CESifo WORKING PAPERS

10634
2023

August 2023

The Impacts of Covid-19 on Racial Inequality in Business Earnings

Robert Fairlie

CESifo

Impressum:

CESifo Working Papers
ISSN 2364-1428 (electronic version)
Publisher and distributor: Munich Society for the Promotion of Economic Research - CESifo GmbH
The international platform of Ludwigs-Maximilians University's Center for Economic Studies and the ifo Institute
Poschingerstr. 5, 81679 Munich, Germany
Telephone +49 (0)89 2180-2740, Telefax +49 (0)89 2180-17845, email office@cesifo.de
Editor: Clemens Fuest
https://www.cesifo.org/en/wp
An electronic version of the paper may be downloaded
· from the SSRN website: www.SSRN.com
· from the RePEc website: www.RePEc.org
· from the CESifo website: https://www.cesifo.org/en/wp

CESifo *Working Paper No. 10634*

The Impacts of Covid-19 on Racial Inequality in Business Earnings

Abstract

Many small businesses closed in the pandemic, but were economic losses disproportionately felt by businesses owned by people of color? This paper provides the first study of the impacts of COVID-19 on racial inequality in business earnings. Pandemic-induced losses to business earnings in 2020 were 16-19 percent for all business owners. Racial inequality increased in the pandemic: Black business owners experienced larger negative impacts on business earnings of 12-14 percent relative to white business owners. Regression estimates for Latinx and Asian business owners reveal negative point estimates but the estimates are not statistically significant. Using Blinder-Oaxaca decompositions and a new pandemic-focused decomposition technique, I find that the industry concentrations of Black, Latinx, and Asian business owners placed each of these groups at a higher risk of experiencing disproportionate business earnings losses in the pandemic. Higher education levels among Asian business owners helped insulate them from larger losses from COVID-19. In the following year of economic recovery, 2021, business earnings rebounded strongly for all groups except for Asian business owners who experienced large relative losses (which were partly due to industry concentrations). State-level variation in policies and disease spread does not explain racial differences in business earnings losses or rebounds.

JEL-Codes: L260, J150.

Keywords: entrepreneurship, Covid, racial inequality, business earnings, pandemic.

Robert Fairlie
University of California
Los Angeles / CA / USA
rfairlie@ucla.edu

August 2023
I thank Brian Headd and seminar participants at Carnegie Mellon and the Cleveland Federal Reserve Bank for comments and suggestions, Gagandeep Sachdeva and Julian Barragan for research assistance, and the U.S. Small Business Administration for funding.

1 Introduction

The mandated closings of non-essential businesses to slow the spread of COVID-19 and disruptions to consumer demand due to health concerns had widespread effects on small businesses starting in the spring of 2020. Business activity fell sharply in the first few months of the pandemic as owners and businesses were forced to shut down operations. Estimates of temporary closures ranged from 22 to 43 percent in the beginning of the pandemic (Bartik et al. 2020; Fairlie 2020). Losses to small business revenues and sales ranged from 30 to 50 percent (Farrell, Wheat, and Mac 2020; Kim, Parker, and Schoar 2020; Bloom, Fletcher, and Yeh 2021; Fairlie and Fossen 2021). Although the losses to small businesses were unprecedented, a pressing concern for inequality is whether they were felt disproportionately by people of color. Minority-owned businesses are important for local job creation (as minority owners disproportionately hire minority workers), economic advancement, and longer-term wealth inequality (Boston 1999, 2006; Stoll et al. 2001; Bradford 2003, 2014; Fairlie and Robb 2008). To date, however, there exists very little evidence on whether small businesses owned by minorities were more negatively impacted by COVID-19, and if so, why.

The limited evidence on this question indicates that Black, Latinx, and Asian business owners were less likely to stay open in the early months of the pandemic (Fairlie 2020; Wilmoth 2020). The number of active Black business owners, for example, dropped by 41 percent in April 2020 compared with a 17 percent drop for whites. No previous studies, however, examine whether there were disproportionate impacts on business earnings, which is important because differential business earnings losses contribute directly to total income inequality. Ten percent of the workforce, or 15 million people, own a business instead of having a wage and salary job, and these owners hold a disproportionate amount of total wealth and create jobs for others (BLS 2022, Headd 2021, Hipple and Hammond 2016, U.S. Census Bureau 2016; Fairlie et al. 2023).

This paper provides the first estimates of the impacts of COVID-19 on racial inequality in business earnings. Using Current Population Survey (CPS) microdata from the Annual Social and Economic Supplement (ASEC) files, I explore whether the earnings of minority business owners were disproportionately affected by COVID-19 and thus contributed to furthering income inequality in the United States. The analysis also provides

the first estimates of business owner earnings losses from 2019 to 2020 for the total U.S (i.e. including all racial groups), and the first estimates of rebounds in business earnings from 2020 to 2021. The World Health Organization declared the novel coronavirus or COVID-19 a pandemic on March 11, 2020, and states imposed social distancing restrictions that shut down non-essential businesses by the end of the month. Thus, calendar year 2020 is the first year affected by the pandemic with nearly the entire year being affected.

Prior evidence on the underlying causes of disproportionate impacts of COVID on minority-owned businesses is also sparse. This paper provides the first test of whether differential impacts by race are due to owner, business, or geographical characteristics. Using Blinder-Oaxaca decompositions and a new decomposition method of identifying pandemic-specific contributions, this study is the first to identify the potential causes of post-pandemic business earnings losses. The new decomposition technique introduced here answers important and pressing questions such as how much did the concentration of Black-owned businesses in specific industries (e.g. services and leisure) place them at a higher risk of business earnings losses in the pandemic. And, how much did geographical differences in COVID case rates and Paycheck Protection Program (PPP) loan receipt rates, and state-level restrictions such as business closure policies and mask mandates contribute to racial disparities in business earnings losses? The new decomposition technique builds on the standard and widely-used Blinder-Oaxaca decompositions that identify the factors that explain why there are racial gaps in outcomes at a specific point in time. The technique isolates the part of the contribution from factors that place racial groups at higher or lower risk to business earnings losses in the pandemic.

The results indicate that COVID-19 induced losses to business earnings in 2020 were disproportionately felt by minority business owners. Controlling for pre-pandemic time trends and baseline owner, business, and geographical characteristics, COVID-19 had large negative impacts on business earnings (16-19 percent) for all business owners. But, losses were much higher for Black business owners: Black business owners experienced disproportionate negative impacts from COVID-19 on business earnings of 12-14 percent relative to white business owners. Regression estimates for Latinx and Asian business owners reveal negative point estimates, but the estimates are not statistically significant. In

the following year of economic recovery, 2021, business earnings rebounded strongly for all groups except for Asian business owners who experienced large relative losses.

Exploring the causes of differential impacts of COVID-19 by race and ethnicity reveals that the types of businesses, owners, and geographical locations that experienced the largest losses in business earnings in the pandemic were in the leisure and hospitality industries, wholesale and retail trade industries, located in the west or south, operating in central city areas, and owners with less education than a college degree. Estimates from Blinder-Oaxaca decompositions indicate that lower levels of education and industry concentrations among Black business owners contribute to disparities in business earnings in 2020. Lower levels of education are the predominant reason for disparities for Latinx business earnings but industry concentrations also contribute in 2020. Industry concentrations reduce Asian business earnings, whereas higher levels of education represent an advantaged characteristic increasing business earnings in 2020. Estimates from the new decomposition technique indicate that the industry concentrations of Black, Latinx, and Asian business owners placed each of these groups at a higher risk of experiencing disproportionate business earnings losses in the pandemic. Higher education levels among Asian business owners helped insulate them from larger losses due to COVID-19. The lack of rebound for Asian business earnings in 2021 was partly due to industry concentrations. On the other hand, state-level variation in COVID case rates and PPP receipt rates, business closure policies, and mask mandates did not contribute to disproportionate earnings losses or gains among business owners of color in 2020 or 2021.

The findings contribute to a small literature exploring disproportionate impacts of COVID on businesses owned by people of color. Providing early evidence on the question, Fairlie (2020) finds using monthly CPS microdata that the number of active Black business owners dropped by 41 percent from February to April 2020 compared with a 17 percent drop for whites. Latinx and Asian business owner activity fell by 32 and 26 percent, respectively.[1] Although all groups started to recover, losses through June from pre-pandemic levels were disproportionately felt by business owners of color. Also using CPS data but focusing on year-over-year (YOY) changes, Wilmoth (2020) finds that Blacks

[1] Also using the CPS, Couch, Fairlie and Xu (2021) find large disproportionate impacts of COVID-19 on minority unemployment rates.

experienced the largest YOY decline at 37.6 percent, with Asians experiencing only a slightly smaller decline at 37.1 percent. The decline for Latinx business owners was smaller (26.0 percent) but also larger than the national average (20.2 percent). Amuedo-Dorantes, Borra, and Wang (2021) find that COVID-19 disproportionately hurt Asian entrepreneurship especially for Asian immigrants, declining by 17 percent relative to non-Latinx whites. Bloom, Fletcher, and Yeh (2021) partnered with a large payments technology company to collect survey data from 2,500 small businesses and find an average loss of 29 percent in sales in 2020 Q2. They find an 8 percent larger drop for Black businesses, but estimates are not statistically significant. Farrell, Wheat, and Mac (2020) examine data from the transactions of financial accounts at JP Morgan Chase (JPMC) for a few states and find that by the end of March 2020, Black firms had cash balances that were 26 percent lower compared with a 12 percent decrease for all firms.[2] Also, the Stanford Latino Entrepreneurship Initiative (2020) surveyed 224 high-revenue Latinx-owned businesses and found that 86 percent of respondents reported immediate negative effects such as delayed projects and closure from the pandemic.

The findings also have implications for broader issues around racial inequality in business earnings. Large and persistent racial disparities in business ownership and outcomes have existed for some time in the United States and are well known, but their causes are not well understood.[3] The lack of research attention is surprising, given the magnitude of these racial disparities and the importance of business ownership as a way to make a living for many Americans. Only 5 percent of Blacks and 8 percent of Latinx own businesses compared with more than 11 percent of non-Latinx whites (Hipple and Hammond 2016). Similarly troubling is that Black- and Latinx-owned businesses have substantially lower average sales and hire fewer employees than white-owned businesses (U.S. Census Bureau 2016; Davila and Mora 2013; Fairlie and Robb 2008). The pandemic may have widened these pre-existing inequalities.

[2] A larger literature examines racial disparities in receipt of financial assistance in the pandemic such as the Paycheck Protection Program (PPP) and Economic Injury Disaster Loan (EIDL) program. See, for example, Atkins, Cook, and Seamans (2021, 2022), Howell et al. (2021), Lederer et al. (2020), Fairlie and Fossen 2021, 2022), Fei and Yang (2021), and Erel and Liebersohn (2020).

[3] See Parker (2018), Davila and Mora (2013), Fairlie and Robb (2008), and Bates (1997) for reviews of this literature.

2 Data

Only a few national datasets provide information on the demographic characteristics of business owners and fewer include information on business owner earnings. I use microdata from the Annual Social and Economic (ASEC) supplement to the Current Population Surveys (CPS) to measure self-employed business ownership and earnings at the individual owner level and explore patterns by race and ethnicity.

2.1 Current Population Survey (CPS)

The CPS is conducted monthly by the U.S. Bureau of the Census and the U.S. Bureau of Labor Statistics. It is the underlying source of official government statistics on employment and unemployment. The data cover all persons in the civilian noninstitutionalized population of the United States living in households. Although the main purpose of the CPS is to collect monthly information on the employment situation, a secondary purpose is to collect information on the demographics of the population. Once a year in March, information on calendar year earnings is conducted in the ASEC supplement to the CPS, which is the data set used here. All data are downloaded directly from the Census Bureau/BLS FTP web page.[4]

2.2 Measures of Business Ownership and Earnings

To estimate business ownership and earnings in the ASEC CPS data, I identify all individuals who report owning a business as their main job over the previous calendar year (based on the class of worker question). The main job is defined in the ASEC as the one with the most hours worked during the year. Thus, individuals who start side businesses will not be counted if they are working more hours on a wage and salary job.

The measure of business ownership in the CPS captures all business owners including those who own incorporated or unincorporated businesses and those who are employers or non-employers. Although some business owners own large businesses, most own small businesses. The outcome studied here is the business earnings of the owner. I calculate business earnings from a survey question that asks for net earnings from the

[4] https://www.census.gov/data/datasets/time-series/demo/cps/cps-asec.html

business (or farm) after expenses during the calendar year. For incorporated business owners the question is asked for earnings from the business before deductions in the calendar year. The ASEC file includes a measure of earnings from the longest job held during the calendar year. The question refers to annual earnings and captures the previous calendar year. Thus, for example, the 2021 ASEC file asks about earnings in the 2020 calendar year.

In addition to providing information on business ownership and earnings, the CPS data include information on detailed demographic information including gender, race, and ethnicity of the owner. The education level and geographical location of the owner are also measured. The data also include information on the industry of the business. The CPS data have been used in previous research to study self-employment, business ownership, and entrepreneurship (e.g., see Hipple and Hammond 2016; Chatterji et al. 2014; Levine and Rubenstein 2016; Wang 2019; Fairlie 2020; Wilmoth 2021).

