Competition and Discrimination in Public Accommodations: Evidence from the Green Books *

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Abstract

Models of taste-based discrimination suggest that competition will drive down the market share of discriminatory firms even in the absence of government intervention. We present a stylized model that captures the nature of the relationship between the ratio of non-discriminatory to discriminatory firms and the ratio of non-discriminatory to discriminatory consumers. We then consider the case of discrimination against black consumers during the Jim Crow era. Combining exogenous variation in the racial composition of local markets induced by white casualties during WWII with a novel dataset of discriminatory and non-discriminatory firms, we find that white casualties are associated with large increases in both the number of non-discriminatory public accommodations as well as the ratio of non-discriminatory to discriminatory public accommodations throughout the United States. While our analysis is most consistent with the market conditions hypothesis, we show that activism among blacks likely played a role in the expansion of access to public accommodations.

Keywords: Green Books, public accommodations, segregation, consumer discrimination, Jim Crow laws
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World War II marked the beginning of a lengthy period of socioeconomic change for African Americans in the United States. While progress occurred differentially across regions, the years leading up to the Civil Rights Act saw wage increases and occupational upgrading among African Americans (Collins, 2000), changes in discriminatory attitudes among whites (Ferrara, 2019), and legislative changes resulting in the desegregation of schools and other public services. Comparatively, little is known quantitatively about access to public accommodations during this period. This paper uses novel county-level estimates of the number of non-discriminatory firms across various different service and retail industries from the *Negro Motorist Green Book* to show that WWII was also a period of unprecedented increases in access to public accommodations.

To understand the increase in non-discriminatory accommodations, we extend Becker's 1971 taste-based discrimination framework to study the determinants of segregation in public accommodations. Becker (1971) formalized the notion of racial prejudice as a taste for discrimination, in which individuals act as though they must pay a cost or forfeit part of their income to be avoid associating with people belonging to particular groups. In this framework, racial discrimination can arise on the part of white employers who in their decision making inflate the cost of wages paid to black employees, on the part of white employees who discount the wages they receive from working at a firm that also hires black workers, or on the part of white consumers, who inflate the price they pay to shop at a firm that employs black labour.

We present a stylized model in which firms pursue profit maximization without any taste-based discrimination concerns, while members of a majority group have some level of aversion to consuming goods and services alongside members of a minority group. In equilibrium, some fraction of firms will choose to discriminate against the minority groups and sell exclusively to a subset of the majority group. Our model predicts that the ratio of minority to majority consumers, as well as the distribution of majority group prejudice, play an important role in determining the ratio of non-exclusionary to exclusionary firms in a market. Specifically, firms maximize their profits by choosing whether or not to discriminate, knowing that if they choose not to discriminate, a fraction of their white clientele will shop elsewhere. In this manner, it captures the notion, advanced by Wright (2013), that competitive concerns were of utmost importance to firms; a non-prejudiced firm would be reluctant to integrate if it meant losing prejudiced customers to rivals that remained segregated. Effectively, this is a setting in which firms discriminate against black consumers, despite have no animus towards them.[1]

[1]At present we have not incorporated prejudice on the part of firm owners into the model. But adding it should not qualitatively affect the model's implications.

We combine the insights of our model with newly constructed county-level estimates of the number of non-discriminatory firms across various different service and retail industries from the *Negro Motorist Green Book*, a travel guide for African American tourists published between 1937-1964 to facilitate travel during the Jim Crow era. A simple regression of the number of Green Book establishments on the ratio of black to white consumers in a county would produce biased estimates of the coefficients of interest. This is due to the fact that the number of black customers in an area may simultaneously respond to the number of non-discriminatory firms in that area, as well as the fact that both the level of discrimination and the number of black customers may be driven by unobservable factors. We circumvent these issues by exploiting exogenous shocks to the number of white consumers in a county induced by geographic variation in World War II casualties. This empirical strategy has been used successfully to analyze the effects of manpower mobilization in World War II on women's educational attainment and family formation (Jaworski, 2014), labour force participation (Goldin and Olivetti, 2013), the structure of midcentury wages (Acemoglu, Autor, and Lyle, 2004), and the effects of WWII on the occupational upgrading of African Americans (Ferrara, 2019).

Our findings suggest that an additional 100 white casualties is associated with an additional 1.4 Green Book establishments, which we consider to be a proxy for non-segregated or black-friendly firms. Then, more closely related to our theoretical model, we conduct a similar exercise for the hotel industry. Using newly digitized counts of hotels by county from the 1935 and 1948 editions of the U.S. Census of Business, we are able to provide estimates for the number of discriminatory hotels, as measured by the total number of hotels minus the number of Green Book hotels.[2] This allows us to construct the ratio of non-discriminatory (Green Book) to discriminatory (non-Green Book) hotels, which, in line with our theoretical framework, we regress on the ratio of black to white consumers. As is expected, a higher ratio of black to white consumers is correlated with a higher ratio of non-discriminatory to discriminatory firms. This result holds when we use white casualties to proxy for the white population and when we use white casualties to instrument for the black-white population ratio.

Although our preliminary analysis is most consistent with the Beckerian, market conditions, hypothesis, in that the increase in the number of establishments during World War II appears to be driven by counties that experienced the highest white casualty rates, we acknowledge that this finding could be related to alternative explanations. Most notably, it

[2]We are currently in the process of digitizing the Census of Business data for other industries, in future work we will expand the scope of this analysis. An additional issue is that for some types of businesses, such as beauty and barber shops, the establishment count data is only available at the city level in 1935; we leave for future work an analysis at the city level.

could be the result of a demand-driven-hypothesis, wherein occupational upgrading among semi-skilled blacks led to an increase in the black demand for public accommodations (Ferrara, 2019). We show that this is likely not the case, as casualties among semi-skilled workers have virtually no effect on the growth in Green Book establishments.

Alternatively, increased access to public accommodations could have been the result of social movements, spurred by African American enlistees who also fought for equality at home. A horse race of white casualties and black enlistees reveals distinct heterogeneity across regions. White casualties were driving the growth in Green Book establishments in the Midwest and the West, while black enlistment was driving the growth in Green Book establishments in the South and the Northeast. Thus, market conditions certainly played an integral role in the growth of non-discriminatory establishments, but social change was regionally important during this time period as well.

While residential discrimination has received a lot of attention from scholars, relatively less attention has been paid to understanding segregation's role in access to public accommodations and business ownership.[3] Work by Gil and Marion (2018) is the most closely related to our own. The authors exploit the enforcement of a ban against segregation in Washington, D.C. in 1953 to test whether segregation in cinemas was due to taste-based discrimination among firms (cinema owners) or consumers, or both parties. Our approach is distinct from this small literature on consumer discrimination insofar as we present a model in which segregation arises in equilibrium and then attempt to test its implications about the determinants of firms' decisions to serve black customers.

Aside from the data contribution, our work contributes meaningfully to the history of the Civil Rights Movement. Our analysis of the market composition of black and white consumers sheds light on how consumers may have played a part in the expansion of non-discriminatory firms before the Civil Rights Act banned discrimination in public accommodations. While other scholars have suggested that consumer-level discrimination on the part of non-minority consumers against minority consumers created profit maximizing incentives for firms to discriminate (Wright, 2013), data availability has limited empirical tests of this hypothesis. The Green Book data and empirical framework we propose permit us to construct an empirical test for the potential market hypothesis for the desegregation of accommodations in America.

[3]Other notable exceptions are Roback (1986)'s study of segregated streetcars. She explores whether the development of the Jim Crow system stemmed from political considerations by elites or a widespread shift in attitude towards blacks.

2 A Model of Consumer Discrimination and Firm Segregation

Here, we present a simple model that captures the equilibrium relationship between firms' decisions to discriminate and consumer tastes. The modeling approach combines elements of Becker's (1971) taste-based discrimination framework with Salop's 1979 circular city entry model. Central to our modeling approach is the notion of sub-markets that are indexed by d. In one of them, $d = 1$, segregation takes places—firms do not sell to members of the minority group. In the other, $d = 0$, firms sell to both majority and minority group consumers. Both of these sub-markets are unit circles with firms and consumers located on the perimeter.[4]

Agents make decisions in the following order: first, firms choose which sub-market—the segregated ($d = 1$) or non-segregated ($d = 0$)—to enter into. After observing the number of competing firms in their respective sub-markets, firms set prices. Next, consumers choose which sub-market to purchase from, taking into account prices and anticipated transportation costs. For black consumers the decision is trivial, they are limited to purchasing from the non-segregated market. However, white consumers, who may have discriminatory preferences, have to choose which sub-market to purchase from.

2.1 Consumers:

The environment consists of a measure one of consumers, θ of which are black, b, and $(1-\theta)$ of which are white, w. Each individual consumes one unit of the good, g. A white consumer's payoff from purchasing g from firm j is:

$$u^d_{W,i} = \begin{cases} g - p^1 - t\,\mathbb{E} \mid \delta^1_i \mid & \text{if } j \text{ discriminates, } d_j = 1 \\ g - p^0(1+\eta_i) - t\,\mathbb{E} \mid \delta^0_i \mid & \text{if } j \text{ does not discriminate, } d_j = 0 \end{cases}$$

The parameter η_i is consumer i's discrimination coefficient. This captures the disutility that a discriminatory individual (a person with $\eta_i > 0$) experiences when they consume g from a firm that also serves black customers. Each individual i knows their η_i, while firms know that $\eta_i \in [0, \infty)$ and its pdf $f(x)$ and cdf $F(x)$. Consumers take into consideration the prices in the two sub-markets, p^1 and p^0, and expected travel costs to the nearest firm in each sub-market, $t\,\mathbb{E} \mid \delta^0_d \mid$ for $d \in \{0, 1\}$. Consumers have to form expectations over travel costs, because we assume that when a consumer chooses a sub-market they are randomly placed on the corresponding unit circle, as a result they do not know their exact location

[4]For the sake of clarity (and to tie in more closely with our empirical exercise), the terms white and black will be used in the place of majority and minority, respectively, when discussing the two types of consumers.

relative to those of firms.

It follows that a white consumer will choose to purchase from a segregated firm if:

$$\underbrace{g - p^1 - t\,\mathbb{E} \mid \delta_i^1 \mid}_{u_{W,i}^1} \geq \underbrace{g - p^0(1+\eta_i) - t\,\mathbb{E} \mid \delta_i^0 \mid}_{u_{W,i}^0}$$

$$\eta_i \geq \frac{p^1 - p^0}{p^0} + \frac{t(\mathbb{E} \mid \delta_i^1 \mid - \mathbb{E} \mid \delta_i^0 \mid)}{p^0}$$

$$\eta_i \geq \frac{p^1 - p^0}{p^0} + \frac{t}{4p^0}\left(\frac{1}{N^1} - \frac{1}{N^0}\right)$$

The intuition is that individuals with "high" ηs are willing to "pay" to discriminate in the form of higher prices at stores that do not serve black customers. A person, i, with discrimination coefficient η_i will prefer to purchase from the segregated firm if the "discrimination mark-up" plus the expected difference in travel costs is smaller than his/her discrimination coefficient. As a result, we arrive at the condition that for a given set of prices, p^0 and p^1 and expected travel costs, $\bar{\eta}$ is the cut-off discrimination coefficient. Any person with a discrimination coefficient above this level will choose the discriminatory firm.

Meanwhile, for a black consumer, the payoff to purchasing g from firm $d_j = 0$ is:

$$u_{B,i}^0 = g - p^0 - t\,\mathbb{E}\,|\delta_i^0|$$

Recall that black consumers can only purchase from non-discriminatory firms and they do not incur a disutility from this transaction. The decision of a black consumer is to purchase good g from firm j if $d_j = 0$ and if $g > p^0 + t\,\mathbb{E}\,|\delta_i^0|$.

