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COMPETITION AND CONSUMER DISCRIMINATION

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ABSTRACT

This paper studies consumer discrimination while taking into consideration the role of competition between firms, providing one of the first large-scale comprehensive analyses of consumer discrimination and market forces. We formally model consumer discrimination, where some majority-group members dislike consuming alongside minorities. In equilibrium, the non-discriminatory-to-discriminatory firm ratio is proportional to the minority-to-majority consumer ratio. Empirically, we examine how local changes in the composition of consumers altered business incentives to discriminate during the decades leading up to the passage of the Civil Rights Act of 1964. Using a nationwide data source of non-discriminatory businesses in three different industries and a research design that leverages two sources of exogenous variation in the ratio of Black-to-White consumers, we find that increases in non-discrimination were concentrated in the least competitive markets, where the threat of defection by White consumers to competing firms was lowest. We assemble new data on over 25,000 prices charged at establishments by discriminatory status and show that non-discriminatory firms charged higher prices than discriminatory firms in the same local market. Consistent with our theoretical model, this finding arises because the effects of greater competition among the more numerous discriminatory firms outweighed the discrimination markup. The results imply that monopoly power blunted the influence of consumer preferences and that Black consumers were harmed through higher prices in the non-discriminatory market.

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There is little empirical analysis of consumer discrimination in the economics literature. Instead, the economics of discrimination has focused on employer discrimination and related labor market discrimination (Neumark, 2018; Lang and Kahn-Lang Spitzer, 2020). Significantly less attention has been paid to the role that consumer preferences, and the resulting behavior of firms, play in a competitive market. If consumers hold discriminatory preferences, discriminatory preferences of firm owners are not required for firms to treat majority and minority group members inequitably. Moreover, unlike firm owner discrimination, consumer discrimination yields a *stable equilibrium* outcome in the sense that discrimination will not be extinguished by competition between firms.

This paper models and tests empirical predictions about firm behavior in response to consumer discrimination. We introduce a model which shows how firm-level discrimination can arise if firms respond to the discriminatory preferences of their consumers, extending Becker's (1971) taste-based discrimination framework and building on the intuition described in Wright (2013) and Cook, Jones, Logan, and Rosé (2023). In our model, firms pursue profit maximization without any discriminatory preferences, while among consumers, members of the majority group have some level of aversion to consuming goods and services alongside members of the minority group. The model assumption of a lack of firm preferences for discrimination is not required, but is useful to highlight that unequal treatment of groups in equilibrium can arise in the absence of discriminatory preferences of firms. Thus, firms decide whether to discriminate based on their expectations about the preferences of their consumer base. They know that if they choose not to discriminate, a fraction of their clientele will patronize their competitors. As a result, in equilibrium, a fraction of firms will choose to discriminate against the minority group and sell exclusively to the majority group.

Two implications related to the role of consumer discrimination in driving firm behavior—both the choice to serve minority consumers and pricing decisions—arise from our modeling approach. First, a change in a local market's consumer composition will elicit a change in the discriminatory behavior of firms. Specifically, our model predicts that an increase in the ratio of minority-to-majority consumers (the consumer ratio), all else equal, will result in an increase in the ratio of non-discriminatory-to-discriminatory firms (the firm ratio).[1] Second, while traditional theories of taste-based discrimination predict that consumers with discriminatory preferences pay for the discrimination they seek, these models do not consider the role that market power may play in blunting the discriminatory markup. Our model predicts that prices will be higher in the non-discriminatory market *if that market*

[1]One can think of this as the elasticity of the firm ratio with respect to the consumer ratio, where each ratio represents the proportion of non-discriminatory to discriminatory agents in its respective market.

has fewer firms operating than in the discriminatory market, thereby directly tying prices to the degree of competition within markets.[2]

Testing the implications of consumer discrimination empirically is difficult for several reasons. Most notably, since the passage of the Civil Rights Act of 1964, firms have been legally prohibited from discriminating against consumers on the basis of race, color, religion, or national origin. Even for time periods when segregation was legal in parts of the United States, empirical analyses of consumer discrimination are limited by the fact that systematic data on discriminatory practices of firms and the prices they charged has been unavailable. We overcome these challenges by focusing on discrimination in public accommodations in the mid-20th century and combining several established data sources with novel data on the prices at public accommodations by discriminatory status. Focusing on the post-World War II years is empirically attractive as this period is characterized by an unprecedented increase in access to public accommodations for Black Americans (Cook et al., 2023), which occurred before the large-scale protests of the Civil Rights Movement.[3]

We first revisit the finding from Cook et al. (2023) that firm-level discrimination responds to the composition of the consumer base. Unlike Cook et al. (2023)'s analysis, however, we use the model-derived empirical specification. We show that the *ratio* of non-discriminatory-to-discriminatory firms responds to the *ratio* of Black-to-White consumers. We combine county-level data on the number of non-discriminatory firms across hotels, eating and drinking establishments, and gas stations from the *Negro Motorist Green Book*, a travel guide for African American motorists published between 1936 and 1966 to facilitate travel, with Census of Business counts of all businesses, by type, for the same time period. Even with precise data on firm counts, regressing the firm ratio on the consumer ratio would produce biased estimates of the relationship of interest. We therefore isolate the causal impact of a change in the consumer ratio on the firm ratio using two established sources of exogenous variation in the consumer ratio: geographic variation in World War II casualties and, focusing on states outside the South, a Black migration instrument that combines national-level changes in Black out-migration from Southern counties during the Second Great Migration with initial stocks of Black Southern migrants at the county-level.[4]

[2]Embedded in this prediction is the intuitive result that, in either market, prices should be lower if there are more firms in the market, and that the price difference between the non-discriminatory and discriminatory markets should grow with the difference in market power between these two markets.

[3]The canonical start of the modern Civil Rights Movement is often noted as 1954/1955, when *Brown v. Board of Education* ruled racially segregated schools unconstitutional in 1954 and the Montgomery Bus Boycott of 1955 focused public attention on racial discrimination in public accommodations.

[4]A version of each instrument was used previously in the analysis in Cook et al. (2023) and builds on a series of papers who have used similar empirical strategies successfully. See, e.g., the effects of manpower mobilization in World War II on women's educational attainment and family formation (Jaworski, 2014),

Given our focus on consumer ratios, our formulation of the instrument is technically different from previous implementations, but leverages the same intuition. These two instruments are distinct in their composition and function to predict changes in the population ratio, but have similar theoretical predictions, lending greater credibility to our empirical results.