Measures of business ownership and outcomes are available from only a handful of other large, nationally representative government datasets such as the Annual Survey of Entrepreneurs (ASE), the Survey of Business Owners (SBO), and the American Community Survey (ACS). Measures of business ownership based on these data, however, cannot capture recent patterns because there is typically a one- to two-year delay in release. Another complication is that the 2020 ACS microdata, which also has annual business earnings, is only being released through "experimental" estimates with a limited number of data tables and geographies due to the impact of the COVID-19 pandemic on data collection (U.S. Census Bureau 2021). In contrast, the BLS has gone to great lengths to make sure that CPS response rates were high even in the early months of the pandemic, and 2020 calendar year earnings are measured from the 2021 March survey when most social restrictions were lifted.

2.3 Survey and Pandemic Timing

On March 11, the World Health Organization (WHO) declared COVID-19 a pandemic, which might have resulted in early demand shifts over health concerns predating shelter-in-place restriction policies. On March 16, 2020, the San Francisco Bay Area imposed shelter-in-place restrictions followed by the State of California on March 19. New

York State followed the next day. By early April all states imposed some social distancing restrictions. Previous studies have generally excluded March as either pre-pandemic or post-pandemic (e.g., Fairlie 2020).

The ASEC provides information on the previous calendar year. For example, the 2021 ASEC covers calendar year 2020. The months of January and February 2020 were likely unaffected by the pandemic. March 2020 is less clear. GDP growth in 2020 Q1 which captures March 2020 shows a large drop. Even if only January and February 2020 are unaffected in calendar year 2020 the estimated impacts will be smaller than if measured over the entire calendar year. It is not possible to remove earnings in these two months from the person's reported earnings for the calendar year. Using this approach, 2019 is the last pre-pandemic year. Thus, estimates of COVID effects will focus on comparisons of 2020 to 2019. For the early-stage economic recovery period the analysis will focus on comparisons of 2021 to 2019.

3 Methods

To more formally test whether COVID had disproportionate impacts on minority business owner earnings, I estimate regressions in which log business earnings is the dependent variable. The regressions control for trends prior to COVID and pre-pandemic differences in business, owner, and geographical characteristics. Controlling for prior trends in business earnings or racial gaps in business earnings might be especially important for identifying the effects of COVID. To start, I estimate the following base equation:

$$(3.1)\quad Y_{it} = \alpha + \gamma^B Black_i + \gamma^L Latinx_i + \gamma^A Asian_i + COVID20_t + \delta^B Black_i * COVID20_t + \delta^L Latinx_i * COVID20_t + \delta^A Asian_i * COVID20_t + COVID21_t + \delta^B Black_i * COVID21_t + \delta^L Latinx_i * COVID21_t + \delta^A Asian_i * COVID21_t + \beta' X_{it} + \lambda_t + Black_i * \lambda_t + Latinx_i * \lambda_t + Asian_i * \lambda_t + \varepsilon_{it}$$

where Y_{it} is annual log business earnings for owner *i* in calendar year *t*, $COVID20_t$ is a dummy variable for the post-COVID year 2020, $COVID21_t$ is a dummy variable for the post-COVID year 2021, , X_{it} includes owner, business, and geographical characteristics, λ_t is a linear time trend, and ε_{it} is the error term. The analysis sample covers seven years

with five pre-COVID years (2015-19) and two post-COVID years (2020 and 2021). As noted above, 2020 captures the months of January and February which were prior to social distancing restrictions and March only partially captures those restrictions. Estimates of *annual* losses in the pandemic will be downward biased because of this limitation.

The parameters of interest are the δ^j, which capture the estimates of COVID effects on business earnings for each minority group, *j*, relative to the left-out group, non-Latinx white business owners. The regressions control for business (industry), owner (education/skill level, age, gender), and geographic (region, central city status) characteristics. The main specification includes a linear time trend and linear time trends interacted with each minority group. All specifications will be estimated with OLS using CPS sample weights.

Equation (3.1) is in the nature of a "difference-in-difference" estimator of the impact of COVID on racial gaps in business earnings. For the Black/white gap for example, the first "difference" is white business earnings minus Black business earnings, and the second "difference" is post-pandemic business earnings minus pre-pandemic business earnings. But dissimilar to most difference-in-difference applications, however, I am not evaluating the impact of a specific policy but am estimating whether there are disparate impacts of COVID-19 relative to pre-pandemic levels and trends. There is no control group as all groups were affected by the pandemic.

Equation (3.1) implicitly calculates the second or post-pre difference from a comparison of 2020 (or 2021) business earnings to mean business earnings from 2015 to 2019 (de-trended). Although this approach provides more precise estimates because of a longer pre-COVID time period, it has the disadvantage of including years that are further away from the beginning of the pandemic in the calculation of COVID effects. One method of addressing this issue is to focus the pre-pandemic period comparison to 2019 only. The simplest way to do this is to include a dummy variable that equals 1 for the entire 2015 to 2018 time period and include its interactions with the race dummies. Pre2019 is a dummy variable equal to one if the year is in 2015 to 2018 and zero otherwise.

Another approach is to include a full set of year dummies and their interactions with race instead of combining all pre-COVID years prior to the base year, 2019. This "event-study" style regression is specified as follows:

(3.2) $Y_{it} = \alpha + \sum_{s=-5}^{2} \delta_s^B \, Black_i + \sum_{s=-5}^{2} \delta_s^L \, Latinx_i + \sum_{s=-5}^{2} \delta_s^A \, Asian_i + \beta' X_{it} + \lambda_t + \varepsilon_{it}$

where the reference year is s=0 (2019), and λ_t are year fixed effects. This event-study regression estimates racial disparities in the pre-COVID years to directly examine whether there were racial differences in any years prior the pandemic (i.e., test the common trends assumption). There might be differential trends in business earnings, but examining years prior to 2019 should not reveal big jumps in earnings at least not at the level created by COVID in 2020 and possibly 2021.

4 Business Earnings Losses in the Pandemic

The pandemic created an unprecedented disruption to the U.S. economy. GDP growth plummeted in early 2020 but then rebounded strongly later in the year. Over the numerous recessions in the second half of the 20th Century and the first two decades of the 21st Century there has never been such a large quarter-to-quarter change in GDP as in the first full quarter in the pandemic, 2020Q2. GDP fell by 31.2 percent in 2020Q2.[5] GDP also fell by 5.1 percent in 2020Q1. For comparison, GDP dropped by 8.5 percent in 2008Q3 (Great Recession). The pandemic created an extremely severe but short recession. GDP reversed course quickly and grew by 33.8 percent in 2020Q3. The NBER officially dates the pandemic-induced recession as occurring from February 2020 (peak) to April 2020 (trough). I turn to examining business earnings before and after the start of the pandemic.

4.1 Business Earnings Trends

Figure 1 displays trends in business earnings by calendar year from 2015 to 2021. Mean and mean log business earnings are shown. All estimates are adjusted for inflation and are measured in 2019 dollars. Mean business earnings dropped from $62,675 in calendar year 2019 to $59,715 in calendar year 2020 for a loss of 5 percent. From 2020 to 2021, business earnings rebounded strongly (+9 percent) in the early stages of the recovery from the pandemic. The rebound was strong enough to result in an increase of 4 percent

[5] Estimates are from the Bureau of Economic Analysis (BEA).

from pre-pandemic levels to 2021. Prior to the start of the pre-pandemic, the trend in mean business earnings was relatively flat from 2015 to 2017, then rose from 2017 to 2018 (8 percent), and dropped from 2018 to 2019 (-8 percent).

I also examine trends in median business earnings. Median business earnings dropped from $40,000 in 2019 to $34,637 in 2020, representing a drop of 13 percent.[6] Median business earnings then rebounded by 9 percent from 2020 to 2021. One troublesome complication with examining trends in median business earnings is that there is lumpiness in reported values with many round numbers (e.g., 35,000 or 40,000) instead of more precise numbers for annual business earnings. Thus, when examining trends over time in median earnings large jumps can occur because of discontinuous changes from one grouping of values to another.[7] I do not continue to report estimates of median business earnings because of this lesser known problem with lumpiness in the distribution.

Trends in mean log business earnings are also displayed in Figure 1. The standard approach in analyzing earnings is to take logs to remove the influence of outliers and because the transformation often fits the data better when estimating regressions. A disadvantage, however, is that business owners can have zero or negative earnings (unlike wage/salary earnings or hourly wages), and taking logs is not possible. To address this concern, all business earnings values less than $1,000 are set to $1,000 (i.e., censored) before taking logs.[8] Mean log business earnings dropped by 17 log points from 2019 to 2020, which represents approximately a 17 percent drop in business earnings. Mean log earnings, however, increased by 14 percent from 2020 to 2021 partly rebounding from the early-stage drop in the pandemic. The COVID induced loss in business earnings is the largest when measured in logs which reduce the influence of large outliers represented by

[6] The median in 2020 but reported in unadjusted dollars is $35,000.

[7] For example, without the CPI adjustment for the trend in median business earnings the values would be $35,000 in calendar years 2015, 2016, 2017, and 2020, and $40,000 in calendar years 2018 and 2019. These estimated year-to-year jumps in median reported business earnings can be misleading regarding underlying trends in median actual business earnings.

[8] The implicit assumption is that earning any amount less than $1,000 per year from a business is the same as earning $0 per year from a business. Taking this approach removes the problem that a change from $100 to $50 in annual business earnings would be similar in log terms as a change from $100,000 to $50,000 in annual business earnings when the first change is inconsequential. Relative business earnings losses are not sensitive to using alternative cutoffs.

very successful business owners and instead focuses more on losses in all other parts of the earnings distribution.[9]

4.2 Racial Disparities in Business Earnings Trends

All racial and ethnic groups experienced business earnings losses from 2019 to 2021. Figure 2 displays trends in mean business earnings from 2015 to 2021 by race and ethnicity. Mean business earnings dropped by 11 percent for Black business owners. Asian business owners lost 15 percent in 2020, and Latinx business owners lost 7 percent in the pandemic. In comparison, white business owners experienced smaller business earnings losses of 2 percent.

Estimated business earnings losses are larger when measured in logs. Figure 3 displays trends in mean log business earnings by race and ethnicity. Using logs, business earnings dropped by 28 percent for Black business owners which was considerably higher than the loss of 15 percent for white business owners. Asian business owners lost 21 percent and Latinx business owners lost 19 percent in the pandemic.

In the economic recovery from 2020 to 2021, Black business earnings mostly returned to pre-pandemic levels, and Latinx business earnings returned to pre-pandemic levels. Asian business earnings, however, did not rebound in 2021. In contrast to these patterns, there is some evidence that white business earnings are now higher in 2021 than in pre-pandemic levels.

Examining business earnings trends by group there is much more variation year-to-year likely due to smaller sample sizes.[10] Tables 1 and 2 report annual business earnings estimates and average sample sizes. Although there is more fluctuation year-to-year, both

[9] Another possible measure of business earnings losses is to create panel data from the CPS ASEC microdata and examine changes specific to the same business owner. For business owners who are active in both 2019 and 2020, I find an average loss in business earnings of 9 percent. A major problem with this approach, however, is the loss in sample size from matching across years of data. The sample size is 18 percent of the annual sample size in 2020. The reduction in sample sizes precludes any analysis by race and ethnicity.

[10] Unfortunately, the relatively small sample sizes do not allow for separate analyses by gender within racial and ethnic groups. Examining total patterns in business earnings for women and men reveals larger losses from 2019 to 2020 for female business owners (5 percent in means and 19 percent in logs) than for male business owners (3 percent in means and 14 percent in logs) but these differences by gender are not as large as for race and ethnicity. The regression and decomposition analyses below control for gender but do not analyze different patterns within race and ethnicity.

mean and mean log business earnings show large losses from 2019 to 2020 and generally a strong rebound in 2021 (except for Asian business earnings). Business earnings losses appear to be the largest for Black business owners and Asian business owners. Business earnings losses in the pandemic appear to be the smallest for white business owners. Prior to the pandemic there appears to be either a flat or slightly increasing upward trend in business earnings for all groups.[11] The fluctuations from year to year make it difficult, however, to see a clear pattern.

Another important finding from the analysis of business earnings is that consistent across the two measures of business earnings is that there is an unambiguous time invariant pattern of relative business earnings across groups.[12] Asian business owners and white business owners have higher business earnings in all years than Black business owners and Latinx business owners. Mean business earnings prior to the pandemic were roughly $73,000 for Asian business owners, $69,000 for white business owners compared with $48,000 for Black business owners, and $45,000 for Latinx business owners. Mean log business earnings were 9 log points higher for Asian business owners, 28 log points lower for Black business owners, and 32 log points lower for Latinx business owners than for white business owners. These long-term disparities in business performance across racial and ethnic groups have been documented using a wide range of data sources and time periods (see Parker, 2018; Davila and Mora, 2013, Fairlie and Robb, 2008; Bates 1997 for reviews).

Allowing for the increasingly multicultural diversity of the country, all of the previous estimates categorize race as any individual reporting that race on a "check all that apply" question. Thus, individuals can belong to multiple race categories instead of mutually exclusive categories.[13] The traditional single-race approach is to categorize individuals into each race group by including only individuals who report one race.[14] The

[11] As noted below in discussing the results of Table 3, formal tests do not reveal differences in pre-pandemic trends across race and ethnic groups.
[12] Grouping all pre-pandemic years, median business earnings were roughly $44,000 for Asian business owners, $42,000 for white business owners, $30,000 for black business owners, and $28,000 for Latinx business owners.
[13] Similar to the Census Bureau and BLS approach Latinx (or Hispanic) is treated as a separate category from race. Throughout the analysis here the white race category removes Latinx (i.e. non-Latinx white).
[14] See income statistics by race for example, https://www.census.gov/data/tables/2021/demo/income-poverty/p60-273.html

estimated losses are similar (Appendix Table 1). Blacks business earnings dropped by 27 log points in 2020 compared with 15 percent for white business earnings. Latinx business earnings dropped by 19 log points and Asian business earnings dropped by 23 log points from 2019 to 2020. The rebounds in 2021 were similar for all groups including the lack of rebound for Asian business earnings.

