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# Black Entrepreneurs, Job Creation, and Financial Constraints

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# ABSTRACT

# Black Entrepreneurs, Job Creation, and Financial Constraints*

Black-owned businesses tend to operate with less finance and employ fewer workers than those owned by Whites. Motivated by a simple conceptual framework, we document these facts and show they are causally connected using large firm-level surveys linked to universal employer data from the Census Bureau. We find that the racial financing gap is most pronounced at start-up and tends to narrow with firm age. At any age, Black-owned firms are less likely to receive bank loans, more likely to refrain from applying because they expect denial, and more likely to report that lack of finance reduces their profitability. Yet the observable characteristics of Black entrepreneurs are similar in most respects to Whites, and in some ways - higher education, growth-oriented motivations, and involvement in the business - would seem to imply higher, not lower, demand for finance. Concerning employment, we find that Black-owned firms have on average about 12 percent fewer employees than those owned by Whites, but the difference drops when controlling for firm age and other characteristics. However, when the analysis holds financial variables constant, the results imply that equally well-financed Black-owned firms would be larger than White-owned by about seven percent. Exploiting the credit supply shock of changing assignment to Community Reinvestment Act treatment through a Regression Discontinuity Design in a firm-level panel regression framework, we find that expanded credit access raises employment 5-7 percentage points more at Black-owned businesses than White-owned firms in treated neighborhoods.

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# 1   Introduction

Financial constraints are frequently portrayed as an important factor in the persistence of racial inequality. Greater liquidity problems may not only lower current consumption, but also reduce investments, mobility, and wealth accumulation, in a self-reinforcing cycle. Recent data from the Federal Reserve's Survey of Consumer Finances show an enormous racial wealth gap, with Black families having both median and mean wealth less than 15 percent of that of Whites. This relationship appears largely unchanged since at least the 1960s.[1]

One important type of financial constraint is that faced by entrepreneurs trying to grow a business. Because Black owners tend to have fewer resources, both personally and through family and friends, they are more dependent on outside funding. An upward-sloping supply curve for external finance implies they face worse financing terms, such that otherwise profitable projects are less likely to be undertaken. Discrimination and greater information asymmetries, associated for instance with a different racial make-up of lenders versus entrepreneurs, may further exacerbate the disparity in the availability and terms of outside finance. If Black owners are less able to finance expansion, even given the same investment opportunities, then their firms will tend to be smaller at all firm ages. To the extent that hiring is segregated, in the sense that Black entrepreneurs are more likely than Whites to hire Black employees, the consequence of tougher financial constraints is lower demand for Black labor and fewer jobs in Black communities.[2]

Motivated by these considerations, this paper analyzes differences in financial constraints and firm employment by race of the owner. We focus on Black-White differentials and start with a conceptual framework that clarifies how differences in personal wealth, information asymmetries, and discrimination can lead to inequality in access to finance and in firm growth. The framework also shows how a policy that expands capital supply may disproportionately aid Black entrepreneurs.

Our empirical analysis begins by documenting basic facts about the amounts and sources of finance and the characteristics of business owners. For this purpose, we draw upon microdata from the 2014 Annual Survey of Entrepreneurs (ASE), a random sample of all U.S. employer-firms with information on 288,000 owners of 184,000 firms (in our regression sample). The data contain a rich set of financial measures, including the reported amounts and

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[1]Bhutta et al. (2020) contains the 2019 data, while earlier studies of racial wealth differences include Terrell (1971) and Blau and Graham (1990).

[2]Bates (1988) and Carrington and Troske (1998) document the clustering of Black employees at Black-owned firms. Stoll, Raphael and Holzer (2004) and Giuliano, Levine and Leonard (2009) document the correlation of race between hiring agents/managers and employees, so that the probability of a Black being hired is greater when the decision-maker is also Black.

sources of finance at start-up and in a recent year and the subjective evaluations of business owners on their constraints. We describe the racial gaps in these measures, and in a style similar to previous research, we examine how these gaps change when we control for firm and owner characteristics. The ASE includes information not only on firm age and industry, but also unusually detailed characteristics of owners: demographics, education, previous entrepreneurial experience, entrepreneurial motivations, and the owners' choices about the firm and their roles in it. Estimating with alternative sets of controls allows an assessment of robustness of the racial gap in financial access, taking into account possible correlates of the demand for finance.

Next, we link the ASE to universal data on U.S. employers from the Longitudinal Business Database (LBD) to measure the number of employees. We investigate how the estimated racial gap in employment for Black versus White owners changes with alternative sets of controls, including owner age, education, and motivations, and firm age and industry. Particularly relevant for this paper are specifications including controls reflecting financial access. These estimates permit a first assessment of the degree to which financial constraints affect the relative employment of firms owned by Blacks.

Yet even with the extensive sets of control variables, there remains the possibility that unobservables, including characteristics and opportunities of entrepreneurs, could bias the estimated racial gap in firm-level employment as well as the influence of financial variables. For example, unmeasured differences in demand for finance resulting from different levels of ambition or aspiration for the business might in principle account for some of the racial gap. To address this identification problem, we examine a policy experiment that shifts the supply of credit, estimating the differences by owner race in the causal effect on employment of the Community Reinvestment Act (CRA).

The CRA incentivizes banks to provide credit and other financial services in lower income neighborhoods. Although much of the motivation for the policy stemmed from the history of "redlining" neighborhoods, the policy does not explicitly target race. But our conceptual framework explains how racial differences in financial constraints may produce different impacts of a credit supply shift. Our identification strategy relies on the CRA design, which is implemented at the Census tract level based on a threshold for median family income (MFI) relative to a reference area, generally that for the Standard Metropolitan Statistical Area (MSA). The MFI calculation changed substantially in 2012, enabling us to apply methods based on regression discontinuity and difference-in-differences with firm fixed-effects. Changes in CRA treatment assignment also resulted from changes in tract boundaries, in reference area incomes, and in tract-level MFI. The last of these may reflect relative decline of the neighborhood, so that the estimated average treatment effect may be

downward-biased, providing a lower bound on the true effect. In this case, our estimates of the Black-White difference can be interpreted as a triple-difference estimator, in which White-owned businesses are controls for Black-owned firms in tracts becoming treated. For estimation, we construct a new firm-level panel database for the 2003-2015 period. In order to identify the characteristics of owners, we pool data from three Surveys of Business Owners (2002, 2007, and 2012) and two ASEs (2014 and 2015). Linking to CRA data provides a treatment indicator and distance from the threshold for each tract-year, and linking with the LBD provides 8,220,000 firm-year observations on employment in 952,000 firms.

Summarizing our findings briefly, although Black-owned businesses tend to start up with less finance, we find smaller differences from White-owned businesses once they are going concerns. But the sources are different in that Black-owned firms are less likely to receive bank loans either at start-up or later in their life cycle. Black business owners are much more likely to refrain from applying for loans because they expect to be denied and to report that lack of financial access reduces their profitability.

The financing gap is not explained by observable characteristics associated with demand. We find that Black owners are generally similar to their White counterparts and are actually somewhat more likely to report strong entrepreneurial motivations along a variety of dimensions, to aspire for their firms to grow, and to hold advanced degrees, characteristics likely to be associated with higher demand for capital.

Nevertheless, Black-owned businesses tend to have lower employment than White-owned, on average. The difference disappears once firm age is controlled for, as firms owned by Blacks tend to be younger. While the size difference remains negligible with a wealth of other controls, including other demographics, human capital, and entrepreneurial motivation, it shifts when financial variables are included: the results imply that with the same financial access Black-owned businesses would be on average about 7 percent larger than those owned by Whites. Finally, we find that Black-owned businesses in neighborhoods becoming treated by the CRA increase employment about 5-7 percentage points more than White-owned businesses in the same areas.

This research relates to several distinct bodies of research. Within the broad literature on racial inequality, earnings and income differences have received the most attention (e.g., Bayer and Charles (2018a), Chetty et al. (2020), and Derenoncourt and Montialoux (2021)). More directly relevant to our focus on business owners are studies of firm-level data that document lower levels of finance in Black-owned businesses. Bates (1997) uses the 1992 Characteristics of Business Owners (CBO) survey and reports lower capitalization and loan receipts among Black-owned relative to White-owned start-ups. Fairlie, Robb and Robinson (2020) use the Kauffman Firm Survey (KFS) to study the evolution of amounts and sources

of finance in a cohort of start-ups entering in 2007. Robb and Fairlie (2007) link a large racial wealth gap to lower start-up rates, smaller size, and higher failure probabilities among Black-owned than White-owned businesses. Fairlie and Robb (2007) examine work experience in a family business and having family members in self-employment. In a paper that overlaps with part of ours, Robb (2018) reports publicly available tabulations of responses to finance questions by race from the 2014 ASE, finding that Black-owned businesses use less start-up capital, are more likely to not apply for a loan because they don't think the lender would approve it, and more frequently report that lack of access to capital negatively affect their profitability.[3] We build on this work in several ways: using the extensive owner characteristics in the confidential ASE data to build up a detailed portrait of Black entrepreneurs and their motivations, relating firm finance and growth through regression analysis using the detailed controls, and estimating the impact of the CRA as an exogenous credit supply shift.

A closely related literature examines racial disparities in denials of loan applications. Many of these focus on personal loans (mortgages) rather than business lending.[4] Cavalluzzo and Cavalluzzo (1998), Blanchflower, Levine and Zimmerman (2003), Blanchard, Zhao and Yinger (2008), and Fairlie, Robb and Robinson (2020) study lending to small businesses. Except for Fairlie, Robb and Robinson (2020), these papers rely upon various waves of Survey of Small Business Finances (SSBF), which has detailed measures of financial characteristics of the sampled businesses. This is particularly true in the 1998 data analyzed by Blanchflower, Levine and Zimmerman (2003) and Blanchard, Zhao and Yinger (2008), containing credit scores, owner wealth, and other proxies for ability to repay and to offer collateral. The 2014 ASE, which we use in part of our analysis, is somewhat weaker in such measures, but it is relatively strong in measuring the amounts and sources of finance, both at start-up and in the year 2014. It also contains much more detail on owner characteristics, including previous business ownership, motivations for ownership, and the roles the owner plays in the firm, including hours of work. These variables reflect on the orientation and degree of ambition of the business, and thus on its demand for capital. The sample sizes in the ASE are two orders of magnitude greater than in the SSBFs and KFS, each of which have just a few thousand observations.[5] Our method in the part of the paper that examines racial gaps

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[3]These papers all use data from firm surveys. Another related set of papers uses individual data to study differences in self-employment by race, e.g., Fairlie and Meyer (1996), Fairlie (1999), Hout and Rosen (2000), and Fairlie and Meyer (2000).

[4]Munnell et al. (1996), Ladd (1998), and Casey, Glasberg and Beeman (2011) study racial discrimination in mortgage lending.

