

African-American Entrepreneurs: Contributions and Challenges

by

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for

Office of Advocacy

U.S. Small Business Administration

under contract number 73351019P0055

Release Date: May 24, 2022



This report was developed under a contract with the Small Business Administration, Office of Advocacy, and contains information and analysis that were reviewed by officials of the Office of Advocacy. However, the final conclusions of the report do not necessarily reflect the views of the Office of Advocacy.

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African-American Entrepreneurs: Contribution and Challenges

Executive Summary

While African-American entrepreneurship is frequently mentioned in political and social discourse, it has not received a corresponding level of attention from systematic research. This report updates and extends previous research by analyzing large household and firm-level data sets, some of which have never been studied before in this context, to provide insights on the challenges and contributions of African-American entrepreneurs.

Consistent with early research, recent household data show that the self-employment rate of African-Americans is only about half that of Whites, and the racial gap in self-employment has narrowed only slightly since 1970. The racial gap in incorporated self-employment is even larger, with Whites 2.5 times more likely than African-American to operate an incorporated business.

The racial gap in earnings is large, over 30 percent in the raw data, for both self-employed and employees. Self-employed African-Americans are less likely than Whites to employ other workers, and their numbers of employees are smaller on average than those of Whites. In firm-level data on employers, the raw employment size gap is about 12 percent, and African-American-owned firms are 18 percent less likely to be in the top 5 percent of the employment size distribution. However, the data also show that African-American-owned firms are more likely to be younger (recent start-ups), and controlling for this factor, African-American- and White-owned employer firms have similar average numbers of employees. Moreover, once financial variables are accounted for, African-American-owned firms are actually 7 percent larger on average, and they are 22 percent more likely to be in the top 5 percent of the employment distribution than White-owned firms.

African-American women appear to face large disadvantages in entrepreneurship. Comparing to White men, White women, and African-American men, African-American women have the lowest rates of self-employment, incorporated self-employment, and hiring of employees, and they have the lowest average hourly earnings for both employees and self-employed. The analysis of gender combined with race shows that gender gaps tend to be larger among Whites than African-Americans, although they are substantial for both. Racial and gender gaps tend to be roughly similar in magnitude, which implies that the gap of African-American women compared to White men is about twice the gap for either African-American men or White women.

African-American owners report stronger entrepreneurial motivations along most dimensions and higher aspirations to grow their businesses than do Whites, on average. Yet, a striking pattern is that the racial gaps in self-employment, employer status, and earnings tend to be not only large but also similar in magnitude across a variety of different dimensions: area poverty, high-tech, veteran, and education. It is not that those variables are unassociated with entrepreneurship behavior, but rather that the nature of their association tends to be similar within races, so that across a large number of types of groups, the gap between Whites and African-Americans is similar. So, while it is true that African-Americans are more likely to live in high poverty areas, less likely to work in high-tech sectors, more likely to be veterans, and less likely to be highly educated, none of these factors goes very far in accounting for African-American-White differences. The racial gaps seem to reflect more of a direct effect of race, resulting for example from disparate treatment or constrained opportunities, rather than operating through any observable characteristics.

Besides the evidence that the smaller size of African-American-owned firms results from difficulties with financial access, a closer examination of financial measures reveals that the tougher financial constraints faced by African-Americans are manifested in lower amounts of finance at start-up, a relative lack of bank loans at start-up, and a relative lack and size of bank loans later in the firm life cycle. African-American entrepreneurs are much more likely to report that they did not apply for credit because they expected to be rejected and that their profitability was negatively affected by problems in accessing finance. Related to financial sources, an analysis of Small Business Administration (SBA) loans finds that African-American-owned firms are more likely than Whites to receive such loans, but the average loan size they receive is smaller.

The importance of finance in understanding African-American-White differences in firm size is reinforced by an estimation of the causal effects of the Community Reinvestment Act (CRA). The main finding is a 3 to 6 percent increase in employment for African-American owned businesses that receive better access to finance. An interpretation of these findings is that African-American entrepreneurs face greater financial constraints relative to their White counterparts. With programs such as the CRA, which relax such constraints, African-American-owned firms benefit more because their constraints are greater.

Thus, this report provides a new perspective on the contributions and challenges of African-American entrepreneurs. African-American-owned businesses contribute strongly to job creation and innovation. Depending on the exact statistical specification, their contributions are usually as large as those of White-owned firms, frequently larger. Yet African-Americans also appear to face larger challenges.

The rate at which African-Americans engage in entrepreneurship is much lower than for Whites, suggesting the presence of larger entry or survival barriers, and the rate is still lower when the analysis turns to firms with paid employees. The disadvantages of African-American entrepreneurs and potential entrepreneurs have externalities for the communities with large shares of African-American population in which African-American-owned firms mostly operate. One factor in this racial entrepreneurship gap is the disparity in access to finance, as the report documents, but there may be other types of barriers as well. It would seem there are large dividends from policies that lower these barriers, enabling African-American entrepreneurs to contribute even more to economic growth and to the reduction of racial inequality.

Introduction

How much do African-American entrepreneurs contribute to business formation, job creation, and innovation in the U.S.? And what barriers do they face that may prevent their contribution from being even larger? Despite their potential importance to the U.S. economy and their prominence in current political debates, there is relatively little knowledge about the contributions and the challenges of African-American entrepreneurs. To fill this gap, we apply econometric analysis to large worker- and firm-level databases, some of which have never before been analyzed in this context. The policy focus is on a particularly important barrier: access to finance.

The small body of previous research on African-American entrepreneurship, reviewed in detail below, finds lower rates of business ownership among African-Americans than among Whites in the U.S. population.² This research frequently points to finance as a large obstacle for African-Americans, noting their households have much lower levels of wealth compared with White households (less than 10 percent at the median according to Eggleston and Munk 2019). Labor market outcomes other than self-employment also show large disadvantages, with a substantial wage gap, especially among men (Neal 2004), and unemployment rates that tend to be double those of Whites. Incarceration rates are also much higher for African-Americans, particularly men (Pettit and Western 2004), with negative implications for subsequent labor market prospects.

The project aimed to address the following questions:³

- Are African-Americans more or less likely than Whites to work as self-employed, and is the long-term trend positive or negative?
- Are African-American-owned businesses more or less successful than those started by Whites in terms of earnings and job creation?
- Are African-American firms more or less innovative, in terms of product and process changes, research and development, and patenting?
- Are African-American women similar or different in their entrepreneurial behavior and outcomes?
- How common is racial diversity within entrepreneurial teams?

² The focus in much of the analysis is a comparison of self-employment and business ownership by non-Hispanic African-Americans with non-Hispanic Whites.

³ The term “self-employed” is generally relevant to individual information derived from household data, while “business owner” typically refers to ownership information derived from firm-level data on employers. We clarify the precise definitions with respect to each data set we analyze below.

- To what extent do differences in African-American-owned businesses reflect other characteristics of the entrepreneurs such as their human capital, motivations for entrepreneurship, access to finance, and choice of industry?
- How do racial differences in entrepreneurial outcomes vary with local area/clientele, education, veteran status, and between high-tech and non-high-tech sectors?
- Do the effects of SBA loans on firm growth vary with the racial composition of the firm's location?
- Do African-American entrepreneurs face worse access to finance?
- Do African-American-owned firms receive many SBA loans, and how do the share of loans and the average loan amounts they receive compare with firms owned by Whites?
- Does the Community Reinvestment Act help growth of African-American-owned businesses?

Our research addresses these questions both by re-analyzing previously studied data, updating and extending results in existing research, and by bringing in new data, particularly large firm-level data sets from the Census Bureau. The sources also include individual-level information from the Decennial Census (DC), American Community Survey (ACS), and the Current Population Survey (CPS), especially the CPS Outgoing Rotation Groups (ORG) and Annual Social and Economic Supplement (ASEC). An important new source, but one that has only been studied at the micro level in our own previous work, is the Annual Survey of Entrepreneurs (ASE). The ASE contains not only detailed information on firm owners, including their motivations for ownership and their roles in the firm, but also a battery of questions on innovation activities of the firms. We link these data to comprehensive panel data on employment from the Longitudinal Business Database (LBD) and for some purposes the Surveys of Business Ownership (SBO) and the Business Register (BR). Together, these data enable a much deeper examination than was heretofore available on the relative performance of firms owned by African-American entrepreneurs.

To examine financial access and financial barriers, we use detailed information from the ASE on sources and amounts of finance. To estimate causal effects of financial access, we examine the Community Reinvestment Act (CRA) on minority businesses using identification strategies based on a Regression Discontinuity Design (RDD) and intertemporal variation arising from changes in census tract boundaries and in CRA designations.

On this basis, this research produces a new portrait of African-American entrepreneurs in the US economy. The analysis includes several aspects of the performance of firms owned by African-Americans, the challenges they face – particularly constraints on capital access – in making greater

contributions, and the role of government policies in alleviating those constraints. The results should be of interest to government and academic researchers and to policymakers interested in both reducing inequality and raising economic growth.

At the same time, it is important to keep in mind the limitations of this research. While we draw upon a large array of data sets, these sources are strongest in studying existing self-employment and businesses, rather than the dynamics of entry and exit. Because African-Americans account for such a small fraction of self-employed and business owners, sample sizes become tiny when only the entering cohort is studied. For similar reasons, the data for studying diversity in ownership is also very limited. We are also unable to study pre-market disadvantages African-Americans may face arising from such factors as differences in schooling quality.

The basic problem is that, despite the richness of the data we study, including confidential business data of the US Census Bureau, our sources (and indeed any conceivable sources) do not permit us to measure all important variables. Specific instances include certain characteristics of entrepreneurs and their businesses. In examining credit constraints, it would be optimal to observe all the same variables seen by loan officers and other creditors making decisions on loans. Business performance is itself difficult to measure, and while we consider size as number of employees and a wealth of measures of innovation behavior, our data do not lend themselves to good measures of other size variables, of productivity and profitability, or of entry and survival.

One consequence of the data limitations is that, as in most research on race (and indeed on any topic in social science), we are able mostly to describe patterns of racial differences, not to infer causality. Even when we employ a rich set of conditioning variables, as we do for most of the questions we address, one cannot completely eliminate the possibility that an unobserved variable is actually driving the difference. Some comfort may be taken from the robustness of most results across alternative specifications, and some important lessons may be drawn from the cases where they differ, but the unobservability problem is inherent in all inferences based on our results.

Literature Review and Contributions of this Project

While African-American entrepreneurship is frequently mentioned in political and social discourse, it has not received a corresponding level of attention from systematic research. Moreover, despite its potential importance for aiding escape from poverty and economic advancement, African-American entrepreneurship has also been the subject of far less research than African-American wage earners. This section briefly reviews the state of knowledge and the contributions of this project for each of the questions on African-American entrepreneurship that we propose to answer. The data sets mentioned here, particularly the less-well-known firm-level data, are described in more detail in the next section.

Probably because of the easier availability of household data, the topic receiving the most attention in previous research is self-employment. Several papers analyze the self-employment of African-Americans in comparison to Whites and others. Focusing on men only, Fairlie and Meyer (2000) document a large gap with a roughly constant factor of about one-third the White rate using samples of Decennial Census data for 1910-1990. They find little impact on this gap from the large changes in education and migration over this long period.⁴ Using the 2012 Survey of Business Owners (SBO), McManus (2016) documents the under-representation more recently, with African-Americans making up 12.6 percent of the nation's population, but only 9.5 percent of businesses, while Whites and Asian-Americans comprise 62.8 percent and 5 percent of the population but represent a proportionately larger 70.9 percent and 7.1 percent of businesses. A study by Fairlie and Meyer (1996) contains comparisons across many racial and ethnic group, while more recently Fairlie et al. (2017) report that while the share of minority-owned new business creation nearly doubled from 23 percent in 1996 to over 44 percent in 2016, most of the increase is attributable to gains in Latino and Asian ownership, and African-American owned business-starts grew only 0.8 percentage points, even showing a decline in the most recent years.⁵

In this project, we replicate and extend this work on self-employment, considering African-American women as well as men, analyzing the longer period of 1970 to as recently as possible (currently, 2018), and running regressions to control for other observable characteristics. We also examine particular types of self-employment, including whether the business is incorporated

⁴ Fairlie (1999) decomposes the racial difference in self-employment among men to find that both lower entry rates and higher exit rates contribute to the gap. Borjas and Bronars (1989) and Kawaguchi (2005) analyze racial differences in selection into self-employment. Hout and Rosen (2000) is another notable study of African-American self-employment, but its usefulness is limited by the small sample size in the General Social Survey data in this study.

⁵ Bates, Bradford, and Seamans (2018) emphasize how much African-American owners and their firms have changed in the 21st century.

(sometimes used as a proxy for genuine entrepreneurship as opposed to a more casual activity) and whether the self-employed person works full-time in the business (similarly reflecting the degree of commitment).⁶ These types of self-employment have received little attention in this context, but our analysis of different types of self-employment may shed new light on the quality of businesses operated by African-American entrepreneurs.

In addition to measuring the numbers of each of these types of self-employment, in this project we study earnings data available from the American Community Survey (ACS) and Current Population Survey (CPS). Raw and regression-adjusted differentials in business income of African-American self-employed compared to Whites, also using employee earnings as a baseline, provides another way to describe relative firm performance (Borjas and Bronars, 1989). As discussed further in the next section, we also exploit a question in the CPS on number of employees of the self-employed person. This question, added to the Outgoing Rotation Group (ORG) questionnaire in 2014, has been little studied before, but it permits us to analyze job creation by African-Americans and others self-employed with the broad sample of the CPS for the first time.

To assess business performance, however, it makes sense to turn to business data, which is our primary focus of analysis in this project. One of the earliest works using firm-level data and studying African-American owners versus other groups is Bates (1989), who analyzes the 1987 Characteristics of Business Owners (CBO) survey and reports lower levels of survival, profitability, and investment among firms owned by African-American men and founded between 1976 and 1982.⁷ Fairlie and Robb (2007) report similar results with the 1992 CBO as does McManus (2016) from the 2012 Survey of Business Owners (the larger successor survey to the CBO). These studies are essentially cross-sectional as they do not link to other data sets and thus rely on information collected in the survey year. More similar to the approach in this project is Jarmin, Krizan, and Luque (2014), who link the 2002-2011 Longitudinal Business Database (LBD) to the 2002 SBO to focus on the Great Recession. They report negative, statistically significant lower employment growth and survival rates for African-American compared to White-owned firms.

In this project, we build on this research in several ways: we use the decennial census and the most recent available years of the ACS to analyze trends over a longer period, not confined to the

⁶ Levine and Rubinstein (2017) argue that incorporated self-employment is a better proxy for entrepreneurship. Kerr and Kerr (2017) analyze incorporated self-employment among immigrants, with a similar motivation. There has been some analysis of incorporated self-employment in broader studies that included but did not focus on African-American entrepreneurs (Blanchflower 2009; Hipple 2010).

⁷ Because the sample was drawn based on 1982 tax filings (Schedule C, Form 1065 or 1120s), the survival analysis could not account for exit before 1982, a period including two severe recessions. Bates (1990a and b) and Headd (1999) contain more information on the CBO.

Great Recession. Brown, Earle, Kim, and Lee (2019), using the 2007 SBO linked to the Business Register (BR) and LBD, find that the probability of an entering firm (defined as oldest establishment of the firm hiring its first employee) being in the top ventile (top five percent for employment) was 50 percent (2.5 percentage points) lower for African-American compared to White-owned entrants. But more than half of this gap disappears with controls for other demographic and human capital characteristics. These results are at odds with conventional views and with other studies that do not focus on the right-tail of the distribution, and this project investigates the right tail using the ASE.

In addition, we analyze several measures of firm performance never before considered in the context of African-American entrepreneurship: product and process innovation activities, research and development (R&D), and patenting. This is a much richer set of measures of firm success than studied previously. We explain all these variables in the next section.

As noted above, several of the most important studies of African-American entrepreneurs focus exclusively on men, and there are very few similar studies of female African-American entrepreneurs. Mora and Davilo (2014) report that in the 2007 SBO more African-American-owned businesses were owned by women than by men, and the number of the former grew by much more (67 percent) than the latter (50 percent) in the five years since 2002. The paper also reports higher probabilities of ceasing operations in 2007 for firms owned by African-American women than either those owned by White women or African-American men which are both higher than the rate for White men. There is a need for more systematic knowledge about African-American women business owners, to which this study contributes.

There is similarly little research on racially diverse entrepreneurial teams. A priori, it is unclear how diversity or similarity affect firm performance. Similar founders may have easier communication, coordination, and trust-building. But diversity may imply varied skill sets and knowledge, leading to greater creativity and innovation, and may combine disparate traits in a team more easily than in single individuals, thus providing a team “jack of all trades” (Lazear 2004, 2005). Hoogendoorn and van Praag (2012) report that business performance decreases with increasing ethnic diversity below a certain share of minorities on the founding team, but it becomes positive for a larger share.

Previous research on African-American contributions to entrepreneurship, particularly at the firm level, has often had little other information on potentially confounding factors. Publicly available tables, analyzed for instance by Robb (2018) in an important first step, do not permit regressions to be run with control variables, even when they are available in the data. An advantage of this project is that these data sets contain an unusual richness of control variables. In particular, the ASE data contain

detailed characteristics of up to four owners and measures of amounts and sources of finance. Moreover, the 2014 ASE contains unusual and detailed questions on the motivations for entrepreneurship, including non-pecuniary motivations.⁸ Using these rich data, we estimate several specifications for each outcome variable: (1) no controls except for firm age; (2) adding demographic and human capital controls; (3) adding measures of motivations; (4) adding measures of access to finance; (5) adding industry of operation; and (6) owner choices about the extent and nature of participation in the business.

Some dimensions of heterogeneity in the differences in outcomes under African-American versus White ownership are valuable to investigate, but previous research has by and large not done so. One exception is the nature of the local area and clientele of the business. Bates (1989) argues that African-American businesses in inner city ghettos that cater to a minority clientele are much less successful than those in other places and with a more diverse set of customers. In this project, we permit the African-American coefficient to vary by local characteristics, including the prevalence of poverty in the local area in which the business is located, but also including education, veteran status, and industry, especially high-technology sectors.

One of the most frequently adduced hypotheses for underperformance of African-American-owned firms is that African-Americans may face worse constraints to access capital.⁹ Among the studies examining financial access are Bates (1997), Coleman (2002, 2003), Robb and Fairlie (2007), Bates and Robb (2013), and Robb (2018), with a general finding of worse conditions for African-Americans. Robb and Robinson (2014) provide a more general analysis of start-up financing. Robb (2018) uses publicly available tabulations from the 2014 ASE to draw comparisons across races in sources of finance, startup capital, and propensity to apply for business credit, and makes a strong case that conditions remain worse even in recent years. But this research is only able to compare unconditional means across racial groups and it cannot account for other characteristics of entrepreneurs, including their human capital and motivations, that may affect the demand for finance. A contribution of this project is to estimate regressions including such controls and thereby to test the robustness of the raw differences across racial groups.

Most previous research on African-American entrepreneurs has been hampered not only by data limitations but also by a lack of identification strategies for estimating causal effects. Some

⁸ Fairlie et al. (2017) report that African-American owners have the lowest rates of startup activity motivated by identification of a new market opportunity, as opposed to entering out of necessity.

⁹ Another hypothesis is that African-American advancement is impeded by violence and breakdowns in the rule of law. Cook (2014) studies patents owned by African-Americans and estimates a large number of missing patents resulting from these factors.

studies make progress by examining loan applications and denials and establish the existence of gaps between African-Americans and Whites, even when controlling for many other variables.¹⁰ This research provides strong evidence of racial discrimination in financial markets, and we provide similar evidence using amount and sources of finance as dependent variables. However, controlling for detailed characteristics of owners and their firms and finding racial differences in amounts and types of finance does not completely preclude the possibility of unobservable factors, for instance in business plans or in unmeasured aspects of personal finances, leading to bias in these estimators.

To build on this research and provide a different type of evidence, we investigate a policy intended to increase access to capital among small businesses, particularly those that are minority-owned. We estimate the causal impact of the Community Reinvestment Act (CRA), which has increasing financial access for minority-owned businesses as a primary objective. Several recent papers have attempted to estimate impacts of this policy, although they have not distinguished effects by race of business owner. Rupasingha and Wang (2017) use county-level data to estimate the impact on business growth. Bostic and Lee (2017) use tract-level data to estimate the impact on small business lending in a cross-sectional regression discontinuity design (RDD). Ding et al. (2018) use changes in Metropolitan Statistical Area (MSA) boundaries to estimate the impact of changing CRA designations on lending. Finally, Bates and Robb (2015) use the Kauffman Firm Survey to compare the degree of loan access through CRA to small businesses in minority neighborhoods to equally creditworthy businesses in other neighborhoods. These papers find some evidence that CRA may increase loan availability for minority-owned businesses. However, the CRA designation depends on the median income of the census tract and not on the minority share of neighborhoods. Thus, identification strategies applied at the county-level or specified by the minority-share or a neighborhood are not accurate measures of the treatment. In our identification, we follow the changes to CRA designations resulting both from the change in tract-level median income, based on the Decennial Census or ACS, and from changes in tract boundaries. Our approach then applies an RDD in median tract income, as described more fully in the methodology section.

The research in this report was completely designed and much of it was executed before the COVID-19 pandemic wreaked havoc on American businesses, but very recent work shows that minority businesses have been hit especially hard. Comprehensive firm-level data, such as those we analyze extensively in this report, are not yet available for 2020. However, Dani, Earle, and Lee

¹⁰ See Cavalluzzo and Cavalluzzo (1998); Cavalluzzo, Cavalluzzo, and Wolken (2002); Blanchflower, Levine, and Zimmerman (2003); Cavalluzzo and Wolken (2005); Blanchflower (2009); Mitchell and Pierce (2011); and Ravina (2012). Chatterji and Seamans (2012) provide evidence for financial market discrimination by showing that the African-American self-employment rate rose following credit card deregulation, and it rose more in states with a history of discrimination.

(forthcoming), report on an extensive survey of 22,102 clients of Small Business Development Centers (SBDCs) in California carried out in August 2020. They find that nearly 45 percent of African-American-owned businesses had closed operations, compared to 30 percent of those owned by Whites, by the end of July 2020.¹¹ Concerning government assistance, Dani et al. (forthcoming) report a lower rate of receiving assistance in minority-owned firms (65 percent versus 71 percent for all) and lower loan amounts for African-Americans compared to Whites in both the Paycheck Protection Program (PPP) and Economic Injury and Disaster Loan (EIDL) programs. For the PPP, the median loan amount for an African-American-owned employer firm is \$15,700 and \$33,000 for those that are White-owned. For the EIDL, the analogous figures are \$18,900 and \$48,900. Thus, at least in these survey data, African-American entrepreneurs are substantially disadvantaged in receiving assistance during the pandemic.¹² Further analysis of the impact of COVID-19 awaits the release of data on this period.

Definition of African-American Entrepreneurs

The definition of race in this report follows guidelines provided by the Office of Management Budget (OMB) and the Census Bureau (CB) as they cover several of the data sources used in this research, such as the Decennial Census, ACS, CPS, and the ASE. A difficulty is finding definitions that are consistent over time and across data sources. Challenges arise because the race variable is self-identified in statistical surveys and the race categories available to respondents in the questionnaires have changed over time. A reasonable approach is to define racial categories narrowly such that they are mutually exclusive and clearly identify the racial group of interest.

Three main changes in the format of the race question in the Census Surveys can affect our estimates. Particularly, in the 1960 Decennial Census and later the 1989 CPS, respondents were provided with an additional fill-in blank to enter their race. It was not until 1980 that the Decennial Census separated Hispanic ethnicity from the other race categories. Then, beginning in 2000 for the

¹¹ These figures can be compared to those in Fairlie (2020), who reports from an analysis of the CPS that the initial impact (February to April) of the crisis resulted in a 41 percent decline in African-American self-employment, compared to 17 percent for Whites, in part because of a higher self-employment rate for African-Americans in industries that at higher risk from the pandemic. Mills (2020) provides similar evidence based on county-level African-American population shares, which are highly correlated with African-American business ownership, adding that African-American-owned businesses were more likely to be located in COVID-19 hotspots, thus also facing greater health challenges to keeping businesses operational.

¹² Using county-level analysis of population shares linked to PPP and EIDL data, Fairlie and Fossen (2021) find that businesses in minority communities receive more loans per employer business in the community, but the loan sizes are smaller and received later than those awarded to businesses in non-minority communities. Lederer et al. (2020) report that African-American applicants to the PPP, compared to White applicants with the same credit scores, experienced less encouragement in applying for a loan, were offered different products, and were provided different information by the bank representatives.

Decennial Census and 2003 for the CPS, respondents were allowed to select multiple categories of race, and in recent years the Census has experimented with an additional prompt allowing respondents to enter their specific region of origin in addition to their ethnicity and race. These changes present challenges for defining the target groups of the study and particularly for evaluating shares for racial or ethnic groups over a long time series.

These changes in the survey questions on race and ethnicity have been addressed differently by different researchers and thus can impact the comparability of estimates across studies. Some recent studies focusing on minority business-ownership use non-Hispanic Whites as the reference category, comparing their outcomes with those of African-American-owned, Hispanic-owned, and Asian-owned businesses (Mora and Davila, 2014; Jarmin, Krizan, and Luque, 2014; McManus, 2016; Fairlie, Robb, and Robinson, 2016; Robb, 2018). In these specifications the Hispanic category includes individuals of different race, and comparisons for African-American-owned businesses and Hispanic-owned businesses are made relative to non-Hispanic White-owned businesses, but this approach limits comparability between race and ethnic categories.

In our study, we define African-Americans as non-Hispanic individuals who select a race of African-American, including those who select multiple races that include African-American and any other races. In short, we categorize a respondent as African-American if they are non-Hispanic and they report at least one race as African-American, irrespective of their place of birth or immigration status. Our comparisons are made with non-Hispanic Whites as the reference group. The construction of our race and ethnicity variables is described in detail in the data section.

Another challenge in constructing the race category arises for the ownership status of a business that has multiple owners of different races. The tendency in publicly available tables from sources such as the ASE and SBO is to define African-American ownership such that more than 50 percent of the business is owned by individuals of African-American race. Our approach in firm-level data is instead to use owners as units of observation and to weight by the owner's share in the business. As most businesses have a single owner, this may make little difference to the results, but it allows us to include businesses with multiple owners, classifying them as African-American to the extent of the African-American share in firm ownership.

Data Sources¹³

This report relies on two primary types of data: individual data from household surveys and firm-level data from surveys and tax reporting. The household data come from the Decennial Census (DC), American Community Survey (ACS), and Current Population Survey (CPS). To examine individual earnings data, we use the CPS Annual Social and Economic Supplement (ASEC). Earnings for self-employed are defined as the sum of business income plus wages and salaries (because many self-employed pay themselves salary and incorporated self-employed are legally required to do so). The CPS provides the number of employees reported by self-employed individuals in questions added to the Outgoing Rotation Groups (ORG) questionnaire since 2014. This allows us to examine the probability of being an employer firm and the number of employees for African-American entrepreneurs from 2014 to 2018. We also use the CPS and ACS to examine heterogeneity in outcomes along several dimensions: gender, income level of area, high-tech sector, veteran status, and education. More details are contained in the Appendix.

The most important firm-level data set we use is the 2014 Annual Survey of Entrepreneurs (ASE) from the U.S. Census Bureau.¹⁴ The ASE sample contains only non-farm private firms with at least one paid employee, and it provides detailed demographic characteristics on business owners and their motivations to start a business, as well as economic characteristics of their firms. Using owner information for each business, we build owner-level ASE data. To make each firm represent the inverse probability of the selection, we construct a new composite weight by multiplying the sampling weight by ownership shares, the sum of which becomes one. Therefore, each owner represents their ownership share of a firm.¹⁵

We link the ASE to the Longitudinal Business Database (LBD) of the U.S. Census Bureau, which consists of all firms and establishments with payroll employment in the US non-farm business sector. This linkage allows us to examine employment and compare differences in job creation and probability of being high growth between African-American owned businesses and businesses owned by Whites.

To study firm-level innovation, we use a rich set of measures in the 2014 ASE, including detailed questions on product and process innovation activities, research and development (R&D), and

¹³ This section contains only a brief summary of the data used in this report. A much more extensive description is presented in the Data Appendix.

¹⁴ See Foster and Norman (2016) for further details about the ASE.

¹⁵ 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.

intellectual property measures, including copyright, trademark, patent (granted), and patent (pending). The ASE also asks about nine different motivations for owning the business, which allow us to compare different motivations of starting business between African-American and White-owned businesses.

The ASE also provides information on the amount and source of start-up capital used to start or initially acquire the business. It also asks more detailed questions on new funding relationships, and information on whether the owner chose not to apply when in need of additional financing, and the reasons for not applying, such as discouragement from expected non-approval, or not wanting to accrue debt. This allows us to identify discouraged borrowers as well as their corresponding reasons. Lastly, the ASE provides information about the factors which negatively impact the profitability of business, such as access to financial capital and cost of financial capital. The data permit an examination of differences in the levels and sources of start-up and recent finance, difficulty in obtaining loans, and the subjective estimate of the importance of capital constraints for profitability.

To estimate the extent to which African-American-owned firms receive SBA loans, we rely on a comprehensive database on 7(a) and 504 loans, which also contain loan amounts. Counts of African-American-owned businesses are derived from the SBO.

To estimate the firm-level impact of the Community Reinvestment Act (CRA), we link CRA data to the LBD, BR, ASEs, and Surveys of Business Owners (SBOs). The result is a large database containing information on firm ownership, CRA status, employment, and other firm characteristics from 2002 to 2015.

Methods

This section briefly summarizes the estimation methods used in the subsequent analyses. A full description of the methods can be found in the Appendix. The report begins with an update and extension of the sort of analysis carried out in most previous research, analyzing African-American self-employment with data from household surveys. Using the Decennial Census and American Community Survey (ACS), we compute long-term trends in the share of African-Americans from 1970 to 2018 in several groups. The shares in total population, adult population, and employed population serve as baselines for examining the share in self-employment.

In the broad literature on entrepreneurship, the self-employment measure is subject to criticism (e.g., Parker 2004), as it may reflect outside contracting, casual work, or subsistence or “necessity” activities, and it does not take into account the degree to which the venture is genuinely entrepreneurial in the colloquial sense of creating jobs and innovating with new products or production processes.¹⁶ One approach in previous research (e.g., Levine and Rubinstein 2017) to come closer to this notion of new business creation is to distinguish incorporated from unincorporated self-employed businesses. Adopting this perspective, we use information on incorporation, which is available in the Decennial since 1970 and in the ACS for all years, and we compare the trends of the share of African-Americans in self-employed, incorporated self-employed, and unincorporated self-employment from 1970 to 2018. In a separate analysis, we also use data on hours of work to distinguish full-time self-employed, as a measure of more committed entrepreneurship. While previous research has documented differences in African-American self-employment, this research provides a longer time series to evaluate the evolution of this variable, more recent data as close to the present as possible, and separate analyses of incorporated and full-time self-employment.

Self-employment probabilities may be correlated with other individual characteristics. To assess how much these may matter, we estimate the racial gap in self-employment within an augmented Mincer-type regression with pooled cross-sections of Decennial-ACS and CPS ORG data, with dependent variables specified as indicators alternatively for self-employment, incorporated self-employment, or full-time self-employment. Covariates include age, gender, education and year effects.¹⁷ If, for example, the probability of self-employment is positively correlated with education

¹⁶ Hurst and Pugsley (2011) show that a majority of small businesses are not successful entrepreneurship in these conventional senses, but they do not examine differences between African-American and non-African-American-owned businesses.

¹⁷ With the CPS ORG data, the controls include calendar month dummies to control for seasonality. In some specifications, we also control for occupation and industry. Although these are choice variables, arguably endogenous to the self-employment decision, it is interesting to examine the robustness of the more parsimonious specification estimates to controlling for these variables.

and African-American educational attainment tends to be lower than average, this equation provides information on the racial gap once this difference is taken into account. In a further extension, we permit coefficients to vary over time, in order to estimate trends in relative African-American self-employment probabilities controlling for other characteristics.

Job creation by African-American entrepreneurs is initially assessed with CPS ORG data for 2014-2019. We compute the fraction of African-Americans among employers and categories of number of employees, for comparison with the shares in population, total employed, and self-employed populations discussed above. The distribution of African-American employers by different size groups allows an assessment of the relative contributions by African-American entrepreneurs to job creation. With the pooled CPS ORG cross-sections, we also estimate equations analogous to the self-employment functions, but with dependent variables defined as indicators for employer or for number of employees above specific sizes (5+, 10+, 20+, and 50+) in order to estimate job creation, while controlling for other characteristics. We estimate earnings regressions for self-employed and for employees separately using the CPS ASEC. The specification of the independent variables is similar in all these regression estimations.

Turning to the firm-level analysis of employment and other outcomes, after comparing simple means for outcomes of businesses with any African-American ownership to those with no African-American ownership, we start with a baseline regression including only an indicator for African-American, other race/ethnicity indicators, and a polynomial in firm age. Then, we estimate additional specifications, adding in turn sets of control variables for other demographic characteristics, human capital, motivations, finance, industry, and other choices of the business owner about the business and the personal involvement of the owner. The order in which we add these covariates is governed by our rough sense of their endogeneity, as many of them may reflect not only constraints but also preferences of the owner. The purpose is similar to studies of wage gaps: to describe differences in firm-level outcomes between African-American and White owners and to examine whether there are observable differences that might account for the raw gap estimated in the baseline regression. The remaining racial gap after controlling for observables may reflect barriers (or other unobserved heterogeneity) to African-American entrepreneurs. In addition to the firm-level employment outcome, we also investigate the prevalence of African-American-owned firms on the right-tail of the employment distribution and examine the many innovation measures available from the ASE, again all at the firm level.

In order to examine heterogeneity in the relative performance of African-American entrepreneurs along several dimensions – gender, low-income PUMA area, veteran, education, and sector (especially high-technology industries) – we use the most recent available household-level data in the CPS and ACS. The regressions contain interaction terms between these characteristics and race/ethnicity.