4.3 Business Owner Activity

One concern is that the findings for large business earnings losses in the pandemic are influenced by a large increase in the percentage of the working-age population drawn into business ownership in the pandemic (which might draw in many low business earners) or a large decrease in the percentage of the working-age population in business ownership in the pandemic (which might shake out less successful and lower business earners). There might have been shifts in the percentage of the working-age population who was working as a business owner in 2020 relative to 2019. Figure 4 displays trends from 2015 to 2021 in the percentage who were active business owners at any time during the calendar year by race and ethnicity and the total. For the total, the active business owner to working-age population ratio did not change from 2019 to 2020. There was not a decrease or increase in the percentage of the population actively owning a business from calendar year 2019 to calendar year 2020. Black business ownership and white business ownership ratios also did not change in the pandemic. The Latinx and Asian business ownership to population ratio essentially did not change from 2019 to 2020. These patterns differ from the large losses to monthly minority business activity found early in the pandemic (Fairlie 2020) suggesting that at some point during 2020 most business owners at least tried to start up operations again.

Business work activity at any time during the calendar year is the basis for being included in the business earnings sample. These findings for the active business ownership percentage suggest that the findings for large business earnings losses in the pandemic are not being overly influenced by large changes in either direction. The share of the working-age population owning businesses is relatively stable over time and through the pandemic when measured over calendar years.

4.4 Disproportionate COVID-19 Impacts by Race and Ethnicity

To more formally test whether COVID had disproportionate impacts among business owners of color, I estimate Equation (3.1) for log business earnings. The regressions build on the underlying patterns displayed in the figures by controlling for pre-COVID trends and owner, business, and geographical characteristics. For example, if there were converging trends in business earnings between two racial groups the regression equation can simulate where these trends would have likely led to in 2020 if COVID had not happened. When COVID disrupts these patterns there are two possible comparisons. One comparison is to what existed in 2019 (static) and the other comparison is to what likely would have happened in 2020 (trend adjusted). The regressions thus estimate the impacts of COVID on relative patterns in business earnings using both comparisons.

Table 3 reports estimates from Equations (3.1) and (3.2). Specification 1 starts with a stripped-down model that includes no additional variables except the race indicators and their interactions with 2020 (i.e., the "Post-COVID" by race interactions). The loss in business earnings for all groups in 2020 is captured by the "Post-COVID" coefficient, which was roughly -15 percent. Focusing on whether there were differential impacts by race/ethnicity, the estimates indicate that Black business owners disproportionately experienced losses in earnings in 2020 relative to just prior to the pandemic, 2019. The Black coefficient estimate of -0.12 implies that Black business owner earnings dropped by 12 log points or approximately 12 percent more than white (only) business owner earnings.[15] The point estimates for the relative COVID effect on Latinx business earnings and Asian business earnings in 2020 are not statistically significant.

Estimates of the business earnings effects in 2021 indicate that the main effect was a full recovery to 2019 levels (found in "Post-COVID 2021"). For both Black business earnings and Latinx business earnings there is no evidence of a differential rebound. The coefficient on Asian business earnings, however, is large, negative and statistically significant. Asian business earnings are substantially lower in 2021 than in 2019.

Specification 2 reports estimates from Equation (3.1). The regression equation includes a time trend, and controls for owner, business, and geographical characteristics.

[15] As noted above, individuals can report multiple races, however, only 6 percent of the Black and Asian samples report multiple races.

The inclusion of the time trend and controls results in Black business earnings dropping by 13 percent more than white business earnings in the pandemic. The coefficient on the COVID effect on Latinx business earning remains roughly similar in magnitude and not statistically significant. The COVID Asian business earnings loss increases in magnitude to 7 log points but remains statistically insignificant. The overall "Post-COVID" coefficient indicates that all groups experienced losses of roughly 17 percent from prediction of where business earnings should in 2020 based on prior trends absent the pandemic. In 2021, estimates indicate no differential level for Black and Latinx business earnings, but a large relative loss for Asian business earnings. There is a positive and statistically significant pre-pandemic time trend but no differential pre-pandemic trends by race/ethnicity (see Appendix Table 2).

Specification 3 reports estimates from the slight variation of Equation (3.1) noted above. In this model, I add an indicator variable that captures years 2015 to 2018 as "Pre2019 interactions" in Table 3. The addition of this set of indicator variables focuses the estimation of COVID effects on using 2019 as the comparison year instead of the average, de-trended level over 2015 to 2018. The coefficients from this specification are similar to the previous specification. They indicate, for example, a similarly large relative drop for Black business earnings of roughly 14 percent in 2020. The point estimates for the Latinx vs white business earnings effect and Asian vs white business earnings effect are similar to the ones in the previous specification but remain statistically insignificant. Altering the comparison year also results in a similar estimate of the COVID effect for all groups of a 17 percent loss in business earnings in 2020. Relative changes in 2021 are also similar with no difference for Black and Latinx business earnings and a large relative loss for Asian business earnings.

Specification 4 of Table 3 reports estimates of Equation (3.2) which is an "event-study" regression. In this specification, a full set of race indicator interactions with each pre-COVID year (2015 to 2019) are included (see Appendix Table X).[16] The coefficient estimate for the COVID Black vs white effect is 14 percent. The point estimates for the Latinx and Asian relative COVID effects are similar but remain statistically insignificant.

[16] None of the pre-pandemic year dummy variables interacted with race/ethnicity are statistically significant (i.e. there are no pre-pandemic "effects" of COVID on racial inequality in business earnings).

The overall COVID effect on all groups is estimated at 14 percent in 2020. In 2021, the overall effect is zero but relative Asian business earnings dropped substantially.

Overall, the robustness of estimates is impressive and reassuring that prior-trends, choice of comparison pre-COVID time period, or inclusion of baseline controls for individual and business characteristics do not affect the results.[17] Black business earnings dropped disproportionately due to COVID. Latinx and Asian business earnings might have also disproportionately dropped due to COVID, but the imprecision of coefficient estimates rules out making strong conclusions regarding these findings. The rebound in the recovery from the pandemic was strong for business earnings for most groups except for Asian business earnings.

It is important to note that the emphasis here is on testing for disproportionate effects of COVID-19 on business earnings among owners of color but that all groups, including white business owners, experienced earnings losses. The total pandemic induced earnings losses for whites are estimated by the regressions to be from 14 to 17 percent depending on the specification. As noted above, Black business owners lost an additional amount in business earnings which added to these base effects totaled from 27 to 30 percent. Latinx business owners lost a total of 17 to 20 percent in business earnings, and Asian business owners lost a total of 20 to 25 percent in business earnings. When the COVID interactions with race and ethnicity are removed and the regressions are re-estimated I find a total effect of COVID on business earnings of between 16 and 19 percent.[18]

5 Business Earnings Losses by Business and Owner Characteristics

This section explores which types of businesses and owners experienced the largest losses in business earnings in the pandemic. The question is also of broader interest than just its value in exploring potential explanations for racial differences in business earnings losses. For example, it is important to better understand which industries experienced the

[17] Estimating a similar set of regression equations using active business ownership as the dependent variable I find no effects of COVID and no disproportionate effects of COVID by race and ethnicity. The only exception is that relative Latinx business ownership rates are slightly higher in 2021.
[18] Changes for total mean log business earnings from 2019 to 2021 were estimated to be between 2 to 7 percent.

largest business earnings losses in the pandemic for all groups. Table 4 reports mean business earnings by the education/skill level of the owner, major industry, region, central city status, and other characteristics. Mean business earnings are reported for 2019 and 2020, and the percent change between the two years. There is a clear positive relationship between education and mean business earnings. For example, in 2019 college graduate business owners had average earnings of $86,000 compared with $46,000 for high school graduate owners (who did not obtain any higher level of education). Interestingly, however, there is not a strong negative relationship between business earnings losses from 2019 to 2020 and education level. The largest business earnings losses occurred for owners with some college, which is defined as those who have some college credits but did not graduate with a bachelor's degree. This group most notably includes owners with 2-year associate's degrees and vocational degrees.

There is wide variation in mean business earnings across major industry groups. In 2019, mean business earnings range from $40,000 in Other Services to $98,000 in Financial Activities. In the pandemic, some sectors experienced large losses: Wholesale and Retail Trade and Other Services each suffered losses over 20 percent, and Leisure and Hospitality lost a startling 43 percent in average earnings. Agriculture and Information (which include technology) both experienced large positive gains in business earnings in the pandemic.

Across regions, the South and West experienced business earnings losses whereas the Northeast experienced essentially no change and the Midwest experienced gains. Within metropolitan statuses, central cities experienced the largest losses in average business earnings. Suburban areas also experienced losses in the pandemic. Rural areas experienced some gains in average business earnings from 2019 to 2020. By gender, male and female business owners experienced similar mean earnings losses in the pandemic. Older business owners experienced larger mean earnings losses.

Table 4 also reports changes in mean business earnings from 2019 to 2021. Most of the reported business and owner characteristics experienced slight growth in business earnings. A few interesting patterns are that the recovery was positively correlated with the education level of the owner, and industries such as information and financial activities grew substantially in 2021. Industries such as manufacturing, other services, and wholesale

and retail trade, on the other hand, continued to have lower business earnings than just prior to the pandemic.

6 Exploration of Causes of Disproportionate Impacts in the Pandemic

This section explores the underlying causes of why Black, Latinx, and Asian business owners experienced disproportionate losses in the pandemic. I take a three-step approach to answer this question. The first step is to simply examine racial differences in business, owner, and geographic characteristics. Are there any characteristics that differ enough by race to potentially explain why some groups experienced larger COVID-induced business earnings losses? This descriptive analysis can identify, for example, whether Black businesses are concentrated in industries that were hit the hardest in 2020 by COVID-19. If Black businesses, on the other hand, have roughly similar industry distributions as white businesses then industry exposure cannot be a major cause of disproportionate earnings losses among Black businesses in the pandemic.

The second step is to explore this question more carefully using Blinder-Oaxaca decompositions. The decompositions estimate how much racial differences in each business, owner, and geographical characteristic contribute to the racial gaps in business earnings prior to COVID-19 and after COVID-19. The decomposition technique provides a direct estimate, for example, of how much the racial difference in industry concentrations contributes to the white-Black gap in business earnings. Comparing estimates from just prior to the pandemic (2019) to the first year of the pandemic (2020) and the first year of the recovery (2021) provides suggestive evidence on how the pandemic altered the relative importance of racial differences in each characteristic.

The third step is to drill down further on the interaction between pre-pandemic business, owner, and geographical characteristics and pandemic-induced business earnings losses. Using a new decomposition technique, I estimate direct contributions from racial differences in pre-pandemic characteristics to the change in the racial business earnings gap from 2019 to 2020, and the change from 2019 to 2020. The technique directly answers the question, for example, of how much of the disproportionate loss in Black business earnings (relative to whites) is due to Black businesses being concentrated in the hardest hit industries in the pandemic.

6.1 Racial Differences in Owner, Business and Geographical Characteristics

Table 5 reports owner, business, and geographical characteristics for each racial and ethnic group prior to the pandemic. Among business owners, there are major differences across racial and ethnic groups. Starting with owner's education, Latinx are the least educated group. Only 21 percent of Latinx have a college degree, whereas 43 percent of whites have a college degree. The percentage of high school dropouts among Latinx is 28 percent which is considerably higher than for whites (4 percent). Blacks also have lower levels of education with 8 percent high school drop-outs and 33 percent with a college degree. Asians have the highest levels of higher education degrees with 62 percent having a college degree. Racial differences in education levels are large and might have placed less educated groups at a higher risk of business earnings losses in the pandemic.

Industry distributions differ across racial and ethnic groups. Table 5 reports industry distributions for business owners. Latino business owners are more concentrated in Construction (29 percent) than white business owners (17 percent). Black business owners are less concentrated in Construction but more concentrated in Transportation (12 percent) and Other Services (14 percent).[19] Asian business owners have the most dissimilar industry distribution with much higher concentrations in Wholesale and Retail Trade (13 percent), Leisure and Hospitality (12 percent), and Other Services (17 percent), and a much lower concentration in construction (5.1 percent). All minority groups have fewer business owners in Agriculture than whites.

Another major difference across racial and ethnic groups is their geographical concentrations across the country. More than one-half of Black owners and 44 percent of Latinx owners live in the South whereas only one-third of white owners live in the South. Roughly 40 percent of Asian and Latinx owners live in the West. The Midwest captures one quarter of the white population, which is the highest of all groups. Turning to central city status, Black, Latinx, and Asian owners are more concentrated in central cities but less concentrated in rural areas than are white owners.

[19] Other Services includes, for example, auto repair, barber shops, beauty salons, dry cleaning, and private households.

Among white owners, 37 percent are female. Black owners are more likely to be female (40 percent) and similarly Asian owners are more likely to be female (44 percent). Latinx owners have the lowest share of female business ownership (34 percent). Black and Latinx owners are younger on average than white owners.

Previous research indicates that many of these characteristics are important in determining business ownership and outcomes.[20] The results reported in Table 4 above demonstrate that many of these characteristics are also associated with business earnings losses in the pandemic. I turn to estimating how much racial differences in each of these characteristics contribute to white-Minority group gaps in business earnings.