[5]The regression samples for loan denial equations using the SSBF are even smaller, containing about 2000 firms in 1993 and 1000 in 1998, as reported in Blanchflower, Levine and Zimmerman (2003, p. 935), for example.

in the measures of financial access is similar to the loan denial research and to research on racial (and gender) gaps in wages.[6]

Distinct from this research on discrimination in loan denials is our estimation of the impact of differential financial constraints on the employment of Black-owned versus White-owned businesses. Although the studies described above have documented lower average levels of finance and smaller average sizes of Black-owned firms, they do not link these two facts directly, through an explicit statistical analysis, as is our purpose in this paper.[7] Our efforts to do so are related to an extensive body of theoretical and empirical research on the relationship of finance and growth (e.g., Levine, 2005; Clementi and Hopenhayn, 2006). As emphasized in the review by Beck (2009), a standard identification problem involves the direction of causality between growth and finance. Despite a long list of empirical studies, the degree to which financial development promotes economic growth at the macro level remains controversial. Most studies use aggregate country-level data (e.g., King and Levine, 1993; Demetriades and Hussein, 1996). Jayaratne and Strahan (1996) use state-level panel data to relate per capita income growth to bank branching deregulation. Pagano and Pica (2012) use international industry-level data on financial development and employment growth. Micro-data would seem more appropriate, but even in this case financial constraints are very difficult to measure (Hubbard, 1998; Farre-Mensa and Ljungqvist, 2016).

Some recent studies have advanced this literature by employing firm-level data and studying particular programs. Banerjee and Duflo (2014) use changes in firm size eligibility for directed credit in India to identify the effects on firm growth. Two papers, Lelarge, Sraer and Thesmar (2010) and Bach (2014), study a French loan guarantee program. Brown and Earle (2017) also study financial access through a government program, SBA loans, using an identification strategy based on geographic variation in the branches of banks supplying most SBA loans. Krishnan, Nandy and Puri (2015) and Bai, Carvalho and Phillips (2018) both exploit state-level banking deregulation in combination with manufacturing firm data to estimate, respectively, effects on productivity and effects on employment growth and reallocation, with consequences for aggregate productivity. None of this recent work on finance-labor links considers differential effects by race or how policies to expand financial access in low-income areas may reduce inequality.

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[6]See, for instance, Card and Lemieux (1994), Neal and Johnson (1996), Heckman, Lyons and Todd (2000), Western and Pettit (2005), and Bayer and Charles (2018b).

[7]The closest is an analysis by Fairlie and Robb (2007) of the log of sales using 1992 CBO data, finding that the coefficient on Black owner changes from -0.4636 to -0.3215 when dummies for the amount of start-up capital are added to the equation. Using a start-up cohort from the 2007 SBO, Brown et al. (2019) report that the probability of a Black-owned firm being in the top 5 percent of the employment size distribution is about 50 percent less than the cohort average, but this declines to about 20 percent after 7 years, and it becomes positive when demographic and finance controls are added.

Finally, this paper relates to previous research on the CRA. Most research on the CRA has focused on mortgage loans (Bhutta, 2011; Lee and Bostic, 2020). A few studies also estimate the CRA impact on the amount of small business lending (Ding, Lee and Bostic, 2020; Bostic and Lee, 2017; Chakraborty et al., 2020). Bates and Robb (2015) aim to examine racial differences in the CRA lending effect using the the rich information but small sample in the Kauffman Firm Survey, although they do not measure CRA treatment and instead focus on minority zip codes. Immergluck (2002) examines rates of loan receipt for firms in predominantly Black areas, again with controls for firm size, credit scores, and other factors. But these studies do not measure CRA treatment at the tract level, and they do not examine firm-level employment outcomes. No previous study estimates the impact of tract-level CRA treatment on firm-level differences in employment by race of the owner.[8]

The paper is organized as follows. We first present a conceptual framework that motivates our estimation of financial constraints, firm employment size, and the effects of the CRA for Black-owned relative to White-owned firms. The next section then describes our data sources and construction, and the one following explains our econometric methods, including the identification strategy for estimating the causal effects of financial access through the CRA. Results are provided in several subsections. The first provides descriptive statistics on racial differences in owner and business characteristics, while the second describes the amounts and sources of finance at start-up and in 2014, as well as some subjective measures of financial constraints. The next subsection concerns firm employment differences by race of the owner and the role of finance and other variables in accounting for the racial gaps. The last subsection contains our estimates of the CRA effect on firm-level employment by owner race. The final section of the paper provides a brief conclusion.

## 2    Conceptual Framework

Our approach to estimating financial constraints relies on standard theories of financial market imperfections augmented by considerations of racial differences and discrimination. The key racial differences lie in the assets an entrepreneur can bring into a business as internal capital, the "wedge" in raising external capital given informational problems that may lead to moral hazard and/or adverse selection, and discrimination by external suppliers

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[8]Ours is not the first study of the CRA to exploit the income threshold, using RD to estimate the impact across tracts (Avery, Calem and Canner, 2003; Bhutta, 2011; Avery and Brevoort, 2015; Bostic and Lee, 2017; Lee and Bostic, 2020), and some have used difference-in-differences based on changes in CRA eligibility resulting from MSA boundary changes (Ding and Nakamura, 2021; Ringo, 2017; Ding, Lee and Bostic, 2020), although none of these use firm-level data or examine racial inequality. Our identification of the CRA effect exploits a much large number of changes associated with the redefinition of CRA eligibility nationwide, as described further below.

of finance, whether based on personal prejudice or statistical discrimination.

Building on Hubbard (1998) and the broader literature on financial factors in investment, we consider a simple model of the demand for and supply of capital, $K$, in terms of costs and returns, $r$. Demand, $D = D(r)$, reflects the return on investment, and we assume for the purposes of exposition that the demand function does not vary by race. In practice, demand for capital may vary with the entrepreneur's human capital, motivations, and choices about the business. As we will show, the racial differences in these factors tend to favor Black over White entrepreneurs, as the former are more likely to have graduate education, to express strong motivations for entrepreneurship and aspirations for their firm to grow, and to choose active roles and long work hours in the business. We will control for these factors and others in some empirical specifications. But of course we cannot control for unobservable factors that may underlie demand, which is the essence of the identification problem, as we discuss further below.

The key differences by race instead appear in the capital supply function. Following Hubbard (1998), we distinguish internal and external sources of finance. As shown in Figure 1, the supply functions for both Blacks, $S_b$, and Whites, $S_w$, are initially horizontal, up to the amount of the entrepreneurs' personal assets, $A_b$ and $A_w$, respectively, at a level equal to the opportunity cost to an entrepreneur of investing in the business, $r_0$. If desired $K > A$, then the business owner must seek external finance, $X = K - A$, which is more expensive than $r_0$ because of agency costs arising from imperfect information. The result is a "wedge" between the costs of internal and external finance. The supply curve after A is upward sloping because of increasing costs associated with higher levels of finance, and increasing information asymmetries between a business and ever more informationally distant financial sources. The wedge in general leads to sub-optimal levels of investment and capital stock relative to the first best $K^*$.

Racial differences exist, first, because of differences in assets. On average, $A_w \gg A_b$ ($A_w/A_b \simeq 7$, according to Bhutta et al. (2020), as noted above). This by itself implies that Black entrepreneurs face worse financial terms as they are more likely to need external finance, and they are likely to be higher on the rising $X$ part of the $K$ supply function, for a given total $K$. In addition, information asymmetries, and therefore agency costs, may be higher for Black than White entrepreneurs, for instance if lenders tend to be White and there is some degree of residential segregation by race.[9] In this case, the slope of the $K$ supply function is steeper for Blacks than Whites. Finally, if Blacks face discrimination from lenders, the $K$ supply function slope becomes still greater for Blacks, compared to

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[9]Bates (1973) finds that the discriminant analysis used by banks to evaluate credit-worthiness does not effectively predict default for Black business borrowers.
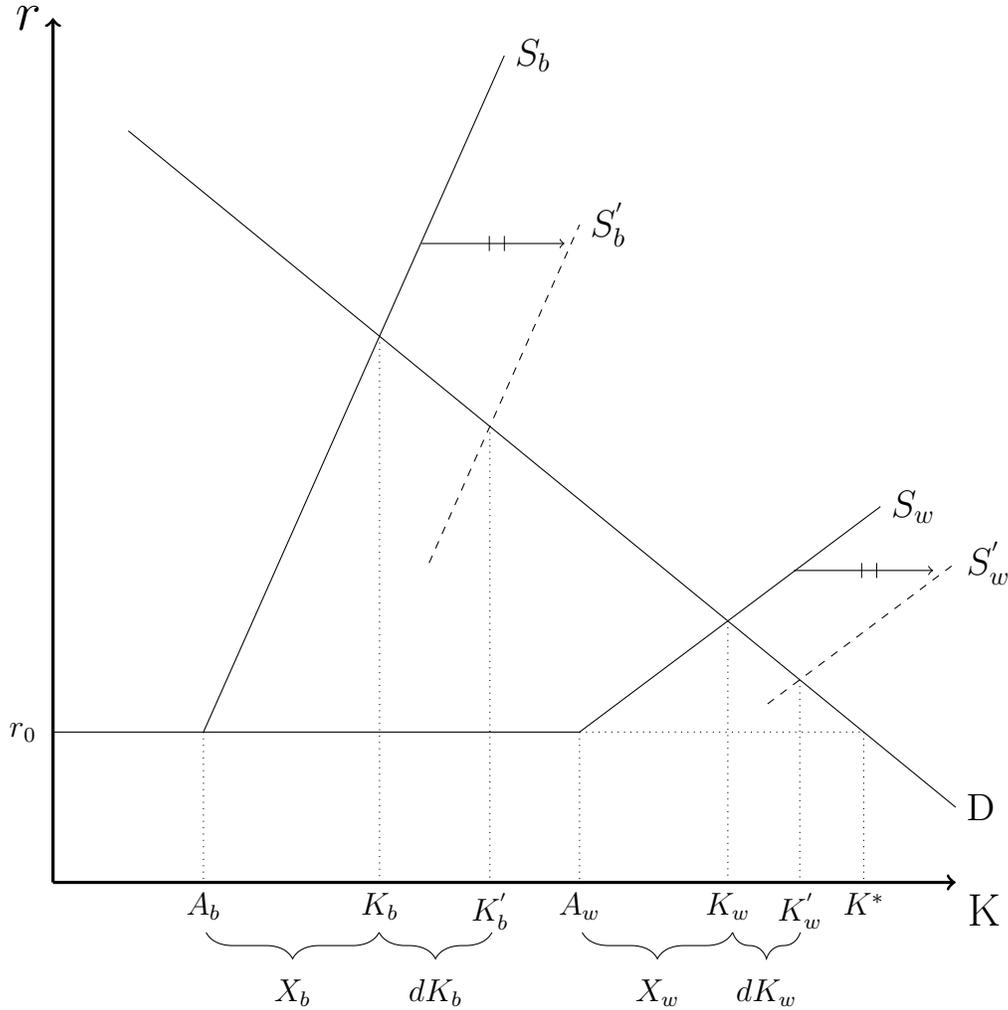
Figure 1: Financial Constraints of Black- and White-Owned Businesses

Whites.

Each of these factors implies that Black entrepreneurs will operate farther up on the upward-sloping portion of the $K$ supply curve than do Whites. Blacks will use less $K$, so that $K_b < K_w$. Holding everything else equal, Blacks will operate with a smaller firm size, even with the same K demand. However, because their personal assets are lower, they may actually use more external finance than Whites, $X_b > X_w$, even though external finance is more expensive for them, $r_b > r_w$, in equilibrium. Thus, observed differences in access to outside funding, for instance through bank loans, may not capture the differences in financial constraints.