In order to investigate whether African-American entrepreneurs face worse access to finance, we study several sets of variables. First, there is the rich set on problems accessing finance in the ASE, described in the previous section. Besides computing summary statistics for these variables by race, we specify regressions for racial differences in access to finance. In some specifications, we control for motivations and choice of industry because while they may be endogenously determined with use of capital, they also shed light on the degree to which racial gaps in financial access remain even these variables are controlled for.

The final question addressed in the project concerns the Community Reinvestment Act (CRA), a federal law intended to increase financial access and reduce redlining in low- and moderate-income (LMI) neighborhoods. Under the CRA guidelines, a tract becomes “eligible” for CRA if the ratio of the tract-level median family income (MFI) to that of the MSA where that tract is located is less than 80 percent. This discrete MFI threshold provides treatment and control groups that are very similar except for CRA eligibility for those with MFI close to the threshold. We estimate the causal effect of the CRA on African-American-owned businesses by exploiting this regulatory discontinuity created by the tract-level income threshold.

In addition to the regulatory threshold, we further exploit time variation created by a change in the reference data used to define the CRA eligibility. The change may alter CRA eligibility two different ways: by updating MFI in a tract and moving it above or below the 80 percent threshold, or by changing tract boundaries. In 2012, the reference data was changed from Census 2000 to ACS 2006-2010, updating tract MFI and accordingly CRA eligibility. This allows us to estimate with firm-level fixed effects. Permitting the CRA coefficient to vary by race of owner provides a credible estimate of the causal effect of improved access to finance under the CRA for African-American-owned relative to White-owned firms.

Results

In the following sections we document our findings and provide discussion in context of the ten research questions posed in the introduction. For convenience, we group these questions into four sections. The first section provides an overview of the racial gap between African-Americans and Whites in entrepreneurship by examining long term trends in household survey data from 1970 to present. The second section turns to firm-level data from the ASE and LBD to consider the racial differences in firm performance. The third section examines heterogeneity of the racial gaps along various demographic and firm characteristics. Finally, the fourth section of results presents analysis of the racial gaps in access to finance.

1. The Racial Gap in Entrepreneurship

Our analysis of household data supports previous research on self-employment, in some cases providing a somewhat different perspective compared with the earlier work. It also updates the basic facts on self-employment by African-Americans in the 21st century, including some data which have not been systematically studied in published sources. It provides estimates of racial gaps controlling for other variables that are correlated with entrepreneurship and that have been changing rapidly in the last 50 years, such as education and marital status. Finally, it provides new analysis, based on household survey data, of employer status and the number of employees of self-employed individuals. In order to focus and to simplify comparisons, the outcomes for African-Americans are generally assessed relative to Whites, both of them non-Hispanic, with the Hispanic population and other minorities controlled for in the analysis.

The household data come from the Decennial Census, the American Community Survey (ACS), and the Current Population Survey (CPS). Calculations of self-employment rates (the ratio of self-employed to all employed) for 10-year intervals from 1970 and annually since 2000 (when the ACS started) are shown in Figure 1.1. The self-employment rate of African-Americans is roughly half that of whites over this whole period. Some slight convergence occurred in the 1990s and again after 2005, but while the former reflected a slight relative rise in African-American self-employment, the latter resulted from an absolute fall in white self-employment.¹⁸

¹⁸ The “declining dynamism” of the U.S. economy (e.g., Decker et al. 2014), thus measured, appears to be largely an issue for Whites rather than African-Americans.

Motivated by a convention in the entrepreneurship literature that treats incorporated self-employed as more likely representing “opportunity entrepreneurship” than “necessity entrepreneurship,” Figure 1.2 divides self-employment into those who operate an incorporated business and those who are unincorporated, with the denominator kept the same as all employment for each race, respectively. The racial gap in incorporated self-employment is even much larger proportionately than the overall self-employment rate difference, with Whites 2.5 times more likely than African-Americans to operate an incorporated business (5 percent of all employed Whites versus 2 percent of all employed African-Americans). The gap shows no tendency to narrow. Correspondingly, the proportional gap in unincorporated self-employment is smaller, although still substantial. In calculations of full-time (at least 35 hours usually worked in a week) self-employment, the rates by race are similar to the overall self-employment rates, so there is little difference in the effort or commitment to the business, at least as measured in this way.

Turning to CPS data for 2014-18, Figure 1.3 shows comparisons of the African-American shares in several population groups. In all cases the group is defined to include only African-Americans and Whites, excluding other races and Hispanics, in order to show most clearly the relative change in African-Americans compared to Whites. The figure first shows three baselines: the African-American share in the total (African-American and White non-Hispanic) population, the African-American share in the adult (age 16 and over) population, and the share in the adult employed population. The African-American self-employment share among Whites and African-Americans at 9.0 percent is less than 60 percent of the employment share at 15.3 percent, while the incorporated self-employment share at 7.3 percent is less than half. The figure also contains recently available CPS data on employer status and number of employees. The African-American share among employers at 5.2 percent is only about a third of the employment share. Considering employers with increasing size, the African-American share in employers with at least 5 employees is only 4.1 percent, and for those with at least 20 employees the share is 3.4 percent, less than one-fifth the African-American share in employment.¹⁹ Correspondingly, the employer rate for African-Americans is less than 25 percent of the overall employer rate for African-Americans and Whites, and the large employer (20 or more employees) rate is less than 20 percent of the overall rate. These data, analyzed here for the first time [as far as we know], show clearly not only the well-known lower self-employment rate for African-Americans, but also the still much lower propensity for African-American entrepreneurs to hire employees and still lower propensity to hire them in large numbers.

¹⁹ The 95th percentile in the employer size distribution is close to 20 (Brown et al., 2019), so those self-employed with at least 20 employees are on the far right tail of the distribution.

The shares of the self-employed among all employed workers and those by race for Whites and African-Americans are provided in Table 1.1. These were estimated using data from the ACS covering years 2014 to 2018 (Panel A), and the CPS MORG for more recent years from 2014 through 2019 (Panel B). Table 1.2 disaggregates these shares by age, education, and marital status. The tabulations show some well-known patterns, and some less well-known. Female employment rates are higher among African-Americans than Whites, but the extra employment is among employees rather than self-employed. Being married is much more common for Whites and for self-employed compared to employees (for both races), but the proportionate gap is bigger for African-Americans. In the Table 1.2 results from the CPS, for example, the marriage rate is almost 50 percent higher among African-American self-employed than among African-American employees, while it is only about 30 percent higher among White self-employed compared to White employees. Older African-Americans (over 55 years old) are less likely to be employed, and still less likely to be self-employed, compared to Whites. African-Americans are less likely to have graduated college, but the impact of college graduation on self-employment is greater among African-Americans than Whites.

The summary statistics in Table 1.1 and Table 1.2 do not account for variation over time, which has been substantial for several of these variables. Thus, the changes in characteristics for self-employed and employee African-Americans and Whites from 1970 to 2018, as measured by the decennial census and ACS, are shown in Figures 1.4-1.7. The female shares in Figure 1.4 are rising in all categories for most of the period until 2010, but they are higher for African-Americans than Whites, both for employees and self-employed. The female share in White self-employment rises more rapidly in recent years, however, so that it essentially converges to the African-American rate of 40 percent by 2018.

The share married, graphed for the same groups in Figure 1.5, is lower for African-Americans (of both employment status) than Whites and higher for self-employed (of both races) than employees, but falling for all groups. The gap between the marriage rate for self-employed and employees is larger for African-Americans than Whites, and the African-American gap widens slightly over this period.

The education patterns in Figure 1.6 show an initially lower high school graduation rate for African-Americans than Whites. For both races, the fraction of employed persons with less than high school graduation falls rapidly, and the racial gap in high school graduation shows a large narrowing during this period. In 1970, about 60 percent of employed African-Americans had less than a high school education, compared to about 38 percent of Whites, but by 2018 they had both fallen to less

than 10 percent. Throughout, however, there is little difference in high school graduation between self-employed and employees within either race.

Correspondingly, the share with a completed bachelor's degree or more education was rising for all groups, as shown in Figure 1.7. By contrast with the lower education level in Figure 1.6, where little difference within race between employees and self-employed was observed, higher education is strongly associated with the probability of self-employment for both races. The roughly parallel time plots in Figure 1.7 reflect a proportionate narrowing of the education gaps between self-employed and employees, particularly for Whites.

Next, we use these demographic characteristics as controls in a pooled cross-sectional regression for 1970 to 2018 to assess the importance of the differences in characteristics in accounting for the self-employment gap. Results are shown in Table 1.3 for three dependent variables: a self-employed indicator, an incorporated self-employed indicator, and a full-time self-employed indicator. The estimated African-American-White gaps adjusted for the characteristics are 4, 1.6, and 3 percentage points for the self-employed, incorporated self-employment, and full-time self-employment, respectively. Relative to the unconditional mean of each outcome variable, African-Americans are 37 to 41 percent lower rates than Whites across different types of self-employment. These adjusted gaps are similar but slightly smaller than those unadjusted (5.8, 2.8, and 4.1 percentage points), suggesting that the characteristics account for relatively small proportion of the African-American-White gap in self-employment rates.²⁰

Other covariates of the models are consistent with previous research. Compared to males, females are less likely to become self-employed. Married people have higher tendencies to become self-employed. Age is positively associated with self-employment propensity. This may be because older people have more capital and higher access to finance. The education has a U shape relationship with the self-employment probability, which reflect that those with lower education (e.g., less than high school) may have difficulties in finding a job in the labor market and become self-employed. This pattern disappears in incorporated self-employment, which suggests that the education may have a linear relationship with successful entrepreneurship.

Estimating separately for each year in the data shows the evolution over time in self-employment rates. Table 1.4 and Figure 1.8 show the African-American-White differentials in the

²⁰ We also estimated specifications adding controls for broad occupational group and broad industry group. The estimated coefficients on African-American tend to fall about 30 percent with these additional controls, but otherwise the qualitative patterns are very similar.

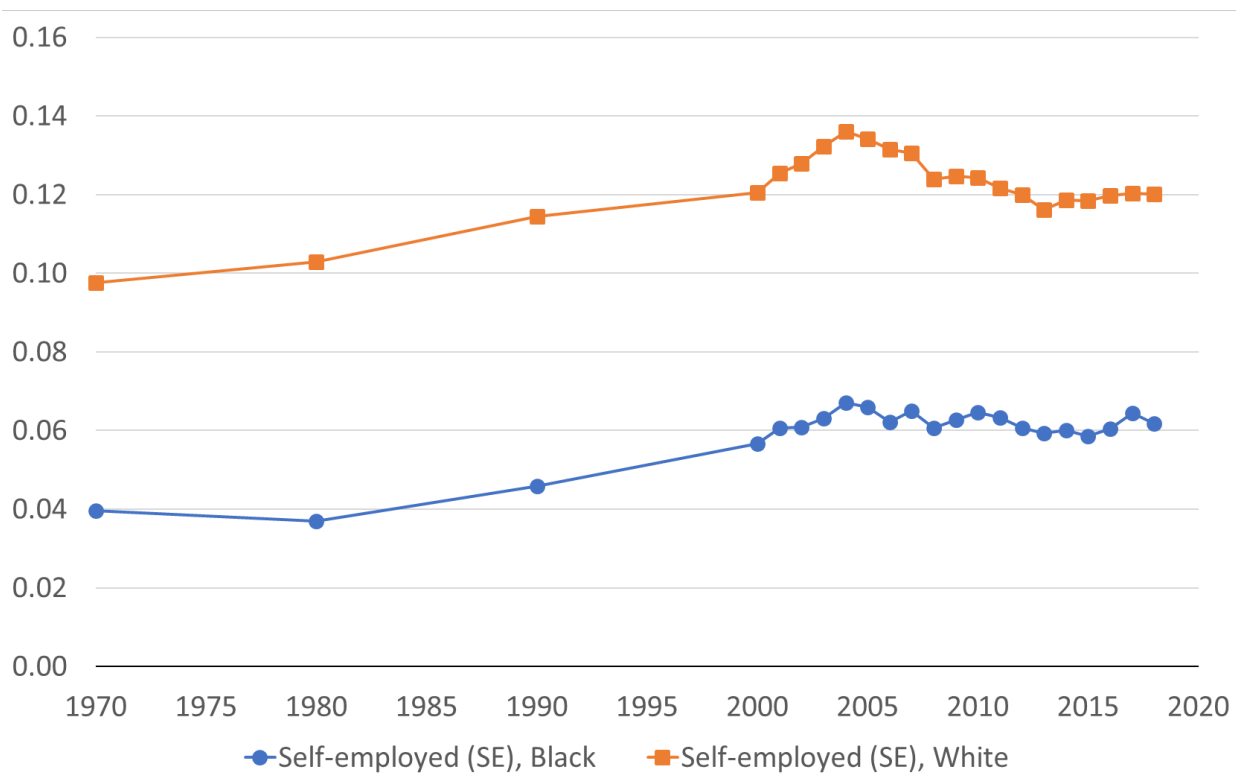
three types of self-employment (total, incorporated, and full-time). Table 1.4 contains the estimated coefficients measuring the percentage point differentials, while Figure 1.8 shows the relative percentage differentials, obtained by dividing the African-American coefficient by the overall mean in self-employment for the corresponding year. Here the results imply slight progress in reducing the regression-adjusted gap from about 40 percent to about 35 percent from 2000 to 2018.

Table 1.5 shows similar results from the CPS for the self-employment, incorporated self-employment, and full-time self-employment probabilities, and Table 1.6 examines employers and different numbers of employees in a similar regression framework. Again, the measured gaps are attenuated, but only slightly, by the inclusion of worker characteristics as controls.

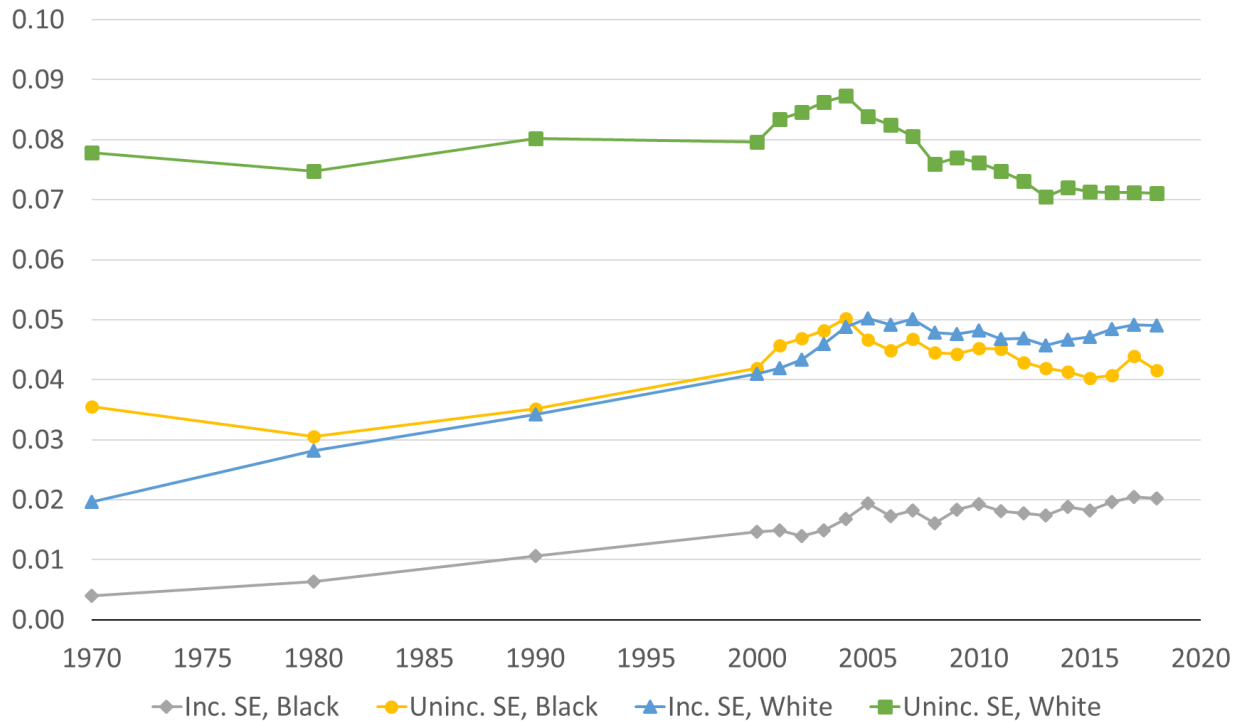
Turning to earnings, Table 1.7 shows the average hourly earnings reported in the CPS ASEC White and African-American employees and self-employed. Table 1.8 shows similar numbers normalized by the mean White employee wage. According to these reports, the self-employed earn a higher hourly rate than do employees, for both races, but the former also have higher variance of earnings. The self-employment premium is higher for African-Americans, at almost 50 percent, compared to 36 percent for Whites. The implied racial wage gap is 37 percent for employees, shrinking slightly to 32 percent for self-employed (taking the White wage as the base). But self-employed African-Americans still have mean wages lower than employee Whites. Even at the 75th percentile a self-employed African-American individual earns only 91 percent of the mean wage of a White employee.

Using the log of hourly earnings in a Mincer-type regression produces the estimates in Table 1.9. Coefficients on other variables are similar to those in previous research for the gender gap, the marriage premium, the concavity of age, and impact of schooling. Accounting for these observables lowers the estimated racial wage gap to 14.2 percent for employees and 12.7 percent for self-employed.²¹ Even controlling for these other factors, a large racial gap in earnings exists for both types of workers.

²¹ The African-American coefficients are slightly smaller if controls for broad occupation and industry are added.

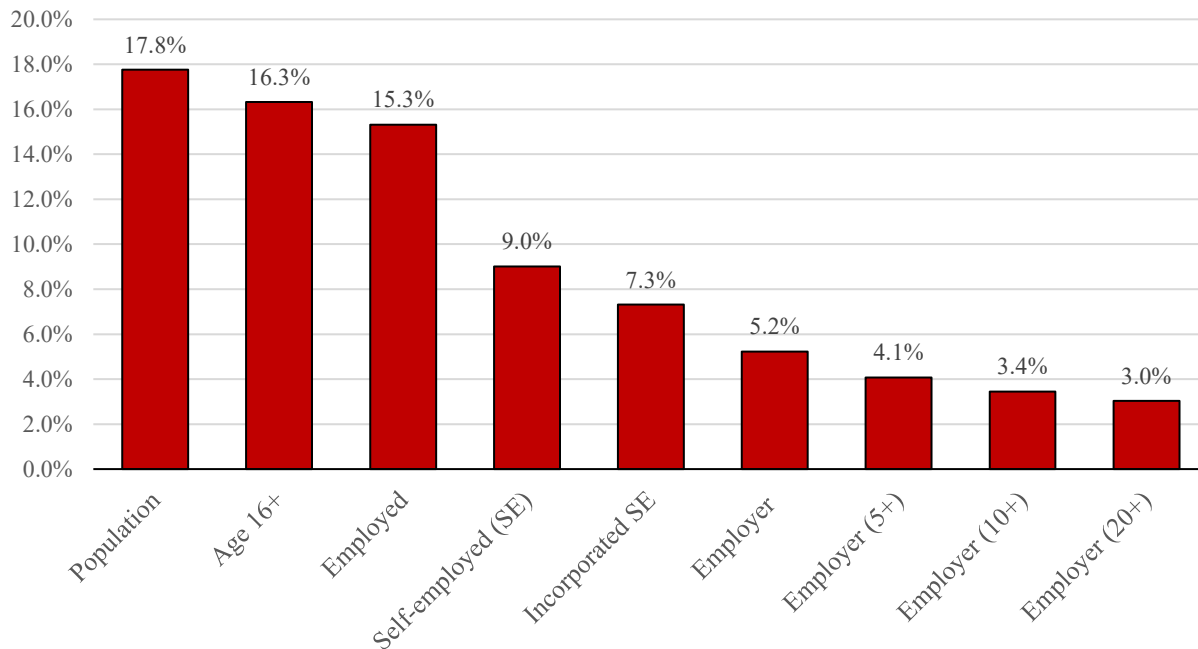
Figure 1.1. Self-Employment Rates by Race, 1970 – 2018

Note: Data are from the Decennial Census 1970, 1980, 1990, 2000, and the ACS 2001-2018. The sample is restricted to individuals who are aged 16 or more, employed in the non-agriculture sector, non-Hispanic, and either African-American or White race. Within each race (i.e., separately for African-Americans and Whites), the self-employment rate is defined as the ratio of the number of self-employed to all employed.

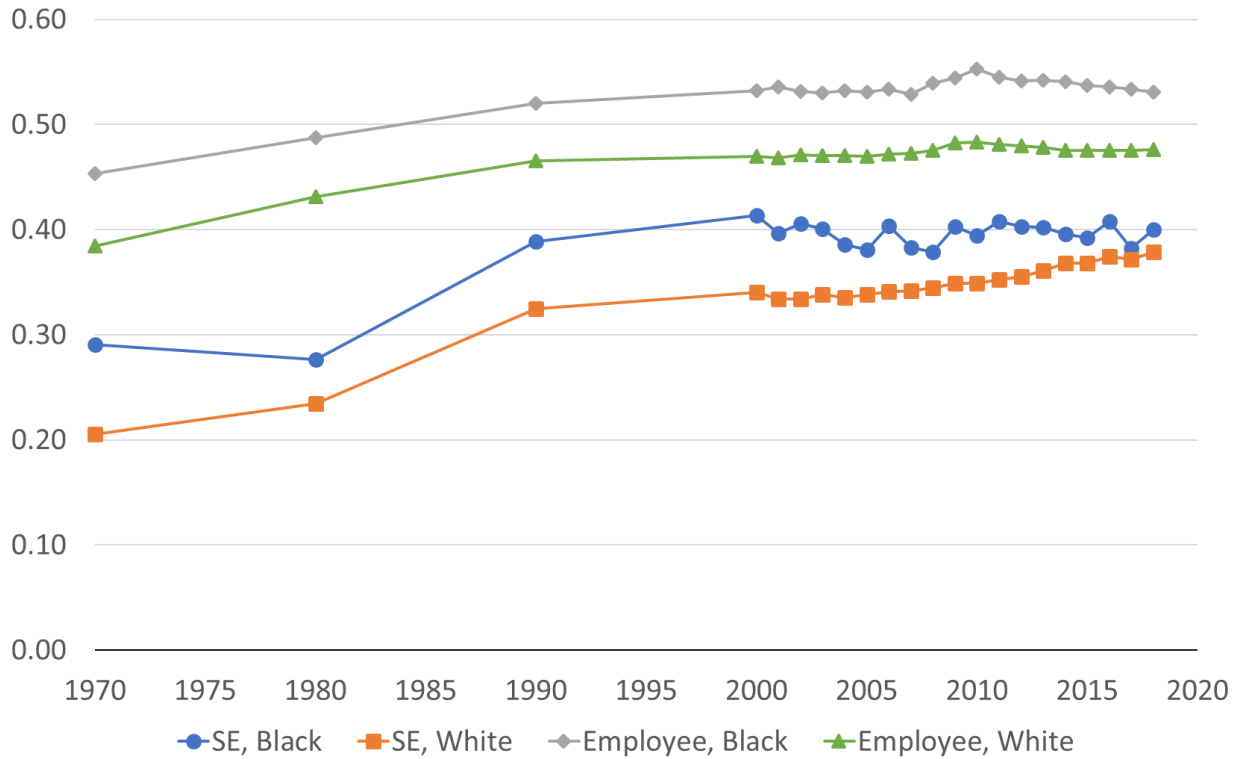
Figure 1.2. Incorporated and Unincorporated Self-Employment Rates by Race, 1970 – 2018

Note: Data are from Decennial Census 1970, 1980, 1990, 2000, and ACS 2001-2018. The sample is restricted to individuals who are aged 16 or more, employed in the non-agriculture sector, non-Hispanic, and either African-American or White race. Within each race (i.e., separately for African-Americans and Whites), the incorporated (unincorporated) self-employment rate is defined as the ratio of the number of incorporated (unincorporated) self-employed to all employed.

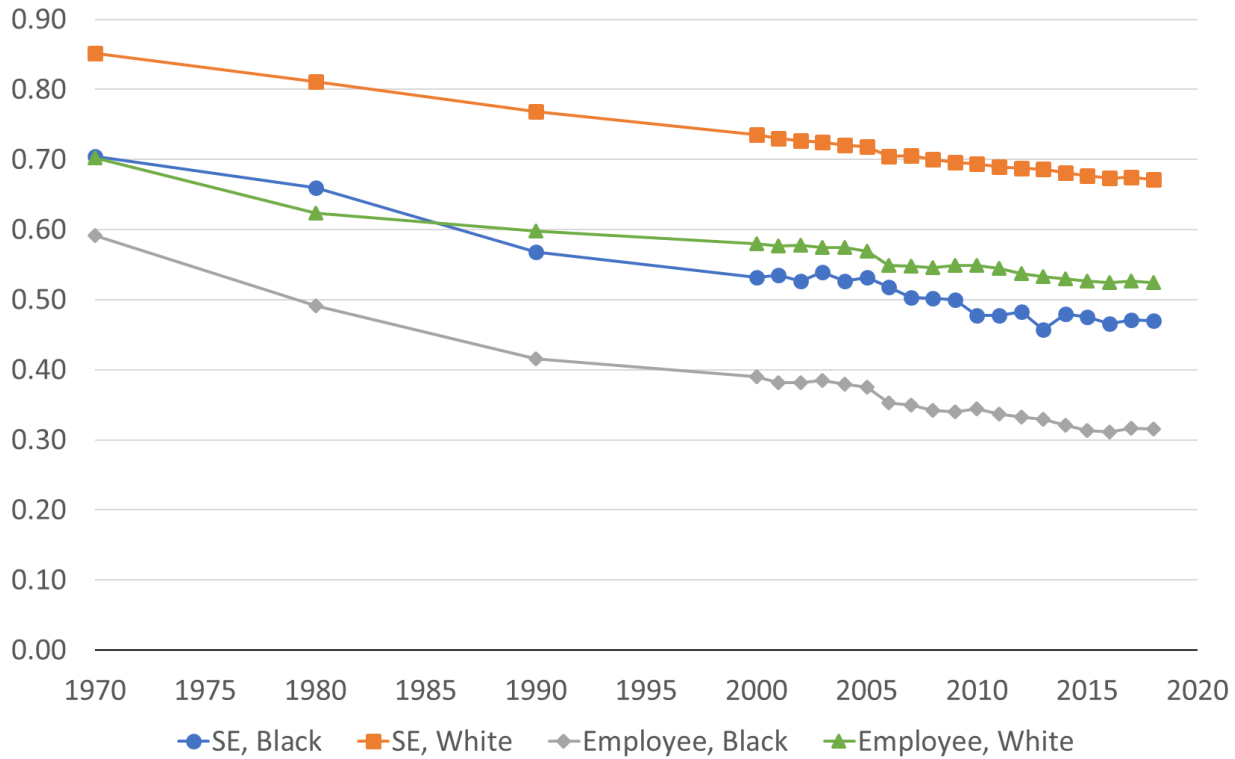
Figure 1.3. Share of African-Americans in all White and African-Americans: Population, Employed, Self-Employed, and Employers



Note: Each bar represents the percentage share of African-Americans relative to all Whites and African-Americans within each population group. Data are from CPS Outgoing Rotation Groups (ORG) 2014-2018. Samples were restricted to White and African-American to provide the share of African-American relative to White. Those in the Armed forces were excluded. From employed sample, those working in agricultural sector are further excluded from the employed. Estimates are weighted by the final weights provided by the CPS.

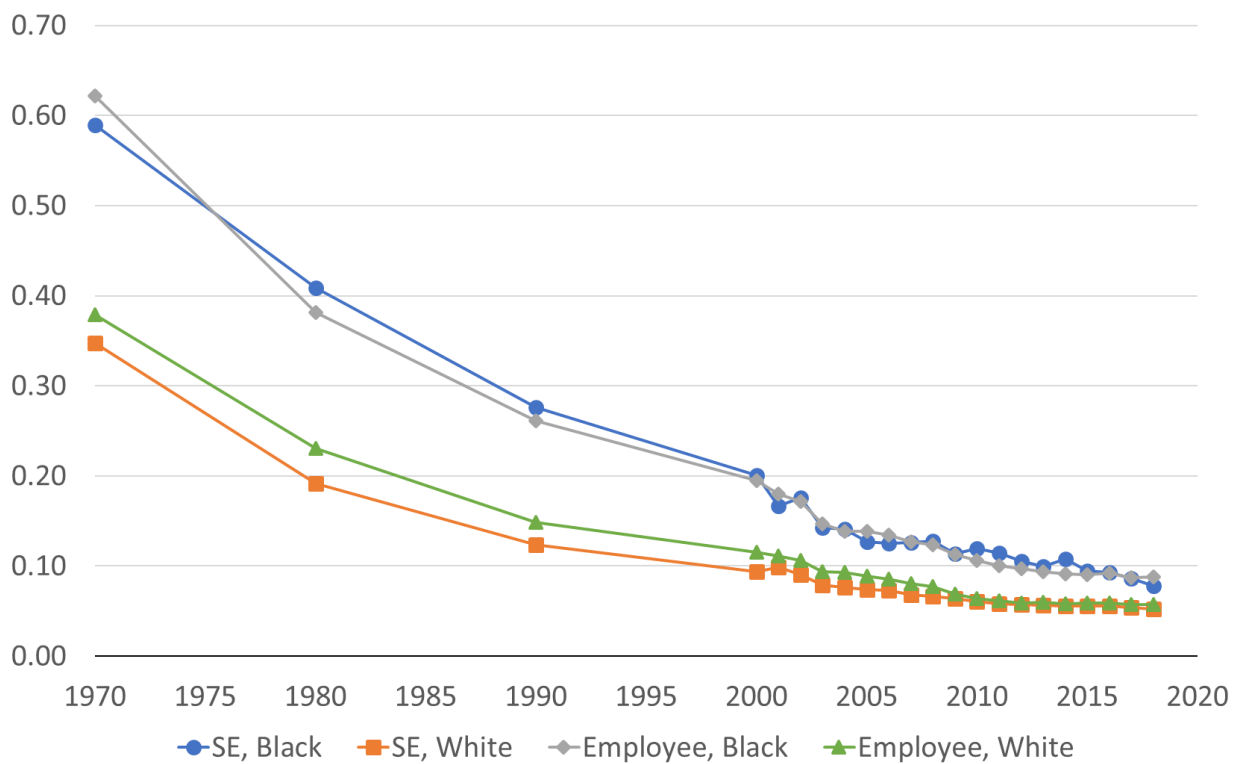
Figure 1.4. Share of Females in Employees and Self-Employed, by Race, 1970 – 2018

Note: Each plot shows the female share in the indicated group. Data are from Decennial Census 1970, 1980, 1990, 2000, and ACS 2001-2018. The sample is restricted to individuals working in the non-agriculture sector.

Figure 1.5. Share of Married in Employees and Self-Employed, by Race, 1970 – 2018

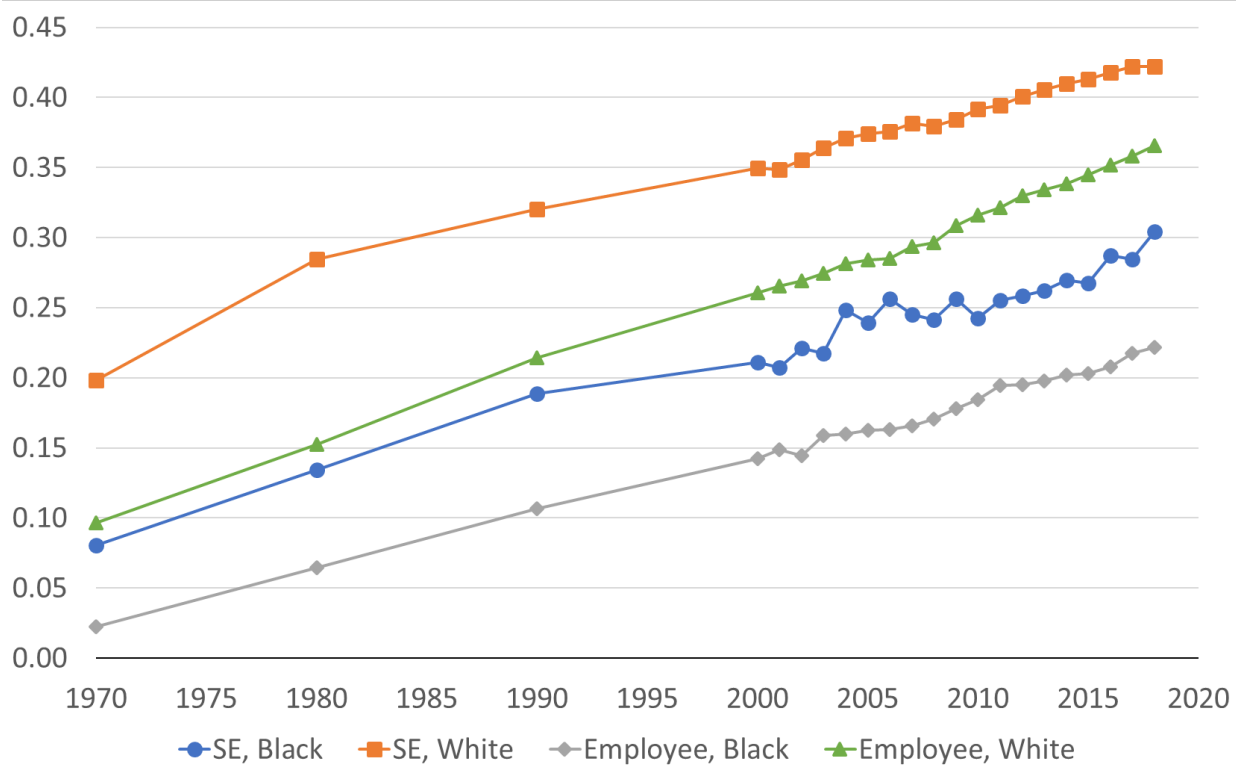
Note: Each plot shows the share of married individuals in the indicated group. Data are from Decennial Census 1970, 1980, 1990, 2000, and ACS 2001-2018. The sample is restricted to individuals working in the non-agriculture sector.