6.3 Pre- and Post-Pandemic Decompositions

How much do racial differences in industry distributions contribute to racial differences in business earnings? And, did this contribution change from before the pandemic to after the pandemic? I estimate Blinder-Oaxaca decompositions to answer these questions and more broadly estimate the separate contributions from group differences in all of the owner, business, and geographical characteristics to racial gaps in business earnings. Specifically, I decompose inter-group differences in log business earnings into the portions due to different observable characteristics across groups (sometimes called the "endowment effect") and to different coefficients across groups (sometime called the "coefficient effect"). The Blinder-Oaxaca decomposition of the white-minority gap in the average value of the dependent variable, Y, can be expressed as:

$$(6.1)\quad \overline{Y}^{W} - \overline{Y}^{M} = \left[(\overline{X}^{W} - \overline{X}^{M})\hat{\beta}^{W}\right] + \left[\overline{X}^{M}(\hat{\beta}^{W} - \hat{\beta}^{M})\right],$$

where $\hat{\beta}^{j}$ is a vector of regression coefficients for owner, business, and geographical characteristics including only group *j* in the estimation sample, and $\overline{X}^{j}$ is a vector of average characteristics for group *j*. I focus on estimating the first component of the decomposition that captures contributions from differences in observable characteristics or endowments.

[20] See Hundley (2000), Zissimopoulos and Karoly (2007), and van der Sluis, van Praag, and Vijverberg (2005), for a few examples, and Parker (2018) for an overall review of the literature.

Given the common focus on the "endowment effect" an increasingly popular approach is to rewrite the first component as:

$$(6.2)\ \left[(\overline{X}^{W} - \overline{X}^{M})\hat{\beta}^{*}\right],$$

where $\hat{\beta}^{*}$is a vector of regression coefficients for owner, business, and geographical characteristics including all racial and ethnic groups in the estimation sample.[21] The use of all racial and ethnic groups in the estimation sample better captures the complete market determining business earnings instead of the coefficient estimates based on only one group. The previous reliance on using the white sample to estimate these coefficients is becoming increasingly problematic as whites represent a declining share of the population.

The linearity of Equation (6.2) makes it straightforward to calculate the separate endowment effects for each characteristic. For example, the method can be used to estimate how much racial differences in industry concentrations contribute to the racial gap in log business earnings, and separately how much racial differences in education levels contribute to the racial gap in log business earnings. These contributions can be estimated for each specific group comparison (e.g., Black/white separate from Latinx/white).

Table 6 reports estimates from the Blinder-Oaxaca decompositions before and after the start of the pandemic for each racial and ethnic group. Columns 1 and 2 report estimates for factors contributing to the difference in log business earnings between Blacks and whites in 2019 and 2020, respectively. The underlying measures of education, industry, region, central city status, and other variables used in the decompositions are reported in Table 5. In 2019 when the Black-white log business earnings gap was 28.1 log points (or roughly 28 percent), the decomposition estimates reveal that having lower skills as measured by education contributes 5.0 log points to the racial log business earnings gap. Black concentrations by industry and region do not contribute notably to why Black business earnings are lower in 2019. Interestingly, the contribution estimate for central city status is negative, implying that Blacks are favorably distributed across central city, suburb, and rural areas (at least in terms of higher business earnings). Racial differences in age,

[21] In the underlying regression used in the decomposition, indicator variables are included for all racial and ethnic groups.

however, contribute to the racial gap in business earnings. Black business owners tend to be younger than white business owners. Finally, a higher percentage of female business owners among Blacks contributes 2.1 log points to the gap.

These were the contributing factors to the Black/white gap in business earnings prior to the start of the pandemic. Did the contributions change after the start of the pandemic? Yes, racial differences in industry distributions became more important in contributing to the racial gap in business earnings. The concentration of Black business owners in industries now contributes to 5.9 log points to gap in log business earnings which is the largest factor. Thus, industry concentrations partly explain why Black business owners were hit harder in the pandemic. The similar contribution estimates from education differences in 2020 compared with 2019 suggests that lower levels of education did not contribute to why Black business owners were hit harder in the pandemic. In the next subsection, I examine this question more directly using a new decomposition technique.

Table 6 also reports the decomposition results for 2021 (Column 3). The decomposition result for 2021 indicate mostly similar estimates as for 2019 as the economy recovered in the pandemic. The white-Black gap was partly explained by Black business owners having lower education levels and being younger.

Columns 5 and 6 of Table 6 report estimates for factors contributing to the difference in log business earnings between Latinx and whites in 2019 and 2020, respectively. The white-Latinx gap in log business earnings is 33.3 log points in 2019. The main contributing factor to this gap was education. Latinx business owners have substantially lower education levels, on average, than white owners and the difference contributes 16.9 log points to the gap in business earnings. No other characteristic was particularly important in 2019 in contributing to the business earnings gap. In the pandemic, however, the unfavorable industry distribution of Latinx business owners contributed to the gap in business earnings by 2.8 log points. Education differences contributed slightly more to the business earnings gap in 2020 than prior to the pandemic.

The decomposition result for 2021 indicate mostly similar estimates as for 2019 as the economy recovered in the pandemic. The white-Latinx gap was only slightly larger in 2021 than in 2019 for which lower educational levels among Latinx business owners is the largest contributing factor.

Asian business earnings are higher than White business earnings. The white-Asian gap is -13.5 log points, implying that Asian business earnings are roughly 13.5 percent higher. The pandemic, however, reduced this advantage leading to a -7.6 log point difference. The main change from before the pandemic to after the pandemic was that industry contributed to the gap in the pandemic. The large negative decomposition estimates for education in both 2019 and 2020 imply that Asian business owners have higher education levels than white owners working as an advantage for business earnings.

The white-Asian gap turned from negative in 2019 to positive in 2021. Working against this positive differential, however, Asian business owners are more educated and have a favorable central city status distribution. Although a higher female percentage among Asian business owners contributed partly to the gap, the positive white-Asian gap in business earnings is mostly unexplained which could include unmeasurable factors such as discrimination, scope and size of business, and access to markets and financial capital.

The findings prior to the pandemic, 2019, are generally similar to those reported in previous studies. For example, lower levels of education obtained by Blacks and Latinos are found to an important factor driving their lower business ownership rates, sales and survival (e.g. Fairlie 1999, 2018; Fairlie and Woodruff 2010; Lofstrom and Wang 2009; Fairlie and Robb 2007, 2008; Davila and Mora 2013). The findings for 2020, however, are different with new factors such as industry composition playing a stronger role in contributing to racial disparities in business earnings.

6.4 Pandemic Decomposition Technique

The Blinded-Oaxaca decompositions focus on point-in-time differences but it is also useful to focus directly on the interaction between racial differences in pre-pandemic owner, business, and geographical characteristics and pandemic business earnings losses. This new decomposition technique differs from the standard Blinder-Oaxaca decompositions because it focuses on identifying factors contributing to the 2019 to 2020 or 2019 to 2021 changes in business earnings instead of identifying factors that contribute to each year separately. The estimates provide a direct answer to the question, for example, of how much the Black industry distribution relative to the white industry distribution contributed to larger Black business earnings losses in the pandemic.

The following equation is calculated:

$$(6.3)\ \left[(\overline{X}^{W}_{2019} - \overline{X}^{M}_{2019})(\hat{\beta}^{*}_{2020} - \hat{\beta}^{*}_{2019})\right],$$

where 2019 or 2020 are used in the estimation sample for the regression coefficients or to calculate average characteristics (or 2019 and 2021). This equation provides an estimate of the disproportionate effects of the pandemic which capture all of the effects of COVID-19 on business earnings such as demand shifts, mandated closures, and social distancing restrictions.

Table 7.A reports estimates for each business, owner, and geographical characteristic and each racial and ethnic group. The disproportionate business earnings loss from 2019 to 2020 among Black owners was -12.7 log points. The largest contributing factor to this disproportionate loss was pre-pandemic industry differences. In other words, the industry concentrations of Black business owners relative to the industry concentrations of white business owners placed them at a higher risk of business earnings losses in the pandemic. This factor alone contributed -6.3 log points to the disproportionate loss, which was roughly half of the total. Specifically, Black businesses are more concentrated in Transportation, Leisure and Hospitality and Other Services, which were also hit hard by the pandemic. Additionally, Black business owners were less concentrated in Agriculture which experienced earnings growth in the pandemic. Disproportionate business earnings losses among Black business owners might have also been partly due to pre-pandemic geographical differences. The relative distribution by central city status contributes -1.1 log points to the disproportionate loss in business earnings and the relative regional distribution contributes an additional -0.9 log points (although neither contribution is statistically significant).

Table 7.B reports estimates for the COVID decomposition for the 2019 to 2021 change. The white-Black gap in mean log business earnings changed only slightly from 2019 to 2021 which is consistent with most business, owner, and geographical characteristic not placing Black businesses are at a higher or lower risk of experiencing a stronger recovery in 2021. Of all the characteristics, a less favorable regional distribution is the only one appearing to contribute to a weaker recovery.

Latinx owners experienced a disproportionate business earnings loss of -4.1 log points due to the pandemic. The largest contributing factor to this disproportionate loss was pre-pandemic industry differences. The industry concentrations of Latinx business owners contributed -2.1 log points to the disproportionate business earnings losses. Latinx businesses are more concentrated in Transportation which experienced large business earnings losses and less concentrated in Agriculture which experienced positive earnings growth. For the change from 2019 to 2021 (Table 7.B) the only factor contributing to a slightly weaker recovery is a less favorable regional distribution for Latinx business owners.

The disproportionate business earnings loss among Asian owners from 2019 to 2020 was -5.9 log points. Again, the largest contributing factor to this disproportionate loss was pre-pandemic industry differences. The industry concentrations of Asian business owners contributed -6.5 log points to the disproportionate business earnings losses. Asian businesses are concentrated in Leisure and Hospitality and Other Services, but less concentrated in Agriculture and Construction. Interestingly, higher education levels among Asian owners relative to white owners shielded them for larger disproportionate business earnings losses. The contribution estimate of a positive 1.8 log points implies that all else equal, Asian business earnings would have increased relative to whites from 2019 to 2020 if only education mattered.

Dissimilar to other groups, Asian business earnings did not recover in 2021. The Asian-white gap was -0.20 log points. The industry composition placed Asian businesses at a higher risk of earnings losses from 2019 to 2021. The remaining gap is due to other unobservable factors which might include discrimination.

Using levels instead of log business earnings, I find similar overall results. For example, I find that an unfavorable industry distribution placed Black business owners at a higher risk of earnings losses in the pandemic. Similarly, industry distributions placed Asian business owners at a higher risk of losses and higher educational levels for Asian business owners reduced their exposure to losses in the pandemic. In 2021, the industry distribution of Asian businesses contributes partly to the lack of a rebound in business earnings for this group.

Focusing the decompositions to show the impacts of differential exposure to pandemic losses is important. The standard Blinder-Oaxaca decompositions reveal the importance of educational differences for point-in-time differences. Instead, the new decomposition technique isolates the part of the contribution from factors that place racial groups at higher or lower risk to business earnings losses in the pandemic and reveals the importance of industry differences in the pandemic.

Differential Exposure to COVID and Policy Responses

Did geographical differences in exposure to COVID and social distancing restrictions contribute to larger minority business earnings losses? To explore whether minorities were differentially exposed to COVID cases and state policies, Table 8 reports COVID cases per capita, social distancing restrictions on businesses early in the pandemic, and mask mandates. COVID cases are measured for the entire year 2020 and 2021, and sourced from the CDC. Early social distancing restrictions refer to the first few months of the pandemic and are sourced from the New York Times. Mask mandates are also sourced from the New York Times and refer to polices as of the end of 2020.[22] All measures are at the state level.

Differences in COVID cases and restrictions are either nonexistent or not large across ethnic and racial groups. Per capita COVID cases were roughly the same for each group at 6 percent in 2020 and 16 percent in 2021. White business owners tend to live in states with fewer early pandemic social distancing restrictions than minority groups. The largest differences are found for state-level mask mandates (which were implemented near the end of 2020). Asian business owners were exposed the most to these restrictions (0.886). Blacks had the lowest likelihood of living in states in which mask mandates were imposed (0.755). Seventy-nine percent of whites lived in states with mask mandates near the end of 2020.

Table 8 also reports state-level differences in total PPP loan receipt per business establishment.[23] State-level differences in loan receipt capture both supply and demand

[22] Both measures were found at https://www.nytimes.com/interactive/2020/us/states-reopen-map-coronavirus.html.

[23] The PPP was designed to provide loans to small businesses to keep them afloat and retain their employees. Loan amounts were intended to equal 2.5 months of average payroll costs, and could be forgiven if the business retained its employees on the payroll.

factors, and thus are difficult to interpret but potentially demonstrate some useful variation in access to loans through differing financial institutional composition, information provision, and local small business development assistance. PPP loans are measured for the entire year 2020 and 2021. Differences in state-level PPP loans per establishment for 2020 are very small across racial groups. For 2021 the differences are a little larger but the variation is mostly between the largest and smallest values per group, and not between white and minority groups.

Table 9.A explores the contributions of these state-level differences to racial inequality in business earnings in the pandemic using the new pandemic-focused decomposition technique for the change from 2019 to 2020. I find that racial differences in exposure to COVID cases per capita does not contribute to disproportionate business earnings losses from 2019 to 2020. Similarly, racial differences in exposure to social distancing restrictions and mask mandates do not contribute to differential business earnings losses by race. State-level differences in PPP receipt rates also do not contribute to racial differences in earnings losses. The decomposition estimates are robust to alternative measures and specifications. These estimates are not sensitive to including or excluding region dummies, alternative measures of business restrictions, and to including these variables together or separately. Similarly, these variables also do not provide contributions to changes from 2019 to 2021 (Table 9.B). In all cases, racial differences in exposure to state-level COVID cases, business restrictions, mask mandates, and PPP loan receipt do not contribute to changes in racial inequality in business earnings.