Using the model-derived specification, we find that increases in the consumer ratio between 1940 and 1950 were related to the growth of the firm ratio over this period. Specifications that use the WWII casualty instrument show that a 1% increase in the change in the consumer ratio leads to a 0.22% and 0.06% increase in the change in the firm ratio for hotels and eating & drinking establishments, respectively. Specifications that use the Black migration instrument for the consumer ratio show that a 1% increase in the change in the consumer ratio leads to a 0.79% and 0.21% increase in the change in the firm ratio for hotels and eating & drinking establishments, respectively. Results for gas stations, however, are small and statistically imprecise.[5]

Importantly, these results align with the practice of racial discrimination at the time, which varied at the extensive and intensive margins. Hotels, which discriminated at the extensive margin (discriminatory hotels did not serve Black customers in any capacity), have the most pronounced effects. For eating and drinking establishments, which sometimes discriminated at the extensive margin, but would often serve Black customers under certain (inferior) conditions—for example, take out orders or segregated seating inside the establishment—we find less of a market response. For gas stations, which typically discriminated on the intensive margin (gas stations rarely denied Black customers service outright, but would not allow full use of facilities such as restrooms and mechanic services), we find little to no response to changes in market composition. Taken together, the results are consistent with the strongest market responses in industries that could not easily substitute between extensive and intensive forms of racial discrimination in response to changing market composition.[6]

Having established the empirical relationship between access to non-discriminatory public accommodations and the local racial composition of consumers holds in our model-derived

labor force participation (Goldin and Olivetti, 2013), the structure of mid-century wages (Acemoglu, Autor, and Lyle, 2004), and the effects of WWII on the occupational upgrading of African Americans (Ferrara, 2022); and variants of the migration instrument in Boustan (2009), Derenoncourt (2022), Bazzi et al. (2023), and others.

[5]Our results are robust to changing the functional form of the dependent and independent variables, the use of different samples, expanding the definition of the market to account for neighboring counties, as well as an extensive set of controls that we discuss in greater detail in Section E of the Online Appendix.

[6]We use the terminology "extensive margin" to refer to industries where the firm either did or did not sell to Black consumers and the term "intensive margin" to refer to industries where firms could provide lower quality services to Black consumers. This is important, as the non-discriminatory firm information we have is for firms that had full and complete integration of services.

specification, we turn our attention to better studying the relationship between market structure, minority access to non-discriminatory treatment, and the prices paid by minority and majority consumers. While the first specification we estimate suggests that the supply of non-discriminatory services responded to demand shocks, it does not conclusively establish that consumer discrimination, the specific mechanism noted by business owners at the time and the key mechanism in our model, was operative. To do so, we turn to the mechanics of firm competition and execute two sets of additional empirical exercises. First, we show that the overall supply response was driven by the least competitive markets. That is, the responsiveness to changes in the consumer ratio was only prominent in markets where firms had few competitors, situations in which White consumers had the least ability to defect to competitors. If the primary driver of the persistence of discrimination was owner preferences, we would not expect firms in the least competitive markets to have been responsive to changes in the consumer ratio.

Next, we consider the price effects of consumer discrimination. Our model presents a scenario where firm owners themselves are non-discriminatory but where discrimination arises in equilibrium because firms respond to the discriminatory preferences of their majority consumer base. Taking into account the size of the discriminatory and non-discriminatory markets, the model suggests that prices will be higher in the non-discriminatory market if the number of firms in that market is lower than in the discriminatory market. While this prediction is at odds with other more traditional models of consumer discrimination that abstract from market power, it is consistent with the historical narrative, which has noted that Black consumers typically paid higher prices than White consumers and had significantly fewer firms willing to serve them (Woodward, 1955; Wilkerson, 2010; Sorin, 2020). Of course, there is still a concern that firm owners could hold discriminatory preferences. In this case, the canonical model of firm-owner discrimination assumes that firms have a distaste for serving a minority customer and only do so at a higher price than the majority client. It should be noted that this relationship cannot hold in a competitive equilibrium, as competition between firms would force the discriminatory firms out of the market. Nevertheless, to empirically evaluate the predictions of our model, we require a setting in which firm-owner price discrimination of this type is not present.

To distinguish the role of consumer discrimination and competitive pressures from the preferences of discriminatory firm owners, we empirically analyze an industry where firms could choose to discriminate on the extensive margin (i.e. to segregate or not) but prices did not vary across Black and White consumers at the same establishment. To do this, we collect novel, comprehensive microeconomic information on prices for hotels from 1940 to 1960 by the discriminatory status of the establishment. We start by supplementing

the Green Book data with several newly digitized travel guides—the 1952 and 1959 *Go Guides* and the 1950 and 1962 *Travel Guides*—which allow us to expand our sample of non-discriminatory establishments.[7] Then, we match these non-discriminatory establishments to data we collected from a national directory of hotels, *The Official Hotel Red Book and Directory*, that includes the price per night for hotels in 1940, 1950, and 1960 for over 26,000 establishment-year observations. Together, these sources allow us to compare the prices across segregated and non-segregated markets in the same industry nationwide, a first in the literature.

Using within-county variation in the number of establishments we first show that the intuitive result embedded in our theoretical model—that prices respond to the level of competition in the local market—holds empirically. That is, prices are lower in markets with a larger number of firms. Then, we exploit within-county variation in the discriminatory status of firms to show that non-discriminatory firms charged systematically higher prices than discriminatory firms, upwards of 10% higher. In the context of the theoretical model, this finding is consistent with a large number of discriminatory firms producing downward pressure on prices due to the competition between them offsetting any gains from serving discriminatory customers. In other words, market competition between discriminating firms outpaced the discriminatory price markup predicted by theory. In line with this prediction, we further show that the difference between the non-discriminatory and discriminatory prices is increasing in the difference in market concentration (which we measure as the number of firms per consumer, given our focus on consumer options) between the non-discriminatory and discriminatory firms. Importantly, this finding also rationalizes the narrative history of racial discrimination by businesses that does not square with economic theory—that non-discriminatory businesses were rarely cheaper for consumers than discriminatory ones.

