineligible.

Exhibit I-B Control Variables

Firm Characteristics:	Loan Characteristics:
State of Firm's Headquarters	Year and Month of Loan
Industry	Loan vs. Line of Credit
Business Age	Purpose of Loan is Debt Consolidation
Most Responsible Owner's Experience	Fixed Rate vs. Variable Rate Loan
Most Responsible Owner's Age	Term of the loan (in months)
Most Responsible Owner's Percentage Ownership	
Sales Level (categories)	**Lender Characteristics:**
Assets Level (categories)	Lender type (category):
Firm Suffered Loss in 2021	Large Bank (> $10 billion deposits)
Revenue stayed the same or grew from 2021 to 2022	Small Bank
Employees stayed the same or grew from 2021 to 2022	Credit Union
In Good or Very Good Condition at yearend 2022	CDFI
Limited Liability Protection Firm	Fintech Lender
Family Business	Nonbank finance company
Credit score	Years of relationship between firm and lender
Duns credit rating	If firm previously borrowed from lender
Woman-majority-owned	Bank deposit concentration index in county
	Number of bank branches in county

Exhibit II Loan Outcomes	White	Hispanic	Asian	Black	Native
Mean Values:					
Loan Rate percent	6.74	8.74	9.16	8.60	7.33
Loan Spread (Loan Rate - Prime Rate) percent	1.722	3.121	3.866	3.374	2.089
Required Collateral Value Relative to Loan (Intervalled)*	1.490	1.992	1.869	1.841	1.643
Fractions Yes:					
Required Collateral vs. Not	0.737	0.741	0.784	0.719	0.679
Required More Collateral than Loan Amount	0.057	0.191	0.106	0.180	0.121
Required Blanket Lien	0.296	0.507	0.431	0.565	0.265
Required Business Assets as Collateral	0.735	0.490	0.734	0.712	0.440
Required Personal Assets as Collateral	0.536	0.589	0.581	0.567	0.450
Required both Business and Personal Assets as Collateral	0.528	0.367	0.550	0.560	0.270
Lender Required External Party to Sign	0.387	0.676	0.731	0.829	0.730
N	992	649	320	434	389
*The survey asked the firm its location in six intervals of collateral relative to the amount of credit granted: 0, 1 – 50%, 51 – 99%, 100%, 101 – 150%, or greater than 150%.					

Exhibit III: Regressions Controlling for Different Characteristics. Minority vs. White Firms

Dep Var: Loan Rate	Model 1	Model 2	Model 3	Model 4	Model 5
Panel A					
Hispanic vs. White	2.0026**	2.3430**	2.6620**	2.8372***	2.9087***
	(0.9234)	(1.0678)	(0.9907)	(0.9854)	(0.9956)
Adjusted R^2	0.0206	0.0942	0.1544	0.2018	0.2123
N	1,641	1,641	1,641	1,641	1,641
Panel B					
Black vs. White	1.8639***	1.9852***	2.1188***	2.0053***	3.0893***
	(0.4687)	(0.5124)	(0.7415)	(0.6930)	(0.8492)
Adjusted R^2	0.0256	0.0444	0.1211	0.1463	0.1710
N	1,426	1,426	1,426	1,426	1,426
Panel C					
Asian vs. White	2.4219***	3.1231***	3.1949***	2.8458***	2.8815***
	(0.7679)	(0.9138)	(1.0042)	(0.9661)	(0.8325)
Adjusted R^2	0.0341	0.1077	0.1717	0.1971	0.2001
N	1,312	1,312	1,312	1,312	1,312
Panel D					
Native vs. White	0.5918	1.0220**	0.7642*	0.6510	1.1290
	(0.4708)	(0.4383)	(0.4459)	(0.4468)	(1.0911)
Adjusted R^2	0.0023	0.0583	0.1225	0.1451	0.1521
N	1,381	1,381	1,381	1,381	1,381
Control Variables					
State and Time Fixed Effects		x	x	x	x
Firm Characteristics			x	x	x
Loan Characteristics				x	x
Lender Characteristics					x
Standard errors in parentheses. Statistical significance: * .10 ** .05 ***.01					