Although state-level variation in PPP loan receipt per business establishment do not appear to contribute to racial differences in business earnings changes in the pandemic there is evidence that receipt of PPP loans might have differed by race across the three rounds of the $800 billion PPP. The decomposition estimates cannot capture differential receipt by race because of a lack of information about PPP loan receipt in the CPS data and lack of race information in the PPP loan data. Previous research on the first round of the PPP which provided $342 billion through 1.7 million loans find that funds went disproportionately less to minority communities (Grotto et al. 2020; Fairlie and Fossen 2021b). In the second round of PPP funding (totaling $189 billion), however, fintech lenders were more involved in making loans, and disbursement to minority businesses and

communities improved (Grotto et al. 2020; Fei and Yang, 2021; Fairlie and Fossen 2021b; Erel and Liebersohn 2020). The PPP restarted in January 2021 for a third round with a strong emphasis on helping eligible borrowers in underserved and disadvantaged communities. PPP funds in the rebooted program in 2021 (totaling $278 billion) appear to have been disproportionately disbursed to minority communities as intended (Fairlie and Fossen 2022). But, admittedly, the research on PPP fund receipt among business owners of color has been limited by data constraints. In particular, information on the race, ethnicity, gender and veteran status of the owner is incomplete (70 percent of loans provide neither race nor ethnicity information, and those that have information are heavily correlated with zip code and owner characteristics indicating that missingness is likely to be non-random).[24]

7 Conclusions

COVID-19 led to a massive shutdown of businesses in the early stages of the pandemic, but surprisingly little is known about whether racial inequality in business outcomes increased. Analyzing the impacts of COVID on business earnings is especially important because of how business earnings contribute directly to racial inequality in total income. This paper provides the first evidence of disproportionate losses to minority business earnings in the pandemic. For the entire country, business earnings dropped by 17 percent from 2019 to 2020. Regression-adjusted estimates that control for pre-pandemic time trends indicate that COVID-19 had negative impacts on business earnings of 16-19 percent. COVID-19 induced losses to business earnings were disproportionately felt by business owners of color. The largest losses were experienced by Black business owners who experienced a loss in business earnings of 28 percent from 2019 to 2020. Regression estimates that control for pre-pandemic trends indicate that Black business owners

[24] A few alternative approaches have been taken to identify the race of the business owner on the loan. Howell et al. (2021), for example, predict a business owner's race and ethnicity using information such as the owner's name and location. Owner names are obtained from business registrations in collaboration with a data analytics firm. A random forest model trained by using the subset of PPP loans with owner's race information is used to improve prediction accuracy. Fei and Yang (2021) focus on PPP recipients in the Food Services and Drinking Places sector for which they can find a Yelp listing. They proxy for minority-owned businesses based on the food type from yelp.com. Chernenko and Scharfstein (2021) merge race and ethnicity information for owners of restaurants in Florida from voter registration data.

experienced losses that were 12 to 14 percent higher than for white business owners. Black business owners tend to be less educated than the national average, which contributes to lower business earnings in general. In the pandemic, however, it was the industry concentration of Black business owners that placed them at a higher risk of experiencing disproportionate business earnings losses. This one factor explained half of the increase in business earnings inequality in the pandemic. Differential exposure to COVID cases, business closure restrictions, mask mandates and aggregate PPP loan receipt by state, however, did not contribute to larger business earnings losses among Blacks relative to whites.

Latinx business owners also experienced large earnings losses in the pandemic. From 2019 to 2020, business earnings dropped by 19 percent for Latinx business owners. Regression estimates for Latinx business owners reveal negative point estimates suggesting disproportionate negative impacts on business earnings, but the estimates are not statistically significant. Latinx business owners tend to be less educated than the national average, which contributes to lower business earnings in general. Similar to Black business owners, the industry concentration of Latinx business owners, however, placed that them at a higher risk of experiencing disproportionate business earnings losses in the pandemic. Also similar to the findings for Black owners, differential exposure to COVID cases and state policies did not contribute to larger relative business earnings for Latinx owners.

Asian business owners experienced disproportionate earnings losses in the pandemic. From 2019 to 2020, business earnings dropped by 21 percent for Asian business owners. Regression estimates for Asian business owners reveal negative point estimates, but the estimates are not statistically significant. Asian business owners tend to be more educated than the national average, which contributes to higher business earnings in general. Focusing on the pandemic, industry concentrations of Asian business owners placed them at a higher risk of experiencing disproportionate business earnings losses in the pandemic. Higher education levels among Asian business owners helped insulate them from larger losses from COVID-19. Again, COVID cases and policy variation did not contribute to differential business earnings losses among Asian owners.

All these estimates are based on business earnings in calendar year 2020. Given that COVID-19 was not declared a pandemic until March 11 by the World Health

Organization and social distancing restrictions were not imposed until late March, calendar year 2020 is only partially capturing pandemic effects. Estimates of total business earnings losses might be too low and estimates of disproportionate losses might also be affected but the direction is less clear. Only two or three months of the calendar year, however, are not captured in measuring impacts. On the other hand, calendar year 2021 captures the year in which vaccines were being administered and social distancing restrictions were being lifted. In contrast to losses in business earnings in 2020, the economic recovery from the pandemic in 2021 showed strong rebounds in business earnings for all groups except Asian business owners.

The disproportionate business earnings losses among business owners of color in the pandemic contributed to widening broader economic inequality setting back one of the long-term goals of fostering minority business development (Bradford 2003, 2014; Kroeger and Wright 2021; Chatterji et al. 2014). Another concern, which is often overlooked, is the loss in economic efficiency resulting from losses to business opportunities for minorities (Fairlie and Robb 2008). Business formation has been associated with the creation of new industries, innovation, job creation, improvement in sector productivity, and economic growth (Reynolds 2005). If minority entrepreneurs face liquidity constraints, discrimination, or other barriers to creating new business or expanding current businesses, there will be efficiency losses in the economy. These efficiency losses may have been exacerbated in the pandemic. Losses to business earnings may be especially damaging for job creation and economic stability in low-income and disadvantaged neighborhoods (Boston 1999, 2006; Stoll, Holzer, and Raphael 2001). Policy solutions to reverse these losses might be difficult to find especially if they involve expanding access to financial capital.

The large earnings losses among small businesses in general and those owned by people of color are worrisome for the longer-term survival of small, local, and diverse businesses throughout the country. Although larger stores and chains with a strong online presence may survive, many small businesses might not have the resources to weather continued reduced demand and longer-term shifts to online shopping. Just prior to the pandemic when small business owners were asked what actions they would take if faced with a two-month revenue loss, 17 percent said they would close or sell the business (Mills

et al. 2020). Early estimates from the weekly U.S. Census Small Business Pulse Survey indicated that only 15-20 percent of businesses have enough cash on hand to cover 3 months of operations (U.S. Census Bureau 2020; Bohn, Mejia, and Lafortune 2020). More research is needed on whether these calendar year earnings losses are more permanent. An important question will be whether the continuing shift in consumer behavior towards online shopping, supply-chain problems, rising inflation, and another round of increases in COVID cases lead to even more small business closures and will these longer-term setbacks from the pandemic disproportionately affect minority-owned businesses. Finally, more research is clearly needed on whether the $800 billion PPP had any long-term effects on helping minority business owners survive the pandemic. The answer to whether unequal access to loans affected racial gaps in business earnings is mostly unknown. Information on race and ethnicity in the loan data has been a major limitation for previous research but there is promise of linking administrative data on business outcomes and race to the loan data in future research.

References

Atkins, Rachel, Lisa D. Cook, and Robert Seamans. 2021. “Discrimination in lending? Evidence from the Paycheck Protection Program.” *Small Business Economics*.

Atkins, Rachel, Lisa D. Cook, and Robert Seamans. 2022. Using Technology to Tackle Discrimination in Lending: The Role of FinTechs in the Paycheck Protection Program. *AER Papers and Proceedings*

Amuedo-Dorantes, Catalina, Cristina Borra, and Chunbei Wang. 2021. "Asian Discrimination in the Coronavirus Era: Implications for Business Formation and Survival." IZA Discussion Paper No. 14182.

Bartik, Alexander W., Marianne Bertrand, Zoë B. Cullen, Edward L. Glaeser, Michael Luca, and Christopher T. Stanton. 2020. “How Are Small Businesses Adjusting to COVID-19? Early Evidence from a Survey. NBER Working Paper No. w26989.

Bates, Timothy. 1997. *Race, Self-Employment & Upward Mobility: An Illusive American Dream*, Washington, D.C.: Woodrow Wilson Center Press and Baltimore: John Hopkins University Press.

Blinder, Alan S. 1973. "Wage Discrimination: Reduced Form and Structural Variables." *Journal of Human Resources* 8: 436-455.

Bloom, Nicholas, Robert S. Fletcher, and Ethan Yeh. 2021. “The Impact of COVID-19 on US Firms,” NBER Working Paper No. w28314.

Bohn, Sarah, Marisol Cuellar Mejia, and Julien Lafortune. 2020. “The Economic Toll of COVID-19 on Small Business,” Public Policy Institute of California.

Boston, Thomas D. 1999. “Generating Jobs Through African American Business Development”, in J. Whitehead and C. Harris, eds. *Readings in Black Political Economy* (Dubuque: Kendall-Hunt).

Boston, Thomas D. 2006. “The Role of Black-owned Businesses in Black Community Development” ed. Paul Ong, *Jobs and Economic Development in Minority Communities: Realities, Challenges, and Innovation.* Temple University Press.

Bradford, William D. 2003. "The Wealth Dynamics of Entrepreneurship for Black and White Families in the U.S.," *Review of Income and Wealth*, 49(1): 89-116.

Bradford, William D. 2014. "The “myth” that black entrepreneurship can reduce the gap in wealth between black and white families." *Economic Development Quarterly* 28.3: 254-269.

Chernenko, Sergey and David S. Scharfstein. 2021. “Racial Disparities in the Paycheck Protection Program,” SSRN Working Paper 3907575.

Chatterji, Aaron K., Kenneth Y. Chay, and Robert W. Fairlie. 2014. "The impact of city contracting set-asides on black self-employment and employment." *Journal of Labor Economics* 32.3 (2014): 507-561.

Couch, Kenneth A., Robert W. Fairlie, and Huanan Xu. 2020. "Early evidence of the impacts of COVID-19 on minority unemployment." *Journal of Public Economics*, 192: 104287.

Dávila, Alberto, and Marie Mora. 2013. *Hispanic Entrepreneurs in the 2000s: An Economic Profile and Policy Implications*. Stanford University Press, Stanford.

Erel, Isil, and Jack Liebersohn. 2020. “Does FinTech Substitute for Banks? Evidence from the Paycheck Protection Program.” NBER Working Paper No. 27659.

Farrell, Diana, Chris Wheat and Chi Mac. 2020. “Small Business Financial Outcomes during the Onset of COVID-19,” JPMorgan Chase & Co. Institute Report.

Fairlie, Robert W. 1999. "The Absence of the African-American Owned Business: An Analysis of the Dynamics of Self-Employment." *Journal of Labor Economics*, 17, no. 1: 80-108.

Fairlie, Robert. 2020. “The Impact of COVID-19 on Small Business Owners: Evidence from the First Three Months after Widespread Social-distancing Restrictions,” *Journal of Economics & Management Strategy* 29(4): 727-740.

Fairlie, Robert, and Frank M. Fossen. 2021. “Sales Losses in the First Quarter of the COVID-19 Pandemic: Evidence from California Administrative Data,” NBER Working Paper No. 28144.

Fairlie, Robert, and Frank M. Fossen. 2022. “The 2021 Paycheck Protection Program Reboot: Loan Disbursement to Employer and Nonemployer Businesses in Minority Communities” *AER Papers & Proceedings*, 112: 287–291.

Fairlie, Robert W., Zachary Kroff, Javier Miranda, and Nikolas Zolas. 2023. *The Promise and Peril of Entrepreneurship: Job Creation and Survival among US Startups*, Cambridge: MIT Press.

Fairlie, Robert W., and Alicia M. Robb. 2007. "Why are Black-Owned Businesses Less Successful than White-Owned Businesses: The Role of Families, Inheritances, and Business Human Capital," *Journal of Labor Economics*, 25(2): 289-323.

Fairlie, Robert W., and Alicia M. Robb. 2008. *Race and Entrepreneurial Success: Black-, Asian-, and White-Owned Businesses in the United States*, Cambridge: MIT Press.

Fairlie, Robert, and Christopher M. Woodruff. 2010. "Mexican-American Entrepreneurship." *The BE Journal of Economic Analysis & Policy* 10.1.

Fei, Celine Yue and Keer Yang. 2021. “Fintech and Racial Barriers in Small Business Lending,” University of North Carolina at Chapel Hill Working Paper.

Headd, Brian. 2021. “Small Business Facts: The Importance of Business Ownership to Wealth,” *U.S. Small Business Administration Report*.

Headd, Brian "Business Ownership Demographics.” U.S. Small Business Administration, Office of Advocacy, March 2021. https://cdn.advocacy.sba.gov/wpcontent/uploads/2021/03/16095912/Business-Ownership-Demographics-Fact-Sheet.pdf.

Hipple, Steven F., and Laurel A. Hammond. 2016. “Self-employment in the United States,” *U.S. Bureau of Labor Statistics Report*.