Figure 1.6. Share of People with Less Than High School Education in Employees and Self-Employed, by Race, 1970 – 2018

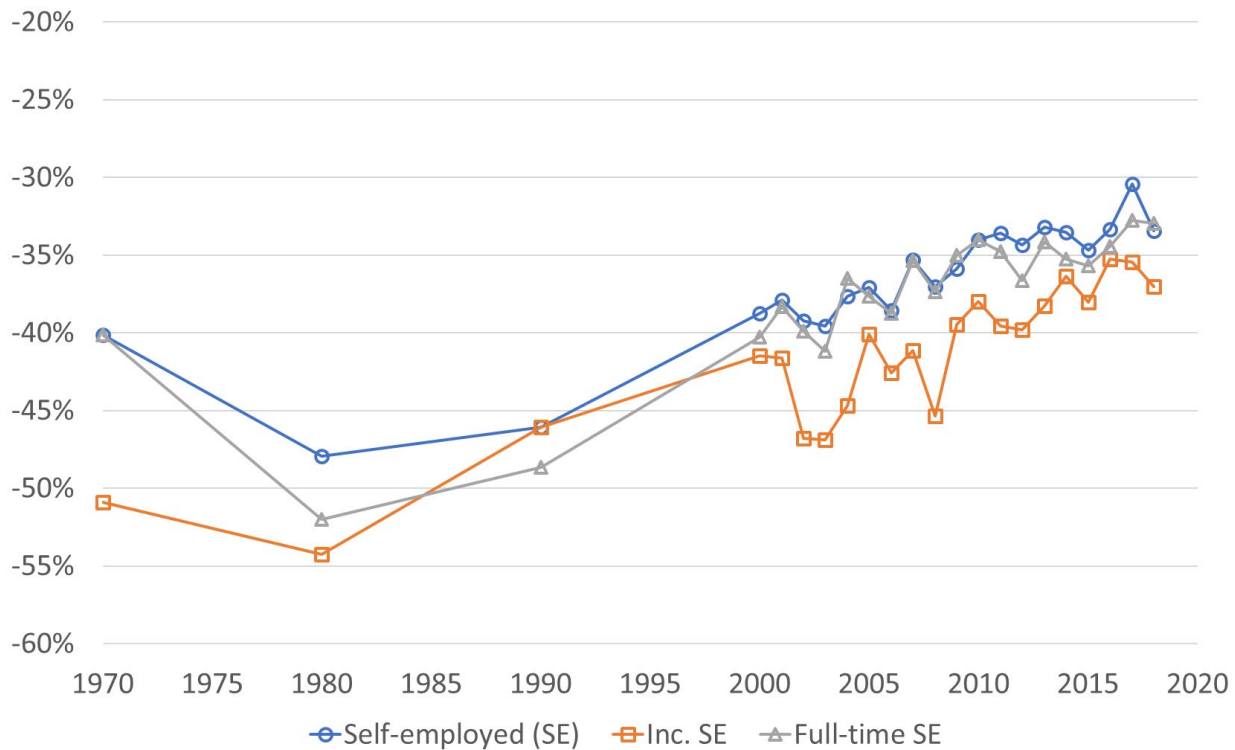


Note: Each plot shows the share of individuals with less than high-school education in the indicated group. Data are from Decennial Census 1970, 1980, 1990, 2000, and ACS 2001-2018. The sample is restricted to individuals working in the non-agriculture sector.

Figure 1.7. Share of People with BA or More Education in Employees and Self-Employed, by Race, 1970 – 2018



Note: Each plot shows the share of individuals with a Bachelor's degree or more education within the indicated group. Data are from Decennial Census 1970, 1980, 1990, 2000, and ACS 2001-2018. The sample is restricted to individuals working in the non-agriculture sector.

Figure 1.8. Regression-Adjusted Entrepreneurship Gaps: African-Americans vs. Whites, 1970 – 2018

Note: The data are from Decennial Census 1970, 1980, 1990, 2000, and ACS 2001-2018. The sample is restricted to individuals working in the non-agriculture sectors. Estimates are weighted by the person weights provided by the Decennial Census and ACS. The percentage gaps in self-employment, incorporated self-employment, and full-time self-employment are estimated by dividing the regression coefficients on African-American by the overall mean for each variable in each year.

Table 1.1. Rates of Types of Self-Employment, by Race

	All Races	White	African-American
(A) ACS 2014-2018			
Self-employed	0.108	0.119	0.061
Incorporated SE	0.041	0.048	0.020
Full-Time SE	0.073	0.081	0.040
Observations	6,072,419	4,207,559	533,639
(B) CPS ORG 2014-2019			
Self-employed	0.110	0.123	0.067
Incorporated SE	0.042	0.051	0.022
Full-Time SE	0.073	0.081	0.046
Employer	0.026	0.032	0.010
Employer 5+	0.0111	0.0140	0.0033
Employer 10+	0.0062	0.0080	0.0016
Employer 20+	0.0029	0.0039	0.0007
Employer 50+	0.0009	0.0012	0.0002
Mean (SD) Employees (among employers)	8.5 (13.6)	9.1 (14.3)	6.4 (11.0)
Observations	911,174	629,681	85,014

Note: Data are from ACS 2014-2018. and CPS ORG 2014-2019. The sample is restricted to civilians, aged 16 or over, who are employed in the non-agriculture sector. Except for the last variable at the bottom of the table, all figures shown are column proportions. For the last variable (the mean number of paid employees), the sample is restricted to self-employed with paid employees (employers), with the standard deviation (SD) of the number of employees shown in parentheses. Estimates are weighted by the person weights for the ACS and the final weights for the CPS ORG. See text for more details on sources and variables.

Table 1.2. Characteristics of Self-Employed and Employees by Race

	All Races	White		African-American	
	Employed	Employee	SE	Employee	SE
(A) ACS 2014-2018					
Age 16-24	0.139	0.141	0.026	0.176	0.040
Age 25-54	0.645	0.625	0.552	0.669	0.679
Age 55+	0.216	0.234	0.422	0.156	0.281
Female	0.465	0.475	0.372	0.535	0.396
< High School	0.100	0.058	0.055	0.090	0.091
High School	0.258	0.252	0.230	0.307	0.273
Some College	0.325	0.339	0.299	0.392	0.353
BA+	0.317	0.352	0.417	0.211	0.283
Married	0.507	0.526	0.676	0.315	0.472
Observations	6,072,419	3,673,133	534,426	498,782	34,857
(B) CPS ORG 2014-2019					
Age 16-24	0.134	0.137	0.023	0.168	0.038
Age 25-54	0.644	0.623	0.548	0.670	0.701
Age 55+	0.222	0.240	0.428	0.162	0.261
Female	0.457	0.469	0.360	0.528	0.362
< High School	0.091	0.052	0.041	0.078	0.059
High School	0.274	0.264	0.233	0.331	0.276
Some College	0.291	0.303	0.268	0.350	0.330
BA+	0.344	0.381	0.458	0.240	0.334
Married	0.534	0.548	0.701	0.339	0.502
Observations	911,174	548,977	80,704	79,287	5,727

Note: Data are from ACS 2014-2018, and CPS ORG 2014-2019. The sample is restricted to individuals working in the non-agriculture sectors. Estimates are weighted by the person weights for the ACS and the final weights provided by the CPS.

Table 1.3. Regression-Adjusted Racial Gaps in Self-Employment, Decennial Census and ACS Data

VARIABLES	(1) SE	(2) Inc. SE	(3) FT SE
African-American	-0.0404*** (0.0002)	-0.0158*** (0.0001)	-0.0300*** (0.0002)
Asian	-0.0109*** (0.0004)	-0.0009*** (0.0003)	-0.0028*** (0.0004)
Other	-0.0017** (0.0008)	-0.0079*** (0.0004)	-0.0041*** (0.0007)
Hispanic	-0.0092*** (0.0003)	-0.0104*** (0.0001)	-0.0102*** (0.0002)
Female	-0.0423*** (0.0002)	-0.0254*** (0.0001)	-0.0546*** (0.0001)
Married	0.0239*** (0.0002)	0.0176*** (0.0001)	0.0181*** (0.0002)
Age	0.0024*** (0.0000)	0.0007*** (0.0000)	0.0055*** (0.0000)
Age Squared	0.0000*** (0.0000)	0.0000*** (0.0000)	-0.0000*** (0.0000)
< High School	0.0063*** (0.0003)	-0.0045*** (0.0001)	0.0005** (0.0002)
Some College	0.0070*** (0.0002)	0.0076*** (0.0001)	0.0046*** (0.0002)
BA+	0.0308*** (0.0002)	0.0261*** (0.0001)	0.0211*** (0.0002)
Mean of Dep. Var.	[0.1103]	[0.0384]	[0.0803]
Year Fixed Effects	Yes	Yes	Yes
Observations	33,101,432	33,101,432	32,700,483
R-squared	0.0432	0.0259	0.0364

Note: Data are from Decennial Census 1970, 1980, 1990, 2000, and ACS 2001-2018. The sample is restricted to individuals working in the non-agriculture sectors. Estimates are weighted by the final weights provided by the ACS. The reference groups are Non-Hispanic White, male, single, and high school for race/ethnicity, gender, marital status, and education, respectively.

Table 1.4. Regression-Adjusted Racial Gaps in Self-Employment, by Year

VARIABLES	(1) SE	(2) Inc. SE	(3) FT SE
African-American 1970	-0.0365*** (0.0007)	-0.0091*** (0.0002)	-0.0365*** (0.0007)
African-American 1980	-0.0453*** (0.0004)	-0.0138*** (0.0002)	-0.0401*** (0.0003)
African-American 1990	-0.0483*** (0.0004)	-0.0143*** (0.0002)	-0.0399*** (0.0004)
African-American 2000	-0.0423*** (0.0004)	-0.0150*** (0.0002)	-0.0338*** (0.0004)
African-American 2001	-0.0426*** (0.0017)	-0.0150*** (0.0009)	-0.0330*** (0.0015)
African-American 2002	-0.0450*** (0.0018)	-0.0173*** (0.0009)	-0.0343*** (0.0016)
African-American 2003	-0.0470*** (0.0017)	-0.0185*** (0.0009)	-0.0364*** (0.0015)
African-American 2004	-0.0460*** (0.0018)	-0.0187*** (0.0010)	-0.0332*** (0.0016)
African-American 2005	-0.0445*** (0.0012)	-0.0174*** (0.0007)	-0.0334*** (0.0011)
African-American 2006	-0.0455*** (0.0010)	-0.0179*** (0.0006)	-0.0336*** (0.0009)
African-American 2007	-0.0415*** (0.0010)	-0.0176*** (0.0006)	-0.0305*** (0.0009)
African-American 2008	-0.0415*** (0.0010)	-0.0185*** (0.0005)	-0.0302*** (0.0009)
African-American 2009	-0.0407*** (0.0010)	-0.0161*** (0.0006)	-0.0278*** (0.0009)
African-American 2010	-0.0383*** (0.0010)	-0.0157*** (0.0006)	-0.0264*** (0.0009)
African-American 2011	-0.0369*** (0.0011)	-0.0157*** (0.0006)	-0.0261*** (0.0009)
African-American 2012	-0.0375*** (0.0010)	-0.0159*** (0.0006)	-0.0273*** (0.0009)
African-American 2013	-0.0351*** (0.0010)	-0.0149*** (0.0006)	-0.0246*** (0.0009)
African-American 2014	-0.0359*** (0.0010)	-0.0144*** (0.0006)	-0.0257*** (0.0008)
African-American 2015	-0.0369*** (0.0010)	-0.0151*** (0.0006)	-0.0259*** (0.0008)
African-American 2016	-0.0359*** (0.0010)	-0.0144*** (0.0006)	-0.0252*** (0.0008)
African-American 2017	-0.0330*** (0.0010)	-0.0147*** (0.0006)	-0.0242*** (0.0009)
African-American 2018	-0.0362***	-0.0153***	-0.0243***

(0.0010) (0.0006) (0.0009)

Note: Data are from Decennial Census 1970, 1980, 1990, 2000, and ACS 2001-2018. The sample is restricted to individuals working in non-agriculture sectors. Coefficients (standard errors) are from separate regressions for each year. Each regression controls other races, age, gender, marital status, and education levels. ACS estimates are weighted by the final weights provided by the ACS.

Table 1.5. Regression-Adjusted Racial Gaps in Self-Employment, CPS ORG Data

VARIABLES	(1) SE	(2) Inc. SE	(3) FT SE
African-American	-0.0315*** (0.0011)	-0.0144*** (0.0007)	-0.0192*** (0.0009)
Asian	-0.0180*** (0.0015)	-0.0070*** (0.0010)	-0.0057*** (0.0013)
Other	-0.0071** (0.0029)	-0.0114*** (0.0017)	-0.0100*** (0.0024)
Hispanic	-0.0082*** (0.0010)	-0.0132*** (0.0006)	-0.0057*** (0.0009)
Female	-0.0414*** (0.0007)	-0.0273*** (0.0005)	-0.0495*** (0.0006)
Age	0.0015*** (0.0002)	0.0005*** (0.0001)	0.0049*** (0.0001)
Age Squared	0.0000*** (0.0000)	0.0000*** (0.0000)	-0.0000*** (0.0000)
< High School	0.0123*** (0.0014)	-0.0072*** (0.0007)	0.0021* (0.0011)
Some College	0.0089*** (0.0009)	0.0078*** (0.0006)	0.0032*** (0.0008)
BA+	0.0265*** (0.0010)	0.0254*** (0.0006)	0.0143*** (0.0008)
Married	0.0248*** (0.0008)	0.0195*** (0.0005)	0.0176*** (0.0007)
Mean of Dep. Var.	[0.1098]	[0.0425]	[0.0735]
Month Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
Observations	911,174	911,174	911,174
R-squared	0.0425	0.0282	0.0301

Note: Data are from CPS ORG 2014-2019. The sample is restricted to individuals working in non-agriculture sectors. Estimates are weighted by the final weights provided by the CPS. The reference groups are Non-Hispanic White, male, single, and high school for race/ethnicity, gender, marital status, and education, respectively.

Table 1.6. Racial Gaps in Employer Probability

VARIABLES	(1) Employer	(2) Emp 5+	(3) Emp 10+	(4) Emp 20+
African-American	-0.0125*** (0.0004)	-0.0063*** (0.0003)	-0.0038*** (0.0002)	-0.0019*** (0.0001)
Asian	0.0006 (0.0009)	-0.0009 (0.0006)	-0.0014*** (0.0004)	-0.0014*** (0.0003)
Other	-0.0040*** (0.0014)	-0.0033*** (0.0008)	-0.0012* (0.0007)	-0.0006 (0.0004)
Hispanic	-0.0081*** (0.0005)	-0.0049*** (0.0003)	-0.0030*** (0.0002)	-0.0016*** (0.0001)
Female	-0.0212*** (0.0004)	-0.0093*** (0.0002)	-0.0056*** (0.0002)	-0.0030*** (0.0001)
Age	-0.0001* (0.0001)	-0.0000 (0.0001)	-0.0001* (0.0000)	-0.0000 (0.0000)
Age Squared	0.0000*** (0.0000)	0.0000*** (0.0000)	0.0000*** (0.0000)	0.0000*** (0.0000)
< High School	-0.0012** (0.0006)	-0.0008** (0.0004)	-0.0004 (0.0003)	-0.0002 (0.0002)
Some College	0.0025*** (0.0004)	0.0015*** (0.0003)	0.0010*** (0.0002)	0.0006*** (0.0001)
BA+	0.0100*** (0.0005)	0.0066*** (0.0003)	0.0046*** (0.0003)	0.0025*** (0.0002)
Married	0.0140*** (0.0004)	0.0064*** (0.0002)	0.0036*** (0.0002)	0.0016*** (0.0001)
Mean of Dep. Var.	[0.0262]	[0.0111]	[0.0062]	[0.0029]
Month Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Observations	911,174	911,174	911,174	911,174
R-squared	0.0206	0.0099	0.0062	0.0034

Note: Data are from CPS ORG 2014-2019. The dependent variables are dummies for whether the person has paid employees, whether they have at least 5 paid employees, at least 10, and at least 20, respectively. The sample is restricted to individuals working in non-agriculture sectors. Estimates are weighted by the final weights provided by the CPS. The reference groups are Non-Hispanic White, male, single, and high school for race/ethnicity, gender, marital status, and education, respectively.

Table 1.7. Hourly Earnings by Race, Employees and Self-Employed

	Employed	White		African-American	
		Employee	SE	Employee	SE
Mean	30.9	33.5	45.4	21.1	31.0
SD	361.5	463.9	243.4	51.5	96.1
P10	7.6	8.3	5.4	6.7	4.8
P25	11.5	12.6	11.5	10.0	9.6
P50	18.8	20.1	21.4	15.0	16.8
P75	30.8	33.1	40.2	23.5	30.6
P90	50.0	52.1	76.9	36.1	54.2
Observations	381,275	204,738	27,310	38,940	2,623

Note: Data are from CPS ASEC 2015-2019. P10 – P90 refer to the wage at various percentiles of the hourly earnings distribution. The sample is restricted to individuals working in the non-agriculture sectors. Estimates are weighted by the ASEC weights provided by the CPS.

Table 1.8. Hourly Earnings by Race, Normalized by Mean White Employee Wage

	Employed	White		African-American	
		Employee	SE	Employee	SE
Mean	0.92	1.00	1.36	0.63	0.93
P10	0.23	0.25	0.16	0.20	0.14
P25	0.34	0.38	0.34	0.30	0.29
P50	0.56	0.60	0.64	0.45	0.50
P75	0.92	0.99	1.20	0.70	0.91
P90	1.49	1.56	2.30	1.08	1.62
Observations	381,275	204,738	27,310	38,940	2,623

Note: Data are from CPS ASEC 2015-2019. These figures are derived from Table 1.7 by dividing throughout by the mean wage for White employees of 33.5.

Table 1.9. Regression-Adjusted Racial Gaps in Hourly Earnings

VARIABLES	(1)	(2)
	Log of Hourly Wages	
	Employee	SE
African-American	-0.142*** (0.004)	-0.127*** (0.025)
Asian	0.007 (0.006)	-0.060** (0.026)
Other	-0.088*** (0.010)	-0.051 (0.052)
Hispanic	-0.118*** (0.004)	-0.134*** (0.019)
Female	-0.235*** (0.003)	-0.365*** (0.014)
Age	0.156*** (0.003)	0.093*** (0.015)
Age Squared	0.047*** (0.001)	0.019*** (0.003)
< High School	-0.000*** (0.000)	-0.000*** (0.000)
Some College	-0.199*** (0.005)	-0.163*** (0.025)
BA+	0.137*** (0.003)	0.121*** (0.018)
Married	0.590*** (0.004)	0.594*** (0.017)
Year Fixed Effects	Yes	Yes
Observations	341,660	38,921
R-squared	0.269	0.099

Note: Data are from CPS ASEC 2015-2019. The sample is restricted to the employed in the non-agriculture sectors. Estimates are weighted by the ASEC weights provided by the CPS. The reference groups are Non-Hispanic White, male, single, and high school for race/ethnicity, gender, marital status, and education, respectively.

2. Firm Performance: Racial Differences

2A. Summary statistics

Tabulations of the characteristics of African-American owners of employer-businesses in the 2014 Annual Survey of Entrepreneurs (ASE) provide a portrait of these entrepreneurs and their businesses subject to the sample restrictions (principally the requirement for firms to have at least one owner with at least 10 percent ownership, so that there is information on the owner's characteristics, including race).²² Table 2A.1 contains basic statistics on demographic variables. Starting with race/ethnicity, the data indicate that African-Americans (i.e., non-Hispanic African-Americans) own only 1.72 percent of employer-firms in the U.S., while Whites own 84 percent, Asians 9 percent, and Hispanics 5 percent. The African-American share is even smaller than that implied by the CPS analysis above, perhaps because of the types of businesses responding to the firm-level ASE differs from those in the household CPS.

The share of women among African-American owners is much higher than for Whites (38 versus 27 percent). African-American owners tend to be younger than Whites: 26 percent of African-Americans are less than 45, compared with 20 percent for Whites, while only 32 percent of African-Americans but 52 percent of Whites are aged 55 or older. African-American owners are more likely to be immigrants (not born a US citizen): 20 percent versus 7 for Whites.

Turning to ownership structure, Table 2A.2 provides information on the size and composition of ownership teams. Again, owners are weighted by their ownership shares in the business. The data contain two ways of measuring the number of owners: a direct question on the total and also the count of the owners for whom detailed information is provided. The two variables yield consistent but not identical results, both showing that African-American owners are more likely to be the sole owner than Whites: for each variable, the difference is more than 10 percentage points. Conversely, African-Americans are much less likely to be members of multi-owner teams: for teams of 2-4 owners, the percentage of African-Americans is 29 percent, versus 38 percent of Whites, and Whites are nearly twice as likely to own firms with more than 4 owners. Among the sole owners, African-Americans are much more likely to be female (27 percent of African-Americans, compared with 14 percent of Whites). The table also shows four different types of diversity, of which the most common is within-family gender diversity (15 percent of African-American owners and 22 percent of Whites). African-Americans are much more likely to participate in teams that are racially or ethnically diverse, which to

²² The analysis focuses on the 2014 ASE because of the richness of variables measuring entrepreneurial motivations and innovation. But the patterns of other characteristics described here are very similar in other ASEs and in the SBOs.

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.²³ Finally, Table 2A.2 shows firm age: African-American-owned businesses tend to be much younger than White-owned: 22 percent for African-Americans versus 13 percent for Whites are recent start-ups less than three years old, 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, and therefore is a basic characteristic that should be taken into account when making comparisons across businesses.

Human capital differences between the African-American and White employer-owners in the ASE sample are shown in Table 2A.3. The main difference in terms of formal schooling is that the African-American owners are much more likely to have advanced degrees: 34 percent of African-Americans 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 African-Americans. African-Americans are somewhat more likely to be veterans of the armed forces: 13 versus 11 percent for Whites.

Table 2A.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”). African-Americans are substantially more 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 African-Americans cite is about 10 percentage points higher than for Whites. African-Americans are also more likely to cite the creative motivation of “best avenue for ideas,” by a similar margin. Concerning the measure of “necessity entrepreneurship” (“unable to find employment”), the rate is higher for African-Americans, 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 African-Americans and 40 percent of Whites. There is a relatively small difference in having an “entrepreneurial role model,” but again African-Americans are more likely to cite this motivation than Whites: 28 versus 23 percent, respectively. Finally, Table 2A.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.” African-American owners are more

²³ The fractions of all racially or ethnically diverse teams including an African-American owner is tiny – about 0.15 percent of all firms – making them difficult to analyze.

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 and aspirations for growth remain even after controlling for other demographic and human capital characteristics.

Racial differences in financial access, as measured from the ASE, are shown in Table 2A.5. Finance is measured as of start-up and in the reference year of 2014. For the amount of start-up capital, a dummy for greater than \$100,000 shows a higher rate for White owners compared with African-American: 18 versus 14 percent. Concerning the source of start-up capital, African-Americans 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 African-Americans compared to Whites. Most of the variables for 2014 focus on outside investment. While African-American 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. Dummy variables for sources of finance in 2014 show that African-Americans are again less likely to receive new bank loans (8 versus 10 percent), and too few receive other forms to merit comparison; for instance, angels and venture capital investments were received in 2014 by only about one in 400 firms, again slightly more by African-American than White owners. Finally, 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 African-Americans say yes to this, compared with only 4 percent of Whites. The second variable asks whether lack of access to capital negatively affected their profits: 27 percent of African-American owners and 10 percent of White owners respond affirmatively. Thus, the data show some evidence, varying depending on the specific measure employed, of an African-American 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.

Table 2A.6 shows the industry composition of businesses owned by African-Americans and Whites. African-American ownership is relatively much higher than Whites in health care, with 27 percent of African-American 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: the education sector for example is twice as likely for African-Americans as Whites, but the respective figures 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 2A.7 shows ASE data on these choices. African-American owners tend to work longer hours in their businesses than do White owners: 29 percent of African-Americans work more than 60 hours, compared to 20 percent of Whites. African-Americans are also more likely to work as managers (83 percent versus 80 for Whites) and as producers (67 versus 63 percent), but they are less likely to exercise financial control (71 versus 74 percent). African-Americans 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).

Summary statistics for outcome variables are displayed in Table 2A.8. Starting with employment size, African-American-owned firms have 9.1 employees on average compared with 10.8 among White-owned. Concerning the right tail of the distribution, here measured as the top five percent in employment size, 4.6 percent of firms owned by African-Americans are in this category compared with 5.5 percent of those owned by Whites.²⁴ Table 2A.8 also shows the fraction exporting: 7.4 percent for White-owned firms and 3.9 percent among those owned by African-Americans. Of course, these differences in means do not control for other variables correlated with firm size and exporting propensity.

Table 2A.8 also shows measures of innovation. The “Any Innovation” variable, equaling one if the firm carried out any of 12 listed product and process innovation activities in the previous three years (2012-14), shows a higher rate among African-American owners (57 percent) than Whites (53 percent). The total number of those twelve types reported, the “Innovation Count” is also higher for African-Americans: 2.4 versus 2.1, on average. Concerning types of innovations, African-American owners have carried out more of both product and process innovations. They are less likely to have introduced completely new products, but they are more likely to have made them easier to use, to upgrade techniques, reduced cost, or changed delivery method. Although few firms carry out research and development (R&D), African-American-owned firms are more likely to do so for both basic and applied R&D in 2014 (the reference year for the R&D questions on the ASE). However, they are less likely to hold copyrights, trademarks, or patents. In the following subsection, we investigate whether these raw differences are associated with other characteristics of African-American entrepreneurs and their firms.

²⁴ The cutoff for five percent is 33 employees. Because the top five percent is measured using the full LBD, the percentage in the full ASE sample is not exactly equal to five percent.

2B. Regression results

The first set of regression estimates, shown in Table 2B.1, uses the motivation variables (dummies for “very important” for each type of motivation) and aspiration to grow as dependent variables. The table contains four specifications. The first (“other racial/ethnic groups”) includes only dummies for other groups so that the coefficients represent the difference of unconditional means between African-American and White owners, and the standard errors provide conventional t-tests of the difference of means. The second specification adds controls for firm age and number of owners, which are correlated with both race and firm performance outcomes; the third adds controls for demographic characteristics of the owner (gender, age, immigrant, diversity of the team if multiple owners); and the fourth adds human capital (educational attainment categories, prior business experience, veteran).

Compared to Whites, African-American owners report motivations that are substantially stronger – about 10 percentage points higher – in categories that can be characterized as both pecuniary (“opportunity for higher income”) and non-pecuniary (“flexible hours” and “balance work and family”). By a similar margin, African-American owners are also more likely to express the creative goal of actualizing a new idea (“best avenue for ideas/goods/services”). The biggest difference is that African-American owners are much more likely – nearly 20 percentage points – to report they “always wanted to start a business.” And they are five percentage points more likely to point to an “entrepreneurial role model” among friends or family as their own motivation. On the other hand, they are only slightly more likely – two to three percentage points – to have a “necessity entrepreneurship” motivation (“unable to find job”), and there is no difference in aversion to working as an employee (“unappealing to work for someone else”). These patterns are quite robust, affected little by controlling for all the other characteristics. The data therefore imply strong positive entrepreneurial motivations among African-Americans, with business ownership driven by creativity, income, job aspects, and dreams of starting a business, all of which are stronger among African-Americans than Whites.

While these measures of motivations are essentially backward-looking, as they pertain to the reasons for business ownership, Table 2B.1 also contains results for the forward-looking variable concerning aspirations for the business to grow (whether the desired size, in revenue or profits, is larger in five years). African-American owners are more than 10 percentage points more likely to desire business growth than are White owners, a result that is again robust across the four specifications shown in the table.

Turning to measures of business performance, each of the next tables includes results from eight regression specifications. The first four are the same as in Table 2B.1. The fifth adds controls for the motivation indicators (with dummies for both “somewhat important” and “very important” included). The sixth includes controls for financial access (the variables shown in Table 2A.5, including detailed categories of amounts of start-up finance and amount of outside finance received in 2014). The seventh specification adds a set of 4-digit industry effects. The eighth adds controls for other choices made by owners about the business and their own involvement in it (the variables discussed in Table 2A.7). The rationale for these specifications, as explained in the Methods section, is that they are increasingly endogenous to business performance. Adding them gradually to the equation may help to clarify the factors lying behind any racial differences.

Table 2B.2 begins this analysis with business performance measured as employment and exports. Employment (logged) in 2014 is about 12 percentage points smaller on average in African-American-owned firms, when no controls are included, in Specification (1). But Specification (2) shows that this mean difference is associated with younger firm age and smaller number of owners among firms with African-American owners, patterns observed in Table 2A.2. Once these two factors are added as controls, African-American-owned firms are on average three percent larger than White-owned, although the difference is not statistically significant at conventional levels. The coefficient is fairly similar with controls for demographics, human capital, and motivations, but it jumps to 0.073 when the financial variables are added in Specification (6). This result suggests that worse access to finance lowers the size of African-American businesses; once this is taken into account, their employment is on average seven percentage points larger than that of White-owned businesses.

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 African-American owners tend to choose industries where firms have more employees on average. Finally, the coefficient becomes somewhat larger in magnitude and significant at the five percent level when owners’ choices are included as regressors, in Specification (8). An interpretation of this result is that African-American owners have more growth-oriented involvement in their businesses, so that when this factor is taken into account, their firms are smaller on average. The difference is slight however: only about 4.4 percent. The conclusion is also that, at least among the ASE sample of employer-firms, African-American ownership is not associated with much if any lower numbers of employees, and in some specifications, such as (6), they have significantly more employees.

A second employment variable concerns the right tail of the distribution of the number of employees, in some sense the “high growth” firms. The results with an indicator for the top five percent by employment size, shown in Table 2B.2, should be interpreted as the difference in the probability of being in that top ventile between African-American-owned and White-owned firms (where the unconditional mean of the dependent variable is 0.05, as in Table 2A.8). With no controls, in Specification (1), the coefficient of -0.009 implies that African-American-owned firms are about one percentage point or 20 percent less likely to be in the top ventile, compared to White-owned firms. But once firm age and number of owners are accounted for, in Specification (2), the coefficient flips sign and implies that African-American-owned firms are 10 percent ($0.005/0.05$) more likely to be in the top 5 percent. Controls for demographic and human capital characteristics and motivation make only slight differences in the coefficient, but it rises to 1.1 percentage point, or about a 22 percent advantage for African-American-owned relative to White-owned businesses, when financial variables are included as controls, in Specification (6). Again, the data suggest that financial constraints limit the possibilities for African-American entrepreneurs to contribute to growth.²⁵

Table 2B.2. also contains the results for exporting behavior, measured here as a simple dummy as to whether the firm exports or not. This variable has an unconditional mean of 0.079, so the estimated coefficients imply a substantially lower exporting probability for African-American- compared to White-owned firms, from about 40 to 50 percent, for Specifications (1)-(6). Only when industry controls are included, in Specification (7), does the estimated gap shrink by about two-thirds. These results suggest that African-American owners tend to be more oriented, relative to Whites, towards domestic than international markets, and that they tend to choose sectors for their businesses that involve less exporting.

The analysis now turns to measures of innovation. Tables 2B.3 and 2B.4 contain results for innovation activities over the previous three years. Regardless of specification, African-American owners are more likely to report some sort of innovation activity (“Any Innovation”) and to report a larger number of activities (“Innovation Count”). While in most specifications they are more likely to report product innovations, they are especially likely to report process improvements. The types of innovations less common in African-American-owned firms involve new products, including both “Completely New Product to the Market” and “New Product to this Business.” But they are much more likely to have “Make Product Easier to Use,” and among process improvements to have

²⁵ Brown, Earle, Kim, and Lee (2019) carry out a similar analysis using the entry cohort in the 2007 SBO. They report a large negative gap in the probability of being in the top 5 percent for African-Americans versus Whites at age zero, but a much smaller one by age seven. Controlling for financial variables raises both coefficients, so that the estimated gap is essentially zero on entry and positive at age seven.

“Upgraded Technique,” “Decreased Production Costs,” and “Changed Delivery Method.” The estimated magnitudes of the racial gaps vary somewhat across specifications, with the African-American-owner coefficient tending to fall when human capital characteristics and entrepreneurial motivations are included as controls. This pattern reflects the patterns of Table 2A.3 and 2A.4, whereby African-American business owners in the ASE are more likely to have characteristics associated with higher levels of innovation, including advanced degrees and the motivation to actualize a new idea.

Table 2B.5 contains results for some other variables related to innovation: R&D and ownership of a trademark, copyright, or patent in 2014. Firms with African-American owners are equally likely as those owned by Whites to engage in basic R&D, but they are more likely to do applied R&D. Given that only about four percent of firms report either basic or applied R&D activity in 2014, the coefficients around 0.01 are not small. Once human capital variables are included, however, the coefficient falls to 0.005 and becomes statistically insignificant. Concerning copyrights, trademarks, and patent ownership (or pending), African-American-owned businesses are less likely to have such intellectual property rights, although the racial gap becomes insignificant once industry controls are included.

To sum up these results briefly, firms owned by African-Americans and Whites are very similar in many respects. African-American-owned firms are not systematically smaller, and it appears they would be larger than White-owned firms if they had equal access to finance. African-American-owned firms are more oriented to domestic markets, so they export less. Concerning innovation, African-American-owned firms are more active in both product and process innovation activities, but they are less likely to introduce a completely new product to market. They are not less likely to engage in R&D, or while ownership of intellectual property rights is lower, the difference disappears with industry controls. A significant factor in the innovation behavior is the much higher rate of advanced degrees among African-American owners (34 percent versus 23 for Whites), but even controlling for this difference, the data show an innovation advantage for African-Americans along several dimensions.

Table 2A.1. Summary Statistics: Owner Race/Ethnicity, Gender, Owner Age, Immigrant

	All	African-American	White
Owner Race/Ethnicity:			
African-American	0.017	1.000	0.000
White	0.835	0.000	1.000
Asian	0.088	0.000	0.000
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 from the 2014 ASE. All variables are dummy variables for the particular category; therefore, the numbers represent the proportion of the sample in the category. N = 288,000 individual owners of 184,000 employer-firms. 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 sector. Census DRB bypass numbers are CBDRB-FY20-CES009-001 and CBDRB-FY20-CES009-002.

