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BLACK OWNERSHIP MATTERS: DOES REVEALING RACE INCREASE DEMAND FOR MINORITY-OWNED BUSINESSES?

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ABSTRACT

Is there consumer demand to support Black-owned businesses? To explore, we investigate the impact of a new feature on a large online platform that made the race of a set of Black business owners salient to customers. We find that this feature substantially increased demand for Black-owned businesses - in the form of more calls to the restaurant, more delivery orders, and - using cell phone data from a different platform - more in person visits to the restaurant. New customers to Black-owned businesses were more likely to be White customers - suggesting demand among White restaurant goers for Black-owned businesses. The gains for Black-owned businesses vary across geographically fine-grained measures of racial prejudice: we observe larger gains in areas with less anti-Black bias, as measured by implicit association tests. We also find suggestive evidence that the effects are stronger in predominately White, Democratic-leaning areas.

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1 Introduction

Ethnic and racial inequality along various dimensions of economic status have existed in the United States since the nation's founding. Nearly sixty years after the landmark achievements of the Civil Rights era, significant disparities in employment, health, and wealth persist today (Massey and Denton, 1993; Cutler and Glaeser, 1997; Chetty et al., 2020). Recent efforts by politicians, businesses, and citizens – ranging from the Black Lives Matter movement to corporate equity initiatives – have sought to address these long-standing outcome differences in health, education, and wealth. Companies ranging from Instagram and LinkedIn to Walmart and Target have sought to accommodate customers' stated preferences to support Black-owned businesses and suppliers, by bringing more attention to Black-owned businesses.

One recent strategy to support minority-owned businesses has been to make the race of business owners more salient to customers. If there exists latent demand to support marginalized groups, then efforts to increase the visibility of owner race therefore have the potential to increase demand among customers who would otherwise support Black business owners but lack information to guide such decisions. On other hand, increasing the salience also risks alienating customers with in-group biases. There is little evidence about the net impact of increasing customer awareness of owner identity impact customer decisions, and the extent to which stated preferences to support minority-owned businesses translate into consumption decisions.

In this paper, we ask whether and how making minority ownership of firms more salient affects consumer demand. Specifically, we evaluate the effect of a change in company policy on a popular review platform - Yelp - that increases the salience of owner identity by providing concrete information to customers about the race of restaurant owners. In particular, the platform added a label that allowed consumers to identify Black-owned businesses on the platform. We study whether this change in consumer information regarding racial identity increased demand for the services offered by Black-owned businesses. We do so using various measures of customer demand and real business performance.

We use a generalized difference-in-differences method to estimate the effect of increasing the salience of minority business ownership. Specifically, we use proprietary data on consumer search behavior and business performance on a a major platform for restaurant reviews and food ordering. We leverage the

high-frequency and individual 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 find that on average increasing the visibility of minority firm ownership increases customer engagement and improves the business outcomes of these firms. In terms of customer engagement, the Black-owned business label increases restaurant page views by 33% (p-value $<.01$); we find similar effects for both website views and calls. Direct measures of economics performance also improved for Black-owned firms that are labeled as such – both total restaurant orders and revenue increased significantly following the addition of the Black-owned business label to the platform. Both orders and revenue increase by at least 30% (p-values < 0.01). The improvements in consumer engagement and business performance do not appear to be driven by strategic selection into the Black-owned business label, as we observe improvements in performance both for restaurants that actively claimed the Black-owned business label, as well as for restaurants that were "tagged" by the platform due to customer reviews.

We conduct a number of robustness checks to verify the general validity our findings. For example, we find that the results are not driven or confounded by secular trends in the relative performance of Black-owned businesses. To address for other potential off-platform shocks at the time of the policy change, we examine the performance effects of businesses that adopted the label only months after its introduction, and find that the label had a positive effect for these businesses as well. Finally, we use a second dataset that provides an external source of data on proprietor race for a subset of businesses in our sample. We find that demand increases and restaurant outcomes improve for firms that received the label, but not for Black-owned businesses that did not receive the label. This finding reinforces our interpretation that the effects were driven by the new feature and not other, observable, changes in the demand for Black-owned businesses.

We then examine whether the Yelp's Black-owned businesses label also affects performance off the platform. We use data from SafeGraph, which tracks the location of millions of US consumers, to estimate number of weekly visits restaurants' visits. Consistent with our main estimates, we find that receiving the Black-owned businesses label increases the number of weekly visits by about 10% ((p-values < 0.01) relative to the mean. This finding further supports our main interpretation that the label increases demand for Black-owned businesses.

Having documented a robust overall effect on 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.[1] To explore the role of customer demographics, we examine whether effects are concentrated for restaurants in neighborhoods with higher levels of Black residents. Moreover, we derive 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 neighborhood with higher shares of white residents, and that labeled Black-owned businesses – which that are as such are likely to disproportionately increase 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 naturally begs the question whether this increase is uniform, or concentrated among those customers who are more sympathetic to the policy or political interests of Black Americans. To provide complementary evidence in this vein, we examine heterogeneity in our main effects on Black-owned firm outcomes by local-level measures of racial attitudes. We use data from Project Implicit, which conducts an Implicit Association Tests (IAT) to provide a measure of strengths of automatic associations between races (Black / White) and attitudes (good / bad). 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, we look at partisanship using data on voting in the 2016 presidential elections. 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. Collectively, our findings suggest that digital platforms can effectively boost the performance of minority firms, particularly during a time of increased national awareness of the challenges that Black business owners face. These effects depend on the specific area and population that is targeted.

[1] In particular, they find that Democrats are more likely to attribute contemporary racial disparities to discrimination, and favor redistributive policies.

Related literature

Our paper contributes to a growing literature on the impact of racial identity on economic transactions, such as hiring and consumption decisions. The seminal work of Bertrand and Mullainathan (2004), for instance, documents that resumes with African-American-sounding names are far less likely to receive callbacks from potential employers than to White-sounding names. A large literature has emerged over the last two decades using similar research designs and to document the effects of racial or ethnic identity on employment (Banerjee et al., 2009), lending (Pope and Sydnor, 2011), and retail (Zussman, 2013), among other markets.

Though digital platforms have at times been offered as way to democratize markets, a large body of research documents bias and discrimination against racial minorities on online platforms (Alyakoob and Rahman, 2022; Blanchflower et al., 2003). On Airbnb, for example, minority customers are at least 16% less likely to be accommodated than identical guests with White-sounding names (Edelman et al., 2017). Similar patterns have been documented in ride-sharing markets (Ge et al., 2020) and online auctions (Ayres et al., 2015).

Our paper contributes to a growing body of work on policies to mitigate social inequality in online platforms. Recent research finds that increased transparency about pricing or reputation can reduce unequal treatment by race/ethnicity (Zhang et al., 2021; Cui et al., 2020). In this paper, we consider a policy that similarly increases information – and in particular, seeks to capitalize on demand for the services offered by minority-owned businesses by making race more salient. This approach stands in contrast to platform policies that seek to reduce the potential for racial bias by concealing the racial identity of market transaction participants.[2] In this vein, closest to our study is concurrent but independent work by Mitkina et al. (2022), who study how increasing the visibility of Black businesses increases foot traffic to these firms. This finding is consistent with our conclusion that increasing the salience of minority ownership status can improve minority business performance.

