Minority-Owned Employer Businesses and their Credit Market Experiences in 2017

by

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Executive Summary

After more than a decade after the financial crisis, credit access continues to be a major challenge for minority employer businesses in the United States. Given the important role these businesses play in our economy, it is vital that that creditworthy firms and entrepreneurs, irrespective of race or ethnicity, are able to secure adequate financing to achieve growth and success. Yet it is especially important for minority-owned businesses given that research has shown they have faced greater challenges in accessing capital and people of color make up a growing share of the U.S. population.

The focus of this study is to examine the current landscape of minority-owned employer businesses and their recent experiences in the credit market. Using data from 2017, this study finds that minority-owned businesses continue to face greater challenges in accessing financial capital and are more likely to be financially constrained when compared to their non-minority counterparts.

The data suggest that some of the racial differences in financial challenges are due to racial differences in credit risk. White-owned businesses and Asian-owned businesses are more than twice as likely as Black-owned businesses and about 50 percent more likely than Hispanic-owned businesses to be in the lowest risk category. Only five percent of White-owned businesses are categorized as high risk, compared with 25 percent of Black-owned businesses and 12 percent of Hispanic-owned businesses. This has implications for the likelihood of positive credit application outcomes.

About 38 percent of White-owned businesses stated that they had not experienced any financial challenges in the prior 12 months, compared with just 17 percent of Black-owned and 29 percent of Asian- and Hispanic-owned. Black-owned firms had the highest

share of businesses facing challenges across all of the various challenges, including credit availability (50 percent), paying operating expenses (50 percent), and making payments on debt (37 percent). Hispanic-owned firms generally had the next highest share of businesses citing challenges, and 41 percent of Asian-owned businesses cited paying operating expenses was a challenge, similar to Hispanic-owned firms.

Given the mission of many community development financial institutions (CDFIs)[1] and credit unions, it is not a surprise that minority-owned businesses were more likely to apply to these sources than their non-minority counterparts. However, the relatively low rates of applications to these sources are surprising. For example, while they were two to three times more likely to apply to CDFIs than White-owned firms, only 11 percent of Black-owned firms and seven percent of Hispanic-owned firms applied to this kind of financial institution. This suggests that these kinds of institutions could do more to reach out to these underserved populations. Black-owned firms face the biggest challenges in obtaining their desired financing. Only 23 percent of their businesses received the full amount sought and only 60 percent received at least some of the financing sought. Hispanic-owned firms did a little bit better at 28 percent and 66 percent, respectively.

Overall, the credit market experiences across demographic groups are different and statistically significant, especially for Black-owned firms and Hispanic-owned firms. While these two groups are equally likely to apply for funding, they are more likely to experience less positive outcomes than businesses owned by Whites. They are more likely than White-owned businesses to have been denied credit, they are less likely to receive most or all of the

[1] CDFIs are private financial institutions that are focused on delivering responsible, affordable lending to help low-income, low-wealth, and other disadvantaged people, businesses, and communities join the economic mainstream.

funding requested, and they are more likely to be financially constrained. They are also more likely to be discouraged and to not apply for funding when needed because they feared their applications would be denied.

The multivariate analyses show statistically significant demographic differences in the credit market experiences of these small businesses. Even after controlling for firm characteristics, credit risk, and other factors, minority-owned businesses were less likely to have some or all of their loan application funding approved, compared with businesses owned by Whites. Businesses owned by Blacks and Hispanics were more likely than those owned by Whites to have their loan application denied outright. Asian-, Black-, and Hispanic-owned businesses were all more likely to be financially constrained, compared with White-owned businesses. Finally, Black-owned businesses were more likely than White-owned businesses to be discouraged and to not apply for funding, even when needed.

Access to capital continues to be a driving factor that disproportionately affects minority-owned businesses, especially those owned by Blacks and Hispanics. Given the lower wealth levels of these two groups, it makes the capital access situation all the more urgent. These recent data illustrate that access to capital remains a critical challenge for minority-owned employer businesses generally, as well as younger firms specifically. Ensuring that minority-owned firms have access to the financial capital they need is essential for them to be able to drive innovation, growth, and job creation in the U.S. economy.

Introduction

More than a decade after the financial crisis, access to financial capital for small businesses continues to be a major issue confronting business owners in the United States (Barkley, Robb, and de Zeeuw, 2018; Fairlie, Robb, and Robinson, 2016; Robb, 2018). Access to capital is critical for small businesses to start and to thrive. Given the important role young firms play in net job creation (Haltiwanger, 2015), it is paramount that creditworthy firms and entrepreneurs, irrespective of race or ethnicity, especially young firms, are able to secure adequate financing to achieve growth and success. This is especially important given that minorities make up a growing share of the U.S. population and their firms are younger, on average, than firms owned by Whites. Ensuring that minority-owned firms have access to the financial capital they need is vital if they are going to drive innovation, growth, and job creation in the U.S. economy.

The focus of this study is to examine the current landscape of small businesses in the United States, especially those owned by minorities, and examine the financing patterns and credit market experiences of these businesses. The study is organized as follows. The first section contains a review of the literature around small business financing and the topic of racial and ethnic differences in business financing and credit market experiences specifically. The second section describes the 2017 Small Business Credit Survey (SBCS) data, which are analyzed in this report, as well as the methodology used. The third section provides descriptive statistics from the 2017 SBCS data for a recent picture of the financing patterns and credit market experiences of U.S. small businesses by race and ethnicity. This is followed by a more in-depth examination of the credit market experiences of minority businesses, broken out by firm age. The study concludes with implications for public policy

and avenues for further research.

Literature Review

Young, growth-oriented entrepreneurial ventures are a key source of job creation and employment growth in the United States (Haltiwanger, Jarmin, and Miranda, 2009; Adelino, Ma and Robinson, 2017). Research has shown that a sufficient level of financial capital is a binding constraint for new firm formation (Kerr and Nanda, 2009; Evans and Jovanovic, 1989).[2] Research also suggests that young firms rely heavily on banks to obtain financial capital, even at their earliest stages of formation (Robb and Robinson, 2014; Berger and Udell 1995). Therefore, ensuring that young firms have appropriate access to financial capital, particularly bank debt, is critical for fostering entrepreneurship, and thereby driving innovation, growth, and job creation in the U.S. economy.

Limited access to financial capital has historically been an especially acute barrier to increased entrepreneurship among minority business founders (Bates, 1997; Fairlie, 1999; Blanchard, Zho, and Yinger, 2005; Bates and Lofstrom, 2013; Fairlie and Woodruff, 2009; Fairlie and Robb, 2008). Yet even recent studies have shown that Blacks and Hispanics are more likely to be undercapitalized when launching their businesses; they were about twice as likely to start their businesses with less than $10,000 in financial capital, compared with Whites and Asians (Robb, 2018). There is a trove of empirical evidence showing that minority-owned firms have experienced higher loan denial probabilities and paid higher interest rates than White-owned businesses even after taking into account differences in

[2] Entry into entrepreneurship has been shown to be positively related to increases in personal wealth, e.g. via bequest (Cagetti and De Nardi, 2006) or external change in taxation rate (Nanda, 2008), and with increased access to bank financing through deregulation and loosening of branching restrictions (Black and Strahan, 2002).

creditworthiness and other factors, including wealth[3] (e.g., Coleman 2002, Mitchell and Pearce 2005; Blanchflower, Levine and Zimmerman, 2003; Cavalluzzo and Wolken, 2005; Mijid and Bernasek 2013; Blanchard, Zhao, and Yinger, 2008; Cole, 2014; Robb, Fairlie, and Robinson 2016; Robb, Barkley, and de Zeeuw 2018).

Wealth allows individuals not only the ability to invest one's own money into a venture, but it can also be used to leverage outside funding in the forms of both debt and equity. The racial and ethnic gaps in wealth and income have been well documented (Federal Reserve Bulletin, 2017). The Survey of Consumer Finances (SCF) shows that, in 2016, the average income of Black and Hispanic households was less than half that of White households, while average net worth was only about a fifth of the wealth of Whites. The median wealth level was even starker, with Blacks having just 10 percent the median wealth of Whites and Hispanics just 12 percent. Asians have wealth levels that are much closer to those of Whites. The extremely low wealth levels of Blacks and Hispanics, compared with Whites, are in part driving the racial gap seen in small business financing (Bates and Robb 2015a; 2015b; Cavalluzzo and Wolken 2005).

This is concerning given that greater access to capital is associated with better outcomes for businesses. For example, Fairlie and Robb (2008) found better capitalized businesses had higher sales, profits, and employment, and were less likely to close than

[3] Wealth allows individuals not only the ability to invest one's own money into a venture, but it can also be used to leverage outside funding in the forms of both debt and equity. The racial and ethnic gaps in wealth and income have been well documented. The Survey of Consumer Finances (SCF) shows that, in 2016, the average income of Black and Hispanic households was less than half that of White households, while average net worth was only about a fifth of the wealth of Whites. The median wealth level was even starker, with Blacks having just 10 percent the median wealth of Whites and Hispanics just 12 percent. Asians have wealth levels that are much closer to those of Whites. The extremely low wealth levels of Blacks and Hispanics, compared with Whites, are in part driving the racial gap we see in small business financing (Bates and Robb 2015a; 2015b; Cavalluzzo and Wolken 2005).

businesses that received lower levels of start-up capital. Robb (2018) found that a much smaller fraction of Whites suggested that the lack of access to credit had a negative impact on profitability, compared to Hispanic-owned and Black-owned businesses. Firms owned by Blacks and Hispanics were also more likely to state that the cost of capital had a negative impact on their profitability, compared with businesses owned by Whites. Finally, for firms that closed down in 2014, Blacks were twice as likely as Whites to state that financial reasons drove their firm closure (Robb 2018).

Researchers have also found that minority-owned businesses can be discouraged from seeking bank loans even when they needed credit because they feared their applications would be rejected (Bates and Robb 2015a; 2015b; Fairlie, Robb, and Robinson, 2016; Cavalluzzo and Wolken, 2005). This finding has persisted beyond the financial crisis. Using tabulations from the 2014 Annual Survey of Entrepreneurs, Robb (2018) found that fewer than 10 percent of White-owned businesses stated that they needed credit but decided not to apply. This compared with nearly 15 percent of Hispanics and 26 percent of Blacks. In terms of reasons given, 47.4 percent of Whites said that they thought the lender would not approve their loan application, compared with 58.5 percent of Blacks and 53.1 percent of Hispanics (Robb 2018). More recently, Robb, Barkley, and de Zeeuw (2018) used the 2016 Small Business Credit Survey to find that Black-owned firms reported being discouraged from applying for financing at significantly higher rates when compared with otherwise similar White-owned firms.