This framework is therefore useful in conceptualizing the difference in the toughness of financial constraints faced by Black relative to White entrepreneurs. Testing the model is difficult because of possible unobservables in capital demand. If we could pin down the

capital demand function, then any differences in total capital usage could be attributed to differences in supply, but we otherwise face a fundamental identification problem. Our approach to this problem, besides controlling for a rich set of owner and firm characteristics, is to exploit the shift in capital supply resulting from the CRA. The CRA incentivizes banks to lend in particular "eligible" neighborhoods (census tracts) through regular reporting and periodic examination by the banking supervisory agencies. Banks are evaluated based on the number and volume of their small loans and small business loans, as well as their provision of other kinds of financial services, in these neighborhoods.

In terms of our model, the CRA shifts the supply curves out, as shown in Figure 1 for $S_b$ shifting to $S_b'$ and $S_w$ shifting the same amount to $S_w'$. We assume the shift is equal for Blacks and Whites, because the CRA gives credit for lending in the eligible tracts regardless of the race of the borrower.[10] For a given outward shift, the increase in $K$ is greater, the higher the slope of the $S$ curve. Since Blacks in this analysis are located on the steeper portion of the $S$ curve, the expansion of $S$ will raise their $K$ and firm size more.

Demonstrating this intuition more formally, suppose that capital demand is linear in $r$ and common across races, given by

$$D = D(r) \tag{1}$$

and suppose that capital supply by race is given by

$$S_i = S_i(r, C) \tag{2}$$

where $r$ is the rate of return on $K$ and $C$ is an indicator for CRA treatment for a race $i$, which is either White ($w$) or Black ($b$). As shown in Figure 1, supply curves differ by position and slope such that not only is $r_b > r_w$ (so that $K_b < K_w$) but also the $S_b$ curve is steeper. This implies that $\partial S_b/\partial r < \partial S_w/\partial r$. In equilibrium, $D = S_i$ for both Whites and Blacks. Total differentiation of the equilibrium condition yields

$$(\partial D/\partial r)dr = (\partial S_i/\partial r)dr + (\partial S_i/\partial C)dC \tag{3}$$

which can be rearranged as follows:

$$dr/dC = (\partial S_i/\partial C)/(\partial D/\partial r - \partial S_i/\partial r). \tag{4}$$

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[10]Although the CRA was motivated by racial discrimination, the policy gives equal incentives for loans across races. According to Baradaran (2017), "the CRA's justification was to remedy a history of discriminatory redlining, and its mission was to require mainstream banks to lend a fair proportion of their loans to the ghetto. Although redlining had been based on explicit racial discrimination, the CRA had to be designed to be color-blind" (p. 232).

In Equation 4, $(\partial S_i/\partial C) > 0$, $(\partial D/\partial r) < 0$, and $(\partial S_i/\partial r) > 0$. Therefore, $dr/dC < 0$. Note this implies $dK/dC = (\partial D/\partial r)(dr/dC) > 0$, as the equilibrium moves along the demand curve ($D$). As $\partial S_i/\partial r$ decreases, $|dr/dC|$ increases, implying greater responsiveness of $r$ to $C$.

We have argued that lower wealth, higher information costs, and discrimination lead to racial differences in supply such that the rising portion of $S_b$ is at a lower $K$ than $S_w$ and $\partial S_b/\partial r < \partial S_w/\partial r$. This latter relationship implies that $dr_b/dC < dr_w/dC$, so that $r$ falls more for Blacks than Whites. It follows that $dK_b/dC > dK_w/dC$: CRA treatment increases capital and firm size for Black entrepreneurs more than for Whites.

Our estimates of racial differences in firm size and in the CRA effect use the number of employees both because it is the best available proxy for firm size, as discussed in the next section, and because it reflects job creation for Black workers, given racial segregation in hiring (Bates, 1988; Carrington and Troske, 1998). To the extent that labor is an (imperfect) substitute for capital, the estimated impact of the CRA will reflect factor substitution, as well as a scale effect. If, however, Black- and White-owned firms operate with the same production functions or at least similar elasticities of substitution between capital and labor, then the relationship will be the same for both, and differenced away in our empirical specification. In estimating the CRA effect, the assumption is still weaker: by constraining the sample to firms with unchanging ownership and controlling for firm fixed effects, the assumption is that CRA treatment does not change the elasticity of capital-labor substitution in Black-owned firms in a way which is systematically different compared to any change which might occur in White-owned firms.

Final points relevant to the simple model relate to demand. First, we assume that investment opportunities are unaffected by the CRA, because census tracts are very small, likely much smaller than the product markets of most firms. Moreover, CRA eligibility is a patchwork, and the roughly 30 percent of tracts that are eligible have ineligible neighbors adjacent and nearby. Finally, if there is a demand shift, then our estimation with triple differences still identifies the differential effect of the supply shift on Blacks if the demand shift is similar for the two races.

A second aspect of capital demand is the assumption that the demand curve is the same across racial groups. The assumption of a common linear demand curve is sufficient (together with the assumption of steeper supply of external finance for Black compared to White-owned firms) to generate a larger CRA effect for Black entrepreneurs, but it is not necessary. In the nonlinear case, such that $\partial D_i/\partial r$ differs for Black and White-owned firms, a sufficient condition for Black-owned firms to grow more with CRA treatment is $(\partial D_b/\partial r)/(\partial S_b/\partial r) < (\partial D_w/\partial r)/(\partial S_w/\partial r)$, implying that the relative steepness of the Black

supply curve is greater than the relative steepness of the Black demand curve. We have argued for a relatively steep Black supply function on the basis of informational asymmetries and discrimination, but we have no a priori reason to believe that the slope of the capital demand function would differ by race.

Of course, entrepreneurs may vary in their desired investment depending on such characteristics as their human capital and motivations for business ownership. We show empirically that the observable patterns are similar for Black and White entrepreneurs and if anything consistent with a higher, not lower, level of demand for capital by Blacks. In examining the relationship between reported use of finance and firm employment, we control for such variables.[11] When we estimate the CRA effect, we control for demand differences across firms with unchanging owners using firm fixed effects. Assuming any racial differences in demand do not change coincidentally with the CRA change, the fixed effects control for them, and we are able to identify the impact of the shift in supply.

# 3 Data

We link multiple large firm-level databases to assess whether financial constraints vary by race and whether they account for differences in firm employment. First, we study the 2014 ASE from the U.S. Census Bureau. The ASE contains rich information on characteristics of business and their owners, and it provides unusually detailed finance variables. We link the ASE to the LBD, an annual, longitudinally linked database covering all U.S. firms and establishments with payroll employment in the non-farm sector. This linkage allows us to follow firms over time and study employment differences between Black- and White-owned firms. In order to examine the impact of the CRA on firms by owner race, we further link these data to the Survey of Business Owners (SBO), the antecedent of the ASE, in 2002, 2007, and 2012, and to the 2015 ASE. Lastly, we link to Federal Financial Institutions Examination Council (FFIEC) CRA compliance data, which provide information on median family income (MFI) and CRA tract eligibility. The following section describes each of these sources in turn.

The ASE surveys non-farm businesses with at least one paid employee and receipts of $1,000 or more. Using the Census Bureau Business Register (BR) as the sampling frame, the ASE sample is stratified by the 50 most populous Metropolitan Statistical Areas (MSAs), state, the firm's number of years in business, and the sampling frame based on the probability

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[11]There may be unobservables as well. One could be consumer discrimination as in Borjas and Bronars (1989). Also, Bone, Christensen and Williams (2014) argue that "systemic restricted choice" affects decision-making of Blacks in seeking outside finance.

of ownership by minorities or women. The sample is randomly selected within strata, except for large companies that are selected with certainty. The initial 2014 ASE sample included about 290,000 employer firms, and the response rate was 74 percent. We restrict the sample to firms with an individual owner having at least 10 percent of the business. The sample is also slightly reduced by missing values. Our final sample for analysis contains 288,000 owners of 184,000 firms.

The ASE provides detailed characteristics of up to four owners with the largest shares in the firm, from which we build owner-level ASE data. Much of our analysis uses the firm-owner as the observational unit, to facilitate controlling for a long list of owner characteristics. However, so that the data are representative of all employer-firms, we construct a composite weight for each owner by multiplying the firm-level sampling weight by the owner's share. Therefore, each owner is represented in proportion to their ownership share in the firm. This procedure clearly makes no difference for single-owner firms, but it takes into account firms with multiple owners and varying characteristics.[12]

We use the detailed information in the ASE to compare finance in Black- and White-owned firms while controlling for a large set of possibly confounding factors that may affect the gaps: human capital, other demographic characteristics, motivations for ownership, choice of industry, and other owner choices about the firm. We define Blacks as non-Hispanic individuals who select a race of Black/African American, including those who select multiple races (i.e., including Black and other races), irrespective of their birthplace. We focus on comparisons of Blacks with non-Hispanic Whites as the reference group. Other race and ethnicity categories include Hispanic, Asian, and other race. Demographic characteristics include gender, age, and immigrant (defined as not born a U.S. citizen). Age is expressed as six categorical variables for less than 25, 25-34, 35-44, 45-54, 55-64, and 65 or over. In cases of multiple owners, the data also include the relationships among business owners, including whether ownership is by a married couple, non-couple family, or multi-generational. We construct dummy variables for diversity in terms of gender (distinguishing within-family from unrelated gender diversity), race and ethnicity, and immigrant status within the owner team. Human capital variables include educational attainment, prior business ownership, and veteran status. Educational attainment is defined as the highest degree prior to owning the business (less than high school graduate, high school graduate, vocational/some college/associate degree, Bachelor's degree, and graduate degree). Prior business experience and veteran status are dummy variables.

Especially useful for this study, the ASE contains unusually rich measures of finance,

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[12]The owner-level ASE has been used in previous research. See Brown et al. (2019) and Brown et al. (2020) for the details of the owner-level data and weight construction.

both at startup and for the year 2014. The amount of startup capital is a variable with ten categories ranging from less than $5,000 to $3 million or more, as well as "none needed" and "don't know." We include all of these variables as controls (in specifications including "finance controls"), but to simplify when we use the startup capital amount as a dependent variable, we construct a dummy variable for greater than $100,000. Sources of startup capital are provided as indicators for each of the following: personal savings, home equity loan, credit cards, bank loan, government loan, family loan, venture capital (VC), and grants.

Pertaining to 2014 (the survey reference year), we create two dummy variables for outside funding: a positive amount up to $100,000 and an amount exceeding $100,000 that year. The ASE also has detailed questions related to new funding relationships with banks, credit unions, other financial institutions, angel investors, VC, other investor businesses, and grants. Along with these, the ASE indicates whether they received the total amount of the requested funding or not from each of those sources. We use this information to create indicators for whether they received the total amount requested for each type of new relationship. The final two finance variables are more subjective. The ASE allows us to identify "discouraged borrowers," an indicator for owners who chose not to apply for a loan in 2014 despite needing additional funding, because they expected not to be approved by a lender. Lastly, we create a dummy variable which indicates whether access to financial capital is reported to negatively affect the profitability of the business.

In order to describe the racial differences in funding patterns, we provide summary statistics for all these variables for Black and White owners separately. Robb (2018) presents similar means by race based on publicly available tabulations of the 2014 ASE, but we go further, using the confidential firm-level data to examine the racial difference controlling for other owner and firm characteristics. However, when we examine the degree to which financial access may affect the racial difference in firm employment size, we restrict the set of finance-related variables included as covariates to those that seem most likely to reflect constraints: dummy variables for bank and VC startup capital sources, a new funding relationship with banks, angel investors, VC, and other investor businesses in addition to ten categories on the startup capital amount and 2014 funding amount.