Howell, Sabrina T., Theresa Kuchler, David Snitkof, Johannes Stroebel, and Jun Wong. 2021. “Racial Disparities in Access to Small Business Credit: Evidence from the Paycheck Protection Program,” National Bureau of Economic Research Working Paper No. w29364.

Hundley, Greg. 2000. "Male/female earnings differences in self-employment: The effects of marriage, children, and the household division of labor." *ILR Review* 54.1: 95-114.

Kim, Olivia S., Jonathan A. Parker, and Antoinette Schoar. 2020. “Revenue collapses and the consumption of small business owners in the early stages of the covid-19 pandemic,” National Bureau of Economic Research, Working Paper No. w28151.

Kroeger, Teresa, and Graham Wright. 2021. "Entrepreneurship and the Racial Wealth Gap: The Impact of Entrepreneurial Success or Failure on the Wealth Mobility of Black and White Families." *Journal of Economics, Race, and Policy*: 4: pages183–195.

Lederer, Anneliese, Sara Oros, Sterling Bone, Glenn Christensen, and Jerome Williams. 2020. “Lending Discrimination within the Paycheck Protection Program,” National Community Reinvestment Coalition, Washington D.C.

Levine, Ross, and Yona Rubinstein. 2016. "Smart and Illicit: Who Becomes an Entrepreneur and Do They Earn More?" *Quarterly Journal of Economics*.

Lofstrom, Magnus, and Chunbei Wang. 2009. "Mexican-American Self-Employment: A Dynamic Analysis of Business Ownership." *Research in Labor Economics* 29: 197-227.

Lofstrom, Magnus, and Chunbei Wang. 2009. "Mexican-American Self-Employment: A Dynamic Analysis of Business Ownership." *Research in Labor Economics* 29: 197-227.

Mills, Claire Kramer, Jessica Battisto, Mels de Zeeuw, Scott Lieberman, and Ann Marie Wiersch. 2020. *Small Business Credit Survey*, Federal Reserve Banks.

Mills, Claire Kramer, and Jessica Battisto. 2020. “Double Jeopardy: COVID-19’S Concentrated Health and Wealth Effects in Black Communities,” Federal Reserve Bank of New York.

Oaxaca, Ronald. 1973. "Male-Female Wage Differentials in Urban Labor Markets," *International Economic Review*, 14 (October), 693-709.

Parker, Simon C. 2018. *The Economics of Entrepreneurship*. Cambridge University Press.

Reynolds, Paul. 2005. *Entrepreneurship in the US: The Future is Now*. Springer.

Stanford Latino Entrepreneurship Initiative. (2020). *The impact of COVID-19 on Latino-owned business*. Stanford, CA: Stanford Latino Entrepreneurship Initiative.

Robles, Bárbara J. 2012. "Emergent entrepreneurs: Latina-owned businesses in the borderlands."

Stoll, Michael A., Steven Raphael, and Harry J. Holzer. 2001. “Why Are Black Employers More Likely than White Employers to Hire Blacks?” Institute for Research on Poverty, University of Wisconsin, Madison.

U.S. Bureau of Labor Statistics. 2020. “Labor Force Statistics from the Current Population Survey,

U.S. Census Bureau. 2016. “Survey of Business Owners (SBO) - Survey Results: 2012.” U.S. Census Bureau.

U.S. Census Bureau. 2021. *Census Bureau Announces Changes for 2020 American Community Survey 1-Year Estimates*, American Community Survey. https://www.census.gov/newsroom/press-releases/2021/changes-2020-acs-1-year.html.

van der Sluis, J., van Praag, M., and Vijverberg, W. 2005. "Education and Entrepreneurship in Industrialized Countries: A Meta-Analysis," *World Bank Economic Review*, 19(2): 225-261.

Wang, Chunbei. "Tightened Immigration Policies and the Self-Employment Dynamics of Mexican Immigrants." *Journal of Policy Analysis and Management* 38.4 (2019): 944-977.

Wilmoth, Daniel. 2020. “Black Business Owners Hit Hard by Pandemic.” U.S. Small Business Administration, Office of Advocacy, August 2020.

Wilmoth, Daniel. 2021. *The Effects of the COVID-19 Pandemic on Small Businesses*, U.S. Small Business Administration, Office of Advocacy Issue Brief Number 16.

Zissimopoulos, Julie M., and Lynn A. Karoly. 2007. "Transitions to self-employment at older ages: The role of wealth, health, health insurance and other factors." *Labour Economics* 14(2): 269-295.

Zissimopoulos, Julie M., and Lynn A. Karoly. 2007. "Transitions to self-employment at older ages: The role of wealth, health, health insurance and other factors." *Labour Economics* 14(2): 269-295.

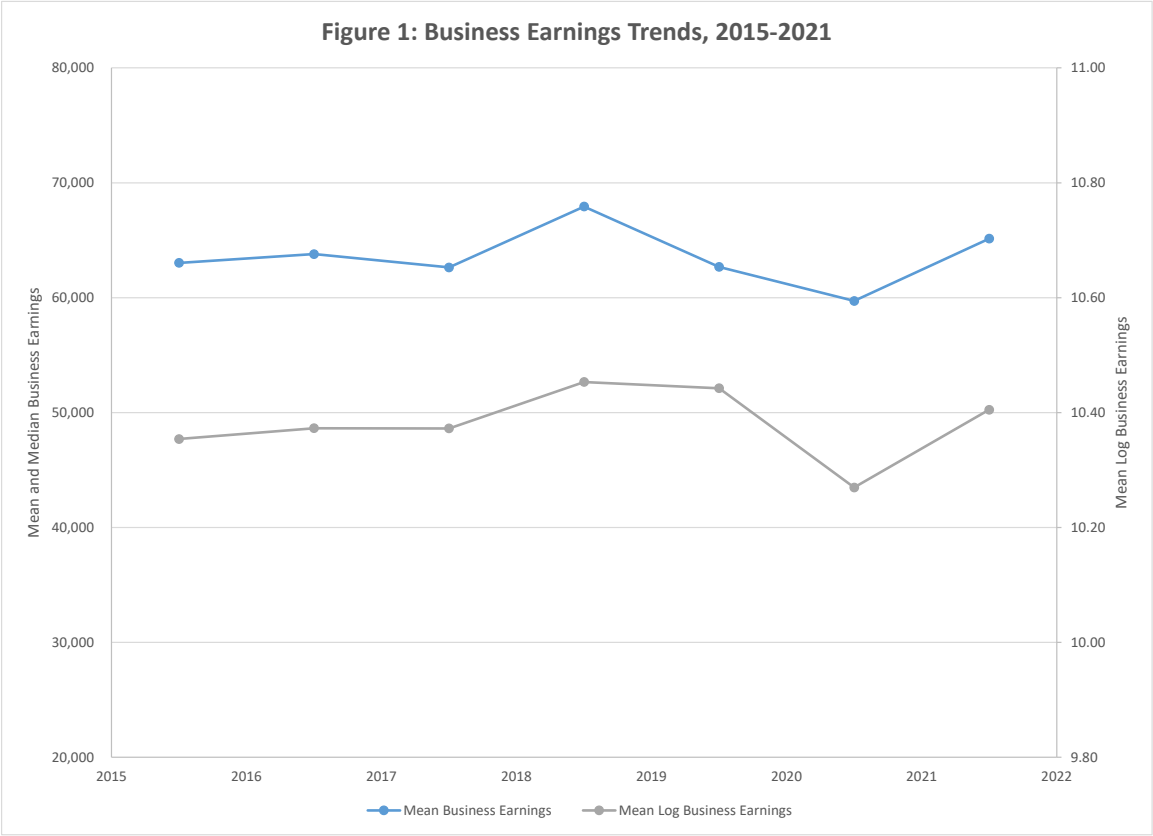
Figure 1: Business Earnings Trends, 2015-2021
80,000
70,000
60,000
50,000
40,000
30,000
20,000
11.00
10.80
10.60
10.40
10.20
10.00
9.80
2015
2016
2017
2018
2019
2020
2021
2022
Mean and Median Business Earnings
Mean Log Business Earnings
Mean Business Earnings
Mean Log Business Earnings

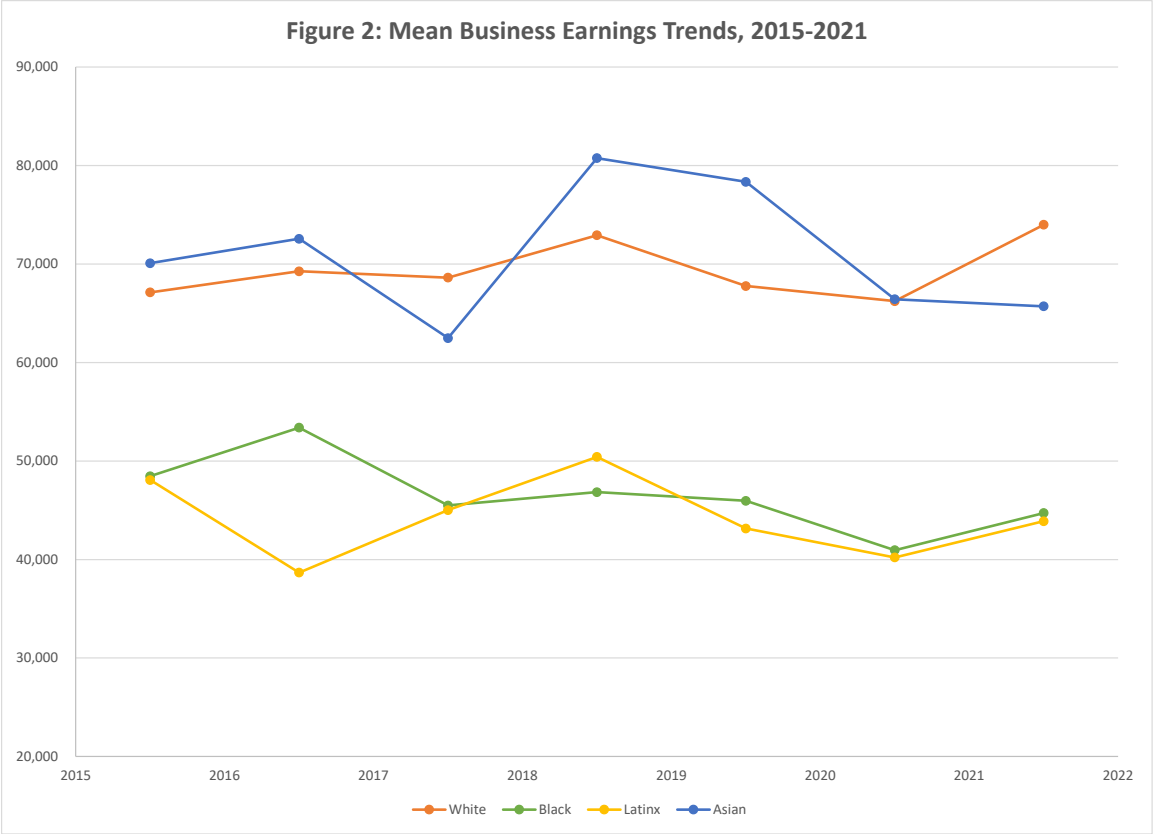
Figure 2: Mean Business Earnings Trends, 2015-2021
90,000
80,000
70,000
60,000
50,000
40,000
30,000
20,000
2015
2016
2017
2018
2019
2020
2021
2022
White
Black
Latinx
Asian

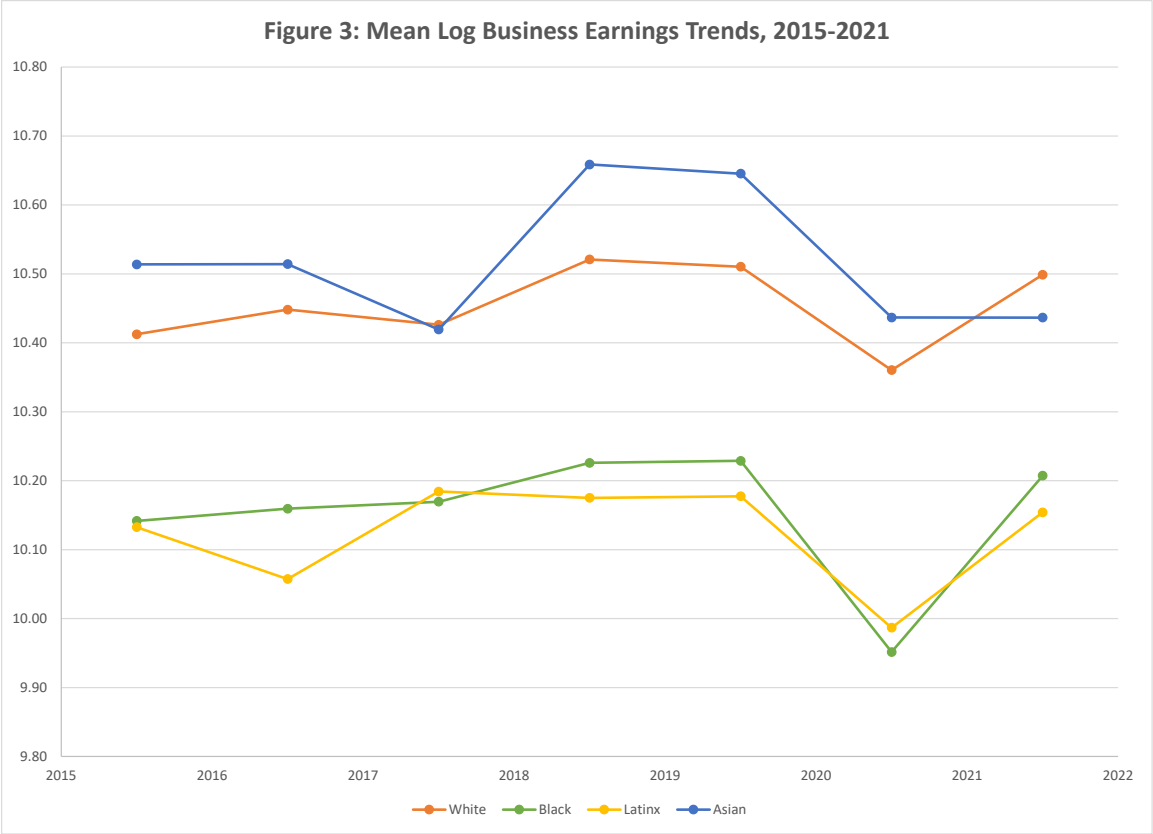
Figure 3: Mean Log Business Earnings Trends, 2015-2021
10.80
10.70
10.60
10.50
10.40
10.30
10.20
10.10
10.00
9.90
9.80
2015
2016
2017
2018
2019
2020
2021
2022
White
Black
Latinx
Asian