This study builds on these later studies by using the 2017 microdata from the Small Business Credit Survey to examine the current state of credit market experiences of small business by race, ethnicity, and firm age. As the minority population continues to rise, it is

more important than ever that these prospective business owners have the resources they need to not only launch, but also grow successful firms. Because banks have historically provided young firms with crucial growth capital and played a substantial role in new firm formation and business expansion in the United States (Berger and Udell, 1995; Robb and Robinson, 2014; Kerr and Nanda, 2009), minority businesses' experiences with financial institutions in the credit market is especially important.

Data and Methodology

Access to timely data on small business financing, especially by owner demographics, has been a challenge. As a result, our understanding of the current financing patterns and credit market experiences of small businesses has been based on anecdotes, dated data, or data that do not fully cover the small business population. This research is the first to use the microdata from the 2017 Small Business Credit Survey (SBCS) to study the financing patterns and credit market experiences of minority-owned businesses by firm age.

The SBCS is a collaborative effort by the Community Development Offices of the 12 regional Federal Reserve Banks, fielded in the third and fourth quarters of 2017.[4] Earlier versions of the survey were conducted by a smaller subset of regional Federal Reserve Banks, but beginning in 2016, the SBCS had the participation of all 12 banks in the Federal Reserve System, with samples drawn from all 50 states and the District of Columbia. The SBCS survey asks respondents about their companies and their credit market experiences over the prior 12-month period. The 2017 survey yielded more than 8,000 responses from employer firms with fewer than 500 full-time employees with owner race and ethnicity.

[4] https://www.fedsmallbusiness.org/

The data have a few drawbacks. The first is that the data are a cross section of firms at one point in time, so they are not examined longitudinally. A second is that there are variables researchers would like to have in the dataset, such as wealth, work experience, and previous entrepreneurial experience, which are not available. The third is that it is a convenience sample of establishments, not a randomized sample. However, the SBCS does employ weights to reflect the full population of small businesses in the United States.

The businesses in the SBCS were classified by the race, gender, or ethnicity of the owner(s) defined by the "owner(s) with more than 50% controlling interest is (are) of that race, ethnicity, or gender." While the samples of Black-owned businesses and Hispanic-owned businesses were large, 642 and 530 respectively, the sample of Asian-owned businesses was smaller, with just 300 respondents. Because of the smaller sample sizes of particular groups, some breakouts by size are not available by Asian-owned businesses and a few are not available for Blacks or Hispanics. In all the following tables and in the multivariate analyses, the four main groups that are compared are: Non-Hispanic Whites, Non-Hispanic Blacks, Non-Hispanic Asians, and Hispanics (of all races).

One benefit of the SBCS survey is that it provides sufficient sample sizes of minority-owned firms to allow for a more in-depth exploration of the current credit market experiences of firms by race and ethnicity than was previously possible. Thus, these new data offer an opportunity to gain unique insight into these important and growing segments of the small business population.

Descriptive Statistics from the 2017 Small Business Credit Survey

An overview of the small business employer population represented by the 2017 SBSC is provided in this section, as well as a more detailed look at the financial challenges

faced by these businesses, their activities in the credit markets, and their experiences in applying for funding. To start, however, it is good to note that the distribution of small employer businesses by race and ethnicity from the 2017 SBCS is similar to the picture provided by the 2016 Annual Survey of Entrepreneurs released by the U.S. Census Bureau (provided in Appendix A). The vast majority of the businesses are White-owned (82 percent). About 10 percent of the firms are owned by Asians, while about 5 percent are owned by Hispanics and 2 percent are owned by Blacks.

Overall, about a third are owned by women or jointly owned by men and women (Table 1). One third of the businesses have been in business for five years or less, while another third have operated for 16 years or more. In terms of size, about half have revenues between $100,000 and $1 million, while more than 30 percent have revenues in excess of $1 million. More than half have fewer than five employees, while only five percent have 50 or more employees. Most (83 percent) are located in urban areas. These characteristics differ by race and ethnicity, examined in the next section.

Table 1: Overview of the 2017 Small Business Credit Survey

Race/ethnicity of owner(s)		
	Non-Hispanic White	82%
	Non-Hispanic Black or African American	2%
	Non-Hispanic Asian	10%
	Hispanic	5%
Gender of owner(s)		
	Men-owned	65%
	Equally owned	15%
	Women-owned	20%
Age of firm		
	<5 years	33%
	6-10 years	20%
	11-15 years	14%
	16+ years	32%
Revenue size of firm		
	$100K or less	18%
	$100K-$1M	51%
	$1M-$10M	27%
	More than $10M	4%
Number of employees		
	1-4 employees	55%
	5-9 employees	18%
	10-19 employees	13%
	20-49 employees	9%
	50-499 employees	5%
Credit risk		
	Low credit risk	68%
	Medium credit risk	25%
	High credit risk	6%
Industry		
	Non-manufacturing goods production & associated services	18%
	Manufacturing	4%
	Retail	14%
	Leisure and hospitality	11%
	Finance and insurance	6%
	Healthcare and education	13%
	Professional services and real estate	19%
	Business support and consumer services	15%
Geographic location		
	Urban	83%
	Rural	17%

Number of survey participants: 8169

Data are weighted by number of employees, age, firm industry, census division, urban/rural status, race/ethnicity, and gender of owner(s).

Source: 2017 Small Business Credit Survey, Federal Reserve Banks

Owner Characteristics

While only about 18 percent of White-owned businesses are owned by women, nearly one-third of Black and Asian businesses are women-owned, and one quarter of Hispanic businesses are owned by women (Table 2). Less than a quarter of White owners are 45 years old or less, while around a third of minority-owned businesses are owned by individuals from this age group.

Table 2: Businesses by Race, Ethnicity, Gender, and Owner Age

	Non-Hispanic			
	White	Black/African American	Asian	Hispanic
Number of survey participants	6600	642	300	530
Gender of owner(s)				
Men-owned	66%	60%	56%	62%
Equally owned	15%	9%	12%	13%
Women-owned	18%	32%	32%	25%
Age of Owner/Primary financial decision maker				
Under 45	23%	32%	37%	33%
46-55	31%	33%	37%	36%
56-65	32%	27%	19%	23%
Over 65	14%	8%	8%	8%

Data are weighted by number of employees, age, firm industry, census division, urban/rural status, race/ethnicity of owner(s), and gender of owner(s).
Source: 2017 Small Business Credit Survey, Federal Reserve Banks

Firm Characteristics

The data also show that White-owned businesses were on average older than their Hispanic- and Black-owned counterparts. As shown in Table 3, about one-third of White-owned firms were in operation for five years or less, compared with 46 percent of Blacks and 44 percent of Hispanics. 35 percent of White-owned businesses had been in operation for 16 years or longer. This compares with just 16 percent of Black-owned firms, 19 percent

of Hispanic-owned firms, and 22 percent of Asian-owned firms.

White-owned businesses were also larger than their Black- and Hispanic-owned counterparts, whether measured by revenues or employment. Only 17 percent of White-owned businesses generated less than $100,000 in revenues, compared with 47 percent of businesses owned by Blacks, 17 percent of Asian-owned businesses, and 34 percent of Hispanic-owned businesses. About 32 percent of White-owned employer businesses generated more than $1 million in sales, compared with just 14 percent of Black businesses and 21 percent of Hispanic businesses. 35 percent of Asian-owned businesses generated $1 million or more in sales in 2017.

In terms of employment, 14 percent of White-owned businesses employed 20 or more people in 2017, compared with just seven percent of Black-owned businesses and nine percent of Hispanic-owned businesses. About two-thirds of Black- and Hispanic-owned firms employed fewer than five employees, compared with 54 percent of White-owned businesses and less than half of Asian-owned businesses.

There were many racial differences in the distribution of firms by industry. Asians were the least likely (16 percent) to be in construction and non-manufacturing goods production, while Hispanics were most likely (29 percent). Blacks were least likely to be in Manufacturing (1 percent). Asians were the most likely to be in Professional Services (27 percent). Black-owned firms were the most likely to be in the business support and consumer services (22 percent).

Overall, minority-owned businesses were more likely to be in urban areas. Over 90 percent of businesses owned by Blacks, Asians, and Hispanics were located in urban areas, compared with 81 percent of White-owned businesses.

Table 3: Firm Characteristics

	Non-Hispanic			
	White	Black/African American	Asian	Hispanic
Number of survey participants	6600	642	300	530
Age of firm				
0-5 Years	33%	46%	35%	44%
6-10 years	19%	25%	29%	22%
11-15 years	14%	13%	15%	15%
16+ Years	35%	16%	22%	19%
Revenue size of firm				
$100K or less	17%	47%	17%	34%
$100K-$1M	51%	39%	49%	45%
$1M-$10M	27%	12%	31%	18%
More than $10M	5%	2%	4%	3%
Number of employees				
1-4 employees	54%	68%	49%	66%
5-9 employees	19%	16%	19%	17%
10-19 employees	12%	9%	17%	8%
20-49 employees	9%	5%	9%	6%
50-499 employees	5%	2%	6%	3%
Industry				
Non-manufacturing goods production & associated services	18%	18%	16%	29%
Manufacturing	4%	1%	5%	3%
Retail	15%	7%	10%	9%
Leisure and hospitality	10%	7%	14%	12%
Finance and insurance	7%	6%	1%	6%
Healthcare and education	12%	19%	16%	12%
Professional services and real estate	18%	20%	27%	15%
Business support and consumer services	15%	22%	12%	15%
Geographic location				
Urban	81%	95%	90%	94%
Rural	19%	5%	10%	6%

Data are weighted by number of employees, age, firm industry, census division, urban/rural status, race/ethnicity of owner(s), and gender of owner(s).
Source: 2017 Small Business Credit Survey, Federal Reserve Banks

Performance

The Small Business Credit Survey asked respondents about their performance at the end of the prior year and about changes in the prior 12 months. In terms of profitability, for all racial groups except Blacks, more than half were experiencing profitability at the end of

2017. White-owned and Asian-owned businesses had the highest proportion of businesses operating at a profit (58 percent), while Black businesses had the lowest proportion at 43 percent. About 41 percent of Black-owned businesses and 30 percent of Hispanic-owned businesses were operating at a loss.

Business owned by Whites and Hispanics firms were the most likely to report an increase in revenues over the prior 12 months, while Asian-owned firms were the most likely to report an increase in employment over the same period. However, Black-owned firms and Hispanic-owned firms were more likely than their White and Asian counterparts to report expecting increased revenue and employment over the next 12 months.

Table 4: Firm Performance

	Non-Hispanic			
	White	Black/African American	Asian	Hispanic
Number of survey participants	6600	642	300	530
Profitability, end of 2016				
At a loss	23%	41%	27%	30%
Broke even	19%	16%	15%	18%
At a profit	58%	43%	58%	53%
Revenue change, prior 12 months				
Decreased	25%	27%	30%	25%
No change	21%	27%	21%	23%
Increased	54%	46%	49%	52%
Employment change, prior 12 months				
Decreased	16%	16%	17%	14%
No change	50%	51%	40%	50%
Increased	34%	33%	43%	36%
Expected revenue change, next 12 months				
Will decrease	8%	6%	10%	3%
Will not change	20%	13%	18%	18%
Will increase	72%	81%	71%	79%
Expected employment change, next 12 months				
Will decrease	5%	4%	9%	2%
Will not change	49%	31%	34%	38%
Will increase	46%	66%	57%	59%

Data are weighted by number of employees, age, firm industry, census division, urban/rural status, race/ethnicity of owner(s), and gender of owner(s).

