

# Do Minority-owned Business Labels Increase Demand? \*

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## Abstract

Analyzing data from a large online platform, we find that labeling restaurants as Black-owned substantially increased their demand, as measured by calls to the restaurant, delivery orders, and - using cellphone data from a different platform - in-person visits to the restaurant. The effects are larger in areas with less anti-Black bias, as measured by Implicit Association Tests. New customers are less likely than the restaurant's prior customers to be Black, as proxied by review profiles. We find similar effects for other minority-owned business labels on the platform, as well as for a Black supplier label on a second platform operating in a different industry.

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# 1 Introduction

Ethnic and racial gaps along various dimensions of economic status are widespread in the United States. One aspect of inequality is the racial gap in business ownership ([Fairlie and Robb, 2007](#)), a form of economic activity widely considered to be a viable path for wealth accumulation and prosperity in minority communities ([Boston, 2006](#)). In turn, efforts by policymakers and businesses – ranging from contracting policies to corporate racial equity initiatives – seek to address racial differences in business viability.

One recent strategy that companies have adopted to support minority-owned businesses is to make the race of business owners more salient to customers. If there is latent demand for the goods and services provided by minority-owned businesses, then raising awareness of owner race has the potential to increase demand among customers. On the other hand, increasing the salience of race risks alienating customers or exacerbating discrimination against minority-owned businesses. Previous research generally finds that revealing minority ownership hurts consumer demand, consistent with the existence of racial bias in the population ( [Blanchflower et al., 2003](#); [Edelman et al., 2017](#); [Ge et al., 2020](#)).

In this paper, we empirically estimate whether making it easier for customers to identify a business owner’s race can improve consumer demand for Black-owned firms. We do so by evaluating the effect of a new company policy on a major business review platform - Yelp - that allowed users to directly search for Black-owned businesses. This change in search technology reduced the relative cost of identifying Black-owned businesses compared to non-Black-owned businesses. We study whether the change in search processes increased demand for the services offered by Black-owned businesses using various measures of customer engagement and real business performance.

We use proprietary data on business performance, as well as a staggered difference-in-differences design, to estimate the effect of reducing the cost of finding minority business ownership through the use of Black-owned business labels. We leverage the high-frequency and granular nature of our data in conjunction with the sharp timing of this corporate policy change to identify the direct effects on consumer demand for services provided by Black-owned businesses. We focus on restaurants, as there are a large number of minority-run firms in this industry.

We find that a quasi-exogeneous increase in the visibility of minority firm ownership on the platform

increased customer engagement and improved the business outcomes of treated firms. In terms of customer engagement, the Black-owned business label led to 25 more weekly restaurant page views (s.e.  $\approx 7.9$ ) compared to a baseline of about 37 weekly visits. This represents an increase of around 65%. We find similar effects for both website views and calls. Direct measures of economic performance also improved. Both total restaurant orders and revenue increased significantly following the adoption of the Black-owned business label within the platform. For example, revenue from transactions on the Yelp platform increased by \$20 a week (s.e.  $\approx 3.8$ ) compared to a baseline revenue of \$37. As we discuss below, the improvements in consumer engagement and business performance do not appear to be driven by strategic selection into the Black-owned business label.

One key threat to the internal validity of our estimates is that the launch of the platform feature occurred just after the death of George Floyd and the ensuing Black Lives Matter (BLM) protests, raising possible confounding factors. We thus present several pieces of evidence to mitigate concerns that the effects are driven by coincident shocks. First, we do not find evidence of pre-trends in the outcomes of soon-to-be labeled and unlabeled businesses. This suggests our results are not driven or confounded by differential trends in the relative performance of Black-owned firms prior to the label treatment. Second, we replicate our findings for the set of firms that adopted the label only at later periods of time. This finding suggests that the results are not driven by institutional shifts around June 2020. Third, we use an external source of data on proprietor race, which allows us to compare the effect on Black-owned businesses that received labels with Black-owned businesses that did not. Instead, we find that the effect is positive only for firms that received the label, which reinforces our view that the effects were driven by the Yelp platform feature rather than by other shocks.

An additional concern is that certain firms strategically select into the Black-owned business label. For instance, better firms may recognize more easily that they are likely to benefit from this platform policy change, in terms of customer engagement and sales. To mitigate concerns regarding endogenous selection, we estimate the effect of the label for the subset of businesses that were less able to manipulate selection of the label – namely, those designed as Black-owned by Yelp based on customer reviews. We find that the effect of the label on this subset of firms is similar to the effect for restaurants that self-identified as Black-owned.<sup>1</sup>

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<sup>1</sup>Relatedly, we also estimate a specification in which we restrict attention only to businesses that were late adopters and were reviewed as Black-owned, further limiting concerns about both selection and timing.

We also assess the generalizability of our findings. While this issue is challenging, given the unique institutional features of our setting, several pieces of evidence suggest the results may be informative outside of this specific context. We begin by examining whether Yelp’s Black-owned businesses label also affects performance off the platform. We use data from SafeGraph, which tracks the location of millions of U.S. consumers, to estimate the number of weekly restaurant visits. Consistent with our main estimates, we find that receiving the Black-owned business label increases restaurant attendance by about 3-3.5 weekly visits, an increase of about 10% relative to the mean. In addition, we examine a similar policy that took place on the Yelp platform at a different point in time, long after the peak of the racial equity protests of summer 2020. In particular, we examine the effect of Yelp’s Latinx-owned business label, which came into effect in September 2020, and find similar results. Finally, we evaluate the effect of a similar policy enacted on a different platform at a different time, namely on Wayfair’s website on February 2023, and again find consistent evidence.

Having documented a robust overall effect on several measures of business performance, we next probe the channels that may explain this finding. Motivated by recent research on the effects of the racial, social, and political characteristics of environment (Gay, 2004), we focus on heterogeneity along demographic, racial, and partisan lines. Alesina et al. (2021), for example, document that views on the sources of racial inequality and the role of ameliorative policies are strongly divided along partisan lines.<sup>2</sup> To explore the role of customer demographics, we examine whether effects are concentrated for restaurants in neighborhoods with higher levels of Black residents. We also explore whether the racial composition of treated restaurants changes in response to the identity label. We test this potential channel by creating an original dataset of consumers’ race based on hand-collected profile pictures of all reviewers on the platform, which allows us to directly estimate the effect of the label across different racial groups. We find our main effects are driven primarily by neighborhoods with higher shares of White residents, and also that labeling restaurants as Black-owned businesses increases the number of White restaurant reviewers. These findings collectively suggest that our main effects are primarily driven by increased patronage of Black restaurants by White consumers.

The increased presence of White customers leads us to explore how our main effects are mediated by political ideology and racial attitudes toward Black Americans (the minority group targeted by

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<sup>2</sup>In particular, they find that Democrats are more likely to attribute contemporary racial disparities to discrimination and to favor redistributive policies.

the change in platform policy). To provide complementary evidence in this vein, we examine heterogeneity in our main effects by local-level measures of racial attitudes. We use data from Project Implicit, which aggregates scores from Implicit Association Tests (IAT) to give area-level indices of racial prejudice.<sup>3</sup> We find that the effects are strongest in areas with weaker average association between "White" and "good," implying lower implicit bias against racial minorities. Finally, looking at partisanship using data on voting in the 2016 U.S. presidential election, we find that the effect of the Black-owned business label is strongest in areas where the majority of the population voted for the Democratic party candidate.

### **Related Literature**

Our paper bridges several streams of research at the intersection of inequality and platform economics. First, our paper contributes to a robust literature on the causes of disparate treatment by race. Many studies in this literature document strong evidence of racially disparate outcomes due to bias, discrimination, or other factors. Evidence of racial disparities has been shown in contexts such as employment, lending, and retail (Bertrand et al., 2004; Zussman, 2013; Pope and Sydnor, 2011; Brooks et al., 2014; Agan and Starr, 2018). More recently, studies have similarly documented bias and discrimination against racial minorities on online platforms (Alyakoob and Rahman, 2022; Edelman et al., 2017; Ge et al., 2020; Ayres et al., 2015).<sup>4</sup> In contrast to the literature showing disparate treatment of minorities, a nascent literature is now exploring how, under certain conditions, minority status can be used to the *benefit* of underrepresented groups. For instance, recent findings show that people are more likely to help minorities who signal their minority status when asking for help (Kirgios et al., 2022). We contribute to this growing body of evidence by providing new evidence of how/when minority status can lead to improved firm outcomes for racial minorities.<sup>5</sup>

Relatedly, we also contribute to research on policies that can ameliorate racial equality (Bayer and Charles, 2018; Deroncourt and Montialoux, 2021) and, in particular, to research on disparities in entrepreneurship (Borjas and Bronars, 1989; Fairlie and Robb, 2007; Lofstrom and Bates, 2013). Several studies have documented the impact of demand-side interventions – such as increased access

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<sup>3</sup>IAT tests indicate implicit bias by measuring of the strength of a person's automatic associations between races (Black/White) and attitudes (good/bad).

<sup>4</sup>While these papers suggest that minority identification can lead to worse outcomes for minority groups, Behaghel et al. (2015) finds that veiling race can also lead to worse outcomes for minorities.

<sup>5</sup>In Appendix B, we present a stylized model formalizing one potential mechanism that may explain why Black-owned business labels can have a positive effect even if the average sentiment in the population is anti-Black.

to government and corporate procurement markets through set-asides – on the viability of minority-owned firms (Chatterji et al., 2014). Our work examines the role of latent consumer demand and highlights policy levers that may affect such demand for the products and services offered by minority proprietors.

Finally, by examining how both partisanship and in- and out-group racial preferences affect consumption decisions, our paper contributes to understanding of how identity and ideology affect economic behavior (Sequeira and Nardotto, 2021). A robust literature documents how race, ethnicity, and group identity affect conflict (Fearon and Laitin, 2003), the provision of public goods (Habyarimana et al., 2007), and political participation (Chandra, 2007). Closely related to our study findings are the results of recent papers using consumption choices to elicit changes in identity (Bertrand and Kamenica, 2018; Atkin et al., 2021; Sequeira and Nardotto, 2021).

## 2 Data and Research Design

### 2.1 Setting

We study the impact of reducing the cost of supporting Black-owned restaurants on the widely used online platform Yelp. Yelp is one of the largest user-generated review sites in the United States, particularly for local businesses like restaurants and bars. Yelp features over 200 million consumer reviews and comprises a substantial base of potential restaurant goers. As of 2022, it had over 76 million monthly visitors<sup>6</sup>. Yelp also allows users to directly order from local businesses through Yelp Transaction Platform (YTP). As a leading online platform for local businesses, Yelp is a sensible setting in which to examine how to shape consumer demand for minority-owned firms. Online food ordering constituted the largest category of transactions by revenue and volume on Yelp’s ordering platform.

In June 2020, Yelp rolled out a new feature on its platform nationwide called the “Black-owned Business” label with the purpose of supporting Black entrepreneurs. This modification to the Yelp platform came in response to increased consumer demand for businesses to respond to racial inequality and social justice concerns in the aftermath of the killing of Minnesota resident George Floyd. Floyd’s death while in police custody spawned a wave of protests nationwide – often tied to the BLM political and

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<sup>6</sup><https://www.enterpriseappstoday.com/stats/yelp-statistics.html>

social movement – against police brutality and other forms of racial injustice.<sup>7</sup> The feature allows Yelp users to explicitly search for Black-owned businesses on the platform by applying the new filter or by directly searching for Black-owned businesses in the search query.<sup>8</sup> Figure I presents the updated web version of Yelp’s search page. The search results page then displays only business tagged as Black-Owned in the selected locality. In addition, for businesses claimed to be Black-owned, the business page also includes a Black-Owned label.

There are two ways for a business to be characterized as Black-owned on Yelp. First, if the business page is claimed by the owner, then the owner can opt into the Black-owned label. Alternatively, Yelp applies an algorithm that characterizes businesses as Black-owned based on past reviews. If two or more reviews mention that the business is Black-owned, then the business will appear in the search results for Black-owned businesses. For businesses reviewed as Black, however, the Black-owned label would not appear in the amenities section of the business page. Yelp does not attempt to verify the race of the owner for either reviewed as or claimed as Black-owned businesses.

## 2.2 Data

We combine several novel data sources to study the effect of identity labels on business outcomes. First, we use proprietary data from Yelp covering a period of over two years, from April 2019 through August 2021. Yelp introduced the identity labeling feature roughly at the middle of this period, in early June 2020. Our dataset consists of weekly information on restaurants in seven large metropolitan areas (MSAs) in the United States: San Francisco, Los Angeles, New York, Minneapolis, Atlanta, Chicago,

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<sup>7</sup>After George Floyd’s death, big business pledged nearly \$50 billion for racial justice (Repko et al., 2020). Yelp’s new policy was part of a larger commitment to support disadvantage or marginalized groups. In 2020 and 2021, Yelp also launched features to identify and promote Women-owned, Latinx-owned, Asian-owned, and LGBTQ-owned businesses. For more information, see Yelp’s blog post: <https://blog.yelp.com/news/yelp-teams-up-with-my-Black-receipt-to-support-Black-owned-businesses/>

<sup>8</sup>We note that other platforms, such as UberEats and DoorDash, piloted similar labels that flagged Black business ownership for customers. While our focus is on the impact of the Yelp label, it is possible that our analysis is in part capturing the effect of concurrent labeling initiatives on other platforms. To assess the extent to which businesses with the Yelp label also received Black-owned labels on other platforms, we collected data from Google Places, which also has Black-owned labels, and from EatOkra, which lists only Black-owned restaurants. In Appendix Table AIII, we estimate the effect of the Black-owned business label, restricting our attention only to businesses that were not labeled as Black-owned on these other platforms. As the results suggest when compared to our main effects, joint labeling does not seem to be a primary explanation for the main effects we document in Table II.

and Houston.<sup>9</sup>

In terms of outcomes, we analyze measures of both customer engagement and real business performance. To measure engagement, we observe the weekly number of times users visited a restaurant's Yelp page, the weekly number of visits to the restaurant website, and the number of calls to the business (directly through Yelp). Collectively, these measures provide information on consumers' intentions to visit or order from a particular restaurant. To measure performance, we rely on proprietary information from the platform on food orders made directly from YTP during our period of study. We use this information to construct two measures of weekly demand on the platform: the number of orders through YTP and total revenue (excluding tips, taxes, and delivery fees) at the business-week level. We also collect additional data from Yelp on business characteristics, such as cuisine, precise geographic location, and Yelp's 5-star ratings.

We also rely on Yelp data to define our treatment sample. For each business, the data also describes whether the business was labeled as Black-owned, how it was labeled as such (claimed by owner or reviewed as Black), and when this "treatment" occurred. Figure II presents the entire distribution of join dates. While most businesses opted into the label near, or very close to, the launch date of the new feature, a significant number opted into the label at substantially later dates. For instance, almost 10% of businesses labeled as Black-owned opted in over a year after launch. These "late adopters" provide us with a subsample of firms that we can use to rule out time-specific confounders.

In addition to the main dataset obtained directly from Yelp, we use several external datasets. First, to identify a broader set of Black-owned businesses than those that adopt the Yelp identity label, we use data from the National Establishment Time Series (NETS) for 2019. From this source, we can identify minority-owned businesses that were not labeled on Yelp. Second, to study the moderating effects of racial composition, we use Zip Code Tabulation Area (ZIP)-level demographic information from the 2015 American Community Survey (ACS).

Third, to study the role of political identity using data on presidential party vote shares by county and zip code, we use county measures of political identity based on David Leip's Election Atlas (Leip, 2019). These data include vote totals disaggregated into three categories: votes for the Republican

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<sup>9</sup>These seven metro areas (spanning 38 counties) represent those for which Yelp is willing to share data. These large and diverse MSAs are a representative cross-section of the United States, in terms of geography and demographic composition. Our sample is primarily urban in nature. The median county in our dataset is 94% "within urban clusters," according to Decennial Census data. We are thus reluctant to extrapolate our findings beyond urban city cores.



candidate, votes for the Democratic candidate, and votes for other candidates in an election. We calculate county-level party vote share, which we then use to classify counties as majority Democratic or Republican. We also use zip code-level data on presidential vote share from the American Ideology Project as a more fine-grained measure of average political identity (Tausanovitch and Warshaw, 2022). These measures of area political identity incorporate survey respondents’ demographics and geography to estimate subcounty levels of candidate vote share and public opinion.

Fourth, to examine heterogeneous effects of Yelp’s label by racial attitudes, we obtain zip code-level average racial prejudice measures derived from Implicit Association Test (IAT) scores. These scores are collected by Project Implicit. IAT scores indicate the strength of associations between racial identity and evaluations (e.g., good, bad) and thus provide a measure of how strongly a person unconsciously associates with racial minorities. These data have been used in a variety of settings to show how systematic variation in socioeconomic outcomes – including test scores, health-care access, and interactions with law enforcement – reflect local variation in racial prejudice (Riddle and Sinclair, 2019; Chin et al., 2020; Leitner et al., 2018). Relative to these and other recent papers examining how regional variation in racial bias correlates with outcomes of interest, which generally rely on county- or state-level proxies, we extend the existing literature by leveraging more fine-grained geographical variation in racial prejudice (i.e., at the zip-code level). We restrict the IAT sample to include zip codes for which with more than 50 participants (to protect anonymity) in the years 2006-2021.