We also contribute to research on policies that can ameliorate racial equality (Bayer and Charles, 2018; Derenoncourt and Montialoux, 2021), and in particular to research on disparities in entrepreneurship (Borjas and Bronars, 1989; Lofstrom and Bates, 2013). Past research finds that businesses owned by minorities tend to be less successful than those owned by White business owners (Fairlie and Robb,

[2]See, e.g., Airbnb's policy surrounding concealment of renter race: https://www.airbnb.com/resources/hosting-homes/a/airbnb-answers-guest-profile-photos-77

2007). The causes of this relative underperformance have been the subject of much investigation.[3] In particular, several studies have documented the impact of demand-side interventions – such as increased access to government and corporate procurement markets through set-asides – on the viability of minority-owned firms (Chatterji et al., 2014; Blanchflower, 2009). 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 our understanding how identity affects economic behavior (Sequeira and Nardotto, 2021). There is a robust literature documenting how race, ethnicity, or 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 are recent papers using consumption choices to to elicit changes in identity (Bertrand and Kamenica, 2018; Atkin et al., 2021; Sequeira and Nardotto, 2021). We add to this growing body of work by demonstrating that consumers can reflect

2 Data and Research Design

2.1 Setting

To study of We study the impacts of making the race of restaurant proprietors salient on Yelp platform. Yelp is one of the largest user-generated review sites, particularly for local businesses, such as restaurants and bars. It features over 200 million consumer reviews for more than 1.5 million businesses,[4] and 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 to minority-owned firms.

In June 2020, Yelp rolled out a new feature called the "Black-owned Business"[5] with the purpose of supporting Black entrepreneurs who had been hit disproportionately harder by the COVID-19 pan-

[3] Although the literature identifies a number of obstacles, Fairlie and Robb (2007) suggests access to capital is perhaps the most severe constraint that minority-owned firms face.

[4] In order to write a review, a user must obtain a free account with Yelp, which requires registering a valid email address. The users can then rate any restaurant (from 1-5 stars), and enter a text review.

[5] This is part of Yelp's larger commitment to support disadvantage or marginalized groups. In the years 2020 and 2021, Yelp has also launched features for Women-owned, Latinx-owned, Asian-owned, and LGBTQ-owned.

demic than any other racial group.[6] 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. 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 business claimed as Black-owned, the business page amenities 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 mentioned that the business is Black-owned, then the business will appear in the search results for Black-owned business. For businesses reviewed as Black, however, the Black-owned label would not appear in the amenities section of the business page. Notably, 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 a variety of data sources to study how increasing the salience of minority proprietorship changes the outcomes of Black-owned businesses. We use proprietary data from Yelp covering a period of over two years, from April 2019 through August 2021; the introduction of the new feature occurred approximately in the middle of the period, on June 2020. The data consists of weekly information on restaurants in seven large metropolitan areas in the US (MSA):San Francisco, Los Angeles, New York, Minneapolis, Atlanta, Chicago, and Houston. 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 data can comprise measures of consumer intent—to visit or order from a particular restaurant. In addition, our proprietary data also include information about food orders made directly from YTP during our period of study. We use this information to construct two measure of weekly demand on the platform: the number of orders though YTP and total revenue (excluding tips, taxes,and delivery fees) at the business-week level.

[6] See Yelp's blog post: https://blog.yelp.com/news/yelp-teams-up-with-my-Black-receipt-to-support-Black-owned-businesses/

We also collect from Yelp additional data on business characteristics, such as cuisine, geographic location, Yelp's 5-star ratings etc. For each business, the data also describes whether the business was labeled as Black-owned, how (claimed by owner or reviewed as Black), and when. Figure II presents the entire distribution of join dates. The majority of business opt into the label at, or very close, to launching the new feature. Nevertheless, a substantial number of businesses opts into the label at later dates. For instance, almost 10% of businesses labeled as Black-owned opt in over a year after launch.

In addition to the main data set obtained directly from Yelp, we use several external data sets. First, we take advantage of National Establishment Time-Series (NETS) 2019 to identify minority-owned businesses that were not labelled on Yelp. Second, to study the moderating effects of racial composition, we use the ZCTA-level demographic information in the American Community Survey (ACS) 2015. Third, to study political identity, we start with precinct-level data on the 2016 presidential elections from the MIT Election Lab. We use ArcGIS to map all precincts in our sample to city and counties. Using these data, we can calculate vote share by party, which we then use to classify each/city county in our sample as majority Democratic or Republican.

Fourth, to examine heterogeneous effects by Racial attitudes, to obtain zipcode-level average race-related IAT results from Project Implicit. 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 – vary by local level 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 sample includes zip codes with more than 50 participants (to protect anonymity) in the years 2006-2021.

Fifth, we scrape 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.[7] Finally, to examine effects of the label on off-platform outcomes, we obtained additional data from SafeGraph. Safegraph is a company that aggregates location data from numerous

[7] 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%. See documentation here: https://github.com/serengil/deepface

smartphone applications and provides the coordinates at each point in time for over 10 million U.S. smartphones. We analyze the number of visits at the establishment-week level as a proxy for dinners in a particular restaurant at a given week.[8]

2.3 Research Design: Generalized Difference-in-Differences Design

Yelp's introduction of Black-owned Business feature provides a platform-level institutional shock to the salience of Black-owned restaurants on the platform. Our objective is thus to examine how the Black-Owned Business label affected customer engagement, and business performance outcomes. To study the effect of the label on restaurant outcomes (Yelp page visit, website visits, calls, orders, and revenue), we first use a matching procedure to match Black and non-Black businesses with similar characteristics. We carry out a coarsened-exact match for all restaurants on a set of predetermined, pre-treatment firm characteristics. In particular, we match on measures of vertical and horizontal differentiation: pre-label Yelp rating, cuisine, franchise status, and zip code. We match coarsely on the firm's cuisine (making categorization broader) and firm rating.[9] We match exactly on the other traits. Firms for which there is no exact match for each of these categories are dropped from our analysis. 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.

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 propriety information about the full sample means. However, for what we can show, it appears that the matched sample is not representative of the entire sample of Yelp businesses. Our final sample has 28,412 matched firms of which 1,694 are eventually labeled as Black-owned.

Using the sample of matched firms, we then use a difference-in-differences (DID) strategy that exploits the fact that restaurants became labelled as "Black-owned" at different points in time, and treatment only applied to a subset of restaurants. Using the data introduced above, we answer this question using

[8] We use several methods to match the data based on restaurants' 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 data sets. 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.

[9] Yelp's cuisine characterization includes 149 categories. We coarsen the cuisine into 6 categories. Yelp ratings are coarsened to the nearest half star, which is the level presented to users.

a panel of restaurants. Specifically, we estimate:

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

where i and t are restaurant and time indices, $\text{Black}_{it} = 1$ if restaurant i is labelled as a Black-owned by the Yelp platform in week t, and 0 otherwise. θ_i and τ_t are business and week fixed effects, respectively.[10] All analyses include the relevant CEM weights. We cluster the standard errors for the error term ε_{it} at the same i-level, corresponding to the level of treatment (Bertrand et al., 2004).

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 θ_i to control for time-invariant differences between Black-owned and non-Black-owned firms, as well as week-year fixed effects, τ_t to account for time-varying shocks to outcomes that are common to all businesses.

Identification Assumption & Event Study Approach A key assumption for interpreting β 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. 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 difference-in-differences (DID) 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 $treat_{ik}$ are dummy variables equal to 1 when an observation is j or k years 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 β_j's are non-zero.