Source: 2017 Small Business Credit Survey, Federal Reserve Banks

Credit Risk

Credit risk in the SBCS is self-reported. Respondents are asked for both their business credit score and their personal credit score, depending on which is used to obtain financing for their business. If the firm uses both, then the highest risk rating was used. Credit risk is defined as the following:

Low risk:	80-100 business credit score or 720+ personal credit score
Medium risk:	50-79 business credit score or 620-719 personal credit score
High risk:	1-49 business credit score or <620 personal credit score

As seen in Table 5, White-owned businesses and Asian-owned businesses are more than twice as likely as Black-owned businesses and almost 50 percent more likely than Hispanic-owned businesses to be in the lowest risk category. Only five percent of White-owned businesses are categorized as high risk, compared with 25 percent of Black-owned businesses and 12 percent of Hispanic-owned businesses. As demonstrated later in the multivariate analyses, having higher credit risk significantly hinders businesses in their attempts to successfully secure financial capital.

Table 5: Credit Risk

	White	Non-Hispanic Black/African American	Asian	Hispanic
Number of survey participants	6600	642	300	530
Credit risk				
Low credit risk	70%	30%	72%	51%
Medium credit risk	24%	45%	22%	37%
High credit risk	5%	25%	7%	12%

Data are weighted by number of employees, age, firm industry, census division, urban/rural status, race/ethnicity of owner(s), and gender of owner(s).
Source: 2017 Small Business Credit Survey, Federal Reserve Banks

Financial Challenges

Minority-owned businesses were more likely to experience financial challenges than White-owned businesses (See Table 6). 38 percent of White-owned businesses stated that they had not experienced any financial challenges in the prior 12 months, compared with just 17 percent of Black-owned, 34 percent of Asian-owned, and 29 percent of Hispanic-owned firms. Blacks had the highest share of businesses facing challenges across all of the various challenges, including credit availability (50 percent), paying operating expenses (50 percent), and making payments on debt (37 percent). While Hispanics generally had the next highest share of businesses citing challenges, about half of Asians cited paying operating expenses was a challenge, compared with 41 percent of Hispanics.

Businesses reacted differently in the face of these challenges. Black business owners and Asian business owners were most likely to use personal funds (76 percent and 79 percent, respectively). This is striking, given the lower levels of wealth among Blacks more generally. It is interesting to note that the rates of using personal assets and guarantees to secure debt were quite similar between Blacks and Whites, which implies that business ownership among Blacks is pulling from the right tail of the wealth distribution. Cutting staff, hours, or downsizing were actions taken by 32 percent of businesses owned by Whites, 32 percent by Blacks, 44 percent by Asians, and 34 percent by Hispanics.

About two-thirds of all employer businesses had prior outstanding debt, regardless of race or ethnicity. White-owned businesses were most likely to have outstanding debt (69 percent) and Asian-owned firms were the least likely (57 percent). Businesses owned by Whites and Asians had more outstanding debt, compared with businesses owned by Blacks and Hispanics. About 26 percent of White-owned businesses and 35 percent of Asian-owned

businesses with debt had $250,000 or more in outstanding debt. This compares with just 11 percent of Black-owned businesses and 17 percent of Hispanic-owned businesses with prior outstanding debt.

In terms of collateral used to secure financing, a personal guarantee was the most frequently cited source, but businesses owned by Whites and Asians were more likely to cite personal guarantees than those owned by Blacks and Hispanics. Business assets were used by over half of White-owned businesses, compared with 40 percent for Asian-owned businesses, 34 percent for Hispanic-owned businesses, and 33 percent of Black-owned businesses. 20 percent of Black-owned business cited that no collateral was used to secure financing, compared with 14 percent of White-owned firms, 21 percent of Asian-owned firms, and 21 percent of Hispanic-owned firms.

Table 6: Financial Challenges, Prior Outstanding Debt, and Collateral Used

	Non-Hispanic			
	White	Black/African American	Asian	Hispanic
Number of survey participants	6600	642	300	530
Financial challenges experienced in prior 12 months				
Making payments on debt	24%	37%	27%	29%
Paying operating expenses (including wages)	40%	50%	41%	41%
Purchasing inventory or supplies to fulfill contracts	16%	28%	29%	26%
Credit availability	28%	50%	33%	41%
Other financial challenge	12%	11%	13%	10%
Did not experience any financial challenges	38%	17%	34%	29%
Actions taken in response to financial challenges				
Made a late payment or did not pay	28%	35%	28%	28%
Used personal funds	65%	76%	70%	79%
Took out additional debt	40%	29%	33%	38%
Cut staff, hours, and/or downsized operations	32%	32%	44%	34%
Other action	16%	14%	14%	12%
Unsure	2%	1%	0%	1%
Primary funding source				
Retained business earnings	71%	60%	68%	66%
Personal funds	17%	29%	22%	25%
External financing	12%	11%	10%	10%
Share with prior outstanding debt	69%	64%	57%	69%
Amount of outstanding debt				
$25K or less	22%	39%	16%	34%
$25K-$100K	33%	34%	30%	32%
$100K-$250K	19%	18%	19%	16%
$250K-$1M	18%	8%	21%	14%
More than $1M	8%	3%	14%	3%
Collateral used to secure debt				
Personal assets	33%	31%	35%	25%
Personal guarantee	56%	48%	56%	47%
Business assets	51%	33%	40%	34%
Portions of future sales	6%	7%	8%	10%
None	14%	20%	21%	21%

Data are weighted by number of employees, age, firm industry, census division, urban/rural status, race/ethnicity of owner(s), and gender of owner(s).

Source: 2017 Small Business Credit Survey, Federal Reserve Banks

Applications for Financing

The SBSC asked respondents if they had applied for financing over the previous 12 months and the results indicate that businesses owned by Blacks and Hispanics were more likely than businesses owned by Whites to apply for credit. Yet, overall, the data show that

less than half of firms, regardless of the owner's race or ethnicity, applied for new financing over the previous year (Table 7). The most common reason for applying for credit cited, across all race and ethnic groups, was to expand the business, pursue a new opportunity, or replace capital access. This implies that access to capital is critically essential for companies to grow and expand. 54 percent of Black- and Asian-owned businesses sought financing to meet operating expenses, while only about 42 percent of White-owned firms and 41 percent of Hispanic-owned firms cited this reason.

Overall, Black- and Hispanic-owned businesses were seeking lower amounts of financing on average. In terms of financial products, a loan or line of credit was the most common kind of financing sought, followed by credit cards, regardless of race or ethnicity. Black-owned businesses were much more likely than any of the other groups to seek cash advances from merchants.

In terms of the sources applied to by these businesses, large banks were the most common source for all groups except White-owned businesses, which applied to small banks most frequently. One interesting finding was that Hispanic-owned businesses were about half as likely as businesses owned by Whites to apply for credit at a small bank. Black-owned businesses were most likely of the groups to apply to online lenders, which could reflect their greater challenges in accessing more traditional finance. One-third of Black-owned businesses applied to online lenders, compared to about one-quarter of the other demographic groups.

Not surprisingly, minority-owned businesses had higher rates of applying to community development financial institutions (CDFIs) and credit unions. These financial institutions are often focused on serving minority-owned businesses. However, the relatively

low rates of applications to these sources are surprising. For example, while they were two to three times more likely to apply to CDFIs than Whites, only 11 percent of Blacks and 7 percent of Hispanics applied to this kind of financial institution. This suggests that these kinds of institutions could do more to reach out to these underserved populations.

Table 7: Firms that Applied for Financing in Prior 12 Months

	Non-Hispanic			
	White	Black/African American	Asian	Hispanic
Number of Firms that Applied	2640	289	114	249
Share of all firms	40%	45%	38%	47%
Reasons for seeking financing				
Meet operating expenses	42%	54%	54%	41%
Expand business, pursue new opportunity, or replace capital assets	59%	67%	55%	61%
Refinance or pay down debt	25%	28%	32%	22%
Other reason	8%	5%	9%	10%
Amount sought				
$25K or less	22%	23%	11%	27%
$25K-$100K	33%	43%	32%	40%
$100K-$250K	19%	23%	29%	17%
$250K+	26%	12%	27%	17%
Application rate by financial product				
Loan or line of credit	86%	86%	92%	80%
Credit card	26%	31%	33%	24%
Equity investment	8%	9%	8%	9%
Leasing	10%	6%	10%	12%
Trade	10%	8%	8%	9%
Factoring	4%	6%	3%	4%
Merchant cash advance	6%	16%	9%	9%
Application rate by source of loan, line of credit, or cash advance				
Large bank	47%	54%	53%	56%
Small bank	50%	39%	42%	26%
Online lender	23%	33%	25%	25%
CDFI	4%	11%	10%	7%
Credit union	9%	13%	10%	12%
Other	18%	22%	16%	24%

Data are weighted by number of employees, age, firm industry, census division, urban/rural status, race/ethnicity of owner(s), and gender of owner(s).

Source: 2017 Small Business Credit Survey, Federal Reserve Banks

Financing Outcomes

In terms of the outcomes of applications for those businesses that did apply, there are large differences by race and ethnicity. While 80 percent of businesses owned by Whites received at least some of the financing requested, the percentages were 59 for Black-owned businesses and 66 for businesses owned by Hispanics (Table 8). Asian-owned businesses had the highest overall approval rate at 85 percent. Nearly half of White-owned businesses received the full amount requested, compared with less than a quarter of Black-owned businesses and 28 percent of businesses owned by Hispanics. Low credit score was the most common reason for denial for Black-owned businesses and was cited by nearly half of those businesses that were denied. Hispanic-owned firms were the most likely to cite an insufficient credit history and cited low credit score and insufficient collateral as the next two most common reasons.

Interestingly, Blacks were less likely than Whites to cite insufficient collateral as the reason for denial, again suggesting that Black business owners are coming from the higher end of the wealth distribution of the population. Also of note, Black- and Hispanic-owned businesses were about half as likely as Whites to state that they were denied because they had too much prior debt. In terms of approval rates by type of source or type of product, Blacks and Hispanics fared slightly better at small banks, but the racial and ethnic gaps in financing application outcomes were prevalent across sources and types.