Combining the share of the black population (θ), the preferences of consumers, and the distribution of η, we arrive at the following expressions for the densities of consumers, denoted S^d, $d \in \{0, 1\}$:

$$S^d = \begin{cases} (1-\theta)[1 - F(\bar{\eta})] & \text{if market is segregated, } d = 1 \\ \theta + (1-\theta)F(\bar{\eta}) & \text{if market is not segregated, } d = 0 \end{cases}$$

2.2 Firms:

Now we turn to the problem faced by firms. They must decide which sub-market to enter into and what price to set, while taking into account what they know about the decisions of consumers. Our modeling of the sub-markets and solution approach draws heavily from Salop (1979), which uses the backward induction solution approach. First we solve for prices in each sub-market, and then we use these to solve for the segregation decision of firms.

Firms are assumed to be identical with cost functions, $C(q) = cq$ (in a departure from Salop's model, we omit fixed costs without loss of generality). Suppose that N^d firms entered sub-market d in the first stage and are located equidistantly along the circumference of the unit circle (which has the important implication that the distance between the firms is $\frac{1}{N^d}$).

In order to solve for an arbitrary firm j's pricing decision, we must first specify firm j's demand. It is important to note that in this environment, competition is local. As depicted in Figure 1, when setting prices, firm j is only competing with its nearest neighbours on either side for making sales to consumers. Following Salop (1979), we posit that firms in sub-market d are charging an equilibrium price p^d_{eq} and firm j is deciding on whether to deviate, by charging a lower price, to steal customers from its neighbours. There is a consumer at some distance x from firm j (where $x < \frac{1}{N^d}$) that is indifferent between buying from j and $j+1$ if[5]

$$g - p^d_j - tx = g - p^d_{eq} - t(\frac{1}{N^d} - x)$$

$$x = \frac{p^d_{eq} - p^d_j + t/N^d}{2t}$$

Since firm j faces the same cut-off consumer on the other side of the market (between j and $j-1$), it has overall demand $q^d_j = 2x \times S^d$. It follows that the expression for firm j's profit is $\Pi^d_j = (p^d_j - c)q_j - \mathcal{F}$.

Solving first for the non-segregated sub-market ($d_j = 0$):

$$\Pi^0_j = (p^0_j - c)\left(\frac{p^0_{eq} - p^0_j + t/N^0}{t}\right) \times \Big(\theta + (1-\theta)F(\bar{\eta})\Big)$$

Taking the first order condition:

$$\frac{\partial \Pi^0_j}{\partial p^0_j} = 0 = \left(\frac{p^0_{eq} - p_j + t/N^0}{t}\right)\left[\theta + (1-\theta)F(\bar{\eta})\right]$$
$$+ (p^0_j - c)(-1/t)\left[\theta + (1-\theta)F(\bar{\eta})\right]$$

Note that here we are assuming that firm j treats $\bar{\eta}$ (and thus S^0) as exogenous, j is a "market size taker."[6]

Since all the firms have the same cost function, it follows that they will price symmetrically, i.e. $p^0_j = p^0_{-j} = p^0_{eq}$, $\forall j$. Thus, we arrive at the equilibrium price in the non-segregated

[5]We focus on consumers to one side of j, but the other side is symmetric since firms are equidistantly far apart and firms other than j are all assumed to be charging the same price.

[6]We are working on a version of the model that relaxes this (admittedly strong) assumption.

market:

$$p^0_{eq} = c + \frac{t}{N^0}$$

Meanwhile, in the segregated sub-market ($d_j = 1$):

$$\Pi^1_j = (p^1_j - c)\left(\frac{p^1_{eq} - p^1_j + t/N^1}{t}\right) \times (1-\theta)[1 - F(\bar{\eta})]$$

Following the same approach as above, we find the equilibrium price in the segregated market:

$$p^1_{eq} = c + \frac{t}{N^1}$$

Next, we can recover the firms' equilibrium profit in each of the sub-markets. Since all firms within a sub-market charge the same price, it follows that an arbitrary firm, j, faces demand $q^d_j = \frac{1}{N^d}$ If it enters the non-segregated market ($d_j = 0$) its profit will be:

$$\begin{aligned}
\Pi^{0*}_j &= (\bar{p}^0 - c)\left(\frac{1}{N^0}\right) \times S^0 \\
&= \left[\left(\frac{t}{N^0} + c\right) - c\right]\left(\frac{1}{N^0}\right)[\theta + (1-\theta)F(\bar{\eta})] \\
&= \frac{t}{(N^0)^2}[\theta - (1-\theta)F(\bar{\eta})]
\end{aligned}$$

Meanwhile, if it enters the segregated market ($d_j = 1$) its will earn:

$$\Pi^{1*}_j = \frac{t}{(N^1)^2}(1-\theta)[1 - F(\bar{\eta})]$$

Now, we turn to the sub-market entry decision of firm j. A firm will choose to discriminate against blacks (i.e. enter the segregated market) if it is more profitable to do so. In other words, firm j enters the segregated market if:

$$\underbrace{\Pi^{1*}_j}_{\substack{\text{Segregated} \\ \text{profit}}} \geq \underbrace{\Pi^{0*}_j}_{\substack{\text{Non-segregated} \\ \text{profit}}} \geq 0$$

Substituting in for Π^{1*}_j and Π^{0*}_j, we get the following condition:

$$\frac{N^0}{N^1} = \sqrt{\frac{\theta + (1-\theta)F(\bar{\eta})}{(1-\theta)[1 - F(\bar{\eta})]}}$$

If we impose some additional assumptions on η, specifically that $\eta \sim U(0,1)$, then the

expression simplifies considerably as $F(\bar{\eta}) = \bar{\eta}$:

$$\frac{N^0}{N^1} = \sqrt{\frac{\theta + (1-\theta)\bar{\eta}}{(1-\theta)[1-\bar{\eta}]}} \tag{1}$$

and if $\bar{\eta} \in (0, 1)$, it follows that

$$\frac{\partial(N^0/N^1)}{\partial\theta} > 0$$

.

The main implication of the model is that a positive level of segregation can be an equilibrium outcome even in the absence of prejudice on the part of firms. In this setting, where firms are pure profit maximizers facing white consumers with discriminatory preferences, as the black population share increases, so will the ratio of non-segregated to segregated firms in the market.

The profit maximizing motive to remain segregated—that is, if there are enough white consumers who discriminate to support this equilibrium—is a central theme in Gavin Wright's *Sharing the Prize*. At the heart of our theoretical specification we suggest that segregated businesses may therefore have an incentive to serve black customers if enough white customers are "missing" from the market. The notion that white businesses may have recognized the potential profits from desegregating is further supported by historical examples from the time. For instance, an article published in *The New York Age* in 1958 stated,

> *"Competition is getting keener every year as more and more white hotels in the quest for increased earning open their doors to Negroes and offer them excellent accommodations and good cuisine[.]"*

In the sections that follow, we present a novel dataset and a causal identification strategy to empirically evaluate the equilibrium relationship presented in equation 4.

3 Data and Methodology

To construct an estimate of the number of non-discriminatory firms in each county we collect a novel dataset of firms that were friendly towards African American consumers from the *Negro Motorist Green Books*. The Green Books were published as travel guides for African American motorists between 1938 and 1964, with the exception of time period during World War II, when many funds were diverted to focus on the war effort.[7] Although the intent of the Green Books was to assist African American motorists, many establishments that are listed in the Green Books were not exclusively for tourists. These include barber shops

[7]We are also unable to locate the 1958 Green Book, so this year is not included in our dataset.

and beauty parlors, restaurants and drinking establishments, as well as pharmacies, liquor stores, and florists.

The Green Books can be viewed online through the New York Public Library's Digital Collections. Using these we constructed a dataset consisting of the geocoded location of each establishment for each year for which the Green Books were published. Figure 3 displays the total number of Green Book establishments between 1938 and 1964. Our analysis focusses on the years 1939-1955 for two reasons. First, the Green Books did not become nationally representative until 1939. Second, as is evident in Figure 3, there was a large drop in the number of establishments after 1955. We suspect this has to do with a change in requirements surrounding advertisements, so we restrict our analysis to the years prior to 1955. Cook, Jones, Logan, and Rosé (2020) provides a comprehensive overview of the drop in the number of Green Book establishments, as well as a more detailed background on the Green Books themselves and the geographic trends, patterns, and correlates.

The goal of our empirical analysis is to understand whether changes in the racial composition of consumers affects firms' incentives to segregate. Since the racial composition of consumers in a given market may be correlated with other unobservable factors that also affect a firm's decision to segregate, we require an exogenous change to the racial composition of markets to fully address our question of interest. We propose that the number of white casualties in World War II can be viewed as an exogenous change in the market composition of black and white consumers. Similar identification strategies have been used to study how the shortage of male labor during World War II affected female labor market outcomes (Acemoglu et al., 2004; Fernandez et al., 2004; Goldin and Olivetti, 2013; Jaworski, 2014).

Most closely related to our work, is that of Ferrara (2019), who uses the World War II casualty rate of semi-skilled whites to identify the effect of labor shortages on occupational upgrading among blacks. We obtain these data from Ferrara (2019) who matched the WWII Enlistment Records to the WWII Honor List of Dead and Missing for the Army and Army Air Force using a combination of direct matches on unique serial numbers and probabilistic matching for those serial numbers that were unable to be identified. Since the firms in our model care about the market share of black and white consumers to the extent that shares affect the total number of possible consumers, we focus on the level of white casualties, rather than the rate of white casualties. Our empirical strategy is therefore a difference-in-differences specification that exploits exogenous variation in the number of white casualties across counties during WWII.

It is important to note that racist attitudes within the military meant that Blacks had proportionally lower enlistment and thus mortalities during WWII. As an example from the June 1945 Congressional Record, James Eastland (D-MS) declared black veterans in-

ferior soldiers and stated that the soldiers from the South were fighting to maintain white supremacy. He went on to state that this sentiment was widely shared and not restricted to Southerners, but simply more open there among them. Eastland says,

> *"In not one instance, Mr. President, could they place a Negro officer in a responsible position. In not one instance could they place upon his shoulders the responsibility of combat [...] Had we depended upon it, the German Army would have gone south to the toe of the Italian boot and destroyed our armies in Europe. The Negro soldier was an utter and dismal failure in combat in Europe."*

In panel (a) of Figure 2 we map the location of Green Book establishments in the year that the United States joined World War II. Panel (b) displays the location of Green Book establishments in 1947, the first year the Green Books resumed publication following the end of World War II. Since the points represent precise geocoded locations, and there may be many points within reasonably close proximity, it is difficult to appreciate the magnitude of the change in Green Book establishments during the wartime period by simply looking at the maps. Figure 3 aggregates the total number of Green Book establishments by year, where it is clear there was a large increase in Green Book establishments between 1942 and 1947.

To begin to understand the causes behind the increase in Green Book establishments during the wartime period and to test whether or not the changes in the consumer base may be a reasonable explanation, we begin by presenting difference-in-differences specification that takes the following form:

$$\text{GB}_{ct} = \alpha + \beta \text{casualties}_c \times \text{post-WWII}_t + \gamma_c + \delta_t + \epsilon_{ct} \tag{2}$$

where GB_{ct} is the number of Green Book establishments in county c at time t, casualties_c is the number of white casualties (in 100s) in county c, and post-WWII_t is an indicator equal to 1 if the year is after World War II. The coefficient of interest, $\hat{\beta}$, measures the differential change in the number of Green Book establishments after World War II attributable to an additional 100 white casualties. We include time fixed effects δ_t to account for unobservable factors that vary across time, but not counties, in addition to county fixed effects γ_c to control for time-invariant unobservable factors that vary across counties. All models are estimated using ordinary least squares regressions and standard errors are clustered at the county level.