[10] In Section 3.2 We also test an alternative specification in which we allow for differential time trends for labelled and unlabelled businesses. In addition, we also verify the robustness of the two-way fixed effects (TWFE) estimator to heterogeneity in treatment effects across groups or time.

3 Results

3.1 Main Results

We begin with a discussion of our baseline estimates of the impact of Yelp's introduction of Black-owned business label on consumer and restaurant outcomes. Our main results are presented in Panel A of Table II, which pools all businesses that received the Black-owned business label, 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 Black-owned restaurants. Restaurants that are treated by the Black-owned business label observe, on average, 28 more Yelp business page views (p-value $<$ 0.01). The magnitude is sizeable, representing a 36% increase from the average restaurant's baseline. This effect is echoed across other customer engagement outcomes. Affected businesses also observe three more customer website views (p-value $<$ 0.01), and receive two more calls directed from the Yelp platform (p-value $<$ 0.01) – both representing increases of more than 50% from baseline values. In short, these results in columns 1-3 suggest that Yelp's Black-owned business label leads to a statistically significant increase in customer engagement.

Columns 4 and 5 suggest that this increased customer engagement with minority-owned restaurants translates into real economic improvements. In column 4, we observe a nearly one-unit increase in orders from Black-owned business (p-value $<$ 0.01), which constitutes a 33% increase from the baseline value. Similarly, the Black-owned business label increases weekly revenue by $22, again roughly representing a 33% increase in total revenue. Note that these improvements merely capture increases in business activity that takes place *on* the Yelp platform, and that we only observe these outcome for the subsample of restaurants affiliated with Yelp Transactions Platform (YTP); nevertheless, we observe statistically significant improvements in business outcomes that may well represent a lower bound on the label's effect.[11]

In Panels B and C of Table II, we separately estimate the effect of the label for businesses that opted in to the label and businesses that were labeled as Black-owned in user reviews. Reassuringly, we see that the results are similar for both groups, though restaurants that claimed the Black-owned business label

[11] The results are robust to estimating the effect on percentage change in outcomes rather than levels. Because outcomes such as calls and website views are sometimes zero within a given week, we use the inverse hyperbolic sine (IHS) transformation, rather than log transformation, which is frequently applied in econometric studies to transform right-skewed variables. The estimation results are presented in Panel A of Table III .

experienced greater increases in both consumer engagement and business outcomes. This difference might represent selection of some businesses into the label, which we discuss in depth below, or the fact that for claimed businesses the label is more pronounced in the search results page and also appears on their business page.

Our main identifying assumption is that Black-owned restaurant outcomes would have followed the same time path in the absence of adopting the label. One potential concern is that unobserved positive secular trends prior to Yelp's addition of the feature are driving the main outcomes. In Figure III, we assuage potential concerns by presenting the event time for our main specification. We generally observe similar "pretrends" between eventual treated and control restaurants in the period prior to receiving the Black-owned business label. These relative pre-trends provide suggestive evidence in favor of a key identifying assumption. 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. We also test the importance of secular trends more formally, by allowing for the outcomes of Black-owned business to vary linearly over time, and find similar results (Table III Panel B).

3.2 Identification and Robustness

In addition to parallel trends assumption, there are a few additional threats to identifying the effect of the Black-owned business label on restaurant outcomes in this setting. One concern is selection into the label. Problematic selection into treatment here could be either relate to the type of businesses that endogenously adopt, or 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 affect business outcomes. This concern is alleviated by the fact that, 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 "selected" by Yelp users. Moreover, Panel C of Table III shows robust effects for businesses that received the feature right at launch. Since these restaurants did not have a say in the exact timing of the launch, this suggests that selection over time is not driving the results.

Another potential threat to identification in our setting is policy changes concurrent with the introduction of the Black-Owned Business feature, which would prevent us from attributing the trend breaks in Figure III to the new feature. To our knowledge and through interviews at Yelp, Yelp did not alter their 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 in the institutional environment taking place at the time that Yelp initiated its policy of making minority proprietorship more salient (such as civil rights protests surrounding issues related to racial justice and inequality). Reassuringly, in Panel D of Table III, we find that even businesses that were late adopters of the label observed significantly improved customer engagement and as well as 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 may have differentially affected labelled 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.

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 US regardless of platform policy. While to accounting for secular trends (Panel B Table III) and using variation in opt in timing (Panel D of Table III) partially address this concern, in order to ameliorate our concerns here, we undertake two additional tests. In both tests, we restrict attention solely to Black-owned restaurants; Thus, our estimate now capture the effect of Black-owned businesses labelled on Yelp, compare to Black-owned businesses that have not (yet) received the label.

The results are presented in Table IV. In Panel A, we re-estimate Equation 1 using as control firms only those restaurants that were ultimately labelled as Black-owned on Yelp. In panel B, 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 labelled on Yelp. In both specifications, we find significant effects similar to our main specification. This suggests that our estimated effects are driven directly by the new feature and not other contemporaneous changes in the institutional environment.

In addition, to examine the effect of Yelp's Black-owned businesses label on performance off the platform, we use aggregated data on mobile geo-position to estimate weekly visits to each establishment. The results are presented in Table V, in which each column differs in the strictness of the matching rule.[12] Across specifications, we find significant increases of about 4 weekly visits to businesses la-

[12]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

beled as Black-owned, which represents about 10% of the matched sample average (about 16% of the median). This finding further supports our findings that the labeling a firm as minority-owned on net increases demand for such businesses.

Finally, we note that our main results rely on the standard difference-in-difference 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 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 AI, 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). Expect of one estimate in Panel C, the results remain statistically significant and are similar in magnitude to our main estimates.[13]

4 Examining Mechanisms

Having documented robust evidence of improved business outcomes for businesses designated as Black-owned on the platform, we now explore various forms of heterogeneity to shed light on mechanisms driving the main estimates. We begin by examining which type of consumers are driving our main treatment effects. In particular, we are most interested in whether: (1) the effects of the Black-owned business label are driven by particular consumer demographics, and (2) the effects are concentrated in ideologically conservative or liberal locations. We then examine which type of Black-owned businesses benefit the most form the introduction of the feature.

4.1 Heterogeneity by Consumers' Race

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

(1 decimal) of fuzzy matches on address. As elaborated in Section 2.2, we manage to match about one third of our sample.

[13] In addition, in an unshown analysis, we test the need for alternative estimators formally by conducting the test suggested in De Chaisemartin and d'Haultfoeuille (2020); 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 143 of 47,390 weights are estimated to be negative, and sum up to -.00006202.

that our average effect is being driven by Black consumers interested in supporting Black businesses. These theories differ in their specific cause and context, but share a reliance evaluators or consumers treating people differently because of preference (or dislike) for a demographic trait itself. For example, nepotism is a form of consumption-motivated discrimination that can lead to a more favorable evaluation of someone based solely on a personal or kinship tie (Goldberg, 1982; Bennedsen et al., 2007). More recently, Greenberg and Mollick (2017) examines the role of homophily in consumer consumption choices, and find that marginalized consumers (in this case, women) have a preference to help proprietors from underrepresented categories succeed—-in particular, in order to "help someone penetrate barriers she can sympathize or empathize with."[14]

On the other hand, theoretical and empirical work highlights mechanisms through which the Black-owned business label may activate White customers as well. A White consumer may choose to frequent a Black-owned business because of her desire to either see other racial groups succeed (e.g., Simon (1993)). Indeed, the last few years have witnessed increased salience of racially-charged political activism, and social inequality in the United States. These events increased awareness of the systemic barriers and economic disparities that exist between the White and Black communities (Schwabish and Kijakazi, 2021; Manekin and Mitts, 2022). For example, in the aftermath of George Floyd's death in 2020, the wave of social activism and protests was heavily White: by some estimates, the majority of protesters in 95% of the participating counties were White Americans Buchanan et al. (2020).[15]

Given that there are conceptual reasons to suggest that our effects on firms could be driven by changes in the behavior of either White or Black consumers, we examine this channel below. 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. Consistent with outgroup altruism, we find that our effects are concentrated in zip-codes with high White population shares. Second, for a subset of businesses for whom we can identify patrons, we show directly show that the Black-owned business were more likely to have White patrons after the introduction of the Yelp Black-owned label.