Table 8: Financing Outcomes

	Non-Hispanic			
	White	Black/African American	Asian	Hispanic
Number of Firms that Applied	2640	289	114	249
Overall approval rate (% receiving at least some financing)	80%	59%	85%	66%
Share receiving the full amount requested	49%	23%	43%	28%
Reasons for financing shortfall				
Not approved	58%	52%	64%	52%
Application(s) pending	11%	12%	13%	10%
Declined funding	37%	39%	38%	37%
Other reason	8%	14%	20%	9%
Reasons for credit denial				
Low credit score	26%	45%		37%
Insufficient credit history	33%	30%		45%
Insufficient collateral	34%	29%		35%
Weak business performance	22%	23%		24%
Too much debt already	31%	17%		16%
Other	9%	3%		1%
Unsure	7%	7%		4%
Approval rate by type of loan, line credit, or cash advance				
SBA loan or line of credit	54%	31%		
Business loan	64%	35%		48%
Line of credit	72%	41%	68%	43%
Approval rate by source of loan, line credit, or cash advance				
Large bank	56%	33%	69%	34%
Small bank	70%	40%		60%
Online lender	75%	54%		

Data are weighted by number of employees, age, firm industry, census division, urban/rural status, race/ethnicity of owner(s), and gender of owner(s). Shaded cells indicate insufficient sample sizes to present data.
Source: 2017 Small Business Credit Survey, Federal Reserve Banks

Non-Applicants

More than half of businesses indicated that they did not apply for financing over the previous 12 months. More than half of White-owned businesses and 44 percent of Asian-owned businesses stated the reason for not applying was that they had sufficient financing; this reason was cited by only 21 percent of Black-owned businesses and 28 percent of

Hispanic-owned businesses (Table 9). Nearly 40 percent of Black-owned businesses did not apply for funding because they were discouraged from doing so because they feared their application would be denied. This was more than three times the rate that businesses owned by Whites and Asians cited this reason, and nearly twice the rate cited by Hispanic-owned firms. Other reasons, such as high costs of financing and difficult application processes, were rarely mentioned as reasons for not applying.

For those citing that they did not apply for credit when needed because they feared their loan application would be denied, businesses owned by Blacks and Hispanics were most likely to cite a low credit score, compared with White-owned businesses. Discouraged would-be Black borrowers were much more likely to cite insufficient collateral than Whites and Hispanics, which could mean these respondents had lower wealth levels than those that applied. Unfortunately, the SBCS does not ask respondents about their wealth levels, so this is merely a possibility.

One interesting finding for non-applicants was that for businesses using credit cards, more than half of the Black- and Hispanic-owned businesses used both personal and business credit cards to fund their businesses, compared with only a third of White-owned businesses. Carrying balances on credit cards can be a very costly way to finance a business, which appears to be a source disproportionately used by Blacks and Hispanics.

Table 9: Firms that did not apply for Financing in Prior 12 Months

	Non-Hispanic			
	White	Black/African American	Asian	Hispanic
Number of firms that did not apply	3960	353	186	281
Non Application Rate	60%	55%	62%	53%
Primary reason for not applying				
Sufficient financing	52%	21%	44%	28%
Discouraged	12%	38%	11%	22%
Debt averse	26%	27%	28%	32%
Credit cost high	5%	5%	7%	11%
Application process too difficult	3%	4%	8%	4%
Other	3%	6%	3%	4%
Discouraged firms' credit challenges				
Low credit score	35%	67%		57%
Insufficient collateral	34%	49%		30%
Weak business performance	33%	21%		38%
Insufficient credit history	34%	35%		46%
Other	10%	5%		1%
Unsure	7%	9%		3%
Non-applicant use of external financing				
Loan or line of credit	39%	28%	31%	40%
Merchant cash advance	2%	7%	2%	5%
Credit card	44%	41%	39%	55%
Trade credit	10%	7%	8%	7%
Equity investment	6%	5%	6%	7%
Factoring	2%	5%	4%	5%
Leasing	7%	7%	7%	6%
Business does not use external financing	30%	32%	37%	22%
Type of credit card used to fund business, non-applicants				
Business card only	58%	36%	48%	40%
Personal card only	9%	10%	7%	9%
Both business and personal cards	33%	54%	45%	51%

Data are weighted by number of employees, age, firm industry, census division, urban/rural status, race/ethnicity of owner(s), and gender of owner(s). Shaded cells indicate insufficient sample sizes to present data.

Source: 2017 Small Business Credit Survey, Federal Reserve Banks

The overall landscape described in detail above paints a picture of minority-owned businesses facing greater challenges in accessing financial capital, when compared with their nonminority-owned counterparts. For Hispanic and Black business owners, these challenges are particularly large. Given the higher credit risk profiles of these businesses, the challenges are clearly due in part to this. However, using multivariate analyses, one can

examine whether these challenges still hold after controlling for risk and other firm characteristics related to credit market outcomes as found in previous research.

Multivariate Analyses

Since credit market outcomes are related to a number of different factors, using multivariate analyses allow for control for many of these factors and to examine whether or not racial and ethnic differences still persist. For this study, a number of different credit market experiences and challenges are analyzed. The first outcome variable is "Mostly Approved," which, for loan applicants, measures whether or not most of the financing that was applied for by the business was received. The "Mostly Approved" variable is defined as equal to one if the applicant received "most" or "all" of the funding requested. The other options were "none" and "some." If the latter options were chosen, then the "Mostly Approved" variable is equal to zero. It is important to note that businesses that did not apply for financing are excluded from this analysis.

The next outcome examined is whether or not the business loan application was rejected. The variable "Denied" is defined as being equal to one if none of the financing requested was received, i.e. the entire loan application was rejected and the applicant received none of the funds requested. The other outcomes for a loan application were having some of the amount approved, having most of the amount requested approved, and having the full amount approved. These three responses were assigned a value of zero for this outcome variable. As with the previous variable "Mostly Approved," only businesses that applied for financing are part of this analysis.

The third outcome examined is "Discouraged," which indicates that the owner needed credit at some point but did not apply for it because they feared their loan

application would be denied. These non-applicants have been referred to as "discouraged" (would-be applicants/borrowers) (Cole and Sokolyk, 2016; Fairlie and Robb, 2008; Fairlie, Robb, and Robinson, 2016). This analysis includes only non-applicants; businesses that did apply for financing were excluded. Of the non-applicants, those that indicated they did not apply for fear of denial are assigned a value of one, while those indicating all other reasons (averse to debt, high cost, etc.) were assigned a value of zero.

The final outcome variable analyzed, which seeks to measure financing challenges is "Constrained." This variable takes the value of one if the respondent applied for funding and did not receive the full amount requested, indicated that they did not apply for credit when they needed it for any reason other than being debt averse, and/or stated that credit availability was a financial challenge. This is a broader measure of financial constraint because it may include borrowers and non-borrowers, as well as loan applicants and non-applicants.

Racial and ethnic differences are explored for each of these four dependent variables outlined above. The main hypothesis being tested is that there should be no racial or ethnic differences in these dependent variables after controlling for factors that are related to credit market outcomes. However, since there is a limited set of variables in this data set, there is no way to control for everything that may be related to these outcomes. There are some factors, such as wealth, which are related to race and ethnicity and may be influencing these outcomes but cannot be controlled for in this analysis. This is the main weakness of this analysis.

This dataset does allow us to investigate the outcomes by the different racial and ethnic groups as well as separately by firm age, which are unique advantages of these data.

The data also cover a more recent time period than many of the other datasets have been used to research this topic. Finally, the breadth of the survey allows us to examine financial challenges in a broader context than is possible with other datasets in that a number of questions pertaining to challenges around capital access can be used to create a unique measure of businesses being financially constrained.

The mean values by race and ethnicity for the four dependent variables in the multivariate models can be found in Table 10, along with the level of significance for any statistically significant differences across the racial and ethnic groups and the sample size for each group. The sample sizes are smaller for this subset of the data because only those observations that had non-missing values for the control variables were included.

While the previous descriptive statistics used sample weights, the results in Table 10 are unweighted because the multivariate results in this section are unweighted logistic regressions. There is some disagreement in the literature on whether or not to use sample weights in multivariate logistic estimation. Following the diagnostics of Solon et al. (2015) and Robb, Barkley, and de Zeeuw (2018), the unweighted results from the multivariate regressions are presented in this report. Probit models were also analyzed and the results are robust across the specifications.

To summarize the findings from the descriptive analysis, the credit market experiences and financial challenges varied by race and ethnicity, especially for Blacks and Hispanics. All three of the minority groups were more likely to experience less positive outcomes for their businesses. Businesses owned by Blacks, Asians, and Hispanics were all less likely than those owned by Whites to receive most or all of the funding requested. Businesses owned by Blacks and Hispanics were more likely than businesses owned by

Whites to have their loan applications completely rejected. They were also more likely to not apply for funding when they needed it because they feared their loan application would be denied. Finally, all three of the minority business owner groups were more likely than White-owned businesses to be financially constrained.

Table 10: Means of Dependent Variables by Race

	Mean	Std. Err.	TTest[1]	Sample Size
Mostly Approved				
	Mean	Std. Err.		
White	0.652370	0.0113161		1,772
Black	0.3303965	0.0312876	***	227
Asian	0.5425532	0.051660	**	94
Hispanic	0.4285714	0.040008	***	154
Denied				
	Mean	Std. Err.		
White	0.1766366	0.0090621		1,772
Black	0.3964758	0.0325388	***	227
Asian	0.127660	0.0346042		94
Hispanic	0.3311688	0.0380485	***	154
Discouraged				
	Mean	Std. Err.		
White	0.1203046	0.0073314		1,970
Black	0.3888889	0.0332471	***	216
Asian	0.1308411	0.0327543		107
Hispanic	0.1736527	0.0294014	***	167
Constrained				
	Mean	Std. Err.		
White	0.4686941	0.0086179		3354
Black	0.817284	0.0192258	***	405
Asian	0.5568182	0.0375516	**	176
Hispanic	0.6775362	0.0281864	***	276

[1] T-test levels of Significance: *** p<0.01, ** p<0.05, * p<0.1
Author's Calculations of 2017 SBCS, Unweighted

To more rigorously examine the relationship between race and ethnicity of a firm's ownership and the dependent variables listed above, a baseline series of multivariate logistic regressions were used with increasingly expansive sets of explanatory variables, starting

with just race and ethnicity and ending with a number of firm and owner characteristics that have been shown to be correlated with these dependent variables. In all the models, the results are shown as average marginal effects with the standard errors displayed in parentheses. These marginal effects show the differential in the likelihood of the dependent variable occurring for changes in the value of an independent variable.