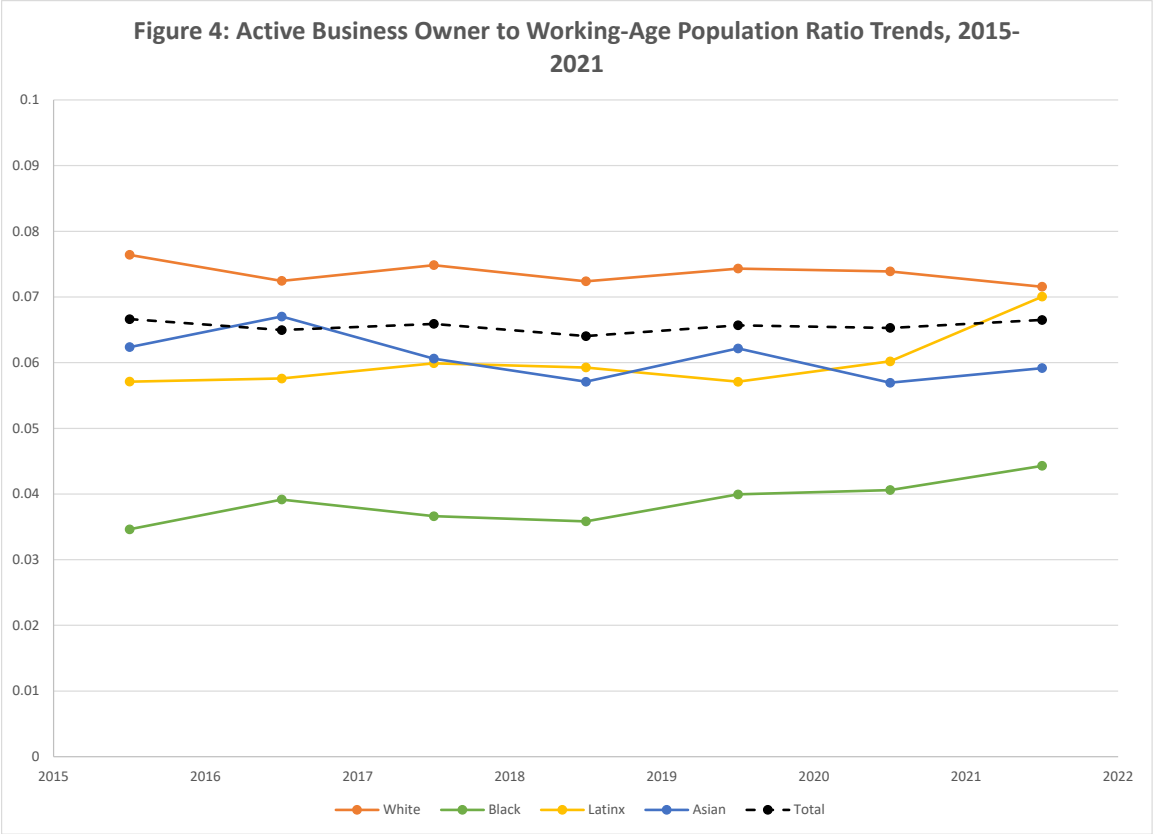
Figure 4: Active Business Owner to Working-Age Population Ratio Trends, 2015-2021
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
2015
2016
2017
2018
2019
2020
2021
2022
White
Black
Latinx
Asian
Total

Table 1: Mean Business Earnings Trends by Race and Ethnicity, 2015-2021

	Total	Black	Latinx	Asian	White
Mean Business Earnings					
2015	63,029	48,461	48,076	70,093	67,131
2016	63,797	53,393	38,679	72,565	69,267
2017	62,636	45,494	45,022	62,482	68,627
2018	67,934	46,845	50,419	80,763	72,932
2019	62,675	45,961	43,152	78,350	67,777
2020	59,715	40,947	40,209	66,434	66,235
2021	65,142	44,722	43,887	65,711	73,994
Growth Rates					
2015-16	1%	10%	-20%	4%	3%
2016-17	-2%	-15%	16%	-14%	-1%
2017-18	8%	3%	12%	29%	6%
2018-19	-8%	-2%	-14%	-3%	-7%
2019-20	-5%	-11%	-7%	-15%	-2%
2020-21	9%	9%	9%	-1%	12%
Avrg. Annual N	6,643	476	1,181	456	4,542

Notes: Author's calculations from Current Population Survey (CPS) microdata, 2015-21. All estimates use CPS provided sample weights. Sample includes only individuals with longest-job held work activity as self-employed business owner in calendar year.

Table 2: Mean Log Business Earnings Trends by Race and Ethnicity, 2015-2021

	Total	Black	Latinx	Asian	White
Mean Log Business Earnings					
2015	10.35	10.14	10.13	10.51	10.41
2016	10.37	10.16	10.06	10.51	10.45
2017	10.37	10.17	10.18	10.42	10.43
2018	10.45	10.23	10.18	10.66	10.52
2019	10.44	10.23	10.18	10.65	10.51
2020	10.27	9.95	9.99	10.44	10.36
2021	10.40	10.21	10.15	10.44	10.50
Growth Rates					
2015-16	2%	2%	-8%	0%	4%
2016-17	0%	1%	13%	-10%	-2%
2017-18	8%	6%	-1%	24%	9%
2018-19	-1%	0%	0%	-1%	-1%
2019-20	-17%	-28%	-19%	-21%	-15%
2020-21	14%	26%	17%	0%	14%
Avrg. Annual N	6,643	476	1,181	456	4,542

Notes: Author's calculations from Current Population Survey (CPS) microdata, 2015-21. All estimates use CPS provided sample weights. Sample includes only individuals with longest-job held work activity as self-employed business owner in calendar year.

Table 3: Regressions for Log Business Earnings, Current Population Survey, 2015-2021

Explanatory Variables	(1)	(2)	(3)	(4)
Black	-0.248	-0.183	-0.170	-0.170
	(0.058)	(0.042)	(0.052)	(0.052)
Latinx	-0.314	-0.146	-0.157	-0.158
	(0.045)	(0.032)	(0.041)	(0.041)
Asian	0.150	0.072	0.097	0.097
	(0.065)	(0.046)	(0.058)	(0.058)
Post-COVID 2020	-0.146	-0.166	-0.166	-0.139
	(0.028)	(0.026)	(0.026)	(0.025)
Post-COVID 2020*Black	-0.121	-0.131	-0.136	-0.143
	(0.082)	(0.076)	(0.077)	(0.073)
Post-COVID 2020*Latinx	-0.035	-0.029	-0.023	-0.026
	(0.063)	(0.057)	(0.059)	(0.056)
Post-COVID 2020*Asian	-0.053	-0.071	-0.083	-0.092
	(0.094)	(0.087)	(0.088)	(0.084)
Post-COVID 2021	-0.004	-0.049	-0.050	0.004
	(0.028)	(0.030)	(0.030)	(0.025)
Post-COVID 2021*Black	-0.016	0.014	0.016	0.003
	(0.080)	(0.087)	(0.087)	(0.072)
Post-COVID 2021*Latinx	-0.017	-0.045	-0.044	-0.050
	(0.061)	(0.065)	(0.065)	(0.054)
Post-COVID 2021*Asian	-0.200	-0.174	-0.171	-0.189
	(0.092)	(0.099)	(0.099)	(0.083)
Main controls	No	Yes	Yes	Yes
Industry controls	No	Yes	Yes	Yes
Time trend	No	Yes	Yes	Yes
Pre 2019 interactions	No	No	Yes	No
Full 2015-19 interactions	No	No	No	Yes
Sample years	2019-21	2015-21	2015-21	2015-21
Sample size	18,357	46,498	46,498	46,498

Notes: (1) The sample consists of business owners (ages 20-64) who worked in their business in the calendar year. (2) Coefficient estimates and their standard errors are reported. (3) Main controls include female, age, education, region, and central city status indicator variables. (4) There is no evidence of differential pre-pandemic trends by race/ethnicity (see Appendix Table 2).

Table 4: Business Earnings Changes by Owner and Business Characteristics, 2019-2020 and 2019-2021

	Mean Business Earnings			
Characteristic	2019	Change 19-20	Change 19-21	Avrg. N
High School Dropout	$36,671	-2%	-13%	522
High School Graduate	$45,992	-5%	6%	1613
Some College	$51,776	-13%	-1%	1635
College Graduate	$85,824	-1%	8%	2349
Agriculture	$42,262	53%	7%	377
Construction	$50,512	8%	10%	1095
Manufacturing	$70,465	-19%	-17%	220
Wholesale and Retail Trade	$66,539	-26%	-12%	572
Transportation	$51,185	-17%	10%	357
Information	$49,958	41%	94%	95
Financial Activities	$98,315	-11%	25%	489
Prof. and Bus. Services	$73,437	4%	-5%	1252
Educ. And Health Services	$71,215	2%	3%	633
Leisure and Hospitality	$60,032	-43%	6%	416
Other Services	$40,154	-22%	-15%	613
Northeast	$61,529	2%	19%	906
Midwest	$60,806	7%	14%	1130
South	$63,181	-9%	-2%	2111
West	$64,112	-10%	-3%	1972
Central City	$61,788	-9%	8%	1515
Suburbs	$70,098	-6%	0%	2455
Rural	$46,891	7%	9%	1151
Not Identified Geog.	$55,510	-1%	3%	998
Female	$45,750	-5%	6%	2332
Male	$72,480	-3%	4%	3787
Below median age	$57,708	-2%	2%	3479
Above median age	$68,738	-8%	6%	2640
Low COVID Cases PC in 202(	$63,533	-3%	7%	2570
High COVID Cases PC in 202(	$61,887	-6%	1%	3549
Early state restrictions	$62,881	-5%	3%	5475
No early state restrictions	$58,183	-2%	15%	644
Some businesses closed (No\	$65,232	-7%	4%	2791
Businesses mostly open (No\	$60,262	-3%	4%	3328

Notes: Author's calculations from Current Population Survey (CPS) microdata, 2019-21. All estimates use CPS provided sample weights. Sample includes only individuals with longest-job held work activity as self-employed business owner in calendar year.

Table 5: Business, Owner and Geographical Characteristics by Race and Ethnicity, 2019

	Percentage of Business Owners with Characteristic			
Characteristic	Black	Latinx	Asian	White
High School Dropout	7.7%	28.3%	6.0%	4.3%
High School Graduate	26.7%	30.6%	17.8%	24.5%
Some College	32.4%	20.4%	14.4%	28.2%
College Graduate	33.3%	20.7%	61.8%	43.0%
Agriculture	1.5%	1.4%	0.3%	6.6%
Construction	10.8%	28.7%	7.8%	17.3%
Manufacturing	1.7%	3.7%	2.0%	3.7%
Wholesale and Retail Trade	8.3%	7.8%	12.8%	9.4%
Transportation	12.0%	7.5%	5.9%	4.6%
Information	2.3%	1.7%	1.4%	2.1%
Financial Activities	6.3%	4.6%	8.3%	8.4%
Prof. and Bus. Services	21.3%	22.7%	20.1%	21.8%
Educ. And Health Services	12.3%	7.2%	12.7%	10.2%
Leisure and Hospitality	9.9%	6.6%	11.9%	6.9%
Other Services	13.7%	8.2%	16.9%	8.9%
Northeast	18.6%	11.4%	21.9%	17.7%
Midwest	14.4%	6.4%	10.2%	25.0%
South	53.5%	44.1%	28.7%	33.0%
West	13.5%	38.0%	39.2%	24.4%
Central City	41.5%	41.4%	39.9%	22.4%
Suburbs	41.8%	47.3%	52.2%	44.7%
Rural	6.7%	4.3%	2.1%	17.8%
Not Identified Geog.	10.0%	7.0%	5.8%	15.0%
Female	39.9%	33.5%	43.7%	36.6%
Male	60.1%	66.5%	56.3%	63.4%
Age	43.95	43.36	45.46	47.00
COVID Cases PC in 2020	0.06	0.06	0.06	0.06
Early state restriction	0.99	0.98	0.99	0.94
Some business closed (Nov.)	0.40	0.51	0.60	0.48
Sample Size	438	1041	444	4270

Notes: Author's calculations from Current Population Survey (CPS) microdata, 2019. All estimates use CPS provided sample weights. Sample includes only individuals with longest-job held work activity as self-employed business owner in calendar year.