[14]More generally, racial and ethnic homophily has been documented in many settings – including within peer groups (friendships), marriages (McPherson et al., 2001; Kalmijn, 1998), and in other relationships ranging from confiding relationships to acquaintances (Verbrugge, 1977; 1983). In addition, network homophily has been found in work environments, which result in acute segregation of the workforce and potentially increased reinforcement of homophily (Stovel Fountain, 2011).

[15]Note, however, that prior studies have found that implicit biases may limit altruism toward racial/ethnic minorities (Rudman and Ashmore 2007; Stepanikova, Triplett, and Simpson 2011).

4.1.1 Neighborhood Demographic Composition

We first test whether Black-owned businesses perform better when a larger share of residents in the neighborhood are Black. To this end, we interact our indicator for the Black-owned business label with zip-code level share of the population that are Black Americans. The results are presented in Table VI. We find that the effects of the Black-owned business label are *weaker* in Black neighborhoods. The coefficient $Post \times Black \times FractionBlack$ is negative and highly significant for website views, restaurant calls, 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 *White* neighborhoods.

4.1.2 Race of Reviewers

The previous section attempts to proxy for consumers' race using neighborhood characteristics. However, this exercise might yield misleading results, as restaurant goers might be visiting from proximate neighborhood 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 visitors, and generally does not share users' personal information with researchers. Thus, we are unable to directly study heterogeneity of consumers' race on the five main outcomes.

Nevertheless, we leverage and additional, yet somewhat nosier, measure of demand—consumers reviews. A nice feature of reviews is that 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 the profile pictures reviewers. We then feed these photos into the DeepFace facial recognition using Python package. The system output detect whether there is a face present in the profile picture and a 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.[16] 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

[16]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 in order to avoid marginal cases.

month.

The results are presented in Table VII. Column 1 shows the effect of the label on the monthly number of reviews received by White reviewers and Column 2 show the effect on the number of Black reviewers. In Panel A, we see that the label increases the number of White reviewers by 0.05, compared to a baseline of 0.26. In contrast, in Column 2, we do not find a significant effect on the number of monthly reviews left by Black reviewers. 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 1.329 (p-value < 0.01) for White reviews, but does not have a significant effect on Black reviewers.

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 the case 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 channel—the role of ideology.

4.2 Heterogeneity in Consumers' Ideology

The results above suggest that White consumers were likely responsible for increases in customer engagement and improved firm outcomes observed in label-affected Black-owned businesses. We next investigate how ideological factors mediate the impact of Yelp's Black-owned business label by exploring the moderating role of racial attitudes. A growing literature in economics considers how various aspects of identity (such as social or political identity) affect day-to-day economic behavior (Pandya and Venkatesan, 2016; Sequeira and Nardotto, 2021).[17] 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).[18] The IAT is a commonly used psychological test to esti-

[17] Relatedly, existing research suggests that consumers choices may in part by shaped by the desire to signal moral values through consumption of goods with positive social impact (Friedrichsen and Engelmann, 2018).

[18] Project Implicit (`https://implicit.harvard.edu/implicit/`) allows to test implicit bias towards multiple concepts such as marital status, religion vs. science, etc. We focus specifically on racial bias as measured by sorting the faces

mate the strength of automatic associations between concepts, evaluations, and stereotypes. The test asks participants to sort words into categories, often combining two categories together. The main intuition 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: "White" and "Good," with higher scores implying stronger bias towards Whites.

Table VIII 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 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 $Post \times Black$ coefficient. In contrast, we see a significant reduction in impact in locations with higher average bias in favor of White American, as is captured by the $Post \times Black \times IAT$ coefficient. The estimated coefficients of $Post \times Black \times IAT$ 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 channel 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.

4.2.1 Role of Political Identity

As another measure of consumers' ideology, we next examine the role of political identity. We document heterogeneity in consumer behavior as a function of local political preferences (Veblen, 1899/1994; Simmel, 1904/1957; Bourdieu, 1984), which is considered by many to be a clear dividing

of African- and European-Americans together with good and bad phrases. One potential concern is that participant 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.

line that signals support of racially-liberal political causes.[19] We estimate partisanship using data on vote shares by party. We aggregate precinct-level vote shares to the city and county levels, defining partisanship to be 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 (Data and Lab, 2018). For ease of interpretation, we discretize this measure by whether at least 50% of the votes went to the Democratic candidate.

Table IX presents the heterogeneous effects of the Black-owned business label on each outcome, by "majority Democrat" status within county (Panel A) and city (Panel B). In Panel A, we see that *most* (or in some cases all) of the effects documented in Table 2 are driven by Democrat-leaning counties. For all five outcomes, the interaction $Post \times Black \times MajorityDem$ is positive and highly significant, while the first order term is small in comparison, and sometimes negative. In Panel B, we also analyze heterogeneous effects by majority-Democrat city 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 that are ideologically aligned with supporting historically disadvantaged minorities.

4.3 Heterogeneity by Firm Attributes

Firm quality In Table X, 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 firm helped those 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 be on the margin of exit (Reshef, 2022; Kim and Luca, 2022).Conceptually both 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 explore in this subsection. We use two different pre-treatment business characteristics from Yelp to define

[19]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).

quality: ratings (based on Yelp's star rating system, a user-generated rating on a one-to-five-star scale) and pre-treatment business performance (Reshef, 2022).

Table X presents 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 is higher for higher-rated firms. We find that businesses that were rated above-median, compared to below-median, gain an additional 45 page views after receiving the Black-Owned Business label. We similarly observe more website views (4.2), more calls (1.5), and more orders (0.49). These findings are significant at the 1% level.

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 significantly greater number of website views, restaurant calls, platform order, and platform-based revenue restaurants with higher composite quality scores.

To summarize our findings here, we find that the main effects are primarily driven by high-rated restaurants, with weaker impact on the lower-rated restaurants. Collectively, the results here suggest that a policy to increase the visibility and business activity of Black-owned firms will be most beneficial for high-quality firms. An examination of why these businesses benefit most is reserved for future study.[20]

Franchisee Restaurants Chain and franchise establishments often operate under the same brand name and follow standardized procedures when running their business. As such, such these restaurants are likely to be associated with the the larger organization rather than the establishment's owner. We thus expect franchisees to benefit less from utilizing the Black-owned business label. Table AII confirms this intuition; For website views, calls, orders, and revenue, there appears to be little-to-no net benefit of being labeled as a Black-owned business.