Table 2A.2. Summary Statistics: Ownership Structure and Firm Age

	All	African-American	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 from the 2014 ASE. 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. N = 288,000 individual owners of 184,000 employer-firms. 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 sector. Census DRB bypass numbers are CBDRB-FY20-CES009-001 and CBDRB-FY20-CES009-002.

Table 2A.3. Summary Statistics: Human Capital Characteristics of Owners

	All	African- American	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 from the 2014 ASE. All variables are dummy variables for the particular category; therefore, the numbers represent the proportion of the sample in the category. N = 288,000 individual owners of 184,000 employer-firms. 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 sector. Census DRB bypass numbers are CBDRB-FY20-CES009-001 and CBDRB-FY20-CES009-002.

Table 2A.4. Summary Statistics: Motivations and Aspirations for Business Ownership

	All	African-American	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 from the 2014 ASE. 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). N = 288,000 individual owners of 184,000 employer-firms. 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 sector. Census DRB bypass numbers are CBDRB-FY20-CES009-001 and CBDRB-FY20-CES009-002.

Table 2A.5. Summary Statistics: Finance

	All	African-American	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 from the 2014 ASE. All variables are dummy variables for the particular financial measure, as explained in the text. N = 288,000 individual owners of 184,000 employer-firms. 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 sector. Census DRB bypass numbers are CBDRB-FY20-CES009-001 and CBDRB-FY20-CES009-002.

Table 2A.6. Summary Statistics: Industry

	All	African-American	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: T Data from the 2014 ASE. 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. N = 288,000 individual owners of 184,000 employer-firms. 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 sector. Census DRB bypass numbers are CBDRB-FY20-CES009-001 and CBDRB-FY20-CES009-002.

Table 2A.7. Summary Statistics: Owner Choices

	All	African- American	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 from the 2014 ASE. All variables are dummy variables for the particular category; therefore, the numbers represent the proportion of the sample in the category. N = 288,000 individual owners of 184,000 employer-firms. 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 sector. Census DRB bypass numbers are CBDRB-FY20-CES009-001 and CBDRB-FY20-CES009-002.

Table 2A.8. Other Dependent Variables

	All	African- American	White
Employment in 2014	10.32	9.056	10.77
Employment Top 5%	0.052	0.046	0.055
Export	0.079	0.039	0.074
Any Innovation	0.533	0.573	0.530
Innovation Count	2.161	2.356	2.114
Any Product Innovation	0.404	0.430	0.399
Completely New Product to the Market	0.049	0.038	0.047
New Product to This Business	0.154	0.113	0.157
Made Product Easier to Use	0.262	0.303	0.254
Any Process Innovation	0.437	0.481	0.434
Upgraded Technique	0.338	0.371	0.338
Decreased Production Costs	0.134	0.148	0.129
Changed Delivery Method	0.125	0.176	0.120
Basic R&D	0.041	0.044	0.039
Applied R&D	0.039	0.053	0.038
Copyright or Trademark	0.080	0.068	0.082
Patent Granted or Pending	0.015	0.008	0.015

Note: Data from the 2014 ASE. Except for Employment in 2014 and Innovation Count, which measure the number of employees and the number of the innovations the firm reports, all other variables are dummy variables for the particular category. N = 288,000 individual owners of 184,000 employer-firms. 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 sector. Firm age is defined as number of years since the first employee was hired. Census DRB bypass numbers are CBDRB-FY20-CES009-001 and CBDRB-FY20-CES009-002.

Table 2B.1. Regression Results: Motivations and Aspiration to Grow

Dependent Variables	(1)	(2)	(3)	(4)
Wanted to be Own Boss	0.041** (0.009)	0.031** (0.009)	0.040** (0.009)	0.037** (0.009)
Flexible Hours	0.098** (0.009)	0.081** (0.009)	0.071** (0.009)	0.066** (0.009)
Balance Work and Family	0.089** (0.009)	0.076** (0.009)	0.067** (0.009)	0.061** (0.009)
Opportunity for Greater Income	0.090** (0.009)	0.082** (0.009)	0.089** (0.009)	0.091** (0.009)
Best Avenue for Ideas/Goods/Service	0.084** (0.009)	0.071** (0.009)	0.071** (0.009)	0.062** (0.009)
Unable to Find Job	0.032** (0.005)	0.026** (0.005)	0.024** (0.005)	0.026** (0.005)
Unappealing to Work for Someone Else	0.001 (0.009)	-0.003 (0.009)	0.001 (0.009)	0.003 (0.009)
Always Wanted to Start Business	0.186** (0.009)	0.175** (0.009)	0.177** (0.009)	0.185** (0.009)
Entrepreneurial Role Model	0.045** (0.008)	0.050** (0.008)	0.054** (0.009)	0.060** (0.009)
Aspirations to Grow Business	0.119** (0.008)	0.106** (0.008)	0.102** (0.008)	0.106** (0.008)
Other Race/Ethnic Groups	Yes	Yes	Yes	Yes
Firm Age & Number of Owners		Yes	Yes	Yes
Demographics			Yes	Yes
Human Capital				Yes

Note: 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 2A.4. 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 sector. N = 288,000 individual owners of 184,000 employer-firms in the ASE. Robust standard errors are in parentheses. ** p<0.01, * p<0.05. Census DRB bypass numbers are CBDRB-FY20-CES009-001 and CBDRB-FY20-CES009-002.

Table 2B.2. Regression Results: Employment in 2014, Employment Top 5% and Export

Dependent Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Employment in 2014	-0.122** (0.021)	0.031 (0.021)	0.032 (0.021)	0.044* (0.021)	0.020 (0.021)	0.073** (0.020)	-0.028 (0.019)	-0.044* (0.018)
Employment Top 5%	-0.009** (0.003)	0.005 (0.004)	0.006 (0.004)	0.009* (0.004)	0.006 (0.004)	0.011** (0.004)	-0.004 (0.003)	-0.004 (0.003)
Export	-0.035** (0.004)	-0.031** (0.004)	-0.035** (0.004)	-0.033** (0.004)	-0.033** (0.004)	-0.031** (0.004)	-0.010** (0.004)	-0.011** (0.004)
Race/Ethnic Groups	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Age & N of Owners		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Demographics			Yes	Yes	Yes	Yes	Yes	Yes
Human Capital				Yes	Yes	Yes	Yes	Yes
Motivations					Yes	Yes	Yes	Yes
Finance						Yes	Yes	Yes
4-digit Industry							Yes	Yes
Other Choices								Yes
Observations	288,000	288,000	288,000	288,000	288,000	288,000	288,000	288,000

Note: 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 2A.8. 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 sector. N = 288,000 individual owners of 184,000 employer-firms in the ASE. Robust standard errors are in parentheses. ** p<0.01, * p<0.05. Census DRB bypass numbers are CBDRB-FY20-CES009-001 and CBDRB-FY20-CES009-002.

Table 2B.3. Regression Results: Innovation

Dependent Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Any Innovation	0.043** (0.009)	0.045** (0.009)	0.039** (0.009)	0.032** (0.009)	0.023* (0.009)	0.025** (0.009)	0.037** (0.009)	0.034** (0.009)
Innovation Count	0.108** (0.024)	0.109** (0.024)	0.088** (0.024)	0.072** (0.024)	0.039 (0.023)	0.044 (0.023)	0.093** (0.023)	0.078** (0.023)
Any Product Innovation	0.032** (0.009)	0.029** (0.009)	0.022* (0.009)	0.018 (0.009)	0.010 (0.009)	0.011 (0.009)	0.025** (0.009)	0.022* (0.009)
Completely New Product to the Market	-0.010** (0.004)	-0.012** (0.004)	-0.015** (0.004)	-0.015** (0.004)	-0.016** (0.004)	-0.016** (0.004)	-0.007 (0.004)	-0.008* (0.004)
New Product to this Business	-0.045** (0.006)	-0.048** (0.006)	-0.051** (0.006)	-0.051** (0.006)	-0.051** (0.006)	-0.049** (0.006)	-0.025** (0.006)	-0.026** (0.006)
Race/Ethnic Groups	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Age & N of Owners		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Demographics			Yes	Yes	Yes	Yes	Yes	Yes
Human Capital				Yes	Yes	Yes	Yes	Yes
Motivations					Yes	Yes	Yes	Yes
Finance						Yes	Yes	Yes
4-digit Industry							Yes	Yes
Other Choices								Yes
Observations	288,000	288,000	288,000	288,000	288,000	288,000	288,000	288,000

Note: 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 2A.8. 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 sector. N = 288,000 individual owners of 184,000 employer-firms in the ASE. Robust standard errors are in parentheses. ** p<0.01, * p<0.05. Census DRB bypass numbers are CBDRB-FY20-CES009-001 and CBDRB-FY20-CES009-002.

Table 2B.4. Regression Results: Innovation

Dependent Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Made Product Easier to Use	0.050** (0.009)	0.046** (0.009)	0.040** (0.009)	0.037** (0.009)	0.027** (0.009)	0.027** (0.009)	0.032** (0.008)	0.028** (0.008)
Any Process Innovation	0.047** (0.009)	0.052** (0.009)	0.047** (0.010)	0.039** (0.009)	0.030** (0.009)	0.032** (0.009)	0.043** (0.009)	0.039** (0.009)
Upgraded Technique	0.034** (0.009)	0.040** (0.009)	0.036** (0.009)	0.027** (0.009)	0.019* (0.009)	0.021* (0.009)	0.026** (0.009)	0.023* (0.009)
Decreased Production Costs	0.019** (0.007)	0.022** (0.007)	0.019** (0.007)	0.017* (0.007)	0.011 (0.007)	0.012 (0.007)	0.025** (0.007)	0.022** (0.007)
Changed Delivery Method	0.056** (0.007)	0.056** (0.007)	0.053** (0.007)	0.051** (0.007)	0.045** (0.007)	0.045** (0.007)	0.053** (0.007)	0.051** (0.007)
Race/Ethnic Groups	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Age & N of Owners		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Demographics			Yes	Yes	Yes	Yes	Yes	Yes
Human Capital				Yes	Yes	Yes	Yes	Yes
Motivations					Yes	Yes	Yes	Yes
Finance						Yes	Yes	Yes
4-digit Industry							Yes	Yes
Other Choices								Yes
Observations	288,000	288,000	288,000	288,000	288,000	288,000	288,000	288,000

Note: 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 2A.8. 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 sector. N = 288,000 individual owners of 184,000 employer-firms in the ASE. Robust standard errors are in parentheses. ** p<0.01, * p<0.05. Census DRB bypass numbers are CBDRB-FY20-CES009-001 and CBDRB-FY20-CES009-002.

Table 2B.5. Regression Results: Basic R&D, Applied R&D, Copyright or Trademark, and Patent Granted or Pending

Dependent Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Basic R&D	0.005 (0.004)	0.004 (0.004)	0.002 (0.004)	0.000 (0.004)	-0.001 (0.004)	-0.001 (0.004)	0.007 (0.004)	0.006 (0.004)
Applied R&D	0.015** (0.004)	0.014** (0.004)	0.011* (0.004)	0.005 (0.004)	0.006 (0.004)	0.005 (0.004)	0.006 (0.004)	0.006 (0.004)
Copyright or Trademark	-0.014** (0.005)	-0.010* (0.005)	-0.013** (0.005)	-0.014** (0.005)	-0.015** (0.005)	-0.014** (0.005)	-0.005 (0.005)	-0.006 (0.005)
Patent Granted or Pending	-0.007** (0.002)	-0.005** (0.002)	-0.006** (0.002)	-0.007** (0.002)	-0.007** (0.002)	-0.007** (0.002)	-0.002 (0.002)	-0.002 (0.002)
Race/Ethnic Groups	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Age & N of Owners		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Demographics			Yes	Yes	Yes	Yes	Yes	Yes
Human Capital				Yes	Yes	Yes	Yes	Yes
Motivations					Yes	Yes	Yes	Yes
Finance						Yes	Yes	Yes
4-digit Industry							Yes	Yes
Other Choices								Yes
Observations	288,000	288,000	288,000	288,000	288,000	288,000	288,000	288,000

Note: 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 2A.8. 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 sector. N = 288,000 individual owners of 184,000 employer-firms in the ASE. Robust standard errors are in parentheses. ** p<0.01, * p<0.05. Census DRB bypass numbers are CBDRB-FY20-CES009-001 and CBDRB-FY20-CES009-002.

3. Heterogeneity in Racial Gaps

3A. The Gender Gap in African-American Entrepreneurship

The overall patterns of self-employment, business ownership, and returns to entrepreneurship conceal not only large racial gaps, but also large gaps by gender. This section documents these gaps with a focus on African-American women entrepreneurs and how their behavior and outcomes differ from African-American men and White women. We compare the gender gap across races, and the racial gap across genders. As in other parts of this study, White and African-American are defined as non-Hispanic, in order to focus the comparison.

The three data sets analyzed here are the American Community Survey (ACS), the Merged Outgoing Rotations Groups (MORG) of the Current Population Survey (CPS), and the Annual Socio-Economic Supplement (ASEC) to the CPS. Each data set has advantages. The ACS has large annual samples that we use to analyze the probability of self-employment and the characteristics of self-employed and employees by race and gender. We also use the ACS in combination with the decennial census to examine self-employment trends going back to 1970. The CPS MORG contains questions on paid employees of the self-employed, which we use to distinguish employers with various numbers of employees (any, 5+, 10+, 20+, and 50+). These questions were added only starting in 2014, and to achieve sufficient sample size (especially for larger employers) we pool all available years 2014-2019 for this paid employee analysis. Finally, we estimate earnings functions for self-employed and employees using the CPS ASEC, which includes previous year information on wage and salary income, net business income from self-employment, weeks worked, and usual hours worked per week. We pool the CPS ASEC files for 2015-2019, providing information for 2014-2018.

Table 3A.1 begins with basic measures of different types of self-employment for recent years in the ACS (top panel) and CPS MORG (bottom panel). The table shows the proportion of each type of self-employment among all employed for all workers, White males, White females, African-American males, and African-American females, respectively. The last variable on the bottom row – “Mean (SD) Employees (among employers)” – gives the average and standard deviation for each of these groups of the number of employees, conditional on the self-employed having paid employees (being an employer).

The overall self-employment rate, at about 11 percent in both the ACS and CPS MORG, conceals large differences by race and gender. The highest rate, 14 percent in the ACS and 14.5

percent in the CPS MORG, is for White men, while the lowest, 4.6 percent in the ACS and 4.7 percent in the CPS MORG, is for African-American women. African-American men and women are both less likely to be self-employed than either White men or White women, and the gender gap within race is larger in percentage points for Whites (4-5 points) than for African-Americans (3-4 points), but proportionately it is similar for the two races.

Incorporated self-employment, sometimes taken as a better measure of genuine entrepreneurship than all self-employment, has a rate of just over 4 percent for all races and genders in both data sources (again as a fraction of all employed). But again, it varies greatly by race and gender. The White male rate of 6.3 (6.7) percent in the ACS (CPS MORG) is more than double the White female and African-American male rates, which are similar at close to 3 percent, and more than quadruple the African-American female rate of 1.3 percent. Full-time self-employment (at least 35 usual hours worked), used here as a proxy to reflect effort into the business, thus another way to look at genuine entrepreneurship, is 7.3 percent for the whole employed population. But it is nearly 11 percent for White men, only 5 percent for White women, 6 percent for African-American men, and under 3 percent for African-American women.

Turning to the data on paid employees from the CPS MORG, in the bottom rows of Table 3A.1, 2.6 percent of employed persons report they are self-employed with paid employees, a bit less than one-quarter of all self-employed. But the employer rate is 4.4 percent for White men, which is much higher than the 1.6 percent for White women, 1.4 percent for African-American men, and 0.6 percent for African-American women. Considering different numbers of employees, about two percent of employed White men have 5 or more, but only 0.7 percent of White women, 0.47 percent of African-American men, and only 0.2 percent of African-American women. To illustrate the enormous variation by race and gender, that rate of 0.2 percent is one-tenth the White male rate for at least 5 employees, and it is equal to the White male rate for at least 50 employees.

The final row in Table 3A.1 shows the mean and standard deviation for the number of paid employees, conditional on the respondent being self-employed. The mean (standard deviation) is highest for White men at 9.4 (14.7), the standard deviation reflecting a longer right tail. The mean for White women is 8.0, for African-American men it is 6.2, and for African-American women it is 6.7.

Across almost all measures of entrepreneurship, the rate is by far highest for White men, substantially lower for White women, who are usually slightly trailed by African-American men,

with African-American women far behind. There are substantial racial and gender gaps not only in self-employment, which have been documented with earlier data, but also in incorporated and full-time self-employment. And similar gaps appear in the number of employees, a standard measure of firm and entrepreneurial performance.

What accounts for these large racial-gender (sometimes called “intersectional”) gaps? One step to deeper understanding may come from considering differences in other characteristics that may be correlated with race, gender, and the entrepreneurship measures. Table 3A.2 contains means of age groups, education type, and married for wage and salary employees and for self-employed by race and gender. Age skews rightward for self-employed versus employees across all race-gender groups, but even much more so for Whites than African-Americans, and with smaller differences by gender.

Education also skews right for self-employed compared to employees, but here the gender and racial differences in the relative education of self-employed within groups are less pronounced, with some suggestion of greater skewness among women compared to men. Among self-employed, the rate of BA or higher is greatest for White women (48.6 percent in the CPS MORG, 43.4 percent in the ACS), second largest for White men (44.3 and 40.7 percent, respectively), next highest for African-American women (36.3 and 31.7 percent, respectively), while lowest among African-American men (28.4 and 27.0 percent, respectively).

Finally, the fraction married, which may be correlated with self-employment for risk-sharing, health insurance, and other reasons, is shown in the bottom row of Table 3A.2. The results here replicate previous findings of higher marriage rates among the self-employed, but they do so for all four race-gender groups. Proportionately, the difference between self-employed and employee marital rates is larger for women of both races. Nevertheless, the marriage rate among self-employed is highest for White men, followed by White women, followed by African-American men, with the lowest rate among African-American women. Clearly, these large differences in characteristics across race-gender groups may have implications for measured gaps in entrepreneurship, and thus provide a motivation to consider regressions controlling for them.

Another measure of success is income adjusted for work contribution, and Table 3A.3 provides information on the distribution of log hourly earnings by race and gender of employees and self-employed. Earnings for employees are total wage and salary incomes in the previous year, while for self-employed they also include self-employment (business) income; both are divided by

weeks worked times usual hours of work in the previous year to obtain hourly earnings. Average hourly earnings are highest for White men, with a premium of about 6 percent for self-employment relative to a wage and salary job as an employee, consistent with some but not all previous research on the self-employment premium (e.g., Hamilton 2000). The premium at the mean is slightly higher for African-American men (about 15 percent) but negative for White women (about -16 percent) and African-American women (about -4 percent). Standard deviations of earnings are typically found to be larger for self-employed than for employees, and this is true for all four racial-gender groups, reflecting the right skewness of self-employment earnings. The calculations of average hourly earnings by groups at various quantiles show that the African-American female disadvantage in hourly earnings holds throughout the distribution for both employees and the self-employed.

Table 3A.4 provides regression results for the probability of self-employment (SE), the probability of incorporated self-employment (Inc. SE), and the probability of full-time self-employment (FT SE). The data are from the ACS, 2014-2018, and the regressors include racial and ethnic categories interacted with female gender, as well as controls for age, education, and marital status, as well as survey year. The right-hand side variables of interest are the racial/ethnic groups and each of these interacted with female, with White male as the omitted group. Constructed this way, the coefficients on the interaction terms represent the gender gap in SE probability within each race. For instance, the gender gap within African-Americans in SE probability is about 3 percentage points, in Inc. SE it is about 1.4 points, and in FT SE it is about 2.7 points. Relative to the African-American means (shown at the bottom of the table) of 6, 2, and 4 percent for these three types of SE, respectively, this implies percent gaps of 50, 70, and 67.5 – enormous differences in the self-employment propensities of African-American women versus African-American men.

These regression-adjusted gaps are larger than the raw, unadjusted gaps presented in Table 3A.1. Taking characteristics into account actually increases the measured gender gap among African-Americans. Put differently, the characteristics of African-American women are associated with self-employment more than those of African-American men, but some unmeasured factor is making African-American women much less likely to be self-employed.

The regression-adjusted gap between African-American women and White men can be calculated from the results in Table 3A.4 by summing the African-American and African-American

female coefficients. The implied differences between African-American women and White men are about 7 percentage points for SE, 3.7 for Inc. SE, and 6.6 for FT SE. These gaps are quite large, representing about 50, 75, and 60 percent of the White male rate. But they are somewhat smaller than the raw gaps in Table 3A.1. In this case, relative to White men, controlling for other characteristics raises the self-employment propensity of African-American women.²⁶

To obtain the racial gap among women, it is necessary to add the White gender gap. For African-American versus White women, this procedure yields gaps of 3, 0.7, and 1.1 percentage points for the three types of SE. While the overall SE rate is substantially lower for African-American than White women, among the SE African-American women are more likely to be full-time.

How have these patterns evolved over time? Using decennial census data back to 1970 as well as all years of the ACS since 2000, we estimate regressions for each year of available data: 1970, 1980, 1990, and 2000-2018. Dependent variables and controls are the same as in Table 3A.4 (other races/ethnicity, marital status, and education), included contemporaneously for each year. Table 3A.5 shows the coefficients (and standard errors and unconditional means of the dependent variables by year) on African-American race and African-American female. The results are plotted in Figure 3A.1 for African-American men and African-American women relative to White men, with the African-American female – White male gap obtained by summing the African-American and African-American female coefficients.

Table 3A.5 and Figure 3A.1 show that the regression-adjusted racial gap in total self-employment among men is fairly constant at about 5-6 percentage points until 2007, after which it gradually narrows to about 4 percentage points. The self-employment gap for African-American women versus White men is larger, around 8 points, until 2000, after which it rises to 9 points by 2004 and then narrows to 7 points, in line with the slight narrowing of the African-American male gap. The gaps in incorporated self-employment are smaller in percentage points, but in percentage terms (when normalized by the unconditional mean in incorporated self-employment) they are large, as we have seen. The African-American male and African-American female differences from the White male incorporated self-employment rate are similar at about 1.5 percentage points in 1970, and they both grow until about 2004, with the male difference doubling to about 3 points and

²⁶ The estimated gap falls slightly more (15-20 percent) when controls for broad occupational and industry groups are added to the regressors.

the African-American female versus White male gap widening to 4 points. The greater rise in the African-American female gap reflects the widening gender gap in incorporated self-employment among African-Americans.

Next, we turn to regressions using the CPS MORG, with the same dependent variables (self-employment measures), the same specifications of covariates, and a similar time period (2014-2019) as in the ACS analysis of Table 3A.4. Table 3A.6 contains the CPS MORG analysis. Qualitatively, the results from the two data sources are very similar, both revealing large racial and gender gaps. The CPS MORG tends to show a slightly larger gender gap within African-Americans than does the ACS, and indeed the within-African-American gender gap in the former is similar in magnitude to the racial gap among men. This implies that the gap between African-American women and White men is roughly twice the racial gap among men. A general pattern across both data sources and all three dependent variables is that the gender gap among African-Americans is smaller than among Whites, and this is especially true for incorporated and full-time self-employment.

As discussed above, a major advantage of the CPS MORG data is that they contain information on the number of employees, asked of each self-employed person. From this variable, we construct 4 dummy dependent variables: whether a person is an employer and whether they have at least 5, 10, and 20 employees, respectively. Table 3A.1 contains summary statistics for these variables by race and gender, showing large racial and gender gaps. The question here is the degree to which those raw gaps reflect other observables differences across racial and gender groups in age, education, and marital status that are known determinants of entrepreneurship and that can be controlled for in regressions. The regression results, using the same sample as in Table 3A.6, are presented in Table 3A.7. The estimated gaps with regression controls are very similar to the raw numbers in Table 3A.1, implying that the observable characteristics provide little explanatory power for the gaps.

Finally, we analyze regression-adjusted gender and racial gaps in hourly earnings. The data for this analysis comes from the CPS ASEC, described above. We examine hourly earnings differences for employees and self-employed separately, with the purpose of comparing the size of the racial and gender gaps for these two groups. Of course, this analysis omits unobserved variables that cannot be controlled for, including unobservable factors affecting the relative returns across the two types of employment. Summary statistics for hourly earnings by race and gender are presented

in Table 3A.3, and the estimation results for the regression-adjusted gaps are shown in Table 3A.8. Compared with the raw gaps, regression adjustment does reduce the differentials somewhat, but the remaining gaps are large. Among men, the estimated hourly earnings racial gap is about 20 percent for employees and a bit less at 14 percent for self-employed. Although far from demonstrating it conclusively, the smaller gap among the self-employed could be interpreted as consistent with the notion that entrepreneurship provides African-American men with a relative advantage, compared with wage and salary work as employees.

On the other hand, the gender gaps in hourly earnings are very large for both races. Indeed, the gender gap among Whites is estimated to be larger than the racial gap among men. The gender gap among African-Americans is smaller than among Whites, substantially so for employees and only slightly so for the self-employed. If we sum the racial gap across men with the gender gap among African-Americans to compare African-American women with White men, we obtain a larger magnitude of the differential among self-employed than among employees: -0.510 among self-employed versus -0.348 among employees. Both of these are huge gaps, but the larger gap for self-employed would seem to run counter to the idea that entrepreneurship is associated with overcoming the racial gap for women.

To summarize briefly, this analysis provides evidence of large disadvantages for African-American women in entrepreneurship. Self-employment rates are lower, including incorporated and full-time self-employment, than for White men, White women, and African-American men. Rates of hiring employees are also lowest for African-American women, and for the proportion of them that operate businesses throughout the observable size distribution. African-American women have lower average hourly earnings than the other groups in both types of employment: employee and self-employed. These results are robust to controls for other observable characteristics, and they change rather little over time. The analysis of gender combined with race shows that gender gaps tend to be larger among Whites than African-Americans, although they are substantial for both. It also reveals that, with the exception of full-time self-employment and average hourly earnings among self-employed, African-American men have lower rates than do White women. This highlights the significant role of race even in a society with large, pervasive gender gaps.

3B. Racial Diversity in Ownership

Much interest attaches to the possibility that racial and other forms of diversity may enhance firm performance. Diversity may imply varied skill sets and knowledge, leading to greater creativity and innovation, and may combine disparate traits in a team more easily than in single individuals, thus providing a team “jack of all trades” (Lazear 2004, 2005). On the other hand, co-owners who are more similar may have easier communication, coordination, and trust-building. Thus, *a priori*, it is unclear how diversity or similarity affect firm performance and growth.

Despite the interest in the topic, there has been relatively systematic research on diversity within ownership teams.²⁷ One problem is that few data sets contain such information. Household surveys such as the ACS and CPS, for example, do not ask questions about co-ownership. Only a few firm-level surveys, such as the SBOs and ASEs, ask the kind of detailed questions that allow diversity to be measured.

Our analysis of the firm-level data suggests that racial diversity in ownership is exceedingly rare. Using a definition of racial/ethnic diversity whereby the business is jointly owned by at least two individuals with different race or ethnicity from one another, and again weighting owners by their ownership shares in the business, we find that only 0.3 percent of firms in the SBO and ASE have both an African-American owner and a White owner. This rarity is itself a major finding, but it also has the effect of limiting sample sizes so much, that statistical analysis of the firm performance consequences of diversity becomes untenable.

One previous study (Brown, Earle, Kim, and Lee 2019) analyzed the impact of racial and ethnic diversity on the probability of high employment (top five percent employment). The data are firms in a particular entry cohort from the 2007 SBO. The basic finding is that racial and ethnic diversity is associated with no improvement in firm employment once the number of owners is taken into account (as it must be, since diversity is impossible with a single owner, and it rises mechanically as the number of owners rises). The point estimates actually imply a negative effect of diversity, but none of the coefficients are statistically significant at the 5 percent level. The lack

²⁷ Diversity in work teams has received more attention. Lazear (1999) presents a theoretical model of the tradeoffs involved in designing diversity in teams. Based on field experiments in the Netherlands, Hoogendoorn and van Praag (2012) report that business performance decreases with increasing ethnic diversity below a certain share of minorities on the founding team, but it becomes positive above a certain threshold, while, along a different dimension of diversity, Hoogendoorn, Oosterbeek, and van Praag (2013) find that equally balanced male-female founding teams achieve higher profits than male-dominated teams.

of significant results may reflect small sample sizes, so further progress on the question awaits the development of better data.

3C. Heterogeneity in Racial Gaps

In this section we document how racial differences in entrepreneurial outcomes vary by local area, high-technology sectors, education, and veteran status. We are concerned primarily with the gap between African-American and White entrepreneurship outcomes. Consistent with the prior discussion on the gender gap, we focus on the non-Hispanic African-American and White employed populations.

The analysis presented in this section relies on the large annual samples of the American Community Survey (ACS) and the detail on employer-type of self-employment that can be analyzed using the Current Population Survey Merged Outgoing Rotations Groups (CPS MORG). We estimate the probability of self-employment and examine how the racial gap varies with local demand conditions, the educational background of entrepreneurs, their past military experience, and their presence in high-technology sectors.

Beyond being an important source of job creation, innovation, and economic development, for the entrepreneurial individual self-employment provides new pathways to economic opportunity. In times and places where quality wage and salary jobs are not readily available workers often turn to self-employment as a primary source of income or to supplement their household income. Consequently, entrepreneurship can be an important avenue to help alleviate poverty and provide generational mobility. Yet, entrepreneurs in economically disadvantaged areas face their own challenges, be they demand-side limitations to accessing a local customer base with spending power, or supply-side obstacles in accessing finance and skilled labor. Although Kugler et al. (2016) provide some detail on entrepreneurship in low-income areas, their study is one far and few between examining this otherwise understudied topic.

In the first part of our analysis, we focus on the prevalence of poverty within a Public Use Microdata Area (PUMA) as a proxy for a low-income area. We define a PUMA as being high poverty if the household poverty rate in the PUMA is above the 80th percentile among all PUMAs. In so doing, our analysis covers a larger sample and a longer time series than the one considered in Kugler et al. (2016), while also narrowly focusing on the racial gap in low-income entrepreneurial performance between African-American and White entrepreneurs. Using our definitions, we

classify 441 PUMAs as high-poverty from 2005-2011 and 688 PUMAs as high-poverty between 2012-2018.

Towards the other end of the income spectrum is entrepreneurship in the high-tech sectors, defined as those industries with relatively high concentrations of STEM activities.²⁸ New business activity in the high-tech sectors generally requires greater capital investments, employs a higher concentration of workers in high paying good quality jobs, and services larger markets beyond local areas. Far from necessity self-employment, high-tech entrepreneurship is more strongly associated with high-growth ventures and greater entrepreneurial dynamism (Hathaway, 2013).²⁹ The question we address concerns the racial gap in high-tech versus non-high-tech sectors.

Our analysis of the racial gap in entrepreneurship in high-poverty areas and in high-tech sectors sheds some light on how African-American entrepreneurs perform relative to Whites at both extremes of entrepreneurial opportunity given their social and economic contexts. Another potentially important source of heterogeneity that contributes directly and significantly to entrepreneurial performance may be education: how does the racial entrepreneurship gap vary with education. Finally, the great interest in economic outcomes for veterans, including their entrepreneurial success, has not been met by corresponding empirical evidence, particularly about racial differences. To better understand how African-American entrepreneurs' experience in the armed forces affects entrepreneurial performance, we assess the racial gap by veteran status.

High-Poverty Areas

Based on ACS data for 2014-2018, Table 3C.1 reports the shares in employment of all self-employed, incorporated self-employed, and the full-time self-employed Whites and African-Americans residing in low-poverty and high-poverty areas.³⁰ These unadjusted means show lower shares in self-employment within race categories for both Whites and African-Americans in high-poverty areas. However, the differences between African-Americans and Whites are larger than those within each race across high- and low-poverty areas. African-American self-employment

²⁸ We apply the high-tech industries definition developed in Wolf and Terrell's (2016) report from the Bureau of Labor Statistics (BLS) that classifies a 4-digit NAICS industry as high-tech if its share of employment in Science, Technology, Engineering, and Math (STEM) occupations is greater than two and a half times the national average (or 14.5 percent share of employment in STEM occupations).

²⁹ See Ian Hathaway (2013), <https://www.edcoinfo.com/wp-content/uploads/2014/04/Kauffman-Foundation-Report-Aug-2013.pdf>.

³⁰ Low-poverty in our samples are defined in contrast to high-poverty areas as having PUMA poverty rates below the 80th percentile across all PUMAs in the nation for that year.

shares are less than half of the corresponding shares for Whites with the biggest differences evident for incorporated self-employment, and the African-American shares in low-poverty areas are well below even the White shares in high-poverty areas.

Table 3C.2 reports demographic characteristics of age, education, and marital status for employees and self-employed by high- and low-poverty area. Again, the biggest differences in characteristics occur between employees and self-employed, and between races, not between high- and low-poverty areas. The table shows higher shares for African-American self-employment in the younger age groups, while Whites have higher self-employed shares for workers over 55 years of age. A similar pattern is evident for education where African-Americans have higher shares of self-employed for those with less than a bachelor's degree, but we see higher shares for Whites with a bachelor's degree or higher.

In the next Table 3C.3 we present the regression coefficients for African-American and White self-employment propensities in high-poverty areas while controlling for age, education, and marital status. The coefficient on the interaction term between African-American and High-poverty gives a regression-adjusted gap of about 0.3 percentage points between the self-employment propensities African-Americans in high-poverty areas with African-Americans in low-poverty areas. Adding to the African-American coefficient we calculate the race-poverty gap between African-Americans in high-poverty areas and Whites in low-poverty areas as 4 percentage points, representing 33 percent of the raw White low-poverty mean. The gap between African-American high-poverty self-employment propensities and White high-poverty propensities are calculated by coefficient on the White and High-poverty interaction term showing a 3.7 percentage gap, representing 33 percent of the White high-poverty self-employed share. The percentage point gaps are smaller for the incorporated and full-time self-employed, but the percentage gaps are similar in sign and magnitude.