Fifth, we explore how the label affects the racial demographic composition of customers by scraping the photos of all Yelp reviewers of the businesses in our sample. We scraped over one million photos, which were then fed into a facial-recognition system, DeepFace, to identify the race of each reviewer.<sup>10</sup>

Sixth, to examine effects of the label on off-platform outcomes, we use data from SafeGraph, a company that tracks location data from the smartphone applications of over 40 million Americans nationwide. This data is in turn aggregated to estimate the total foot traffic for over 3.6 million points of interest (POIs) around the United States (Williams, 2020).<sup>11</sup> We analyze the number of visits at

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<sup>10</sup>In particular, we use the DeepFace library in Python. DeepFace was created by Facebook and uses neural network to analyze human faces in digital images. The DeepFace method reaches an accuracy of 97.35%. More details can be found at <https://github.com/serengil/deepface>.

<sup>11</sup>SafeGraph uses data based on GPS information from cellphone devices for which provide users give permission to track their location via different mobile apps. The location data are based on “pings” that register whenever a phone application requests location data from the device. Thus, the ping frequency – which SafeGraph uses to compile point-of-interest visits

the establishment-week level as a proxy for dinners in a particular restaurant at a given week.<sup>12</sup> One aspect of the Safegraph data that is worth noting upfront is that we cannot verify whether aggregate POI visits capture dine-in or take-out food purchases. We take this measure of off-platform activity to represent the union of both dine-in and take-out customers.

Finally, to evaluate the effect of a similar policy enacted by a different company at a different time, we obtained data from the furniture sales platform Wayfair, which launched a Black-owned label on its website in February 2023. Using weekly webpage visits and revenue, we conduct a similar analysis of the effect label on consumer demand and performance. Additional details regarding Wayfair’s labeling policy and the data we used to test our main hypothesis in this additional setting are discussed in the Appendix D.

### 2.3 Research Strategy: Generalized Difference-in-Differences Design

Our objective in this paper is to examine how the Black-owned business label has affected customer engagement and performance outcomes. Yelp’s introduction of this feature provides a platform-level institutional shock that reduces the cost of searching for Black-owned restaurants.

To study the effect of the Black-owned business label on restaurant outcomes (Yelp page visit, website visits, calls, orders, and revenue), we combine a staggered difference-in-difference regression framework with a matching procedure to define our sample of treatment and control businesses.<sup>13</sup> We start by carrying out coarsened exact matching (CEM) on all Yelp restaurants to create our sample of similar treatment and control restaurants [Iacus et al. \(2012\)](#). We match restaurants based on a set of pre-treatment firm characteristics: pre-label Yelp rating, whether the restaurant offers delivery, franchise status, outcome pretrends, and zip code. We match coarsely on the firm’s Yelp rating and pretrends, and match exactly on the other traits.<sup>14</sup> We drop firms for which there is no exact match for

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– reflects the amount of time a specific device relies on applications and movements. According to [Chen et al. \(2022\)](#), the median time between pings in our sample for a given device is 48 seconds (with a mode of 5 minutes).

<sup>12</sup>We use several methods to match the data, based on a restaurant’s name, zip code, latitude-longitude, and address. We match approximately one-third of our sample. We note that the matched sub-sample is *not* representative and that we are only able to match to a relatively small number of such restaurants. We are unable to explain why some businesses do not match across the two datasets. That said, since our main estimates build on panel data and rely on within-unit variation, selection seems to be less of a concern in our setting.

<sup>13</sup>Several recent studies have combined matching with a difference-in-difference design, such as [Jäger and Heining \(2022\)](#) and [Azoulay et al. \(2010\)](#).

<sup>14</sup>Yelp ratings are coarsened to the nearest half star, which is the level presented to users. We match coarsely on pretrends in weekly calls and Yelp orders. We code a restaurant as offering delivery based on whether it delivered through Yelp or listed delivery as one of its stated amenities. Lastly, as presented in Appendix Table [AI](#), we obtain qualitatively similar

each of category. Matching allows us to compare two firms with similar quality and intended clientele, and thus allows us to construct a more appropriate counterfactual for measuring the effect of Yelp’s Black-owned business label. Finally, when conducting the analysis for a sub-sample, we rematch (and re-weight) all observations. We include more details on our matching protocol in Section C.3.

Table I presents descriptive statistics for the final sample of matched firms. Unfortunately, due to our non-disclosure agreement with Yelp, we are unable to reveal confidential exact information about the full sample means. However, based on the information that we can show, the matched sample does not appear to be representative of the entire sample of Yelp businesses. Our final sample has 27,834 matched firms, of which 1,288 are eventually labeled as Black-owned.

Using the sample of matched firms, we then use a staggered difference-in-differences (DID) strategy, exploiting the timing of label adoption (Athey and Imbens, 2022; Goodman-Bacon, 2021). Specifically, we estimate:

$$y_{it} = \beta \text{Black}_{it} + \theta_i + \tau_t + \varepsilon_{it} \quad (1)$$

where  $i$  and  $t$  index restaurant and time.  $\text{Black}_{it} = 1$  if restaurant  $i$  is labeled as Black-owned on the platform in week  $t$ , and 0 otherwise.  $\theta_i$  and  $\tau_t$  are firm and week fixed effects, respectively.<sup>15</sup>

The dependent variables  $y_{it}$  are various measures for restaurants’ demand, such as weekly number of page views on Yelp, website visits, calls, and orders and revenue on Yelp. Our model includes firm fixed effects  $\theta_i$  to control for time-invariant differences between Black-owned and non-Black-owned firms, as well as week-year fixed effects,  $\tau_t$ , to account for time-varying shocks to outcomes that are common to all businesses. We cluster the standard errors for the error term  $\varepsilon_{it}$  at the same  $i$ -level, corresponding to the level of treatment (Bertrand et al., 2004).<sup>16</sup> All analyses include the relevant CEM weights.

### Identification Assumptions & Event Study Approach

estimates when using the full sample of Yelp businesses, without any matching.

<sup>15</sup>For businesses reviewed as Black-owned, we also allow for differences in the period between receiving the first and second review. In addition, as presented in Appendix Table AII, we also verify the robustness of the two-way fixed effects (TWFE) estimator to heterogeneity in treatment effects across groups or time, in line with recent work (Callaway and Sant’Anna, 2021).

<sup>16</sup>We verify that the main results are robust, at similar significance levels, to clustering at the zip code or city levels. Results are available upon request.

One key assumption for interpreting  $\beta$  in Equation 1 as a causal effect is that business outcomes in treated and control firms would have evolved similarly in the absence of the label.<sup>17</sup> While this assumption is unverifiable to some degree, it is still possible to provide evidence consistent with its veracity. To this end, we show that the effect of the Black-owned business label is not an artifact of preexisting outcomes trends. We do so by estimating a more flexible event-study specification that takes the form:

$$y_{it} = \alpha + \sum_{j=T_0}^{-1} \beta_j BlackPre_{ij} + \sum_{k=1}^{T_1} \beta_k Black_{ik} + \theta_i + \tau_t + \varepsilon_{it} \quad (2)$$

where  $BlackPre_{ij}$  and  $Black_{ik}$  are dummy variables equal to 1 when an observation is  $j$  or  $k$  months before or after the date of treatment—the adoption of the Black-owned business label. We can inspect the strength of our main identifying assumption by examining whether the  $\beta_j$ 's are non-zero.

## 3 Results

### 3.1 Main Results

We begin with a discussion of our baseline estimates of Equation of 1, which tell us the impact of Yelp's Black-owned business label on consumer demand and economic outcomes. Our main results are presented in Panel A of Table II, which pools all businesses that received the Black-owned business label during the analysis time period (irrespective of whether the business self-reports as Black-owned or is reviewed as such by customers). We observe improvements in outcomes across the board for Yelp-labeled Black-owned businesses. Restaurants that are treated with the label observe, on average, 25 more Yelp business page views (s.e.= 7.9). The magnitude is sizable, representing a 67% increase from the average restaurant's baseline. These improvements are echoed across other customer engagement outcomes: treated businesses observe almost four more customer website views (s.e. $\approx$  0.7) and receive almost two more calls directed from the Yelp platform (s.e. $\approx$  0.3) – both representing increases of over 100% from baseline values. In short, the results in columns 1-3 suggest that Yelp's Black-owned business label leads to a statistically significant overall increase in customer

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<sup>17</sup>A second identification concern, discussed at length in Section 3.2, is that shocks concurrent with the timing and location of the Yelp reform could confound our estimation. [Athey and Imbens \(2022\)](#) highlight that in our setting, we also assume exogenous timing of treatment. In other words, we assume that labeling is not related to factors affecting our firm performance measures.

engagement.

Columns 4 and 5 suggest that the label’s impact on customer engagement with minority-owned restaurants may also translate into real economic improvements. In column 4, we observe a nearly one-unit increase in orders from Black-owned business (s.e.= 0.15), which constitutes a 53% increase from the baseline value. Similarly, the Black-owned business label increases weekly revenue by \$20, again roughly representing a 52% increase in total revenue. We note that these improvements are limited, as they only capture increases in business activity that takes place *on* the Yelp platform and are only observed for the subsample of restaurants affiliated with Yelp Transactions Platform (YTP). Accepting this caveat, however, we observe statistically significant differences in business outcomes that may well represent a lower bound on the label’s effect.<sup>18</sup>

As we discuss in Section 2.3, a core identifying assumption is that Black-owned restaurant outcomes would have followed the same time path in the absence of having the identity label on the platform. As such, a potential concern is that preexisting secular trends prior to Yelp’s addition of the feature are driving the main outcomes. In Figure III, we assuage potential concerns about endogenous adoption or unobserved confounders by presenting the event time estimates that correspond to our main specification. We generally observe similar “pre-trends” between eventual treated and control restaurants in the period prior to receiving the Black-owned business label. The stable pre-trends provide suggestive evidence in favor of this key identifying assumption. Moreover, following introduction of the feature, we see a relatively sudden and persistent increase in an outcome at the date of treatment, suggesting a causal effect of the label rather than other shocks that may have occurred before or after label adoption.<sup>19</sup>

We provide similar graphical evidence for all of our main robustness specifications in Appendix Figure AII. In short, we consistently find evidence of stable pre-trends (supporting the identifying assumption), followed by improvements in Black-owned business outcomes.

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<sup>18</sup>We note, however, that while the estimates of effects on Yelp-based outcomes are large in percentage terms, they are quite modest in level terms, perhaps due to the relatively low baseline levels.

<sup>19</sup>Appendix Figure AI presents the event time estimates at the weekly, rather than monthly, level. The results confirm our main findings in Figure III.

### 3.2 Identification and Robustness

In addition to the parallel trends assumption, there are a few additional threats to identifying the effect of the Yelp label on restaurant outcomes in this setting. One concern is selection into the label. Problematic selection into treatment here could be related to either the type of businesses that endogenously select into label participation or to the endogenous timing of adoption (for example, firms may adopt the label during a time of poor performance). Both types of selection would potentially be correlated with unobserved factors that may affect business outcomes.

To somewhat mitigate this concern, we separately estimate the effect of the label for businesses that opted into the label and businesses that were labeled as Black-owned in user reviews.<sup>20</sup> Results are in Panels B and C of Table II (with the corresponding event study estimates in the top two panels of Figure AII). Reassuringly, as we can see in Panel C of Table II, the effects persist even for businesses that did not actively opt into the label but instead were designated as Black-owned by the Yelp platform due to customer feedback. These businesses could exercise less control over the fact and timing of adoption. We find similar effects for both groups, with slightly larger effects (except on page views) for restaurants reviewed as Black-owned.

Another potential threat to identification in our setting are policy changes concurrent with the introduction of the black-owned business feature that would prevent us from attributing the trend breaks in Figure III to the new feature. To our knowledge, based on interviews at Yelp, Yelp did not alter its search or rating algorithms to incorporate the new feature. The only change following introduction was to allow users to explicitly search for Black-owned businesses.

Similarly, there may have been other off-platform changes that differentially affected Black-owned restaurants, particularly given changes to the institutional environment at the time Yelp initiated its policy of making minority proprietorship more salient (such as protests surrounding racial justice and inequality). Reassuringly, in Panel D of Table II, we find that even businesses that were late adopters of the label, which we define as adopting at least six weeks after the label's launch, observed significantly improved customer engagement and improved firm performance, in terms of sales and revenue. These results suggest that changes concurrent with Yelp's roll-out of the Black-owned business label – which

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<sup>20</sup> Approximately 50% of the Black-owned businesses in our sample claimed the label, while the other 50% were reviewed as Black-owned by Yelp users. Since the label appears more prominently on businesses claimed as Black-owned, once a business claims the label, it can no longer receive the reviewed-as-Black-owned label. Approximately 5.5% of businesses claimed the label after already being reviewed by Yelp users.

may have differentially affected labeled firms – are unlikely to be fully responsible for the improved performance we observe. Given the findings here, any confounding factor would have to occur at multiple points in time.

In Panel E, we restrict attention only to businesses that were late adopters *and* were reviewed as Black-owned by Yelp users. Again, though this substantially reduces our sample size, the positive effect of the label on business outcomes remains economically and statistically significant.

A related concern is whether the causal effect we have uncovered represents the impact of Yelp’s Black-owned business label itself or a general effect on Black-owned businesses in the United States regardless of platform policy. While using variation in label timing (Panel D of Table II) partially addresses this concern, to ameliorate our concerns, we undertake an additional test to estimate the incremental effect of the label on Black-owned businesses. In particular, we restrict attention solely to Black-owned restaurants by estimating the effect on Black-owned businesses labeled on Yelp, compared to Black-owned businesses that have not (yet or ever) received the label. To this end, we merge the data with the National Establishment Time-Series (NETS) 2019, which allows us to identify minority-owned businesses even if they were never labeled on Yelp.<sup>21</sup>

We then re-estimate Equation 1 using as control firms only restaurants labeled minority-owned in the NETS data set (but not on Yelp) or those that were not yet labeled as Black-owned on Yelp. The results are presented formally in Table III and graphically in Appendix Figure AIII. We find significant effects similar to our main specification. This suggests that our estimated effects are driven directly by the new label and not by contemporaneous changes in the institutional environment.

Finally, we note that our main results rely on the standard DID approach, in which different businesses become treated at different times. Recent econometric literature suggests that the two-way fixed effects (TWFE) may be biased when there are heterogeneous treatment effects across cohorts or time. The main intuition is that the estimated treatment effect may be “contaminated” by treatments of other groups or at other times (De Chaisemartin and d’Haultfoeuille, 2020; Callaway and Sant’Anna, 2021; Goodman-Bacon, 2021). In Table AII, we test the robustness of our main estimates using three methods designed to address concerns regarding heterogeneous treatment effects, as suggested in Cengiz et al. (2019); Callaway and Sant’Anna (2021); Wooldridge (2021a). By and large, the results remain

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<sup>21</sup> Admittedly, it is possible that owner race in the NETS data changed between 2019, when we have the NETS indicator for Black-owned businesses, and mid-2020, when the Yelp platform change took place.

statistically significant and are similar in magnitude to our main estimates.<sup>22</sup>

### 3.3 External Validity

Another potential concern is the external validity of the main findings and their generalizability to other settings. Recent research suggests that events of mid-2020 – such as the killing of George Floyd, widespread BLM protests in response to the perception of police mistreatment, and other factors – shifted both political attitudes and attitudes about racial disparities (Klein Teeselink and Melios, 2021; Reny and Newman, 2021). As such, given that other forces may have also affected differential demand for minority businesses at the time the platform change was introduced, the magnitude of the effect of the Black-owned business label should be treated with some amount of caution. Despite this limitation, we provide several pieces of additional evidence suggesting the results may be informative beyond this specific context.

First, we underscore our findings in Panel D of Table II (discussed above in Section 3.2). Even when we restrict our analysis to restaurants that adopted the Black-owned business label several months after the highly salient events of June 2020, we still observe statistically significant improvements in both customer engagement and firm performance. This finding suggests to us that Yelp’s labeling policy had effects that were – at least to some degree – independent of the effects of the events such as the killing of George Floyd and the subsequent political organizing that took place during the period in which Yelp released the label.

Second, we examine the effect of Yelp’s Black-owned businesses label on performance that we can measure off the platform. Note that a limitation of our main analysis is that we do not observe all purchases affected by the policy intervention. Rather, we only observe customer engagement and sales that take place on the Yelp platform. As such, we may underestimate the true effect of Yelp’s Black-owned business label, which in turn complicates an assessment of how/whether effects would be expected to scale. To shed light on possible off-platform activity, we use aggregated data on mobile geo-position from Safegraph to estimate weekly visits to each establishment.<sup>23</sup>

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<sup>22</sup>In an additional set of analyses, we formally test the need for alternative estimators by conducting the test suggested in De Chaisemartin and D’Haultfoeuille (2022). The test estimates the prevalence of negative weights in computing the ATE. We find that the sum of negative weights comprises a tiny percentage of the positive weights for all five outcomes. For example, for YTP revenue, only 314 of 32,581 weights are estimated to be negative, and sum up to -.00033658. Results are available upon request.