Our analysis connects to a rich literature in empirical industrial organization about preference externalities in markets where fixed costs are large and tastes vary substantially across different demographic groups of consumers. Generally, these models have been applied to settings like media markets (newspapers and radio, or television programming (Anderson and Waldfogel, 2015)), or to businesses like restaurants, where consumer groups have differentiated tastes for the product (Waldfogel, 2008).[8] Our framework ties into the preference externalities literature, but is distinct insofar as the difference in preferences over goods

[7]Since these guides are not continuously available we cannot use them to study changes in the firm ratio. We also digitized the Department of the Interior Guide for 1939 and 1941, as well as the Wisconsin Black Business directory for 1950, but these guides did not provide any additional new establishments.

[8]More closely related to our analysis and to the decision of firms to discriminate against Black patrons, Gil and Marion (2018) estimate a structural model of cinema entry during the 1950s and find evidence that is consistent with the theory of preference externalities—Black-friendly cinemas faced higher fixed costs, but higher variable profits in more residentially segregated markets.

across the two groups stems from the fact that a share of the majority consumer base derives disutility from consuming alongside members of the minority group—the difference in taste distributions for products does not stem from characteristics of the goods themselves. Moreover, in our model, firms do not decide where to place their product offering along a quality dimension; instead, they make a discrete choice about whether, conditional on entry into the market, they choose to serve one group of patrons or not. One finding in the existing literature is that the presence of fixed costs can lower access to goods or services catering to minority groups. This is consistent with our modeling approach and our empirical finding that the relative size of the minority population is a key determinant of the firm ratio in a market. An important result from our modeling approach that does not appear in this existing work is that the patterns of firm entry into the discriminatory and non-discriminatory markets can lead to majority and minority consumers paying different prices for the same good or service in equilibrium.

In addition, we provide an extensive analysis, both theoretical and empirical, of the implications of consumer discrimination for market access and pricing. The few studies of consumer discrimination in markets are isolated to small market areas and specific industries (see, e.g., the important analyses of African-American cinemas in Gil and Marion (2018, 2022), as well as earlier work by Roback (1986)). Together with Cook et al. (2023), we lay a new foundation for the ongoing study of consumer discrimination and market processes. While Cook et al. (2023) provides a descriptive analysis of the Green Book data, an overview of discrimination in public accommodations in the years leading up to the passage of the Civil Rights Act of 1964, and a rudimentary empirical analysis of consumer discrimination, the current paper differs from and extends our earlier work in several important ways. First, we develop a theoretical model of consumer discrimination that captures both the equilibrium relationship between consumer ratios and firm ratios, as well as the pricing behavior of firms under monopolistic competition and in the face of consumer discrimination. From here, we derive and estimate the equilibrium relationship identified by the model and provide additional tests for consumer discrimination by examining the heterogeneous effects by market concentration. Finally, in contrast to Cook et al. (2023), our analysis of prices leverages new, novel data on firm-specific prices and more comprehensive information on non-discriminatory businesses to estimate the price effects of discrimination, the first large-scale test in the literature. Taken together, our approach can serve as a base upon which additional empirical analyses can examine other dimensions of consumer discrimination in markets, which have been relatively unexplored in the literature.

2 Consumer Discrimination

2.1 Brief History of Consumer Discrimination in the 20th Century

Prior to the passage of the Civil Rights Act of 1964, discrimination in public accommodations was common throughout the United States (Woodward, 1955; Franklin, 1956; Sorin, 2020; Cook et al., 2023). In the American South, discrimination was entrenched in state laws, known infamously as the Jim Crow laws, that segregated White and Black people in almost every facet of life. While state legislation did not require racial segregation in the North, it was still pervasive there, especially in the context of public accommodations.[9]

After World War II, public demonstrations demanding the integration of Southern businesses increased and brought media attention to the scope of discrimination.[10] Business owners engaged in a delicate balance of avoiding public scorn for either advocating or decrying discriminatory practices. As described by Oppenheimer (1989), a merchant's choice of whether to segregate was made in consideration of the pressures from Black, non-discriminatory White, and discriminatory White clientele. That Black consumers presented a potential new group of customers was not lost on firm owners;[11] however, decisions regarding desegregation had to be made by weighing the demands and the size of each group of consumers.

Importantly, discrimination at the time was not necessarily an either/or proposition. Many discriminatory businesses *did* serve Black customers, but in segregated and marginalizing ways (Sorin, 2020). As noted above, at the extensive margin, business owners could fully desegregate, but doing so meant that they had to contend with the threat of defection from their majority-White consumer base. At the intensive margin, better treatment of Black customers could have increased sales to them; the contemporaneous literature notes that exclusionary policies toward Black consumers led to lower levels of consumption (and higher levels of savings) among Black consumers at the time, even when controlling for income (Tobin, 1952; Alexis, 1970).

Ultimately, there was very little voluntary desegregation except when group pressures presented as economic pressures, through sit-ins or boycotts (Wright, 2013). These economic pressures led many businesses in the South to desegregate prior to the passage of the Civil Rights Act, with 138 cities reporting some integrated facilities by March 10th of 1961

[9] Some of the earliest sit-in demonstrations were in Chicago, IL in the 1940s, as late as 1960, cities such as Xenia, OH were also involved in the sit-in movement (Oppenheimer, 1989).

[10] Some suggest that the footage broadcast on television of the Children's Crusade of 1963 served as the catalyst for Kennedy's support for Civil Rights Legislation (Bay, 2021).

[11] Even the 1956 edition of the Green Book recognized this fact, stating, "Through this guide a number of white business places have come to value and desire your patronage."

(Oppenheimer, 1989).[12] Desegregation occurred slowly, in part, because of the preferences of the majority (White) consumers who consistently stated in public opinion polls that they held mixed feelings with respect to integration. Some noted explicitly that they would not patronize non-discriminatory businesses.[13]

Even before the Civil Rights Movement began in earnest, it was also common for White consumers to boycott businesses that refused to uphold segregationist practices. Raper (1933) describes the situation in Greenville, MS, where a Chinese-American business was targeted. There, "white people have held several anti-Chinese meetings, to which Negroes were invited. The Negroes, however, did not attend, and subsequently a white committee waited upon them to ascertain their attitude toward the Chinese. The immediate purpose of the movement was to establish a boycott against Chinese business, in which the cooperation of the Negroes was essential. Somewhat amused and silently unsympathetic with the effort, the Negroes failed to participate" (p. 106). The White boycott of this Chinese-American-owned business had little impact on the revenue of the firm, since few White customers patronized this non-discriminatory business. This is revealing because it shows how White consumers used boycotts of businesses to achieve racially motivated goals, and because it shows that non-discriminatory businesses derived relatively little revenue from White consumers, which would be consistent with social sanctions for integrated consumption.