[20] Another potential explanation is that consumers use the Black-owned label to infer something about the quality about restaurants serving cuisines that are considered stereotypical "Black." To address this concern, in Table AIII we restrict the analysis only to restaurants serving European and Asian cuisines (and also South and Central American), for which we expect this concern to be alleviated. While this sample selection process substantially decreases our statistical power (as is evident by the sharp drop in the number of observations), we find consistent, and for the most part statistically significant effects of label on business performance.

5 Conclusion

In this paper, we study the effect of a corporate policy designed to increase the salience a business owner's status as a racial minority 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 increases restaurant page views 33% over baseline levels, and website views and calls each by over 50%. Moreover, these restaurants observe substantial increases in both orders and revenue following the addition of the Black-owned business label to the platform (over 30%). Theses gains in customer engagement and firm performance are evidence for for restaurants that opt into the minority label, as well as for restaurants identified as Black-owned by the platform, thus ameliorating concerns of strategic selection into label adoption. A number of robustness checks strengthen our interpretation as causal in nature.

In terms of channels, we provide suggestive evidence that racial characteristics, attitudes, and political affiliation of consumers matter. First. we show that the average effect of increased salience of minority firm ownership 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 towards supporting historically marginalized groups.

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.

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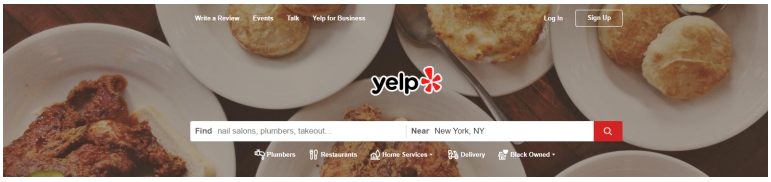
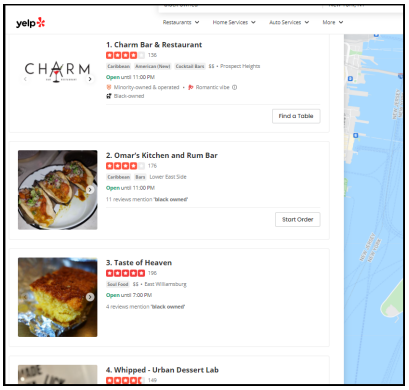
Figures

Figure I: Searching for Black-Owned Businesses on Yelp

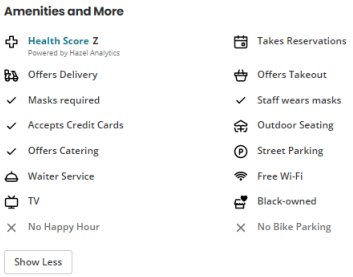
Panel A: Search on Yelp



Panel B: Search Results Page

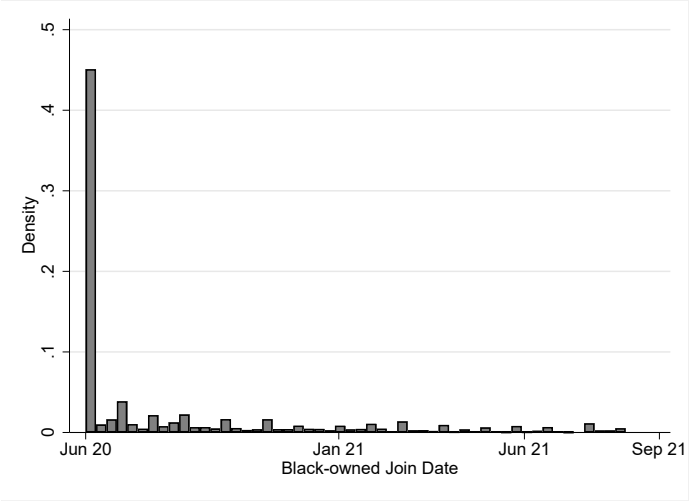


Panel C: Restaurant Page



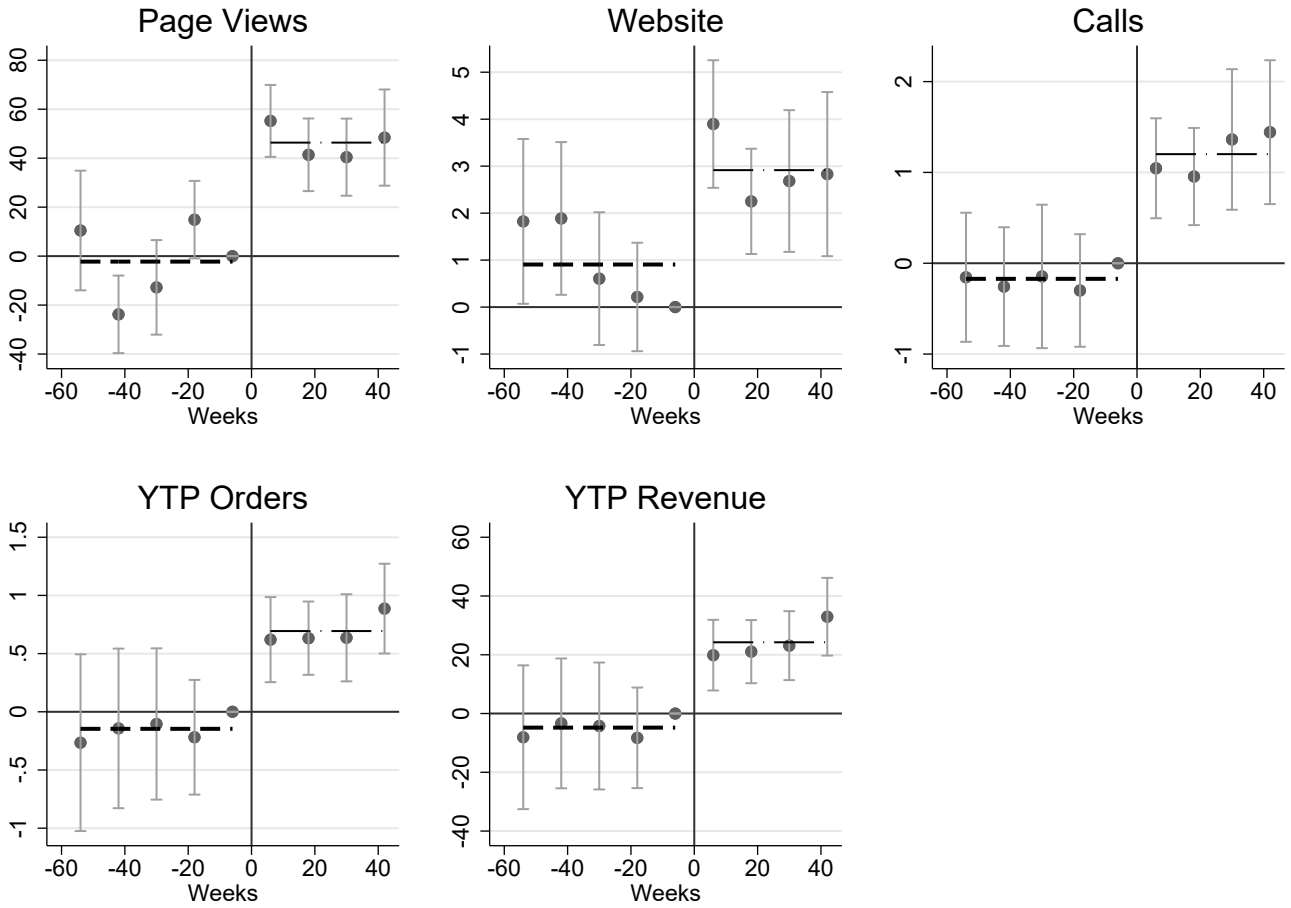
Notes: The figure demonstrates how the Yelp platform operates. Panel A presents the search landing page. Panel B presents a sample search results page. Panel C presents a sample restaurant page on the Yelp platform.