In summary, our analysis finds further support that self-employment activities are depressed in high-poverty areas. When considering race and residence in high-poverty areas, we find that the racial gap between African-Americans and Whites is wider than the poverty gap.

High-technology Sectors

Tables 3C.4 reports the shares of self-employment by type for low-tech versus high-tech sectors. Low-tech sectors are defined as industries with less than two and half times the share of

STEM workers employed nationally by that industry. Accordingly, 10.4-11.3 percent of all workers are classified as employed in high-tech sectors in the ACS annually over 2003-2018, and 10.5-10.9 percent in the CPS-MORG from 2014 - 2019.

Notably, the unadjusted means reported in Table 3C.4 show that African-Americans have little more than half the self-employment rates in high-tech sectors compared to Whites. However, African-American entrepreneurs are more likely to be incorporated in high-tech industries than in low-tech industries in contrast with White entrepreneurs who are about equally as likely to incorporate their businesses either in low-tech or high-tech sectors. This pattern of incorporated self-employment supports the estimates reported in the bottom panel of Table 3C.4 that the difference between employer type high-tech African-American and White self-employment (1.9 – 0.7 percentage points) is about half that of the corresponding low-tech difference (3.3 – 1.0 percentage points). Furthermore, as firm-size increases, the gap between high-tech and low-tech rates for Whites widens, whereas for African-Americans these shares tend to remain the same, even though African-American high-tech employers have fewer paid employees on average (7.9) than Whites (10.7).

Turning to Table 3C.5 considering the age, educational attainment, and marital status of the high-tech self-employed by race, the estimates show a common pattern of African-American entrepreneurs skewing younger than White in both the low-tech and high-tech sectors. African-American entrepreneurs also concentrate more in educational attainment below a bachelor's degree while a greater share of White entrepreneurs have at least a bachelor's degree.

Table 3C.6 provides regression estimates of the racial gap in high-tech entrepreneurship controlling for age, education, marital status, and survey year. The regressors include racial and ethnic categories interacted with an indicator for high-technology industries. Whites in low-tech sectors are the reference group.

The coefficients on the interacted terms tell us the high-tech gap within African-Americans in SE probability is about 2 percentage points, in Inc. SE about 0.3 percentage points, and in FT SE about 1.5 percentage points. This implies percentage gaps of about 38, 60, and 61, relative to the overall African-American mean for self-employment propensities for African-Americans in high-tech versus African-Americans in low-tech. We find more than half of the reduction in the African-American high-tech gap for the regression-adjusted Inc. SE (0.3 percentage points) compared to the unadjusted gap (0.7 percentage points). This is a consequence of adjustment to education and age,

where we see higher shares for African-Americans in high-tech incorporated self-employment in age groups of 25 – 54 years of age and for those with a bachelor's degree or higher.

The regression-adjusted gap between African-American high-tech and White low-tech is calculated as 6.2 percent points for SE, 2 percent points for Inc. SE, and 4.5 percent points for FT SE. Compared to the means for White low-tech by self-employment type the method reveals large gaps in propensities of 50, 42, and 54 percent less for African-American SE, Inc SE, and FT SE respectively. Comparing African-American high-tech entrepreneurship with White high-tech entrepreneurship reveals the racial high-tech self-employment gap at 1.8, 3.1, and 1.3 percentage points for the different types of SE considered.

The three regression-adjusted gaps discussed above for African-American high-tech versus African-American low-tech self-employment (2, 0.3, 1.5) percentage points; African-American high-tech versus White low-tech self-employment (6.2, 2, 4.5) percentage points; and African-American high-tech versus White high-tech self-employment (1.8, 3.1, 1.3) percentage points, indicate relatively higher African-American propensities for high-tech incorporated self-employment but still the gaps with Whites remain large and significant.

Table 3C.7 and Figure 3C.1 shows the evolution of the racial gap between SE African-American Low-tech, SE African-American High-tech, SE Inc African-American Low-tech, and SE Inc African-American High-tech all relative to SE White low-tech. The regression coefficients reported here are estimated individually for years 2003 to 2018 using the ACS while controlling for age, education, and marital status. Noticeably, the racial gap for high-tech self-employment is always larger compared to low-tech self-employment. However, these gaps for high-tech have been narrowing over time. The gap for Inc. SE in high-tech becomes nearly the same as Inc. SE in low-tech by 2018, and the SE African-American High-tech gap falls by about 50 percent since 2003.

Regression estimates from the CPS-MORG for years 2014 to 2019 are presented in Tables 3C.8 and 3C.9. The results for SE, Inc. SE, and FT SE in Table 3C.8 are largely consistent with the estimates using the ACS data for the same years. However, Table 3C.9 sheds some additional light on the employer type self-employment and size of businesses. Focusing on the coefficients for the African-American interaction term, we see the gap relative to African-American-low tech is small and narrows as firm size increases. Adding these coefficients to those for the African-American variable we see the gap with White low-tech also narrows with increasing firm size.

In summary, we find large gaps for African-Americans relative to Whites in the propensities to be self-employed in high-technology sectors. However, these gaps have been narrowing especially for the incorporated and employer-type high-tech businesses to the extent that the gap for low-tech African-American incorporated self-employment and high-tech African-American incorporated self-employment are nearly closed.

Veteran Status

Table 3C.10 provides descriptive statistics on entrepreneurship outcomes by race (White versus African-American) and veteran (nonveteran versus veteran). Looking at unadjusted differences in entrepreneurship measures, veterans, on average, are more likely to be entrepreneurs. Between 2014 and 2018, the veteran self-employment rate stood at 13.7 percent, or about 3 percentage points higher than the overall self-employment rate at 10.8 percent. However, differences by race are large among veterans. As reported in Table 3C.10 (top panel), the White veteran self-employment rate is 14.9 percent while that for African-American veterans is 9.2 percent. The results from CPS provides similar to those from ACS. Veterans compared to nonveterans also have higher entrepreneurship propensities within the racial groups and types of self-employment considered, a pattern that holds with increasing firm size 3C.10 (bottom panel). Furthermore, calculating the raw gap between veteran and nonveteran self-employed shows a similar pattern for both racial groups, and the largest differences are in fact across the racial groups.

Table 3C.11 reports differences between employed wage earners and the self-employed by their individual characteristics of age, education, and marital status. These raw means paint an interesting picture. The African-American veteran shares for younger age groups below 55 years are higher than those for Whites, as is self-employment for African-American veterans with high school or lower levels of educational attainment. We control these factors in regressions to estimate the adjusted gaps.

Table 3C.12 shows the regression-adjusted gaps for different types of veteran self-employment. Unlike the descriptive statistics showing higher rates of self-employment in veterans than in nonveterans, the regressions show significant and negative coefficients for the race and veteran interactions. This is mainly because veteran entrepreneurs are older than nonveterans and we control ages in our regressions. The coefficients for the interactions of African-American and Veteran indicate a small (0.9, 0.3, 0.6) percentage point veteran gap among African-American, but

adding these to the coefficient of African-American reveals larger (4.7, 2.0, 3.4) percentage point gap relative to White nonveterans. These represent 40, 17, and 37 percent relative to the White nonveteran rate, and 24, 11, and 19 percent of the White veteran rates for SE, Inc SE, and FT SE respectively.

Table 3C.13 and Figure 3C.2 show the evolution of the regression-adjusted coefficients over time using the Decennial Census 1970 to 1990 and the ACS from 2000 to 2018. The gap for African-American veterans in incorporated self-employment has been widening relative to White nonveteran self-employed, briefly dropping below 2 percentage points between 2014 and 2017 yet suggesting a possible widening again in recent years. The overall African-American veteran gap to White nonveterans has narrowed from over 6 percent points in 2004 to below 5 percent in 2018.

In Tables 3C.14 and 3C.15 we present regression estimates from the CPS-MORG for years 2014 to 2019. These results are largely consistent with the estimates using the ACS data for the same years however Table 3C.15 provides some additional information on racial gap for veteran employer firms. Focusing on the coefficients for the African-American interaction term, we see the gap relative to African-American nonveteran is small and narrows as firm size increases. Adding these coefficients to those for the African-American variable we see the gap with White nonveteran also narrowing with increasing firm size. These patterns follow with the decreasing and not significant gaps for White veteran firms relative to White nonveterans as firm sizes increase.

Educational Attainment

Tables 3C.16 and 3C.17 report the proportion of each type of self-employment among all employed, and the corresponding proportions for White and African-American self-employed by educational attainment, less than high school, high school only, some college, and bachelor's degree or more. Among all self-employed, the highest rates of 14 and 14.5 percent, in ACS (top panel) and CPS (bottom panel), are for Whites with a bachelor's degree or above, and the lowest of 5.5 and 6.4 percent, ACS and CPS respectively, are for African-Americans with high school diplomas. The within race gaps between high school educated and those with a bachelor's or more are roughly the same, about 2-3 percentage points.

Tables 3C.18 and 3C.19, break down these proportions by age and marital status of employed wage earners and self-employed for African-Americans and Whites. Noticeably, the age distributions between the employed wage earners and the self-employed are nearly similar within

each race and education category. The CPS-MORG estimates (bottom panel) show higher proportions for wage employment for the ages 25 - 54 years, but these differences are consistent across all categories. When comparing African-American shares to White shares, the age distributions show higher proportions of African-Americans between the ages of 25 - 54 years and consequently lower participation rates for African-Americans in the youngest and oldest age groups. The marital status variable supports the expectation of higher proportions of self-employed individuals being married.

Tables 3C.20 (ACS 2014 – 2018) and 3C.21 (CPS-MORG 2014 - 2019) show the regression-adjusted coefficients for African-Americans and Whites interacted with their educational attainment while controlling for age and marital status. The reference education group is high school only. These coefficients show higher propensities towards entrepreneurship within each race category relative to those with only a high school education. Notably, the less than high school group also shows higher propensities relative to only high school education both for African-Americans and Whites and these gaps get larger with higher levels of educational attainment and self-employment commitment for SE Inc or SE FT.

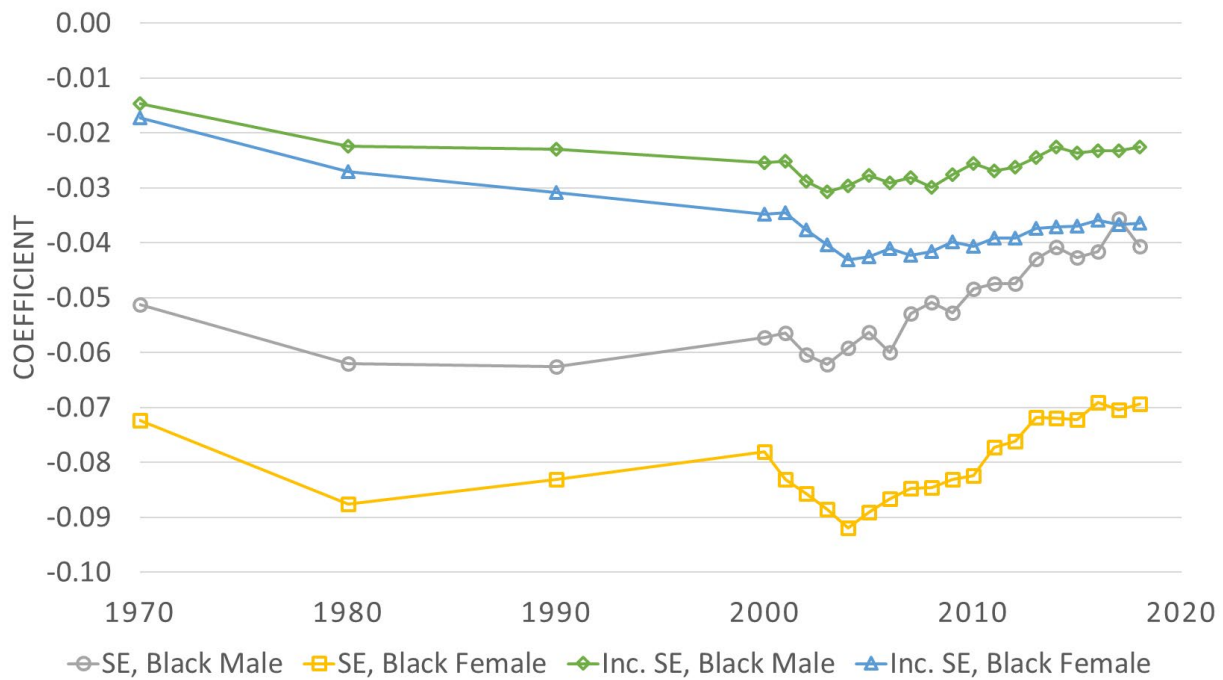
We next follow similar methods as described in prior sections to calculate the regression-adjusted racial and education gaps in propensities for self-employment. Relative to Whites with a high school diploma, these higher propensities are largest for African-Americans with some college education, estimated at 2.9 percentage points for SE, 1.0 percentage points for Inc SE, and 0.25 for FT SE, representing 26, 8, and 23 percent of White high school propensities. Notably, only African-Americans with bachelor's degree have higher propensities relative to Whites with high school diplomas and by a small 0.4 percentage point difference. Comparing racial differences within the same education categories, we find the largest gap for African-Americans with less than high school compared to Whites with less than high school at 5.3, 1.7, 4.2 percentage points for SE, Inc SE, and FT SE respectively. These represent 47, 42, and 57 percent of White less than high school propensities. The education-race gap is narrower but is still large for those with bachelor's degree and above at 4.2, 2.0, and 2.7 percentage points, or 30, 31, and 28 percent of the White bachelor's and above propensities for SE, Inc SE, and FT SE respectively. Table 3C.22 reports the regression-adjusted coefficients for employer-type self-employment with 5+, 10+, and 20+ employees. This table shows that the race-education gaps narrow substantially with increasing firm size and are even insignificant for Some College education or below. The largest gap for employers is for bachelor's and above education with African-Americans showing propensities 1.6, 0.9, 0.6,

0.3 percentage points lower than Whites in firms with any employees, more than 5 employees, more than 10 employees, and more than 20 employees respectively.

To summarize, the African-American White education-race gap gets larger with increasing levels of education but narrows for incorporated and full-time self-employment, as well as with increasing firm sizes.

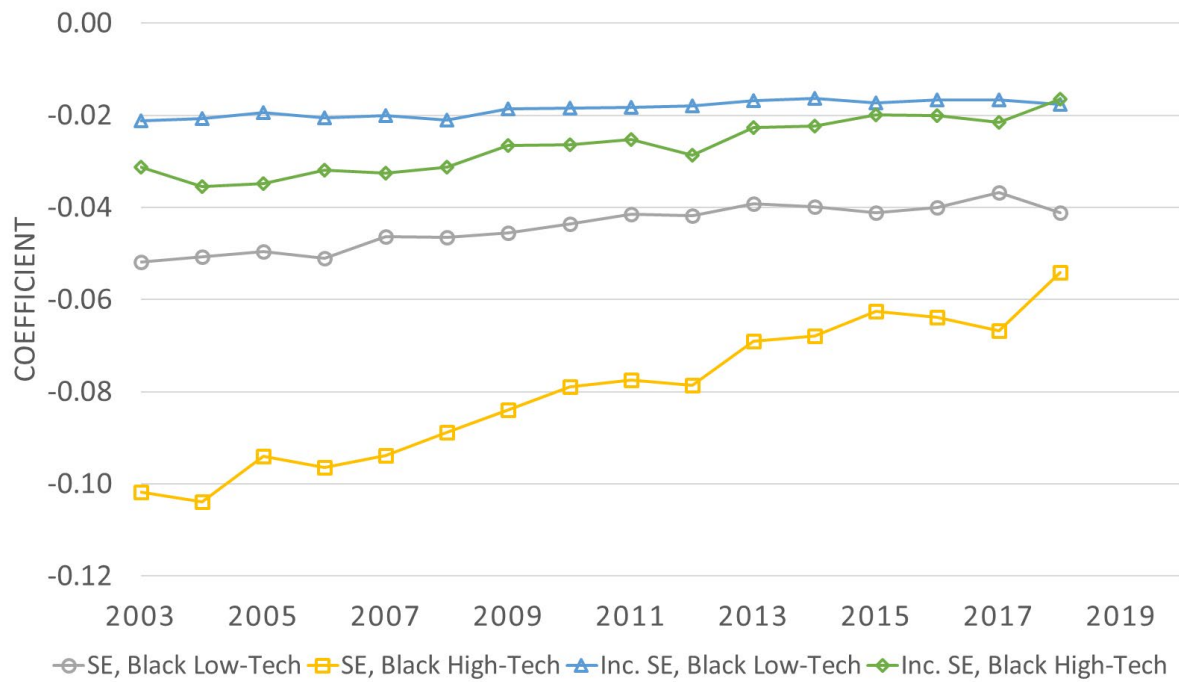
Overall, a striking pattern in this analysis of heterogeneity is that racial gaps tend to be not only large but also similar in magnitude across the different dimensions considered here: area poverty, high-tech, veteran, and education. It is not that those variables are unassociated with entrepreneurship behavior, but rather that the nature of their association tends to be similar within races, so that across a large number of types of groups, the gap between Whites and African-Americans is similar. So, while it is true that African-Americans are more likely to live in high poverty areas, less likely to work in high-tech sectors, more likely to be veterans, and less likely to be highly educated, none of these factors goes very far in accounting for African-American-White differences. The racial gaps seem to result from something intrinsic to race, such as disparate treatment or different opportunities, rather than these other characteristics.

Figure 3A.1. Regression-Adjusted Racial-Gender Gaps in Self-employment, African-American Men and African-American Women Relative to White Men, by Year



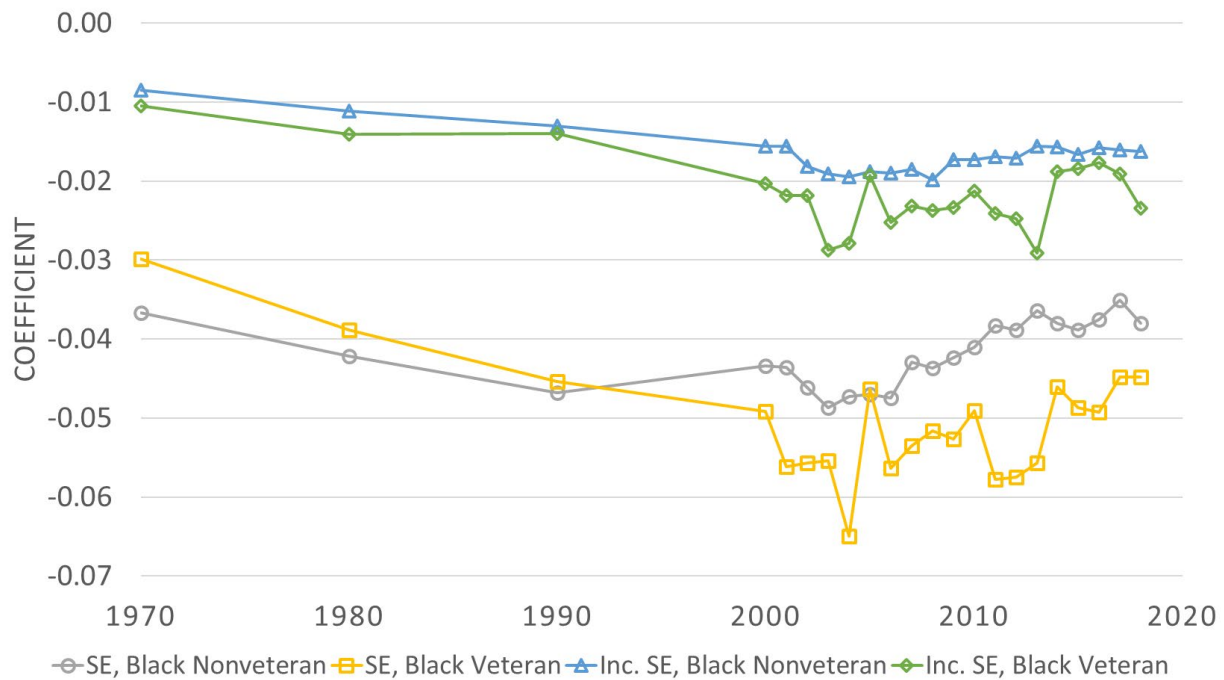
Note: These time plots use the coefficients for self-employment (SE) and incorporated self-employment (Inc. SE) from Table 3A.5. The coefficients on African-American race in each year from that table show the gap between African-American and White men. The sum of the coefficients for African-American race and African-American female from the table show the gap between self-employment rates for African-American women versus White men. Data: Decennial Census 1970, 1980, 1990, 2000, and ACS 2001-2018.

Figure 3C.1. High-Tech Coefficients of Regressions: Self-employment and Incorporated Self-employment in Each Year, ACS 2003-2018



Note: Coefficients for self-employment and incorporated self-employment from Table 3C.6. are presented. The coefficients of non-Hispanic African-American in each year are used for African-American Low-tech. The sum of the coefficients between non-Hispanic African-American and non-Hispanic African-American High-tech in each year are used for African-American high-tech. Data: ACS 2003-2018.

Figure 3C.2. Regression-Adjusted Racial and Veteran Gaps in Self-employment and Incorporated Self-employment, by Year



Note: These time plots use the coefficients for self-employment and incorporated self-employment from Table 3C.12. The coefficients of African-American in each year are used for African-American Nonveterans. To show the gap between self-employment rates for African-American veterans versus White nonveterans, the sum of the coefficients between African-American and African-American Veteran in each year are used for African-American veterans. Data: Decennial Census 1970, 1980, 1990, 2000, and ACS 2001-2018.

Table 3A.1. Fraction of Employment in Types of Self-employment, by Race and Gender

	All	White Male	White Female	African- American Male	African- American Female
(A) ACS 2014-2018					
Self-employed	0.108	0.140	0.096	0.078	0.046
Incorporated SE	0.041	0.063	0.031	0.027	0.013
Full-Time SE	0.073	0.108	0.050	0.056	0.027
Observations	6,072,419	2,245,582	1,961,977	245,528	288,111
(B) CPS ORG 2014-2019					
Self-employed	0.110	0.145	0.097	0.089	0.047
Incorporated SE	0.042	0.067	0.033	0.033	0.013
Full-Time SE	0.073	0.108	0.049	0.065	0.029
Employer	0.026	0.044	0.016	0.014	0.006
Employer 5+	0.0111	0.0198	0.0070	0.0047	0.0019
Employer 10+	0.0062	0.0115	0.0038	0.0024	0.0008
Employer 20+	0.0029	0.0058	0.0016	0.0009	0.0005
Employer 50+	0.0009	0.0019	0.0005	0.0003	0.0002
Mean (SD) Employees (among employers)	8.5 (13.6)	9.4 (14.7)	8.0 (12.6)	6.2 (10.1)	6.7 (12.8)
Observations	911,174	338,832	290,849	39,584	45,430

Note: Data are from ACS 2014-2018 and CPS ORG 2014-2019. The sample is restricted to non-Hispanic individuals of either White or African-American race, aged 16 or over, and working in the non-agriculture sector. Except for the last variable at the bottom of the table, all figures shown are column proportions. For the last variable (the mean number of paid employees), the sample is restricted to self-employed with paid employees (employers), with the standard deviation (SD) of the number of employees shown in parentheses. Estimates are weighted by the person weights for the ACS and the final weights for the CPS ORG. See text for more details on sources and variables.

Table 3A.2. Characteristics of Self-Employed and Employees by Race and Gender

	All	White Male		White Female		African-American Male		African-American Female	
		EMP	SE	EMP	SE	EMP	SE	EMP	SE
(A) ACS 2014-2018									
Age 16-24	0.139	0.134	0.022	0.150	0.034	0.176	0.037	0.175	0.045
Age 25-54	0.645	0.635	0.540	0.613	0.573	0.671	0.679	0.666	0.679
Age 55+	0.216	0.232	0.439	0.237	0.393	0.153	0.284	0.158	0.277
< High School	0.100	0.065	0.064	0.050	0.038	0.098	0.098	0.082	0.081
High School	0.258	0.275	0.246	0.225	0.202	0.351	0.300	0.269	0.231
Some College	0.325	0.316	0.283	0.363	0.326	0.363	0.340	0.418	0.371
BA+	0.317	0.343	0.407	0.361	0.434	0.188	0.261	0.231	0.317
Married	0.507	0.550	0.696	0.501	0.641	0.367	0.521	0.270	0.398
Observations	6,072,419	1,911,883	333,699	1,761,250	200,727	225,075	20,453	273,707	14,404
(B) CPS ORG 2014-2019									
Age 16-24	0.134	0.130	0.021	0.144	0.026	0.165	0.031	0.170	0.052
Age 25-54	0.644	0.632	0.537	0.612	0.569	0.676	0.713	0.664	0.679
Age 55+	0.222	0.238	0.442	0.243	0.405	0.158	0.256	0.166	0.269
< High School	0.091	0.057	0.050	0.046	0.026	0.080	0.066	0.077	0.047
High School	0.274	0.289	0.257	0.235	0.190	0.367	0.306	0.299	0.225
Some College	0.291	0.283	0.251	0.327	0.299	0.326	0.311	0.372	0.365
BA+	0.344	0.371	0.443	0.391	0.486	0.226	0.318	0.252	0.363
Married	0.534	0.571	0.710	0.522	0.684	0.400	0.541	0.284	0.433
Observations	911,174	288,037	50,795	260,940	29,909	36,009	3,575	43,278	2,152

Note: Data are from ACS 2014-2018 and CPS ORG 2014-2019. EMP = employee. SE = self-employed. The sample is restricted to non-Hispanic individuals either White or African-American, aged 16 or over, and working in the non-agriculture sector. Estimates are weighted by the person weights for the ACS and the final weights for the CPS ORG.

Table 3A.3. Log Hourly Earnings of Employees and Self-Employed, by Race and Gender

	All	White Male		White Female		African-American Male		African-American Female	
		EMP	SE	EMP	SE	EMP	SE	EMP	SE
Mean	2.94	3.14	3.20	2.89	2.83	2.80	2.95	2.65	2.61
SD	0.84	0.81	1.15	0.77	1.22	0.76	1.09	0.74	1.14
P10	2.04	2.24	2.01	2.04	1.53	1.98	1.86	1.83	1.43
P25	2.45	2.67	2.62	2.45	2.26	2.36	2.42	2.26	2.08
P50	2.93	3.14	3.18	2.88	2.88	2.80	2.96	2.67	2.67
P75	3.43	3.62	3.84	3.36	3.52	3.22	3.50	3.07	3.22
P90	3.91	4.06	4.46	3.77	4.16	3.65	4.06	3.51	3.87
Observations	380,581	106,772	16,954	97,966	9858	17,657	1654	21,283	919

Note: Data are from CPS ASEC 2015-2019. Data are for previous year, so the time period covered is 2014-2018. The sample is restricted to non-Hispanic individuals either White or African-American, aged 16 or over, and working in the non-agriculture sector. EMP = employee. SE = self-employed. For employees, hourly wages are computed as annual wage and salary income/(weeks worked*usual hours worked). For self-employed, hourly wages are computed as (wage and salary income + nonfarm business income)/(weeks worked*usual hours worked). Estimates are weighted by the ASEC weights for the CPS ASEC.

Table 3A.4. Regression-Adjusted Racial and Gender Gaps in Self-employment, ACS Data

VARIABLES	(1) SE	(2) Inc. SE	(3) FT SE
African-American	-0.0402*** (0.0007)	-0.0231*** (0.0004)	-0.0390*** (0.0006)
White*Female	-0.0400*** (0.0004)	-0.0300*** (0.0002)	-0.0550*** (0.0003)
African-American*Female	-0.0304*** (0.0008)	-0.0135*** (0.0005)	-0.0273*** (0.0007)
Mean of Dep. Var.			
White	[0.1195]	[0.0481]	[0.0812]
African-American	[0.0611]	[0.0195]	[0.0404]
Demographic Controls	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
R-squared	0.0419	0.0259	0.0318

Note: Data are from ACS 2014-2018. The sample is restricted to individuals working in the non-agriculture sector. Estimates are weighted by the person weights provided by the ACS. Controls for other races/ethnicity, years, age, education, and marital status are also included. The reference group is White men. Observations = 6,072,419.

Table 3A.5. Regression-Adjusted Racial and Gender Gaps in Types of Self-employment by Year, 1970-2018

VARIABLES and YEARS	(1) SE	(2) Inc. SE	(3) FT SE
African-American 1970	-0.0513*** (0.0010)	-0.0147*** (0.0004)	-0.0513*** (0.0010)
African-American 1980	-0.0620*** (0.0006)	-0.0224*** (0.0003)	-0.0625*** (0.0005)
African-American 1990	-0.0625*** (0.0007)	-0.0230*** (0.0004)	-0.0619*** (0.0006)
African-American 2000	-0.0572*** (0.0007)	-0.0254*** (0.0004)	-0.0568*** (0.0006)
African-American 2001	-0.0564*** (0.0028)	-0.0252*** (0.0016)	-0.0554*** (0.0025)
African-American 2002	-0.0604*** (0.0029)	-0.0288*** (0.0016)	-0.0582*** (0.0027)
African-American 2003	-0.0621*** (0.0028)	-0.0307*** (0.0015)	-0.0618*** (0.0025)
African-American 2004	-0.0591*** (0.0030)	-0.0297*** (0.0017)	-0.0556*** (0.0027)
African-American 2005	-0.0563*** (0.0020)	-0.0277*** (0.0012)	-0.0541*** (0.0018)
African-American 2006	-0.0600*** (0.0016)	-0.0291*** (0.0010)	-0.0566*** (0.0015)
African-American 2007	-0.0529*** (0.0017)	-0.0282*** (0.0010)	-0.0499*** (0.0015)
African-American 2008	-0.0508*** (0.0016)	-0.0299*** (0.0009)	-0.0489*** (0.0014)
African-American 2009	-0.0527*** (0.0017)	-0.0276*** (0.0010)	-0.0493*** (0.0015)
African-American 2010	-0.0484*** (0.0017)	-0.0255*** (0.0010)	-0.0444*** (0.0015)
African-American 2011	-0.0475*** (0.0018)	-0.0269*** (0.0011)	-0.0442*** (0.0016)
African-American 2012	-0.0474*** (0.0017)	-0.0262*** (0.0010)	-0.0455*** (0.0014)
African-American 2013	-0.0429*** (0.0017)	-0.0244*** (0.0010)	-0.0403*** (0.0015)
African-American 2014	-0.0408*** (0.0016)	-0.0226*** (0.0010)	-0.0404*** (0.0014)
African-American 2015	-0.0427*** (0.0016)	-0.0237*** (0.0010)	-0.0405*** (0.0014)

African-American 2016	-0.0416*** (0.0016)	-0.0233*** (0.0010)	-0.0406*** (0.0014)
African-American 2017	-0.0356*** (0.0017)	-0.0232*** (0.0010)	-0.0374*** (0.0014)
African-American 2018	-0.0406*** (0.0016)	-0.0226*** (0.0010)	-0.0366*** (0.0014)
African-American*Female 1970	-0.0211*** (0.0012)	-0.0026*** (0.0004)	-0.0211*** (0.0012)
Mean of Dep. Var. 1970	[0.0396]	[0.0041]	[0.0396]
African-American*Female 1980	-0.0256*** (0.0006)	-0.0047*** (0.0003)	-0.0244*** (0.0006)
Mean of Dep. Var. 1980	[0.0370]	[0.0064]	[0.0274]
African-American*Female 1990	-0.0206*** (0.0008)	-0.0078*** (0.0004)	-0.0213*** (0.0007)
Mean of Dep. Var. 1990	[0.0459]	[0.0107]	[0.0335]
African-American*Female 2000	-0.0208*** (0.0008)	-0.0094*** (0.0004)	-0.0217*** (0.0007)
Mean of Dep. Var. 2000	[0.0566]	[0.0147]	[0.0418]
African-American*Female 2001	-0.0267*** (0.0032)	-0.0094*** (0.0017)	-0.0267*** (0.0028)
Mean of Dep. Var. 2001	[0.0606]	[0.0149]	[0.0460]
African-American*Female 2002	-0.0253*** (0.0034)	-0.0089*** (0.0017)	-0.0260*** (0.0030)
Mean of Dep. Var. 2002	[0.0608]	[0.0139]	[0.0450]
African-American*Female 2003	-0.0264*** (0.0032)	-0.0097*** (0.0016)	-0.0232*** (0.0028)
Mean of Dep. Var. 2003	[0.0630]	[0.0149]	[0.0453]
African-American*Female 2004	-0.0328*** (0.0034)	-0.0134*** (0.0018)	-0.0321*** (0.0030)
Mean of Dep. Var. 2004	[0.0671]	[0.0169]	[0.0501]
African-American*Female 2005	-0.0328*** (0.0022)	-0.0149*** (0.0013)	-0.0321*** (0.0020)
Mean of Dep. Var. 2005	[0.0660]	[0.0194]	[0.0479]
African-American*Female 2006	-0.0267*** (0.0019)	-0.0120*** (0.0010)	-0.0266*** (0.0016)
Mean of Dep. Var. 2006	[0.0622]	[0.0173]	[0.0449]
African-American*Female 2007	-0.0318*** (0.0019)	-0.0141*** (0.0010)	-0.0319*** (0.0017)
Mean of Dep. Var. 2007	[0.0651]	[0.0183]	[0.0473]
African-American*Female 2008	-0.0338*** (0.0018)	-0.0117*** (0.0009)	-0.0306*** (0.0015)
Mean of Dep. Var. 2008	[0.0607]	[0.0161]	[0.0425]

African-American*Female 2009	-0.0304*** (0.0019)	-0.0122*** (0.0011)	-0.0244*** (0.0016)
Mean of Dep. Var. 2009	[0.0627]	[0.0183]	[0.0431]
African-American*Female 2010	-0.0340*** (0.0019)	-0.0151*** (0.0011)	-0.0297*** (0.0016)
Mean of Dep. Var. 2010	[0.0646]	[0.0193]	[0.0435]
African-American*Female 2011	-0.0297*** (0.0020)	-0.0123*** (0.0012)	-0.0255*** (0.0017)
Mean of Dep. Var. 2011	[0.0633]	[0.0181]	[0.0416]
African-American*Female 2012	-0.0287*** (0.0019)	-0.0129*** (0.0011)	-0.0240*** (0.0016)
Mean of Dep. Var. 2012	[0.0606]	[0.0177]	[0.0390]
African-American*Female 2013	-0.0289*** (0.0019)	-0.0130*** (0.0010)	-0.0269*** (0.0016)
Mean of Dep. Var. 2013	[0.0594]	[0.0174]	[0.0391]
African-American*Female 2014	-0.0311*** (0.0018)	-0.0145*** (0.0010)	-0.0270*** (0.0015)
Mean of Dep. Var. 2014	[0.0602]	[0.0188]	[0.0389]
African-American*Female 2015	-0.0295*** (0.0018)	-0.0133*** (0.0010)	-0.0269*** (0.0015)
Mean of Dep. Var. 2015	[0.0586]	[0.0183]	[0.0389]
African-American*Female 2016	-0.0275*** (0.0018)	-0.0126*** (0.0011)	-0.0246*** (0.0015)
Mean of Dep. Var. 2016	[0.0604]	[0.0197]	[0.0400]
African-American*Female 2017	-0.0349*** (0.0019)	-0.0135*** (0.0011)	-0.0293*** (0.0015)
Mean of Dep. Var. 2017	[0.0645]	[0.0205]	[0.0418]
African-American*Female 2018	-0.0287*** (0.0018)	-0.0139*** (0.0011)	-0.0287*** (0.0016)
Mean of Dep. Var. 2018	[0.0618]	[0.0203]	[0.0422]

Note: Data are from Decennial Census 1970, 1980, 1990, 2000, and ACS 2001-2018. The samples are restricted to individuals working in non-agriculture sectors. Dependent variables are dummies for self-employment (SE), incorporated self-employment (Inc. SE), and full-time self-employment (FT SE); unconditional means are provided for each of these in each year. Regressions are estimated separately for each year of the data. The reported coefficients (standard errors) are for African-American versus White race, and for African-American female versus African-American male, with contemporaneous controls included for other racial/ethnic groups, gender, marital status, and education. Estimates are weighted by the ACS person weights.