<sup>23</sup>A detailed description of this data is found in Section 2.2 and Appendix C.



The results are presented in Table IV, in which each column differs in the strictness of the matching rule.<sup>24</sup> Across specifications, we find significant increases of about 3-3.5 weekly visits to businesses labeled as Black-owned, which represents about 10%-15% of the matched sample average. This result further supports our finding that labeling firms as minority-owned increases demand for such businesses overall.

Third, to bolster the case that the introduction of the Black-owned business label had an effect on firm outcomes that was independent of the timing of Yelp’s policy, we examine the effect of a similar policy change that took place on the Yelp platform at a different time – namely, Yelp’s Latinx-owned business label, which took effect in September 2020.

The results are presented formally in Table V and graphically in Appendix Figure AV. Reassuringly, we observe effects that are qualitatively similar to our core findings on the impact of the Black-owned business label. We observe sizable (and highly significant) improvements in all outcomes. For instance, the Latinx-owned business label leads to an increase of 31 additional page views (60% of baseline) and additional \$15 increase in Yelp platform-based revenue (27% of baseline).<sup>25</sup> While extrapolation is still challenging, these results suggest that the effects we observe on Black-owned businesses might be more broadly applicable in settings beyond merely the adoption of identity-based labels in the presence of salient social movements. Similarly, our supplementary analyses provide *prima facie* evidence that the effects we observe need not be limited only to initiatives that promote supporting the interests of Black business owners.

Finally, we evaluate the effect of a similar policy enacted by a different company at a different time. We focus on Wayfair, a company that sells furniture and home goods online. In February 2023, the platform introduced a labeling scheme that allows customers to search for Black furniture suppliers. Table VI presents the main estimates (the results are presented graphically in Figure AVI). In columns 1-2, we estimate our baseline specification in levels, with outcomes normalized by pre-treatment mean (to accommodate company data disclosure requirements). In columns 3-4, we focus on the intensive margin and present results in log terms for strictly positive observations. Similar to our main findings

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<sup>24</sup>In column 1, we include only businesses with exact matches on business name, zip code, and longitude-latitude coordinates. In column 2, we allow for fuzzy matches on names. Finally, column 3 also allows for looser coordinates matches (1 decimal) of fuzzy matches on address. After re-matching based on treatment assignment, we are left with approximately 2,609, 3,075, and 3,399 restaurants, respectively.

<sup>25</sup>Notably, we find largely similar effects for Yelp’s female-owned business label. We do not include these results in the paper, given that it focuses on race and ethnicity, but these results are available to readers upon request.

when evaluating the labeling effects on the Yelp platform, we find that furniture suppliers labeled as Black-owned experience an increase in demand following the introduction of the platform feature. We document positive effects on both weekly customer engagement (webpage visits) and revenue. For instance, in column 3, we observe a sizable increase in webpage traffic of 57%. The results are noisier for revenue, potentially due to the small number of suppliers that are treated.<sup>26</sup>

While our analyses in this subsection are only suggestive, the results discussed above nevertheless increase our confidence that our main findings have some relevance in other contexts. We also note, though, that general equilibrium effects may hamper our ability to make strong statements about external validity. For example, to the extent that other firms recognize information about the beneficial effects of identifying Black-owned suppliers, this awareness may create incentives to adopt the label – either honestly, by Black proprietors, or perhaps even by non-Black proprietors. These general equilibrium effects complicate the interpretation of our main effects. We leave a more thorough examination of the downstream consequences of Black-owned business labels to be explored in future research.

## 4 Examining Mechanisms

Having documented robust evidence of improved business outcomes for businesses designated as Black-owned on Yelp, we now explore various forms of heterogeneity to shed light on mechanisms driving the main estimates. We begin by examining which types of consumers are driving our main treatment effects. In particular, we are most interested in whether the effects of the Black-owned business label are driven by particular consumer demographics, including whether they are concentrated in ideologically conservative or liberal locations. We then examine which types of Black-owned businesses benefit the most from the introduction of the feature.

### 4.1 Heterogeneity by Consumers' Race

There are conceptual reasons to believe our effects could be driven by either Black or White consumers. On one hand, several theories would suggest in-group favoritism (i.e., that our average effect

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<sup>26</sup>The effects of the label on Wayfair are beyond the focus on the paper. We provide additional details about Wayfair's Black-owned business label policy in Appendix D. Notably, Wayfair labeled substantially fewer Black-owned suppliers compared to Yelp, which may explain the relatively noisy estimates on sales.

is being driven by Black consumers interested in supporting Black businesses), as in the form of nepotism (Goldberg, 1982; Bennedsen et al., 2007) or homophily Greenberg and Mollick (2017). On the other hand, prior work highlights mechanisms through which the Black-owned business label may activate White customers as well, such as altruism (e.g., Simon, 1993), social activism Buchanan et al. (2020), and conspicuous consumption (in the spirit of Veblen, 1899).

Below, we examine conceptual reasons that suggest our effects on firms could be driven by changes in the behavior of either White or Black consumers. We do so in two ways. First, for our full matched sample, we examine whether effects are concentrated for restaurants in neighborhoods with higher levels of Black residents. We find that our effects are concentrated in zip codes with high White population shares. Second, for a subset of businesses for which we can identify customers, we directly show that the Black-owned business were more likely to have White customers after the introduction of the Yelp Black-owned label.

#### 4.1.1 Neighborhood Demographic Composition

We first test whether Black-owned businesses perform better when a larger share of residents in their neighborhood are Black. To this end, we interact our indicator for the Black-owned business label with the zip-code level share of the population that are Black Americans. The results are presented formally in Table VII and graphically in Appendix Figure AVII. We find that the effects of the Black-owned business label are *weaker* in Black neighborhoods. The coefficient  $Black \times FractionBlack$  is negative and highly significant for website visits, restaurant calls, and platform-based orders and revenue. The negative coefficient thus suggests that the positive effect of the Black-owned business label is realized mainly by Black-owned businesses in *less* Black neighborhoods.

#### 4.1.2 Race of Reviewers

The previous section attempted to proxy for consumers' race using neighborhood characteristics. However, this exercise might have yielded misleading results, as restaurant goers might have been visiting from proximate neighborhoods or even other towns. Though we expect racial composition to be correlated across neighboring geographies, it is unclear whether looking at demographic information in the neighborhood at which the restaurant is located. Unfortunately, Yelp does not collect demographic information about its users and generally does not share their personal information with

researchers. Thus, we are unable to directly study the heterogeneity of consumers' race on the five main outcomes.

Nevertheless, we leverage an additional, yet somewhat noisier, measure of demand—consumers' reviews. Users tend to identify themselves by name and profile picture when leaving a review, and this data is publicly available. To this end, we scrape the reviews of all businesses in our sample, particularly reviewers' profile pictures. We then feed these photos into the DeepFace facial recognition using the Python package. The system output detects whether there is a face present in the profile picture and the probability that the individual belongs to various races: Black, White, Latinx, Indian, Asian, and Middle Eastern. We code reviewers' race if the algorithm assigns a probability of 60% or more to a particular race.<sup>27</sup> Since reviews are not as prevalent as calls and page visits, we aggregate ratings to the business-month, rather than business-week, level. We construct two outcome measures: the number of White reviewers and the number of Black reviewers in a given month.

The results are presented in Table VIII. Column 1 shows the effect of the label on the monthly number of reviews received by White reviewers, and Column 2 shows the effect on the number of Black reviewers. In Panel A, we see that the label increases the number of White reviewers by 0.089 compared to a baseline of 0.24. In contrast, in Column 2, we find a much smaller and statistically insignificant effect on the number of monthly reviews left by Black reviewers (0.035). Panel B presents similar results using Poisson regression. Again, we find that receiving the Black-owned business label leads to an incidence rate ratio (IRR) of 1.62 (s.e.= 0.16) for White reviews compared to less than half for Black reviewers.<sup>28</sup>

Taken together, these results suggest that the positive effect of the new feature on the demand for Black-owned businesses is primarily driven by White consumers. In this work, we are unable to clearly identify the underlying reason for the differential response of White consumers. For instance, it could be that Black, but not White, consumers were already aware which restaurants are Black-owned and thus gained little knowledge from the introduction of the feature. Nevertheless, the next section explores one potential explanation: the role of ideology.

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<sup>27</sup>The results are qualitatively robust to slightly higher or lower thresholds. Our definition is more conservative than the DeepFace default assignment, which takes the higher probability race. We impose the 60% restriction to avoid marginal cases.

<sup>28</sup>In an unshown analysis, we test whether the Black-owned business label affected the *type* of ratings left by reviewers, e.g., whether restaurants labeled as Black-owned received higher (or lower) subsequent ratings. We do not find any significant effects.

## 4.2 The Role of Political Ideology and Racial Attitudes

As another measure of consumers' ideology, we next examine the role of political ideology. We document heterogeneity in consumer behavior as a function of local political preferences (Veblen, 1899; Bourdieu, 1987), which many consider to be a clear dividing line that signals support of racially liberal political causes.<sup>29</sup>

We estimate partisanship using data on vote shares by party. We first aggregate precinct-level vote shares to the county and zip-code levels, defining partisanship as the proportion of total votes received by President Donald Trump in the 2016 election of the total votes received by the Democratic and Republican parties (MIT Election Data and Science Lab, 2018; Dave Leips Atlas, 2016). For ease of interpretation, we discretize this measure by whether at least 50% of the votes went to the Democratic candidate.<sup>30</sup>

Table IX presents the heterogeneous effects of the Black-owned business label on each outcome by “Majority Democrat” status within county (Panel A) and zip code (Panel B).<sup>31</sup> In Panel A, we see that *most* (or in some cases all) of the effects documented in Table II are driven by Democrat-leaning counties. For all five outcomes, the interaction  $Black \times MajorityDem$  is positive and statistically significant, while the first-order term is small in comparison. The latter finding suggests that in the small subset of non-majority Democratic counties in our data, there is little evidence of a “backlash” in Republican areas to the Black-owned business label. This finding is consistent with the label reducing search costs for the subset of consumers who are most likely to support the sociopolitical interests of Black-owned businesses.

In Panel B, we also analyze heterogeneous effects by majority-Democrat zip-code status. We find that the Black-owned business label has relatively larger effects within majority-Democratic cities in terms of phone calls, restaurant orders, and revenue. Consistent with the results on heterogeneity by racial consumer demographics and racial attitudes, the results suggest that the effects are concentrated among customers who are ideologically aligned with supporting historically disadvantaged minorities.

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<sup>29</sup>For instance, while 78% of Republicans opposed the BLM movement, 85% of Democrats supported the movement (Horowitz, 2021). More generally, support for Black voters' political interests has long been concentrated within one political party (Kuziemko and Washington, 2018).

<sup>30</sup>As presented in Appendix Table AIV, the results are qualitatively similar when using the continuous Democratic vote share.

<sup>31</sup>The results are presented graphically in Appendix Figure AVIII.

To measure the moderating role of ideological factors, we next estimate the heterogeneous effect of Yelp’s Black-owned business label by racial attitudes. A growing literature in economics considers how various aspects of identity (such as social or political ideology) affect day-to-day economic behavior (Pandya and Venkatesan, 2016; Sequeira and Nardotto, 2021). Drawing on this literature, we consider whether the impact of an intervention to increase the salience of minority ownership will be more pronounced for consumers who are less racially biased.

We examine heterogeneous effects by average consumers’ implicit bias using data from Project Implicit. Project Implicit allows individuals from across the country to evaluate their implicit bias by taking the Implicit Association Test (IAT).<sup>32</sup> The IAT is a psychological test commonly used to estimate the strength of automatic associations between concepts, evaluations, and stereotypes. The test typically asks participants to sort words into one of two categories. The main intuition behind the test is that participants are able to sort words more efficiently when the two categories are more closely associated. Following the literature (Greenwald et al., 2003), we use the IAT D measure, which estimates the standardized difference between reaction time for different category combinations. In particular, we measure the efficiency gain from combining the words “White” and “Good,” with higher scores implying stronger bias toward Whites.

Table X presents the heterogeneous effects of the Black-owned business label on each outcome by average zip code-level IAT score. Since we find a strong negative correlation between the average IAT score and the fraction of black residents (-0.86), we control for racial composition and post label time. We find that the effects of the Black-owned business label are primarily driven by locations with lower implicit biases, as captured by the *Black* coefficient. In contrast, we see a significant reduction in impact in locations with higher average bias in favor of White American, as captured by the *Black*  $\times$  *IAT* coefficient. The estimated coefficients of *Black*  $\times$  *IAT* are economically meaningful and negative on all five outcomes, and are statistically significant for phone calls, restaurant orders, and revenue.

In short, our findings in this subsection in conjunction with Section 4.1 above provide a plausible chan-

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<sup>32</sup>Project Implicit (<https://implicit.harvard.edu/implicit/>) allows for testing of implicit bias toward multiple concepts, such as marital status, religion vs. science, etc. We focus specifically on racial bias as measured by sorting the faces of African and European Americans with good and bad phrases. One potential concern is that participants actively select to take the IAT. There is no way for us to verify whether the sample of test takers is representative of the entire population in the region. Our analysis implicitly assumes that the average bias of test takers is a decent proxy for the average bias in the population.

nel through which the Black-owned business label improved performance for targeted firms. Namely, rather than increasing in-group favoritism within the subset of Black consumers, the treatment activated demand within the subset of *White* consumers that was most likely to support Black businesses due to lower levels of racial bias.

### 4.3 Heterogeneity by Firm Attributes

**Firm quality** In Table [XI](#), we explore the heterogeneous effects of the Black-owned business label by firm quality. While the average effect of making ownership salient is an important quantity of interest, the heterogeneity of treatment effects by firm quality can be important for evaluating distributional consequences. In particular, we are interested in understanding whether Yelp’s attempt to help Black-owned firms helped restaurants that were already considered “high-quality” (but which perhaps were overlooked by White consumers) or whether the policy helped Black-owned firms that may have been on the margin of exit ([Kim and Luca, 2022](#)). Conceptually, both possibilities are plausible; the magnitude and direction of countervailing competing heterogeneities are believed to be influenced by characteristics of market participants ([Myles Shaver and Flyer, 2000](#)), which we explore in this subsection. We use two different pre-treatment business characteristics from Yelp to define quality: ratings (based on Yelp’s star rating system, similar to [Reshef, 2023](#)) and pre-treatment business performance.

Table [XI](#) presents the results. In Panel A, we first explore differential effects by Yelp star rating prior to the launch of the new feature. For all five of our main outcomes, we see that the benefits of the Black-owned business label are higher for higher-rated firms. We find that businesses rated above-median, compared to below-median, gained an additional 42 page views after receiving the Black-Owned Business label. We similarly observe more website views (3.7) and more calls (0.8).

In Panel B, we create a standardized index of pre-label performance, in line with [Kling et al. \(2007\)](#). When we pool all five of our main outcomes within a single quality index and use this as a source of heterogeneity, we again find the Black-owned business label has greater benefits, in terms of customer engagement and firm performance, for high-quality businesses. We observe significant differential increases in all of our five main outcomes for restaurants with higher composite quality scores.

In sum, we find that the main effects are primarily driven by high-rated restaurants and less so by

lower-rated restaurants. Collectively, the results here suggest that a policy of increasing the visibility and business activity of Black-owned firms will be most beneficial for high-quality firms.<sup>33</sup> An examination of why these businesses benefit most is reserved for future study.<sup>34</sup>

## 5 Conclusion

In this paper, we studied the effect of a corporate policy designed to reduce the cost of searching for Black-owned businesses on customer engagement and firm performance. Across a number of outcomes, we find that restaurants tagged as “minority-owned” experience sustained improvements in business outcomes. The Black-owned business label led to large increases in restaurant page views, website views, and calls, each by over 50% above the baseline. Moreover, these restaurants experienced substantial increases in both orders and revenue following the addition of the Black-owned business label to the platform. These gains in customer engagement and firm performance are evident for restaurants that opted into the minority label as well as for restaurants identified as Black-owned by the platform, thus ameliorating concerns regarding selection into label adoption. A number of robustness checks further strengthen our interpretation as causal in nature.

In terms of channels, we provide suggestive evidence that the racial characteristics, attitudes, and political affiliation of consumers matter. First, we show that the average effect in our setting is driven primarily by neighborhoods with higher shares of White residents. This finding is corroborated and bolstered by the additional finding that the tagging of Black-owned businesses increases the number of White restaurant reviewers. Second, using voting data and implicit bias measures, we show that the effects are more prominent in more liberal and less biased geographies. We thus conclude that the main effects are primarily driven by White consumers with more favorable attitudes toward supporting historically marginalized groups.