Exhibit IV Split Sample Regressions: Minority-White Interest Rate Differences

	Hispanics	Blacks	Asians	Natives
Panel A: By relationship Length with Lender				
Less than or equal to 5 years	3.3312*	1.0837	0.8391	0.5346
	(1.6622)	(0.9714)	(1.8169)	(1.4756)
N	926	844	817	863
More than 5 years	2.3477**	3.0606***	3.8078***	1.3801
	(0.9785)	(0.9788)	(1.0411)	(1.0282)
N	715	582	495	518
Panel B: Type of loan				
Loan	2.4803**	2.5289***	3.0594***	0.8267
	(0.9285)	(0.8789)	(1.0276)	(1.1318)
N	1446	1267	1166	1233
Line of Credit	0.4809	4.1107	-0.8806	2.8035
	(1.7546)	(3.3065)	(1.4159)	(1.8576)
N	195	159	146	148
Panel C: New Credit vs. Renewal				
New Credit	2.4974***	2.0964**	1.5817	-0.1018
	(0.7778)	(0.9057)	(0.9831)	(0.7589)
N	1270	1199	1068	1128
Renewal	2.9905	5.6609***	4.6012***	6.0234***
	(2.2403)	(1.3237)	(1.1687)	(1.8520)
N	371	227	244	253
Panel D: Purpose of Loan				
Debt Consolidation	4.0970**	2.6756**	1.9044	0.1924
	(1.5386)	(0.9963)	(2.4478)	(1.0919)
N	535	413	359	395
Other	2.4141**	3.3818***	2.6014**	1.5014
	(0.9075)	(0.9976)	(1.1105)	(1.1852)
N	1106	1013	953	986
Panel E: Loan Amount				
>=500,000 (median)	1.2850*	1.4815***	1.7401**	0.2628
	(0.7118)	(0.5020)	(0.6793)	(0.4186)
N	963	811	651	773
<500,000	5.9586***	3.5161***	3.7964***	1.6030
	(1.4462)	(1.1662)	(1.2872)	(1.5314)
N	678	615	661	608
Panel F: Asset Level				
>7,500,000	3.8015***	2.0315	2.5284	0.2901
	(1.3292)	(1.6629)	(1.8192)	(0.5458)
N	925	745	677	806
<=7,500,000	5.9586***	3.5161***	3.7964***	1.6030
	(1.4462)	(1.1662)	(1.2872)	(1.5314)
N	678	615	661	608
Panel G: Lender type				
Banks	4.5005***	1.4769**	3.4438***	1.6924**
	(1.3657)	(0.6709)	(0.9533)	(0.7015)
N	650	563	516	552
Nonbank Lenders	5.9586***	3.5161***	3.7964***	1.6030
	(1.4462)	(1.1662)	(1.2872)	(1.5314)
N	678	615	661	608
Standard errors in parentheses. Statistical significance: *.10 **.05 ***.01				

Exhibit V   Regressions Predicting Minority-White Differences in Collateral

Dependent Variable	Hispanic vs. White	Black vs. White	Asian vs. White	Native vs. White
Required Collateral Value Relative to Loan (Intervalled) #	0.290**	0.149	0.286	0.097
	(0.114)	(0.202)	(0.213)	(0.179)
Required Collateral vs. Not	-0.025	-0.011	0.031	-0.014
	(0.043)	(0.065)	(0.081)	(0.049)
Require More Collateral than Loan Amount	0.075***	0.050	0.028	-0.026
	(0.028)	(0.039)	(0.047)	(0.036)
Required Blanket Lien	0.011	0.102*	-0.118	-0.095*
	(0.045)	(0.060)	(0.102)	(0.053)
Required Business Assets as Collateral	-0.261***	-0.027	-0.017	-0.243***
	(0.054)	(0.072)	(0.089)	(0.045)
Required Personal Assets as Collateral	0.010	0.015	0.017	-0.014
	(0.047)	(0.081)	(0.085)	(0.050)
Required both Business and Personal Assets as Collateral	-0.181***	0.000	-0.005	-0.176***
	(0.060)	(0.0836)	(0.0890)	(0.0437)
Granted Less than Requested	0.0053	-0.144***	-0.053	-0.055
	(0.044)	(0.032)	(0.085)	(0.066)
Lender Required External Party to Sign	0.118**	0.259***	0.207***	0.261***
	(0.051)	(0.035)	(0.041)	(0.039)
N	1,641	1,426	1,312	1,381
Control Variables	All	All	All	All
Standard errors in parentheses. Statisical significance: * .10 ** .05 *.01**				
#The survey asked the firm its location in six intervals of collateral relative to the amount of credit				
granted: 0, 1 – 50%, 51 – 99%, 100%, 101 – 150%, or greater than 150%.				
Collateral relative to loan uses OLS, while the other dependent variables use Probit.				
This exhibit reports the the minority indicator variable in regressions predicting the dependent variable.				