Table 3A.6. Regression-Adjusted Racial and Gender Gaps in Self-Employment, CPS ORG Data

VARIABLES	(1) SE	(2) Inc. SE	(3) FT SE
African-American	-0.0338*** (0.0017)	-0.0215*** (0.0011)	-0.0300*** (0.0015)
White*Female	-0.0447*** (0.0009)	-0.0336*** (0.0006)	-0.0562*** (0.0007)
African-American *Female	-0.0397*** (0.0019)	-0.0191*** (0.0012)	-0.0344*** (0.0016)
Mean of Dep. Var.			
White	[0.1231]	[0.0514]	[0.0811]
African-American	[0.0673]	[0.0224]	[0.0462]
Demographic Controls	Yes	Yes	Yes
Month Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
R-squared	0.0426	0.0287	0.0304

Note: Data are from CPS ORG (Current Population Survey Outgoing Rotation Groups) for 2014-2019. The sample is restricted to individuals working in the non-agriculture sectors. Controls for other races/ethnicity, years, age, education, and marital status are also included. The reference group is White men. Estimates are weighted by the final weights provided by the CPS. Observations = 911,174.

Table 3A.7. Regression-Adjusted Racial and Gender Gaps in Employer Probability

VARIABLES	(1)	(2)	(3)	(4)
	Employer	Emp 5+	Emp 10+	Emp 20+
African-American	-0.0226*** (0.0008)	-0.0113*** (0.0005)	-0.0069*** (0.0003)	-0.0038*** (0.0002)
White*Female	-0.0270*** (0.0005)	-0.0124*** (0.0003)	-0.0075*** (0.0002)	-0.0041*** (0.0002)
African-American*Female	-0.0067*** (0.0008)	-0.0023*** (0.0004)	-0.0013*** (0.0003)	-0.0003 (0.0002)
Mean of Dep. Var.				
White	[0.0316]	[0.0140]	[0.0080]	[0.0039]
African-American	[0.0096]	[0.0033]	[0.0016]	[0.0007]
Demographic Controls	Yes	Yes	Yes	Yes
Month Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
R-squared	0.0212	0.0103	0.0065	0.0036

Note: Data: CPS ORG 2014-2019. The dependent variables are dummies for whether the person has paid employees, whether they have at least 5 paid employees, at least 10, and at least 20, respectively. The sample is the same as Table 4.6, restricted to individuals working in the non-agriculture sectors. Estimates are weighted by the final weights provided by the CPS. Controls for other races/ethnicity, year, survey month, age, education, and marital status are also included. The reference group is White men. Observations = 911,174.

Table 3A.8. Regression-Adjusted Racial and Gender Gaps in Hourly Earnings

VARIABLES	(1)	(2)
	Log of Hourly Wages	
	Employee	SE
African-American	-0.196*** (0.007)	-0.136*** (0.031)
White*Female	-0.257*** (0.004)	-0.399*** (0.017)
African-American*Female	-0.152*** (0.008)	-0.374*** (0.051)
Mean of Hourly Wages		
White	[3.0]	[3.1]
African-American	[2.7]	[2.8]
Demographic Controls	Yes	Yes
Year Fixed Effects	Yes	Yes
Observations	341,660	38,921
R-squared	0.269	0.100

Note: Data are from CPS ASEC 2015-2019. The sample is restricted to the employed (employee or self-employed) in the non-agricultural sectors. Estimates are weighted by the ASEC weights provided by the CPS. Controls for other races/ethnicity, year, age, education, and marital status are also included. The reference group is White men.

Table 3C.1. Fraction of Employment in Types of Self-employment, by Area Poverty

	All	White Low Poverty	White High Poverty	African- American Low Poverty	African- American High Poverty
Self-employed	0.108	0.120	0.113	0.063	0.057
Incorporated SE	0.041	0.049	0.039	0.022	0.015
Full-Time SE	0.073	0.082	0.075	0.043	0.035
Observations	6,072,419	3,657,530	550,029	351,899	181,740

Note: Data are from ACS 2014-2018. The sample is restricted to non-Hispanic individuals either White or African-American, aged 16 or over, and working in the non-agriculture sector. Estimates are weighted by the person weights for the ACS.

Table 3C.2. Characteristics of Self-Employed and Employees by Race and Location in High Poverty Areas

	All	White		White		African-American		African-American	
		Low-Poverty		High-Poverty		Low-Poverty		High-Poverty	
		EMP	SE	EMP	SE	EMP	SE	EMP	SE
Age 16-24	0.139	0.136	0.025	0.177	0.039	0.174	0.037	0.180	0.047
Age 25-54	0.645	0.626	0.550	0.616	0.564	0.673	0.686	0.659	0.663
Age 55+	0.216	0.238	0.425	0.207	0.397	0.153	0.277	0.161	0.290
< High School	0.100	0.057	0.052	0.068	0.073	0.082	0.079	0.106	0.119
High School	0.258	0.249	0.228	0.270	0.244	0.286	0.256	0.352	0.312
Some College	0.325	0.336	0.299	0.353	0.294	0.393	0.351	0.391	0.356
BA+	0.317	0.358	0.421	0.310	0.389	0.239	0.314	0.151	0.212
Married	0.507	0.536	0.683	0.461	0.620	0.342	0.509	0.259	0.384
Observations	6,072,419	3,189,189	468,341	483,944	66,085	328,124	23,775	170,658	11,082

Note: Data are from ACS 2014-2018. EMP = employee. SE = self-employed. The sample is restricted to non-Hispanic individuals either White or African-American, aged 16 or over, and working in the non-agriculture sector. Estimates are weighted by the person weights for the ACS.

Table 3C.3. Regression-Adjusted Racial Gaps in Self-Employment, by Area Poverty

VARIABLES	(1) SE	(2) Inc. SE	(3) FT SE
African-American	-0.0362*** (0.0006)	-0.0159*** (0.0003)	-0.0262*** (0.0005)
White*High-poverty	0.0020*** (0.0006)	-0.0047*** (0.0003)	0.0003 (0.0005)
African-American*High-poverty	-0.0031*** (0.0008)	-0.0027*** (0.0005)	-0.0043*** (0.0007)
Mean of Dep. Var.			
White	[0.1195]	[0.0481]	[0.0812]
African-American	[0.0611]	[0.0195]	[0.0404]
R-squared	0.0389	0.0219	0.0235

Note: Data are from ACS 2014-2018. The sample is restricted to individuals working in the non-agriculture sector. Estimates are weighted by the person weights provided by the ACS. Controls for other races/ethnicity, years, age, education, and marital status are also included. The reference group is Whites in low-poverty areas. Observations = 6,072,419.

Table 3C.4. Fraction of Employment in Types of Self-employment by High-Tech Sector

	All	White Low-tech	White High-tech	African- American Low-tech	African- American High-tech
(A) ACS 2014-2018					
Self-employed	0.108	0.123	0.092	0.062	0.053
Incorporated SE	0.041	0.048	0.046	0.019	0.026
Full-Time SE	0.073	0.084	0.063	0.041	0.037
Observations	6,072,419	3,716,972	490,587	494,196	39,443
(B) CPS ORG 2014-2019					
Self-employed	0.1098	0.1268	0.0953	0.0680	0.0600
Incorporated SE	0.0425	0.0514	0.0512	0.0217	0.0306
Full-Time SE	0.0735	0.0836	0.0622	0.0464	0.0437
Employer	0.0262	0.0333	0.0186	0.0098	0.0072
Employer 5+	0.0111	0.0146	0.0092	0.0033	0.0030
Employer 10+	0.0062	0.0083	0.0058	0.0016	0.0017
Employer 20+	0.0029	0.0040	0.0031	0.0007	0.0006
Employer 50+	0.0009	0.0013	0.0009	0.0002	0.0002
Mean (SD) Employees (among employers)	8.5 (13.6)	8.9 (14.1)	10.7 (15.7)	6.3 (10.8)	7.9 (14.0)
Observations	911,174	557,435	72,246	78,455	6,559

Note: Data are from ACS 2014-2018 and CPS ORG 2014-2019. The sample is restricted to non-Hispanic individuals either White or African-American, aged 16 or over, and working in the non-agriculture sector. For the mean number of paid employees in the bottom row, the sample is restricted to self-employed with paid employees (employers), with the standard deviation (SD) of the number of employees is shown in parentheses. Estimates are weighted by the person weights for the ACS and the final weights for the CPS ORG. See text for more details on sources and variables.

Table 3C.5. Characteristics of High-Tech Self-Employed and Employees by High-tech Sector

	All	White		White		African-American		African-American	
		Low-tech		High-tech		Low-tech		High-tech	
		EMP	SE	EMP	SE	EMP	SE	EMP	SE
(A) ACS 2014-2018									
Age 16-24	0.139	0.152	0.137	0.060	0.055	0.183	0.175	0.076	0.073
Age 25-54	0.645	0.615	0.607	0.697	0.682	0.661	0.662	0.760	0.757
Age 55+	0.216	0.233	0.256	0.243	0.263	0.155	0.163	0.164	0.170
< High School	0.100	0.064	0.063	0.017	0.016	0.094	0.095	0.031	0.030
High School	0.258	0.265	0.262	0.153	0.146	0.316	0.314	0.200	0.194
Some College	0.325	0.346	0.341	0.281	0.275	0.395	0.392	0.362	0.358
BA+	0.317	0.325	0.333	0.550	0.563	0.195	0.199	0.407	0.419
Married	0.507	0.512	0.532	0.633	0.641	0.306	0.316	0.427	0.432
Observations	6,072,419	3,229,972	487,000	443,161	47,426	461,540	32,656	37,242	2,201
(B) CPS ORG 2014-2019									
Age 16-24	0.134	0.147	0.024	0.063	0.011	0.176	0.039	0.075	0.029
Age 25-54	0.644	0.613	0.551	0.692	0.524	0.662	0.700	0.762	0.704
Age 55+	0.222	0.240	0.425	0.245	0.465	0.162	0.260	0.164	0.267
< High School	0.091	0.057	0.044	0.013	0.009	0.083	0.063	0.023	0.009
High School	0.274	0.278	0.248	0.166	0.078	0.341	0.290	0.210	0.089
Some College	0.291	0.311	0.277	0.248	0.181	0.354	0.336	0.311	0.260
BA+	0.344	0.354	0.431	0.573	0.732	0.222	0.311	0.456	0.642
Married	0.534	0.535	0.697	0.643	0.741	0.329	0.497	0.456	0.567
Observations	911,174	483,890	73,545	65,087	7,159	73,126	5,329	6,161	398

Note: Data are from ACS 2014-2018 and CPS ORG 2014-2019. EMP = employee. SE = self-employed. The sample is restricted to non-Hispanic individuals either White or African-American, aged 16 or over, and working in the non-agriculture sector. Estimates are weighted by the person weights for the ACS and the final weights for the CPS ORG.

Table 3C.6. Regressions: Self-employment in High-Technology Sectors, ACS 2014-2018

VARIABLES	(1) SE	(2) Inc. SE	(3) FT SE
African-American	-0.0398*** (0.0005)	-0.0169*** (0.0003)	-0.0295*** (0.0004)
White*High-tech	-0.0440*** (0.0005)	-0.0114*** (0.0004)	-0.0317*** (0.0005)
African-American*High-tech	-0.0231*** (0.0015)	-0.0031*** (0.0010)	-0.0152*** (0.0013)
Mean of Dep. Var.			
White	[0.1195]	[0.0481]	[0.0812]
African-American	[0.0611]	[0.0195]	[0.0404]
R-squared	0.0410	0.0223	0.0251

Note: Data are from ACS 2014-2018. The sample is restricted to individuals working in the non-agriculture sectors. Estimates are weighted by the person weights provided by the ACS. The reference groups are Non-Hispanic Whites, not in high-tech (low-tech) sector, single, and high school for race/ethnicity, gender, marital status, and education. Observations = 6,072,419.

Table 3C.7. Regressions: High-tech Self-employment in Each Year, Decennial Census 1970, 1980, 1990, 2000, and ACS 2001-2018

VARIABLES	(1) SE	(2) Inc. SE	(3) FT SE
African-American 2003	-0.0518*** (0.0019)	-0.0212*** (0.0009)	-0.0418*** (0.0016)
African-American 2004	-0.0508*** (0.0019)	-0.0208*** (0.0010)	-0.0385*** (0.0017)
African-American 2005	-0.0496*** (0.0013)	-0.0194*** (0.0007)	-0.0386*** (0.0011)
African-American 2006	-0.0511*** (0.0011)	-0.0206*** (0.0006)	-0.0395*** (0.0009)
African-American 2007	-0.0463*** (0.0011)	-0.0200*** (0.0006)	-0.0356*** (0.0010)
African-American 2008	-0.0465*** (0.0011)	-0.0211*** (0.0006)	-0.0356*** (0.0009)
African-American 2009	-0.0455*** (0.0011)	-0.0186*** (0.0006)	-0.0328*** (0.0009)
African-American 2010	-0.0436*** (0.0011)	-0.0184*** (0.0006)	-0.0319*** (0.0009)
African-American 2011	-0.0415*** (0.0012)	-0.0183*** (0.0007)	-0.0305*** (0.0010)
African-American 2012	-0.0418*** (0.0011)	-0.0180*** (0.0006)	-0.0316*** (0.0009)
African-American 2013	-0.0392*** (0.0011)	-0.0169*** (0.0006)	-0.0289*** (0.0009)
African-American 2014	-0.0398*** (0.0011)	-0.0164*** (0.0006)	-0.0301*** (0.0009)
African-American 2015	-0.0411*** (0.0010)	-0.0173*** (0.0006)	-0.0302*** (0.0009)
African-American 2016	-0.0401*** (0.0011)	-0.0167*** (0.0006)	-0.0295*** (0.0009)
African-American 2017	-0.0368*** (0.0011)	-0.0166*** (0.0006)	-0.0285*** (0.0009)
African-American 2018	-0.0412*** (0.0011)	-0.0176*** (0.0006)	-0.0290*** (0.0009)
African-American*High-tech 2003	-0.0500*** (0.0039)	-0.0100*** (0.0025)	-0.0369*** (0.0035)
Mean of Dep. Var. 2003	[0.0630]	[0.0149]	[0.0453]
African-American*High-tech 2004	-0.0531*** (0.0046)	-0.0147*** (0.0026)	-0.0379*** (0.0043)
Mean of Dep. Var. 2004	[0.0671]	[0.0169]	[0.0501]

African-American*High-tech 2005	-0.0444*** (0.0033) [0.0660]	-0.0155*** (0.0018) [0.0194]	-0.0355*** (0.0027) [0.0479]
Mean of Dep. Var. 2005			
African-American*High-tech 2006	-0.0454*** (0.0027) [0.0622]	-0.0113*** (0.0019) [0.0173]	-0.0334*** (0.0024) [0.0449]
Mean of Dep. Var. 2006			
African-American*High-tech 2007	-0.0475*** (0.0026) [0.0651]	-0.0125*** (0.0017) [0.0183]	-0.0354*** (0.0023) [0.0473]
Mean of Dep. Var. 2007			
African-American*High-tech 2008	-0.0423*** (0.0025) [0.0607]	-0.0101*** (0.0016) [0.0161]	-0.0304*** (0.0021) [0.0425]
Mean of Dep. Var. 2008			
African-American*High-tech 2009	-0.0385*** (0.0028) [0.0627]	-0.0079*** (0.0020) [0.0183]	-0.0273*** (0.0024) [0.0431]
Mean of Dep. Var. 2009			
African-American*High-tech 2010	-0.0353*** (0.0031) [0.0646]	-0.0080*** (0.0021) [0.0193]	-0.0241*** (0.0027) [0.0435]
Mean of Dep. Var. 2010			
African-American*High-tech 2011	-0.0360*** (0.0033) [0.0633]	-0.0069*** (0.0024) [0.0181]	-0.0283*** (0.0027) [0.0416]
Mean of Dep. Var. 2011			
African-American*High-tech 2012	-0.0368*** (0.0030) [0.0606]	-0.0107*** (0.0019) [0.0177]	-0.0270*** (0.0024) [0.0390]
Mean of Dep. Var. 2012			
African-American*High-tech 2013	-0.0299*** (0.0030) [0.0594]	-0.0058*** (0.0021) [0.0174]	-0.0223*** (0.0025) [0.0391]
Mean of Dep. Var. 2013			
African-American*High-tech 2014	-0.0281*** (0.0031) [0.0602]	-0.0060*** (0.0022) [0.0188]	-0.0164*** (0.0028) [0.0389]
Mean of Dep. Var. 2014			
African-American*High-tech 2015	-0.0214*** (0.0032) [0.0586]	-0.0026 (0.0021) [0.0183]	-0.0145*** (0.0027) [0.0389]
Mean of Dep. Var. 2015			
African-American*High-tech 2016	-0.0237*** (0.0031) [0.0604]	-0.0034 (0.0023) [0.0197]	-0.0177*** (0.0026) [0.0400]
Mean of Dep. Var. 2016			
African-American*High-tech 2017	-0.0300*** (0.0032) [0.0645]	-0.0049** (0.0022) [0.0205]	-0.0176*** (0.0028) [0.0418]
Mean of Dep. Var. 2017			
African-American*High-tech 2018	-0.0130*** (0.0036) [0.0618]	0.0011 (0.0024) [0.0203]	-0.0101*** (0.0031) [0.0422]
Mean of Dep. Var. 2018			

Note: Data are from Decennial Census 1970, 1980, 1990, 2000, and ACS 2001-2018. The sample is restricted to individuals working in the non-agriculture sectors. Estimates are weighted by the person weights provided by the ACS. The reference groups are Non-Hispanic White, not in high-tech (low-tech) sectors, single, and high school for race/ethnicity, gender, marital status, and education.

Table 3C.8. Regression-Adjusted Racial and High-tech Gap in Self-Employment, CPS Data

VARIABLES	(1) SE	(2) Inc. SE	(3) FT SE
African-American	-0.0362*** (0.0011)	-0.0166*** (0.0007)	-0.0238*** (0.0009)
White*High-tech	-0.0447*** (0.0013)	-0.0096*** (0.0010)	-0.0318*** (0.0011)
African-American*High-tech	-0.0233*** (0.0035)	-0.0020 (0.0025)	-0.0148*** (0.0030)
Mean of Dep. Var.			
White	[0.1231]	[0.0514]	[0.0811]
African-American	[0.0673]	[0.0224]	[0.0462]
Demographic Controls	Yes	Yes	Yes
Month Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
Observations	911,174	911,174	911,174
R-squared	0.0404	0.0241	0.0228

Note: Data are from CPS ORG 2014-2019. The sample is restricted to individuals working in the non-agriculture sectors. Estimates are weighted by the final weights provided by the CPS. Controls for other races/ethnicity, years, age, education, and marital status are also included. The reference group is Whites not in high-tech (low-tech) sectors.

Table 3C.9. Regression-Adjusted Racial and High-tech Gaps in Employer Probability

VARIABLES	(1) Employer	(2) Emp 5+	(3) Emp 10+	(4) Emp 20+
African-American	-0.0150*** (0.0005)	-0.0073*** (0.0003)	-0.0044*** (0.0002)	-0.0021*** (0.0001)
White*High-tech	-0.0196*** (0.0006)	-0.0081*** (0.0004)	-0.0041*** (0.0003)	-0.0017*** (0.0003)
African-American*High-tech	-0.0084*** (0.0012)	-0.0034*** (0.0009)	-0.0017*** (0.0006)	-0.0010*** (0.0004)
Mean of Dep. Var.				
White	[0.0316]	[0.0140]	[0.0080]	[0.0039]
African-American	[0.0096]	[0.0033]	[0.0016]	[0.0007]
Observations	911,174	911,174	911,174	911,174
R-squared	0.0176	0.0085	0.0052	0.0027

Note: Data are from CPS ORG 2014-2019. The sample is restricted to individuals working in the non-agriculture sectors. Estimates are weighted by the final weights provided by the CPS. Controls for other races/ethnicity, years, survey month, age, education, and marital status are also included. The reference group is Whites not in high-tech (low-tech) sectors.

Table 3C.10. Fraction of Employment in Types of Self-employment by Veteran Status

	All	White Nonveteran	White Veteran	African- American Nonveteran	African- American Veteran
(A) ACS 2014-2018					
Self-employed	0.108	0.118	0.149	0.060	0.092
Incorporated SE	0.041	0.047	0.061	0.019	0.034
Full-Time SE	0.073	0.081	0.097	0.039	0.060
Observations	6,072,419	3,932,065	256,139	500,522	30,946
(B) CPS ORG 2014-2019					
Self-employed	0.1098	0.1214	0.1559	0.0658	0.0994
Incorporated SE	0.0425	0.0506	0.0673	0.0215	0.0399
Full-Time SE	0.0735	0.0805	0.0967	0.0453	0.0666
Employer	0.0262	0.0311	0.0414	0.0093	0.0159
Employer 5+	0.0111	0.0138	0.0182	0.0032	0.0050
Employer 10+	0.0062	0.0079	0.0103	0.0015	0.0028
Employer 20+	0.0029	0.0038	0.0049	0.0007	0.0010
Employer 50+	0.0009	0.0012	0.0018	0.0002	0.0001
Mean (SD) Employees	8.5	9.1	9.1	6.4	5.6
(among employers)	(13.6)	(14.2)	(14.6)	(11.2)	(7.8)
Observations	911,174	586,362	40,288	79,922	4,734

Note: Data are from ACS 2014-2018 and CPS ORG 2014-2019. The sample is restricted to non-Hispanic individuals either White or African-American, aged 16 or over, and working in the non-agriculture sector. For the mean number of paid employees in the bottom row, the sample is restricted to self-employed with paid employees (employers), with the standard deviation (SD) of the number of employees is shown in parentheses. Estimates are weighted by the person weights for the ACS and the final weights for the CPS ORG. See text for more details on sources and variables.

Table 3C.11. Characteristics of Veteran Self-Employed and Employees by Race and Veteran Status

	All	White		White		African-American		African-American	
		Nonveteran		Veteran		Nonveteran		Veteran	
		EMP	SE	EMP	SE	EMP	SE	EMP	SE
(A) ACS 2014-2018									
Age 16-24	0.139	0.144	0.130	0.019	0.016	0.180	0.172	0.023	0.021
Age 25-54	0.645	0.633	0.626	0.542	0.506	0.673	0.675	0.633	0.621
Age 55+	0.216	0.223	0.244	0.439	0.477	0.147	0.154	0.344	0.358
< High School	0.100	0.055	0.055	0.026	0.027	0.089	0.089	0.035	0.035
High School	0.258	0.251	0.249	0.280	0.273	0.310	0.308	0.284	0.280
Some College	0.325	0.336	0.331	0.413	0.401	0.391	0.388	0.456	0.454
BA+	0.317	0.358	0.365	0.282	0.299	0.211	0.215	0.225	0.230
Married	0.507	0.521	0.539	0.664	0.675	0.307	0.316	0.508	0.513
Observations	6,072,419	3,439,227	492,838	215,175	40,964	468,696	31,826	27,953	2,993
(B) CPS ORG 2014-2019									
Age 16-24	0.134	0.139	0.024	0.018	0.002	0.172	0.040	0.018	0.008
Age 25-54	0.644	0.632	0.570	0.534	0.295	0.674	0.717	0.643	0.517
Age 55+	0.222	0.229	0.406	0.448	0.704	0.154	0.243	0.339	0.475
< High School	0.091	0.049	0.042	0.023	0.020	0.078	0.063	0.020	0.010
High School	0.274	0.263	0.232	0.300	0.249	0.334	0.277	0.305	0.271
Some College	0.291	0.301	0.267	0.370	0.290	0.348	0.329	0.418	0.351
BA+	0.344	0.387	0.460	0.308	0.440	0.240	0.332	0.258	0.368
Married	0.534	0.543	0.698	0.678	0.739	0.329	0.495	0.537	0.587
Observations	911,174	512,261	74,101	33,775	6,513	74,686	5,236	4,248	486

Note: Data are from ACS 2014-2018 and CPS ORG 2014-2019. EMP = employee. SE = self-employed. The sample is restricted to non-Hispanic individuals either White or African-American, aged 16 or over, and working in the non-agriculture sector. Estimates are weighted by the person weights for the ACS and the final weights for the CPS ORG.

Table 3C.12. Regression-Adjusted Racial and Veteran Gaps in Self-employment

VARIABLES	(1) SE	(2) Inc. SE	(3) FT SE
African-American	-0.0375*** (0.0005)	-0.0161*** (0.0003)	-0.0276*** (0.0004)
White*Veteran	-0.0113*** (0.0009)	-0.0033*** (0.0006)	-0.0057*** (0.0007)
African-American*Veteran	-0.0092*** (0.0021)	-0.0034** (0.0013)	-0.0059*** (0.0018)
Mean of Dep. Var.			
White	[0.1195]	[0.0481]	[0.0812]
African-American	[0.0611]	[0.0195]	[0.0404]
R-squared	0.0389	0.0219	0.0235

Note: Data are from ACS 2014-2018. The sample is restricted to individuals working in the non-agriculture sectors. Estimates are weighted by the person weights provided by the ACS. The reference groups are non-Hispanic White, nonveteran, single, and high school for race/ethnicity, gender, marital status, and education. Observations = 6,072,419.

Table 3C.13. Regression-Adjusted Racial and Veteran Gaps in Types of Self-employment by Year, 1970-2018

VARIABLES	(1) SE	(2) Inc. SE	(3) FT SE
African-American 1970	-0.0367*** (0.0007)	-0.0085*** (0.0002)	-0.0367*** (0.0007)
African-American 1980	-0.0422*** (0.0004)	-0.0111*** (0.0002)	-0.0351*** (0.0003)
African-American 1990	-0.0468*** (0.0004)	-0.0130*** (0.0002)	-0.0379*** (0.0004)
African-American 2000	-0.0434*** (0.0004)	-0.0156*** (0.0002)	-0.0357*** (0.0004)
African-American 2001	-0.0436*** (0.0018)	-0.0156*** (0.0010)	-0.0347*** (0.0016)
African-American 2002	-0.0461*** (0.0019)	-0.0181*** (0.0010)	-0.0358*** (0.0017)
African-American 2003	-0.0487*** (0.0018)	-0.0191*** (0.0009)	-0.0377*** (0.0016)
African-American 2004	-0.0473*** (0.0019)	-0.0195*** (0.0010)	-0.0351*** (0.0017)
African-American 2005	-0.0470*** (0.0012)	-0.0188*** (0.0007)	-0.0363*** (0.0011)
African-American 2006	-0.0475*** (0.0011)	-0.0190*** (0.0006)	-0.0361*** (0.0009)
African-American 2007	-0.0429*** (0.0011)	-0.0185*** (0.0006)	-0.0326*** (0.0009)
African-American 2008	-0.0437*** (0.0010)	-0.0198*** (0.0005)	-0.0328*** (0.0009)
African-American 2009	-0.0424*** (0.0011)	-0.0173*** (0.0006)	-0.0300*** (0.0009)
African-American 2010	-0.0410*** (0.0011)	-0.0173*** (0.0006)	-0.0295*** (0.0009)
African-American 2011	-0.0383*** (0.0011)	-0.0169*** (0.0007)	-0.0280*** (0.0010)
African-American 2012	-0.0389*** (0.0011)	-0.0171*** (0.0006)	-0.0294*** (0.0009)
African-American 2013	-0.0364*** (0.0010)	-0.0156*** (0.0006)	-0.0269*** (0.0009)
African-American 2014	-0.0380*** (0.0010)	-0.0157*** (0.0006)	-0.0284*** (0.0009)
African-American 2015	-0.0389*** (0.0010)	-0.0166*** (0.0006)	-0.0284*** (0.0008)

African-American 2016	-0.0375*** (0.0010)	-0.0158*** (0.0006)	-0.0276*** (0.0009)
African-American 2017	-0.0351*** (0.0011)	-0.0161*** (0.0006)	-0.0269*** (0.0009)
African-American 2018	-0.0380*** (0.0010)	-0.0163*** (0.0006)	-0.0269*** (0.0009)
African-American*Veteran 1970	0.0068*** (0.0023)	-0.0022*** (0.0008)	0.0068*** (0.0023)
Mean of Dep. Var. 1970	[0.0396]	[0.0041]	[0.0396]
African-American*Veteran 1980	0.0033*** (0.0011)	-0.0033*** (0.0005)	0.0063*** (0.0010)
Mean of Dep. Var. 1980	[0.0370]	[0.0064]	[0.0274]
African-American*Veteran 1990	0.0014 (0.0014)	-0.0010 (0.0007)	0.0047*** (0.0012)
Mean of Dep. Var. 1990	[0.0459]	[0.0107]	[0.0335]
African-American*Veteran 2000	-0.0058*** (0.0014)	-0.0047*** (0.0008)	-0.0015 (0.0013)
Mean of Dep. Var. 2000	[0.0566]	[0.0147]	[0.0418]
African-American*Veteran 2001	-0.0126** (0.0058)	-0.0062* (0.0032)	-0.0048 (0.0054)
Mean of Dep. Var. 2001	[0.0606]	[0.0149]	[0.0460]
African-American*Veteran 2002	-0.0096 (0.0064)	-0.0037 (0.0034)	-0.0087 (0.0055)
Mean of Dep. Var. 2002	[0.0608]	[0.0139]	[0.0450]
African-American*Veteran 2003	-0.0067 (0.0067)	-0.0096*** (0.0032)	-0.0128** (0.0054)
Mean of Dep. Var. 2003	[0.0630]	[0.0149]	[0.0453]
African-American*Veteran 2004	-0.0177*** (0.0064)	-0.0084** (0.0034)	-0.0086 (0.0059)
Mean of Dep. Var. 2004	[0.0671]	[0.0169]	[0.0501]
African-American*Veteran 2005	0.0007 (0.0049)	-0.0005 (0.0027)	0.0022 (0.0042)
Mean of Dep. Var. 2005	[0.0660]	[0.0194]	[0.0479]
African-American*Veteran 2006	-0.0089** (0.0038)	-0.0062*** (0.0022)	-0.0065** (0.0033)
Mean of Dep. Var. 2006	[0.0622]	[0.0173]	[0.0449]
African-American*Veteran 2007	-0.0106*** (0.0038)	-0.0047** (0.0022)	-0.0059* (0.0034)
Mean of Dep. Var. 2007	[0.0651]	[0.0183]	[0.0473]
African-American*Veteran 2008	-0.0079** (0.0038)	-0.0039* (0.0021)	-0.0065** (0.0032)
Mean of Dep. Var. 2008	[0.0607]	[0.0161]	[0.0425]

African-American*Veteran 2009	-0.0103*** (0.0040) [0.0627]	-0.0060*** (0.0023) [0.0183]	-0.0073** (0.0034) [0.0431]
Mean of Dep. Var. 2009			
African-American*Veteran 2010	-0.0081* (0.0042) [0.0646]	-0.0040 (0.0025) [0.0193]	-0.0030 (0.0036) [0.0435]
Mean of Dep. Var. 2010			
African-American*Veteran 2011	-0.0195*** (0.0044) [0.0633]	-0.0072*** (0.0027) [0.0181]	-0.0133*** (0.0038) [0.0416]
Mean of Dep. Var. 2011			
African-American*Veteran 2012	-0.0186*** (0.0039) [0.0606]	-0.0077*** (0.0023) [0.0177]	-0.0127*** (0.0033) [0.0390]
Mean of Dep. Var. 2012			
African-American*Veteran 2013	-0.0193*** (0.0042) [0.0594]	-0.0135*** (0.0021) [0.0174]	-0.0102*** (0.0038) [0.0391]
Mean of Dep. Var. 2013			
African-American*Veteran 2014	-0.0080* (0.0045) [0.0602]	-0.0031 (0.0028) [0.0188]	-0.0046 (0.0038) [0.0389]
Mean of Dep. Var. 2014			
African-American*Veteran 2015	-0.0098** (0.0046) [0.0586]	-0.0018 (0.0031) [0.0183]	-0.0076** (0.0038) [0.0389]
Mean of Dep. Var. 2015			
African-American*Veteran 2016	-0.0118** (0.0046) [0.0604]	-0.0019 (0.0031) [0.0197]	-0.0087** (0.0039) [0.0400]
Mean of Dep. Var. 2016			
African-American*Veteran 2017	-0.0097** (0.0048) [0.0645]	-0.0030 (0.0032) [0.0205]	-0.0067* (0.0040) [0.0418]
Mean of Dep. Var. 2017			
African-American*Veteran 2018	-0.0068 (0.0049) [0.0618]	-0.0071*** (0.0027) [0.0203]	-0.0019 (0.0043) [0.0422]
Mean of Dep. Var. 2018			

Note: Data are from Decennial Census 1970, 1980, 1990, 2000, and ACS 2001-2018. The sample is restricted to individuals working in the non-agriculture sectors. Estimates are weighted by the person weights provided by the ACS. The reference groups are White, nonveteran, single, and high school for race/ethnicity, gender, marital status, and education.