The logit models are presented, although the probit models were also examined. While similar, they differ in the assumption of the underlying distribution. Logit assumes the distribution is logistic (i.e. the outcome either happens or it does not). Probit assumes the underlying distribution is normal, meaning that essentially the observed outcome either happens or does not but this reflects a certain threshold being met for the underlying latent variable which is normally distributed. In practice, the end result of these different distributional assumptions is that coefficients differ, usually by a factor of about 1.6. However, if you look at marginal effects (meaning the effects on the predicted mean of the outcome holding other covariates at the mean or averaging over observed values) the logit and probit models will generally make the same predictions and the choice probably does not matter. The coefficients of the logit model can be transformed into odds ratios by exponentiating the coefficients, which reflect the predicted change in the odds given a 1 unit change in the predictor.[5]

An initial set of Logit models for the four outcome variables is provided in Appendix B, with each outcome having four columns of results. Column one provides results from simply regressing race and ethnicity on the dependent variable, employing no

[5] The odds ratio reflects the change relative to the base odds of the outcome occurring. If a given outcome rarely occurs or almost always occurs, a small change in probability can correspond to a large odds ratio. And given odds ratios are a ratio or ratios, this can be confusing, so the marginal effects are reported here.

additional controls. The second column presents findings from the next model specification, which adds controls for firm revenues, firm age, firm age squared, and firm industry. Column three presents the results from the third model specification, which adds in the additional control of credit risk, as described above. Finally, the results in column four control for a number of additional variables, including: rural vs. urban location, whether the firm is profitable or not, whether the firm exports or not, the firm's employment size being five employees or more, and, finally, whether the owner is female or male. These baseline results show that the statistically significant racial and ethnic differences seen in the univariate comparisons in Table 10 do not disappear when we control differences in other factors such as credit risk and firm age.

Given the importance of young firms in driving job creation in the U.S. as well as the fact that minority-owned firms are younger on average than their non-minority counterparts, the following set of multivariate results start with the full models provided in Column four of the tables in Appendix B. These results, for all firms, are provided in Column one. The second column present results for young firms, defined as firms that have been in operation for five years or less, while the third and last column presents the results from firms that have been in operation for more than 10 years. This allows us to examine potential financing challenges for young firms, which are the driving force of net job creation in this country, as well as examine whether or not any racial and ethnic differences in accessing credit persist for more established firms.

Mostly Approved

The results showed that all minority groups were less likely than Whites to be approved for most or all of the financing that was sought. As shown in Table 11, even after

controlling for a number of firm characteristics, all of the coefficients on the race and ethnicity variables were negative and statistically significant. This holds true for all minority groups, indicating that Blacks, Asians, and Hispanics were all less likely to receive most or all of the funding requested, compared with similar businesses owned by Whites.

In terms of the other explanatory variables, the excluded categories for these models were $100K in revenues or less, nonmanufacturing goods production and associated services, and low credit risk. Higher revenues were associated with better loan application outcomes, as were being older, being a low credit risk, being profitable, being located in a rural area, and having five or more employees. Having multiple owners and being female-owned were not statistically significant in predicting loan applications being approved, nor were most of the coefficients on the dummies for the various industries. In fact, the only industry that had a statistically significant coefficient (negative) was the sector including healthcare and education. A full list of variable descriptions can be found in Appendix C.

When we look just at young firms that are five years old or less, we see a similar story. The negative coefficient on Asian and the positive coefficient on employment are no longer statistically significant, but the others remain statistically significant. Not surprisingly, revenues, profitability, and lower credit risk remain strongly predictive of getting approval for financing. The coefficient on female is positive and statistically significant, which is good news for women-owned businesses, which tend to be younger on average, than male-owned businesses.

Once we restrict the analysis to the sample of firms that are more than 10 years old, we see that only the coefficient on Black ownership remains negative and statistically significant. At this point, only the largest revenue class ($10M+) is statistically significant,

but both profitability and employment remain positive and statistically significant, while medium or high credit risks continue to have a negative and statistically significant impact on the loan application outcome. Thus, helping business owners achieve scale and profitability and working to improve their credit scores could go a long way in improving access to financing, even as firms age.

Table 11: Loan Application Approved or Mostly Approved by Firm Age Groups

	(1) ALL	(2) <=5 Years	(3) > 10 Years
Black/African American	-0.653***	-0.696***	-0.801***
	(0.171)	(0.268)	(0.305)
Asian	-0.414*	-0.533	-0.437
	(0.229)	(0.416)	(0.366)
Hispanic	-0.559***	-0.886***	-0.374
	(0.189)	(0.340)	(0.307)
Revenues $100,001 - $500,000	0.315*	0.622***	0.345
	(0.170)	(0.228)	(0.398)
Revenues $500,001 - $1 million	0.207	0.190	0.386
	(0.192)	(0.290)	(0.410)
Revenues $1 million - $5 million	0.271	0.647**	0.233
	(0.199)	(0.330)	(0.408)
Revenues $5 million - $10 million	0.859***	1.912**	0.646
	(0.276)	(0.742)	(0.463)
Revenues More than $10 million	1.147***	0.403	1.576***
	(0.304)	(1.066)	(0.516)
Revenues: Unsure/Not Answered	1.474**	0.777	1.819
	(0.625)	(0.833)	(1.182)
Manufacturing	0.203	0.136	0.268
	(0.166)	(0.319)	(0.237)
Retail	0.186	0.0637	0.157
	(0.190)	(0.340)	(0.286)
Leisure and hospitality	-0.171	-0.0597	-0.519
	(0.199)	(0.328)	(0.319)
Finance and insurance	0.276	-0.231	0.210
	(0.374)	(0.700)	(0.544)
Healthcare and education	-0.434**	-0.568*	-0.478
	(0.194)	(0.338)	(0.311)
Professional services & real estate	-0.175	-0.126	-0.266
	(0.145)	(0.287)	(0.208)
Business support & consumer services	0.173	0.0742	0.0576
	(0.167)	(0.303)	(0.245)
Firm age	0.0176***	-0.387	0.0202*
	(0.00650)	(0.244)	(0.0108)
Firm age squared	-0.000148**	0.0505	-0.000181*
	(6.82e-05)	(0.0416)	(9.48e-05)
Medium credit risk	-0.845***	-0.723***	-0.797***
	(0.104)	(0.185)	(0.157)
High credit risk	-1.786***	-1.483***	-1.820***

	(1) ALL	(2) <=5 Years	(3) > 10 Years
	(0.230)	(0.337)	(0.413)
Urban	-0.363**	-0.470*	-0.307
	(0.144)	(0.249)	(0.215)
More than 5 employees	0.266**	0.307	0.342*
	(0.124)	(0.207)	(0.195)
Profitable	0.557***	0.435**	0.710***
	(0.0994)	(0.183)	(0.144)
Multi-owner	-0.112	-0.0748	0.0187
	(0.0983)	(0.181)	(0.144)
Exporter	-0.356**	-0.787**	-0.108
	(0.156)	(0.342)	(0.216)
Women-Owned	0.0712	0.382**	0.0134
	(0.107)	(0.192)	(0.161)
Constant	0.337	0.999**	0.0726
	(0.224)	(0.435)	(0.478)
Observations	2,247	670	1,154

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Denied

As shown in Table 12, even after controlling for all the factors mentioned above, Black and Hispanic-owned businesses were more likely than White-owned businesses to not receive any of the funding requested and have their loan applications completely denied. In general, firms that were profitable, that had more revenues, and which were lower credit risks were less likely to have their loan applications denied. Businesses in the health care, education, professional services, and real estate sectors were more likely to have their loan applications denied. Revenues become less important as firms age, but profitability and lower credit risk are still highly correlated with lower loan application denials.

Table 12: Application Denied, by Firm Age Groups

	(1) ALL	(2) <=5 Years	(3) > 10 Years
Black/African American	0.511***	0.542**	0.680**
	(0.171)	(0.266)	(0.322)
Asian	-0.472	0.439	-1.096
	(0.324)	(0.461)	(0.746)
Hispanic	0.540***	0.806**	0.620*
	(0.197)	(0.343)	(0.335)
Revenues $100,001 - $500,000	-0.442**	-0.942***	0.0294
	(0.172)	(0.250)	(0.414)
Revenues $500,001 - $1 million	-0.682***	-1.058***	-0.378
	(0.206)	(0.335)	(0.441)
Revenues $1 million - $5 million	-0.463**	-0.626*	-0.213
	(0.214)	(0.366)	(0.441)
Revenues $5 million - $10 million	-1.061***	-2.351**	-0.721
	(0.334)	(1.107)	(0.533)
Revenues More than $10 million	-1.498***	-0.982	-1.813***
	(0.397)	(1.194)	(0.680)
Revenues: Unsure/Not Answered	-0.934	-0.608	-0.815
	(0.674)	(0.895)	(1.202)
Manufacturing	-0.00948	-0.0889	0.0742
	(0.200)	(0.382)	(0.298)
Retail	0.0463	0.259	0.360
	(0.227)	(0.397)	(0.343)
Leisure and hospitality	0.244	0.140	0.652*
	(0.232)	(0.395)	(0.377)
Finance and insurance	-0.117	1.019	-0.258
	(0.453)	(0.710)	(0.778)
Healthcare and education	0.550**	0.694*	0.729**
	(0.217)	(0.379)	(0.359)
Professional services & real estate	0.579***	0.926***	0.331
	(0.169)	(0.323)	(0.261)
Business support & consumer services	0.0686	0.367	-0.104
	(0.198)	(0.349)	(0.312)
Firm age	-0.0124	0.405	-0.0255**
	(0.00762)	(0.294)	(0.0129)
Firm age squared	0.000148*	-0.0303	0.000260**
	(7.69e-05)	(0.0487)	(0.000108)
Medium credit risk	0.619***	0.446**	0.643***
	(0.123)	(0.217)	(0.191)
High credit risk	1.068***	0.885***	1.382***
	(0.202)	(0.318)	(0.373)
Urban	0.235	0.270	0.297
	(0.173)	(0.300)	(0.272)
More than 5 employees	-0.133	-0.149	-0.0954
	(0.143)	(0.239)	(0.236)
Profitable	-0.411***	-0.372*	-0.531***
	(0.116)	(0.211)	(0.177)
Multi-owner	0.0342	-0.110	-0.0562
	(0.115)	(0.205)	(0.179)
Exporter	0.298	0.387	-0.00369

	(1) ALL	(2) <=5 Years	(3) > 10 Years
	(0.182)	(0.362)	(0.277)
Women-Owned	-0.0736	-0.404*	-0.114
	(0.123)	(0.220)	(0.198)
Constant	-1.294***	-2.058***	-1.314**
	(0.254)	(0.526)	(0.539)
Observations	2,247	670	1,154
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1			

Discouraged

Recall that Black-owned businesses had discouraged rates that were much higher than the other groups. As seen in Table 13, after controlling for other factors, the coefficient on Black is positive and statistically significant for firms overall and for firms that were 10 years or older. However, for young firms, none of the coefficients on race and ethnicity were statistically significant. Similar to the previous models, higher credit risk and not being profitable were strongly correlated with being discouraged. Firm size, measured by revenues and employment, was not statistically significant. However, being in an urban area was statistically significant and strongly correlated with being discouraged for firms overall and for young firms, but not for older ones. Interestingly, being female-owned was also strongly correlated with being discouraged for young firms and firms overall, but not for older firms.