In some specifications we replace county-level fixed effects with a matrix of pre-WWII control variables $\mathbf{X}_c'$ to account for a variety of initial conditions that may be correlated with WWII casualties and the growth in Green Book establishments. These controls in-

clude the share of farmland in 1940, as this has been shown to be an important determinant of mobilization during WWII (Acemoglu et al., 2004). We also include per-capita measures of various religious denominations in 1940,[8] and the population in 1940.[9], both of which are taken from the ICPSR Historical, Demographic, Economic, and Social Database. Importantly for an analysis using the Green Book data, we also include 1940 measures of the number of black postal workers, average educational attainment, and the prevalence of household appliances (from the 1940 Census of Population); manufacturing involvement and WWII contracts (from ICPSR); in addition to confederate symbols (Southern Poverty Law Centre), historical lynchings Cook (2012), and residential segregation Logan and Parman (2017). From the 1940 Census of Population, we also include the share of black residents who had migrated from out of state in the last 5 years, and the share of black residents who had migrated within state in the last 5 years. Conditioning on existing black migrants is useful for proxying for migration chains and is reminiscent of the shift-share instruments used in other work to identify migration-induced changes in the black population (Boustan, 2009; Derenoncourt, 2019). Unfortunately, all counties in the United States do not have values of all variables. We restrict to the set of counties for which we have all variables, which substantially reduces the number of counties. Thus our preferred specifications include only county and year fixed effects.

Identification in equation 2 relies on several assumptions that underlie the difference-in-differences framework. First, counties with low levels of casualties must share a common support with counties with high levels of casualties. Fortunately, we have a reasonably rich set of controls that help mitigate any pre-existing differences across counties with different levels of white casualties.

Second, changes in Green Book listings must reflect real changes in the provision of non-discriminatory public accommodations and not merely selection into the Green Books. If there is selection across counties, a sufficient condition for this assumption being met is that the selection process is independent of the treatment. That is, selection must be the same across counties with different levels of white casualties. Figure 5 displays time series of the number of Green Book establishments in the full sample, the number of establishments in counties that had at least one Green Book in the previous year, and the number of establishments that occur in new counties. Nearly all of the growth in Green Book establishments between 1939 and 1955 occurred in counties that had at least one Green Book establishment in 1939. While this does not rule out selection within a county or city that had an exist-

[8]These include Baptists, Congregationalists, Disciples, Lutherans, Methodists, Presbyterians, Episcopalians, Roman Catholics, Jewish, and all other religions.

[9]It does not make a difference whether we condition on total population or the white population.

ing Green Book, it does alleviate concern that selection occurred across counties. In the empirical section, we include a robustness check that restricts the analysis to only include counties that had at least one Green Book establishment in 1939.

The third assumption that is required to interpret $\hat{\beta}$ as the causal effect of white casualties on the growth of Green Book establishments is that there cannot have been any anticipation effects wherein Green Book establishments started occurring more frequently prior to World War II in anticipation of the shortage of white consumers induced by the war. The history surrounding the United States' involvement in the war suggests that this is unlikely, given that the United States did not enter the war until the Japanese unexpectedly attacked Pearl Harbor.

The fourth and final assumption required is that of parallel trends, which states simply that in the absence of World War II all counties would have experienced the same growth in Green Book establishments, regardless of their level of white casualties. Since this assumption refers to a hypothetical, we cannot formally test it; however, we can estimate additional specifications that lend support to the credibility of the assumption. To do so, we estimate additional models in an event study framework,

$$\text{GB}_{ct} = \psi_c + \phi_t + \sum_{t=1939,\neq 1941}^{1955} \delta_t \mathbb{1}(\text{year} = t) \times \text{casualties}_c + \epsilon_{ct}, \tag{3}$$

where we replace the interaction of casualties and the indicator for being observed in the post-war period with a set of interactions between the casualty rate and each year. We leave out 1941, so that all coefficients are measured with respect to the first year the United States formally entered World War II. If there were no differential trends in the number of Green Book establishments observed in counties with high and low enlistment rates prior to World War II, then the coefficient estimates on the interaction terms in the pre-war period should not be statistically different from 0.

4 Results

4.1 The Effect of White Casualties on Green Book Growth

Before presenting our main results, we display estimates from the event study framework of equation 3 in Figure 8. Each of the points represents a coefficient estimate associated with a yearly treatment and the bands represent 95% confidence intervals. All coefficients are measured relative to one year prior to WWII. Immediately this figure makes it clear that there were no differential trends in the growth of Green Book establishments before the war. After WWII, an additional 100 white casualties is associated with just over one

more Green Book establishment. This treatment effect remains stable over time, suggesting that the number of Green Book establishments grew during the wartime period, but did not continue to grow after white casualties subsided.

The event study estimates lend support to the parallel trends assumption and are in line with the theoretical model that predicts that counties with high white casualties should experience disproportionate growth in their non-segregated markets. In the following section we provide an empirical analysis that more closely matches the theoretical model but makes use of a more limited data sample. We therefore complete this sction by presenting estimates of equation 2 for the full sample, as well as providing a discussion of some of the heterogeneity in our findings.

Table 3 displays these pooled results, where the pre-treatment period includes the years 1939-1941 and the post-treatment period is 1947-1955.[10] Column (1) presents standard difference-in-differences estimates where we do not include any controls or fixed effects, other than state fixed effects.[11] The treatment effect of 1.405 can be interpreted as an additional 1.4 Green Book establishments after WWII in counties that experienced an additional 100 white casualties. While the average county in 1941 had 0.59 Green Book establishments, counties that had at least one Green Book establishment in 1939 had an average of 4.8 Green Book establishments in 1941. In both samples, an increase of 1.4 Green Book establishments represents an economically meaningful change in the magnitude of the non-segregated market.

Since we do not have a full set of controls for all counties in our Green Book dataset, column (2) of Table 3 checks whether dropping these counties alters our treatment effect. Column (3) includes the full set of county-level controls, as well as year fixed effects, for this restricted sample. Column (4) replaces county level controls with county level fixed effects, and column (5) presents our most restrictive specification, where we include state by year fixed effects. In each specification, the treatment effect is largely the same as in column (1) and is both economically and statistically significant.

Figure 10 displays the treatment effects by region within the United States. While the West saw the largest gains in the growth of non-discriminatory establishments ($\hat{\beta} = 1.59$), the magnitude of this estimate is similar across regions, with the smallest effect

[10] One concern may be that our results depend on the time frame we have chosen to include in our sample. Since we have good reason to exclude the years prior to 1939 and after 1955, we re-run our analysis sequentially dropping years from our sample. Figure 9 displays the results from this exercise, where the first coefficient (in red) is the coefficient estimate from our main analysis. Given that the coefficient estimates do not vary substantially from one sample to the next, this suggests that our results do not depend on the sample we have chosen to use.

[11] We include state fixed effects to capture regional variation in the propensity to discriminate, but the results are similar if we omit state fixed effects.

in the Northeast ($\hat{\beta} = 1.35$). The values presented in the figure were generated from estimating equation 2 separately for each region and includes year and county fixed effects. An alternative specification that interacts the treatment effect with region dummies produces estimates of similar magnitude and fails to reject the null hypothesis that the regional treatment effects are all the same. The fact that non-segregated markets grew across all regions suggests that the treatment effect is not being driven by unobserved region-specific factors.

Due to the detailed nature of our Green Book data, we are also able to provide an analysis of treatment effects by the type of establishment. Table 5 displays these results, replicating the full sample (1), and then presenting estimates for barber shops and beauty parlors (2), eating and drinking establishments (3), gas or service stations (4), hotels and models (5), informal accommodations (6), and other establishments (7). Most of these categories are self-explanatory, with the exception of informal accommodations, which represent tourist homes—individual households (most often black) willing to open their homes to tourists—as well as Y.M.C.As and Y.W.C.As. The breakdown by type of establishment lends additional support to our hypothesis regarding firms' incentives to discriminate. First, the largest effect is among eating and drinking establishments ($\hat{\beta} = 0.738$), which are businesses that are not always intended for tourists, and should therefore be most affected by the number of white casualties in the county in which the business is located. Gas stations, which are almost certainly intended for those on the road, have one of the smaller effects ($\hat{\beta} = 0.061$); however, the smallest effect appears in informal accommodations ($\hat{\beta} = 0.0175$), which is also imprecisely estimated. In some sense the results for informal accommodations act as a placebo test, since there should not be any market incentives to increase the number of informal establishments.

The final set of results we present in this section examines the growth of Green Book establishments within cities. To do this, we leverage information from the residential security maps drawn by the Home Owner's Loan Corporation (HOLC) in the 1930s. These maps ranked neighborhoods by relative lending riskiness. Neighborhoods with "A" ratings were considered safe, while those in "D" neighborhoods were considered risky and subsequently redlined, whereby lenders would not loan to residents in those neighborhoods. "No grade" neighborhoods were either sparsely built up, industrial, commercial, undeveloped, or farmland. Figure 11 displays an example of the original maps from the city of New York. In many instances, redlined areas were disproportionately African American, and the legacy of the discriminatory practice of redlining has negatively affected these communities for generations (Aaronson et al., 2018).

We obtain all available digital shapefiles of redlined cities from the Digital Scholarship

Lab at the University of Richmond and overlay them with the geocoded location of Green Book establishments. This allows us to compute the number of Green Book establishments within each type of HOLC rating across cities. An example of this overlay for the city of New York is found in Figure 12. We restrict our sample to only include cities for which we have available HOLC maps and we use the level of white casualties of the county in which the city is located in order to estimate of equation 2. Table 6 displays the results of this exercise for each type of neighborhood.

By far, the largest increase in Green Book establishments occurred in D-grade or "redlined" neighborhoods ($\hat{\beta} = 1.096$, $p < 0.01$)). C-grade neighborhoods also experienced an increase in the number of Green Book establishments ($\hat{\beta} = 0.123$, $p < 0.1$). No-grade neighborhoods also experienced a similar increase in the number of Green Book establishments as C-grade neighborhoods, although it is imprecisely estimated. Figure 13 shows that the majority of the growth in D-grade neighborhoods occurred in eating and drinking establishments, formal accommodations, and "other" establishments, which include a number of different types of stores: pharmacies, liquor stores, convenience stores, etcetera.

Thus far, we have suggested that the causal relationship between white casualties and Green Book growth is related to the change in market composition of black and white consumers; however, we have not provided a formal test for this hypothesis. The following section connects the theory and empirics by introducing a new dataset that allows us to focus on the share of discriminatory to non-discriminatory establishments.

4.2 Connecting the Theory and Empirics

To motivate the empirical specification in this section, consider once again the equilibrium condition derived in Section 2,

$$\frac{N^0}{N^1} = \sqrt{\frac{\theta + (1-\theta)\bar{\eta}}{(1-\theta)[1-\bar{\eta}]}} \tag{4}$$

This equation explicitly relates the ratio of non-discriminatory to discriminatory firms to the ratio of non-discriminatory to discriminatory consumers, bearing in mind that the consumer ratio is both a function of the number of black and white consumers (θ and $(1-\theta)$, as well as the number of white consumers who are willing to shop in the non-segregated market ($F(\bar{\eta})$).[12]. This specification implies that changes in the ratio of non-discriminatory to discriminatory firms may arise from changes in the market composition of consumers or in the propensity for white customers to discriminate. Unfortunately, we do not have a way

[12]We refer to non-discriminatory consumers as those who purchase from firms who sell to the minority group, thus the minority group is automatically included in the count of non-discriminatory consumers.

of estimating $F(\bar{\eta})$, so our empirical specification focusses on the ratio of black and white consumers. If $F(\bar{\eta})$ is unchanged over time, then we can account for this empirically through a county-level fixed effect, or by including out set of controls which include factors assumed to be associated with the racial animosity of an area, like confederate symbols and historical lynchings. A limitation of our analysis occurs when $F(\bar{\eta})$ does change over time.