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<sup>33</sup>Chain and franchise restaurants are likely to be associated with their larger organization rather than with the establishment’s owner; thus, we expect franchisees to benefit less from using the Black-owned business label. Appendix Table AV confirms this intuition; for website views and calls, there appears to be little-to-no net benefit of being labeled a Black-owned business.

<sup>34</sup>Another potential explanation is that consumers use the Black-owned label to infer something about the quality of restaurants serving cuisine that is considered stereotypically “Black.” To address this concern, in Table AVI, we restrict the analysis to restaurants serving European, Asian, and South and Central American cuisines, for which we expect this concern to be alleviated. While this sample selection process substantially decreases our statistical power (as is evident in the sharp drop in the number of observations), we find consistent and, for the most part, statistically significant effects of label on business performance.



Overall, our results highlight consumer preferences for supporting minority-owned businesses and suggest that platforms can in some cases increase demand for minority-owned businesses by making the ethnicity of minority owners more salient. Specifically, our findings provide evidence that increasing visibility can improve the restaurant performance of Black business owners, to the extent that there exists latent demand for such establishments among White consumers.

Our results can also be compared with previous literature that documents extensive anti-Black bias in the United States. This raises an important conceptual question: How can Black-owned business labels improve outcomes in a world with anti-Black bias? While we are unable to assess the relative importance of this particular mechanism compared to alternative explanations, we present a stylized model formalizing one potential mechanism. The main idea of the model – presented in [Appendix B](#) – is that, unlike in previous settings, in which all users immediately became aware of minority ownership, in this setting, consumers chose to actively learn about a seller’s race. The main result of the model is that specific types of users, particularly those with strong preferences toward a seller’s race, select into using the label. This self-selection can lead to positive effects of the label on Black-owned businesses, even when the average sentiment in the population is anti-Black.

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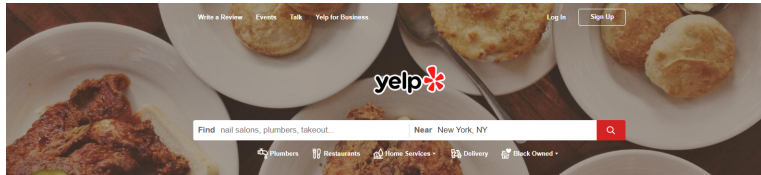
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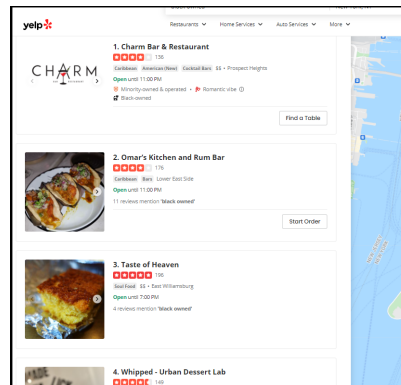
# Figures

Figure I: Searching for Black-Owned Businesses on Yelp

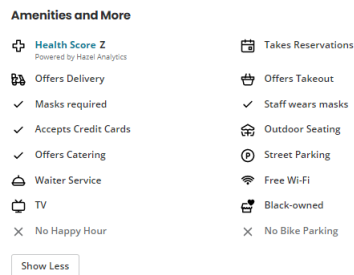
Panel A: Search on Yelp



Panel B: Search Results Page

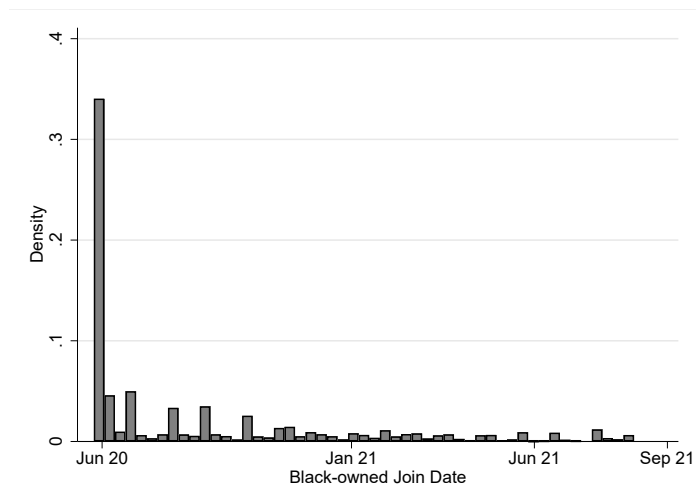


Panel C: Restaurant Page



*Notes:* The figure demonstrates how the Yelp platform operates. Panel A presents the search landing page. Panel B presents a sample search results page. Panel C presents a sample restaurant page on the Yelp platform.

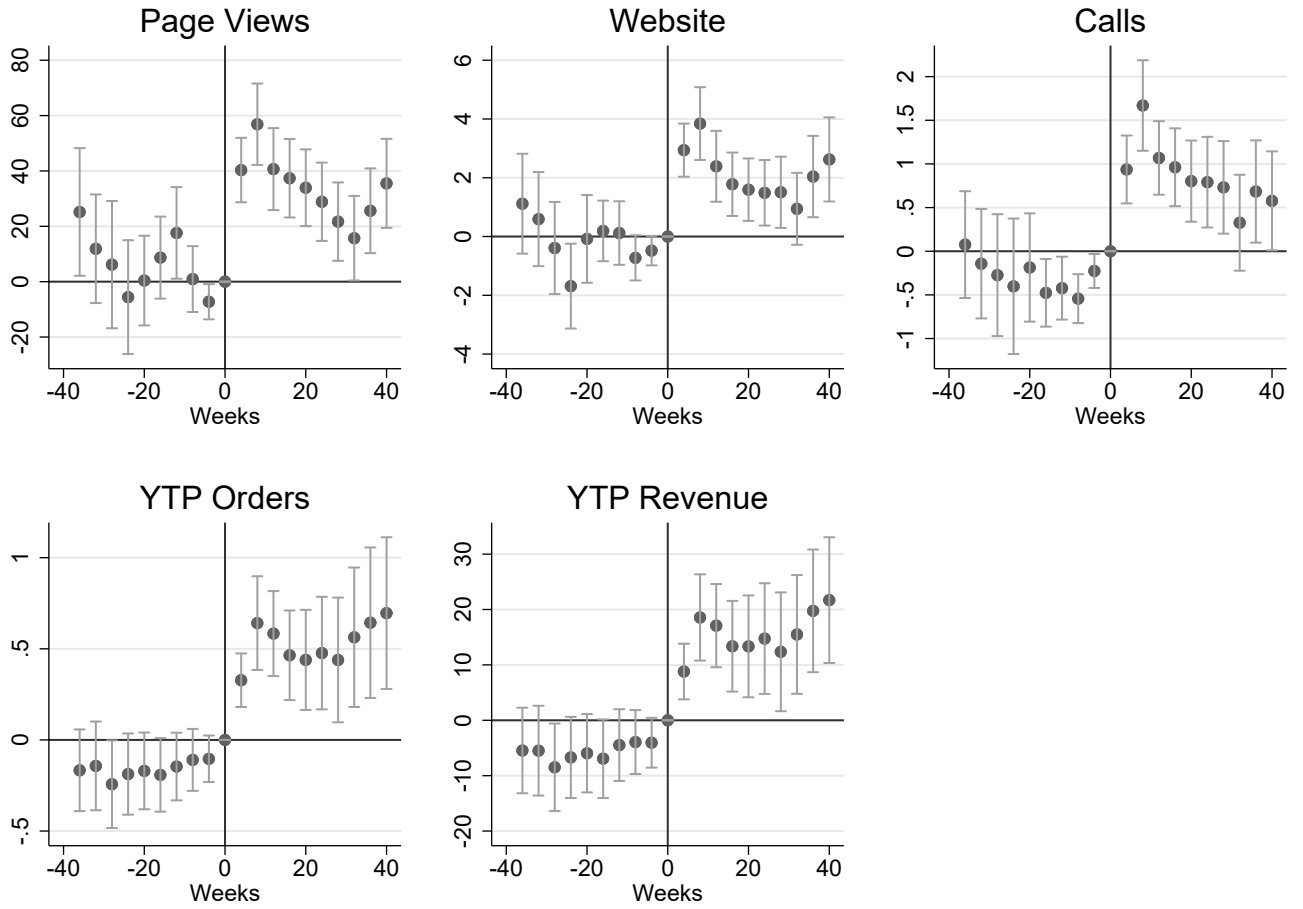
Figure II: Joining dates



Notes: The figure presents the distribution of dates (by week) for which businesses obtain (either by self-identification or by user reviews) Yelp's Black-owned business label.



Figure III: The Effect of the Label on Business Outcomes



*Notes:* The figure displays results based Equation 2 for each of five primary consumer demand and firm performance outcomes, where the estimate between treatment and control firms is allowed to vary for each month around the introduction of the Black-owned business label (see description around Equation 2). Each panel also reports 95% confidence intervals. Standard errors are clustered at the business level.

## Tables

Table I: Comparison of Matched Firm Sample to the Complete Firm Sample

	Matched Sample (Weighted)				Full Data			
	Black-Owned (N=1,288)		None Black- Owned Businesses (N=26,546)		Black-Owned (N=1,831)		None Black- Owned Businesses (N=295,367)	
	Mean	Std.Dev.	Mean	Std.Dev.	Mean	Std.Dev.	Mean	Std.Dev.
Ratings	3.92	0.62	3.88	0.62	3.91	0.68	3.52	0.86
Franchisee	0.02	0.15	0.02	0.15	0.03	0.16	0.17	0.38
Delivery	0.70	0.46	0.70	0.46	0.73	0.45	0.42	0.49
Year Created	2017	3.65	2015	4.41	2017	3.75	2013	4.58
Num. Zip Codes	520	-	520	-	788	-	3425	-
Cuisine (HHI)	0.31	-	0.31	-	0.55	-	0.35	-

*Notes:* This table presents summary statistics for our main (matched) sample of Black and non-Black-owned firms (columns 1-4), as well as for the full sample of Black and non-Black-owned firms (columns 5-8). Columns 1 and 2 (3 and 4) show the mean and standard deviation for the Black-owned (non-Black-owned) firms. Columns 5 and 6 (7 and 8) show the mean and standard deviation for the Black-owned (non-Black-owned) firms for the *unmatched*, or full, sample of restaurants.

Table II: The Effect of the Label on Business Outcomes

	(1) Page Views	(2) Website	(3) Calls	(4) YTP Orders	(5) YTP Revenue
Panel A: All Black-owned Businesses					
Black	25.346*** (7.910)	3.891*** (0.739)	1.651*** (0.293)	0.678*** (0.152)	20.101*** (3.842)
Observations	2446843	2446843	2446843	370867	370867
# of Clusters	27763	27763	27763	3621	3621
Dep Var. Mean	37.50	2.28	0.80	1.26	37.90
Panel B: Self-labeled as Black-owned Businesses					
Black	45.622*** (10.071)	4.853*** (1.067)	1.828*** (0.405)	0.863*** (0.235)	24.967*** (5.831)
Observations	1839985	1839985	1839985	224409	224409
# of Clusters	21230	21230	21230	2381	2381
Dep Var. Mean	34.28	2.15	0.67	1.38	42.18
Panel C: Reviewed as Black-owned Business By Users					
Black	21.139 (14.782)	5.012*** (1.454)	2.240*** (0.571)	0.961*** (0.264)	26.742*** (5.978)
Observations	1122039	1122039	1122039	238170	238170
# of Clusters	12619	12619	12619	2260	2260
Dep Var. Mean	49.16	2.95	1.10	1.18	35.08
Panel D: Only Late Adopters Black-owned Businesses					
Black	35.003*** (8.823)	2.993*** (0.688)	1.246*** (0.228)	0.406*** (0.118)	13.661*** (3.877)
Observations	1787888	1787888	1787888	177573	177573
# of Clusters	20803	20803	20803	2072	2072
Dep Var. Mean	25.46	1.56	0.53	1.31	39.70
Panel E: Only Late Adopters Reviewed as Black-owned Businesses					
Black	27.597 (17.430)	2.338** (1.069)	1.365*** (0.397)	0.608*** (0.198)	19.242*** (6.415)
Observations	695003	695003	695003	93688	93688
# of Clusters	8220	8220	8220	1116	1116
Dep Var. Mean	32.81	2.06	0.67	1.07	32.71

*Notes:* This table presents OLS regressions results relating firm outcomes to the adoption of the Black-owned business label in a DID design (see description around Equation 1). *Black* is an indicator of whether a restaurant is designated by Yelp as having a Black proprietor in a given week. The unit of observation is the business week. The dependent variables are the weekly number of Yelp restaurant page views (Column 1), the number of restaurant website views (Column 2), the number of calls to the restaurant via the Yelp online platform (Column 3), the weekly number of online orders (Column 4), and the platform-based revenue and weekly revenue (Column 5). All regressions include business and week fixed effects. Standard errors are in parentheses and are clustered at the business-level. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Table III: The Effect of the Label on Business Outcomes: Using Only Other Black-Owned Businesses as Controls

	(1)	(2)	(3)	(4)	(5)
	Page Views	Calls	Website	YTP Orders	YTP Revenue
Black	23.810*** (6.974)	1.955*** (0.255)	4.207*** (0.590)	0.685*** (0.137)	20.474*** (4.084)
Observations	132435	132435	132435	74515	74515
# of Clusters	1518	1518	1518	678	678
Dep Var. Mean	145.82	3.32	8.21	1.11	33.93

*Notes:* This table presents OLS regression results relating firm outcomes to the adoption of the Black-owned business label in a DID design (see description around [Equation 1](#)). *Black* is an indicator for whether a restaurant is designated by Yelp as having a Black proprietor in a given week. We restrict the sample to businesses identified as Black-owned on Yelp or NETS. The estimates compare the effects of Black-owned businesses labeled on Yelp to Black-owned businesses not (yet) labeled on Yelp. The unit of observation is the business week. The dependent variables are the weekly number of Yelp restaurant page views (Column 1), the number of restaurant website views (Column 2), the number of calls to the restaurant via the Yelp online platform (Column 3), the weekly number of online orders (Column 4), and the platform-based revenue and weekly revenue (Column 5). All regressions include business and week fixed effects. Standard errors are in parentheses and are clustered at the business level. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Table IV: The Effect of the Label on Off-Platform Business Outcomes

	(1) Weekly Visits	(2) Weekly Visits	(3) Weekly Visits
Black	3.117** (1.504)	3.369** (1.398)	3.570*** (1.342)
Observations	419637	494486	547924
# of Clusters	2609	3075	3399
Dep Var. Mean	29.75	30.65	32.09

*Notes:* This table presents OLS regression results relating firm outcomes to the adoption of the Black-owned business label in a DID design (see description around [Equation 1](#)). *Black* is an indicator for whether a restaurant is designated by Yelp as having a Black proprietor in a given week. The unit of observation is the business week. The dependent variable is number of weekly visits in the SafeGraph data. Columns differ only in the matching procedures between the main and SafeGraph data. Column 1 restricts the sample to exact matches on longitude-latitude, zip code, and restaurant name; Column 2 allows for fuzzy name matches; and Column 3 also allows for looser coordinate matches (1 decimal) or fuzzy matches on address. All regressions include business and week fixed effects. Standard errors are in parentheses and are clustered at the business level. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Table V: The Effect of the Latinx-owned Label on Business Outcomes

	(1)	(2)	(3)	(4)	(5)
	Page Views	Calls	Website	YTP Orders	YTP Revenue
Latinx	31.466*** (7.632)	2.028*** (0.429)	5.842*** (1.055)	0.514*** (0.169)	15.299*** (4.752)
Observations	2307834	2307834	2307834	387426	387426
# of Clusters	25766	25766	25766	3848	3848
Dep Var. Mean	51.77	1.17	3.17	1.80	55.64

*Notes:* This table presents OLS regression results relating firm outcomes to the adoption of the Black-owned business label in a DID design (see description around [Equation 1](#)). *Latinx* is an indicator for whether a restaurant is designated by Yelp as having a Latinx proprietor in a given week. The unit of observation is the business week. The dependent variables are the weekly number of Yelp restaurant page views (Column 1), the number of restaurant website views (Column 2), the number of calls to the restaurant via the Yelp online platform (Column 3), the weekly number of online orders (Column 4), and the platform-based revenue and weekly revenue (Column 5). All regressions include business and week fixed effects. Standard errors are in parentheses and are clustered at the business level. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Table VI: The Effect of the Black-owned Status on Wayfair

	(1) Engagement	(2) Revenue	(3) Engagement	(4) Revenue
Post X Black	0.513*** (0.158)	0.339 (0.329)	0.571*** (0.22)	0.356 (0.239)
Observations	16811	16764	16802	16594
# of Black-owned Suppliers	21	21	21	18
# of Not Black-owned Suppliers	1443	1443	1443	1443
# of Unique Items	929640	929640	929640	927735

*Notes:* This table presents OLS regression results relating firm outcomes to the adoption of the Black-owned business label in a DID design (see description around [Equation 1](#)). *Black* is an indicator of whether a restaurant is designated by Wayfair as having a Black proprietor in a given week. The unit of observation is the business week. The dependent variables are engagement, as defined by the weekly number of product page visits (Columns 1 & 3), and weekly seller revenue (Columns 2 & 4). All regressions include seller and week fixed effects. Standard errors are in parentheses and are clustered at the seller level. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Table VII: Heterogeneity in the Effect of the Label by Neighborhood Demographic Composition

	(1) Page Views	(2) Website	(3) Calls	(4) YTP Orders	(5) YTP Revenue
Black	26.425** (10.872)	5.453*** (1.002)	2.321*** (0.405)	0.863*** (0.210)	27.512*** (5.467)
Black $\times$ Frac. Black	-3.484 (17.124)	-4.938*** (1.228)	-2.118*** (0.517)	-0.591** (0.267)	-23.598*** (7.921)
Observations	2446693	2446693	2446693	370867	370867
# of Clusters	27761	27761	27761	3621	3621
Dep Var. Mean	37.50	2.28	0.80	1.26	37.90

*Notes:* This table presents OLS regression results relating firm outcomes to the adoption of the Black-owned business label, examining heterogeneity by pre-treatment demographic composition (focusing on Black population share). *Black* is an indicator of whether a restaurant is designated by Yelp as having a Black proprietor in a given week. *Frac. Black* is a continuous variable indicating the fraction of residents in a restaurant's zip code who are Black. The unit of observation is the business week. The dependent variables are the weekly number of Yelp restaurant page views (Column 1), the number of restaurant website views (Column 2), the number of calls to the restaurant via the Yelp online platform (Column 3), the weekly number of online orders (Column 4), and the platform-based revenue and weekly revenue (Column 5). All regressions include business and week fixed effects. Standard errors are in parentheses and are clustered at the business level. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .



Table VIII: Effect on Reviewers' Race

	(1) By White Users	(2) By Black Users
Panel A: Linear Flow of Reviews by Reviewers' Race		
Black	0.089*** (0.018)	0.035 (0.023)
Panel A: Poisson Flow of Reviews by Reviewers' Race (IRR)		
Black	1.620*** (0.16)	1.311** (0.12)
Observations	34254	34254
# of Clusters	2156	2156
Dep Var. Mean	0.24	0.14

*Notes:* This table presents regression results relating the number of Yelp reviews (by race of customer) to the adoption of the Black-owned business label. *Black* is an indicator of whether a restaurant is designated by Yelp as having a Black proprietor in a given week. The unit of observation is the business month. The dependent variables are the number of reviews by White customers (Column 1) and the number of reviews by Black customers (Column 2). In Panel A, we estimate the regression relating the Black-owned business label to reviews using a linear regression model. In Panel B, we use a Poisson regression model. All regressions include business and week fixed effects. Standard errors are in parentheses and are clustered at the business level. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Table IX: Heterogeneity in the Effect of the Label by Political Ideology

	(1) Page Views	(2) Website	(3) Calls	(4) YTP Orders	(5) YTP Revenue
Panel A: Majority Democrats (By County)					
Black	8.674 (7.096)	0.430 (0.637)	0.067 (0.201)	0.192 (0.125)	4.774 (4.072)
Black × Majority Dem.	18.948* (10.905)	5.361*** (0.987)	2.405*** (0.361)	0.707*** (0.179)	23.941*** (5.290)
Observations	2446693	2446693	2446693	370867	370867
# of Clusters	27761	27761	27761	3621	3621
Number of Counties	48	48	48	16	16
Mean Majority Dem.	0.75	0.75	0.75	0.69	0.69
Dep Var. Mean	37.50	2.28	0.80	1.26	37.90
Panel B: Majority Democrats (By Zipcode)					
Black	44.404*** (10.385)	4.098*** (0.820)	1.476*** (0.307)	0.514*** (0.132)	15.864*** (4.033)
Black × Majority Dem.	-22.387* (13.053)	1.630 (1.110)	1.026** (0.425)	0.408** (0.185)	13.587*** (5.194)
Observations	2443211	2443211	2443211	370134	370134
# of Clusters	27709	27709	27709	3603	3603
Mean Majority Dem.	0.82	0.82	0.82	0.87	0.87
Dep Var. Mean	37.47	2.27	0.80	1.26	37.95

*Notes:* This table presents OLS regression results relating firm outcomes to the adoption of the Black-owned business label, examining heterogeneity by pre-treatment political characteristics (whether a city or county is majority Democrat). *Black* is an indicator of whether a restaurant is designated by Yelp as having a Black proprietor in a given week. *Majority Dem.* is a dummy variable indicating that either a county (Panel A) or zip code (Panel B) voted for the Democratic presidential candidate in 2016. Democratic vote share is determined by collapsing precinct-level returns from the Dave Leip’s Atlas and MIT Election Lab to the relevant geographic level. The unit of observation is the business week. The dependent variables are the weekly number of Yelp restaurant page views (Column 1), the number of restaurant website views (Column 2), the number of calls to the restaurant via the Yelp online platform (Column 3), the weekly number of online orders (Column 4), and the platform-based revenue and weekly revenue (Column 5). All regressions include business and week fixed effects. Standard errors are in parentheses and are clustered at the business-level. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Table X: Heterogeneity in the Effect of the Label by Racial Attitudes

	(1)	(2)	(3)	(4)	(5)
	Page Views	Website	Calls	YTP Orders	YTP Revenue
Panel C: Racial Bias (Average IAT Score By Zipcode)					
Black	33.784 (39.372)	7.836** (3.786)	5.107*** (1.629)	2.315** (0.948)	65.255*** (21.138)
Black $\times$ IAT Score	-25.882 (116.788)	-8.286 (10.781)	-9.635** (4.590)	-5.076* (2.783)	-131.999** (63.772)
Observations	2429242	2429242	2429242	370310	370310
# of Clusters	27557	27557	27557	3612	3612
Dep Var. Mean	37.66	2.29	0.80	1.26	37.93

*Notes:* This table presents OLS regressions results relating firm outcomes to the adoption of the Black-owned business label, examining heterogeneity by zip code-level IAT bias toward White and good. *Black* is an indicator of whether a restaurant is designated by Yelp as having a Black proprietor in a given week. IAT Score is a continuous variable indicating the IAT D score, where higher values are associated with more bias toward White and good. The unit of observation is the business week. The dependent variables are the weekly number of Yelp restaurant page views (Column 1), the number of restaurant website views (Column 2), the number of calls to the restaurant via the Yelp online platform (Column 3), the weekly number of online orders (Column 4), and the platform-based revenue and weekly revenue (Column 5). All regressions include business and week fixed effects. Standard errors are in parentheses and are clustered at the business level. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Table XI: Heterogeneity in the Effect of the Label by Business Performance

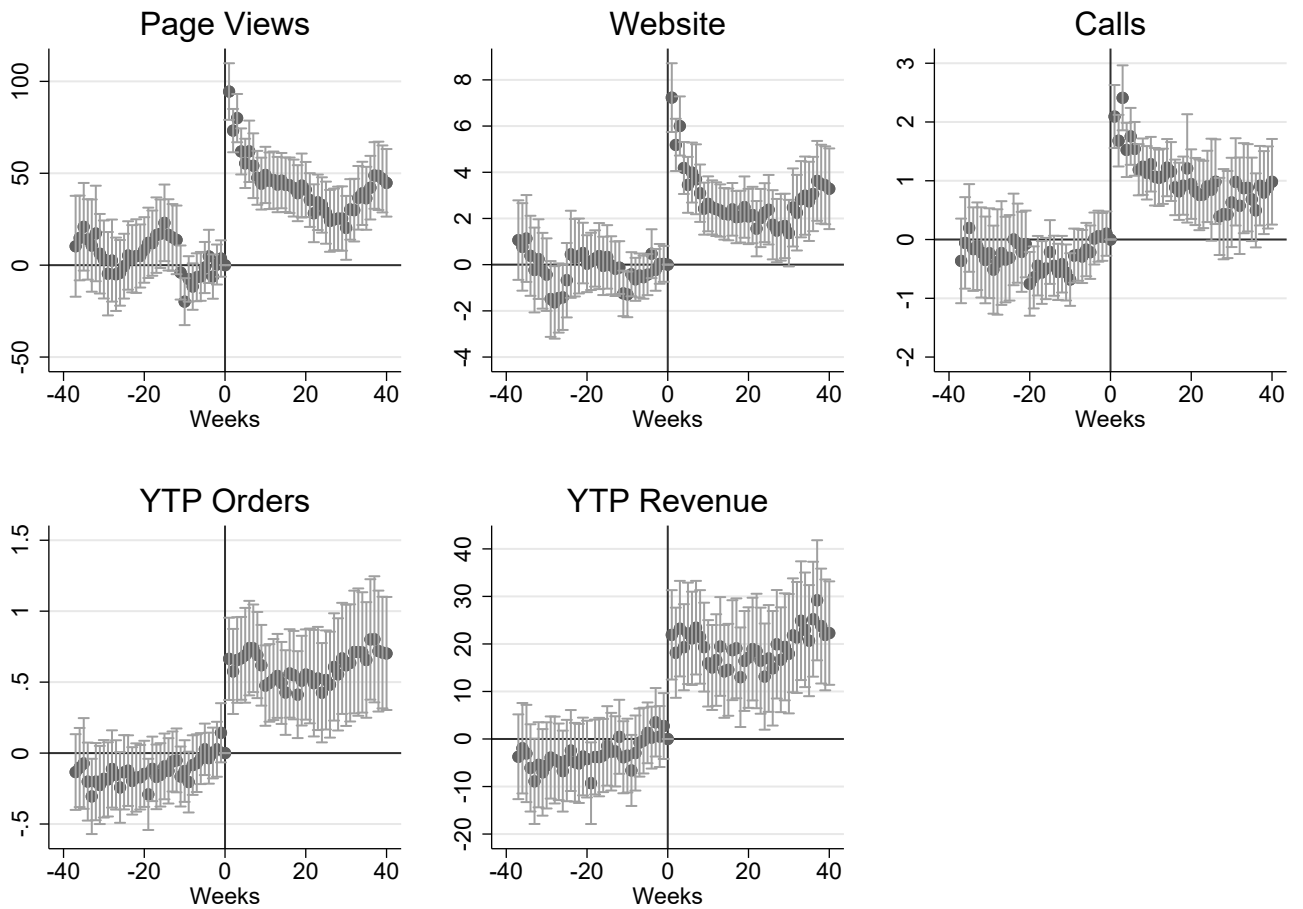
	(1) Page Views	(2) Website	(3) Calls	(4) YTP Orders	(5) YTP Revenue
Panel A: Rating Above/Below Median					
Black	-13.927 (9.376)	0.880* (0.525)	0.781*** (0.261)	0.361*** (0.106)	11.481*** (3.300)
Black $\times$ Ratings	42.787*** (12.831)	3.678*** (1.079)	0.784* (0.436)	0.311 (0.208)	8.083 (5.509)
Observations	489745	489745	489745	307285	307285
# of Clusters	4514	4514	4514	2308	2308
Panel B: Performance Pre-feature Index					
Black	24.870 (15.693)	-1.727 (1.640)	-1.172* (0.629)	0.305*** (0.097)	6.791** (2.699)
Black $\times$ Index	0.095 (5.818)	1.543** (0.615)	0.742*** (0.235)	0.065** (0.026)	2.673*** (0.772)
Observations	265291	265291	265291	324090	324090
# of Clusters	2463	2463	2463	2463	2463

*Notes:* This table presents OLS regression results relating firm outcomes to the adoption of the Black-owned business label, examining heterogeneity by pre-treatment restaurant quality. *Black* is an indicator of whether a restaurant is designated by Yelp as having a Black proprietor in a given week. Panel A examines heterogeneous effects by restaurant pre-treatment rating based on Yelp’s five-star rating system. Panel B examines heterogeneous effects by restaurant quality using a standardized index of quality based on the five main outcomes (quality index computed a z-score as in [Kling et al. \(2007\)](#)). The dependent variables are the weekly number of Yelp restaurant page views (Column 1), the number of restaurant website views (Column 2), the number of calls to the restaurant via the Yelp online platform (Column 3), the weekly number of online orders (Column 4), and the platform-based revenue and weekly revenue (Column 5). All regressions include business and week fixed effects. Standard errors are in parentheses and are clustered at the business level. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

## **Online Appendix - Not for publication**

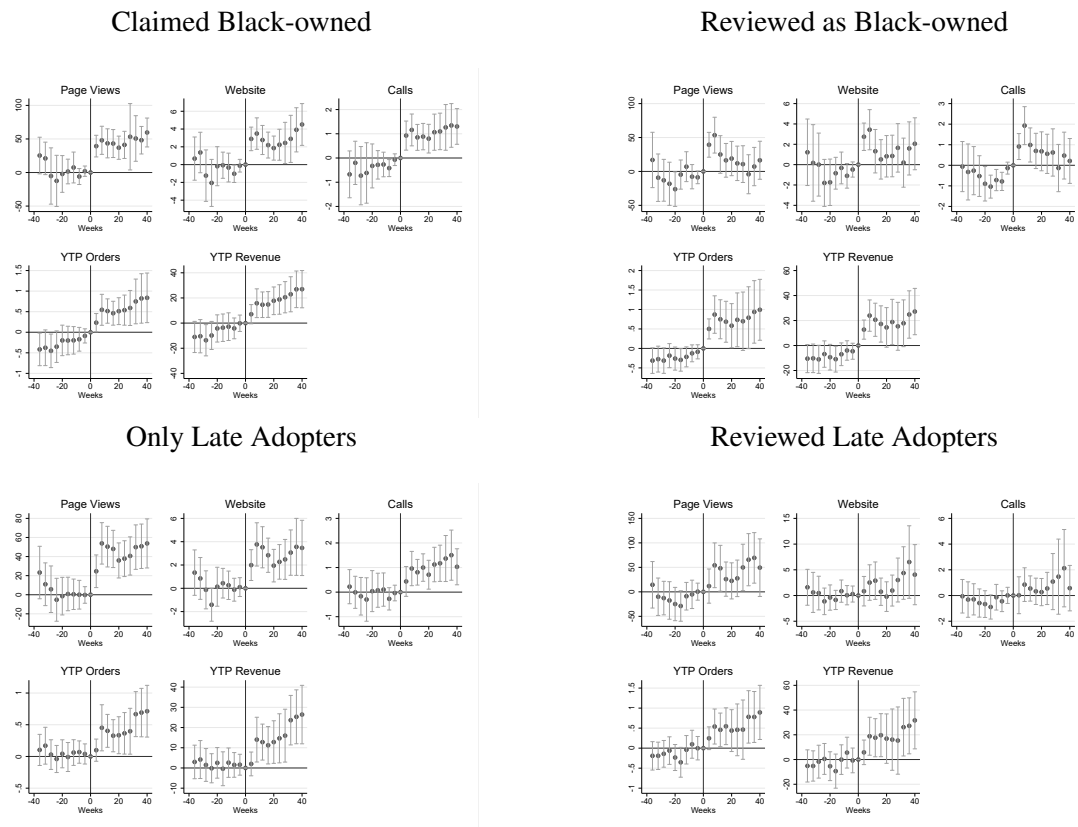
### **A Additional Tables and Figures**

Figure AI: The Effect of the Label on Business Outcomes (Week-level Analysis)



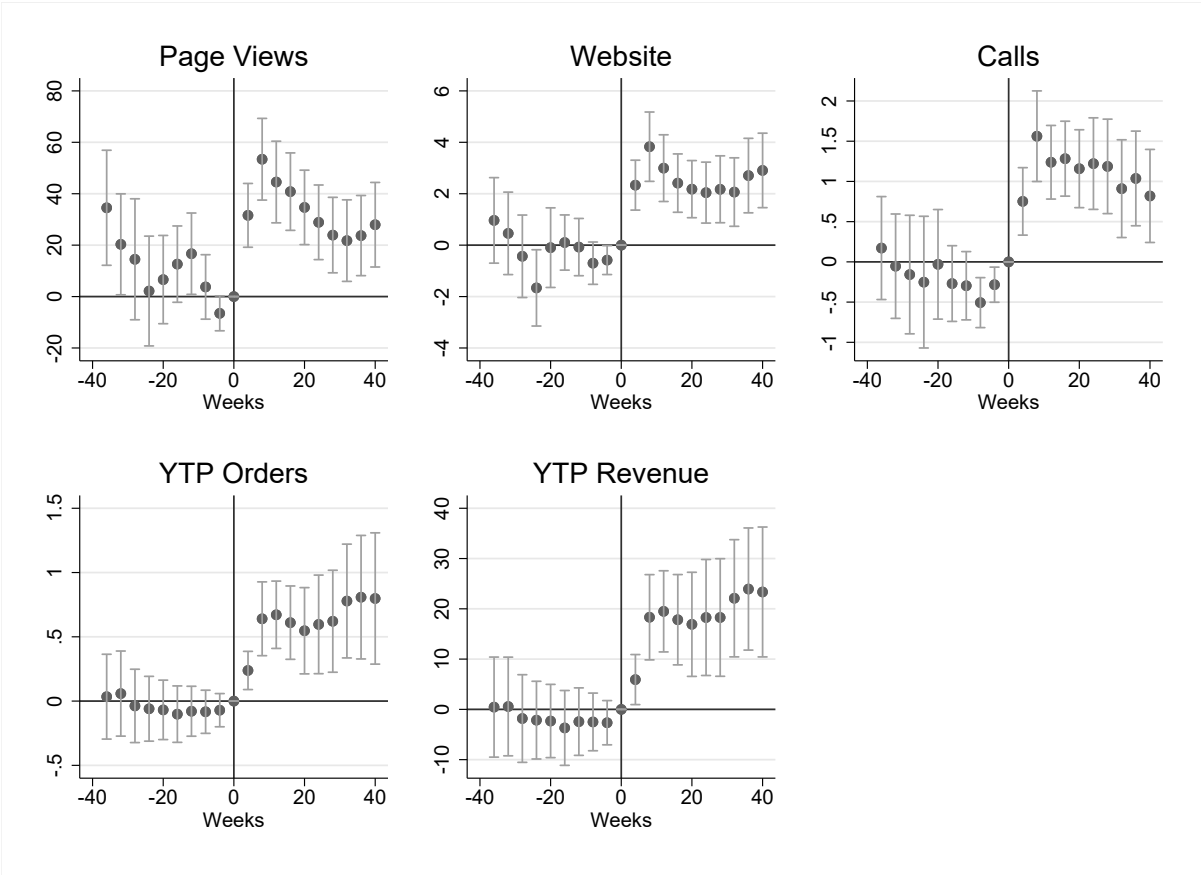
*Notes:* The figure displays results based on [Equation 2](#) for each of five primary consumer demand and firm performance outcomes, where the estimate between treatment and control firms is allowed to vary for each week around the introduction of the Black-owned business label (see description around [Equation 2](#)). Each panel also reports 95% confidence intervals. Standard errors are clustered at the business level.