Differences in the amount, sources, and attempts to obtain finance may result from differences in demand for capital, as discussed in the Conceptual Framework section above. While demand is not directly observable, it may be related to a number of owner characteristics, including demographics, and it may also be related to motivations for owning the business. In general, nonpecuniary motivations for lifestyle reasons, such as work/family balance, would seem to imply less ambition to grow the business, and thus lower demand for capital. On motivations, the ASE asks the importance for owning the business of nine different motivations,

with the options of "very important," "somewhat important," or "not important." For each motivation, we construct two dummy variables representing very important and somewhat important. The motivations are as follows: 1) "Best avenue for my ideas/goods/services" (Ideas); 2) "Opportunity for greater income/wanted to build wealth" (Income); 3) "Couldn't find a job/unable to find employment" (No Job); 4) "Wanted to be my own boss" (Own Boss); 5) "Working for someone else didn't appeal to me" (Work for Self); 6) "Always wanted to start my own business" (Always Wanted); 7) "An entrepreneurial friend or family member was a role model" (Role Model); 8) "Flexible hours" (Flexible Hours); 9) "Balance work and family" (Balance Family). These questions allow us to address the possibility that Blacks and Whites may differ on average in their motivations for business ownership, which could affect both the demand for finance and firm employment size.

The ASE also includes variables representing owner choices about the business. Like motivations, we include these in some specifications because they could reflect owner preferences about the business that might matter for finance and employment. Job function is a set of dummy variables for the owner's role(s) in the business including manager, good/service provider, financial controller, and none of these roles. Primary income is a dummy variable indicating whether this business is the owner's primary income source. Hours worked is a categorical variable for ranges of average weekly hours the owner spends managing or working in the business. Home-based is a dummy variable indicating whether the business operates primarily from home.

We link the ASE to the LBD, which consists of all firms and establishments with payroll employment in the U.S. non-farm business sector. The main LBD variables used in the 2014 ASE analysis are number of employees and firm age, as of 2014. The number of employees is a common measure of firm size, primarily for reasons of availability and reliability, in research on finance and growth. But we are especially interested in employment because it reflects opportunities for workers and thus wider potential impacts of capital constraints than those affecting only business owners. In order to estimate the impact of the CRA, we use the panel LBD from 2003 to 2015, because our identification strategy in this part of the paper relies on changes over time; other firm characteristics (including age) are absorbed by firm fixed effects in this longitudinal analysis.

To measure owner race over this longer period for a large sample, we use not only the 2014 ASE but also the Survey of Business Owners (SBO) for 2002, 2007, and 2012, and the 2015 ASE. The SBO is similar to the ASE in providing detailed owner characteristics, of which race is most important for present purposes. Each of these sources is a sample survey, so the data are not complete or sufficiently well-developed to examine changing characteristics over time. We assume that the characteristics are fixed, and, except for the

14

race interaction with CRA treatment, they drop out of the estimating equation with firm fixed effects, as we explain below. We exclude firms appearing in more than one of these surveys that report inconsistent characteristics, because we cannot distinguish ownership change from measurement error.

Because the characteristics are thus excluded in the CRA analysis (again, except for the race-CRA interaction), we use a firm-level race variable in this part of the paper. We define a firm as Black-owned if any of its owners are non-Hispanic and report Black race. To estimate the CRA impact, we link the LBD, SBOs, and ASEs to annual tract-level information from the Federal Financial Institutions Examination Council (FFIEC) for 2003-2015. The important variable in these data is the tract's median family income (MFI) ratio, its MFI relative to the reference area (the MSA or Metropolitan Division of the tract, or the state for non-MSA tracts). If a tract's MFI ratio is less than 80 percent, the tract is designated as Low-Moderate Income (LMI). LMI tracts are "eligible" for the CRA, which means that loans to individuals and small businesses in the tract count towards a positive CRA rating in the bank examination periodically carried out by regulators.[13] We use the distance of the MFI ratio to the 80 percent threshold in the Regression Discontinuity Design (RDD), explained below.

CRA eligibility is time-varying at the tract level because of the periodic recomputation of the MFI ratio, which may change either because the tract MFI or reference area MFI changes. During the 2003-2015 period, the major recomputation of MFI was based on the 2006-2010 American Community Survey and applied beginning in 2012. CRA eligibility is time-varying at the firm-level not only because of MFI changes, but also because of changes in tract boundaries, which makes it possible that a firm in a fixed location may move from CRA ineligibility to eligibility. The major change in tract boundaries during the 2003-2015 period also took place in 2012, based on the 2010 Census. A second change came from redrawing some MSA boundaries in 2014. Our methods, described in the next section, exploit these sources of variation as well as the eligibility threshold in a panel framework with firm fixed-effects and RDD combined.[14]

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[13]Because of some ambiguity as to which establishment of a multi-unit firm benefits from the loan, we exclude multi-units from the CRA analysis. And because only loans to small businesses are eligible, we exclude firms that always have revenue over $500,000 throughout 2003-15.

[14]The tract code for each establishment comes from the Business Register. It varies over time as tract boundaries are redefined. Studies of CRA effects at the tract level face the problem that these changes make it difficult to follow tracts over time. Our use of firm-level data solves this problem as we follow firms even when tract boundaries change.

# 4 Methods

We start by describing the differences in firm financing and owner characteristics by race. Of course, both the levels and sources of finance are jointly determined by the supply and demand for finance. Without more data it is impossible to distinguish a situation in which, for example, Black owners face worse credit supply conditions from one where Blacks prefer to operate with less outside finance than do Whites. Put differently, it is possible that unmeasured factors correlated with race are driving the observed differences in levels and sources of finance.

In other words, we address this identification problem in several ways. First, we estimate the racial gaps in financial measures controlling for firm and owner characteristics. To take one example, firm age is generally positively correlated with financial access. If Blacks tend to own younger firms, then this factor alone might account for a gap in finance. Additional factors that are potentially relevant include other owner demographic characteristics (age and gender), human capital (education, veteran experience, previous business ownership), motivations for ownership, and owner choices about running the business, including the industry in which to operate.

In an approach similar to that in research on wage gaps, we first estimate the raw gap in measured access and then examine how the gap changes when we include alternative sets of covariates. The most general specification of the regression for racial gaps in access to finance is the following:

$$F_{ij} = \alpha + \beta B_{ij} + \sum_k \delta^k G_{ij}^k + \boldsymbol{Z_j}\boldsymbol{\theta} + \boldsymbol{X_{ij}}\boldsymbol{\gamma} + M_{ij} + S_j + O_{ij} + \epsilon_{ij} \qquad (5)$$

where $F_{ij}$ represents the various financial measures for owner $i$ at firm $j$, $B_{ij}$ is an indicator for a Black owner, and $G_{ij}^k$ is a dummy variable for a race/ethnicity group k (i.e., Hispanic, non-Hispanic Asian, and other minorities, so that non-Hispanic White is the reference group). Because businesses in our sample are at different stages of the life cycle and their ownership teams vary in size, we control for a set of categories of firm age (0-2, 3-5, 6-10, 11-15, and more than 15 years since entry, defined in the LBD as the first year in which employees are hired by any of the firm's current establishments) and the number of owners (1, 2-4, 5 or more, and "don't know"), represented by $Z_j$. Other controls for a vector of owner characteristics, $X_{ij}$, include demographic variables (owner age, gender, immigrant, and ownership team diversity) and proxies for human capital (educational attainment categories, prior business experience, and veteran status). $M_{ij}$ is a set of motivation variables about the reasons for owning a businesses, as described in the data section. $S_j$ is the set of 4-digit NAICS industry dummies.

Finally, $O_{ij}$ is the set of choice variables (owner's role in business, average hours per week worked in business, primary source of income from business, and home-based business).

The dependent variables are financial measures available from the 2014 ASE: an indicator for start-up capital amount greater than $100,000, start-up capital sources (e.g., personal savings and other assets, home equity loans, personal or business credit cards, bank loan, government loan, family loan, VC, and grants), any outside and investor funding in 2014, outside and investor funding in 2014 greater than $100,000, and source of funding received in 2014 (bank, angel investor or VC, other investor businesses, and grants). Two other dependent variables are relevant for difficulty in obtaining additional finance in 2014: not applying because they expected to be turned down, and profitability negatively affected by lack of finance. These questions are necessarily subjective and qualitative, but they may provide evidence on different supply conditions faced by Blacks compared to Whites.

The coefficient on the Black owner indicator ($\beta$) captures the gap between Black and White owners. To understand how much of the Black-White gap in access to finance is explained by owner- and firm-level characteristics, we start with simple regressions of the finance measures on only race/ethnicity. We successively add sets of control variables, including firm age and number of owners, demographic characteristics, and human capital variables. Arguably, such characteristics are pre-determined with respect to access to finance. In other specifications, we also add controls for motivations, choice of industry, and other choices (owner roles, hours worked, primary source of income, and home-based). While some of these variables may be jointly determined with use of capital, examining alternative specifications including them sheds light on the degree to which racial gaps in financial access remain even after such variables are controlled. Any remaining racial gaps may be interpreted as tougher financial constraints faced by Black entrepreneurs. But they could also reflect some other type of unobserved heterogeneity, for instance some common factor affecting the financial measures.

Next, we study gaps by owner race in the number of employees at the firm level. Again, we consider alternative specifications of a regression with different control variables. The important difference here is that we add a set of financial variables, as our main purpose is to assess the extent to which firm employment differences may be explained by differences in finance. The most general specification is the following equation:

$$E_{ij} = \alpha + \beta B_{ij} + \sum_k \delta^k G_{ij}^k + \boldsymbol{Z_j}\boldsymbol{\theta} + \boldsymbol{X_{ij}}\boldsymbol{\gamma} + M_{ij} + K_j + S_j + O_{ij} + \epsilon_{ij} \qquad (6)$$

where $E_{ij}$ is the log of the number of paid employees. $K_j$ is the set of detailed categories of finance variables as described in the data section (amounts of start-up finance, amount of

outside finance received in 2014, indicators for sources of startup capital, and indicators for new funding relationship sources). The rest of the terms in the equation, $M_{ij}$, $S_j$, and $O_{ij}$, are the same as in Equation 5.

The final way in which we address the identification problem in estimating racial differences in firm employment and finance uses the CRA as a policy experiment affecting credit supply. We estimate the causal effect of the CRA on Black-owned businesses using the geographic and time variation in the CRA tract-level treatment. We exploit the regulatory discontinuity created by the tract-level MFI threshold, which provides treatment and control groups that are very similar, except for CRA eligibility, among those close to the threshold, in an RDD. We further exploit changes over time in the CRA treatment, resulting from changes in the recomputation of the MFI ratio or by changing tract boundaries.