If we assume that all white customers discriminate, then $F(\bar{\eta}) = 0$. Under this assumption, taking the natural logarithm of both sides of equation 4 yields:

$$\underbrace{\ln\left[\frac{N^0}{N^1}\right]}_{\substack{\text{Ratio of Non-Discriminatory} \\ \text{to Discriminatory Firms}}} = \frac{1}{2} \underbrace{\ln\left[\frac{\theta}{(1-\theta)}\right]}_{\substack{\text{Ratio of Black} \\ \text{to White Consumers}}} \tag{5}$$

from which we arrive at estimating equation:

$$\ln(\text{firm ratio})_{ct} = \alpha_0 + \alpha_1 \ln(\text{B-W ratio})_{ct} + \gamma_c + \delta_t + \epsilon_{ct}, \tag{6}$$

where $\ln(\text{Firm Ratio})_{ct}$ is the natural logarithm of the ratio of non-discriminatory to discriminatory firms in county c in time t, $\ln(\text{B-W Ratio})_{ct}$ is the natural logarithm of the ratio of black to white consumers in county c in time t, and as before, γ_c represents county-specific fixed effects and δ_t represents year specific fixed effects. In this case, the county fixed effects may account for county differences in the propensity for white consumers to discriminate—e.g., variation in $F(\bar{\eta})$ across counties. If the empirical specification in equation 6 perfectly aligned with the theoretical specification in equation 5 then the estimate of α_1 would be equal to 0.5.

Of course, equation 6 is somewhat restrictive in the sense that it assumes the effect of the number of black consumers on the firm ratio is of equal magnitude (and opposite sign) as the effect of the number of white consumers. That is,

$$\ln(\text{firm ratio})_{ct} = \alpha_0 + \alpha_1 \ln(\text{black consumers})_{ct} + \alpha_2 \ln(\text{white consumers})_{ct} + \gamma_c + \delta_t + \epsilon_{ct}, \tag{7}$$

where again, if the theoretical specification and the empirical specification aligned then $\hat{\alpha}_1 = -\hat{\alpha}_2$ and equation 6 would be the correct estimating equation. Since there is reason to believe that this restriction may not hold in practice, we therefore present separate empirical results for equation 6, as well as equation 7. The obvious empirical concern with both equations is that neither accounts for endogenous population change. To circumvent this issue, we propose to proxy for the change in the number of white consumers using the

number of white casualties during WWII. Equation 7 then becomes,

$$\ln(\text{firm ratio})_{ct} = \beta_0 + \beta_1 \ln(\text{black consumers})_{ct} + \beta_2 \ln(\text{casualties} \times \text{post-WW2})_{ct} + \beta_3 \ln(\text{casualties})_c + \beta_4 \ln(\text{after})_t + \epsilon_{ct}, \quad (8)$$

where, in equation 8 we expect counties that experienced more white casualties during WWII to have a higher ratio of non-discriminating to discriminating firms. We treat equation 8 as a reduced form specification, and also use the difference-in-differences specification to instrument for the black-white population ratio.

To construct the ratio of non-discriminatory to discriminatory firms requires a measure of each type of firm. For this analysis, we restrict our attention to formal accommodations, as we have digitized the retail and service trade volumes of the 1935 and 1948 United States Censuses of Business to construct county-level estimates of the total number of accommodations.[13]. Figure 14 shows an example of the number of accommodations in counties in Alabama from the 1948 Census of Business. We have information on the number of establishments, total number of guest rooms, receipts, active proprietors, number of employees, and total payroll. We are only using information on the number of establishments. From these variables, we construct the number of discriminatory firms using the following formulas:

$$\begin{aligned} \#\ \text{discriminatory}_{c,t<1942} &= \#\ \text{CoB establishments}_{c,1935} - \#\ \text{GB establishments}_{c,t} \\ \#\ \text{discriminatory}_{c,t>1942} &= \#\ \text{CoB establishments}_{c,1948} - \#\ \text{GB establishments}_{c,t}, \end{aligned}$$

where we use the number of Green Book establishments (# GB establishments$_{c,t}$) in county c in time t to compute the number of non-discriminatory establishments, and the county-level estimates of the total number of accommodations from the Census of Business as our measure of all hotels. Unfortunately, the Census of Business only reported estimates for counties that met a certain population threshold, so our sample for this exercise is smaller than that in our previous analysis.

An additional benefit of using the Census of Business counts as a control variable is that it addresses the concern that counties that experienced a high growth in non-discriminatory establishments may have experienced a high growth in all establishments, in which case our previous analysis would not actually be picking up changes in market segregation. Table 7

[13]Whereas the 1948 Census of Business lists motels explicitly, the 1935 publication is not explicit about the inclusion or exclusion of motels in the definition of hotel. However, it is our opinion that the 1935 definition would have included both categories of establishment as certain types of establishments are explicitly excluded (boarding houses, Y.M.C.A.s, and tourist camps, for example). Moreover, the term "motel" was quite novel at the time as it was coined in 1925 (Jackson, 1993).

reports the results of this exercise for our original specification, equation 2, where we make three changes. First, we now report results where both the dependent variable and the number of white casualties are measured in terms of the inverse-hyperbolic sine, allowing us to approximate the natural logarithm, which is most consistent with the theoretical framework above. In this case, our coefficient estimates can be roughly interpreted as elasticities.[14] Second, we restrict our sample to hotels and the subset of counties for which the Census of Business data is available. Third, in some columns we condition on the Census of Business estimates.

For reference, Column (1) of Table 7 shows the results for Green Book hotels for the full sample and suggests that a 1% increase in white casualties is associated with a 0.25 % increase in the number of Green Book hotels after WWII. Column (2) restricts the sample to the set of counties for which we have Census of Business estimates, and column (3) conditions on the Census of Business hotels. The remainder of the table replicates the previous table where we restrict to the county control sample, condition on our full set of controls, replace controls with county fixed effects, and finally add state by year fixed effects. The treatment effect is stable across all specifications, but reduces in magnitude to 0.18 when we include our county controls, a result that is driven by the addition of the controls and not the restriction of the sample.

In Table 8 we turn to our theoretical specification. Here, we begin by estimating equation 6 using levels in column (1) and the arcsinh transformation in column (2). The interpretation of Column (2) is that a 10% increase in the ratio of black to white population is associated with a 1.1% change in the ratio of non-discriminatory to discriminatory firms. This value is much different from the 5% that would be predicted by the theoretical model, but is nevertheless in the same direction as predicted by theory. In column (3) we allow the magnitude of the effect of black and white population changes to differ by separately controlling for each population using the arcsinh transform. Here we see that a 10% increase in the black population is associated with a 0.03% increase in the ratio of non-segregated to segregated firms and that a 10% increase in the white population is associated with a 0.2% decrease in the ratio of non-segregated to segregated firms.

In column (4), we use the interaction of white casualties in WWII and an indicator for being after the war period to proxy for the change in the white population. The coefficient on the arcsinh of the black population decreases in magnitude slightly between column (3) and (4) from 0.003 to 0.002. As expected, the coefficient on the interaction of white casualties and post-WWII is positive, suggesting that areas with more white casualties saw differential increases in their ratio of non-segregated to segregated firms after WWII. That

[14] See the detailed description in (**?**).

being said, the coefficient is imprecisely estimated.

Ultimately, the objective of our analysis in this section is to understand how changes in the black-white population ratio is related to changes in the ratio of non-discriminatory to discriminatory firms. From Table 8 we a positive correlation between these ratios, as would be predicted by theory, but using a specification that does not account for the endogenous nature of population change. To further address this, we use the number of white casualties in WWII interacted with an indicator for being after WWII to instrument for the black-white population ratio. Table 9 presents the first stage results where we regress the black-white population ratio on the treatment indicator. As before, column (1) presents a standard difference-in-differences specification, where we condition on state fixed effects, column (2) restricts to the set of counties for which we have a full set of controls, column (3) conditions on the controls, column (4) replaces controls with county and year fixed effects, and column (5) adds state X year fixed effects. Our treatment effect varies between 0.0016 and 0.0035 depending on specifications and all coefficients are estimated precisely.

The IV results are presented in Table 10. Columns (1) through (3) use the full sample. In columns (3) through (6) we restrict to the years 1940 and 1950 and in columns (7) and (8) we use the % change in the ratio of non-discriminatory to discriminatory firms between 1940 and 1950 as the dependent variable and the % change in the black-white population ratio as the independent variable, for which we instrument with the number of white casualties. In this latter specification, we have to restrict the sample to the years 1940 and 1950 an we can only include counties where the 1940 ratio of non-discriminatory to discriminatory firms was greater 0. This leaves us with a cross-section of 157 counties.

We begin by presenting OLS estimates of the relationship between the non-discriminatory to discriminatory firm ratio and the black-white population ratio in column (1). This specification suggests that a 1 unit increase in the black-white population ratio is associated with a 0.021 unit increase in the non-discriminatory to discriminatory firm ratio. To put this in perspective, the smallest value of the black-white population ratio in our dataset is 0 and the largest is 5.92, meaning that for each white person in that county, there are nearly 6 black people. Conditional on state fixed effects, instrumenting the black-white population ratio with the difference-in-differences specification (column (2)) yields an IV estimate of 1.167, suggesting that a one unit increase in the black-white population ratio leads approximately to a one unit increase in the ratio of non-discriminatory to discriminatory firms. In column (3) we estimate a fixed effects IV specification with county fixed effects, which leads to an imprecisely estimated coefficient of 4.85. Our results are largely unchanged when we restrict to the years 1940 and 1950 in columns (4) through (6).

When we estimate the specifications using the change in the firm ratio and the change

in the population ratio, the OLS results suggest that a 100 percentage point change in the black-white population ratio between 1940 and 1950 is associated with an 80 percentage point change in the non-discriminatory-discriminatory firm ratio during this time period. Instrumental variable estimates increase the magnitude of this coefficient estimate slightly to 91 percentage points and both OLS and IV results are estimated precisely. In each instance, the IV results suggest that the OLS estimates understate the magnitude of the effect of population change on the firm ratio, but across specifications the direction of coefficient estimates is consistent with the notion that a higher black-white population ratio is associated with a higher ratio of non-segregated to segregated firms.

Our results in this section are consistent with the market conditions hypothesis, wherein business owners faced with a decline in their white consumer base began opening their stores to black consumers. That being said, other hypotheses are certainly possible. The following section evaluates in greater detail an alternative set of candidate hypotheses.

4.3 Alternative Explanations for the Growth in Green Book Establishments

There are several other reasons for why we may have seen a large increase in the number of Green Book establishments during the World War II period. Most closely related to our theoretical model is the possibility that $F(\bar{\eta})$ changed over this time period. One way this could have occurred that is also grounded in the historical narrative is through black participation in the war.[15] Although the army remained largely segregated through the end of WWII, black participation in the war was not trivial. By 1947, nearly 1.2 million blacks had served in the armed forces, yet they continued to face rampant discrimination at home. This was particularly true in the South, and acts of protest against segregation among black veterans become commonplace.

Examples outside the South also occurred, such as James G. Thompson's famous Letter to the Editor of the black-owned newspaper, *Pittsburgh Courier*, wherein he expressed his confliction over serving for a country in which he was denied the full rights of a citizen. Thompson's letter spurred the *Double V Campaign*—referring to African American's participating in victory over the Axis powers, as well as in the fight for equality at home—a campaign that eventually became national in nature and that many claim played an integral role in laying the foundation of the Civil Rights Movement. Thus, the growth in non-discriminatory establishments we see during this time period could be related to black participation in the war.

Another possibility related to the work of Ferrara (2019), is that WWII was a period of occupational upgrading among African Americans who filled semi-skilled positions pre-

[15] See, *"Did World War II Launch the Civil Rights Movement?"* by Annette McDermott.

viously held by whites. While Ferrara (2019) explicitly shows the link between white labor shortages and occupational upgrading among African Americans, black socioeconomic progress leading up to the Civil Rights Movement has been discussed extensively in the existing literature (see, e.g., **?**). If occupational upgrading led to an increase in incomes for blacks, this could have resulted in higher demand for consumer goods among African Americans.