Figure AII: The Effect of the Label on Business Outcomes (Alternative Sub-Samples)



*Notes:* The figure displays results based on Equation 2 for each of five primary consumer demand and firm performance outcomes, where the estimate between treatment and control firms is allowed to vary for each month around the introduction of the Black-owned business label (see description around Equation 2). Each panel presents the results of each sub-sample, corresponding to the specifications in Panels B through E of Table II. Each panel also reports 95% confidence intervals. Standard errors are clustered at the business level.

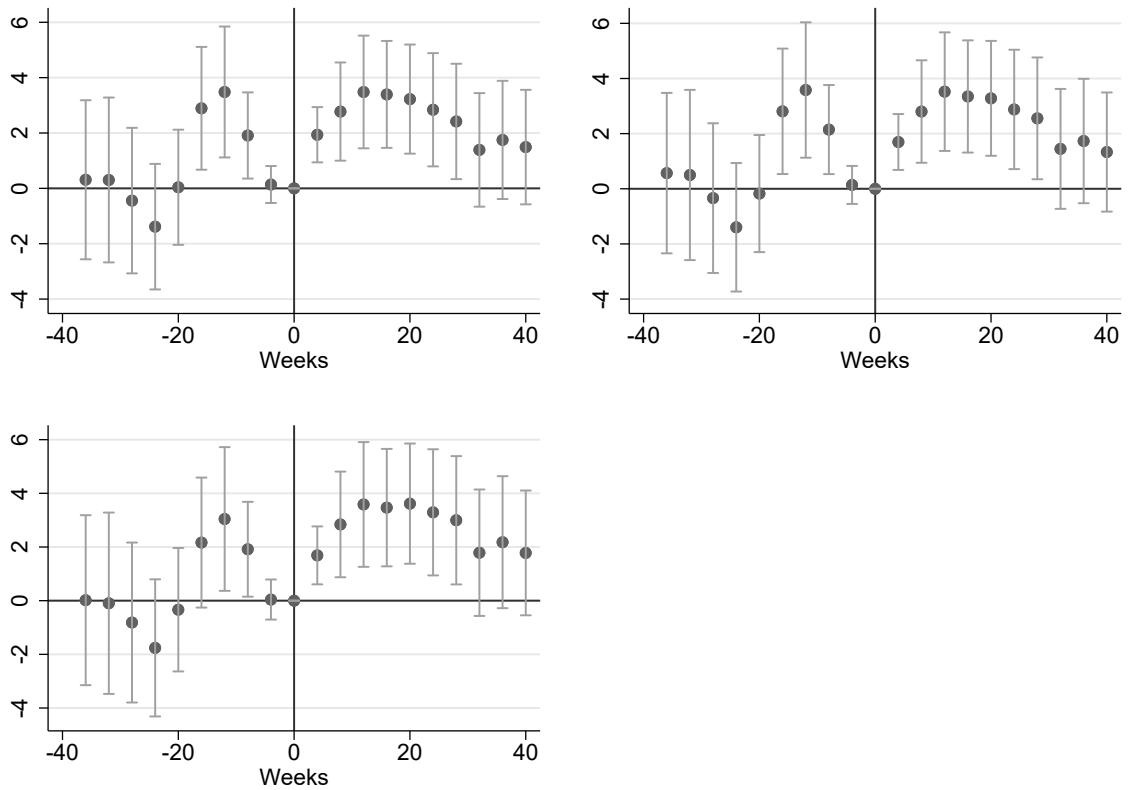
Figure AIII: The Effect of the Label on Business Outcomes: Using Only Other Black-Owned Businesses as Controls



*Notes:* The figure displays results based on Equation 2 for each of five primary consumer demand and firm performance outcomes, where the estimate between treatment and control firms is allowed to vary for each month around the introduction of the Black-owned business label (see description around Equation 2). We restrict the sample to businesses identified as Black-owned on Yelp or NETS, essentially comparing the effects of Black-owned businesses labeled on Yelp to Black-owned businesses not (yet) labeled on Yelp. Each panel also report 95% confidence intervals. Standard errors are clustered at the business level.

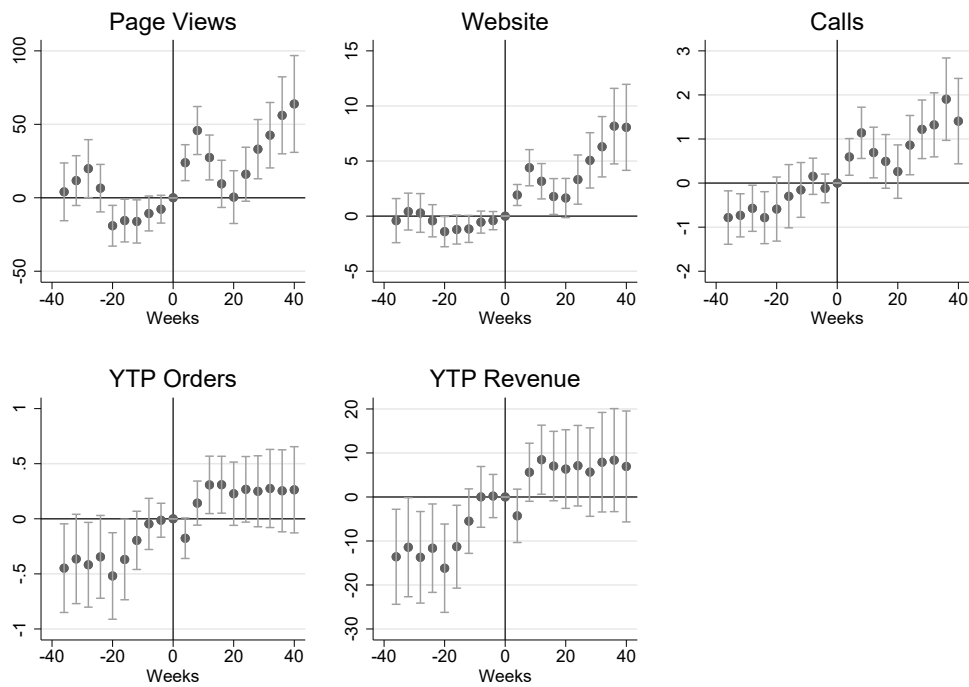


Figure AIV: The Effect of the Label on Off-Platform Business Outcomes



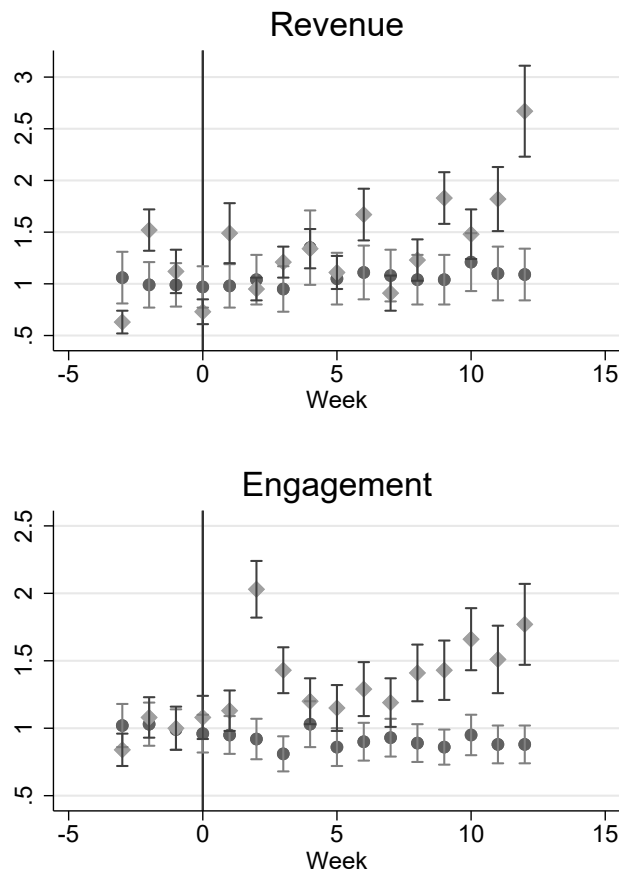
*Notes:* Figure displays results based on Equation 2 for the number of weekly visits in the SafeGraph data, where the estimate between treatment and control firms is allowed to vary for each month around the introduction of the Black-owned business label (see description around Equation 2). Each panel presents the results of each matching algorithm, corresponding to the specifications in Table IV, as well as 95% confidence intervals. Standard errors are clustered at the business level.

Figure AV: The Effect of the Latinx-owned Label on Business Outcomes



*Notes:* The figure displays results based on Equation 2 for each of five primary consumer demand and firm performance outcomes, where the estimate between treatment and control firms is allowed to vary for each month around the introduction of the Latinx-owned business label (see description around Equation 2). Each panel also reports 95% confidence intervals. Standard errors are clustered at the business level.

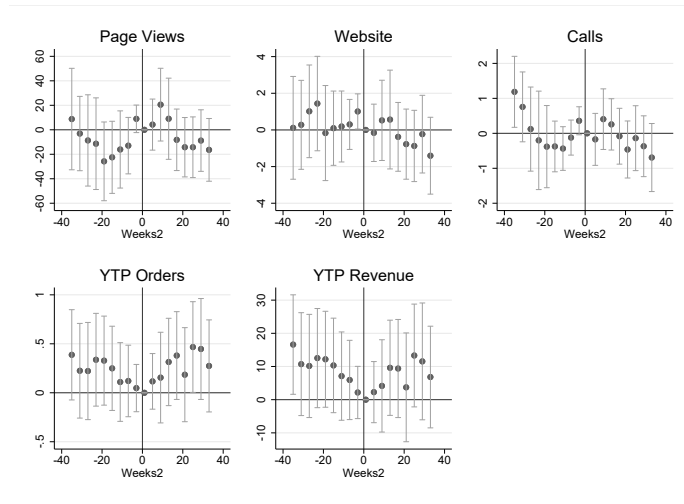
Figure AVI: The Effect of the Black-owned Status on Wayfair



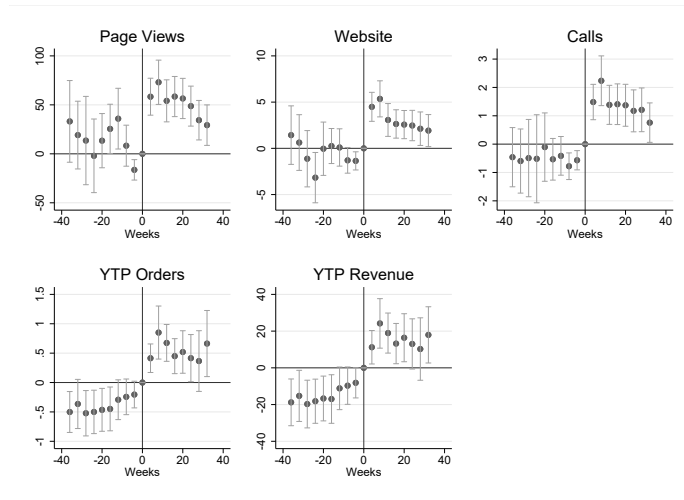
*Notes:* The figure displays results based on Equation 2 for the two primary consumer demand and firm performance outcomes, where the estimate between treatment and control firms is allowed to vary for each month around the introduction of the Black-owned business label (see description around Equation 2). Each panel also reports 95% confidence intervals. Standard errors are clustered at the business level.

Figure AVII: Heterogeneity in the Effect of the Label by Neighborhood Demographic Composition

Panel A: High Fraction of Black Residents



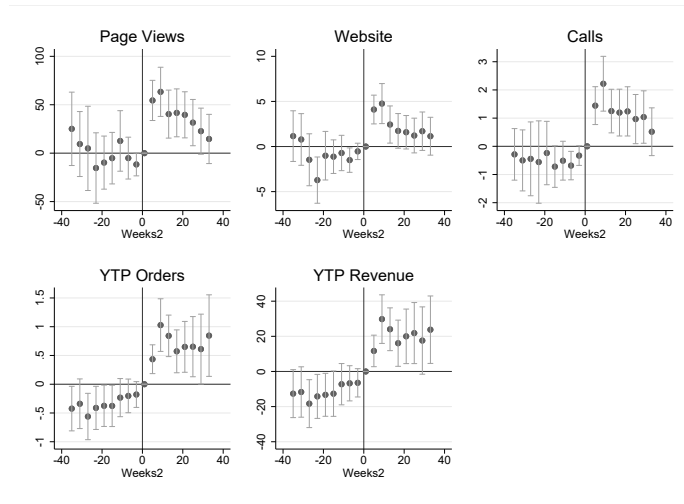
Panel B: Low Fraction of Black Residents



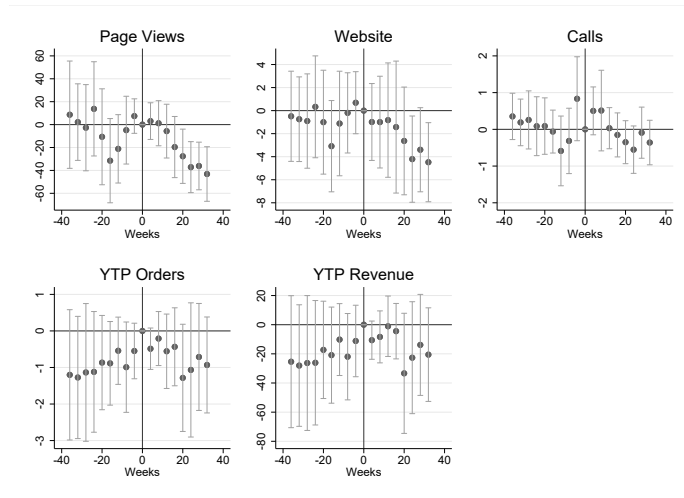
*Notes:* The figure displays the results based on Equation 2 for each of five primary consumer demand and firm performance outcomes, examining heterogeneity by pre-treatment demographic composition (focusing on Black population share), where the estimate between treatment and control firms is allowed to vary for each month around the introduction of the Black-owned business label (see description around Equation 2). Panel A (B) presents the effect in geographies with a high (low) fraction of Black residents. Each panel also reports 95% confidence intervals. Standard errors are clustered at the business level.