Table 13: Discouraged, by Firm Age Groups

	(1) ALL	(2) <=5 Years	(3) > 10 Years
Black/African American	0.540***	-0.106	1.090***
	(0.196)	(0.335)	(0.325)
Asian	-0.0543	0.175	-0.302
	(0.347)	(0.546)	(0.644)
Hispanic	-0.108	0.000400	0.187
	(0.248)	(0.383)	(0.392)
Revenues $100,001 - $500,000	0.107	0.0570	-0.0244
	(0.185)	(0.278)	(0.358)
Revenues $500,001 - $1 million	0.259	-0.0390	0.118
	(0.231)	(0.439)	(0.387)
Revenues $1 million - $5 million	-0.569**	-1.037*	-0.674

	(1) ALL	(2) <=5 Years	(3) > 10 Years
	(0.274)	(0.547)	(0.434)
Revenues $5 million - $10 million	-0.260	0.0937	-0.404
	(0.432)	(1.061)	(0.591)
Revenues: Unsure/Not Answered	-0.250	0.0596	0.0246
	(0.620)	(0.885)	(0.906)
Manufacturing	0.264	0.491	0.219
	(0.247)	(0.439)	(0.351)
Retail	-0.0352	-0.474	0.0509
	(0.278)	(0.498)	(0.402)
Leisure and hospitality	-0.135	0.0141	-0.574
	(0.302)	(0.463)	(0.585)
Finance and insurance	0.0429	-0.166	-0.260
	(0.352)	(0.737)	(0.497)
Healthcare and education	-0.193	0.00404	-0.866*
	(0.287)	(0.478)	(0.472)
Professional services & real estate	-0.0509	0.416	-0.342
	(0.217)	(0.396)	(0.313)
Business support & consumer services	0.0575	0.448	-0.489
	(0.244)	(0.398)	(0.392)
Firm age	-0.0332***	-0.321	-0.0446***
	(0.00815)	(0.366)	(0.0136)
Firm age squared	0.000250***	0.0511	0.000325***
	(7.03e-05)	(0.0609)	(9.58e-05)
Medium credit risk	1.680***	1.313***	1.758***
	(0.147)	(0.256)	(0.221)
High credit risk	2.880***	2.728***	3.058***
	(0.231)	(0.352)	(0.433)
Urban	0.706***	0.927**	0.411
	(0.227)	(0.392)	(0.319)
More than 5 employees	0.0172	0.305	-0.0317
	(0.175)	(0.311)	(0.259)
Profitable	-0.724***	-0.619**	-0.911***
	(0.139)	(0.251)	(0.213)
Multi-owner	0.132	0.336	0.0319
	(0.140)	(0.237)	(0.215)
Exporter	0.435**	0.721	0.212
	(0.220)	(0.469)	(0.317)
Women-Owned	0.273*	0.463*	0.197
	(0.141)	(0.240)	(0.223)
Constant	-2.572***	-2.675***	-1.597***
	(0.328)	(0.685)	(0.564)
Observations	2,460	576	1,457

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Constrained

Recall that firms were defined as being financially constrained if they responded affirmatively to any of the following: they applied for funding and did not receive the full amount requested, they indicated that they did not apply for credit when they needed it for any reason other than being debt averse, or they stated that credit availability was a financial challenge. This measure is also applied to the greatest number of respondents in that it includes borrowers and non-borrowers, applicants and non-applicants. In the univariate results, all three of the minority groups (Black, Asian, and Hispanic) were more likely than Whites to cite they were financially constrained as defined by the broadest measure of the four dependent variables.

In the multivariate analysis, the results on race and ethnicity were mixed. The coefficients on all three variables were positive and statistically significant for the model with all firms, but statistically significant for Asian and Hispanic young firms, but not for the older ones. This result was the opposite for Black-owned firms. The coefficient was statistically significant for older firms, but not for the young ones. Interestingly, size was not correlated except for the highest revenue levels. Older and profitable firms were less likely to be constrained, as expected, and credit risk was again highly correlated, also as expected. Interestingly, urban firms and firms that were exporters were more likely to be constrained. The coefficient on female ownership was negative and statistically significant for young firms only.

Table 14: Constrained, by Firm Age Groups

	(1) ALL	(2) <=5 Years	(3) > 10 Years
Black/African American	0.780***	0.417	0.941***
	(0.156)	(0.266)	(0.239)
Asian	0.309*	0.628*	0.134
	(0.175)	(0.366)	(0.255)
Hispanic	0.447***	0.853***	0.354
	(0.154)	(0.328)	(0.228)
Revenues $100,001 - $500,000	-0.0443	-0.131	0.210
	(0.137)	(0.198)	(0.272)
Revenues $500,001 - $1 million	0.134	0.142	0.206
	(0.155)	(0.269)	(0.283)
Revenues $1 million - $5 million	-0.223	-0.303	-0.156
	(0.158)	(0.276)	(0.285)
Revenues $5 million - $10 million	-0.366*	-0.889	-0.283
	(0.207)	(0.563)	(0.323)
Revenues More than $10 million	-0.696***	-0.950	-0.754**
	(0.218)	(0.987)	(0.333)
Revenues: Unsure/Not Answered	-0.752**	-0.741	-0.456
	(0.372)	(0.578)	(0.552)
Manufacturing	0.0478	0.112	0.0758
	(0.128)	(0.288)	(0.165)
Retail	0.0631	0.129	0.0890
	(0.143)	(0.293)	(0.194)
Leisure and hospitality	0.148	-0.174	0.564**
	(0.164)	(0.281)	(0.253)
Finance and insurance	-0.575***	-0.911*	-0.482*
	(0.219)	(0.489)	(0.284)
Healthcare and education	0.0684	0.319	-0.204
	(0.156)	(0.305)	(0.229)
Professional services & real estate	0.0979	0.0204	0.172
	(0.110)	(0.246)	(0.145)
Business support & consumer services	0.0758	0.441	-0.0146
	(0.132)	(0.273)	(0.178)
Firm age	-0.0311***	0.298	-0.0257***
	(0.00438)	(0.213)	(0.00678)
Firm age squared	0.000226***	-0.0477	0.000196***
	(4.21e-05)	(0.0362)	(5.58e-05)
Medium credit risk	1.517***	1.419***	1.649***
	(0.0907)	(0.173)	(0.128)
High credit risk	2.942***	3.033***	2.789***
	(0.317)	(0.527)	(0.480)
Urban	0.356***	0.546***	0.271*
	(0.107)	(0.210)	(0.144)
More than 5 employees	-0.122	-0.232	-0.0295
	(0.0963)	(0.180)	(0.137)
Profitable	-1.008***	-0.933***	-1.066***
	(0.0777)	(0.156)	(0.104)
Multi-owner	0.0793	-0.0205	0.0762
	(0.0746)	(0.153)	(0.101)
Exporter	0.204*	1.386***	0.0534

	(1) ALL	(2) <=5 Years	(3) > 10 Years
	(0.117)	(0.377)	(0.146)
Women-Owned	-0.0861	-0.372**	0.163
	(0.0816)	(0.162)	(0.113)
Constant	0.360**	-0.168	0.0902
	(0.177)	(0.383)	(0.330)
Observations	4,211	1,118	2,337

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Conclusions and Policy Implications

Overall, credit market experiences vary across racial and ethnic groups. Businesses owned by Hispanics, Blacks, and Asians are more likely to be financially constrained than businesses owned by Whites and they are less likely than Whites to have their loan applications mostly or fully approved. Black- and Hispanic-owned businesses are more likely to have their loan applications denied and to be discouraged from applying when credit is needed for fear of having their loan application denied.

The multivariate analyses show significant demographic differences in the credit market experiences of these businesses. Even after controlling for firm characteristics, credit risk, and other factors, minority-owned businesses were less likely to have some or all of their loan application funding approved, compared with businesses owned by Whites. While this appears to dissipate for Asian- and Hispanic-owned firms as they get older, this finding remains true even for Black-owned businesses that have been operating for more than a decade.

After controlling for credit risk, profitability, firm size, and age, Blacks and Hispanics were more likely than Whites to have their loan application denied outright. Survey responses provide some indication that that over-indebtedness is not the reason for

these denials. Credit scores and profitability are two of the strongest variables correlated with these application outcomes.

Minority-owned businesses were more likely to experience financial challenges than their White-owned counterparts and this was true for young firms specifically, which are the main driver of job creation. Ensuring that minority-owned employer firms have access to the financial capital they need is vital for these businesses to drive innovation, growth, and job creation in the U.S. economy.

One public policy recommendation that emerges is helping minority-owned businesses improve their credit scores. This could be done in a number of ways. Financial literacy training, wealth building, and better access to affordable credit options are three offerings that could move the needle on this challenge. Affordable credit options could also improve the bottom lines of these companies, helping to boost profitability.

Another policy implication emerging out of this research is to support the lenders that are already successfully reaching minority business borrowers and help them expand their lending to these businesses. While Blacks and Hispanics are more reliant than Whites on lenders such as community development financial institutions and credit unions, they are using them at far lower rates than conventional banks. CDFIs and credit unions could do more effective outreach to these populations of business owners in order to more deeply engage with these borrowers.

The need for financial innovation is urgent. There is a critical capital gap for entrepreneurs of color that has persisted for decades and shows no signs of diminishing. Banks could partner with CDFIs so they can better match borrowers with lenders that have missions to lend to them. More creative thinking around new programs and outreach to

underserved communities is urgently needed.

Given that large banks are the most common source of financial capital to small businesses, policymakers could consider ways to encourage large banks to lend to minority-owned businesses. Building on the Community Reinvestment Act, there could be special Community Reinvestment Act credits or tax incentives for increased lending to minority-owned businesses and rewards for the top performers of all banks, large and small.

Section 1071 of the Dodd-Frank Wall Street Reform Act requires banks to collect information on race, ethnicity, and gender of business loan applications and outcomes. Having better data on small business lending by these characteristics, which is the intent of the statute, would help researchers and policy makers better understand the credit market gaps at a more granular level by city and state.

While this study cannot fully assess conditions of minority-owned businesses or the underlying causes of those conditions, it does provide evidence that minority business owners continue to face greater challenges in accessing financial capital. Improved knowledge of minority-owned firms' financing needs and the reasons underlying the racial and ethnic gaps in capital access are fundamental to understanding and bolstering the entrepreneurial sector's health and growth, and this is increasingly important to the U.S. economy in general.

While minorities make up 40 percent of the U.S. population, they currently own only about 20 percent of the employer businesses in this country. And in terms of sales, payroll, and employment, their shares are much lower. As the minority population continues to rise, it will become more important than ever that prospective and current business owners have the resources they need to launch and grow successful firms.