Finally, the selection of businesses into the Green Books may have changed over this time period. While we have shown this is likely not the case at the county level, it may still have occurred within counties with existing Green Books. We examine each of the above explanations in sequence below.

4.3.1 *Black Enlistees and the Rise of the Civil Rights Movement*

The first explanation we examine is that black participation in the war is driving the results. This would confound the treatment effect from white casualties if black participation was high in areas with more white casualties. To test the attitude change hypothesis, we make use of the counts of black enlistments in our WWII data. As we discussed previously, black combat roles were minimal and the change in attitudes would have been spurred by returning blacks, not those who were deceased. Table 11 tests this hypothesis by region. The specifications in this table display a horse race between the post-WWII effect of black enlistments and that of white casualties. We report coefficient estimates with standard errors below in parentheses, and standardized coefficients below in brackets. These standardized coefficients are comparable within specifications, but not across specifications. All specifications condition on black enlistment, white casualties, black population, white population, and also include year and state fixed effects.

The results in Table 11 suggest that black involvement in World War II may have played a significant role in the growth of non-discriminatory firms in the post-war period, but that there is substantial heterogeneity across regions. There was virtually no effect of black enlistment on the post-war growth of non-discriminatory businesses in the Midwest, and a negative effect of black enlistment in the West; whereas black enlistment in the Northeast and the South appear to be driving the growth in non-discriminatory establishments in these regions. That being said, there is still a notable impact from white casualties on non-discriminatory establishment growth in both the South and the Northeast.

4.3.2 *Occupational Upgrading and Black Socioeconomic Progress*

Next we examine the possibility that occupational upgrading, and therefore an increase in demand among African Americans is at the heart of the increase in the number of non-discriminatory establishments. To do this, we make use of the white casualties by skill-level

available in the World War II data. We estimate a specification that takes the following form:

$$\text{GB}_{ct} = \alpha + \sum_{s \in \text{skills}} \left[\beta_s \text{casualties}_{sc} \times \text{post-WWII}_t + \gamma_s \text{casualties}_{sc} \right] + \delta_t + \epsilon_{ct}, \tag{9}$$

where we now include a separate variable for the number of white casualties of each skill level, as well as the interaction of these casualties with an indicator for the post-WWII period. The skill levels s include unskilled, clerical, semi-skilled, agriculture, skilled, professional, and services. Ferrara (2019) shows that African American workers filled the labor shortages induced by the white casualty rate among semi-skilled workers and finds no effect for low-skilled and high-skilled positions.

Figure 15 displays the coefficient estimates on each of the skill X post-WWII interactions in equation 9. The effect of white casualties among semi-skilled workers on Green Book establishments in the post-WWII period is close in magnitude to 0 and not statistically different from 0. This suggests that while African Americans may have been filling these positions, this is not the primary channel behind the growth in the non-segregated market.

That being said, the effect of white deaths among those in the service industry warrants further discussion. According to the Dictionary of Occupational Titles from the United States Department of Labor (1939), the service industry includes domestic service occupations, personal service occupations, protective service occupations (police, firemen, etcetera), and building service workers and porters. Since aside from the protective service occupations, the majority of these jobs are likely to be in hotels, this finding may be in line with the change in attitudes hypothesis. If African Americans began working in hotels where they themselves were not allowed to stay, they may have pushed for more equality in the hotel industry. Alternatively, the presence of more black workers may have led to a change in attitudes among whites. This is also consistent with the findings of **?**, in that after blacks filled semi-skilled positions, whites in these positions were more likely to report having an interracial friendship, live in a mixed race area, and to favour integration, mixed schools, and mixed churches.

5 Conclusion

During World War II there was an unprecedented increase in the number of public accommodations that served African American clientele. In this paper, we quantify the extent of this change by making use of a novel dataset that describes the number of non-discriminatory public accommodations as measured by listings in the *Green Books*. We then use our dataset to study the determinants of firms' decision to discriminate against potential customers that

belong to a minority group. We introduce a stylized model in which retail segregation arises in equilibrium; not as a result of firm's forgoing profits, but due to firms' decisions in the face of majority group customers that harbour a distaste for consuming alongside members of the minority group. In particular, our model aims to reflect the reality of segregation in public accommodations throughout much of the United States before the passage of the Civil Rights Act in 1964, and to better understand the decision of firms to discriminate during this period.

Motivated by the theoretical model's predictions that an increase in the black share of the population will lead to less discrimination in public accommodations, we relate the change in Green Book establishments to a shortage of white consumers induced by casualties in World War II. Using counties as the unit of observation, we identify the causal impact of an exogenous change in the white population, and thus the racial composition of counties, on the number of establishments listed in the Green Books using a difference-in-differences methodology with the level of white WWII mortality as the source of identifying variation. Our results are also robust to using WWII mortality as an instrument for the change in the black-white population ratio for the hotel industry.

The increase in non-discriminatory establishments during WWII occurred alongside a wave of socioeconomic progress among African Americans. We show that while our findings are most consistent with a market conditions hypothesis, the push for equality among blacks during this time period likely also played a role in the growth of non-discriminatory establishments. This was particularly true in the American South, where distinguished groups like the Tuskegee Airmen may have influenced public perception of African Americans in the military and in society more broadly.

In addition to contributing to a greater understanding of the impact of WWII on U.S. society and outcomes for blacks in particular, we shed light on the determinants of discrimination in public accommodations before the Civil Rights Act. Our findings support an interpretation that among the industries captured in the Green Books, local retail and service markets were quite responsive to changes in the racial composition of local consumers. In particular, this highlights the role of consumer discrimination in supporting a segregated equilibrium and provides empirical evidence in line with **?**'s hypothesis that profit maximizing firms maintained segregated markets on the basis of white consumer discrimination.

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A Figures

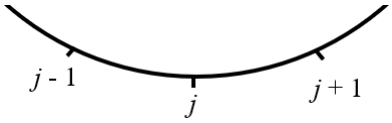
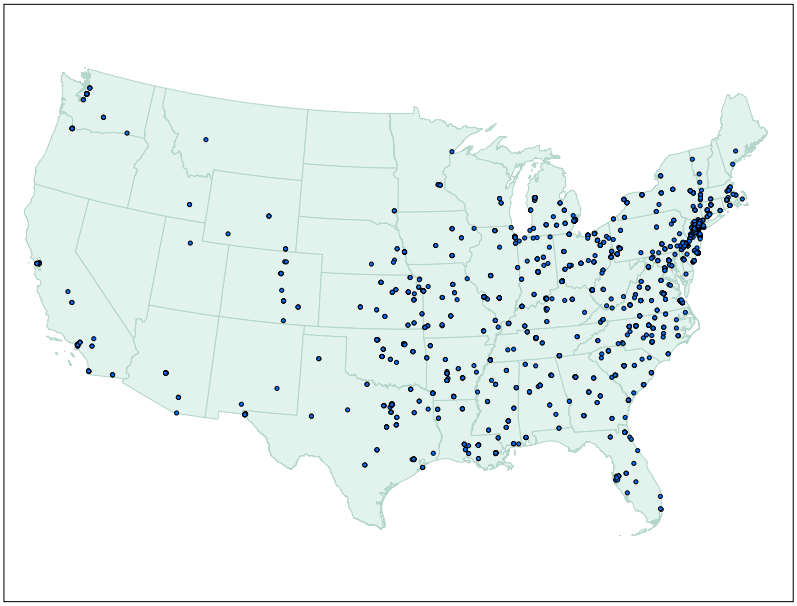
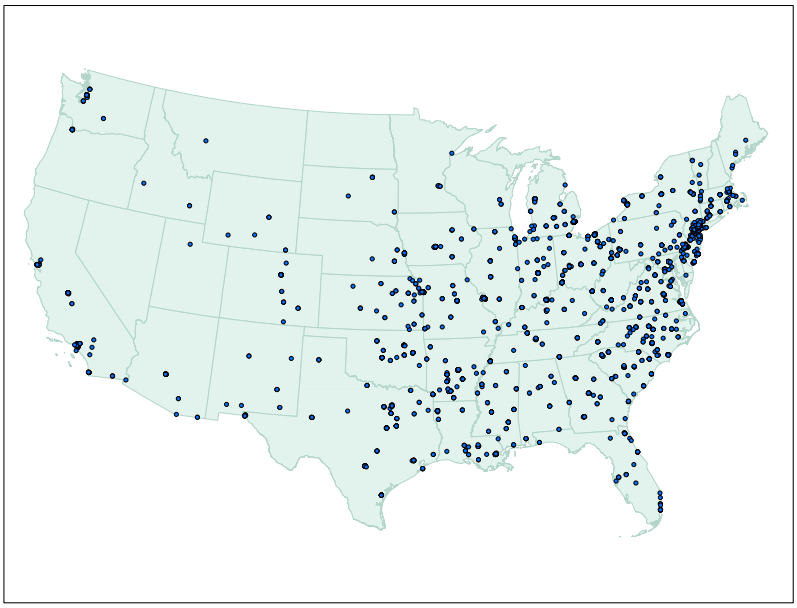


Figure 1: Depiction of firm j's neighborhood in a sub-market.



(a) Establishments in 1941



(b) Establishments in 1947

Figure 2: The location of Green Book establishments in 1941, the year the United States entered World War II, and 1947, the first year the Green Books resumed publication after World War II ended.

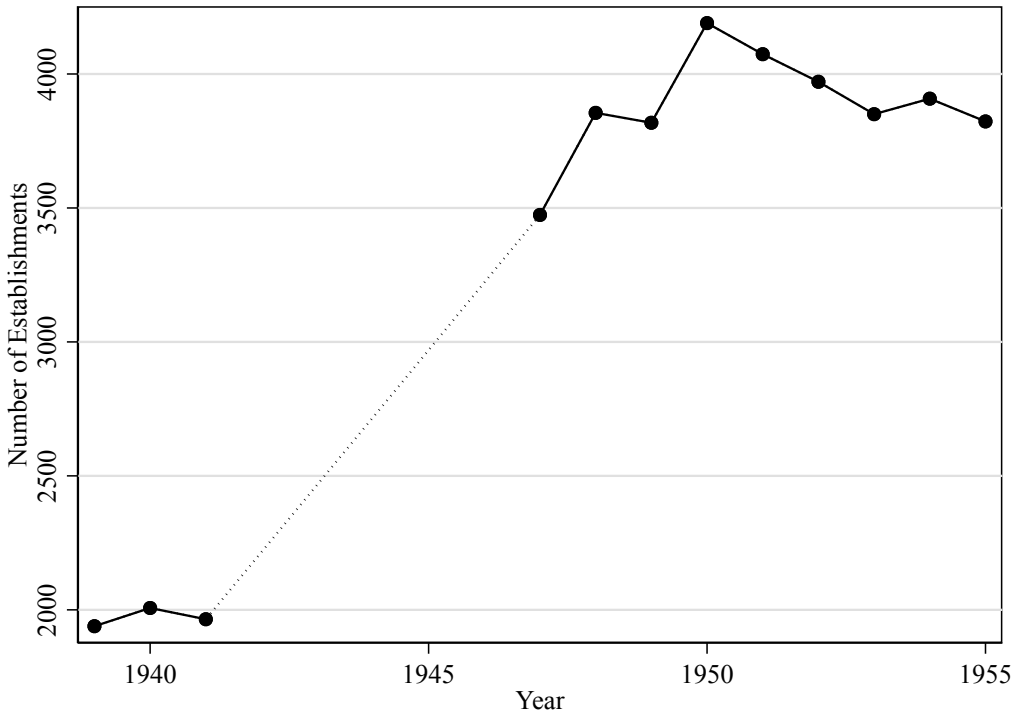


Figure 3: The total number of Green Book establishments over time.