Several important economic considerations of segregation are embedded in the historical narrative of this period. Most pertinent to our study of consumer discrimination is the degree to which White consumers' preferences for discrimination led firms to maintain segregation. If firms discriminated against Black clientele to appease White consumers, then how much (if any) desegregation of public accommodations would have occurred without legal intervention? A second question relates to the size of the effect—could market responses have led to the end of racial discrimination in public accommodations? And finally, what are the implications of having two separate markets, one segregated and one non-segregated, on prices for consumers—do we see price differentials arise that are consistent with differences in market sizes?

In what follows, our analysis speaks to these questions, in that we provide a mechanism through which market forces could have led to the desegregation of firms. Empirically, we

[12] An important caveat to this observation noted by Oppenheimer himself is that the meaning of "integrated" was never formally defined and thus integration could mean any type of desegregation along a spectrum from a small business serving Black clientele in a predominantly Black neighborhood to the complete integration of businesses in the downtown core.

[13] One such survey was conducted by sociology students at Belmont Abbey College during the sit-in movement of 1960 in Charlotte, NC. They found that over half of White respondents said that they would not patronize a department store's lunch counter if it were to integrate (and over 30% of respondents indicated that they would no longer shop at the store's other departments either) (Martin, 1960).

show that, while market forces likely did reduce segregation in public accommodations, they were not enough to overcome the deeply rooted social norms throughout most of the United States. As a result, without a federal ban on racial discrimination, Black consumers had less access to public accommodations and paid higher prices than their White counterparts.

2.2 A Model of Consumer Discrimination and Firm Segregation

We present a simple stylized model in which consumers select between discriminatory and non-discriminatory firms. For White consumers, this decision is contingent upon their preferences regarding the presence of Black consumers in the same retail or service establishment. Black consumers, conversely, are restricted to purchasing from non-discriminatory businesses. Firms compete on prices within each sub-market (discriminatory or non-discriminatory) and the number of discriminatory and non-discriminatory firms is determined in equilibrium. Ultimately, the number of firms in each sub-market determines the pricing power of firms.

Our modeling approach is consistent with the differentiated product oligopoly models that are prevalent in the preference externality literature (Anderson and Waldfogel, 2015). We adapt Salop's (1979) circular city entry model to study the decision of firms about whether to sell a good or service in a discriminatory (i.e., segregated) setting or in an inclusive one (i.e., non-segregated). Central to this approach is the notion of sub-markets, indexed by d. In one of them, $d = 1$, segregation takes place and firms do not sell to members of the minority group. In the other, $d = 0$, firms sell to both majority and minority group consumers.[14] Both of these sub-markets are unit circles with firms and consumers located on the perimeter. For clarity, and to tie in more closely with our context, the terms White and Black will be used in the place of majority and minority, respectively.

The different types of agents make their decisions in the following order: first, firms simultaneously choose which sub-market to enter—the segregated ($d = 1$) or the non-segregated ($d = 0$) sub-market. Next, price setting takes place in the two sub-markets (we assume a symmetric equilibrium price in each one). Finally, consumers choose which sub-market to purchase from, taking into account prices and anticipated transportation costs. For Black consumers the decision is trivial, as they are limited to purchasing from the non-segregated market. Meanwhile, White consumers, who may have discriminatory preferences, have to choose whether to purchase from the segregated or non-segregated market.

The environment consists of a measure one of consumers, θ of which are Black, B, and

[14] We focus on the decision of a firm to refuse to sell to a minority group. We abstract from firms discriminating by providing inferior service or selling a lower quality good to members of the minority group.

$(1-\theta)$ of which are White, W. Each individual consumes one unit of the good, g. A White consumer's payoff from purchasing g from a discriminatory firm ($d_j = 1$) is:

$$u^1_{W,i} = g - p^1 - t\,\mathbb{E} \mid \delta^1_i \mid,$$

where p^1 is the price per unit of the good, and t is the cost per unit of travel. 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 relative to those of firms *ex ante*.[15] The expected travel costs to the nearest firm in each sub-market are represented by the per unit cost of travel times the expected distance $t\,\mathbb{E} \mid \delta^1_i \mid$.

If a White consumer chooses to purchase at the non-discriminatory firm, they must take into account their discrimination coefficient, η_i. In this case, their utility is:

$$u^0_{W,i} = g - p^0 + \eta_i - t\,\mathbb{E} \mid \delta^0_i \mid,$$

where p^0 is now the per unit price charged by the non-discriminatory firm, and $t\,\mathbb{E} \mid \delta^0_i \mid$ is the expected travel cost to the nearest non-discriminatory firm. The discrimination coefficient, η_i, 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 $\eta_i \in [0, \infty)$ with pdf $f(x)$ and cdf $F(x)$.

When deciding whether to purchase from a segregated or non-segregated firm, a White consumer will take into consideration the (equilibrium) prices in both sub-markets, p^1 and p^0, and the expected travel costs. They will choose to purchase from a segregated firm if:

$$\underbrace{g - p^1 - t\,\mathbb{E} \mid \delta^1_i \mid}_{u^1_{W,i}} \geq \underbrace{g - p^0 + \eta_i - t\,\mathbb{E} \mid \delta^0_i \mid}_{u^0_{W,i}}$$

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

implying that:

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

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, $\tilde{\eta}$ is the cut-off discrimination

[15] One could think about distance as being along a characteristic dimension (aside from price) of the object being sold instead of physical distance. In this case, consumers are not sure exactly how far the good or service being transacted is from their preferred variety.

coefficient such that equation (1) holds with equality. Any person with a discrimination coefficient above this level will choose the discriminatory sub-market. Substituting this cut-off value into the distribution of η, gives the share of White consumers, $F(\tilde{\eta})$, who would prefer to purchase from a non-segregated firm. Both $F(\tilde{\eta})$, and $\tilde{\eta}$ are observed by firms.

Meanwhile, for a Black consumer, the payoff to purchasing g from an unsegregated firm ($d_j = 0$) is:

$$u^0_{B,i} = g - p^0 - t\,\mathbb{E}\,|\delta^0_i|$$

A Black consumer will decide to purchase good g from firm j if the utility from doing so is greater than the price of the good plus the transportation costs ($g > p^0 + t\,\mathbb{E}\,|\delta^0_i|$). That is, if they do not incur any disutility from this transaction. For simplicity, we assume that this inequality holds for all Black consumers, thus they are randomly allocated to firms in the non-segregated sub-market.