Clearly, access to capital is still a driving factor that is disproportionately affecting minority-owned businesses, especially those owned by Blacks and Hispanics. Given this is further compounded by the lower wealth levels of these two groups, it makes fully understanding the situation all the more urgent. While these newly available data illustrate that financing challenges for minority firms remain front and center for employer businesses across the United States, more comprehensive and timely data is needed to study this issue in greater depth. Understanding how wealth levels affect capital access, why application rates to mission driven financial institutions are still quite low, and how business owners can most quickly improve their credit scores are just three suggested research topics as next steps for investigation.

References

Adelino, M., S. Ma, and D.T. Robinson (2016). Firm Age, Investment Opportunities, and JobCreation. *Journal of Finance*, Forthcoming; Duke I&E Research Paper No. 16-5. Available at https://ssrn.com/abstract=2375173

Barkley B., A. Robb, M. de Zeeuw (2018). *2016 Small Business Credit Survey: Report on Minority-Owned Firms*. Federal Reserve Bank of Cleveland.

Bates, T. (1997). *Race, Self-Employment and Upward Mobility: An Elusive American Dream.* Washington, DC: Woodrow Wilson Center Press and Baltimore: Johns Hopkins University Press.

Bates, T. and Loftstrom, M. (2013). African Americans' Pursuit of Self-Employment. *Small Business Economics* 40:73-86.

Bates, T., & Robb, A. (2015a). Has the Community Reinvestment Act Increased Loan Availability among Small Businesses Operating in Minority Neighborhoods? *Urban Studies* 52, 1702–1721.

Bates, T., & Robb, A. (2015b). Impacts of Owner Race and Geographic Context on Access to Small Business Financing. *Economic Development Quarterly* 30, 159–170.

Berger, A.N., & Udell, G.F. (1995). Relationship Lending and Lines of Credit in Small Firm

Finance. *The Journal of Business,* 68, 3, 351-381.

Black, S.E., & Strahan, P.E. (2002). Entrepreneurship and Bank Credit Availability. *The Journal of Finance* 57(6), 2807–2833

Blanchard, L., Zhao, B., & Yinger, J. (2005). *Do Credit Market Barriers Exist for Minority and Women Entrepreneurs?* Syracuse University Working Paper.

Blanchard, L. and Zhao, B. and Yinger, J. (2008). Do Lenders Discriminate Against Minority and Woman Entrepreneurs? *Journal of Urban Economics*, Vol. 63, No. 2. Available at SSRN: https://ssrn.com/abstract=1932262

Blanchflower, D.G., Levine, P.B., & Zimmerman, D.J. (2003). Discrimination in the Small-Business Credit Market. *Review of Economics and Statistics*, 85, 4, 930-943.

Cagetti, M. & De Nardi, M. (2006). Entrepreneurship, Frictions, and Wealth. *Journal of Political Economy*, 114(5), 835–870.

Cavalluzzo, K., & Wolken, J. (2005). Small Business Loan Turndowns, Personal Wealth and Discrimination. *Journal of Business*, 78, 2153-2178.

Cole, R. (2014). *Credit Scores and Credit Market Outcomes: Evidence from the Survey of Small Business Finances and the Kauffman Firm Survey*. U.S. Small Business

Administration Report. Washington, D.C.

Cole, R. and Sokolyk, T. (2016). Who Needs Credit and Who Gets Credit? Evidence from the Surveys of Small Business Finances. *Journal of Financial Stability*, 24, 40-60.

Coleman, S. (2002). The Borrowing Experience of Black and Hispanic-Owned Small Firms: Evidence from the 1998 Survey of Small Business Finances. *The Academy of Entrepreneurship Journal,* 8, 1–20.

Evans, D.S., & Jovanovic, B. (1989). An Estimated Model of Entrepreneurial Choice under Liquidity Constraints. *Journal of Political Economy* 97(4), 808–827.

Fairlie, R.W. (1999). The Absence of the African-American Owned Business: An Analysis of the Dynamics of Self-Employment, Journal of Labor Economics 17(1): 80-108.

Fairlie, R.W., and Woodruff, C. (2009). *Mexican-American Entrepreneurship*. University of California Working Paper.

Fairlie, R., & Robb, A. (2008). *Race and Entrepreneurial Success: Black- Asian- and White-Owned Businesses in the United States*. Cambridge: MIT Press.

Fairlie, R., Robb, A. & Robinson, D. (2016). *Black and White: Access to Capital among*

Minority-Owned Startups. Stanford Institute for Economic Policy Research discussion paper 17-03.

Federal Reserve Bulletin (2017). *Changes in U.S. Family Finances from 2013 to 2016: Evidence from the Survey of Consumer Finances*. September. Vol. 103, No. 3

Haltiwanger, J., Jarmin, R. Miranda, J. (2009). *Jobs Created from Business Startups in the United States*. Kauffman Foundation Working Paper.

Haltiwanger, J. (2015). Job creation, job destruction, and productivity growth: The role of young businesses. *Economics*, *7*(1), 341-358.

Kerr, W.R., & Nanda, R. (2009). Democratizing Entry: Banking Deregulations, Financing Constraints, and Entrepreneurship" *Journal of Financial Economics* 94(1), 124–149.

Lownes-Jackson, M., Olorunniwo, F., Flott, P., & Ellzy, J. (2003). Financial obstacles faced by African American entrepreneurs: an insight into a developing area of the US economy. *The Journal of Developing Areas*, 125-145.

Mijid, N. and Bernasek, A. (2013). Decomposing Racial and Ethnic Differences in Small Business Lending: Evidence of Discrimination. *Review of Social Economy* (Ahead of Print) 1-31.

Mitchell, K. & Pearce, D.K. (2005). *Availability of Financing to Small Firms Using the Survey of Small Business Finances.* U.S. Small Business Administration, Office of Advocacy.

Nanda, R. (2008). *Cost of external finance and selection into entrepreneurship*. Harvard Business School Working Paper 08-047.

Palia, D. (2015). *Differential Access to Capital from Financial Institutions by Minority Entrepreneurs*. Available at SSRN: http://dx.doi.org/10.2139/ssrn.2613087

Robb, A., Barkley, B. and de Zeeuw, M. (2018). *Mind the Gap: How Do Credit Market Experiences and Borrowing Patterns Differ for Minority-Owned Firms*? Federal Reserve Bank of Atlanta.

Robb, A., & Robinson, D. (2014). The Capital Structure Decisions of New Firms. Review of Financial Studies. *Society for Financial Studies*, 27.1, 153-179.

Robb, A. (2018). *Financing Patterns and Credit Market Experiences: A Comparison by Race and Ethnicity for US Employer Firms.* U.S. Small Business Administration, Office of Advocacy.

Appendix A: The 2016 Annual Survey of Entrepreneurs

Table 1: 2016 Annual Survey of Entrepreneurs

	# of Firms	Sales ($1,000s)	Employment	Annual payroll ($1,000s)
White	4,534,290	10,918,706,136	52,123,706	2,148,677,771
	85.0%	92.0%	88.7%	91.0%
Black or African American	121,466	104,264,457	1,132,916	31,415,343
	2.3%	0.9%	1.9%	1.3%
Asian	555,262	690,725,018	4,424,656	142,058,761
	10.4%	5.8%	7.5%	6.0%
Other Race	128,456	135,743,010	976,032	31,866,948
	2.4%	1.1%	1.7%	1.3%
Hispanic	337,533	408,233,082	2,787,944	91,225,211
	6.3%	3.4%	4.7%	3.9%
All firms Classifiable by Race/Ethnicity	5,333,444	11,873,702,820	58,735,530	2,360,835,270
Publicly Traded Firms	268,314	22,524,393,186	62,347,813	3,743,710,755
All firms	5,601,758	34,398,096,007	121,083,343	6,104,546,025

Source: 2016 Annual Survey of Entrepreneurs, US Census Bureau

Appendix B: Base Models

Table B.1: Loan Application Approved or Mostly Approved

	(1)	(2)	(3)	(4)
Black/African American	-1.336***	-0.993***	-0.625***	-0.653***
	(0.150)	(0.159)	(0.168)	(0.171)
Asian	-0.459**	-0.421*	-0.476**	-0.414*
	(0.213)	(0.222)	(0.225)	(0.229)
Hispanic	-0.917***	-0.826***	-0.617***	-0.559***
	(0.170)	(0.178)	(0.186)	(0.189)
Revenues $100,001 - $500,000		0.546***	0.488***	0.315*
		(0.160)	(0.167)	(0.170)
Revenues $500,001 - $1 million		0.605***	0.426**	0.207
		(0.173)	(0.180)	(0.192)
Revenues $1 million - $5 million		0.854***	0.600***	0.271
		(0.167)	(0.174)	(0.199)
Revenues $5 million - $10 million		1.526***	1.173***	0.859***
		(0.244)	(0.251)	(0.276)
Revenues More than $10 million		1.821***	1.509***	1.147***
		(0.271)	(0.279)	(0.304)
Revenues: Unsure/Not Answered		1.929***	1.634***	1.474**
		(0.596)	(0.606)	(0.625)
Manufacturing		0.117	0.141	0.203
		(0.153)	(0.158)	(0.166)
Retail		0.169	0.114	0.186
		(0.181)	(0.186)	(0.190)
Leisure and hospitality		-0.0757	-0.119	-0.171
		(0.189)	(0.195)	(0.199)
Finance and insurance		0.525	0.371	0.276
		(0.354)	(0.364)	(0.374)
Healthcare and education		-0.298	-0.339*	-0.434**
		(0.182)	(0.188)	(0.194)
Professional services & real estate		-0.0892	-0.188	-0.175
		(0.139)	(0.143)	(0.145)
Business support & consumer services		0.175	0.201	0.173
		(0.159)	(0.164)	(0.167)
Firm age		0.0215***	0.0177***	0.0176***
		(0.00627)	(0.00645)	(0.00650)
Firm age squared		-0.000174***	-0.000151**	-0.000148**
		(6.60e-05)	(6.76e-05)	(6.82e-05)
Medium credit risk			-0.883***	-0.845***
			(0.103)	(0.104)
High credit risk			-1.902***	-1.786***
			(0.227)	(0.230)
Urban				-0.363**
				(0.144)
More than 5 employees				0.266**
				(0.124)
Profitable				0.557***
				(0.0994)
Multi-owner				-0.112
				(0.0983)
Exporter				-0.356**
				(0.156)
Women-Owned				0.0712
				(0.107)
Constant	0.629***	-0.407**	0.202	0.337
	(0.0499)	(0.169)	(0.184)	(0.224)
Observations	2,247	2,247	2,247	2,247

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table B.2: Loan Application Denied