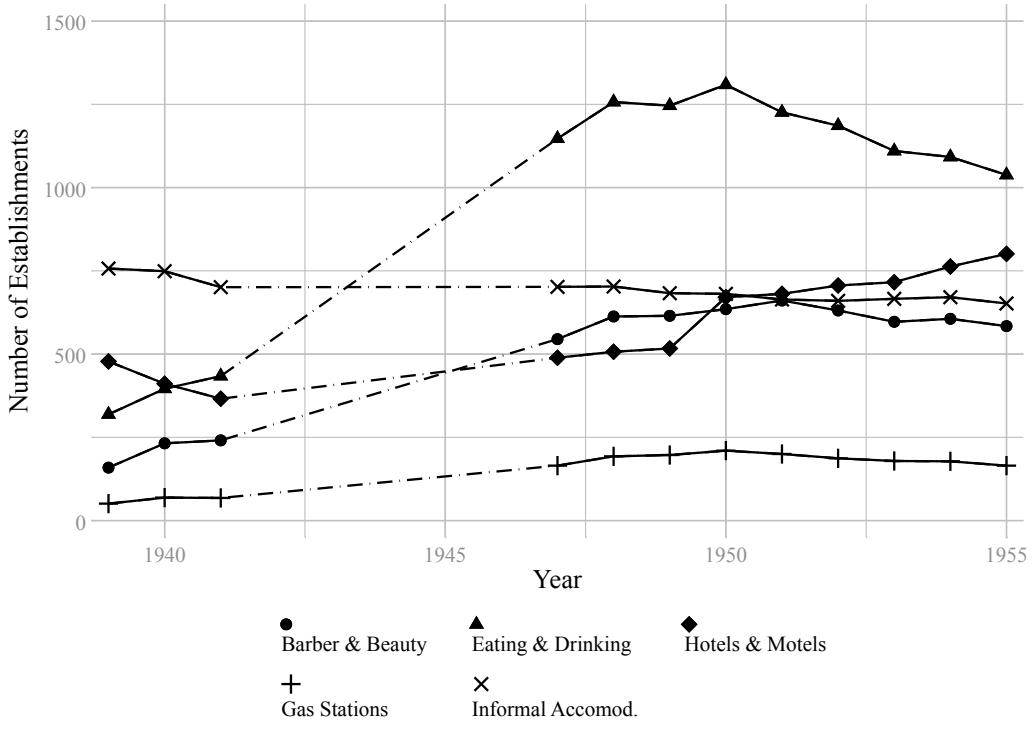


Figure 4: The total number of Green Book establishments by industry over time.

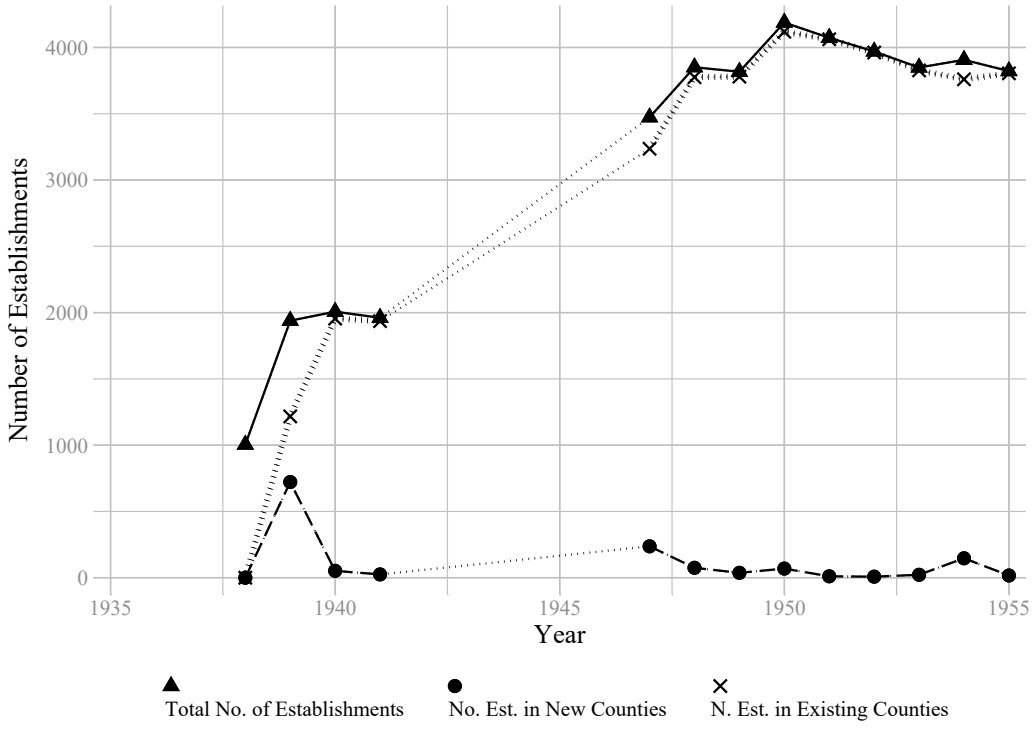


Figure 5: The growth in Green Book establishments among new counties and counties that had at least one Green Book.

Figure 6: The change in Green Book establishments plotted against the number of white casualties in WWII.

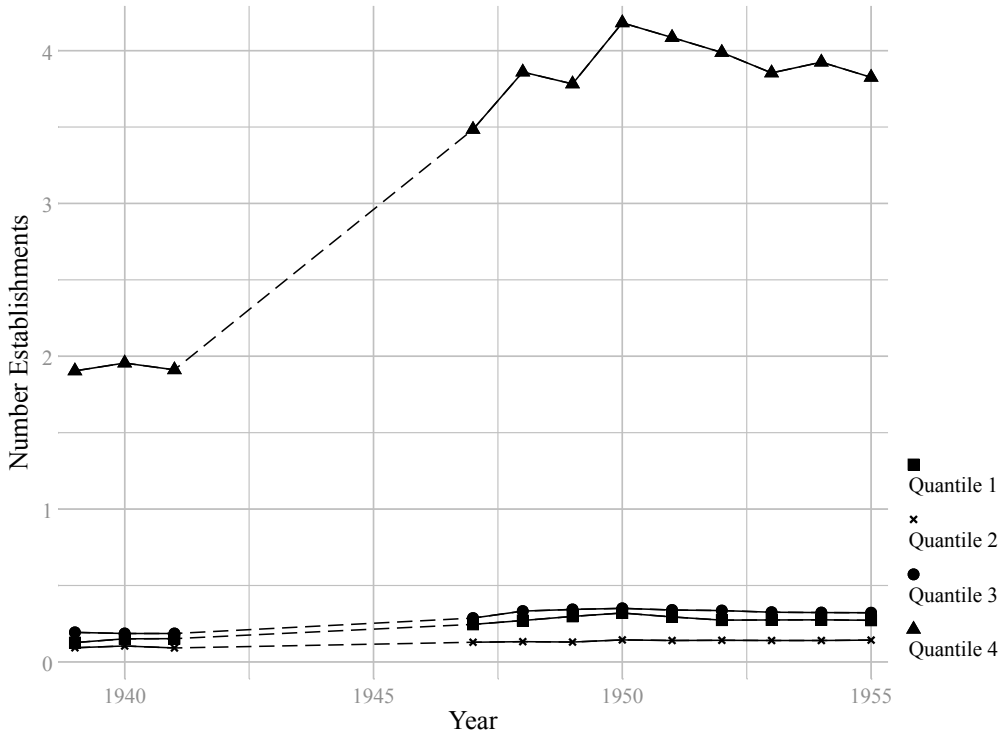


Figure 7: The total number of Green Book establishments quantile of white casualty distribution.

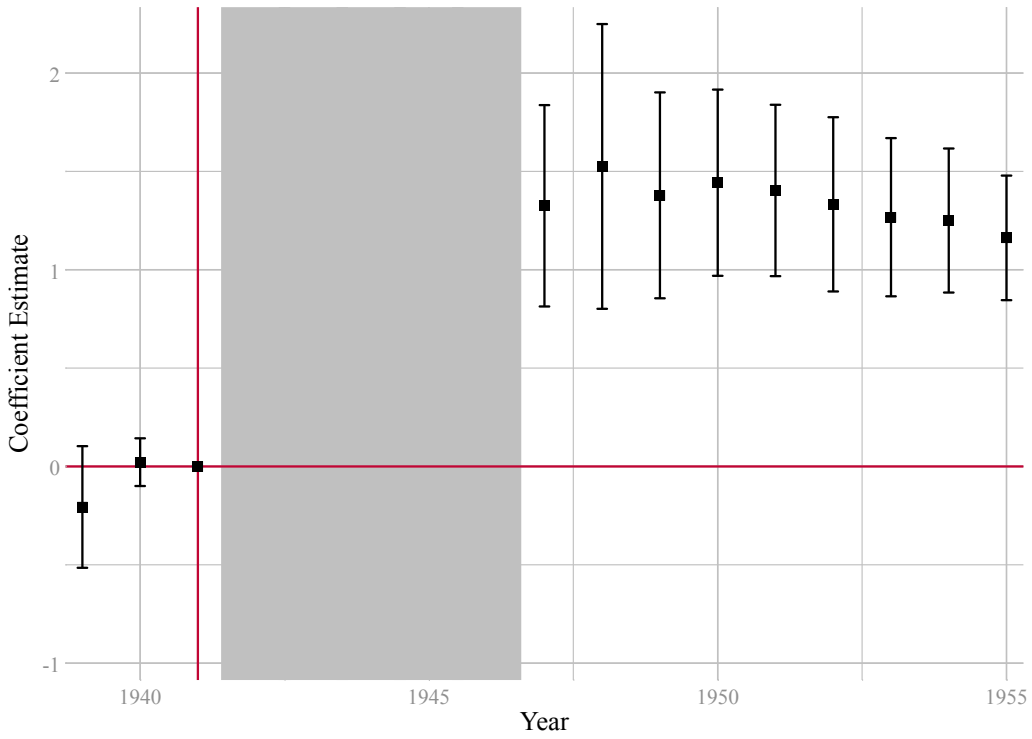


Figure 8: Coefficient estimates and 95% confidence bands from estimating equation 3 using OLS. The dependent variable is the number of Green Book establishments. Each estimate is measured with respect to 1941, so that coefficient estimates represent the differential change in the number of Green Book establishments for an additional 100 white casualties relative to 1941.

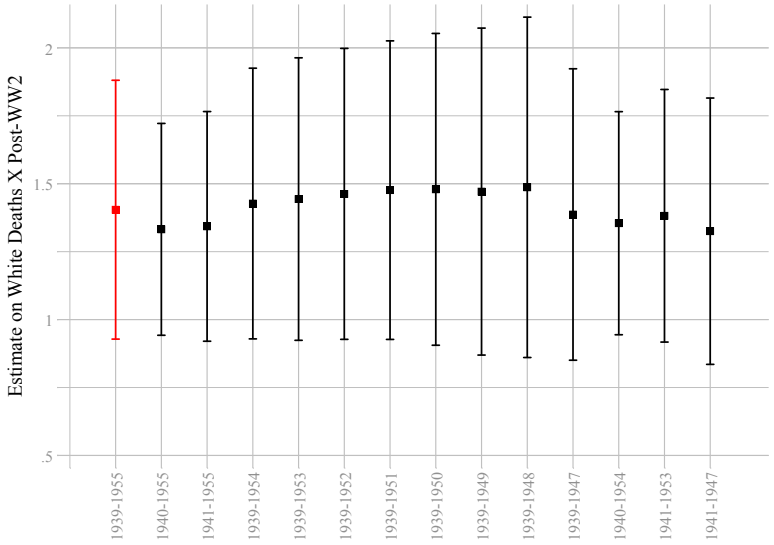


Figure 9: Coefficient estimates and 95% confidence bands from varying the years we include in our study and replacing enlistment with casualties. The first coefficient estimate that appears in red is the treatment effect estimated using our preferred sample, 1939-1955.