For simplicity, we focus here on tracts that were ineligible before 2012 (going back to 2003), and examine the impact of becoming eligible from 2012-2015. Because firm-level fixed effects address time-invariant owner characteristics, we also focus on firm-level variation. Firms are linked longitudinally, permitting us to estimate the following equation with firm-level fixed effects:

$$E_{jct} = \alpha + \beta_0 D_{ct} + \beta_1 D_{ct} * B_{jct} + f(MFI_{ct}, D_{ct}) + \rho_j + T_t + \epsilon_{jct} \tag{7}$$

where $E_{jct}$ is employment for firm $j$ in census tract $c$ at time $t$, and $D_{ct}$ is an indicator for whether the designated tract is CRA-eligible or not in time $t$. $B_{jct}$ indicates whether the firm has a Black owner or not. The Black owner dummy is not included separately in the regression, because it is collinear with the firm fixed effects. $D_{ct} * B_{jct}$, our main variable of interest, is an interaction between CRA treatment and Black ownership, and $\beta_1$ is the associated coefficient representing the difference in the CRA effect relative to firms with White ownership. $MFI_c$ is the relative MFI ratio, the running variable in the RDD set-up, and $f(MFI_{ct}, D_{ct})$ is a polynomial function of the running variable allowed to vary with treatment; we consider linear and quadratic forms with different bandwidths. $\rho_j$ are firm fixed effects, and $T_t$ are year fixed effects. This equation provides a credible estimate of the causal effect of improved access to finance under the CRA for Black-owned relative to White-owned firms ($\beta_1$). As discussed in the Conceptual Framework section, the coefficient on the CRA main effect, $\beta_0$, may be downward biased to the extent that CRA treatment is associated with a declining tract economy. In this case, $\beta_1$ can be interpreted as a triple-difference estimator. But CRA treatment may also result from changes in other parts of the tract's reference area for the relative MFI calculation or from changes in tract boundaries that move firms between tracts with no changes in MFI. To the extent that these latter

sources of variation dominate, the sum of $\beta_0$ and $\beta_1$ can be interpreted as the total effect of increased financial access for Black entrepreneurs under the CRA.

To assess robustness and following conventional RDD methods, we not only examine the full sample of firms in tracts that were ineligible prior to 2012, but we also estimate on two constrained bandwidths: firms in tracts with an MFI ratio up to 20 percentage points above the threshold (i.e, MFI ratio from 80 to 100), and firms in tracts with an MFI ratio up to 5 percentage points above the threshold (i.e., MFI ratio from 80 to 85), in both cases measured prior to the change in 2012.

# 5  Results

## 5.1  Characteristics of Black-Owned Businesses

Tabulations of the characteristics of Black owners of employer-businesses in the 2014 ASE provide a detailed portrait of these entrepreneurs and their businesses. Table 1 contains basic statistics on demographic variables. Starting with race/ethnicity, the data indicate that non-Hispanic Blacks own only 1.72 percent of employer firms in the U.S., while non-Hispanic Whites own 84 percent, non-Hispanic Asians 9 percent, and Hispanics 5 percent. The share of women among Black owners is much higher than for Whites (38 versus 27 percent). Black owners tend to be younger than Whites: 26 percent of Blacks are less than 45, compared with 20 percent for Whites, while 32 percent of Blacks and 52 percent of Whites are aged 55 or older. Black owners are more likely to be immigrants: 20 percent versus 7 for Whites.[15].

Turning to ownership structure, Table 2 provides information on the size and composition of ownership teams. The data contain two ways of measuring the number of owners: a direct question on the total number of owners, and the number of owners for whom detailed information is provided. The two variables yield consistent, but not identical results, both showing that Black owners are more likely to be the sole owner than Whites: for each variable, the difference in sole ownership is more than 10 percentage points. Conversely, Blacks are much less likely to be members of multi-owner teams: for teams of 2-4 owners, the percentage for Blacks is 29 percent, versus 38 percent for Whites, and Whites are nearly twice as likely to own firms with more than 4 owners. Among the sole owners, Blacks are much more likely to be female (27 percent of Blacks, compared with 14 percent of Whites). The table also shows four different types of diversity, the most common being within-family

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[15]These characteristics are similar to those of self-employed Blacks and Whites in household surveys, as shown in Lee et al. (Forthcoming)

Table 1: Summary Statistics: Owner Race/Ethnicity, Gender, Owner Age, Immigrant

|  | (1) All | (2) Black | (3) White |
|---|---|---|---|
| **Owner Race/Ethnicity** | | | |
| Non-Hispanic Black | 0.017 | 1.000 | 0.000 |
| Non-Hispanic White | 0.835 | 0.000 | 1.000 |
| Non-Hispanic Asian | 0.088 | 0.000 | 0.000 |
| Non-Hispanic other race | 0.008 | 0.000 | 0.000 |
| Hispanic | 0.052 | 0.000 | 0.000 |
| | | | |
| **Gender** | | | |
| Female | 0.280 | 0.379 | 0.269 |
| Male | 0.720 | 0.621 | 0.731 |
| | | | |
| **Owner Age (years)** | | | |
| 35 | 0.053 | 0.053 | 0.049 |
| 35 - 44 | 0.166 | 0.209 | 0.150 |
| 45 - 54 | 0.290 | 0.319 | 0.282 |
| 55 - 64 | 0.310 | 0.271 | 0.323 |
| 64 | 0.181 | 0.149 | 0.196 |
| | | | |
| **Immigrant** | | | |
| Immigrant | 0.155 | 0.201 | 0.066 |
| Non-immigrant | 0.845 | 0.799 | 0.934 |

Note: Data are from the 2014 Annual Survey of Entrepreneurs (ASE). N = 288,000 individual owners of 184,000 employer-firms. All variables are dummy variables for the particular category; therefore, the numbers represent the proportion of the sample in the category. Owners are weighted by their ownership share in the firm and by the ASE weights, so the sample is representative of all employer-firms in the U.S. non-farm private sector. The results presented in this table are approved for dissemination by the DRB (CBDRB-FY20-CES009-001).

gender diversity (15 percent of Black owners and 22 percent of Whites). Blacks are much more likely to participate on teams that are racially or ethnically diverse, which to some extent follows mechanically for minority groups, and they are slightly more likely to be on a multi-owner team with unrelated members of the opposite sex or with both immigrant and non-immigrant owners. Table 2 also shows differences in firm age: Black-owned businesses tend to be much younger than White-owned: 22 percent for Blacks versus 13 percent for Whites are recent start-ups less than three years old, and 42 versus 26 percent are less than six years old, while only 34 percent versus 53 percent are more than 10 years old. Firm age is highly correlated with firm growth and behavior, so it should be taken into account when making comparisons across businesses.

Table 2:  Summary Statistics: Ownership Structure and Firm Age

|  | (1) All | (2) Black | (3) White |
|---|---|---|---|
| **Number of Owners Per Firm** | | | |
| Single owner | 0.585 | 0.685 | 0.581 |
| 2 - 4 owners | 0.378 | 0.292 | 0.381 |
| >4 owners | 0.033 | 0.019 | 0.034 |
| Don't know | 0.005 | 0.005 | 0.004 |
| | | | |
| **Sole Owner** | | | |
| Female | 0.148 | 0.269 | 0.138 |
| Male | 0.458 | 0.445 | 0.463 |
| | | | |
| **Diversity** | | | |
| Race/ethnicity | 0.031 | 0.086 | 0.018 |
| Family gender | 0.213 | 0.154 | 0.215 |
| Unrelated gender | 0.039 | 0.043 | 0.037 |
| Immigrant | 0.034 | 0.039 | 0.026 |
| | | | |
| **Firm Age (years)** | | | |
| 0 - 2 | 0.142 | 0.224 | 0.129 |
| 3 - 5 | 0.146 | 0.199 | 0.134 |
| 6 - 10 | 0.214 | 0.240 | 0.207 |
| 11 - 15 | 0.471 | 0.318 | 0.500 |
| >15 | 0.027 | 0.019 | 0.030 |

Note: Data are from the 2014 Annual Survey of Entrepreneurs (ASE). N = 288,000 individual owners of 184,000 employer-firms. All variables are dummy variables for the particular category; therefore, the numbers represent the proportion of the sample in the category. Number of Owners is measured from an explicit question ("In 2014, how many people owned this business?"), while owner characteristics are measured for each of the largest owners separately; thus, their totals differ slightly. Owners are weighted by their ownership share in the firm and by the ASE weights, so the sample is representative of all employer-firms in the U.S. non-farm private sector. The results presented in this table are approved for dissemination by the DRB (CBDRB-FY20-CES009-001).

Human capital differences between Black and White employer-owners in the ASE sample are shown in Table 3. Black owners are much more likely to have advanced degrees: 34 percent of Blacks versus 23 percent of Whites. On the other hand, Whites are more likely to have prior business experience: 32 percent for Whites versus 27 percent for Blacks. Blacks are somewhat more likely to be veterans of the armed forces: 13 versus 11 percent for Whites.

Table 4 shows racial differences in the motivations for business ownership. The numbers refer to the proportion of the sample responding that the given reason was "very important" (rather than "not important" or "somewhat important"). Blacks are substantially more

Table 3: Summary Statistics: Human Capital Characteristics of Owners

|  | (1) All | (2) Black | (3) White |
|---|---|---|---|
| Education | | | |
| Less than high school | 0.033 | 0.027 | 0.025 |
| High school | 0.186 | 0.132 | 0.188 |
| Some college | 0.264 | 0.264 | 0.272 |
| Undergraduate | 0.277 | 0.239 | 0.283 |
| Graduate | 0.239 | 0.339 | 0.233 |
| | | | |
| Prior business experience | 0.322 | 0.273 | 0.322 |
| Veteran | 0.100 | 0.126 | 0.111 |

Note: Data are from the 2014 Annual Survey of Entrepreneurs (ASE). N = 288,000 individual owners of 184,000 employer-firms. All variables are dummy variables for the particular category; therefore, the numbers represent the proportion of the sample in the category. Owners are weighted by their ownership share in the firm and by the ASE weights, so the sample is representative of all employer-firms in the U.S. non-farm private sector. The results presented in this table are approved for dissemination by the DRB (CBDRB-FY20-CES009-001).

Table 4: Summary Statistics: Motivation and Aspiration for Business Ownership

|  | (1) All | (2) Black | (3) White |
|---|---|---|---|
| Motivations | | | |
| Wanted to be Own Boss | 0.566 | 0.609 | 0.568 |
| Flexible Hours | 0.438 | 0.527 | 0.430 |
| Balance Work and Family | 0.476 | 0.555 | 0.466 |
| Opportunity for Greater Income | 0.542 | 0.626 | 0.536 |
| Best Avenue for Ideas/Goods/Service | 0.499 | 0.578 | 0.494 |
| Unable to Find Job | 0.067 | 0.091 | 0.059 |
| Unappealing to Work for Someone Else | 0.274 | 0.277 | 0.275 |
| Always Wanted to Start Business | 0.414 | 0.580 | 0.394 |
| Entrepreneurial Role Model | 0.240 | 0.279 | 0.234 |
| | | | |
| Aspirations to Grow Business | 0.636 | 0.756 | 0.637 |

Note: Data are from the 2014 Annual Survey of Entrepreneurs (ASE). N = 288,000 individual owners of 184,000 employer-firms. The motivations variables are dummy variables for the owner reporting the particular motivation as a "very important" reason for owning the business (rather than "not important" or "somewhat important"). Aspirations to grow is a dummy if the owners would like the firm to have larger sales or profits in five years (rather than smaller or the same). Owners are weighted by their ownership share in the firm and by the ASE weights, so the sample is representative of all employer-firms in the U.S. non-farm private sector. The results presented in this table are approved for dissemination by the DRB (CBDRB-FY20-CES009-001).

likely than Whites to cite both pecuniary and non-pecuniary motivations for business ownership, especially for "wanted flexible hours," "balance work and family," and "opportunity for greater income." For each of these, the rate at which Blacks cite them as "very important" is about 10 percentage points higher than for Whites. Blacks are also more likely to cite the creative motivation "best avenue for ideas" by a similar margin. Concerning the measure of "necessity entrepreneurship" ("unable to find employment"), the rate is higher for Blacks, but low for both groups, at nine and six percent, respectively. The largest difference is for the motivation "always wanted to start a business," cited by 58 percent of Blacks and 39 percent of Whites. There is a relatively small difference in having an "entrepreneurial role model," but again Blacks are more likely to cite this motivation than Whites: 28 versus 23 percent, respectively. Finally, Table 4 also contains information on business aspirations based on the ASE question "Where would the owner(s) like this business to be in five years?" Responses include larger, smaller, or about the same "in terms of sales or profits," and the table shows the proportion responding "larger." Black owners are more likely to aspire for a larger firm: 76 percent versus 64 percent for White owners. Below, we show that these racial differences in motivations for business ownership remain even after controlling for other demographic and human capital characteristics. In sum, these measures of motivations and aspirations provide no support for any notion that Black owners might be culturally conditioned towards less ambitious goals for their businesses.