Table 3C.14. Regression-Adjusted Racial and Veteran Gaps in Self-Employment

VARIABLES	(1) SE	(2) Inc. SE	(3) FT SE
African-American	-0.0335*** (0.0011)	-0.0157*** (0.0007)	-0.0217*** (0.0009)
White*Veteran	-0.0077*** (0.0020)	-0.0007 (0.0014)	-0.0043** (0.0017)
African-American*Veteran	-0.0082* (0.0049)	-0.0014 (0.0032)	-0.0041 (0.0041)
Mean of Dep. Var.			
White	[0.1231]	[0.0514]	[0.0811]
African-American	[0.0673]	[0.0224]	[0.0462]
Demographic Controls	Yes	Yes	Yes
Month Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
Observations	911,174	911,174	911,174
R-squared	0.0383	0.0238	0.0213

Note: Data are from CPS ORG 2014-2019. The sample is restricted to individuals working in the non-agriculture sectors. Estimates are weighted by the final weights provided by the CPS. Controls for other races/ethnicity, years, age, education, and marital status are also included. The reference group is White nonveterans.

Table 3C.15. Regression-Adjusted Racial and Veteran Gaps in Employer Probability

VARIABLES	(1) Employer	(2) Emp 5+	(3) Emp 10+	(4) Emp 20+
African-American	-0.0134*** (0.0005)	-0.0066*** (0.0003)	-0.0040*** (0.0002)	-0.0020*** (0.0001)
White*Veteran	-0.0026** (0.0011)	-0.0008 (0.0008)	-0.0006 (0.0006)	-0.0003 (0.0004)
African-American*Veteran	-0.0067*** (0.0020)	-0.0039*** (0.0012)	-0.0020** (0.0008)	-0.0013*** (0.0005)
Mean of Dep. Var.				
White	[0.0316]	[0.0140]	[0.0080]	[0.0039]
African-American	[0.0096]	[0.0033]	[0.0016]	[0.0007]
Observations	911,174	911,174	911,174	911,174
R-squared	0.0163	0.0080	0.0050	0.0026

Note: Data are from CPS ORG 2014-2019. The sample is restricted to individuals working in the non-agriculture sectors. Estimates are weighted by the final weights provided by the CPS. Controls for other races/ethnicity, years, survey month, age, education, and marital status are also included. The reference group is White nonveterans.

Table 3C.16. Fraction of Employment in Types of Self-employment by Education

	All	White <HS	White HS	African- American <HS	African- American HS
(A) ACS 2014-2018					
Self-employed	0.108	0.113	0.110	0.062	0.055
Incorporated SE	0.041	0.031	0.038	0.013	0.014
Full-Time SE	0.073	0.072	0.077	0.034	0.036
Observations	6,072,419	238,038	1,041,898	50,604	158,959
(B) CPS ORG 2014-2019					
Self-employed	0.1098	0.0998	0.1102	0.0516	0.0568
Incorporated SE	0.0425	0.0245	0.0403	0.0098	0.0146
Full-Time SE	0.0735	0.0596	0.0768	0.0275	0.0378
Employer	0.0262	0.0217	0.0277	0.0043	0.0064
Employer 5+	0.0111	0.0080	0.0110	0.0015	0.0013
Employer 10+	0.0062	0.0042	0.0059	0.0007	0.0006
Employer 20+	0.0029	0.0017	0.0027	0.0005	0.0001
Employer 50+	0.0009	0.0004	0.0007	0.0002	0.0001
Mean (SD) Employees (among employers)	8.5 (13.6)	6.8 (11.2)	7.6 (12.2)	9.4 (18.0)	3.9 (5.6)
Observations	911,174	32,616	167,788	7,029	28,263

Note: Data are from ACS 2014-2018 and CPS ORG 2014-2019. The sample is restricted to non-Hispanic individuals either White or African-American, aged 16 or over, and working in the non-agriculture sector. For the mean number of paid employees in the bottom row, the sample is restricted to self-employed with paid employees (employers), with the standard deviation (SD) of the number of employees is shown in parentheses. Estimates are weighted by the person weights for the ACS and the final weights for the CPS ORG. See text for more details on sources and variables.

Table 3C.17. Fraction of Employment in Types of Self-employment by Education, Some College and BA or above

	All	White Some Col	White BA+	African- American Some Col	African- American BA+
(A) ACS 2014-2018					
Self-employed	0.108	0.107	0.139	0.055	0.081
Incorporated SE	0.041	0.041	0.065	0.016	0.036
Full-Time SE	0.073	0.072	0.094	0.036	0.057
Observations	6,072,419	1,394,759	1,532,864	205,026	119,050
(B) CPS ORG 2014-2019					
Self-employed	0.1098	0.1104	0.1445	0.0637	0.0913
Incorporated SE	0.0425	0.0427	0.0689	0.0199	0.0402
Full-Time SE	0.0735	0.0709	0.0946	0.0440	0.0663
Employer	0.0262	0.0259	0.0398	0.0082	0.0176
Employer 5+	0.0111	0.0108	0.0191	0.0027	0.0073
Employer 10+	0.0062	0.0060	0.0114	0.0012	0.0038
Employer 20+	0.0029	0.0028	0.0057	0.0005	0.0016
Employer 50+	0.0009	0.0009	0.0020	0.0002	0.0005
Mean (SD) Employees (among employers)	8.5 (13.6)	8.4 (13.5)	10.2 (15.5)	5.8 (10.3)	7.6 (12.4)
Observations	911,174	190,764	238,513	28,959	20,763

Note: Data are from ACS 2014-2018 and CPS ORG 2014-2019. The sample is restricted to non-Hispanic individuals either White or African-American, aged 16 or over, and working in the non-agriculture sector. For the mean number of paid employees in the bottom row, the sample is restricted to self-employed with paid employees (employers), with the standard deviation (SD) of the number of employees is shown in parentheses. Estimates are weighted by the person weights for the ACS and the final weights for the CPS ORG. See text for more details on sources and variables.

Table 3C.18. Characteristics of Self-Employed and Employees by Race and Education, Less than High School and High School

	All	White <HS		White HS		African-American <HS		African-American HS	
		EMP	SE	EMP	SE	EMP	SE	EMP	SE
(A) ACS 2014-2018									
Age 16-24	0.139	0.380	0.347	0.158	0.144	0.281	0.268	0.187	0.179
Age 25-54	0.645	0.428	0.439	0.574	0.572	0.512	0.515	0.645	0.647
Age 55+	0.216	0.193	0.214	0.269	0.284	0.208	0.217	0.168	0.174
Married	0.507	0.329	0.359	0.485	0.503	0.253	0.263	0.295	0.303
Observations	6,072,419	209,247	28,791	920,356	121,542	47,142	3,462	149,786	9,173
(B) CPS ORG 2014-2019									
Age 16-24	0.134	0.440	0.106	0.150	0.031	0.320	0.039	0.18	0.051
Age 25-54	0.644	0.382	0.539	0.580	0.554	0.482	0.657	0.646	0.704
Age 55+	0.222	0.177	0.355	0.270	0.416	0.198	0.304	0.174	0.245
Married	0.534	0.313	0.597	0.516	0.684	0.240	0.437	0.318	0.465
Observations	911,174	29,341	3,275	148,515	19,273	6,647	382	26,710	1,553

Note: Data are from ACS 2014-2018 and CPS ORG 2014-2019. EMP = employee. SE = self-employed. The sample is restricted to non-Hispanic individuals either White or African-American, aged 16 or over, and working in the non-agriculture sector. Estimates are weighted by the person weights for the ACS and the final weights for the CPS ORG.

Table 3C.19. Characteristics of Self-Employed and Employees by Race and Education, Some College and BA or above

	All	White		White		African-American		African-American	
		Some Col		BA+		Some Col		BA+	
		EMP	SE	EMP	SE	EMP	SE	EMP	SE
(A) ACS 2014-2018									
Age 16-24	0.139	0.175	0.160	0.058	0.051	0.202	0.194	0.065	0.060
Age 25-54	0.645	0.600	0.597	0.717	0.692	0.662	0.665	0.781	0.773
Age 55+	0.216	0.225	0.243	0.225	0.257	0.135	0.141	0.155	0.167
< High School	0.100	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
High School	0.258	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Some College	0.325	1.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000
BA+	0.317	0.000	0.000	1.000	1.000	0.000	0.000	1.000	1.000
Married	0.507	0.493	0.510	0.621	0.634	0.291	0.300	0.416	0.427
Observations	6,072,419	1,236,131	121,542	1,307,399	158,628	193,011	9,173	108,843	12,015
(B) CPS ORG 2014-2019									
Age 16-24	0.134	0.175	0.028	0.055	0.009	0.195	0.052	0.062	0.015
Age 25-54	0.644	0.594	0.561	0.709	0.539	0.665	0.698	0.771	0.709
Age 55+	0.222	0.231	0.410	0.236	0.452	0.140	0.250	0.167	0.276
< High School	0.091	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
High School	0.274	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Some College	0.291	1.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000
BA+	0.344	0.000	0.000	1.000	1.000	0.000	0.000	1.000	1.000
Married	0.534	0.505	0.681	0.636	0.730	0.304	0.466	0.450	0.579
Observations	911,174	168,495	22,269	202,626	35,887	27,130	1,829	18,800	1,963

Note: Data are from ACS 2014-2018 and CPS ORG 2014-2019. EMP = employee. SE = self-employed. The sample is restricted to non-Hispanic individuals either White or African-American, aged 16 or over, and working in the non-agriculture sector. Estimates are weighted by the person weights for the ACS and the final weights for the CPS ORG.

Table 3C.20. Regressions: Self-employment by Education, ACS 2014-2018

VARIABLES	(1) SE	(2) Inc. SE	(3) FT SE
African-American	-0.0354*** (0.0008)	-0.0137*** (0.0004)	-0.0290*** (0.0007)
White*Less than HS	0.0260*** (0.0009)	0.0033*** (0.0005)	0.0156*** (0.0007)
African-American* Less than HS	0.0088*** (0.0015)	-0.0002 (0.0007)	0.0030*** (0.0011)
White*Some College	0.0030*** (0.0005)	0.0059*** (0.0003)	-0.0017*** (0.0004)
African-American*Some College	0.0067*** (0.0009)	0.0045*** (0.0005)	0.0040*** (0.0008)
White*Bachelor's plus	0.0247*** (0.0005)	0.0242*** (0.0003)	0.0114*** (0.0004)
African-American* Bachelor's plus	0.0185*** (0.0012)	0.0178*** (0.0008)	0.0137*** (0.0010)
Mean of Dep. Var.			
White	[0.1195]	[0.0481]	[0.0812]
African-American	[0.0611]	[0.0195]	[0.0404]
R-squared	0.0391	0.0220	0.0237

Note: Data are from ACS 2014-2018. The sample is restricted to individuals working in the non-agriculture sectors. Estimates are weighted by the person weights provided by the ACS. The reference groups are Non-Hispanic White, and high school for race/ethnicity, gender, and marital status. Observations = 6,072,419.

Table 3C.21. Regression-Adjusted Racial and Education Gap in Self-Employment, CPS Data

VARIABLES	(1) SE	(2) Inc. SE	(3) FT SE
African-American	-0.0330*** (0.0018)	-0.0155*** (0.0010)	-0.0269*** (0.0015)
White*Less than HS	0.0205*** (0.0021)	-0.0015 (0.0011)	0.0090*** (0.0017)
African-American* Less than HS	0.0015 (0.0033)	-0.0013 (0.0016)	-0.0009 (0.0026)
White*Some College	0.0060*** (0.0012)	0.0047*** (0.0007)	-0.0026*** (0.0010)
African-American*Some College	0.0127*** (0.0022)	0.0077*** (0.0012)	0.0095*** (0.0018)
White*Bachelor's plus	0.0291*** (0.0012)	0.0252*** (0.0008)	0.0124*** (0.0010)
African-American* Bachelor's plus	0.0253*** (0.0027)	0.0205*** (0.0017)	0.0198*** (0.0023)
Mean of Dep. Var.			
White	[0.1231]	[0.0514]	[0.0811]
African-American	[0.0673]	[0.0224]	[0.0462]
Demographic Controls	Yes	Yes	Yes
Month Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
Observations	911,174	911,174	911,174
R-squared	0.0386	0.0239	0.0216

Note: Data are from CPS ORG 2014-2019. The sample is restricted to individuals working in the non-agriculture sectors. Estimates are weighted by the final weights provided by the CPS. Controls for other races/ethnicity, years, age, and marital status are also included. The reference group is Whites with only high school education.

Table 3C.22. Regression-Adjusted Racial and Education Gaps in Employer Probability

VARIABLES	(1) Employer	(2) Emp 5+	(3) Emp 10+	(4) Emp 20+
African-American	-0.0140*** (0.0007)	-0.0066*** (0.0004)	-0.0035*** (0.0003)	-0.0017*** (0.0002)
White*Less than HS	0.0029*** (0.0010)	0.0009 (0.0006)	0.0004 (0.0005)	-0.0000 (0.0003)
African-American* Less than HS	-0.0003 (0.0010)	0.0010* (0.0006)	0.0005 (0.0004)	0.0006* (0.0003)
White*Some College	-0.0002 (0.0006)	0.0005 (0.0004)	0.0005* (0.0003)	0.0003 (0.0002)
African-American*Some College	0.0035*** (0.0008)	0.0021*** (0.0004)	0.0010*** (0.0003)	0.0006*** (0.0002)
White*Bachelor's plus	0.0099*** (0.0006)	0.0071*** (0.0004)	0.0050*** (0.0003)	0.0027*** (0.0002)
African-American* Bachelor's plus	0.0080*** (0.0012)	0.0045*** (0.0007)	0.0024*** (0.0005)	0.0011*** (0.0003)
Mean of Dep. Var.				
White	[0.0316]	[0.0140]	[0.0080]	[0.0039]
African-American	[0.0096]	[0.0033]	[0.0016]	[0.0007]
Observations	911,174	911,174	911,174	911,174
R-squared	0.0164	0.0081	0.0050	0.0026

Note: Data are from CPS ORG 2014-2019. The sample is restricted to individuals working in the non-agriculture sectors. Estimates are weighted by the final weights provided by the CPS. Controls for other races/ethnicity, years, survey month, age, and marital status are also included. The reference group is Whites with only high school education.

4. Financial Access: Racial Gaps and Policy Impact

An omnipresent theme in many discussions of racial disparities in business ownership is access to finance. Differential access could result from disparate treatment by providers of finance, including banks and investors, because of either personal prejudice or statistical inference. Of course, the existence of disparities does not prove that discrimination is the cause (e.g., Lang and Spitzer 2020). Whatever the source, a number of policies have been designed explicitly to counteract the disparities in financial access by race. Yet, while there has been substantial previous research on this topic, our understanding of the degree of financial inequality is incomplete, and there has been little or no rigorous analysis of relevant policies.

This section builds on the previous research to further understanding of the African-American-White gap in the access to finance and the impact of a particularly important policy: the Community Reinvestment Act (CRA). Earlier sections of this report already provide strong evidence for an important role played by financial disparities. In particular, the firm-level analysis of employment size differences found that controlling for measures of financial access nearly always raised the coefficient on African-American ownership, sometimes substantially, and never lowered the coefficient significantly. For example, the African-American versus White gap from a regression with $\log(\text{employment})$ as the dependent variable is about –12 percent when no covariates are included, and it rises to 3 percent when firm age and number of owners are controlled and falls to 2 percent when demographics, human capital, and motivations are included. But it jumps to 7 percent when finance controls are added. Similarly, the relative probability of an African-American-owned firm being in the largest 5 percent of all firms nearly doubles from 0.6 to 1.1 percentage points, or from 12 percent to 22 percent, when financial controls are added to the regression. Thus, the major finding with respect to firm size and finance was that while African-American and White owners are associated with fairly similar firm size when finance is not taken into account, African-American-owned firms tend to be distinctly larger once finance is controlled for (although this result disappears when the estimate is within four-digit industry).

These results constitute indirect evidence for the role that financial access plays in firm size and job creation. The first part of this section looks at the issue of racial differences in financial access more directly, using the unusually rich data of the 2014 Annual Survey of Entrepreneurs (ASE). Two sets of questions on the ASE are exploited as dependent variables in our analysis: the amount and sources of finance for the firm at startup, and the amount, sources, and difficulties obtaining finance in the year 2014 (the survey was actually carried out in 2015). Not only do these data provide remarkable

detail on access to finance at the firm level, but 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. We also measure the incidence and average amount of SBA loans for African-American- and White-owned firms.

Many of the finance variables measure outcomes: the amount or the source of finance at start-up or in the previous year. As such, they are jointly determined by the supply of and the demand for finance. Without more data, it is impossible to distinguish a situation in which, for example, African-American owners face worse credit supply conditions from one where African-Americans 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.

We address this identification problem in three ways. The first is to examine two ASE questions on the difficulty of getting additional financing 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 African-Americans compared to Whites. Second, we examine how the racial gaps in the finance variables change as we control for firm and owner characteristics. If African-Americans tend to own younger firms and they are less likely to have co-owners (both of which are true), that may result in less finance. Additional factors that are potentially relevant include other demographic characteristics (age and gender), human capital (education, veteran experience, previous business ownership), motivations for ownership, and choices of the owner about running the business, including the industry in which to operate. Any of these variables may be correlated with race and finance, so controlling for them reveals the robustness of the finance-race correlation. The final way we address the identification issue comes in the second subsection below, where we estimate the impact of the CRA, which shifts the supply of finance.

The CRA is intended to “encourage depository institutions to help meet the credit needs of communities in which they operate, including Low- and Moderate-Income (LMI) neighborhoods.”³¹ An LMI neighborhood is defined at the census tract level as having a median family income of less than 80 percent of the median family income of the MSA to which it belongs. The CRA emphasizes residential mortgage loans and small business loans, the primary loan types in LMI neighborhoods, and each insured depository institution is assessed periodically by a federal supervisory agency to ensure

³¹ The purpose of Community Reinvestment Act (CRA) is stated by the Federal Financial Institutions Examination Council at <https://www.ffiec.gov/cra/history.htm>.

they are providing “sufficient credit” in those neighborhoods. The analysis here exploits the 80 percent threshold to use regression discontinuity (RD) methods that compare firms in neighborhoods close to the threshold. It also exploits the change in CRA tract eligibility in 2012, examining the impact on African-American owned businesses in tracts that were not eligible before 2012 but became eligible that year, in a difference-in-differences (DD) estimation.

Previous studies of African-American entrepreneurship have generally concluded that African-American entrepreneurs are disadvantaged in financial markets, but data limitations have prevented the research from considering the possibility that unmeasured covariates drive the degree of financial access, rather than race. Previous studies have also generally lacked credible identification strategies for estimating the impacts of policies to enhance financial access, which can also shed light on racial gaps. For both of these types of research, sample sizes at the firm level have typically been small, or recourse has been made to aggregated data or published tabulations, so that regressions with controls cannot be estimated. The research reported here makes progress on all these fronts.

4A. Measuring the Racial Gap in Firm-Level Financial Access

The basic method in this subsection is to estimate the gap between African-American and White business owners for each measure of financial access. In an approach similar to that in research on wage gaps, we consider the raw gap in measured access and then examine how it changes when we include several sets of covariates. We start with summary statistics on the firm-level measures that will be the dependent variables in regressions. Table 4A.1 contains variables at startup and Table 4A.2 contains variables in calendar year 2014. All variables are binary, so only means need be considered.

The first measure in Table 4A.1 is whether the firm had capital greater than \$100,000 at startup.³² While 18 percent of White owners report more than \$100,000, only 14 percent of African-American owners do so. The other measures in Table 4A.1 concern the sources of start-up capital (for which multiple choices are permitted). African-Americans are more likely than Whites to use personal savings and credit cards but less likely to use bank loans. Venture capital, the focus of many studies of financial access, is negligible for both races (reflecting its role in the US economy as a whole), but slightly larger for African-Americans (0.6 versus 0.5 percent for Whites).

³² The ASE questionnaire asks for the amount of start-up capital in ranges of unequal size and with the top range unbounded, so it is not straightforward to compute mean values of start-up capital. Moreover, there are other answers – “don’t know” (higher for Whites) and “none needed” (higher for African-Americans) – which are hard to include, but seem to fit better as less than \$100,000, where we classified them. The results reported here are qualitatively robust to alternative thresholds that we considered.

The variables for 2014 focus on outside funding. African-Americans are slightly more likely than Whites to report positive amounts from banks, other financial institutions, and outside investors (37.3 versus 35.6 percent), but they are less likely to receive more than \$100,000 (10.6 versus 12.1 percent). The probability of new funding in 2014 from banks is lower for African-Americans (7.9 percent versus 9.9 percent for Whites). It is negligible for both races from other types of outside investors (angels, venture capital, other investor businesses) and from grants, but in all cases it is slightly higher for African-Americans than for Whites. Thus, while a study focused on angel investors or venture capital might conclude that African-American owners actually have an advantage in attracting finance, the information on bank lending – as well as the negligible amounts of the other sources overall – suggest the opposite.

The final two variables in Table 4A.2 provide measures of the difficulty of getting additional financing in 2014. The first is a dummy for the firm not applying for finance because they expected the lender would not approve. The second is a dummy for lack of finance negatively affecting profitability. These questions are subjective and qualitative, so they do not permit strong conclusions, but they may provide evidence on different financial supply conditions faced by African-Americans compared to Whites. Indeed, the means in Table 4A.2 imply large differences in lack of application for additional funding because of expecting non-approval: at 14.9 percent, African-American owners are more than 3 times as likely as Whites, at 4.3 percent, to avoid application. The proportionate difference is similar for lack of finance reducing profitability: 27.3 percent for African-Americans and 9.6 percent for Whites.

Overall, this analysis of summary statistics implies a disadvantage for African-Americans in financial access, one which is concentrated in bank lending. Nevertheless, while the subjective variables just reviewed show large differences, the differences in the outcomes for the amount and sources of finance are proportionately much smaller. One interpretation of these contrasting results is that African-American owners actually have a stronger demand for finance than do White owners, on average, but because of greater supply constraints they do not achieve the same level of finance. Another possibility is that the simple comparisons of means over- or under-states the racial gap because they reflect other variables correlated with race and with finance. Our next step is therefore to consider including such variables in finance regressions where race is the main variable of interest.

Other covariates are potentially endogenous, jointly determined with business ownership, success, and demand for finance. So our approach is to gradually add sets of variables and examine how the estimated racial gap in finance changes. The first set includes only race-ethnicity dummies,

with non-Hispanic White the omitted category and African-American non-Hispanic the variable of interest, to focus on African-American-White differences and to test the statistical significance of the differences observed in the preceding summary statistics. The second set adds firm age (in categories: 0-2, 3-5, 6-10, 11-15, and 16 and more years) and number of owners (1, 2-4, 5 and more). These are basic firm characteristics that previous research has shown are highly correlated with firm behavior and performance. The third set includes other demographic characteristics: owner age (in categories), gender, and immigrant, while the fourth adds human capital (five types of education, previous business ownership, and veteran experience). So far, these variables are arguably exogenous, predetermined with respect to investment and financing decisions. The fifth set adds controls for owner motivations, distinguishing for example those with nonpecuniary, lifestyle motives for entrepreneurship. The sixth set adds 4-digit industry controls, arguably a choice that may depend to some extent on financial access. The seventh and final set consists of measures of the owner's participation in the business: the role (manager, producer, financial controller, no role), whether the business is the owner's primary source of income, whether it is home-based, and the average number of hours per week the owner works in the business (six categories: 0, 1-19, 20-39, 40, 41-59, 60 and over). These choices may well be jointly determined with the amount of finance, but we include them in a final specification because any remaining racial gap is all the more likely to be genuine, reflecting differences in the supply of finance faced by owners of different races.

Tables 4A.3 and 4A.4 contain the results for these regressions for the same finance variables shown in Tables 4A.1 and 4A.2. The first column shows the raw differences between African-American 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 4A.1), this implies that African-American entrepreneurs are more than 20 percent less likely to obtain such large levels of finance when starting up. The estimated gap in the 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 African-Americans than Whites and it increases to greater than 3 percentage points with some sets of controls. While this gap in favor of African-American owners is always statistically significant, it is less than 10 percent of the overall mean of this variable (35 percent, in Table 4A.2).

Concerning sources of funding at start-up, the higher probability for African-Americans 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 African-American than for White owners, with some slight attenuation varying across sets of covariates. Compared with a mean of 9.6 percent, these results imply a disadvantage for African-Americans of about 15-20 percent.

The final two variables in Table 4A.4 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. The results imply that avoiding finance applications because of an expectation the lender would refuse is 10 percentage points higher for African-Americans than for Whites, again implying African-Americans are 3 times more likely to be in this category. And they imply that African-Americans are 16-17 percentage points more likely, even when all the controls are added to the equation, to say that their profitability is negatively affected by difficulties with access to finance, nearly 3 times as likely as for Whites.

To summarize this briefly, these results provide strong support that African-American owners are more likely to perceive financial access as a problem. The analysis of outcomes shows smaller differences than does the perception, but other factors on the demand and supply side may also explain outcomes. The analysis does support the presence of an African-American disadvantage in financial markets in two ways: in the amount of finance at start-up and in obtaining bank loans both at start-up and in the year 2014. These results are robust to including many control variables, intended to account for differences in demand for capital.

A final analysis in this subsection concerns differences in SBA loan receipt by African-American- compared with White-owned firms. For this purpose, we use comprehensive data from the SBA 7A and 504 loan programs and study the incidence and amounts of the loans by race. The loan data cover the period 1953-2010 and include owner race and the loan amount. We compare the number of loans to the number of firms in the 2002 SBO, by race. African-American owners received 5.72 percent of SBA loans, much lower than the 73.29 percent received by Whites. The number of African-American-owned firms is also much lower, however: 1.71 percent of all firms compared to 85.43 percent for Whites. Measured in this way, the incidence of SBA loans is much higher for African-Americans. The average loan size is much lower for African-American-owned firms, however: about \$198,000 (in \$2010) compared with \$328,000 for those owned by Whites, a 65 percent difference.

When firm size (measured by employment) is taken into account, the gap shrinks substantially, but it is still sizable at about 24 percent. Given the previous finding that SBA loans stimulate growth of employment, this result provides further evidence that African-American-owned businesses may be constrained by lack of finance.

4B. Estimating the Impact of the Community Reinvestment Act

This section takes a different approach to estimate differences in the supply of credit faced by African-American and White entrepreneurs. It does so by reporting estimates of the causal effect of the Community Reinvestment Act (CRA). The CRA incentivizes banks to lend in “eligible” census tracts, where “eligibility” is defined as having a ratio of median family income (MFI) to that of its metropolitan statistical area (MSA) of less than 80 percent.³³ The incentives include the frequency of bank examination, the regulatory approval of actions such as mergers, and the publishing of ratings for each bank, which then leads to public pressure on banks receiving low ratings. The method in this section exploits this regulatory threshold to create a regression discontinuity (RD) design. The discrete MFI threshold provides treatment and control groups that are very similar except for CRA eligibility for those with MFI close to the threshold.

In addition to the regulatory threshold, the method further exploits time variation created by a change in the reference data used to define the CRA eligibility. The change may alter CRA eligibility two different ways: by updating MFI in a tract and moving it above or below the 80 percent threshold, or by changing tract boundaries. In 2012, the reference data was changed from Census 2000 to ACS 2006-2010, updating MFI and accordingly CRA eligibility. In addition, the Participant Statistical Areas Program (PSAP) updates the boundaries of Census tracts (split or merged) based on changes in population every 10 years. Because the eligibility of the CRA tract is based on tract-level MFI relative to MFI in the whole MSA, this change creates exogenous variation in the CRA eligibility of the tract in which firm locates.

To assess robustness and following conventional RD 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.

³³ If the tract is not located in the MSA, it is eligible if its MFI is less than 80 percent of the nonmetropolitan portion of the state in which the tract is located.

The data for this analysis consists of linking of SBOs from 2002, 2007, and 2012 with ASEs from 2014 and 2015 (the most recently available), with the LBD, and with CRA data on tract-level incomes. SBOs and ASEs are linked to check consistency of ownership in firms found in multiple surveys; any cases of inconsistency are eliminated.³⁴ Linking to the LBD permits measurement of employment by year and the location of firms by tract, both before and after the change in 2012. The CRA data allow measurement of tract eligibility.

Because of possible asymmetries in how changes in CRA eligibility affects local businesses, we focus here on tracts that were ineligible before 2012 (going back to 2003) and examine the impact of becoming eligible from 2012 on. The data we examine run from 2003 through 2015, and firms are linked longitudinally. This allows us to estimate the following equation with firm-level fixed effects as follows:

$$E_{ict} = \alpha + \beta_0 D_{ct} + \beta_1 D_{ct} AA_i + \theta_1 MFI_{ct} + \theta_2 MFI_{ct} D_{ct} + \mathbf{X}_{ict} \mathbf{f} + \mathbf{Z}_{ct} \mathbf{g} + r_i + \tau_t + \varepsilon_{ict}, \quad (10)$$

where E_{ict} is log(employment) for firm i in census tract c in time t , D_{ct} is the treatment dummy which is equal to zero in all tracts in the sample before 2012 and equal to one in treated tracts from 2012 on, $AA_i = 1$ if the firm has an African-American owner, β_1 is the associated coefficient representing the difference from firms with White ownership, the MFI ratio is included separately and interacted with D_{ct} , $\mathbf{X}_{ict}$ is a set of firm-level characteristics (firm age, other owner characteristics including other owners and ethnicities), $\mathbf{Z}_{ct}$ is a set of tract-level characteristics (e.g. population), r_i are firm fixed effects, and τ_t are year effects. This equation provides a credible estimate of the causal effect of improved access to finance under the CRA both for African-Americans (as the sum of β_0 and β_1) and of the relative effect of the CRA on African-American-owned versus White-owned firms (β_1).

Summary statistics for the principal variables are shown in Table 4B.1. The full sample covers 8,220,000 firm-years with 952,000 firms, of which 69,000 are in CRA tracts from 2012. In terms of firm-years, 3.0 percent of all, and 4.7 percent of African-American-owned firm-years are in CRA tracts. Within the full sample, African-American-owned firms tend to be in tracts with lower MFI ratios, but employment tends to be similar between all firms and those owned by African-Americans. With a 20 percent bandwidth (MFI ratio from 80 to 100 percent), the total sample shrinks to 2,591,000 firm-years, 297,000 firms, and 50,000 firms switching into CRA eligible tracts from 2012. With a 5

³⁴ We drop inconsistent cases because although some of them may reflect true ownership change, even in this case the dynamics of employment would be complicated to study. A more important consideration is that many of the inconsistencies may result from measurement error, in which case it would be unclear how the firm's ownership should be coded.

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 not fall as rapidly as the bandwidth because it is thicker close to the threshold, and 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 African-American owned firms that switch is substantially lower: 2000, 1500, and 500 in the three samples. Thus, there is some tradeoff between a smaller bandwidth, which provides more convincing interpretation of an “as if random” allocation of the firms across tracts, and the precision of the estimates, and for this reason we report regression results for all three samples.

These regression results are presented in Table 4B.2. 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 results show that the MFI and interaction variables have small coefficients and they make little difference for the results of interest.

The main CRA effect in the full sample (β_0 in the equation above) is estimated to be positive and statistically significant, but small at 0.4 percent, and it is negative and small in all the other specifications and samples. The variable of interest is the CRA interaction with African-American 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. All the estimates are highly significant.

These coefficients are β_1 in the equation above, representing the difference in the CRA effect on firms with African-American owners relative to those with White owners. To obtain the estimated effect on African-American owners, it is necessary to sum β_0 and β_1 . Because β_0 is estimated to be negative, this total effect is smaller than β_1 , but because β_0 is estimated to be small in magnitude relative to β_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 African-American owned firms range from 3 to 6 percent.

These 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, much less whether loan receipt, or the size of the loan, is associated with the CRA. But CRA tracts are about 30 percent of all tracts in the US, and thus our estimates could imply a 1.5 percent increase in employment in African-American-owned businesses nationwide, which would be a substantial number. 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, 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 African-American 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 African-American entrepreneurs face greater constraints in the form of a leftward-shifted supply curve relative to their White counterparts. The CRA relaxes those constraints, and African-Americans benefit more because their constraints were greater. An alternative explanation is that African-American owners have some unobserved skills that permits them to take better advantage of relaxed financial constraints than Whites are able to do. But it is unclear what those skills might be. While logically possible, this interpretation seems implausible. Coupled with the evidence of the previous section on the financial disadvantages at start-up and in receiving formal loans from banks, the results here imply that financial access is indeed a major obstacle for African-American owned businesses.

Table 4A.1. Startup Finance

Finance Measures	All	White	African-American
Startup Capital Greater Than 100k	0.191	0.184	0.144
Sources of Start-Up Capital			
Personal Savings or Other Assets	0.691	0.678	0.745
Home Equity	0.075	0.072	0.079
Credit Cards	0.127	0.122	0.199
Banks	0.184	0.19	0.154
Government Loan	0.023	0.023	0.035
Family Loans	0.052	0.052	0.033
Venture Capital	0.005	0.005	0.006
Grants	0.002	0.002	0.006

Note: All variables are dummy variables for the particular category; therefore, the numbers represent the proportion of the sample in the category. N = 288,000 individual owners of 184,000 employer-firms. 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 sector.