Figure AVIII: Heterogeneity in the Effect of the Label by Political Ideology

Panel A: Majority Democrat



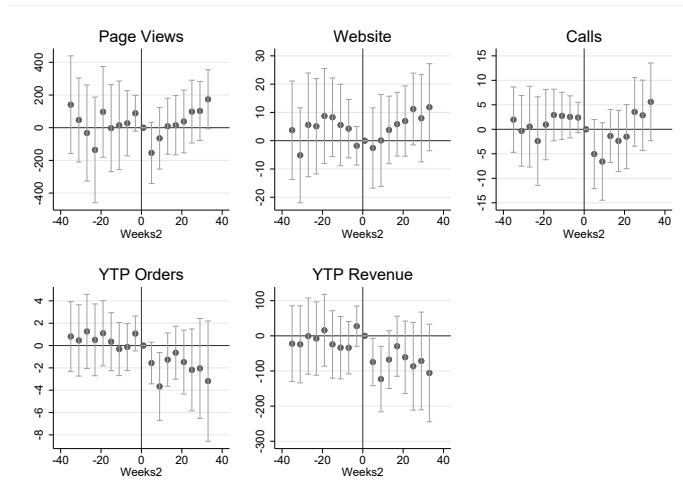
Panel B: Majority Republican



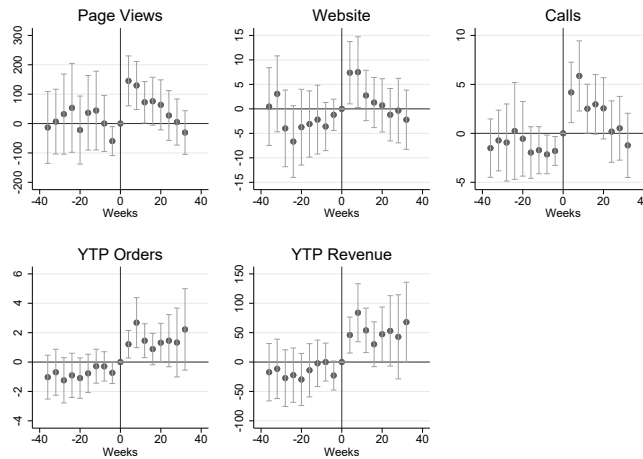
*Notes:* The figure displays results based on Equation 2 for each of five primary consumer demand and firm performance outcomes, examining heterogeneity by pre-treatment political ideology (focusing on majority vote in the 2016 presidential election), where the estimate between treatment and control firms is allowed to vary for each month around the introduction of the Black-owned business label (see description around Equation 2). Panel A (B) presents the effect in geographies with majority Democrats (Republicans). Each panel also reports 95% confidence intervals. Standard errors are clustered at the business level.

Figure AIX: Heterogeneity in the Effect of the Label by Racial Attitudes

Panel A: High Anti-Black Bias



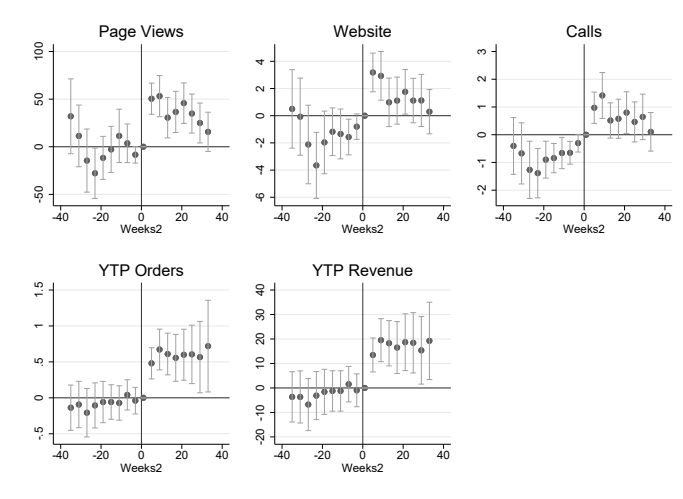
Panel B: Low Anti-Black Bias



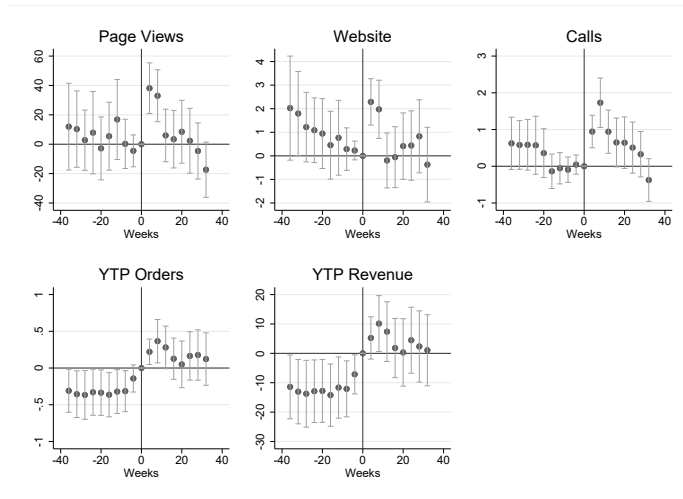
Notes: Figure displays results based on Equation 2 for each of five primary consumer demand and firm performance outcomes by zip code-level IAT bias towards White and good, where the estimate between treatment and control firms is allowed to vary for each month around the introduction of the Black-owned business label (see description around Equation 2). Panel A (B) presents the effect in geographies with a high (low) Anti-Black bias. Each panel also reports 95% confidence intervals. Standard errors are clustered at the business level.

Figure AX: Heterogeneity in the Effect of the Label by Firms' Ratings

Panel A: High Ratings



Panel B: Low Ratings



Notes: The figure displays results based on Equation 2 for each of five primary consumer demand and firm performance outcomes by indicator for whether the restaurant has an above-median rating, where the estimate between treatment and control firms is allowed to vary for each month around the introduction of the Black-owned business label (see the description around Equation 2). Panel A (B) presents the effect in geographies with a high (low) Anti-Black bias. Each panel also reports 95% confidence intervals. Standard errors are clustered at the business level.

Table AI: The Effect of the Label on Business Outcomes (Full, Unmatched Sample)

	(1) Page Views	(2) Website	(3) Calls	(4) YTP Orders	(5) YTP Revenue
Panel A: All Black-owned Businesses					
Black	35.489*** (6.062)	3.403*** (0.511)	2.060*** (0.231)	0.960*** (0.158)	27.959*** (5.216)
Observations	31675899	31675899	31675899	7513564	7513564
# of Clusters	272245	272245	272245	59451	59451
Dep Var. Mean	58.48	3.87	2.75	1.94	61.51
Panel B: Claimed Black-owned Businesses					
Black	51.346*** (7.882)	4.304*** (0.707)	2.244*** (0.320)	1.229*** (0.237)	37.168*** (7.646)
Observations	31675899	31675899	31675899	7513564	7513564
# of Clusters	272245	272245	272245	59451	59451
Dep Var. Mean	58.48	3.87	2.75	1.94	61.51
Panel C: Reviewed as Black-owned Businesses					
Black	33.658*** (10.466)	3.849*** (0.863)	2.573*** (0.357)	1.092*** (0.212)	29.863*** (6.460)
Observations	31675899	31675899	31675899	7513564	7513564
# of Clusters	272245	272245	272245	59451	59451
Dep Var. Mean	58.48	3.87	2.75	1.94	61.51
Panel D: Only Late Adopters Black-owned Businesses					
Black	33.738*** (6.072)	2.105*** (0.542)	1.469*** (0.205)	0.685*** (0.102)	20.367*** (3.493)
Observations	31548075	31548075	31548075	7438679	7438679
# of Clusters	271256	271256	271256	58887	58887
Dep Var. Mean	57.83	3.83	2.74	1.94	61.49
Panel E: Only Late Adopters Reviewed as Black-owned Businesses					
Black	32.343*** (9.178)	1.018 (0.813)	1.488*** (0.359)	0.876*** (0.190)	25.362*** (6.109)
Observations	31570774	31570774	31570774	7451660	7451660
# of Clusters	271458	271458	271458	58992	58992
Dep Var. Mean	57.91	3.84	2.74	1.94	61.51

*Notes:* This table presents OLS regression results relating firm outcomes to the adoption of the Black-owned business label in a difference-in-differences design (see description around Equation 1). *Black* is an indicator for whether a restaurant is designated by Yelp as having a Black proprietor in a given week. The unit of observation is the business week. The dependent variables are the weekly number of Yelp restaurant page views (Column 1), the number of restaurant website views (Column 2), the number of calls to the restaurant via the Yelp online platform (Column 3), the weekly number of online orders (Column 4), and the platform-based revenue and weekly revenue (Column 5). All regressions include business and week fixed effects. Standard errors are in parentheses and are clustered at the business level. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .



Table AII: Robustness to Heterogeneous Dynamic Treatment Effects

	(1)	(2)	(3)	(4)	(5)
	Page Views	Website	Calls	YTP Orders	YTP Revenue
Panel A: TWFE With Heterogeneous ATTs (Wooldridge 2021)					
Black	32.119*** (9.002)	3.508*** (0.674)	1.323*** (0.259)	0.722*** (0.231)	20.825*** (6.050)
Observations	3190188	3190188	3190188	775478	775478
Panel B: “Stacked” DiD (Cengiz et al. 2019)					
Black	25.644*** (8.899)	3.655*** (0.732)	1.509*** (0.267)	0.717*** (0.218)	22.458*** (5.457)
Observations	11752378	11752378	11752378	1533918	1533918
Panel C: Multiple Periods DiD (Callaway & Sant’Anna 2021)					
Black	37.300*** (9.308)	3.245*** (0.746)	1.322*** (0.243)	0.429*** (0.123)	12.926*** (3.713)
Observations	178211	178211	178211	26548	26548

*Notes:* This table presents robustness checks related to our main OLS regression in Panel A of Table II. All results relate firm outcomes to the adoption of the Black-owned business label in a DID design (see description around Equation 1). In Panel A, we modify our framework to use the two-way Mundlak (TWM) regression as described in Wooldridge (2021b). In Panel B, we adopted the “stacked” DID, design in which data for each treatment “episode” (defined in the text) is restacked before estimating our DID design, as in Cengiz et al. (2019). Finally, in Panel C, we account for treatment effect heterogeneity, as described in Callaway and Sant’Anna (2021). *Black* is an indicator for whether a restaurant is designated by Yelp as having a Black proprietor in a given week. The unit of observation is the business week. The dependent variables are the weekly number of Yelp restaurant page views (Column 1), the number of restaurant website views (Column 2), the number of calls to the restaurant via the Yelp online platform (Column 3), the weekly number of online orders (Column 4), and the platform-based revenue and weekly revenue (Column 5). All regressions include business and week fixed effects. Standard errors are in parentheses and are clustered at the business level. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Table AIII: The Effect of the Label on Businesses Not Labeled on Other Platforms

	(1)	(2)	(3)	(4)	(5)
	Page Views	Website	Calls	YTP Orders	YTP Revenue
Panel A: Black-owned Businesses Not Labeled on EatOkra					
Black	10.748 (12.115)	1.829** (0.732)	0.998*** (0.304)	0.660** (0.315)	16.485** (6.877)
Observations	1609246	1609246	1609246	170190	170190
# of Clusters	18593	18593	18593	1841	1841
Dep Var. Mean	28.40	1.70	0.59	1.33	40.00
Panel B: Black-owned Businesses Not Labeled on Google					
Black	9.479 (8.697)	1.916*** (0.517)	1.219*** (0.255)	0.395** (0.160)	11.804** (4.593)
Observations	1699128	1699128	1699128	226052	226052
# of Clusters	19393	19393	19393	2200	2200
Dep Var. Mean	32.12	1.91	0.72	1.24	37.11

*Notes:* This table presents OLS regression results relating firm outcomes to the adoption of the Black-owned business label in a DID design (see description around [Equation 1](#)), excluding businesses labeled as Black-owned on other platforms. *Black* is an indicator for whether a restaurant is designated by Yelp as having a Black proprietor in a given week. The unit of observation is the business week. The dependent variables are the weekly number of Yelp restaurant page views (Column 1), the number of restaurant website views (Column 2), the number of calls to the restaurant via the Yelp online platform (Column 3), the weekly number of online orders (Column 4), and the platform-based revenue and weekly revenue (Column 5). All regressions include business and week fixed effects. Standard errors are in parentheses and are clustered at the business level. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Table AIV: Heterogeneity in the Effect of the Label by Political Ideology (Continuous Vote Share)

	(1) Page Views	(2) Website	(3) Calls	(4) YTP Orders	(5) YTP Revenue
Panel A: Majority Democrats (By County)					
Black	96.396** (38.114)	1.314 (3.163)	0.644 (1.170)	0.274 (0.604)	-0.782 (17.529)
Black × Democrat	-79.676 (57.536)	7.323 (4.605)	2.869* (1.573)	1.375 (1.007)	53.671** (27.148)
Observations	1314697	1314697	1314697	186118	186118
# of Clusters	14822	14822	14822	1843	1843
Number of Counties	29	29	29	13	13
Mean Majority Dem.	0.54	0.54	0.54	0.55	0.55
Dep Var. Mean	44.12	2.60	0.95	1.55	48.07
Panel B: Majority Democrats (By Zipcode)					
Black	79.199*** (16.365)	2.389* (1.386)	0.418 (0.491)	0.226 (0.242)	3.290 (7.348)
Black × Democrat	-79.581*** (29.691)	4.559* (2.752)	2.842*** (1.031)	0.915** (0.416)	34.758*** (12.535)
Observations	2442806	2442806	2442806	370017	370017
# of Clusters	27703	27703	27703	3601	3601
Mean Majority Dem.	0.72	0.72	0.72	0.75	0.75
Dep Var. Mean	37.47	2.27	0.80	1.26	37.95

*Notes:* This table presents OLS regression results relating firm outcomes to the adoption of the Black-owned business label, examining heterogeneity by pre-treatment political characteristics (a city or county Democrat vote share). *Black* is an indicator for whether a restaurant is designated by Yelp as having a Black proprietor in a given week. *Democrat* is the vote share for the Democratic presidential candidate in 2016 in a county (Panel A) or zip (Panel B). Democratic vote share is determined by collapsing precinct-level returns from the Dave Leip’s Atlas and MIT Election Lab to the relevant geographic level. The unit of observation is the business week. The dependent variables are the weekly number of Yelp restaurant page views (Column 1), the number of restaurant website views (Column 2), the number of calls to the restaurant via the Yelp online platform (Column 3), the weekly number of online orders (Column 4), and the platform-based revenue and weekly revenue (Column 5). All regressions include business and week fixed effects. Standard errors are in parentheses and are clustered at the business level. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Table AV: Heterogeneity in the Effect of the Label by Franchisee Status

	(1) Page Views	(2) Website	(3) Calls	(4) YTP Orders	(5) YTP Revenue
Black	5.780 (5.825)	2.896*** (0.495)	1.333*** (0.199)	0.533*** (0.115)	16.166*** (3.085)
Black × Franchisee	2.947 (10.104)	-3.213*** (0.815)	-1.726*** (0.254)	0.141 (0.470)	-4.396 (10.972)
Observations	2446843	2446843	2446843	370867	370867
# of Clusters	27763	27763	27763	3621	3621

*Notes:* This table presents OLS regression results relating firm outcomes to the adoption of the Black-owned business label, examining heterogeneity by whether the restaurant is a franchisee. *Black* is an indicator for whether a restaurant is designated by Yelp as having a Black proprietor in a given week. *Franchisee* is a dummy variable indicating whether a restaurant is a franchisee. The dependent variables are the weekly number of Yelp restaurant page views (Column 1), the number of restaurant website views (Column 2), the number of calls to the restaurant via the Yelp online platform (Column 3), the weekly number of online orders (Column 4), and the platform-based revenue and weekly revenue (Column 5). All regressions include business and week fixed effects. Standard errors are in parentheses and are clustered at the business level. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Table AVI: Heterogeneity in the Effect of the Label by Cuisine

	(1) Page Views	(2) Website	(3) Calls	(4) YTP Orders	(5) YTP Revenue
Panel A: Asian and European Restaurants					
Black	40.909* (22.287)	11.569** (5.150)	3.241* (1.761)	1.977** (0.787)	74.711*** (27.901)
Observations	243349	243349	243349	65457	65457
# of Clusters	5166	5166	5166	659	659
Panel B: Asian, European, and South/Central American Restaurants					
Black	39.782* (21.322)	7.586*** (2.172)	2.132*** (0.766)	0.582 (0.368)	25.769** (11.977)
Observations	395511	395511	395511	109055	109055
# of Clusters	8342	8342	8342	1092	1092

*Notes:* This table presents OLS regression results relating firm outcomes to the adoption of the Black-owned business label, examining heterogeneity by the type of cuisine offered by a restaurant. *Black* is an indicator for whether a restaurant is designated by Yelp as having a Black proprietor in a given week. In Panel A, we limit restaurants to only those that (according to Yelp’s type of food designation) offer food from either an Asian country or a European country. In Panel B, we limit restaurants to only those that offer food from either an Asian country, a European country, or a Latin American country. The dependent variables are the weekly number of Yelp restaurant page views (Column 1), the number of restaurant website views (Column 2), the number of calls to the restaurant via the Yelp online platform (Column 3), the weekly number of online orders (Column 4), and the platform-based revenue and weekly revenue (Column 5). All regressions include business and week fixed effects. Standard errors are in parentheses and are clustered at the business-level. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

## B Conceptual Framework

The main finding of the paper is that receiving the Black-owned label has a direct positive effect on restaurant demand. This result stands in contrast to previous research on online platforms, which finds that revealing minority ownership often has a negative effect on consumer demand. There are many potential explanations as to why the results in this setting diverge from previous findings. Below, we present a stylized model formalizing one potential mechanism.<sup>35</sup> The main idea of the model is that, unlike previous settings in which all users immediately became aware of minority ownership, in this setting, consumers had to actively learn about owners' race. The main result of the model is that specific types of users, particularly those with strong preferences towards owners' race, select into using the label. This self-selection can lead to positive effects of the label on Black-owned businesses, even when the average sentiment in the population is anti-Black.