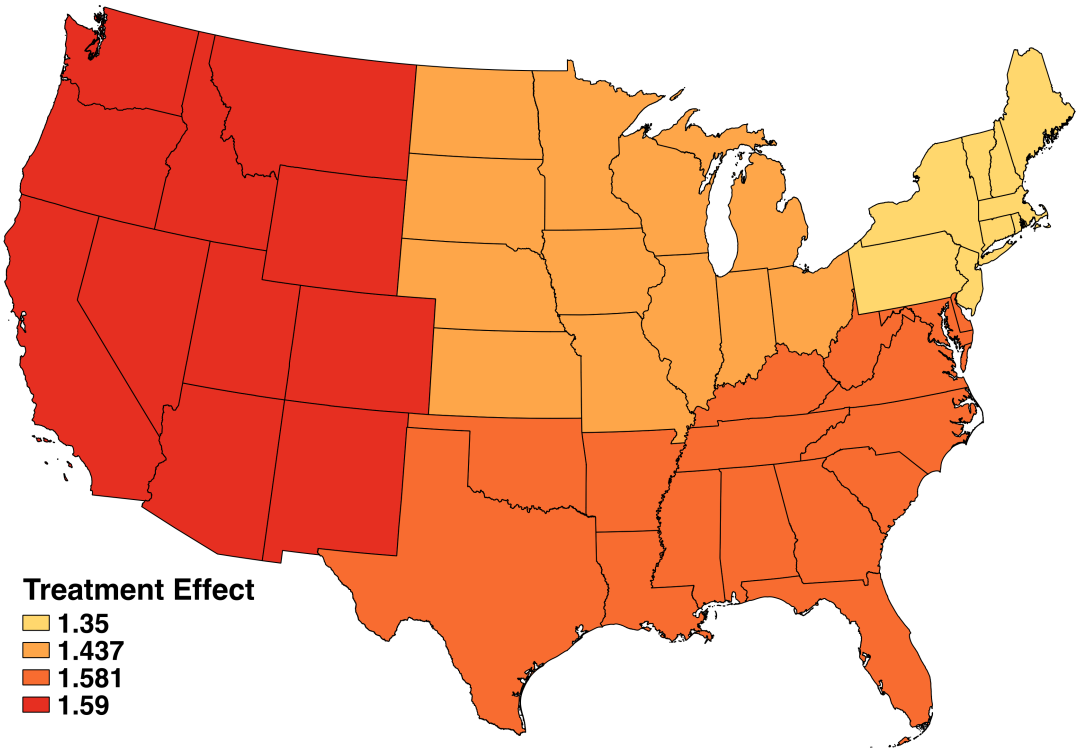


Figure 10: Coefficient estimates and 95% confidence bands from varying the years we include in our study and replacing enlistment with casualties. The first coefficient estimate that appears in red is the treatment effect estimated using our preferred sample, 1939-1955.

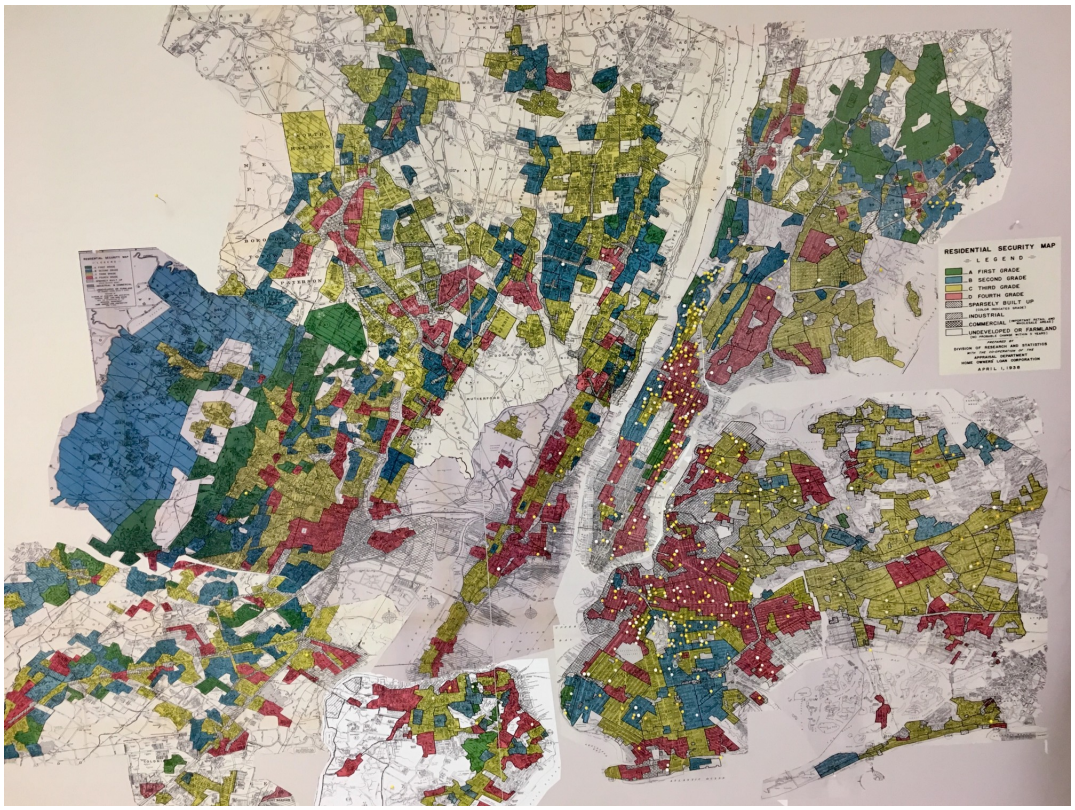


Figure 11: An original HOLC map of New York City and Newark from Medium.com

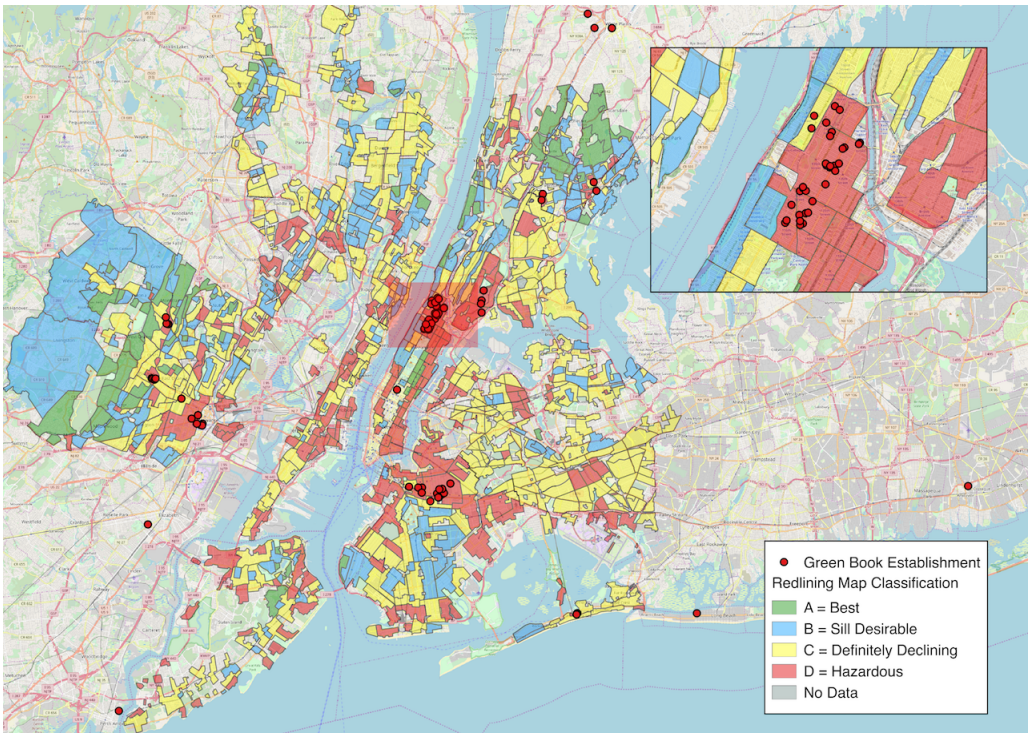


Figure 12: A digital reproduction of the HOLC map of New York City and Neward constructed using shapefiles from the Digital Scholarship Lab at the University of Richmond and our geocoded Green Book establishments.

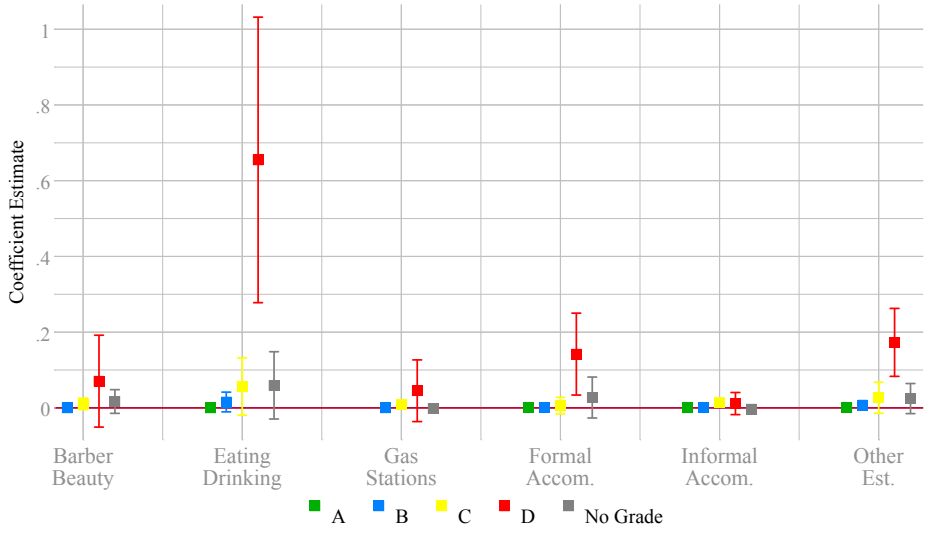


Figure 13: Coefficient estimates and 95% confidence bands by HOLC grade and industry.

State and County	Number of Establishments	Total number of guest rooms	Receipts (add 000)	Active proprietors and firm members	Employees (full-time and part-time). Average for year.	Total pay roll* (add 000
ALABAMA	248	9,728	$4,223	210	2,656	$998
Baldwin	8	170	29	7	16	4
Butler	3	49	14	3	9	2
Calhoun	7	223	84	5	64	20
Clarke	5	83	22	5	16	2
Colbert	3	137	50	2	35	15
Covington	8	124	34	7	31	8
Dallas	5	247	61	4	45	21
De Kalb	5	134	14	3	10	3
Escambia	3	99	27	2	23	8

Figure 14: An example of hotels by county from the 1935 Census of Business.

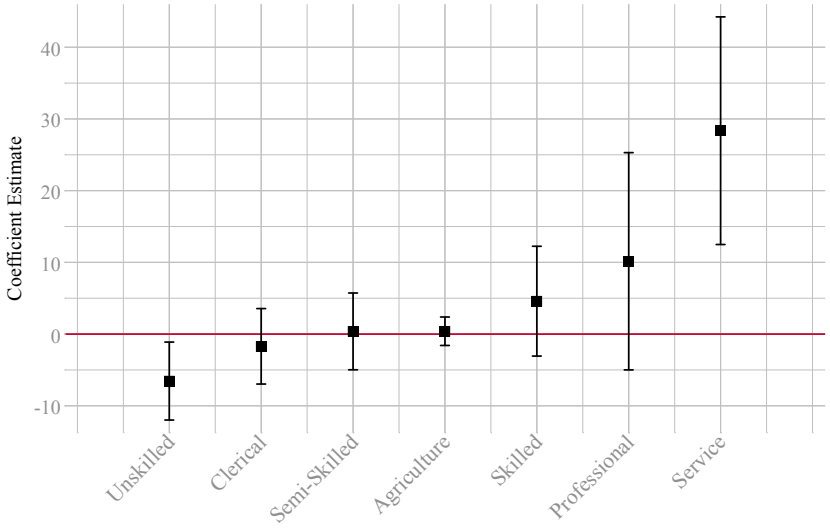


Figure 15: Coefficient estimates and 95% confidence bands from using white casualties among each of the skill levels.