Table 5 shows the industry composition of businesses owned by Blacks and Whites. Black ownership is relatively much higher than Whites in health care, with 27 percent of Black owners versus 10 percent of Whites. White ownership is more common in construction, manufacturing, and wholesale and retail trade. Other industries are more similar in their racial proportions or are small for both: Black entrepreneurs are twice as likely to be in the education sector, for example, but the figures for the two race groups are just two and one percent.

In addition to industry, business owners choose other aspects of the business and their involvement, which may influence outcomes. Table 6 shows ASE data on these choices. Black owners tend to work longer hours in their businesses than do White owners: 29 percent of Blacks work more than 60 hours, compared to 20 percent of Whites. Other differences are slight. Blacks are more likely to work as managers (83 versus 80 percent for Whites) and as producers (67 versus 63 percent), but they are less likely to exercise financial control (71 versus 74 percent). Blacks and Whites report similarly on whether the business is their primary source of income (71 and 73 percent) and on whether the business is home-based (25 percent for both).

Table 5: Summary Statistics: Industry

|  | (1) All | (2) Black | (3) White |
|---|---|---|---|
| Primary sector | 0.010 | 0.004 | 0.011 |
| Construction | 0.125 | 0.071 | 0.137 |
| Manufacturing | 0.047 | 0.013 | 0.051 |
| Wholesale trade | 0.055 | 0.019 | 0.055 |
| Retail trade | 0.115 | 0.059 | 0.111 |
| Transportation | 0.029 | 0.050 | 0.029 |
| Information | 0.012 | 0.013 | 0.013 |
| Finance | 0.045 | 0.051 | 0.048 |
| Real estate | 0.049 | 0.030 | 0.052 |
| Professional and management | 0.163 | 0.171 | 0.168 |
| Administrative and support | 0.061 | 0.088 | 0.063 |
| Education | 0.011 | 0.021 | 0.010 |
| Health | 0.112 | 0.275 | 0.102 |
| Art and entertainment | 0.017 | 0.017 | 0.018 |
| Accommodation and food | 0.078 | 0.048 | 0.062 |
| Other services | 0.067 | 0.067 | 0.064 |
| Missing sector | 0.005 | 0.003 | 0.006 |

Note: Data are from the 2014 Annual Survey of Entrepreneurs (ASE). N = 288,000 individual owners of 184,000 employer-firms. The "Primary sector" includes NAICS sector 11, 21 and 22: Agriculture, Forestry, Fishing and Hunting, Mining, and Utilities. Manufacturing comprises NAICS 31-33. Retail trade comprises NAICS 44-45. Transportation comprises NAICS 48-49. Professional and management comprises NAICS 54-55. Owners are weighted by their ownership share in the firm and by the ASE weights, so the sample is representative of all employer-firms in the U.S. non-farm private sector. The results presented in this table are approved for dissemination by the DRB (CBDRB-FY20-CES009-001).

## 5.2 Racial Gap in Financial Access

Racial differences in financial access, as measured in the ASE, are shown in Table 7. Finance is measured as of start-up and in the reference year of 2014. For the amount of start-up capital, a higher share of White-owned businesses have greater than $100,000 compared with Black-owned: 18 versus 14 percent. Concerning sources of start-up capital, Blacks are more likely to use personal assets and credit cards, but less likely to receive a bank loan, at 15 versus 19 percent. The fraction receiving venture capital is about 1 out of 200 firms, with a slightly higher rate for Blacks compared to Whites. Most of the variables for 2014 finance focus on outside investment. While Black owners are slightly more likely to have positive amounts of outside finance, at 37 versus 36 percent, they are slightly less likely to receive new outside finance greater than $100,000, at 11 versus 12 percent. Blacks are again less likely to receive new bank loans (8 versus 10 percent), and too few receive other forms to

Table 6: Summary Statistics: Owner Choices

|  | All | Black | White |
|---|---|---|---|
| **Owner Role in Business** |  |  |  |
| Manager | 0.798 | 0.825 | 0.799 |
| Producer | 0.624 | 0.671 | 0.633 |
| Financial control | 0.729 | 0.710 | 0.748 |
| None listed | 0.063 | 0.049 | 0.062 |
|  |  |  |  |
| **Average Hours Per Week Owner Works in Business** |  |  |  |
| None | 0.057 | 0.040 | 0.058 |
| <20 | 0.135 | 0.115 | 0.137 |
| 20 - 39 | 0.148 | 0.144 | 0.149 |
| 40 | 0.152 | 0.133 | 0.146 |
| 41 - 59 | 0.302 | 0.278 | 0.309 |
| >59 | 0.206 | 0.290 | 0.202 |
|  |  |  |  |
| Business is primary source of income | 0.728 | 0.709 | 0.726 |
| Home-based | 0.238 | 0.252 | 0.250 |

Note: Data are from the 2014 Annual Survey of Entrepreneurs (ASE). N = 288,000 individual owners of 184,000 employer-firms. All variables are dummy variables for the particular financial measure, as explained in the text. Owners are weighted by their ownership share in the firm and by the ASE weights, so the sample is representative of all employer-firms in the U.S. non-farm private sector. The results presented in this table are approved for dissemination by the DRB (CBDRB-FY20-CES009-001).

merit comparison; for instance, angels and venture capital investments were received in 2014 by only about one in 400 firms, again slightly more by Black than White owners.

The table shows two variables measuring financial constraints from the owner's viewpoint. The first asks if the reason why the firm needed finance but did not apply was "expected lender would not approve": 15 percent of Blacks say yes to this, compared with only 4 percent of Whites. The second question asks whether lack of access to capital negatively affected their profits: 27 percent of Black owners and 10 percent of White owners respond affirmatively. Thus, the data show some evidence, varying depending on the specific measure employed, of a Black disadvantage in finance, but the differences are often small. It will be important to evaluate the racial differences when other factors, including firm age and owner demographics and human capital are controlled.

Differences in the financial measures by race may reflect other characteristics of owners and their opportunities. Hence, our next step is to estimate finance regressions where race is the main variable of interest, while controlling for such characteristics. Some covariates are potentially endogenous, jointly determined with business ownership, success, and demand for finance. Our approach is to gradually add sets of variables and examine how the estimated

Table 7: Summary Statistics: Finance

|  | All | Black | White |
|---|---|---|---|
| Start-up Capital >$100k | 0.191 | 0.144 | 0.184 |
| | | | |
| Start-up Capital Source | | | |
| Personal savings and other assets | 0.691 | 0.745 | 0.678 |
| Home equity loans | 0.075 | 0.079 | 0.073 |
| Personal/business credit cards | 0.127 | 0.199 | 0.122 |
| Bank loan | 0.184 | 0.154 | 0.190 |
| Government loan | 0.023 | 0.035 | 0.023 |
| Family loan | 0.052 | 0.033 | 0.052 |
| Venture capital | 0.005 | 0.006 | 0.005 |
| Grants | 0.002 | 0.006 | 0.002 |
| | | | |
| Outside and Investor Funding in 2014 | | | |
| >$0 | 0.353 | 0.373 | 0.356 |
| >$100k | 0.120 | 0.106 | 0.121 |
| | | | |
| Funding received in 2014, by source: | | | |
| Bank | 0.096 | 0.079 | 0.099 |
| Angel investor/ VC | 0.003 | 0.003 | 0.002 |
| Other investor business | 0.003 | 0.003 | 0.002 |
| Grants | 0.002 | 0.004 | 0.002 |
| | | | |
| Financial Constraints | | | |
| Didn't apply; expected lender would not approve | 0.046 | 0.149 | 0.043 |
| Lack of capital reduces profits | 0.107 | 0.273 | 0.096 |

Note: Data are from the 2014 Annual Survey of Entrepreneurs (ASE). N = 288,000 individual owners of 184,000 employer-firms. All variables are dummy variables for the particular financial measure, as explained in the text. Owners are weighted by their ownership share in the firm and by the ASE weights, so the sample is representative of all employer-firms in the U.S. non-farm private sector. The results presented in this table are approved for dissemination by the DRB (CBDRB-FY20-CES009-001 and CBDRB-FY20-CES009-002).

racial gap in finance changes.

Table 8 and Table 9 contain the results for these regressions for the same finance variables shown in Table 7. The first column shows the raw differences between Black and White owners, while the others add successive sets of control variables. Starting with amounts of finance, the gap of 4 percentage points in the probability of having more than $100,000 at start-up is remarkably robust across all specifications. Comparing to the overall mean of 19 percent (from Table 7), this implies that Black entrepreneurs are more than 20 percent less likely to obtain such large levels of finance when starting up. The estimated gap in the

Table 8: Regression-Adjusted Racial Gaps in Startup Finance

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| **Startup Capital** | -0.040 | -0.036 | -0.039 | -0.040 | -0.043 | -0.042 | -0.046 |
| **Greater than 100k** | (0.007) | (0.007) | (0.007) | (0.007) | (0.007) | (0.006) | (0.006) |
| Source: | | | | | | | |
| Personal Savings | 0.066 | 0.053 | 0.046 | 0.047 | 0.042 | 0.045 | 0.046 |
| or Other Assets | (0.008) | (0.008) | (0.008) | (0.008) | (0.008) | (0.008) | (0.008) |
| Home Equity | 0.007 | 0.008 | 0.007 | 0.008 | 0.007 | 0.005 | 0.003 |
| | (0.005) | (0.005) | (0.005) | (0.005) | (0.005) | (0.005) | (0.005) |
| Credit Cards | 0.077 | 0.065 | 0.062 | 0.062 | 0.059 | 0.057 | 0.055 |
| | (0.008) | (0.008) | (0.008) | (0.008) | (0.008) | (0.008) | (0.008) |
| Banks | -0.036 | 0.021 | -0.012 | -0.016 | -0.019 | -0.023 | -0.025 |
| | (0.007) | (0.007) | (0.007) | (0.007) | (0.007) | (0.006) | (0.006) |
| Government Loan | 0.012 | 0.013 | 0.013 | 0.012 | 0.011 | 0.010 | 0.010 |
| | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) |
| Family Loans | -0.019 | -0.018 | -0.017 | -0.017 | -0.016 | -0.016 | -0.016 |
| | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) |
| Venture Capital | 0.001 | 0.001 | 0.001 | 0.001 | 0.000 | 0.000 | 0.000 |
| | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) |
| Grants | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.002 | 0.002 |
| | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) | (0.001) | (0.001) |
| Race/Ethnic Groups | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Age & N of Owners | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Demographics | | | ✓ | ✓ | ✓ | ✓ | ✓ |
| Human Capital | | | | ✓ | ✓ | ✓ | ✓ |
| Motivations | | | | | ✓ | ✓ | ✓ |
| 4-digit Industry | | | | | | ✓ | ✓ |
| Other Choices | | | | | | | ✓ |
| Observations | 288,000 | 288,000 | 288,000 | 288,000 | 288,000 | 288,000 | 288,000 |