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, $d \in \{0, 1\}$:

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

We assume that there is no heterogeneity in preferences across Black consumers and White consumers that choose to purchase in the non-segregated market. It follows from this that consumers of both types are uniformly distributed around the unit circle.

Firms simultaneously decide which sub-market to enter and what price to set while taking into account what they know about the decisions of consumers. Our modelling of the sub-markets and solution method draws heavily from Salop (1979). We solve for the decision of firms to discriminate in equilibrium through backwards induction. First, we solve for prices in each sub-market, assuming a symmetric equilibrium price in each of them, and then we use these to solve for the segregation decision of firms.

We assume the following cost function: all firms have constant marginal costs of production, but the fixed costs of operating in the discriminatory market, $\mathcal{F}_1$, may differ from the fixed costs of operating in the non-discriminatory market, $\mathcal{F}_0$. This difference allows us to account for the fact that, historically, minority-serving businesses faced high barriers to entry due to the fact that it was harder them to access capital.[16] Further, we assume that when firms enter a sub-market, they locate equidistantly along the circumference of the unit

[16]This is consistent with Gil and Marion (2018)'s findings that fixed were higher for African-American cinemas.

circle; as a result, if N^d firms entered sub-market d, 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 neighbors on either side for making sales to consumers. As noted earlier, similar to 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 neighbors. There is a consumer at some distance x from firm j (where $x < \frac{1}{N^d}$) who faces transportation cost t per unit of distance that is indifferent between buying from j and $j+1$ if [17]

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

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

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 $\Pi^d_j = (p^d_j - c)q^d_j - \mathcal{F}_d$.

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

$$\Pi^0_j = (p^0_j - c)\left(\frac{p^0_{eq} - p^0_j + t/N^0}{t}\right) \times \Big(\theta + (1-\theta)F(\tilde{\eta})\Big) - \mathcal{F}_0$$

Taking the first order condition yields:

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

Note that because we are treating $\tilde{\eta}$ (and thus S^0) as exogenous, the firms' entry and pricing decisions do not affect $\tilde{\eta}$. This is consistent with myopic decision-making on the part of firms, when setting prices they only consider local competition within their sub-market.[18] An implication of this is that firms price less aggressively than they would if they took into account the impact of their price setting on the share of consumers that would buy from their sub-market.[19]

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

[18] This aligns with firms thinking of themselves as small relative to their sub-market and not taking into account how their price setting affects the total mass of consumers in their sub-market.

[19] The alternative approach in which individual firms consider the effect of their pricing decision on the share of White consumers that will purchase from their sub-market amounts to endogenizing $\tilde{\eta}$. We focus

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

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

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

$$\Pi_j^1 = (p_j^1 - c)\left(\frac{p_{eq}^1 - p_j^1 + t/N^1}{t}\right) \times (1-\theta)[1 - F(\tilde{\eta})] - \mathcal{F}_1 \tag{2}$$

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

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

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 $q_j^d = \frac{1}{N^d}$. If it enters the non-segregated market ($d_j = 0$), its profit will be:

$$\begin{aligned}
\Pi_j^{0*} &= (\bar{p}^0 - c)\left(\frac{1}{N^0}\right) \times S^0 - \mathcal{F}_0 \\
&= \left[\left(\frac{t}{N^0} + c\right) - c\right]\left(\frac{1}{N^0}\right)[\theta + (1-\theta)F(\tilde{\eta})] - \mathcal{F}_0 \\
&= \frac{t}{(N^0)^2}[\theta + (1-\theta)F(\tilde{\eta})] - \mathcal{F}_0
\end{aligned}$$

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

$$\Pi_j^{1*} = \frac{t}{(N^1)^2}(1-\theta)[1 - F(\tilde{\eta})] - \mathcal{F}_1$$

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

$$\underbrace{\Pi_j^{1*}}_{\substack{\text{Segregated} \\ \text{profit}}} \geq \underbrace{\Pi_j^{0*}}_{\substack{\text{Non-segregated} \\ \text{profit}}} \geq \pi^* \text{ where } \pi^* \text{ is an arbitrary profit level}[20]$$

on the first case for reasons of tractability.

[20] In the long run, free entry should bring the proft level down to zero, but this does not have to hold in

Substituting in for Π_j^{1*} and Π_j^{0*}, we obtain the following condition:

$$\frac{N^0}{N^1} = \sqrt{\frac{\theta + (1-\theta)F(\tilde{\eta})}{(1-\theta)[1-F(\tilde{\eta})]} \cdot \frac{\pi^* + \mathcal{F}_1}{\pi^* + \mathcal{F}_0}}$$

If we impose some additional assumptions on η, specifically that $\eta \sim U(0,1)$, then the expression simplifies considerably as $F(\tilde{\eta}) = \tilde{\eta}$:

$$\frac{N^0}{N^1} = \sqrt{\frac{\theta + (1-\theta)\tilde{\eta}}{(1-\theta)(1-\tilde{\eta})} \cdot \frac{\pi^* + \mathcal{F}_1}{\pi^* + \mathcal{F}_0}} \tag{3}$$

and since $\tilde{\eta} \in (0,1)$, it follows that:

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

An alternative way of thinking about this relationship is in terms of the ratio of Black and White consumers. Recall that θ is the share of the population that is Black. If the total consumer base is $P = B + W$, where B is the number of Black consumers and W is the number of White consumers, then the equation can be rewritten as:

$$\frac{N^0}{N^1} = \sqrt{\frac{B + W\tilde{\eta}}{W(1-\tilde{\eta})} \cdot \frac{\pi^* + \mathcal{F}_1}{\pi^* + \mathcal{F}_0}}$$

where the numerator on the right-hand side is the number of Black consumers plus the number of non-discriminatory White consumers, while the denominator is the number of discriminatory White consumers. The relationship states that the ratio of non-discriminatory to discriminatory firms is related to the ratio of non-discriminatory to discriminatory consumers. More formally:

$$\frac{\partial(N^0/N^1)}{\partial(B/W)} > 0 \tag{4}$$

The first implication of the model is that a positive level of segregation can be a stable 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 ratio of non-discriminatory to discriminatory consumers increases, so will the ratio of non-segregated to segregated firms in the market. At the heart of our theoretical specification, we suggest that demand shocks that change the ratio of Black and White consumers in a local market may lead previously discriminatory firms to desegregate, or new entrants to choose the non-discriminatory market.