Figure II: Joining dates



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

Figure III: Combined



Notes: 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 year around the introduction of the Black-owned business label (see description around Equation 2). Each panel also report 95% confidence intervals. Standard errors clustered at the firm-level.

Tables

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

	Matched Sample				Full Data			
	Black-Owned (N=1,694)		None Black-Owned Businesses (N=26,718)		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	3.93	0.63	3.93	0.52	3.92	0.67	3.54	0.83
Franchisee	0.02	0.15	0.01	0.11	0.02	0.15	0.21	0.40
On YTP	0.67	0.47	0.30	0.46	0.68	0.47	0.30	0.46
Year Created	2015	5.52	2012	6.77	2015	5.48	2010	7.18
Num. Zip Codes	592	–	592	–	700	–	3504	–
Cuisine (HHI)	0.61	–	0.61	–	0.55	–	0.39	–

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 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 for our five-city sample.

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				
Post X Black	27.642***	2.869***	1.874***	0.706***	22.060***
	(4.859)	(0.408)	(0.204)	(0.131)	(4.105)
	Panel B: Claimed Black-owned Businesses				
Post X Black	51.718***	4.927***	2.067***	0.958***	28.859***
	(8.991)	(0.783)	(0.295)	(0.231)	(7.907)
	Panel C: Reviewed as Black-owned Businesses				
Post X Black	26.403***	2.937***	2.083***	0.672***	20.171***
	(6.044)	(0.506)	(0.253)	(0.144)	(4.333)
Observations	3190666	3190666	3190666	775478	775478
# of Clusters	28412	28412	28412	6456	6456
Dep Var. Mean	76.99	5.56	2.64	2.08	61.30

Notes: This table presents OLS regressions results relating firm outcomes to the adoption of the Black-owned business label in a difference-in-differences design (see description around Equation 1). *bo* is a dummy that is 1 if a restaurant is designated by Yelp as having a Black proprietor in a given week, and 0 otherwise (the Black-owned business label generally becomes active within the online marketplace, and keeps this status for the remainder of the sample). Results are based on the matched sample of Black and White-owned, where we match coarsely on the firm's cuisine and firm rating, and match exactly on zip code and franchise status. The unit of observation is the business-week. The dependent variables are: weekly number of Yelp restaurant page view (Column 1), number restaurant website views (Column 2), number of calls to the restaurant via the Yelp online platform (Column 3), 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 city level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table III: Robustness Tests: Alternative Functional Forms, Controls, and Subsamples

	(1) Page Views	(2) Website	(3) Calls	(4) YTP Orders	(5) YTP Revenue
	Panel A: Asinh Outcomes				
Post X Black	0.562***	0.308***	0.274***	0.146***	0.305***
	(0.025)	(0.023)	(0.016)	(0.026)	(0.063)
Observations	3190666	3190666	3190666	775478	775478
# of Clusters	28412	28412	28412	6456	6456
Dep Var. Mean	76.99	5.56	2.64	2.08	61.30
	Panel B: Linear Time Trend				
Post X Black	76.605***	1.837***	1.145***	0.459***	16.303***
	(8.178)	(0.367)	(0.207)	(0.145)	(4.709)
Observations	3190666	3190666	3190666	775478	775478
# of Clusters	28412	28412	28412	6456	6456
Dep Var. Mean	76.99	5.56	2.64	2.08	61.30
	Panel C: Only Early Adopters				
Post X Black	25.826***	3.140***	2.129***	0.786***	24.836***
	(6.372)	(0.517)	(0.273)	(0.174)	(5.409)
Observations	2164608	2164608	2164608	589263	589263
# of Clusters	20163	20163	20163	4984	4984
Dep Var. Mean	87.73	6.27	3.04	2.16	62.98
	Panel D: Only Late Adopters				
Post X Black	30.082***	1.916**	1.038***	0.615***	18.104***
	(5.612)	(0.606)	(0.199)	(0.121)	(3.931)
Observations	2361883	2361883	2361883	503287	503287
# of Clusters	23815	23815	23815	4657	4657
Dep Var. Mean	61.74	4.44	2.06	1.96	56.77

Notes: This table presents robustness checks related to our main OLS regressions in Table II. All results relate firm outcomes to the adoption of the Black-owned business label in a difference-in-differences design (see description around Equation 1). *bo* is a dummy that is 1 if a restaurant is designated by Yelp as having a Black proprietor in a given week, and 0 otherwise (the Black-owned business label generally becomes active within the online marketplace, and keeps this status for the remainder of the sample). Results are based on a matched sample of Black and White-owned firms, where we match coarsely on the firm's cuisine and firm rating, and match exactly on zip code and franchise status. The unit of observation is the business-week. The dependent variables are: weekly number of Yelp restaurant page view (Column 1), number restaurant website views (Column 2), number of calls to the restaurant via the Yelp online platform (Column 3), weekly number of online orders (Column 4), and the platform-based revenue and weekly-revenue (Column 5). In Panel A, the dependent variables are the per-business inverse hyperbolic sine transformation of outcomes. In Panel B, we add firm-specific linear time trends as a control variable. In Panels C and D, respectively, we split our matched sample into early and late "adopters" of the platform's Black-owned business label. All regressions include business and week fixed effects. Standard errors are in parentheses and are clustered at the city level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table IV: Confirming Label Validity: Using Other Black-Owned Businesses as Controls

	(1) Page Views	(2) Calls	(3) Website	(4) YTP Orders	(5) YTP Revenue
	Panel A: Using Black-Owned Businesses on Yelp as Controls				
Post X MOB	35.314***	2.204***	2.860***	0.869***	28.967***
	(8.535)	(0.296)	(0.518)	(0.179)	(6.347)
Observations	186393	186393	186393	108339	108339
# of Clusters	1694	1694	1694	924	924
Dep Var. Mean	195.14	6.13	12.89	1.81	55.53
	Panel B: Using Black-Owned Businesses on NETS as Controls				
Post X MOB	28.296***	1.943***	2.838***	0.963*	20.466
	(6.770)	(0.322)	(0.441)	(0.514)	(12.723)
Observations	209008	209008	209008	113227	113227
# of Clusters	1868	1868	1868	959	959
Dep Var. Mean	180.71	5.87	11.79	1.89	57.06