Note: Data are from the 2014 Annual Survey of Entrepreneurs (ASE). N = 288,000 individual owners of 184,000 employer-firms. Each cell in the table contains an estimate of the African-American owner coefficient (and associated standard error), with the dependent variable indicated in bold and the specification controlling for the various sets of regressors listed in the bottom panel of the table. The dependent variables are explained in the text, with summary statistics provided in Table 7. Owners are weighted by their ownership share in the firm and by ASE weights, so the sample is representative of all employer-firms in the U.S. non-farm private sector. Robust standard errors are in parentheses. The results presented in this table are approved for dissemination by the DRB (CBDRB-FY20-CES009-002).

probability of having more than $100,000 in outside finance during 2014 is a negative 1.6 percentage points, about 13 percent of the overall mean, but the gap essentially disappears once controls for firm age and number of owners are added, and is negligible across the

remaining specifications. The probability of any outside finance that year is actually higher for Blacks than Whites, and it increases to greater than 3 percentage points with some sets of controls. While this gap in favor of Black owners is always statistically significant, it is less than 10 percent of the overall mean of this variable (35 percent, in Table 7).

Table 9: Regression-Adjusted Racial Gaps in 2014 Finance

|  | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| **2014 Outside Funding** | -0.016 | -0.003 | -0.002 | 0.001 | -0.003 | 0.001 | -0.001 |
| **Greater than 100k** | (0.006) | (0.006) | (0.006) | (0.006) | (0.006) | (0.006) | (0.006) |
| **2014 Outside Funding** | 0.017 | 0.027 | 0.032 | 0.035 | 0.028 | 0.036 | 0.031 |
| **Greater than Zero** | (0.009) | (0.009) | (0.009) | (0.009) | (0.009) | (0.009) | (0.009) |
| Source: | | | | | | | |
| **New Funding** | -0.020 | -0.018 | -0.013 | -0.012 | -0.015 | -0.015 | -0.016 |
| **from Banks** | (0.005) | (0.005) | (0.005) | (0.005) | (0.005) | (0.005) | (0.005) |
| **New Funding** | 0.000 | 0.000 | -0.001 | -0.001 | -0.001 | 0.000 | 0.000 |
| **from Angel Investors/VC** | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) |
| **New Funding** | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| **from Other Business** | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) |
| **New Funding** | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 |
| **from Grants** | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) |
| Financial Constraints: | | | | | | | |
| **Avoid Additional Funding** | 0.106 | 0.102 | 0.100 | 0.101 | 0.099 | 0.100 | 0.097 |
|  | (0.007) | (0.007) | (0.007) | (0.007) | (0.007) | (0.007) | (0.007) |
| **Access to Finance Negatively** | 0.176 | 0.168 | 0.164 | 0.167 | 0.162 | 0.165 | 0.160 |
| **Impacts Profitability** | (0.008) | (0.008) | (0.008) | (0.008) | (0.008) | (0.008) | (0.008) |
| Race/Ethnic Groups | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Age & N of Owners | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Demographics | | | ✓ | ✓ | ✓ | ✓ | ✓ |
| Human Capital | | | | ✓ | ✓ | ✓ | ✓ |
| Motivations | | | | | ✓ | ✓ | ✓ |
| 4-digit Industry | | | | | | ✓ | ✓ |
| Other Choices | | | | | | | ✓ |
| Observations | 288,000 | 288,000 | 288,000 | 288,000 | 288,000 | 288,000 | 288,000 |

Note: Data are from the 2014 Annual Survey of Entrepreneurs (ASE). N = 288,000 individual owners of 184,000 employer-firms. Each cell in the table contains an estimate of the African-American owner coefficient (and associated standard error), with the dependent variable indicated in bold and the specification controlling for the various sets of regressors listed in the bottom panel of the table. The dependent variables are explained in the text, with summary statistics provided in Table 7. Owners are weighted by their ownership share in the firm and by ASE weights, so the sample is representative of all employer-firms in the U.S. non-farm private sector. Robust standard errors are in parentheses. The results presented in this table are approved for dissemination by the DRB (CBDRB-FY20-CES009-002).

Concerning sources of funding at start-up, the higher probability for Blacks to use personal resources is robust and only slightly attenuated when other covariates are added. The lower probability of starting up with a bank loan is moderately attenuated, but remains statistically significant even with all controls included. The probability of a new funding

relationship with a bank remains significantly lower for Black than for White owners, with some slight attenuation that varies across sets of covariates. Compared with a mean of 9.6 percent, these results imply a disadvantage for Blacks of about 15-20 percent.

The final two dependent variables in Table 9 pertain to difficulties in raising finance in 2014. The estimated racial gaps are hardly affected by the addition of any of the sets of control variables.[16] The results imply that avoiding finance applications because of an expectation the lender would refuse is 10 percentage points higher for Blacks than for Whites, again implying Blacks are three times more likely to be in this category. And they imply that Blacks are 16-17 percentage points (nearly three times) more likely than Whites, even when all the controls are added to the equation, to say that their profitability is negatively affected by difficulties with access to finance.

To summarize briefly, these results provide strong support that Black owners are more likely to perceive financial access as a problem. The analysis of actual outcomes shows smaller differences than do the perceptions, but other factors on the demand and supply side may also help explain outcomes. The two types of outcomes for which there is a clear Black disadvantage are in the amount of finance at start-up and in obtaining bank loans both at start-up and in 2014.[17] These results are robust to including many control variables intended to account for differences in demand for capital.

## 5.3 Black Ownership and Firm Employment

Summary statistics for the number of employees are displayed in Table 10. Black-owned firms have 9.1 employees on average compared with 10.8 among White-owned ones, a difference of 19 percent when using the Black average as the base.

Table 10: Summary Statistics: Firm Performance

|  | (1) All | (2) Black | (3) White |
|---|---|---|---|
| Employment in 2014 | 10.32 | 9.056 | 10.77 |

Note: Data are from the 2014 Annual Survey of Entrepreneurs (ASE). N = 184,000 employer-firms. The sample is weighted by the ASE weights, so the sample is representative of all employer-firms in the U.S. non-farm private sector.The results presented in this table are approved for dissemination by the DRB (CBDRB-FY20-CES009-001).

Table 11 contains regression estimates with log employment in 2014 as the dependent

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[16]This is similar to the result in Fairlie, Robb and Robinson (2020) that the Black-White gap for not applying for a loan due to fear of denial is little affected by controls.

[17]Robb and Robinson (2014) emphasize the importance of bank loans for entrants and young firms in the Kauffman Firm Survey.

variable. In Specification (1), with no controls, employment in 2014 is about 12 percent lower on average in Black-owned firms. But Specification (2) shows that this mean difference is associated with younger firm age and a smaller number of owners among firms with Black owners, patterns observed in Table 2. Once these two factors are added as controls, Black-owned firms are on average three percent larger than White-owned, although the estimate is not statistically significant at conventional levels. The coefficient is fairly similar with controls for demographics, and it rises slightly with human capital, probably because of Blacks' lower rate of prior business experience. It falls about 0.025 with controls for motivations, consistent with Blacks having a somewhat stronger growth orientation relative to Whites. But it jumps to 0.073 when the financial variables are added in Specification (6). This result suggests that worse access to finance lowers employment at Black-owned businesses; once this is taken into account, their employment is on average seven percentage points larger than that of White-owned businesses.

Table 11: Regression Results: Employment in 2014 on Black

|  | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| Black | -0.122 | 0.031 | 0.032 | 0.044 | 0.020 | 0.073 | -0.028 | -0.044 |
|  | (0.021) | (0.021) | (0.021) | (0.021) | (0.021) | (0.020) | (0.019) | (0.018) |
| Race/Ethnic Groups | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Age & N of Owners |  | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Demographics |  |  | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Human Capital |  |  |  | ✓ | ✓ | ✓ | ✓ | ✓ |
| Motivations |  |  |  |  | ✓ | ✓ | ✓ | ✓ |
| Finance |  |  |  |  |  | ✓ | ✓ | ✓ |
| 4-digit Industry |  |  |  |  |  |  | ✓ | ✓ |
| Other Choices |  |  |  |  |  |  |  | ✓ |
| Observations | 288,000 | 288,000 | 288,000 | 288,000 | 288,000 | 288,000 | 288,000 | 288,000 |

Note: Data are from the 2014 Annual Survey of Entrepreneurs (ASE). N = 288,000 individual owners of 184,000 employer-firms in the ASE. Each cell in the table refers to an estimate of the African-American coefficient (and associated standard error) for an equation in the text, with the dependent variable indicated in bold and the specification controlling for the various sets of regressors listed in the bottom panel of the table. The dependent variables are explained in the text, with summary statistics provided in Table 1d. Owners are weighted by their ownership share in the firm and by ASE weights, so the sample is representative of all employer-firms in the U.S. non-farm private sector. Robust standard errors are in parentheses. The results presented in this table are approved for dissemination by the DRB (CBDRB-FY20-CES009-002).

When 4-digit industry controls are added, the coefficient declines and becomes negative, but small and insignificant, as shown in Specification (7). This suggests that Black owners tend to choose industries where firms have more employees on average. Finally, the coefficient becomes somewhat more negative and significant at the five percent level when owners' choices are included as regressors in Specification (8). This result provides further support

for the interpretation that Black owners have more growth-oriented involvement in their businesses. Similarly to motivations, when this factor is held constant, their firms are smaller on average.

The employment regression results suggest that Black-owned firms have several characteristics associated with being larger, including presence in industries with larger average firm size, and higher owner education, growth-oriented motivations, and involvement in the firm. These factors are outweighed, however, by being younger and having fewer owners and less financing, which are associated with smaller size.[18] Black-owned firms would be larger than those owned by Whites if they had the same access to finance.

## 5.4   Impact of the Community Reinvestment Act

The estimation results so far are consistent with an interpretation that Black entrepreneurs face tougher financial constraints that impede their ability to grow. The data we study provide detailed information on access to finance at the firm level, and the comprehensive information on firm age and industry and on owner characteristics, motivations, and choices also allows an assessment of the extent to which racial gaps may be "explained" by these correlated observables. But the results could also be explained by unobservables affecting firm employment size and use of finance. For instance, some entrepreneurs may have lower goals for the growth of their firms and consequently lower demand for finance. The rich set of measures on motivations and aspirations in the ASE provide no evidence that Blacks have lower goals, but the observable measures may not fully account for unobserved demand for finance. Our final step in this paper is therefore to estimate the impact of varying credit conditions resulting from CRA changes.