The model also allows for a comparison of prices across submarkets. Specifically, absent

the short-run.

discrimination on the part of firm owners, the price in the non-discriminatory market will be higher than in the discriminatory market if there are fewer firms in the non-discriminatory market: $p^0_{eq} > p^1_{eq}$ if $N^0 < N^1$. This result warrants further discussion, since theories of taste-based discrimination have differing predictions on how discrimination would affect prices, depending on who behaves in a discriminatory manner. Absent any consideration of market structure, if White consumers behave in a manner consistent with taste-based discrimination, then they effectively require compensation to shop alongside Black consumers. Under this assumption, the prices in the non-segregated market would be lower than the prices in the segregated market. If, on the other hand, a model assumes that firm owners are discriminatory, then they charge Black customers higher prices than White customers in order to recover their disutility from serving Black clientele.

Though theoretically plausible, we are not aware of any historical evidence that supports the idea that different races were charged different prices by the same retail firm owners. Our model provides a separate channel through which prices can be higher in the non-segregated market without any taste-based discrimination on the part of firm owners. This is due to the role of market structure across the segregated and non-segregated markets, wherein an overall larger number of discriminatory businesses in the segregated market creates downward pressure on prices in that sub-market which would counteract any price gains from serving discriminating clients. This theoretical result suggests that price differentials that appear consistent with taste-based discrimination on the part of firm owners can arise through an entirely different mechanism. In the case of our model, minority consumers would be forced to pay higher prices due to the difference in the market structure that endogenously forms based on the preferences of the majority consumer base.[21] We return to this theoretical result in the empirical sections that follow.

On a final note, it is important to recognize that the model treats the decision to enter the segregated market as discrete. That is, there are no dimensions along a segregation continuum that the firm can choose. In some industries, this matches the reality of the decision making. For example, hotels simply did or did not serve Black customers. At the same time, other businesses such as restaurants tended to discriminate along other margins—providing

[21] Our result also differs from the partial integration equilibrium—one where some firms only serve discriminatory White customers and other firms serve non-discriminatory White customers and Black customers—in Amegashie (2023). In this model, prices are higher in the segregated market than the non-segregated one and profits also follow the same pattern. This framework focuses on instances where consumers from the minority group have lower valuations of the good/service than majority group members, and thus are not willing to pay the high price that discriminatory members of the majority are willing to pay; this can result in a subset of firms selling only to majority group members. Moreover, Amegashie (2023) explores the pricing decisions of Bertrand duopolists (a model with a monopolist is also presented), the impact of free entry of firms is not studied.

either limited or second-class service to Black customers; and while gas stations did not typically ban Black customers, they would not provide full service such as use of restrooms or the services of an attendant to pump gas. In these instances, changes in market composition may have less pronounced effects on non-discrimination because businesses could move along this continuum of discriminatory services as market composition changed. In fact, these establishments *were* serving Black customers, but in an explicitly discriminatory fashion. This is important insofar as our data on non-discriminatory businesses captures businesses that provided *full and equitable* treatment to Black customers, irrespective of industry. For this reason (among others we discuss below), in our empirical analysis, we take the market for hotels as the one that most closely corresponds to the setting of the model. In the sections that follow, we describe our approach, which combines several novel data sources with both causal and descriptive empirical strategies to evaluate the *market conditions* relationship presented in equation 3, as well as the price implications of such a model.

3 Empirical Strategies

Our empirical analysis of consumer discrimination consists of two different approaches—each of which examines a different component of the theoretical model's predictions. We begin with the model-derived equilibrium relationship between the firm ratio and the consumer ratio. Once we establish the baseline result, we use this specification to provide additional evidence that is consistent with consumer discrimination in the presence of firms that have market power. Second, we examine whether the price differences predicted by the model are borne out in the data. To do this, we present several different pieces of empirical evidence that, together, examine the role of the market in generating price differences between discriminatory and non-discriminatory establishments. The following two subsections explain each approach in detail. We follow this with a thorough description of the data sources we use in our analyses in Section 4.

3.1 The Relationship Between the Firm Ratio and the Consumer Ratio

Equation 4 from the model implies that the ratio of non-discriminatory to discriminatory firms is increasing in the ratio of Black-to-White consumers. The first goal of our empirical analysis is to analyze this equilibrium result using geographic variation in each ratio at the county level. This exercise is similar in spirit to the empirical analysis in Cook et al. (2023) which focused on the relationship between the share of non-discriminatory firms and the Black share of the population, but our use of the ratios derives from the theoretical model. Thus, before proceeding with any follow-up analysis, we need to understand whether

these baseline estimates align with the predictions of the model—specifically, whether the firm ratio is increasing in the Black-to-White population ratio. We estimate the following specification:

$$\text{asinh}(\Delta\text{firm ratio}_c) = \beta_0 + \beta_1 \text{asinh}(\Delta\text{consumer ratio}_c) + \boldsymbol{X_c\theta} + \gamma_s + \epsilon_c, \tag{5}$$

where we define Δfirm ratio$_c$ as:

$$\Delta\text{firm ratio}_c = \frac{N_{0c}^{1950} - N_{0c}^{1940}}{N_{1c}^{1940}}$$

That is, the change in the number of non-discriminatory establishments in county c between 1940 and 1950, normalized by the number of discriminatory establishments in county c in 1940. The consumer ratio can be defined similarly as:

$$\Delta\text{consumer ratio}_c = \frac{B_c^{1950} - B_c^{1940}}{W_c^{1940}},$$

which is the change in the Black population between 1940 and 1950, normalized by the White population. As usual, $\boldsymbol{X_c\theta}$ is a matrix of county-level controls and γ_s is a set of state fixed effects.

There are several reasons to define Δfirm ratio$_c$ and Δconsumer ratio$_c$ in this manner. First and foremost, defining the ratios in reference to a baseline of 1940 is analogous to the existing migration literature that has focused on population shares (Bazzi et al., 2023; Derenoncourt, 2022). While our measures are distinct, in that they focus on the ratio rather than the share, this formulation is mechanically comparable to this established literature. Second, normalizing by the White population in 1940 provides a relative measure of Black population change, which allows for more meaningful comparisons across different geographic regions. For instance, a change of 100 Black residents would be much more meaningful in a town with 1,000 existing White residents than it would in a city of 100,000 White residents. Further, estimating the equation in changes differences out any time-invariant county-specific characteristics. This would, for example, account for county differences in the propensity for White consumers to discriminate. In the context of the model, this would be driven by variation in $F(\bar{\eta})$ across counties.