Notes: This table presents robustness checks related to testing whether our main OLS regressions in Table II represents the impact of the Black-owned business label itself, or a general effect on Black-owned businesses in the US regardless of platform policy. As before all results relate firm outcomes to the adoption of the Black-owned business label in a difference-in-differences design (see description around Equation 1). *Black* is a dummy that is 1 if a restaurant is designated by Yelp as having a Black proprietor in a given week, and 0 otherwise (the Black-owned business label generally becomes active within the online marketplace, and keeps this status for the remainder of the sample). In Panel A, we define as the treated restaurants only those that adopted the label in June 2020 (i.e., the "early" adopters), and compare to the set of restaurants that ultimately adopted the label (the "late" adopters); in other words, we just use the time variation for the set of ever-treated firms. In Panel B, we use an independently dataset that identifies all Black-owned firms in our dataset, and defined as our control firms the set of Black-owned restaurants who do not adopt Yelp's Black-owned business label. Results are again based on a matched sample where we match coarsely on the firm's cuisine and firm rating, and match exactly on zip code and franchise status. The unit of observation is the business-week. The dependent variables are: weekly number of Yelp restaurant page view (Column 1), number restaurant website views (Column 2), number of calls to the restaurant via the Yelp online platform (Column 3), 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 city level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

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

	(1) Weekly Visits	(2) Weekly Visits	(3) Weekly Visits
Post X Black	4.115***	3.708***	4.182***
	(1.361)	(1.299)	(1.289)
Observations	883581	979380	1067909
# of Clusters	8400	9329	10197
Dep Var. Mean	44.64	44.68	44.83

Notes: This table presents OLS regressions results relating firm outcomes to the adoption of the Black-owned business label in a difference-in-differences design (see description around Equation 1). *bo* is a dummy that is 1 if a restaurant is designated by Yelp as having a Black proprietor in a given week, and 0 otherwise (the Black-owned business label generally becomes active within the online marketplace, and keeps this status for the remainder of the sample). Results are based on the matched sample of Black and White-owned, where we match coarsely on the firm's cuisine and firm rating, and match exactly on zip code and franchise status. The unit of observation is the business-week. The dependent variable is number of weekly visits in the SafeGraph data. Columns defer only in the matching procedures between the main and SafeGraph data. Column 1 restrict 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 coordinates 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 city level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table VI: Heterogeneity By Neighborhood Demographic Composition

	(1) Page Views	(2) Website	(3) Calls	(4) YTP Orders	(5) YTP Revenue
Post X Black	36.663***	4.896***	3.230***	1.371***	47.175***
	(8.967)	(0.806)	(0.374)	(0.248)	(8.121)
Post X Black X Frac. Black	-23.436	-5.262***	-3.519***	-1.706***	-64.410***
	(16.806)	(1.217)	(0.579)	(0.384)	(12.510)
Observations	3189039	3189039	3189039	775478	775478
# of Clusters	28388	28388	28388	6456	6456
Dep Var. Mean	77.03	5.56	2.64	2.08	61.30

Notes: This table presents OLS regressions 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 a dummy that is 1 if a restaurant is designated by Yelp as having a Black proprietor in a given week, and 0 otherwise (the Black-owned business label generally becomes active within the online marketplace, and keeps this status for the remainder of the sample). Frac.Black is a continuous variable indicating the fraction of residents in a restaurant's zip code that are Black. Results are based on the matched sample of Black and White-owned, where we match coarsely on the firm's cuisine and firm rating, and match exactly on zip code and franchise status. The unit of observation is the business-week. The dependent variables are: weekly number of Yelp restaurant page view (Column 1), number restaurant website views (Column 2), number of calls to the restaurant via the Yelp online platform (Column 3), 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 city level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table VII: Effect on Reviewers' Race

	(1) By White Users	(2) By Black Users
	Panel A: Linear Flow of Reviews by Reviewers' Race	
Post X Black	0.050***	-0.029
	(0.013)	(0.024)
	Panel B: Poisson Flow of Reviews by Reviewers' Race (IRR)	
Post X Black	1.329***	1.102
	(0.07)	(0.07)
Observations	128438	128438
# of Clusters	6816	6816
Dep Var. Mean	0.26	0.10

Notes: This table presents regressions results relating the number of Yelp reviews (by race of customer) to the adoption of the Black-owned business label. *Post* $\times$ *Black* is a dummy that is 1 if a restaurant is designated by Yelp as having a Black proprietor in a given week, and 0 otherwise (the Black-owned business label generally becomes active within the online marketplace, and keeps this status for the remainder of the sample). Results are based on the matched sample of Black and White-owned, where we match coarsely on the firm's cuisine and firm rating, and match exactly on zip code and franchise status. The unit of observation is the business-week. 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, and 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 city level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table VIII: Heterogeneity by Racial Attitudes

	(1) Page Views	(2) Website	(3) Calls	(4) YTP Orders	(5) YTP Revenue
Post X Black	45.482	7.593***	5.388***	2.886***	93.220***
	(30.285)	(2.445)	(1.172)	(0.755)	(21.675)
Post X Black X IAT Score	-30.740	-9.458	-7.572**	-5.331**	-162.290***
	(91.808)	(7.246)	(3.845)	(2.222)	(62.379)
Observations	3167116	3167116	3167116	773818	773818
# of Clusters	28189	28189	28189	6440	6440
Dep Var. Mean	77.02	5.55	2.64	2.08	61.34

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 Implicit Association Test bias towards white and good. *Black* is a dummy that is 1 if a restaurant is designated by Yelp as having a Black proprietor in a given week, and 0 otherwise (the Black-owned business label generally becomes active within the online marketplace, and keeps this status for the remainder of the sample). IATScore is a continuous variable indicating the IAT D score, where higher values are associated with more bias towards White and good. Results are based on the matched sample of Black and White-owned, where we match coarsely on the firm's cuisine and firm rating, and match exactly on zip code and franchise status. The unit of observation is the business-week. The dependent variables are: weekly number of Yelp restaurant page view (Column 1), number restaurant website views (Column 2), number of calls to the restaurant via the Yelp online platform (Column 3), 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 city level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table IX: Heterogeneity by Voting

	(1) Page Views	(2) Website	(3) Calls	(4) YTP Orders	(5) YTP Revenue
	Panel A: Majority Democrats (By County)				
Post X Black	5.893	-1.114	-0.173	-0.269	-10.891*
	(13.636)	(1.529)	(0.506)	(0.165)	(6.177)
Post X Black × Majority Dem.	31.256**	5.394***	2.624***	1.410***	48.048***
	(15.641)	(1.690)	(0.589)	(0.234)	(8.582)
Observations	1744770	1744770	1744770	436733	436733
# of Clusters	15344	15344	15344	3608	3608
Number of Counties	39	39	39	12	12
Dep Var. Mean	100.70	7.00	3.75	2.76	83.62
	Panel B: Majority Democrats (By City)				
Post X Black	41.910***	3.374***	1.105***	0.210*	6.665
	(9.118)	(0.980)	(0.364)	(0.127)	(4.915)
Post X Black × Majority Dem.	-14.494	-0.426	0.835**	0.541***	16.699***
	(10.411)	(1.068)	(0.419)	(0.165)	(6.079)
Observations	3047918	3047918	3047918	744958	744958
# of Clusters	27082	27082	27082	6189	6189
Number of Cities	248	248	248	81	81
Dep Var. Mean	78.36	5.63	2.69	2.11	62.32
n	78.37	5.63	2.69	2.11	62.32