Table 6: Decompositions of Log Business Earnings Gaps (2019, 2020, 2021)

	White-Black Gap			White-Latinx Gap			White-Asian Gap		
	2019	2020	2021	2019	2020	2021	2019	2020	2021
White log business income	10.510	10.361	10.499	10.510	10.361	10.499	10.510	10.361	10.499
Minority log business income	10.229	9.952	10.207	10.177	9.987	10.154	10.645	10.437	10.437
White-minority group gap	0.281	0.409	0.292	0.333	0.374	0.345	-0.135	-0.076	0.062
Contributions from racial differences in:									
Education	0.050	0.047	0.047	0.169	0.185	0.149	-0.071	-0.074	-0.061
	(0.006)	(0.006)	(0.006)	(0.020)	(0.022)	(0.020)	(0.008)	(0.009)	(0.008)
Industry	0.005	0.059	0.059	0.000	0.028	0.005	-0.006	0.054	0.007
	(0.002)	(0.014)	(0.015)	(0.000)	(0.007)	(0.001)	(0.002)	(0.013)	(0.002)
Region	-0.005	0.004	0.004	-0.001	0.009	0.013	0.005	0.014	0.003
	(0.007)	(0.003)	(0.004)	(0.002)	(0.006)	(0.013)	(0.007)	(0.008)	(0.003)
Central City Status	-0.016	-0.006	-0.006	-0.026	-0.007	-0.029	-0.033	-0.019	-0.033
	(0.005)	(0.002)	(0.002)	(0.009)	(0.003)	(0.011)	(0.011)	(0.007)	(0.012)
Age	0.024	0.020	0.020	0.029	0.019	0.024	0.012	0.003	0.008
	(0.004)	(0.006)	(0.004)	(0.005)	(0.005)	(0.005)	(0.002)	(0.001)	(0.002)
Female	0.021	0.005	0.005	-0.019	-0.046	-0.045	0.045	-0.004	0.034
	(0.001)	(0.000)	(0.000)	(0.001)	(0.003)	(0.003)	(0.002)	(0.000)	(0.002)
All included variables	0.080	0.128	0.128	0.153	0.188	0.116	-0.048	-0.026	-0.041
	(0.013)	(0.020)	(0.021)	(0.024)	(0.029)	(0.019)	(0.008)	(0.004)	(0.007)

Notes: (1) All decomposition specifications use pooled coefficient estimates from the full sample of all races (and include a full set of race dummies in the regressions). (2) Sampling weights are used in all specifications.

Table 7.A: Decompositions of Changes in Log Business Earnings Gaps (2019 to 2020

	Black-White	Latinx-White	Asian-White
Minority log bus. income 2020	9.952	9.987	10.437
Minority log bus. income 2019	10.229	10.177	10.645
Minority loss	-0.277	-0.191	-0.209
White log bus. income 2020	10.361	10.361	10.361
White log bus. income 2019	10.510	10.510	10.510
White loss	-0.150	-0.150	-0.150
Minority Disproportionate Loss	-0.127	-0.041	-0.059
Contributions to disproportionate losses from 2019 racial differences in:			
Education	-0.008	-0.018	0.015
	(0.005)	(0.011)	(0.009)
Industry	-0.064	-0.020	-0.066
	(0.025)	(0.008)	(0.026)
Region	-0.009	-0.011	-0.013
	(0.009)	(0.011)	(0.013)
Central City Status	-0.011	-0.013	-0.013
	(0.013)	(0.014)	(0.014)
Age	0.008	0.008	0.004
	(0.006)	(0.006)	(0.003)
Female	-0.001	0.001	-0.003
	(0.002)	(0.001)	(0.003)
All included variables	-0.085	-0.052	-0.076
	(0.042)	(0.026)	(0.038)

Notes: (1) All decomposition specifications use pooled coefficient estimates from the full sample of all races (and include a full set of race dummies in the regressions). (2) Sampling weights are used in all specifications.

Table 7.B: Decompositions of Changes in Log Business Earnings Gaps (2019 to 2021)

	Black-White	Latinx-White	Asian-White
Minority log bus. income 2021	10.207	10.154	10.437
Minority log bus. income 2019	10.229	10.177	10.645
Minority loss	-0.022	-0.023	-0.209
White log bus. income 2021	10.499	10.499	10.499
White log bus. income 2019	10.510	10.510	10.510
White loss	-0.012	-0.012	-0.012
Minority Disproportionate Loss	-0.010	-0.012	-0.197
Contributions to disproportionate losses from 2019 racial differences in:			
Education	0.001	0.002	-0.002
	(0.005)	(0.011)	(0.009)
Industry	-0.001	0.005	-0.010
	(0.001)	(0.003)	(0.008)
Region	-0.014	-0.014	0.001
	(0.013)	(0.013)	(0.001)
Central City Status	0.003	0.003	0.003
	(0.015)	(0.015)	(0.015)
Age	0.004	0.004	0.002
	(0.006)	(0.006)	(0.003)
Female	0.003	-0.003	0.006
	(0.002)	(0.001)	(0.003)
All included variables	-0.005	-0.003	0.000
	(0.004)	(0.003)	(0.000)

Notes: (1) All decomposition specifications use pooled coefficient estimates from the full sample of all races (and include a full set of race dummies in the regressions). (2) Sampling weights are used in all specifications.

Table 8: Geographical Differences in COVID Cases and Policy Variables by Race and Ethnicity, 2019

	Average Value for Business Owners			
Characteristic	Black	Latinx	Asian	White
COVID Cases PC in 2020	0.059	0.061	0.057	0.061
Early State Business Restrictions	0.991	0.984	0.992	0.942
Mask Mandates (Dec. 2020)	0.755	0.763	0.886	0.788
PPP Loans PE in 2020	0.651	0.655	0.644	0.644
COVID Cases PC in 2021	0.162	0.161	0.151	0.163
PPP Loans PE in 2021	0.879	0.804	0.776	0.813
Sample Size	438	1041	444	4270

Notes: Calculated from Current Population Survey (CPS) microdata, 2019. All estimates use CPS provided sample weights. Sample includes only individuals with longest-job held work activity as self-employed business owner in calendar year. State-level COVID cases are from CDC, early state business restrictions are from NY Times, and mask mandates in Dec. 2020 are from NY Times. Paycheck Protection Program (PPP) loans are from the SBA, and employer establishments are from the U.S. Census.

Table 9.A: Decompositions of Changes in Log Business Earnings Gaps with Added Policy Variables (2019 to 2020)

	Black-White	Latinx-White	Asian-White
Minority log bus. income 2020	9.952	9.987	10.437
Minority log bus. income 2019	10.229	10.177	10.645
Minority loss	-0.277	-0.191	-0.209
White log bus. income 2020	10.361	10.361	10.361
White log bus. income 2019	10.510	10.510	10.510
White loss	-0.150	-0.150	-0.150
Minority Disproportionate Loss	-0.127	-0.041	-0.059
Contributions to disproportionate losses from 2019 racial differences in:			
Education	-0.008	-0.018	0.015
	(0.005)	(0.011)	(0.009)
Industry	-0.064	-0.020	-0.066
	(0.025)	(0.008)	(0.026)
Region	-0.005	-0.009	-0.015
	(0.005)	(0.009)	(0.016)
Central City Status	-0.011	-0.012	-0.012
	(0.012)	(0.014)	(0.014)
Age	0.008	0.008	0.004
	(0.006)	(0.006)	(0.003)
Female	-0.001	0.001	-0.003
	(0.002)	(0.001)	(0.003)
COVID Cases PerCap. in 2020	0.001	0.000	0.001
	(0.009)	(0.002)	(0.018)
Early State Business Restrictions	-0.002	-0.002	-0.002
	(0.006)	(0.005)	(0.006)
Mask Mandates (Dec 2020)	-0.002	-0.002	0.007
	(0.002)	(0.002)	(0.007)
PPP Loans PerEst. In 2020	0.001	0.001	0.000
	(0.003)	(0.005)	(0.000)
All included variables	-0.084	-0.052	-0.071
	(0.045)	(0.028)	(0.039)

Notes: (1) All decomposition specifications use pooled coefficient estimates from the full sample of all races (and include a full set of race dummies in the regressions). (2) Sampling weights are used in all specifications.

Table 9.B: Decompositions of Changes in Log Business Earnings Gaps with Added Policy Variables (2019 to 2021)

	Black-White	Latinx-White	Asian-White
Minority log bus. income 2021	10.207	10.154	10.437
Minority log bus. income 2019	10.229	10.177	10.645
Minority loss	-0.022	-0.023	-0.209
White log bus. income 2021	10.499	10.499	10.499
White log bus. income 2019	10.510	10.510	10.510
White loss	-0.012	-0.012	-0.012
Minority Disproportionate Loss	-0.010	-0.012	-0.197
Contributions to disproportionate losses from 2019 racial differences in:			
Education	0.001	0.003	-0.002
	(0.005)	(0.011)	(0.009)
Industry	-0.001	0.005	-0.010
	(0.001)	(0.003)	(0.008)
Region	-0.012	-0.012	0.002
	(0.013)	(0.013)	(0.003)
Central City Status	0.003	0.004	0.004
	(0.016)	(0.018)	(0.019)
Age	0.004	0.004	0.002
	(0.006)	(0.006)	(0.003)
Female	0.003	-0.003	0.006
	(0.002)	(0.001)	(0.003)
COVID Cases PerCap. in 2021	0.000	0.001	0.003
	(0.004)	(0.009)	(0.042)
Early State Business Restrictions	-0.005	-0.004	-0.005
	(0.006)	(0.005)	(0.006)
Mask Mandates (Dec 2020)	-0.001	-0.001	0.003
	(0.002)	(0.002)	(0.007)
PPP Loans PerEst. In 2021	0.002	0.000	-0.001
	(0.007)	(0.001)	(0.004)
All included variables	-0.005	-0.004	0.002
	(0.005)	(0.004)	(0.002)

Notes: (1) All decomposition specifications use pooled coefficient estimates from the full sample of all races (and include a full set of race dummies in the regressions). (2) Sampling weights are used in all specifications.

Appendix Table 1: Mean Log Business Earnings Trends by Race and Ethnicity, 2015-2021
Using Single-Race Classification

	Total	Black	Latinx	Asian	White
Mean Log Business Earnings					
2015	10.35	10.13	10.13	10.50	10.41
2016	10.37	10.15	10.06	10.52	10.45
2017	10.37	10.19	10.18	10.47	10.43
2018	10.45	10.21	10.18	10.72	10.53
2019	10.44	10.21	10.18	10.66	10.52
2020	10.27	9.94	9.99	10.44	10.37
2021	10.40	10.22	10.15	10.47	10.51
Growth Rates					
2015-16	2%	1%	-8%	2%	4%
2016-17	0%	4%	13%	-5%	-2%
2017-18	8%	2%	-1%	25%	10%
2018-19	-1%	-1%	0%	-6%	-1%
2019-20	-17%	-27%	-19%	-23%	-15%
2020-21	14%	28%	17%	3%	14%
Avrg. Annual N	6,643	450	1,181	425	4,460

Notes: Calculated from Current Population Survey (CPS) microdata, 2015-21. All estimates use CPS provided sample weights. Sample includes only individuals with longest-job held work activity as self-employed business owner in calendar year. Racial group designations include individuals who report one race only instead of multiple races.

Appendix Table 2: Regressions for Log Business Earnings, Current Population Survey, 2015-2021 (Pre-Pandemic Trends and Interactions)

Explanatory Variables	(1)	(2)	(3)	(4)
Trend		0.027	0.027	
		(0.006)	(0.008)	
Trend*Black		0.001	-0.006	
		(0.017)	(0.025)	
Trend*Latinx		-0.008	-0.003	
		(0.013)	(0.018)	
Trend*Asian		0.005	-0.009	
		(0.019)	(0.027)	
Year 2015-18			0.002	
			(0.028)	
Year 2015-18*Black			-0.036	
			(0.085)	
Year 2015-18*Latinx			0.026	
			(0.063)	
Year 2015-18*Asian			-0.066	
			(0.094)	
Year 2018				-0.010
				(0.025)
Year 2018*Black				-0.021
				(0.076)
Year 2018*Latinx				0.003
				(0.056)
Year 2018*Asian				0.008
				(0.084)
Year 2017				-0.080
				(0.025)
Year 2017*Black				-0.042
				(0.075)
Year 2017*Latinx				0.099
				(0.056)
Year 2017*Asian				-0.131
				(0.083)
Year 2016				-0.066
				(0.025)
Year 2016*Black				-0.007
				(0.075)
Year 2016*Latinx				-0.028
				(0.057)
Year 2016*Asian				-0.061
				(0.082)
Year 2015				-0.105
				(0.025)
Year 2015*Black				-0.011
				(0.077)
Year 2015*Latinx				0.058
				(0.058)
Year 2015*Asian				0.014
				(0.084)
Main controls	No	Yes	Yes	Yes
Industry controls	No	Yes	Yes	Yes
Time trend	No	Yes	Yes	Yes
Pre 2019 interactions	No	No	Yes	No
Full 2015-19 interactions	No	No	No	Yes
Sample years	2019-21	2015-21	2015-21	2015-21
Sample size	18,357	46,498	46,498	46,498

Notes: (1) See Table 3 for main estimates. Only pre-pandemic trends and interactions are reported here. (2) The sample consists of business owners (ages 20-64) who worked in their business in the calendar year. (3) Coefficient estimates and their standard errors are reported. (4) Main controls include female, age, education, region, and central city status indicator variables.