Because there were many counties that did not see a change in the firm ratio between 1940 and 1950, we estimate equation 5 by transforming each side using the inverse hyperbolic sine function.[22] This has the added benefit that it allows us to interpret $\hat{\beta}_1$ as an elasticity, which lends itself to an intuitive interpretation. Our results are robust to using other functional

[22]Since the outcome in our specifications is a ratio, we do not use other estimation methods, like Poisson regression.

forms, including in logarithms, levels and, as in Derenoncourt (2022), after taking quantiles of the independent and dependent variables. These results can be found in Section E2 of the Online Appendix.

In the context of the model, both the racial composition of the population and the propensity for White consumers to discriminate shape firm behavior.[23] Endogenous sorting of people across space for a variety of reasons—to places with better amenities or better economic opportunities, more or fewer discriminatory establishments, etc.—would also confound the OLS estimate. Given the pervasiveness of classical measurement error in historical data, we can also expect the OLS estimates to be attenuated toward zero.

For these reasons, we use two instruments that generate exogenous variation in the consumer ratio. One instrument generates exogenous variation in the level of the White population in 1940, while the second generates exogenous variation in the change in the Black population. These instruments are the number of White casualties during World War II and predicted Black migration patterns during the Second Great Migration.[24] While both instruments are related to the change in the consumer ratio as we have defined it, and should give qualitatively similar results, they are two very different sources of variation to estimate the relationship. We view our use of two instruments as a strength of our empirical approach, as the instruments are independent of each other but operate similarly in terms of eliminating endogeneity between the Black/White consumer ratio and the firm ratio.[25]

A version of these instruments was used by Cook et al. (2023) to analyze the relationship between the share of non-discriminatory businesses and the Black share of the population; however, given their focus on the *shares*, it is not clear that the instruments will work in the same way in our setting. Further, our Black migration instrument, which we describe in detail in Section 4.1.2 is different from the migration instrument used in Cook et al. (2023), in that it is constructed to match the ratio specification and uses more granular information on migration patterns.

In each specification, the first stage regresses the change in the Black/White population ratio on the instrument, Z_c, again, using the inverse hyperbolic sine transformation:

$$\text{asinh}(\Delta\text{consumer ratio}_c) = \beta_0 + \beta_1 \text{asinh}(Z_c) + \boldsymbol{X_c\theta} + \gamma_s + \epsilon_c \tag{6}$$

[23] While we explicitly model firms as agnostic with respect to the race of customers they serve, it is also the case that if the firm has discriminatory preferences, they would be less willing to enter the non-discriminatory market for the same change in the consumer ratio.

[24] Here, the White WWII casualties generate exogenous variation in a mechanical manner: they are correlated with the 1940 White population because they are related to the number of people who enlisted, which itself is related to the size of the population.

[25] In Section E1 of the Online Appendix we also present our results where we use both instruments in the same model.

In the second stage, we regress the change in the firm ratio on the predicted change in the Black/White population ratio that comes from equation 6:

$$\text{asinh}(\Delta\text{firm ratio}_c) = \beta_0 + \beta_1 \text{asinh}(\Delta\widehat{\text{consumer ratio}}_c) + \boldsymbol{X_c\theta} + \gamma_s + \epsilon_c, \tag{7}$$

Identification in each of the IV specifications requires the instruments to be correlated with the endogenous regressor, but uncorrelated with the unobserved factors included in the error term. Importantly, all specifications include state fixed effects, thus, our empirical strategy exploits variation within states. Since we present two separate specifications, we discuss the validity of the exclusion restriction as well as the data sources used to construct each instrument separately in Section 4.1.2, as well as Section E5 of the Online Appendix.

3.2 The Relationship Between Prices and Black-friendly Businesses

Our theoretical model also implies that prices will be higher at non-discriminatory establishments if there are fewer firms in the non-discriminatory market. We test this empirically through a set of exercises that focus exclusively on the hotel industry for data availability reasons.

First, we ensure that our price data are consistent with standard assumptions about market concentration and pricing. As noted by (Mazzeo, 2002), an economically interesting component of the price regression is the degree to which competition among firms drives down prices: all else equal, we should see that prices are lower in markets with more firms. Indeed, this is the main mechanism behind the price differentials predicted by our theoretical model. Specifically, in either market, equation 2 shows that the prices in each market are proportional to the inverse of the number of firms in that market, suggesting that markets with a higher concentration of firms should have lower prices. We examine how the concentration of firms in a local market relates to the prices of firms in that market by estimating a simple hedonic price regression:

$$\ln(\text{Price})_{jct} = \alpha + \beta \text{num\_estab}_{ct} + \boldsymbol{X}_{jct}\boldsymbol{\Omega} + \gamma_c + \zeta_t + \epsilon_{jct}, \tag{8}$$

where the dependent variable is the natural logarithm of the nightly price at establishment j in county c at time t. The variable, num_estab_{ct} is the count of establishments in county c at time t, and $\boldsymbol{X}_{jct}$ is a matrix of controls.[26] The specification also includes year and

[26] Our controls, which are discussed further in Section 4.3, include county population, its square, the share of the population that is Black, whether the establishment was accredited by the AHA, the number of rooms by type (room, apartment, suite, cottage, missing), indicators for the type of plan (summer or winter), and whether the name of the establishment includes "hotel" or "motel". Many of these specific controls capture factors that would be related to both marginal costs and prices, including demographic characteristics that may also be related to either marginal costs or unobserved components of demand.

county fixed effects, ζ_t and γ_c, respectively. The latter allows us to hold county-specific unobservable factors constant to exploit variation in within-county pricing.