	(1)	(2)	(3)	(4)
Black/African American	1.119***	0.776***	0.504***	0.511***
	(0.149)	(0.160)	(0.168)	(0.171)
Asian	-0.383	-0.468	-0.436	-0.472
	(0.315)	(0.322)	(0.323)	(0.324)
Hispanic	0.836***	0.754***	0.586***	0.540***
	(0.182)	(0.190)	(0.194)	(0.197)
Revenues $100,001 - $500,000		-0.596***	-0.554***	-0.442**
		(0.166)	(0.168)	(0.172)
Revenues $500,001 - $1 million		-0.925***	-0.804***	-0.682***
		(0.190)	(0.194)	(0.206)
Revenues $1 million - $5 million		-0.853***	-0.657***	-0.463**
		(0.180)	(0.185)	(0.214)
Revenues $5 million - $10 million		-1.509***	-1.233***	-1.061***
		(0.303)	(0.308)	(0.334)
Revenues More than $10 million		-1.983***	-1.726***	-1.498***
		(0.370)	(0.373)	(0.397)
Revenues: Unsure/Not Answered		-1.286*	-1.041	-0.934
		(0.659)	(0.664)	(0.674)
Manufacturing		0.0439	0.0351	-0.00948
		(0.191)	(0.194)	(0.200)
Retail		0.0335	0.0946	0.0463
		(0.223)	(0.225)	(0.227)
Leisure and hospitality		0.182	0.212	0.244
		(0.226)	(0.230)	(0.232)
Finance and insurance		-0.302	-0.173	-0.117
		(0.442)	(0.447)	(0.453)
Healthcare and education		0.447**	0.487**	0.550**
		(0.207)	(0.210)	(0.217)
Professional services & real estate		0.498***	0.581***	0.579***
		(0.164)	(0.167)	(0.169)
Business support & consumer services		0.0442	0.0451	0.0686
		(0.193)	(0.195)	(0.198)
Firm age		-0.0153**	-0.0124	-0.0124
		(0.00751)	(0.00761)	(0.00762)
Firm age squared		0.000167**	0.000150*	0.000148*
		(7.59e-05)	(7.67e-05)	(7.69e-05)
Medium credit risk			0.652***	0.619***
			(0.122)	(0.123)
High credit risk			1.174***	1.068***
			(0.199)	(0.202)
Urban				0.235
				(0.173)
More than 5 employees				-0.133
				(0.143)
Profitable				-0.411***
				(0.116)
Multi-owner				0.0342
				(0.115)
Exporter				0.298
				(0.182)
Women-Owned				-0.0736
				(0.123)
Constant	-1.539***	-0.760***	-1.239***	-1.294***
	(0.0623)	(0.185)	(0.203)	(0.254)

Observations	2,247	2,247	2,247	2,247

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table B.3: Firm is Financially Constrained

	(1)	(2)	(3)	(4)
Black/African American	1.623***	1.287***	0.743***	0.780***
	(0.133)	(0.140)	(0.152)	(0.156)
Asian	0.354**	0.281*	0.322*	0.309*
	(0.156)	(0.164)	(0.171)	(0.175)
Hispanic	0.868***	0.677***	0.465***	0.447***
	(0.133)	(0.140)	(0.150)	(0.154)
Revenues $100,001 - $500,000		-0.443***	-0.344***	-0.0443
		(0.123)	(0.132)	(0.137)
Revenues $500,001 - $1 million		-0.409***	-0.200	0.134
		(0.133)	(0.143)	(0.155)
Revenues $1 million - $5 million		-0.923***	-0.643***	-0.223
		(0.126)	(0.135)	(0.158)
Revenues $5 million - $10 million		-1.211***	-0.817***	-0.366*
		(0.171)	(0.180)	(0.207)
Revenues More than $10 million		-1.614***	-1.206***	-0.696***
		(0.182)	(0.193)	(0.218)
Revenues: Unsure/Not Answered		-1.328***	-1.018***	-0.752**
		(0.330)	(0.348)	(0.372)
Manufacturing		0.107	0.117	0.0478
		(0.111)	(0.119)	(0.128)
Retail		-0.00826	0.0941	0.0631
		(0.131)	(0.139)	(0.143)
Leisure and hospitality		0.102	0.110	0.148
		(0.149)	(0.159)	(0.164)
Finance and insurance		-0.868***	-0.767***	-0.575***
		(0.197)	(0.212)	(0.219)
Healthcare and education		-0.0664	-0.00991	0.0684
		(0.141)	(0.150)	(0.156)
Professional services & real estate		-0.116	0.0558	0.0979
		(0.101)	(0.107)	(0.110)
Business support & consumer services		0.0402	0.0344	0.0758
		(0.120)	(0.129)	(0.132)
Firm age		-0.0359***	-0.0305***	-0.0311***
		(0.00413)	(0.00431)	(0.00438)
Firm age squared		0.000263***	0.000232***	0.000226***
		(4.11e-05)	(4.20e-05)	(4.21e-05)
Medium credit risk			1.566***	1.517***
			(0.0887)	(0.0907)
High credit risk			3.090***	2.942***
			(0.315)	(0.317)
Urban				0.356***
				(0.107)
More than 5 employees				-0.122
				(0.0963)
Profitable				-1.008***
				(0.0777)
Multi-owner				0.0793
				(0.0746)
Exporter				0.204*
				(0.117)
Women-Owned				-0.0861
				(0.0816)
Constant	-0.125***	1.094***	0.331**	0.360**
	(0.0346)	(0.132)	(0.144)	(0.177)

Observations	4,211	4,211	4,211	4,211

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table B.4: Discouraged (Needed Credit but Did not Apply for Fear of Denial)

	(1)	(2)	(3)	(4)
Black/African American	1.538***	1.303***	0.649***	0.540***
	(0.156)	(0.169)	(0.192)	(0.196)
Asian	0.0960	0.0849	0.0921	-0.0543
	(0.295)	(0.304)	(0.337)	(0.347)
Hispanic	0.430**	0.175	-0.0316	-0.108
	(0.216)	(0.223)	(0.248)	(0.248)
Revenues $100,001 - $500,000		-0.261	-0.0881	0.107
		(0.160)	(0.178)	(0.185)
Revenues $500,001 - $1 million		-0.224	0.0906	0.259
		(0.192)	(0.214)	(0.231)
Revenues $1 million - $5 million		-1.198***	-0.733***	-0.569**
		(0.215)	(0.233)	(0.274)
Revenues $5 million - $10 million		-1.095***	-0.436	-0.260
		(0.366)	(0.386)	(0.432)
Revenues More than $10 million		-1.254***	-0.495	-0.278
		(0.405)	(0.420)	(0.462)
Revenues: Unsure/Not Answered		-0.606	-0.257	-0.250
		(0.560)	(0.593)	(0.620)
Manufacturing		0.377*	0.475**	0.264
		(0.214)	(0.232)	(0.247)
Retail		-0.0726	0.0113	-0.0352
		(0.248)	(0.270)	(0.278)
Leisure and hospitality		-0.112	-0.153	-0.135
		(0.265)	(0.294)	(0.302)
Finance and insurance		-0.230	-0.0682	0.0429
		(0.308)	(0.337)	(0.352)
Healthcare and education		-0.296	-0.112	-0.193
		(0.255)	(0.279)	(0.287)
Professional services & real estate		-0.287	-0.0218	-0.0509
		(0.195)	(0.212)	(0.217)
Business support & consumer services		-0.0236	0.0401	0.0575
		(0.220)	(0.242)	(0.244)
Firm age		-0.0386***	-0.0317***	-0.0332***
		(0.00758)	(0.00803)	(0.00815)
Firm age squared		0.000263***	0.000236***	0.000250***
		(6.74e-05)	(6.97e-05)	(7.03e-05)
Medium credit risk			1.705***	1.680***
			(0.145)	(0.147)
High credit risk			2.942***	2.880***
			(0.227)	(0.231)
Urban				0.706***
				(0.227)
More than 5 employees				0.0172
				(0.175)
Profitable				-0.724***
				(0.139)
Multi-owner				0.132
				(0.140)
Exporter				0.435**
				(0.220)
Women-Owned				0.273*
				(0.141)
Constant	-1.990***	-0.932***	-2.073***	-2.572***

	(0.0693)	(0.202)	(0.239)	(0.328)
Observations	2,460	2,460	2,460	2,460

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Appendix C: 2017 Small Business Credit Survey Variable Definitions

More definitions, survey instruments, and other reports can be found at https://www.fedsmallbusiness.org/survey

Credit Risk: Self-reported business credit score or personal credit score, depending on which is used to obtain financing for the business. If the firm uses both, the highest risk rating is used.

Low risk:	*80-100 business credit score or 720+ personal credit score*
Medium risk:	*50-79 business credit score or 620-719 personal credit score*
High risk:	*1-49 business credit score or <620 personal credit score*

Industry Categories: Classified based on the description of what the business does, as provided by the survey respondent

Nonmanufacturing goods production and associated services:	Agriculture, Forestry, Fishing, and Hunting; Mining, Quarrying, and Oil and Gas Extraction; Utilities; Construction; Wholesale Trade; Transportation and Warehousing (NAICS: 11, 21, 22, 23, 42, 48-49)
Manufacturing:	Manufacturing (NAICS: 31-33)
Retail:	Retail Trade (NAICS: 44-45)
Leisure and hospitality:	Arts, Entertainment, and Recreation; Accommodation and Food Services (NAICS: 71, 72)
Finance and insurance:	Finance and Insurance (NAICS: 52)
Healthcare and education:	Educational Services; Health Care and Social Assistance (NAICS: 61, 62)
Professional services and real estate:	Information; Real Estate and Rental and Leasing; Professional, Scientific, and Technical Services; Management of Companies and Enterprises (NAICS: 51, 53, 54, 55)
Business support and consumer services:	Administrative and Support and Waste Management and Remediation Services; Other Services (NAICS: 56, 81)
Urban:	*Headquarters located in or associated with a micro- or metropolitan area (with at least 10,000 people)*
Rural:	*Headquarters not located in or associated with a micro- or metropolitan area. Includes both 'rural' and 'super-rural' locations as classified by the Center for Medicare and Medicaid Services*

Classified using race and ethnicity of firm owner(s), as provided by the survey respondent.

Minority:	*Owner(s) with more than 50% controlling interest is(are) not non-Hispanic white*
Non-minority:	*Owner(s) with 50% or more controlling interest is(are) non-Hispanic white*

Classified using gender of firm owner(s), as provided by the survey respondent.

Men-owned:	*More than 50% of the business is owned by men*
Equally owned:	*50% of the business is owned by men and 50% of the business is owned by women*

Women-owned:	*More than 50% of the business is owned by women*
Self-reported source from which the firm owner(s) obtained, or attempted to obtain, a loan or line of credit product.	
Large bank:	*Respondents were provided a list of large banks (those with at least $10B in deposits) operating in their state*
Small bank:	*Bank not listed in the large bank list provided*
Online lender:	*Nonbank online lender; examples include Lending Club, OnDeck, Prosper, CAN Capital, Paypal Working Capital, Kabbage, etc.*
Community development financial institution (CDFI):	*Financial institution that provides credit and financial services to underserved markets and populations, and is certified by the CDFI Fund at the U.S. Department of the Treasury*
Credit union:	*Non-profit cooperative where members can borrow money at competitive rates from pooled deposits*