### B.1 Model

We describe a partial equilibrium model in which consumers have to decide whether to purchase a good or an outside option. Consistent with the empirical setting, we abstain from price-setting behavior and assume price remains fixed.

Formally, we assume there exists an economy with a set of consumers of measure 1 and a single good that generates baseline utility (net of price) of  $u_i \sim N(0, \sigma_u) \equiv \Phi_u$ .  $u_i$  represents a draw from the distribution of individual-level utility from purchasing the product. We normalize the baseline utility from the outside good to zero for all consumers. The product is produced by a Black-owned supplier with probability  $\alpha$ , and the outside good is always produced by a non-Black-supplier. Consumers are endowed with a preference,  $v_i$ , toward Black-owned suppliers. For  $v_i > 0$ , a consumer has a preference for Black-owned businesses, and vice versa. Without loss of generality, we make the simplifying assumption that  $v_i$  is a warm glow utility from supporting Black-owned businesses, and that consumers do not realize the utility benefit  $v_i$  if they do not know the owner's race with certainty. Thus, for  $v_i > 0$ , Black ownership increases the utility from the product to  $u_i + v_i$ , and for  $v_i < 0$ , Black ownership increases the utility from purchasing the non-Black product (the outside good) to  $0 + v_i$ . We assume that  $v_i \sim N(\mu_v, \sigma_v) \equiv \Phi_v$ , and is independent of  $u_i$ . We assume that  $\mu_v < 0$ , implying that

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<sup>35</sup>Given the data we have, we are unable to assess the relative importance of this particular mechanism compared to alternative explanations.

the average sentiment in the population is anti-Black bias, consistent with previous research. Finally, each consumer knows their  $u_i$  and  $v_i$  with certainty.

We explore three different information environments: The first, which will serve as our baseline, is an environment with no information regarding owners' race. The second is the case where the ownership status is costlessly revealed to all consumers in the market. This resembles policies studied in previous research, which reveal suppliers' identities via names and photos. Third, to model the Black-owned label adopted by Yelp, we consider the case where the label is not automatically revealed to all consumers, but instead they must actively search on the platform to learn about owners' race. In particular, we consumers pay a (hassle) cost,  $c$ , to learn about owners' race. The main assumption we make for this search technology is based on the fact that Yelp offers a filter to search for Black-owned businesses but does not offer a filter to search for non-Black-owned businesses. The only way for consumers to avoid Black-owned businesses is by first applying the filter to identify Black-owned businesses and then conducting a regular search in which they ignore all the businesses previously identified as Black-owned. However, this process is likely to be significantly more complicated and demanding than simply searching for a Black-owned business. Accordingly, we assume that learning about an owner's race and then choosing a non-Black-owned business is going to entail a higher hassle cost to users, namely  $c' > c$ .

**Lemma 1.** *If consumers have, on average, anti-Black bias, then revealing Black-owned status to all consumers reduces the demand for Black-owned products compared to the baseline of no ownership information.*

*Proof.* At baseline, there is no ownership information, and consumers will only purchase the product if  $u_i > 0$ , which happens with probability  $1 - \Phi_u(0) = 0.5$ . Once ownership is revealed, consumers will only purchase if  $0 < (u_i + v_i) \sim N(\mu_v, \sigma_u + \sigma_v) \equiv \Phi_{u+v}$ . When  $\mu_v < 0$  (i.e., the average consumer prefers non-Black products), consumers will purchase the product with probability  $1 - \Phi_{u+v}(0) < 0.5$ .

□

**Lemma 2.** *Assume that  $c' - c$  is sufficiently larger than  $-\mu_v$ , then: Allowing consumers to learn about Black ownership increases demand for Black-owned products compared to the baseline of no ownership information, even if the average consumer has anti-Black bias.*

*Proof.* Starting with consumers with  $v_i > 0$ : if  $u_i < -v_i$ , then they will never purchase the product (and will never search for the label); if  $u_i > 0$ , then they will always buy the product, as they did in the no-information case. Finally, a share  $\{0.5 - \Phi_u(-v_i)\} \times \{1 - \Phi_v(0)\}$  of consumers with  $-v_i < u_i < 0$  and  $v_i > 0$  will search (and buy a Black-owned product) if  $0 < \alpha(u_i + v_i) - c$ , which happens with probability:

$$\{1 - \Phi_{u+v}(c/\alpha)\} \times \{0.5 - \Phi_u(-v_i)\} \times \{1 - \Phi_v(0)\} \quad (3)$$

Equation 3 represents the measure of consumers switching from the outside good to purchasing the product after actively learning about ownership. Similarly, the measure of consumers switching from the product to the outside good is given by:

$$P(u_i < \alpha(0 - v_i) + (1 - \alpha)(u_i) - c') \Rightarrow \{\Phi_{u+v}(-c'/\alpha)\} \times \Phi_u(-v_i) - 0.5 \times \{\Phi_v(0)\}$$

Thus, the Black-owned product will experience a net increase in demand if:

$$\{1 - \Phi_{u+v}(c/\alpha)\} \times \{0.5 - \Phi_u(-v_i)\} \times \{1 - \Phi_v(0)\} > \{\Phi_{u+v}(-c'/\alpha)\} \times \Phi_u(-v_i) - 0.5 \times \{\Phi_v(0)\} \Rightarrow$$

$$\frac{1 - \Phi_{u+v}(c/\alpha)}{1 - \Phi_{u+v}(c'/\alpha)} > \frac{1 - \Phi_v(0)}{\Phi_v(0)} \quad (4)$$

The LHS of Equation 4 decreases in  $c$  and increases in  $c'$ , thus increasing in  $c' - c$ ; and the RHS increases in  $\mu_v$ . Hence, the condition holds when  $c' - c$  is sufficiently large compared  $-\mu_v$ .  $\square$

Equation 4 also reveals the main forces driving the model. We first observe that if there is no anti-Black bias in the population  $\mu_v = 0$  and the cost of searching for Black- and non-Black-owned businesses are the same  $c' = c$ , then both sides equal exactly 1. The RHS, which captures consumers' tendency to avoid Black-owned businesses and introduces more anti-Black bias in the population (decreasing  $\mu_v$ ), increases consumers' preference to avoid Black-owned businesses, reducing the effectiveness of the label. The LHS captures the relative cost of avoiding Black-owned businesses. As  $c'$  increases compared to  $c$ , it becomes increasingly costly for consumers to discriminate against Black-owned businesses. At the extreme, if the label cannot be used to identify non-Black-owned businesses ( $c \rightarrow$



$\infty$ ), then the label will increase the demand for Black-owned business regardless of the mean anti-Black bias in the population.

## C Data Appendix

### C.1 Primary Data Sources

Our main analysis builds on data generously provided by Yelp. The company agreed to provide data on restaurants in only seven metropolitan areas, which were constructed based on the list of zip codes within each MSA. The metro areas in the sample were chosen to be large and diverse MSAs. They capture a relatively representative cross-section of urban America in terms of geography and demographic composition. The data cover a period of approximately two-and-a-half years, from April 2019 through August 2021. They consist of several files at the business and business-week levels. Business-level files contain time-invariant business characteristics such as restaurant location. Business-week data includes time-varying characteristics, such as ratings, attributes, consumer engagement metrics, and transactions through Yelp Transactions Platforms (YTP). From our experience working with Yelp data, we found that restaurants' opening and closing dates (i.e., entry and exit) are sometimes incomplete. When available, we use the data provided by Yelp. Alternatively, when the data is unpopulated, we use the first (last) date in which we find any positive engagement with a business, whether through Yelp or YTP, as its entry (exit) date, and code missing values as zeros.

Our three main engagement outcomes of interest are a restaurant's weekly number of page views, website visits, and calls. Notably, we only observe website visits and calls initiated through the Yelp platform. For reasons unknown to us, the vast majority of data on these three measures of engagement are missing from Yelp's records for the last three months of 2019. Yelp has not been able to provide an accounting of these missing months. For this reason, we omit these months when analyzing those outcomes. We note, however, that our results remain virtually unchanged when they are included in the analysis.

Our two main business performances are YTP-based restaurant transactions: the number and value of restaurant orders made on the platform. YTP, launched in 2013 by Yelp, allows users to order from local restaurants. YTP operates as a part of the standard Yelp website but represents a subset of restaurants that consumers can browse on Yelp. These data on YTP transactions are much better populated, although only for this subset of restaurants that conduct such transactions.

Data for our explanatory variable of interest - the set of restaurants that are treated by Yelp's Black-owned Business label - are obtained from two different sources of Yelp information. First, for busi-

nesses claimed as Black-owned, the attributes dataset details the precise week at which a restaurant adopted the label. Second, and in contrast, for businesses reviewed as Black-owned by Yelp users, we only observe the month of review. In general, Yelp only labels a business as Black-owned after receiving at least two reviews mentioning Black ownership. To be conservative about classifying restaurants as “treated” by the label, we always code reviews as being received at the beginning of the month. If a businesses claims to be Black-owned and is also reviewed as such, we code the Black-owned label as the earlier of the two: either the self-claim or the second review. We also control the time between the first review as Black-owned to second review or claim, and allow for an additional differential impact of having just one review.

## **C.2 Supplementary Data Sources**

We also collect a variety of additional data sources to both examine robustness and to explore channels. To identify the impact of the minority-owned business label, relative to minority-owned businesses that were not labeled on the Yelp platform, we use the 2019 National Establishment Time-Series (NETS) dataset. We restrict attention to businesses labeled as part of the food industry (according to their NAICS) and identify all businesses on our sample zip codes labeled “Minority-owned.” These businesses are matched using Stata’s `relink` command on business (cleaned) name, address, and exact match on zip code. We use a cutoff of 0.85 match score. We are able to confidently match 240 businesses with the Yelp data.

Because the Yelp data on outcomes captures only a subset of economic activity related to customer demand and performance, we wanted to explore the effect of the label off the Yelp platform. To this end, we use data from data vendor SafeGraph, which provides anonymous mobile phone location data collected from devices in the United States. Specifically, SafeGraph collects and manages points of interest (POIs) in the United States (e.g., latitude and longitude, physical address, and postal code). We use Safegraph data to obtain the number of weekly visits to each POI. We explore three alternative methods to match between the Yelp and Safegraph data: (1) two decimal longitude-latitude, zip code, and fuzzy name (above 0.8); (2) zip code, and slightly looser coordinate matching (one decimal) and name (above 0.5); and (3) zip code and fuzzy street name and name (above 0.5). In addition, since this analysis examined the effect on a different, off-Yelp, outcome, we rematch the date using weekly visits pre-trends.

The analysis of the sample of Latinx-owned businesses is constructed from the raw data, similar to the Black-owned sample. The main difference is that Yelp doesn't allow users to review a business as Latinx-owned; thus, the labels are based solely on businesses self-claims. The analysis of the Wayfair intervention is described in detail in [Appendix D](#).

Heterogeneity by neighborhood demographics is based on the Zip Code Tabulation Area (ZCTA)-level demographic information in the American Community Survey (ACS) 2015, using the fraction of Black residents. Yelp did not share any user photos with the research team; thus, we independently scraped reviewers' public profile photos from the platform. Since the Yelp website does not search by address, we instead used Google search. In particular, for each business in our sample, we search Google using the name and exact address to find its Yelp page. When we could not find a perfect match, a research assistant manually checked whether the search results match the business. Then, for each business, we scraped all of the reviews left via Yelp. We obtained more than one million profile pictures, which were then fed into the DeepFace facial recognition using Python, as described in [subsection 2.2](#) of the main text.

Heterogeneity based on political ideology comes from voting data in the 2016 Presidential election. Matching voting data across datasets is challenging, as voting precincts do not perfectly align with either counties or zip codes. We thus rely on two sources. First, we use county measures of political identity based on David Leip's Election Atlas ([Leip, 2019](#)). We use these data to calculate county-level vote share, which we then use to classify each geography as majority Democratic or Republican. We also rely on more finely grained measures of *estimated* political identity at the zip-code level from the American Ideology Project, created by ([Tausanovitch and Warshaw, 2022](#)). AIP's estimates of political preferences by zip code incorporate survey respondents' demographics and geography to estimate subcounty levels of candidate vote share and public opinion.

### **C.3 Matched Subsample**

To mitigate threats to identification, our preferred empirical strategy relies on the selection of a matched control restaurant for each restaurant that adopts the Black-owned business label. To systematically choose a set of non-Black-owned businesses that is comparable with the set of Black-owned businesses, we implement a Coarsened Exact Matching (CEM) procedure. We then used this matched sample to run our DID models. This design is similar in spirit to several recent papers, such as [Azoulay](#)

et al. (2010) and Sabety (2022).

To capture both vertical and horizontal measures of differentiation, we base the matching on several predetermined characteristics. First, to control for quality, we use restaurants' Yelp Star Ratings, which are based on the average cumulative Yelp user rating. Since ratings may be directly affected by the introduction of the label, we use the rating at the week prior to the introduction of the label. We coarsen the average rating to the nearest star, also allowing for no star rating in the pre-period. Second, to control for differences in the services offered by restaurants, we include an indicator for whether a restaurant offers delivery during our sample period. This measure is based both on delivery directly through YTP, as well as other channels, as indicated by restaurants' attributes. Third, since Yelp does not collect chain status for its restaurants, we impute (large) chain indicator based on whether a restaurant's name appears ten or more times in the data. Fourth, to control for secular trends at the restaurant level, we also match on outcome pre-trends.

Since YTP orders and revenue move similarly, we match only on pre-trends in the weekly number of orders, which we do by taking the difference between the average number of orders in the (approximately) two months proceeding the introduction of the label and the two months prior to that. Similarly, for our measures of consumer engagement, we focus on the one we consider closest to actual demand, number of weekly calls. Since these measures tend to be noisier, we match on pre-trends both (approximately) two months and weeks prior to the introduction of the label. Each difference is then coarsened into five bins, based on the distribution of pre-trends, and we allow for no YTP orders. Finally, and perhaps most restrictively, we control for special heterogeneity by precisely matching on restaurants' five-digit zipcodes.

As we show in [Table I](#), the raw Yelp data include almost 300,000 business in over 4,000 zip codes. After coarsening our main variables, we divide the full sample into 64,000 unique stratas. Of these, we are able to match within 1,091 stratas, which account for approximately 65% of businesses ever labeled as Black-owned. We calculate the matching weights, which are then used for our main specification. In addition, each time we restrict the analysis to a subsample, such as late adopters of only reviewed-as-Black-owned businesses, we drop any unmatched businesses and recalculate the matching weights for the relevant subsample.

## **D Wayfair Black-owned Label**

### **Setting**

One concern readers may have is that our estimates might not generalize beyond the Yelp platform. As such, we seek to explore the generalizability of our findings beyond our main context by exploring the impact of a Black-owned label in a different setting. Specifically, we examine the effect of Wayfair’s launch of a similar label that identifies Black small business owners – in this case, furniture suppliers. Wayfair is one of the ten largest e-commerce websites in the United States and focuses on selling furniture and home goods online.

During the first week of February 2023 (over two-and-a-half years after the launch of Yelp’s Black-owned business label), Wayfair launched a Black-owned Business label, “Black-owned or Designed,” on its website. The launch of the label was accompanied by an informational campaign on social media outlets such as LinkedIn and Facebook, as well as via mass emails to Wayfair customers. The label is presented at the top of the product pages of each one of the products affiliated with the particular seller. Wayfair users are able to search specifically for Black-owned products using the free text search bar or use the Black-owned filter to refine their search results. Unlike Yelp, Wayfair actively verifies, through video calls and third-party verification, that the products are Black-owned or designed. In total, the treated Wayfair sample included approximately 30 sellers with over 18,000 unique products.

### **Data & Design**

Wayfair provided us with limited access to administrative sales and customer engagement data to evaluate the effectiveness of its Black-owned business label. The time period of our data from the company spans the first four months of 2023. For each seller (treated and control units), we observe (1) the total number of page visits of all products sold by the supplier in a given week (engagement) and (2) the total weekly revenue on the platform. We note that no identifiable information of customers or suppliers was shared with the research team. In addition, to protect sensitive business information, raw numbers were divided by the mean weekly engagement or revenue of all sellers in the pre-period, the first four weeks of 2023. Using this data, we conduct a similar analysis to the main specification as described in Equation 1. Each observation represents a supplier-week combination, and standard errors are clustered at the supplier level. As with the Yelp sample used to conduct our primary analyses, we select control suppliers using a Coarsen Exact Matching algorithm that includes the number

of orders, active unique products, and total products' webpage visits in the first month of 2023. The final sample consist of 1,464 businesses, of which 21 are labeled as Black-owned or designed, selling almost one million unique items.