Summary statistics for the principal variables are shown in Table 12. The full sample covers 8,220,000 firm-years with 952,000 firms, all of which are in ineligible (untreated) tracts during 2003-2011. Of these, 69,000 are switchers, firms located in CRA tracts starting in 2012. In terms of firm-years, 3.0 percent of all, and 4.7 percent of Black-owned firm-years are in 2012 or later in CRA tracts. Within the full sample, Black-owned firms tend to be in tracts with lower MFI ratios, but employment is similar when comparing all firms to those owned by Blacks. With a 20 percent bandwidth (MFI ratio from 80 to 100 percent before 2012), the total sample shrinks to 2,591,000 firm-years, 297,000 firms, and 50,000 firms switching into CRA-eligible tracts in 2012. With a 5 percent bandwidth (MFI ratio from 80 to 85 percent), the sample falls to 591,000 firm-years, 68,000 firms, and 19,500 switchers. The sample does

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[18]Note that firm age and the number of owners have implications for financing. Younger firms tend to have more difficulty attracting external financing. More owners create the potential for more self-financing, as well as additional collateral and networks to attract external financing.

Table 12: Summary Statistics: CRA Analysis

| Sample Used | (1) Full Sample | (2) | (3) 20% Bandwidth | (4) | (5) 5% Bandwidth | (6) |
|---|---|---|---|---|---|---|
| Means | All | Black Owner | All | Black Owner | All | Black Owner |
| CRA | 0.03 | 0.05 | 0.07 | 0.10 | 0.12 | 0.14 |
| Tract/MSA Income Ratio | 126.10 | 121.80 | 93.88 | 92.08 | 86.44 | 84.98 |
| Tract/MSA Income Ratio*CRA | 1.98 | 3.03 | 4.77 | 6.38 | 7.95 | 9.10 |
| Employment | 11.84 | 11.64 | 12.69 | 12.21 | 12.88 | 10.44 |
| Employment (standard deviation) | 40.84 | 41.54 | 40.26 | 47.64 | 37.78 | 27.30 |
| N of Firm-year Obs. | 8,220,000 | 149,000 | 2,591,000 | 53,000 | 591,000 | 14,000 |
| N of Firm Obs. | 952,000 | 19,000 | 297,000 | 6,800 | 68,000 | 1,700 |
| N of Switching Firms | 69,000 | 2,000 | 50,000 | 1,500 | 19,500 | 500 |

Note: Data are from the 2003-2015 Longitudinal Business Database (LBD) linked to 2002, 2007, and 2012 Survey of Business Owners (SBO) and 2014 and 2015 Annual Survey of Entrepreneurs (ASE). The results presented in this table are approved for dissemination by the DRB (CBDRB-FY2020-CES005-034).

not fall as rapidly as the bandwidth, because it is thicker close to the threshold. The number of switchers falls even less, because the probability of switching is higher for firms in tracts with MFI ratios close to the threshold. As a result, the sample still provides a good basis for estimation, although it should be noted that the number of Black-owned firms that switch is substantially lower: 2000, 1500, and 500 in the three samples. Thus, there may be a tradeoff between a smaller bandwidth, which provides more convincing interpretation of an "as if random" allocation of the firms across CRA eligibility, and the precision of the estimates. For this reason we report regression results for all three samples.

These regression results are presented in Table 13. For each of the three samples described above, three specifications are shown: one omits the MFI ratio, the second includes it, and the third allows the coefficient on it to change with CRA status. The MFI and interaction variables have small coefficients and they make little difference for the results of interest. Results are also similar if the running variable MFI ratio enters the equation in quadratic form.

The main CRA effect in the full sample ($\beta_0$ in the equation above) is estimated to be positive and statistically significant, but small at 0.4 percent. It is negative and small in all the other specifications and samples. The variable of interest is the CRA interaction with Black owner, and the estimated coefficients are remarkably similar across samples and specifications. The implied effect on employment is 5 to 7 percent, with the larger estimates for the smallest sample based on the 5 percent bandwidth. Although the standard errors are

Table 13: RD-DD Regression Results: Racial Gap in the Impact of the CRA

|  | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|---|---|---|---|---|---|---|---|---|---|
| CRA | 0.0040 | -0.0033 | -0.0138 | -0.0132 | -0.0151 | -0.0264 | -0.0176 | -0.0216 | -0.0273 |
|  | (0.0020) | (0.0021) | (0.0026) | (0.0025) | (0.0027) | (0.0033) | (0.0045) | (0.0051) | (0.0059) |
| CRA*Black | 0.0633 | 0.0633 | 0.0628 | 0.0539 | 0.0538 | 0.0528 | 0.0677 | 0.0676 | 0.0674 |
|  | (0.0129) | (0.0129) | (0.0129) | (0.0145) | (0.0145) | (0.0145) | (0.0219) | (0.0219) | (0.0219) |
| MFI |  | -0.0002 | -0.0002 |  | -0.0001 | 0.0000 |  | -0.0001 | -0.0001 |
|  |  | (0.0000) | (0.0000) |  | (0.0000) | (0.0000) |  | (0.0001) | (0.0001) |
| CRA*MFI |  |  | -0.0008 |  |  | -0.0011 |  |  | -0.0006 |
|  |  |  | (0.0001) |  |  | (0.0002) |  |  | (0.0003) |

Note: RD-DD stands for Regression Discontinuity-Difference-in-Differences. Data are from the 2003-2015 Longitudinal Business Database (LBD) linked to 2002, 2007, and 2012 Survey of Business Owners (SBO) and 2014 and 2015 Annual Survey of Entrepreneurs (ASE). Observations = 8,220,000 for the full sample, 2,591,000 for the 20 percent bandwidth sample, and 591,000 for the 5 percent bandwidth sample. All regressions include firm and year fixed effects. Firm-level clustered standard errors are reported in parentheses. The results presented in this table are approved for dissemination by the DRB (CBDRB-FY2020-CES005-034).

larger with a smaller bandwidth, all the estimates are highly significant.

These coefficients are $\beta_1$ in the equation above, representing the difference in the CRA effect on firms with Black owners relative to those with White owners. To obtain the estimated effect on Black owners, it is necessary to sum $\beta_0$ and $\beta_1$. Because $\beta_0$ is estimated to be negative,[19] this total effect is smaller than $\beta_1$, but because $\beta_0$ is estimated to be small in magnitude relative to $\beta_1$, the sum is still positive and different from zero at any conventional level of statistical significance. Depending on the sample and specification, the estimated total impact on Black-owned firms ranges from 3 to 6 percent. An alternative interpretation is that the main effect also captures a downward bias associated with the dip in measured MFI. In this case, $\beta_1$ is a triple-difference estimator, and the range of the estimated impact is 5 to 7 percent.

In either case, the magnitudes are not large, but it should be borne in mind that the estimates here are only "intent-to-treat." We do not observe whether any particular firm receives a loan, or a larger loan, as a result of the CRA. But CRA tracts are about 30 percent of all tracts in the US, and thus our estimates could imply a 1.5-2.5 percent increase in employment in Black-owned businesses nationwide. This additional job creation would be substantial for the predominantly Black neighborhoods where most Black-owned businesses are located. Also relevant is that the costs of the CRA essentially involve extra time spent by bank examiners who are focused on issues of financial stability. As a caveat, however,

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[19]The non-positive CRA benefit for White-owned firms is consistent with the Bates and Robb (2016) finding that White-owned businesses' credit access is not sensitive to whether they are located in minority or majority-White neighborhoods.

the estimates here do not account for possible displacement effects, whereby banks might transfer lending activity from non-CRA to CRA tracts, resulting in no net gain. This possibility would have implications for a welfare evaluation of the CRA, but it does not in any way undermine the conclusion that increased access to finance benefits Black-owned firms.

These results provide evidence not only concerning a particular policy, the CRA, but also on the general issue of financial constraints. A plausible interpretation of the results is that Black entrepreneurs typically face greater constraints in the form of a supply curve steeper and to the left of the one faced by their White counterparts. The CRA relaxes those constraints, and Blacks benefit more because their constraints were greater. A possible alternative explanation is that Black owners have some unobserved skills that permits them to take better advantage of relaxed financial constraints. But it is unclear what those skills might be. While logically possible, this interpretation seems implausible. Coupled with the evidence on the financial disadvantages of blacks at start-up and in receiving formal loans from banks, the results here imply that financial access is indeed a major obstacle for Black-owned businesses.

# 6    Conclusion

In this paper, we have presented several perspectives and types of evidence on the question whether the growth and job creation of firms owned by Black entrepreneurs is impeded by tougher financial constraints that those faced by Whites. Our conceptual framework showed the role of wealth disparities in raising the relative cost of funds for Blacks, a difference likely to be exacerbated by greater informational asymmetries and racial discrimination. The model shows that the latter factors under some conditions additionally imply that an expansion in financial access, for instance through a policy like the CRA, could stimulate greater growth at Black-owned than at White-owned businesses.

While the simple model assumes the demand for capital is the same across races, our analysis of characteristics of owners of employer-businesses in the ASE reveals that Black owners have several observable characteristics - younger age group, higher levels of education, greater motivations for entrepreneurship, higher aspirations to grow, more recent start-up, and choice of industry - that are associated with higher demand for capital, on average compared to Whites. Not all these differences are large, and there may be components of demand we do not observe, but the observable patterns of these variables are wholly inconsistent with the notion that Black-owned firms have lower demand for capital.

The first type of evidence consists of measures of the firm's sources and amounts of finance

at start-up and in 2014, plus some subjective questions on financial constraints. We find that Black-owned firms generally operate with less finance, especially at start-up and from outside sources, particularly bank credit. These results are statistically and quantitatively important, and they are robust to inclusion of several sets of controls, including other demographic characteristics and entrepreneurial motivations and choices that could proxy for demand for finance. In its approach, this analysis complements previous research, and it is similar in style to studies of wage gaps by race or gender.

The other two types of evidence focus on how financial constraints affect firm employment size. In the first of these, we show that Black-owned employer-firms have about 12 percent fewer employees compared with White-owned firms. But once we control for firm age and number of owners, this difference becomes essentially zero, and it jumps to a positive, statistically significant 7 percent when we control for the financial measures. This result implies that with the same financial access, Black-owned firms would actually be significantly larger than White-owned. This result is also consistent with the qualitative pattern in the data that Black owners tend to cite every type of entrepreneurial motivation and to be more likely to have growth aspirations relative to White owners, on average.

In the final empirical analysis, we estimate the impact of an intervention to expand financial access - the CRA - on the relative employment of Black-owned versus White-owned firms. The results from estimating causal effects using regression discontinuity and difference-in-differences methods imply that the increased financial access benefits employment in Black-owned firms about 5-7 percentage points more than in White-owned. Taken together, these results consistently support the hypothesis that Black entrepreneurs face tougher financial constraints that reduce their firms' employment growth.

Available data are not sufficient to disentangle the relative importance of discrimination of various types, information problems, and pre-existing wealth differences in these results. But they do suggest that policies designed to expand financial access, such as the CRA, can contribute to alleviating the disparity. To the extent that Black-owned firms draw their employees disproportionately from the Black population, reducing their financial constraints has the potential to contribute more broadly to diminishing racial inequality.

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