B Tables

Table 1: County Data Descriptive Statistics, Full Panel in 1940

	mean	sd	min	max
Demographics				
White population (1000s)	37.94	133.882	0.025	3764.34
Black population (1000s)	3.97	13.365	0.000	298.36
Farmland share	0.69	0.271	0.000	2.04
Residential Segregation				
Dissimilarity index	0.51	0.310	0.000	0.99
Isolation index	0.11	0.140	0.000	1.00
World War II				
White enlistment (1000s)	1.98	6.926	0.004	163.06
Black enlistment (1000s)	0.21	0.841	0.000	23.30
White mortality count	48.40	154.727	0.000	3505.00
Black mortality count	1.90	8.200	0.000	239.00
Green Book Listings				
Barber & beauty shops	0.07	0.928	0.000	38.00
Eating & drinking places	0.12	1.383	0.000	51.00
Hotels & motels	0.13	0.827	0.000	19.00
Gasoline stations	0.02	0.206	0.000	6.00
Informal lodging	0.23	0.913	0.000	11.00
Observations	3023			

Table 2: County Data Descriptive Statistics, Accommodations in 1940

	mean	sd	min	max
Demographics				
White population (1000s)	53.96	168.775	1.999	3764.34
Black population (1000s)	4.67	16.526	0.000	298.36
Farmland share	0.67	0.283	0.000	2.04
Residential Segregation				
Dissimilarity index	0.57	0.301	0.000	0.99
Isolation index	0.11	0.151	0.000	1.00
World War II				
White enlistment (1000s)	2.82	8.719	0.052	163.06
Black enlistment (1000s)	0.27	1.046	0.000	23.30
White mortality count	68.15	194.269	0.000	3505.00
Black mortality count	2.37	10.156	0.000	239.00
Hotels and Motels				
Hotels & motels in the Green Book	0.20	1.039	0.000	19.00
Hotels & motels in the 1935 Census of Bus.	14.26	41.035	0.000	1139.00
Hotels & motels in the 1948 Census of Bus.	26.96	67.805	0.000	1920.00
Observations	1852			

Notes: This dataset is limited to counties that appeared in both the 1935 and 1948 editions of the United States Census of Business. Thus, it is only includes counties with a population greater than 2,500 in 1940.

Table 3: Effects of White Casualties on the Number of Green Book Establishments

	(1)	(2)	(3)	(4)	(5)
# White Casualties × Post-WWII	1.405***	1.398***	1.332***	1.405***	1.488***
	(0.243)	(0.247)	(0.248)	(0.254)	(0.271)
County Sample		X	X		
County Controls			X		
County F.E.				X	X
Year F.E.				X	X
State F.E.	X	X	X		
State × Year F.E.					X
Observations	39660	30096	30096	39660	39660
Adjusted R^2	0.444	0.442	0.732	0.892	0.894
# Clusters	3305	2508	2508	3305	3305

Notes: The dependent variable in each column is the number of Green Book establishments. Casualties are measured in units of 100. Standard errors clustered by county in parentheses. Column 1 displays the results of equation 2 with only state fixed effects. Column 2 presents the same specification as column 1, but restricts the sample to include only observations for which we have control variables. Column 3 includes our set of initial condition controls from 1940: population, the share of the county that is farmland, per capita religious rates, and the isolation and dissimilarity indices from Logan and Parman (2017). Column 4 replaces county controls and state fixed effects with county fixed effects, in addition to including year fixed effects. Column 5 includes state × year fixed effects on top of county and year fixed effects. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 4: Additional Considerations of the Effect of White Casualties on the Number of Green Book Establishments

	#GB	Pr(GB)	#GB	asinh(#GB)
# White Casualties × Post-WW2	1.405***	0.00356*	1.371***	
	(0.254)	(0.002)	(0.296)	
asinh(# White Casualties) × Post-WW2				0.252***
				(0.029)
Had GB in 1939			X	
Observations	39660	39660	4764	39660
Adjusted R^2	0.892	0.846	0.891	0.902
# Clusters	3305	3305	397	3305

Notes: The dependent variable column 1 and 3 is the number of Green Book establishments, in column 2 it is an indicator for whether the county has at least one Green Book establishment and in column 4 it is the inverse hyperbolic sine of the number of Green Book establishments. Casualties are measured in units of 100. Standard errors clustered by county in parentheses. All columns include year and county fixed effects. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 5: Effects of White Casualties on Number of Establishments by Industry

	(1) total	(2) barber	(3) eating	(4) gas	(5) hotel	(6) informal	(7) other
# White Casualties × Post-WWII	1.405***	0.167***	0.738***	0.0608*	0.161***	0.0175	0.261***
	(0.254)	(0.060)	(0.182)	(0.033)	(0.042)	(0.013)	(0.046)
Observations	39660	39660	39660	39660	39660	39660	39660
Adjusted R^2	0.892	0.804	0.867	0.770	0.870	0.849	0.785
# Observations	3305	3305	3305	3305	3305	3305	3305

Notes: The title of each column refers to the type of establishment counts that are used as the dependent variable. Casualties are measured in units of 100. Standard errors clustered by county in parentheses. All columns include year and county fixed effects. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 6: Treatment Effect by Redline District

	(1) Total	(2) A	(3) B	(4) C	(5) D	(6) None
# White Casualties × Post-WW2	1.372***	0.00180	0.0241	0.123*	1.096***	0.127
	(0.322)	(0.001)	(0.020)	(0.071)	(0.227)	(0.099)
Observations	1956	1956	1956	1956	1956	1956
Adjusted R^2	0.886	0.484	0.452	0.747	0.907	0.785
# Clusters	163	163	163	163	163	163

Notes: The dependent variable in each column is the number of Green Book Establishments. Casualties are measured in units of 100. Standard errors clustered by county in parentheses. All columns display the results of equation 2 using the number of Green Book establishments by HOLC grade. All columns include county and year fixed effects. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 7: Treatment Effects Conditional on Census of Business Hotels

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
asinh(# White Casualties) × Post-WW2	0.252***	0.265***	0.267***	0.274***	0.184***	0.265***	0.327***
	(0.028)	(0.032)	(0.032)	(0.033)	(0.030)	(0.033)	(0.039)
COB Sample		X	X	X	X	X	X
COB Control			X	X	X	X	X
County Sample				X	X		
County Controls					X		
County F.E.						X	X
Year F.E.						X	X
State F.E.	X	X	X	X	X		
State × Year F.E.							X
Observations	39660	22980	22980	19788	19788	22980	22980
Adjusted R^2	0.439	0.459	0.501	0.518	0.712	0.902	0.906

Notes: The dependent variable in each column is the inverse hyperbolic sine of the number of Green Book establishments so that the coefficient estimates can be roughly interpreted as elasticities. Casualties are measured in units of 100. Standard errors clustered by county in parentheses. Column 1 displays the results of equation 2 for the Census of Business sample, and column 2 conditions on the number of establishments from the Census of Business. Column 3 restricts to the sample for which we have the full set of controls, and column 4 includes these controls. Column 5 replaces controls with county and year fixed effects, and column 6 includes state X year fixed effects. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 8: Treatment Effects Grounded in Theoretical Specification

	(1)	(2)	(3)	(4)
	Firm Ratio	asinh(Firm Ratio)	asinh(Firm Ratio)	asinh(Firm Ratio)
Black-White Population Ratio	0.0830			
	(0.067)			
asinh(B-W Population Ratio)		0.116*		
		(0.070)		
asinh(Black Population)			0.00329***	0.00202**
			(0.001)	(0.001)
asinh(White Population)			-0.0202**	
			(0.009)	
asinh(# White Casualties) X post-WWII				0.00315
				(0.003)
Observations	22900	22900	22900	22900
Adjusted R^2	0.391	0.475	0.474	0.474
# Clusters	1915	1915	1915	1915

Notes: The dependent variable in column 1 is the ratio of discriminatory (Green Book) to non-discriminatory (non-Green Book) firms, in column 2 and 3 it is the inverse hyperbolic sine of this ratio, in column 4 and 5 it is the inverse hyperbolic sine of the number of non-discriminatory (Green Book) establishments. Standard errors clustered by county in parentheses. All columns include county and year fixed effects. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 9: First Stage: Effects of White Deaths on the Black-White Population Ratio

	(1)	(2)	(3)	(4)	(5)
# White Casualties × Post-WW2	0.00324***	0.00350***	0.00292***	0.00318***	0.00164***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)
County Sample		X	X		
County Controls			X		
County F.E.				X	X
Year F.E.				X	X
State F.E.	X	X	X		
State × Year F.E.					X
Observations	37779	30096	30096	37779	37779
Adjusted R^2	0.422	0.410	0.673	0.990	0.992
# Clusters	3150	2508	2508	3150	3150

Notes: The dependent variable in each column is the ratio of Green Book hotels to non-Green Book hotels. Casualties are measured in units of 1,000. Standard errors clustered by county in parentheses. Column 1 displays the results of equation 2 without county and year fixed effects. Column 2 presents the same specification as column 1, but restricts the sample to include only observations for which we have control variables. Column 3 includes our set of initial condition controls from 1940: population, the share of the county that is farmland, per capita religious rates, and the isolation and dissimilarity indices from Logan and Parman (2017). Column 4 replaces county controls with county fixed effects, in addition to including year fixed effects. Column 5 includes state × year fixed effects on top of county and year fixed effects. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 10: IV Results: Effects of a Change in the Market Composition on the Ratio of Non-Discriminatory to Discriminatory Firms

Dependent Variable:	$\frac{GB}{non-GB}$						$\Delta\frac{GB}{non-GB}$	
	(1) OLS	(2) IV	(3) IV	(4) OLS	(5) IV	(6) IV	(7) OLS	(8) IV
Black-White Population Ratio	0.0211**	1.167**	4.857	0.0276*	1.040**	3.732		
	(0.011)	(0.486)	(6.066)	(0.016)	(0.413)	(15.837)		
Δ B-W Ratio							0.803***	0.910***
							(0.290)	(0.328)
Observations	22900	22900	22900	3810	3810	3810	157	157
# Clusters	1915	1915	1915	1915	1915	1915		

Notes: The dependent variable in each column is the ratio of Green Book hotels to non-Green Book hotels. Casualties are measured in units of 1,000. Standard errors clustered by county in parentheses. All columns include county and year fixed effects. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 11: White Casualties or Black Enlistments?

	(1) Midwest	(2) South	(3) Northeast	(4) West
# White Deaths × Post-WW2	1.173***	0.388**	0.499***	1.926***
	(0.171)	(0.161)	(0.058)	(0.130)
	[0.290]	[0.066]	[0.125]	[0.788]
# Black Enlistees × Post-WW2	-0.000	0.109***	0.303***	-0.141**
	(0.042)	(0.012)	(0.014)	(0.056)
	[-0.000]	[0.238]	[0.317]	[-0.134]
Observations	13524	11652	9132	5352
Adjusted R^2	0.360	0.369	0.737	0.791

Notes: The dependent variable in each column is the number of Green Book establishments. Casualties and enlistees are measured in units of 100. Standard errors clustered by county in parentheses. All columns include controls for the black and white population, the number of black enlistees and the number of white casualties, as well as year and state fixed effects. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$