Table 4A.2. 2014 Finance

Finance Measures	All	White	African-American
2014 Outside and Investor Funding Greater Than 100k	0.12	0.121	0.106
2014 Outside and Investor Funding Greater Than Zero	0.353	0.356	0.373
Sources of New Funding:			
New Funding from Banks	0.096	0.099	0.079
New Funding from Angel Investors or Venture Capital	0.003	0.002	0.003
New Funding from Other Business	0.003	0.002	0.003
New Funding from Grants	0.002	0.002	0.004
Avoided Additional Funding	0.046	0.043	0.149
Access to Finance Negatively Impacts Profitability	0.107	0.096	0.273

Note: All variables are dummy variables for the particular category; therefore, the numbers represent the proportion of the sample in the category. N = 288,000 individual owners of 184,000 employer-firms. 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 sector.

Table 4A.3. Regression-Adjusted Racial Gaps in Startup Finance

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

Note: 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 4A1. 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 sector. N = 288,000 individual owners of 184,000 employer-firms in the ASE. Robust standard errors are in parentheses. ** p<0.01, * p<0.05. Census DRB bypass numbers are CBDRB-FY20-CES009-001 and CBDRB-FY20-CES009-002.

Table 4A.4. Regression-Adjusted Racial Gaps in 2014 Finance

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

Note: 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 4.A.2. 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 sector. N = 288,000 individual owners of 184,000 employer-firms in the ASE. Robust standard errors are in parentheses. ** p<0.01, * p<0.05. Census DRB bypass numbers are CBDRB-FY20-CES009-001 and CBDRB-FY20-CES009-002.

Table 4B.1. Descriptive Statistics: Community Reinvestment Act (CRA)

Sample	Full Sample		20% Bandwidth		5% Bandwidth	
	All	African-American Owner	All	African-American Owner	All	African-American Owner
Means						
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
(SD)	(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: Bandwidth is defined based on the ratio of a tract's median family income (MFI) relative to MSA's MFI where that tract is located. Census DRB bypass number is CBDRB-FY2020-CES005-034.

Table 4B.2. RD-DD Regression Results: Racial Gap in the Impact of the CRA

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		Full			20 Percent			5 Percent	
CRA	0.004** (0.002)	-0.003 (0.002)	-0.014*** (0.003)	-0.013*** (0.003)	-0.015*** (0.003)	-0.026*** (0.003)	-0.018*** (0.005)	-0.022*** (0.005)	-0.027*** (0.006)
CRA*African-American	0.063*** (0.013)	0.063*** (0.013)	0.063*** (0.013)	0.054*** (0.015)	0.054*** (0.015)	0.053*** (0.015)	0.068*** (0.022)	0.068*** (0.022)	0.067*** (0.022)
Income		-0.000*** (0.000)	-0.000*** (0.000)		-0.000 (0.000)	0.000 (0.000)		-0.000 (0.000)	-0.000 (0.000)
CRA*Income			-0.001*** (0.000)			-0.001*** (0.000)			-0.001* (0.000)

Note: 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. *** p<0.01, ** p<0.05, * p<0.1. Census DRB bypass number is CBDRB-FY2020-CES005-034.

Conclusion

Our research updates and extends previous research on African-American entrepreneurship by analyzing large household and firm-level data sets, some of which have never been studied before in this context, to provide insights on the challenges and contributions of African-American entrepreneurs. We began this report with a list of research questions we sought to address. Here we return to these questions to summarize our main findings.

Are African-Americans more or less likely than Whites to work as self-employed, and is the long-term trend positive or negative?

The self-employment rate of African-Americans is half that of Whites, as of 2018, and the racial gap in self-employment has narrowed only slightly since 1970, when it was 60 percent. There was a slight convergence in the 1990s and again after 2005, but while the former reflected a slight relative rise in African-American self-employment, the latter resulted from an absolute fall in White self-employment. The racial gap in incorporated self-employment, sometimes considered a more reliable measure of genuine entrepreneurship, is even larger in proportional terms than the overall self-employment rate difference, with Whites 2.5 times more likely than African-Americans to operate an incorporated business. Taking into account individual characteristics (gender, age, and education) reduces the gaps only slightly, again implying only a small narrowing of the racial gap in self-employment since 2000, from about 40 percent in 2000 to 35 percent in 2018.

Are African-American-owned businesses more or less successful than those started by Whites in terms of earnings and job creation?

The African-American-White hourly earnings gap among self-employed is similar to that among employees, both about 15 percentage points at the median and 40 at the mean. The self-employment premium within races is also similar, at about 5 percentage points at the median and 30 at the mean, but because mean African-American earnings are much smaller overall, the proportionate premium is much larger among African-Americans: nearly 50 versus 36 percent. The racial wage gap is such that African-American self-employed earn less than White employees at all points in the distribution except for the most successful African-American entrepreneurs at the top: even at the 75th percentile a self-employed African-American individual earns only 91 percent of the mean wage of a

White employee. Accounting for other characteristics lowers the estimated magnitude of the mean racial wage gap for the self-employed to 12.7 percent, statistically significant.

African-Americans are less likely to be employers: 1.6 percent of all employed African-Americans hire employees, compared to 4.4 percent of all employed Whites. The proportional racial gap in hiring persists at various numbers of employees: 0.7 percent of employed African-Americans hire 5 or more employees and 0.16 percent hire 20 or more, while the corresponding numbers for Whites are 1.98 percent and 0.58 percent respectively. The racial gaps in each of these employer groups fall by about half when other personal characteristics are accounted for, but they remain substantial and statistically significant. Among employers, the average number of employees is 9.4 for Whites and 8.0 for African-Americans.

Consistent with the evidence from individual workers, firm-level data on employers show an employment size difference, with an average of 9.1 employees in African-American-owned and 10.8 in White-owned firms. However, these data also show that African-American-owned firms tend to be younger (more recently established), and once this factor is accounted for, the racial size gap disappears. The evidence suggests that if African-Americans had equal access to finance, they would actually be larger than White-owned firms.

A similar pattern of racial differences appears in the probability of being a high-growth firm, here defined as employment in the top 5 percent of the distribution. African-American-owned firms are about 20 percent less likely to be in the top 5 percent, compared to White-owned firms. But once firm age and number of owners are accounted for, there is little difference between the races, and once financial variables are held constant, we find that African-American-owned firms are actually 20 percent more likely to be high growth in this sense.

Are their firms more or less innovative, in terms of product and process changes, research and development, and patenting?

Concerning other firm-performance measures, African-American-owned firms are only about half as likely to export as White-owned firms (3.9 versus 7.4 percent), a gap that persists even when other firm and owner characteristics are controlled. African-American-owned firms are slightly likely to report both product and process innovation activities, and they are more likely to engage in R&D, especially applied R&D, but they are less likely to own intellectual property rights. A significant factor in the innovation behavior is the much higher rate of advanced degrees among African-American

owners (34 percent versus 23 for Whites in the firm-level data), but even controlling for this difference, the data show a slight innovation advantage for African-Americans along several dimensions.

Are African-American women similar or different in their entrepreneurial behavior and outcomes?

The evidence is consistent with large disadvantages for African-American women in entrepreneurship. Self-employment rates are lower, including incorporated and full-time self-employment, than for White men, White women, and African-American men. Rates of hiring employees are also lowest for African-American women, and for the proportion of them that operate businesses throughout the observable size distribution. African-American women have lower average hourly earnings than the other groups in both types of employment: employee and self-employed. These results are robust to controls for other observable characteristics, and they change rather little over time. The analysis of gender combined with race shows that gender gaps tend to be larger among Whites than African-Americans, although they are substantial for both. It also reveals that, with the exception of full-time self-employment and average hourly earnings among self-employed, African-American men have lower rates across all measures than do White women. This highlights the significant role of race even in a society with large, pervasive gender gaps.

How common is racial diversity within entrepreneurial teams? To what extent do differences in African-American-owned businesses reflect other characteristics of the entrepreneurs such as their human capital, motivations for entrepreneurship, access to finance, and choice of industry? How do racial differences in entrepreneurial outcomes vary with local area/clientele, education, veteran status, and between high-tech and non-high-tech sectors?

Analysis that moves beyond the raw data to take into account differences in characteristics across owner race and types of firms generally finds only modest impact from demographic variables, human capital, motivations, and owner choices about the firm. For finance variables, however, there is a systematic tendency for the relative size of African-American-owned firms to increase, when they are taken in account. Analysis within industry of the firm shows that African-American entrepreneurs tend to choose sectors with larger firms.

The results imply strong positive entrepreneurial motivations among African-Americans, with business ownership driven by creativity, income, job aspects, and dreams of starting a business, all of

which are stronger among African-Americans than Whites. African-American owners are more than 10 percentage points more likely to desire business growth than are White owners and have more growth-oriented involvement in their businesses.

Yet, a striking pattern in our analysis of heterogeneity is that racial gaps tend to be not only large but also similar in magnitude across the different dimensions considered here: area poverty, high-tech, veteran, and education. It is not that those variables are unassociated with entrepreneurship behavior, but rather that the nature of their association tends to be similar within races, so that across a large number of types of groups, the gap between Whites and African-Americans is similar. So while it is true that African-Americans are more likely to live in high poverty areas, less likely to work in high-tech sectors, more likely to be veterans, and less likely to be highly educated, none of these factors goes very far in accounting for African-American-White differences. The racial gaps seem to reflect more of a direct effect of race, resulting for example from disparate treatment, rather than operating through other observable characteristics.

Do the effects of SBA loans on firm growth vary with the racial composition of the firm's location? Do African-American entrepreneurs face worse access to finance? Do African-American-owned firms receive many SBA loans, and how do the share of loans and the average loan amounts they receive compare with firms owned by Whites? Does the Community Reinvestment Act help growth of African-American-owned businesses?

Our results suggest that worse access to finance lowers the size of African-American businesses; once this is taken into account, their employment is on average seven percent larger than that of White-owned businesses. The tougher financial constraints are most clearly manifested in the lower amounts of finance at start-up, the relative lack of bank loans at start-up, and the relative lack and smaller size of bank loans later in the firm lifecycle. African-American entrepreneurs are much more to report that they did not apply for credit because they expected to be rejected and that their profitability was negatively affected by problems in accessing finance. Although the incidence of SBA loan receipt is higher for African-American than White entrepreneurs, the average amount is lower, even adjusted for the smaller size of firms owned by the latter compared with those owned by the former.

Our causal assessment of the Community Reinvestment Act (CRA) finds a 3 to 6 percent increase in employment for African-American owned businesses that receive better access to finance

through the eligibility of the Census tract within which they are located. Our interpretation of these findings is that African-American entrepreneurs face greater financial constraints relative to their White counterparts. With programs such as the CRA, which relax such constraints, African-American firms are more able to contribute to economic growth and reduction in racial inequality.

The results also suggest some fruitful avenues for future research. We document that entrepreneurs and the characteristics of their firms are broadly similar across African-Americans and Whites. An important exception is the significant raw difference in firm size, but our results suggest this is related to African-American-owned firms being more recent entrants and facing tougher credit constraints. Yet the size differences, even the raw difference, is much smaller than the gap in the number of entrepreneurs and particularly in the number who are employers. While previous research has provided insights on self-employment differences, data limitations have prevented analysis of factors affecting the transition of a non-employer to an employer business. Another question relates to why African-American entrepreneurs receive less finance. Discrimination is an obvious candidate, but does that result from prejudice or statistical discrimination by creditors? Or is there a role for customer or worker prejudice? Do opportunities for expansion differ systematically, for instance because of the business location? Finally, there is much scope for policy analysis. Could the CRA be improved to create more opportunities for African-American-owned firms to grow? Besides finance, what other interventions could help African-American entrepreneurs? Should policy be targeted on entry and survival, not just growth of existing firms? Our understanding of African-American entrepreneurs, their contributions, and the challenges they face would be greatly enhanced by research devoted to answering these questions.

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Appendix: Data and Methods

This appendix contains detailed descriptions of the many data sets and methods used in the report. The main body of the report has brief summaries of each of these.

Data

A first important set of sources consists of household data from the Decennial Census (DC), American Community Survey (ACS), and Current Population Survey (CPS). We distinguish incorporated from unincorporated self-employed, sometimes taken as a way to identify genuine entrepreneurship, and full-time from part-time self-employment. We also examine long-term trends in the share of African-American owned businesses using time series back to 1970.³⁵ To examine individual earnings data we use the CPS Annual Social and Economic Supplement (ASEC). Earnings for self-employed are defined as the sum of business income plus wages and salaries (because many self-employed pay themselves salary, and incorporated self-employed are legally required to do so). To examine job creation, we use the CPS and 2014 Annual Survey of Entrepreneurs (ASE) from the U.S. Census Bureau. The CPS provides the number of employees reported by self-employed individuals in questions added to the Outgoing Rotation Groups (ORG) questionnaire since 2014. This allows us to examine probability of being an employer firm and the number of employees for African-American entrepreneurs from 2014 to 2018.

The ASE is an annual survey of employer businesses that collects characteristics for businesses and business owners by gender, ethnicity, race, and veteran status. The ASE sample contains non-farm businesses with at least one paid employee and receipts of \$1,000 or more. Using the Census Business Register (BR) as the sampling frame, the ASE sample is stratified by the 50 most populous Metropolitan Statistical Areas (MSAs), state, and the firm's number of years in business.³⁶ The ASE sample is randomly selected, except for large companies in each stratum, which are selected with certainty based on volume of sales, payroll, or number of paid employees. Only businesses where an individual owns at least 10 percent of the equity have detailed owner information and are used in the analysis. The initial 2014 ASE sample included about 290,000 employer firms, and the response rate was 74 percent.

The ASE, similarly to the SBO, provides detailed demographic characteristics on business owners and their motivations to start a business, as well as economic characteristics of their firms. Particularly, the ASE provides detailed owner information up to 4 owners, which allows us to examine owner-level heterogeneity. Using 1 to 4 owners in each business, we build owner-level ASE data. To make each firm represent the inverse probability of the selection, we construct a new composite weight

³⁵ The analysis excludes imputed values for class of worker (from which self-employment is derived). To study trends before 2003, a caveat results from changes in the questions used to identify race on the various questionnaires: a fill-in blank for race provided from 1960 in the Census and 1989 in the CPS (only defined categories were provided prior); the separation of the race and Hispanic origin questions in 1980; and the possibility for respondents to select multiple races starting in 2000 for the Census and 2003 for the CPS. Our analysis shows these breakpoints in the time series, although our preliminary analysis suggests that their effects are minor. Lieberman and Waters (1988) discuss these issues in the earlier years.

³⁶ See Foster and Norman (2016) for further details about the ASE.

by multiplying the sampling weight by ownership shares, the sum of which becomes one. Therefore, each owner represents their ownership share of a firm.³⁷

We link the ASE to the Longitudinal Business Database (LBD) of the U.S. Census Bureau, which consists of all firms and establishments with payroll employment in the US non-farm business sector. This linkage allows us to examine employment and compare differences in job creation and probability of being high growth between African-American owned businesses and businesses owned by Whites.

To study firm-level innovation, we use a rich set of measures in the 2014 ASE, including detailed questions on innovation activities, research and development (R&D), and intellectual property measures. The ASE asks whether the business conducted twelve different product or process innovation activities in the last three years (2012-2014). Product innovations include: 1) sold a new good or service that no other business has ever offered before; 2) sold a new good or service that this business has never offered before; 3) improved a good or service's performance by making changes in materials, equipment, software, or other components; 4) developed a new use for a good or service; 5) added a new feature to a good or service; and 6) made it easier for customers to use a good or service. Process innovations include: 1) applied a new way of purchasing, accounting, computing, maintenance, inventory control, or other support activity; 2) reduced costs by changing the way a good or service was distributed; 3) upgraded a technique, equipment, or software to significantly improve a good or service; 4) made a significant improvement in a technique or process by increasing automation, decreasing energy consumption, or using better software; 5) decreased production costs by improving the materials, software, or other components; and, 6) changed a delivery method to be faster or more reliable.

For R&D, the ASE asks business owners to answer whether their business did any of seven different R&D activities in 2014. Applied R&D activities include: 1) conducted work that might lead to a patent; 2) developed and tested prototypes that were derived from scientific research or technical findings; and 3) applied scientific or technical knowledge in a way that has never been done before. Basic R&D activities include: 1) produced findings that could be published in academic journals or presented at scientific conferences; 2) created new scientific research or technical solutions that can be generalized to other situations; 3) conducted work to discover previously unknown scientific facts, structures, or relationships; and 4) conducted work to extend the understanding of scientific facts, relationships or principles in a way that could be useful to others. The last set of innovation variables regards intellectual property. The ASE asks whether the business owns one or more of each of the following in 2014: copyright, trademark, patent (granted), and patent (pending).

Detailed information in the ASE also permits an examination of how the relative performance of African-American owned firms varies when controlling for possibly confounding factors that may affect the gap: human capital, other demographic characteristics, motivations for ownership, access to finance, and choice of industry. The ASE includes detailed owner demographic characteristics such as gender, age, race and ethnicity, citizenship, type of education, prior business experience, and veteran

³⁷ 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.

status. They also include the relationships among business owners in the case of multiple owners, for instance, whether it is couple-owned, non-couple family-owned, or multi-generational.

The ASE asks about nine different motivations for owning the business, including: 1) “Best avenue for my ideas/goods/services”; 2) “Opportunity for greater income/Wanted to build wealth”; 3) “Couldn’t find a job/Unable to find employment”; 4) “Wanted to be my own boss”; 5) “Working for someone else didn’t appeal to me”; 6) “Always wanted to start my own business”; 7) “An entrepreneurial friend or family member was a role model”; 8) “Flexible hours”; and 9) “Balance work and family.” These questions ask how important each of these nine reasons is: “not important”; “somewhat important”; or, “very important.” These questions allow us to compare different motivations of starting business between African-American and White-owned businesses.

The ASE also provides information on the amount and source of start-up capital used to start or initially acquire the business including savings, other assets and borrowed funds, and the 4-digit NAICS industries of the firms. Amount of capital is expressed as ten categorical variables from less than \$5,000 to \$3 million or more, as well as “none needed” and “don’t know.” Furthermore, the ASE asks more detailed questions on new funding relationships, such as whether the business attempted to engage with banks, credit unions, other financial institutions, angel investors, venture capitalists, crowdfunding platform, and grants, and if they received the total amount of the requested funding, or not. The ASE also provides information on whether the owner chose not to apply when in need of additional financing, and the reasons for not applying, such as discouragement from expected non-approval, or not wanting to accrue debt. This allows us to identify discouraged borrowers as well as their corresponding reasons. Lastly, the ASE provides information about the factors which negatively impact the profitability of business, such as access to financial capital and cost of financial capital.

We use the CPS to examine heterogeneity in the entrepreneurial outcome differences between African-American and White business owners. As we described above, detailed owner and firm characteristics allow us to look at how outcomes vary with education, ethnicity, and industry. For industry, we can compare the business outcomes in the high-tech sector, where the high-tech sector is defined by the share of Science, Technology, Engineering, and Mathematics (STEM) employment in the industry. We also compare outcomes for African-American entrepreneurs in predominantly low-income areas with those in higher income areas, using the share of households under the poverty line, further described below.

We examine racial differences in financial access using information in the ASE. The data permit an examination of differences in the levels and sources of start-up and recent finance, difficulty in obtaining loans, and the subjective estimate of the importance of capital constraints for profitability, as described above.

To estimate the incidence and amounts of government-guaranteed loans received by African-American-owned firms, we use an SBA database containing all 7(a) and 504 loans from 1953 to 2010. The database includes variables representing owner race, the date of the loan, and the amount of the loan, which we use in this analysis. To examine incidence, we use the 2002 SBO to compute the share of firm ownership by race.

To estimate the firm-level impact of the Community Reinvestment Act (CRA), we link CRA data to the LBD, BR, SBOs, and ASEs. The CRA data are publicly available, providing information at the tract level including the tract's relative median income level and the number and dollar amount of small business loans from 2003 to 2015. This information will be used to define CRA eligible tracts, where the tract is eligible for the CRA if its family median income relative to its MSA is less than 80 percent, and to measure the closeness to this threshold of tracts above and below it, for the Regression Discontinuity Design (RDD). Small business loans at the tract level allow us to examine the differences in financing between CRA and non-CRA tracts. The CRA eligibility is time varying at the tract level because of changes when the median incomes are periodically recomputed (for instance in 2012). The CRA eligibility is also time-varying at the firm-level because of changes in tract boundaries, thus, because of such changes, a firm in a fixed location may move from CRA eligibility to ineligibility, or vice versa. Our methods, described in the next section, exploit both of these sources of variation in a panel framework with firm fixed-effects and RDD combined.

Methods

The report starts with an update and extension of the sort of analysis carried out in most previous research, analyzing African-American self-employment with data from household surveys. Using the Decennial Census and American Community Survey (ACS), we compute long-term trends in the share of African-Americans from 1970 to 2018 in several groups. The shares in total population, adult population, and employed population serve as baselines for examining the share in self-employment.

In the broad literature on entrepreneurship, the self-employment measure is subject to criticism (e.g., Parker 2004), as it may reflect outside contracting, casual work, or subsistence or “necessity” activities, and it does not take into account the degree to which the venture is genuinely entrepreneurial in the colloquial sense of creating jobs and innovating with new products or production processes.³⁸ One approach in previous research (e.g., Levine and Rubinstein 2017) to come closer to this notion of new business creation is to distinguish incorporated from unincorporated self-employed businesses. Adopting this perspective, we use information on incorporation, which is available in the Decennial since 1970 and in the ACS for all years, and we compare the trends of the share of African-Americans in self-employed, incorporated self-employed, and unincorporated self-employment from 1970 to 2018. In a separate analysis, we also use data on hours of work to distinguish full-time self-employed, as a measure of more committed entrepreneurship. While previous research has documented differences in African-American self-employment, this research provides a longer time series to evaluate the evolution of this variable, more recent data as close to the present as possible, and separate analyses of incorporated and full-time self-employment.

Self-employment probabilities may be correlated with other individual characteristics. To assess how much these may matter, we estimate the racial gap in self-employment within an

³⁸ Hurst and Pugsley (2011) show that a majority of small businesses are not successful entrepreneurships in these conventional senses, but they do not examine differences between African-American and non-African-American-owned businesses.

augmented Mincer-type regression with pooled cross-sections of Decennial-ACS and CPS ORG data specified as follows:

$$Y_{it} = \alpha + \beta A_{it} + \mathbf{X}_{it}\boldsymbol{\mu} + \tau_t + \omega_{it}, \quad (1)$$

where Y_{it} is an indicator alternatively for self-employment, incorporated self-employment, or full-time self-employment of an individual i at time t , A_{it} is a dummy for African-American, $\mathbf{X}_{it}$ is a set of control variables (in this case, individual characteristics of age, gender, and education), τ_t are year effects, and ω_{it} is an error term.³⁹ If, for example, the probability of self-employment is positively correlated with education and African-American educational attainment tends to be lower than average, this equation provides information on the racial gap once this difference is taken into account. In a further extension, we permit β and μ to vary over time, in order to estimate trends in relative African-American self-employment probabilities controlling for other characteristics.

Next, we turn to job creation, which we initially assess with recently available data from the Current Population Survey (CPS) Outgoing Rotation Groups (ORG) to study self-employed individuals who hire employees (“employers”). We pool information from 2014 (the first year of the available information on this variable) to 2019, which is the most recent available CPS-ORG. Then, we compute the fraction of African-Americans among employers and categories of number of employees, for comparison with the shares in population, total employed, and self-employed populations discussed above. The distribution of African-American employers by different size groups allows an assessment of the relative contributions by African-American entrepreneurs to job creation. With the pooled CPS ORG cross-sections, we also estimate equations analogous to (1), but with dependent variables defined as indicators for employer or for number of employees above specific sizes (5+, 10+, 20+, and 50+) in order to estimate job creation, while controlling for other characteristics. We estimate earnings regressions for self-employed and for employees separately using the CPS ASEC. The specification of the independent variables is again the same as in Equation (1).

Turning to the firm-level analysis of employment and other outcomes, after comparing simple means for outcomes of businesses with any African-American ownership to those with no African-American ownership, we start with a baseline regression including only an indicator for African-American, other race/ethnicity indicators, and a polynomial in firm age. Then, we estimate additional specifications, adding in turn sets of control variables for other demographic characteristics, human capital, motivations, finance, and industry. The purpose is to describe differences in firm-level outcomes between African-American and White owners and to examine whether there are observable differences that might account for the raw gap estimated in the baseline regression. The remaining racial gap after controlling for observables may reflect barriers (or other unobserved heterogeneity) to African-American entrepreneurs.

³⁹ With the CPS ORG data, the controls include calendar month dummies to control for seasonality. In some specifications, we also control for occupation and industry. Although these are choice variables, arguably endogenous to the self-employment decision, it is interesting to examine the robustness of the more parsimonious specification estimates to controlling for these variables.

In addition to the firm-level employment outcome, we also examine the many innovation measures available from the ASE, again all at the firm level. We also investigate outcomes on the right-tail of the employment distribution. Our baseline regression is specified in the following equation.

$$Y_{ij} = \alpha + \beta A_{ij} + \sum_k \delta^k G_{ij}^k + \mathbf{Z}_j \theta + u_i, \quad (2)$$

where Y_{ij} is a performance measure for an owner i at a firm j , A_{ij} is an indicator for an African-American owner, and G_{ij}^k is a dummy variable for a race/ethnicity group k (e.g., Hispanic, Asian, Native American, and other minority), included so that β measures the African-American versus White difference. Our firm performance variables include employment (log-transformed), top 5% of employment distribution, innovation (product and process), and R&D activities and whether they have. Because firms in different stages of the business life cycle have varying size of their ownership teams, we control for a set of categories of firm age (0-2, 3-5, 6-10, 11-15, and 16 or more years) since the first worker was hired by the firm and the number of owners (1, 2-4, 5 or more, and “don’t know”), represented by $\mathbf{Z}_j$. The coefficient of the African-American owner indicator (β) captures the differences in firm-level outcomes between African-American and White owners.

With equation (2), we estimate the raw gap in firm-level performances without controlling observable characteristics between race groups. But previous studies have found that skill differences may partially explain why African-American owned firms tend to be less successful. In order to understand how much of the gap can be explained by owner characteristics, we estimate the regression with a set of owner characteristics, specified in the following equation:

$$Y_{ij} = \alpha + \beta A_{ij} + \sum_k \delta^k G_{ij}^k + \mathbf{Z}_j \theta + \mathbf{X}_{ij} \boldsymbol{\gamma} + u_{ij}, \quad (3)$$

where $\mathbf{X}_{ij}$ is a vector of characteristics of an owner i at a firm j . This vector includes demographic variables (owner age and gender), proxies for human capital (education, veteran, and prior business), and ownership team variables (size and family relationships). For multi-owner firms, we compute the average characteristics of owners. Arguably, such characteristics are pre-determined with respect to firm-level performances. The β estimated from equation (2) provides an adjusted gap in business outcomes between firms owned by African-American and White owners.

In addition to owner characteristics, African-American owners may differ from White owners in terms of their motivations, start-up capital, and choice of industries, which are less clearly exogenous and may be jointly determined with firm performance. Accordingly, we control for motivations to owning a business. Most small business owners start their businesses due to non-pecuniary motives with no intention to grow or innovate (Hurst and Pugsley 2011). African-American owners may have different pecuniary motivations to own their businesses, which may influence their firm performance. We estimate the following specification:

$$Y_{ij} = \alpha + \beta A_{ij} + \sum_k \delta^k G_{ij}^k + \mathbf{Z}_j \theta + \mathbf{X}_{ij} \boldsymbol{\gamma} + M_{ij} + u_{ij}, \quad (4)$$

where M_{ij} is the set of motivation variables. As described in the data section, the survey asks about the reasons for owning a business. The nine motivation variables available include: new idea, income, no job, own boss, work for self, always wanted, role model, flexible hours, and balance work and life. The survey respondents indicate whether each motivation is “not important”, “somewhat important”, or “very important.” In our specifications, we control dummies for “somewhat important” and “very important” for each motivation.

We then control for measures of financial access, including the amount of start-up capital and outside finance received in 2014. The importance of access to finance for business start-ups is well documented in the literature (e.g. Evans and Jovanovic 1989; Evans and Leighton 1989). Moreover, lower start-up finance among African-American owners may account for the differences in innovation outcomes between African-American and White owners (Robb and Fairlie 2007). Our specification is:

$$Y_{ij} = \alpha + \beta A_{ij} + \sum_k \delta^k G_{ij}^k + \mathbf{Z}_j \theta + \mathbf{X}_{ij} \boldsymbol{\gamma} + M_{ij} + K_j + u_{ij}, \quad (5)$$

where K_j is the set of vectors of detailed categories of amounts of start-up finance and amount of outside finance received in 2014 (below \$5k, \$5k-\$10k, \$10k-\$25k, \$25k-\$50k, \$50k-\$100k, \$100k-\$250k, \$250k- \$1m, \$1m-\$3m, above \$3m, don't know, and none needed), indicator for sources of startup capital (bank or venture capital), indicator for new funding relationship sources (bank or Angel/VC/other investor businesses).

Finally, we control the different choices of industry, which allows us to compare African-American and White owners within the same industry. If African-American owners are more likely to own businesses in industries with small businesses (or less productive firms), the racial gap in previous specifications may be influenced by different choices of industries. We estimate the regression with the following specification:

$$Y_{ij} = \alpha + \beta A_{ij} + \sum_k \delta^k G_{ij}^k + \mathbf{Z}_j \theta + \mathbf{X}_{ij} \boldsymbol{\gamma} + M_{ij} + K_j + S_j + u_{ij}, \quad (6)$$

where S_j is the set of vectors of 4-digit NAICS industry dummies.

We use the most recent available household-level data in the CPS and ACS to examine heterogeneity in the relative performance of African-American entrepreneurs along several dimensions: gender, low-income PUMA area, veteran, education, and sector (especially high-technology industries). Besides splitting the sample along each of these dimensions, we specify regressions allowing for racial heterogeneity as follows:

$$Y_{it} = \alpha + \sum_h \beta^h H_i^h A_i + \sum_h \sum_k \delta^{hk} H_i^h G_i^k + \mathbf{X}_{it} \boldsymbol{\mu} + \tau_t + \omega_{it}, \quad (7)$$

where $H_i^h A_i$ are the interaction terms between the African-American dummy A_i and characteristics H_i^h for the dimension of heterogeneity h (education or gender categories) for an individual i . The omitted race group is White. For consistency, we control for demographic characteristics across the heterogeneity specifications.

In order to investigate whether African-American entrepreneurs face worse access to finance, we study several sets of variables. First, there is the rich set on problems accessing finance in the ASE, described in the previous section. Besides computing summary statistics for these variables by race, we specify regressions for racial differences in access to finance as follows:

$$F_{ij} = \alpha + \beta A_{ij} + \sum_k \delta^k G_{ij}^k + \mathbf{Z}_j \theta + \mathbf{X}_{ij} \gamma + u_{ij}, \quad (8)$$

where F_{ij} represents the various measures of financial access in the ASE, which include an indicator for startup capital amount above \$100K, indicators for the sources startup capital sources (personal/family savings or assets, personal/family home equity loan, credit card, government, business loan from a bank or financial institution, business loan/investment from family/friend(s), investment by venture capitalist(s), or grants), indicator for whether receiving positive outside funding in 2014, indicator for 2014 outside funding above 100K, indicators for new funding sources (banks, angel investors/venture capital, other investor businesses, grants). Outcome variables also include an indicator for if a firm avoids additional financing because they didn't think business would be approved by lender dummy and an indicator for access to financial capital negatively impact the profitability of this business. In other specifications, we control for motivations and choice of industry because while they may be endogenously determined with use of capital, they also shed light on the degree to which racial gaps in financial access remain even these variables are controlled for.

The final question addressed in the project concerns the Community Reinvestment Act (CRA), a federal law intended to increase financial access and reduce redlining in low- and moderate-income (LMI) neighborhoods. Under the CRA guidelines, a tract becomes "eligible" for CRA if the ratio of the tract-level median family income (MFI) to that of the MSA where that tract is located is less than 80 percent.⁴⁰ This discrete MFI threshold provides treatment and control groups that are very similar except for CRA eligibility for those with MFI close to the threshold. We estimate the causal effect of the CRA on African-American-owned businesses by exploiting this regulatory discontinuity created by the tract-level income threshold.

In addition to the regulatory threshold, we further exploit time variation created by a change in the reference data used to define the CRA eligibility. The change may alter CRA eligibility two different ways: by updating MFI in a tract and moving it above or below the 80 percent threshold, or by changing tract boundaries. In 2012, the reference data was changed from Census 2000 to ACS 2006-2010, updating tract MFI and accordingly CRA eligibility. In addition, the Participant Statistical Areas Program (PSAP) update the boundaries of Census tracts (split or merged) based on changes in population every 10 years. Because the eligibility of the CRA tract is based on tract-level MFI relative to MFI in a neighborhood area, this change creates exogenous variation in the CRA eligibility of the tract in which firm locates. This allows us to estimate equation (9) with firm-level fixed effects as follows:

$$E_{jct} = \alpha + \beta_0 D_{ct} + \beta_1 D_{ct} A_{jct} + f(MFI_c) + \mathbf{X}_{ict} \gamma + r_i + \tau_t + \varepsilon_{ict}, \quad (9)$$

⁴⁰ If the tract is not located in the MSA, it is eligible if its MFI is less than 80 percent of the nonmetropolitan portion of the state in which the tract is located.

where E_{jct} is firm-level employment for a firm j in census tract c in time t , D_{ct} is an indicator whether the designated tract is CRA eligible or not in time t , A_{jct} is an indicator for whether a firm has African-American owner, $f(MFI_c)$ is the function of the relative MFI ratio of the tract to its MSA in a polynomial function. X_{ict} is a set of firm-level characteristics (e.g. age and age squared), r_i are firm fixed effects, τ_t are year effects, and ε_{ict} is an error term. Permitting β to vary by race of owner provides a credible estimate of the causal effect of improved access to finance under the CRA for African-American-owned relative to White-owned firms.