Notes: This table presents OLS regressions 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 a dummy that is 1 if a restaurant is designated by Yelp as having a Black proprietor in a given week, and 0 otherwise (the Black-owned business label generally becomes active within the online marketplace, and keeps this status for the remainder of the sample). MajorityDem is a dummy variable indicating that either a county (Panel A) or city (Panel B) voted for the Democratic presidential candidate in 2016. Democratic vote share is determined by collapsing precinct-level returns from the MIT Election Lab to the relevant geographic level. Results are based on the matched sample of Black and White-owned, where we match coarsely on the firm's cuisine and firm rating, and match exactly on zip code and franchise status. The unit of observation is the business-week. The dependent variables are: weekly number of Yelp restaurant page view (Column 1), number restaurant website views (Column 2), number of calls to the restaurant via the Yelp online platform (Column 3), 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 city level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table X: Heterogeneity By Business Performance

	(1) Page Views	(2) Website	(3) Calls	(4) YTP Orders	(5) YTP Revenue
	Panel A: Rating Above/Below Median				
Post X Black	5.497	0.811*	1.010***	0.452***	16.391***
	(5.686)	(0.448)	(0.245)	(0.148)	(5.370)
Post X Black × Ratings	45.083***	4.238***	1.471***	0.486**	10.687
	(10.413)	(0.881)	(0.435)	(0.238)	(7.698)
Observations	1488725	1488725	1488725	710150	710150
# of Clusters	11174	11174	11174	5266	5266
	Panel B: Performance Pre-feature (Five Outcomes Index)				
Post X Black	21.266***	0.832*	-0.133	0.382***	8.846***
	(6.469)	(0.485)	(0.249)	(0.114)	(3.280)
Post X Black × Index	8.176	1.481***	1.089***	0.196***	8.109***
	(5.725)	(0.381)	(0.217)	(0.074)	(2.530)
Observations	737397	737397	737397	737397	737397
# of Clusters	5505	5505	5505	5505	5505

Notes: This table presents OLS regressions results relating firm outcomes to the adoption of the Black-owned business label, examining heterogeneity by pre-treatment restaurant quality. *Black* is a dummy that is 1 if a restaurant is designated by Yelp as having a Black proprietor in a given week, and 0 otherwise (the Black-owned business label generally becomes active within the online marketplace, and keeps this status for the remainder of the sample). 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 standarized index of quality based on the five main outcomes in Table II (quality index computed a z-score as in Kling et al. (2007). Results are based on the matched sample of Black and White-owned, where we match coarsely on the firm's cuisine and firm rating, and match exactly on zip code and franchise status. The unit of observation is the business-week. The dependent variables are: weekly number of Yelp restaurant page view (Column 1), number restaurant website views (Column 2), number of calls to the restaurant via the Yelp online platform (Column 3), 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 city level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

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Table AI: Robustness to Heterogeneous Dynamic Treatment Effects

	Page Views	Website	Calls	YTP Orders	YTP Revenue
	Panel A: TWFE With Heterogeneous ATTs (Wooldridge 2021)				
Post X Black	38.966***	3.845***	2.654***	0.859***	27.864***
	(5.990)	(0.525)	(0.282)	(0.207)	(6.868)
Observations	3190188	3190188	3190188	775478	775478
# of Clusters	27934	27934	27934	6456	6456
	Panel B: "Stacked" DiD (Cengiz et al. 2019)				
Post X Black	32.473***	3.636***	2.441***	0.859***	26.337***
	(4.676)	(0.406)	(0.205)	(0.123)	(3.982)
Observations	15205809	15205809	15205809	3442544	3442544
# of Clusters	28391	28391	28391	6440	6440
	Panel C: Multiple Periods DiD (Callaway & Sant'Anna 2021)				
Post X Black	-6.531	3.084***	2.373***	0.893***	30.728***
	(8.556)	(0.500)	(0.210)	(0.112)	(4.289)
Observations	224829	224829	224829	135750	135750
# of Clusters	28412	28412	28412	9124	9124

Notes: This table presents robustness checks related to our main OLS regressions in Table II. All results relate firm outcomes to the adoption of the Black-owned business label in a difference-in-differences 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" difference-in-difference design in which data for teach treatment "episode" (defined as we explain in the text) is restacked before estimating our difference-in-differences 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). *Post* $\times$ *Black* is a dummy that is 1 if a restaurant is designated by Yelp as having a Black proprietor in a given week, and 0 otherwise (the Black-owned business label generally becomes active within the online marketplace, and keeps this status for the remainder of the sample). Results are based on a matched sample of Black and White-owned firms, where we match coarsely on the firm's cuisine and firm rating, and match exactly on zip code and franchise status. The unit of observation is the business-week. The dependent variables are: weekly number of Yelp restaurant page view (Column 1), number restaurant website views (Column 2), number of calls to the restaurant via the Yelp online platform (Column 3), 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 city level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table AII: Heterogeneity By Franchisee Status

	(1) Page Views	(2) Website	(3) Calls	(4) YTP Orders	(5) YTP Revenue
Post X Black	27.908***	2.942***	1.920***	0.722***	22.692***
	(4.948)	(0.415)	(0.208)	(0.133)	(4.157)
Post X Black × Franchisee	-13.285	-3.680***	-2.268***	-0.795	-30.879*
	(11.794)	(1.402)	(0.353)	(0.657)	(16.980)
Observations	3190666	3190666	3190666	775478	775478
# of Clusters	28412	28412	28412	6456	6456

Notes: This table presents OLS regressions results relating firm outcomes to the adoption of the Black-owned business label, and examines heterogeneity by whether the restaurant is a franchisee. *Post* × *Black* is a dummy that is 1 if a restaurant is designated by Yelp as having a Black proprietor in a given week, and 0 otherwise (the Black-owned business label generally becomes active within the online marketplace, and keeps this status for the remainder of the sample). Franchise is a dummy variable indicating whether a restaurant. Results are based on the matched sample of Black and White-owned, matching exactly on zip code and franchise status. The unit of observation is the business-week. The dependent variables are: weekly number of Yelp restaurant page view (Column 1), number restaurant website views (Column 2), number of calls to the restaurant via the Yelp online platform (Column 3), 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 city level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table AIII: Heterogeneity By Cuisine

	(1) Page Views	(2) Website	(3) Calls	(4) YTP Orders	(5) YTP Revenue
	Panel A: Only Asian and European Restaurants				
Post X Black	56.597	7.666**	1.322	2.090**	66.765*
	(37.723)	(3.873)	(1.579)	(0.934)	(35.141)
Observations	54154	54154	54154	19488	19488
# of Clusters	762	762	762	184	184
	Panel B: Only Asian, European, and South/Central American Restaurants				
Post X Black	30.339**	3.941***	1.825**	0.579	17.489
	(14.737)	(1.279)	(0.852)	(0.485)	(15.001)
Observations	158027	158027	158027	67443	67443
# of Clusters	1997	1997	1997	581	581

Notes: This table presents OLS regressions results relating firm outcomes to the adoption of the Black-owned business label, and examines heterogeneity by the type of cuisine offered by a restaurant. *Post* $\times$ *Black* is a dummy that is 1 if a restaurant is designated by Yelp as having a Black proprietor in a given week, and 0 otherwise (the Black-owned business label generally becomes active within the online marketplace, and keeps this status for the remainder of the sample). 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 European country. In Panel B, we limit to only those restaurants that offer food from either an Asian country, European country, or Latin American country. Results are based on the matched sample of Black and White-owned, matching exactly on zip code and franchise status. The unit of observation is the business-week. The dependent variables are: weekly number of Yelp restaurant page view (Column 1), number restaurant website views (Column 2), number of calls to the restaurant via the Yelp online platform (Column 3), 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 city level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.