Second, we establish whether prices were higher in the non-discriminatory market through a similar price regression to equation 8 that examines the differences in prices across types of markets:

$$\ln(\text{Price})_{jct} = \alpha + \beta \text{Black-friendly}_{jct} + \boldsymbol{X}_{jct}\boldsymbol{\Omega} + \gamma_c + \zeta_t + \epsilon_{jct}, \tag{9}$$

where the main dependent variable is again the natural logarithm of the nightly price at establishment j in county c at time t and the independent variable Black-friendly$_{jct}$ is an indicator that equals 1 if the establishment serves Black customers. The matrix, $\boldsymbol{X}_{jct}$ includes the same set of controls as in equation 8, and we again include county and year fixed effects. Admittedly, this analysis consists of a simple OLS specification. While we include a relatively rich set of available controls, as well as county and year fixed effects, there is nothing inherently causal embedded in this analysis, and therefore, there may be concerns that the coefficient estimate on Black-friendly businesses does not convey information about the true price differences between non-discriminatory and discriminatory firms. To alleviate such concerns, we also present a bounding exercise developed by Cinelli and Hazlett (2020) to provide estimates of the coefficient on "Black-friendly" under various assumptions about the strength of possible confounders.

Our final exercise is descriptive in nature and directly addresses the mechanism predicted by the theoretical model. Specifically, we examine the size of the price differences between non-discriminatory and discriminatory markets in relation to the size of the differences in market concentration between both types of markets. We describe this exercise, which is meant to examine the model's prediction that the price difference should grow with the difference in market concentration, in detail in Section 5.3

4 Data Construction

Together, our empirical analyses require a substantial amount of data, drawn from a variety of historical sources. We require data on the number of non-discriminatory firms, the number of discriminatory firms, prices, Black and White consumer numbers, each of the instrumental variables, plus a variety of additional controls to be used for robustness analysis. Some of these data were used in previous work (Cook et al., 2020, 2023; Jones et al., 2024), some draw on the additional existing datasets, and several are new to our current analysis and were newly collected. This section outlines the sources used in each of the two empirical analyses described above.

4.1 The Relationship Between the Firm Ratio and the Consumer Ratio

4.1.1 The Firm and Consumer Ratios

The first goal of our empirical analysis is to understand whether changes in the racial composition of consumers affect firms' incentives to discriminate. We construct the ratio of Black and White consumers in 1940 and 1950 from county population data compiled by Haines (2010). To measure the firm ratio, first and foremost, requires a measure of firm-level discrimination, for which we use the data from Cook et al. (2023) which contains counts of each type of firm, by industry—formal accommodations, eating and drinking establishments, and gas stations—for the years 1940 and 1950. The counts of non-discriminatory firms, N_0 in equation 3, were generated from the *Negro Motorist Green Books*.[27] These were travel guides that listed establishments that were friendly towards African American clientele. Known simply as "The Green Books", they were published between 1936 and 1966, with a brief interruption during World War II, when many resources were diverted to focus on the war effort.[28] 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 and beauty parlors, restaurants and drinking establishments, as well as pharmacies, liquor stores, and florists. A more detailed historical background on the Green Books can be found in the comprehensive accounts of Cook et al. (2020), Sorin (2020), Taylor (2020), Bay (2021), Cook et al. (2023), and Hall (2023).

The counts of discriminatory firms were constructed from the 1935 and 1948 U.S. Census of Business reports on formal accommodations, eating and drinking establishments, and gas stations.[29] We obtain estimates of the total counts of establishments in each industry for 1940 and 1950 by linearly interpolating from the 1935 and 1948 counts. From here, we construct the number of discriminatory, or segregated, firms, N_1 in equation 3, for each industry using the following formula:

$$N_{1_{c,t}} = N_{c,t} - N_{0_{c,t}}$$

[27] The Green Books are available through the New York Public Library's Digital Collections.

[28] For example, during the war, gasoline was heavily rationed; most Americans were limited to enough fuel for approximately 8.5 miles of driving per day, this greatly diminished the use for a motorist guide (Taylor, 2020).

[29] Strictly speaking, in 1935, statistics on the hotel industry were published separately from other services trades, but they were included in the services trades volumes of subsequent Census of Business publications. Further, 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 hotels. 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," a portmanteau arising from motor and hotel, was quite novel at the time as it was coined in 1925 (Jackson, 1993).

where $N_{0_{c,t}}$ is the number of Green Book establishments in county c at time t and $N_{c,t}$ is the estimate of the total number of establishments in county c at time t from the Census of Businesses. The difference between the two gives a measure of discriminatory firms in county c at time t, $N_{1_{c,t}}$. Focusing our sample to counties that are included in the Census of Business yields 1900 counties in the WWI sample and 1254 counties in the Great Migration sample for formal accommodations; 3051 counties in the WWII sample and 1687 in the Great Migration sample for eating and drinking establishments; and, 3057 counties in the WWII sample and 1683 counties in the Great Migration sample for gas stations.

Our primary analysis centers on the years 1940 and 1950 for several reasons. Perhaps most intuitively, 1940 and 1950 are census years which means we can easily link our establishment-level data to other contemporaneous data sources. Second, on a practical level, the Green Books did not become nationally representative until 1939, beginning in 1940 affords us the greatest national representation.[30] Finally, beginning in 1955, there was a sizeable decline in the number of Green Book establishments. This fact, which was only discovered by empirically evaluating the establishments in the Green Books, is discussed in more detail in Cook et al. (2020), Cook et al. (2023) and Jones et al. (2024). While Cook et al. (2020) hypothesize that this could have been the result of a change in advertising incentives within the Green Book publications, Jones et al. (2024) provide empirical evidence that the decline was, at least in part, related to urban renewal projects that demolished many predominantly Black neighborhoods in the 1950s and 1960s.[31] The only type of establishments that did not experience a decline in listings following 1955 were formal accommodations. Figure 2 displays the growth in the number of eating and drinking establishments, hotels, and gas stations from 1939 to 1951. The number of each type of establishment grew over the period of our analysis, with a particularly large expansion in the number of eating and drinking establishments listed in the Green Books.

In Section A of the Online Appendix we address some potential concerns with using the Green Books to measure non-discriminatory firms in a local market. Specifically, we discuss why the presence of more Green Book establishments is a reasonable proxy for a more positive local racial sentiment; why we do not view selection into the Green Books as a concern in the type of empirical analysis we conduct; and, that we are confident in our use of establishments that cater to tourists in an analysis of local shocks. Some of these points

[30] The 1938 edition has a note explaining that "[t]he 1939 issue will contain the western section of the United States and will be complete" (Green, 1938).

[31] Another reason why it may be advantageous to focus on 1940-1950 is because large national protests regarding public accommodations began in earnest after 1955, which makes the decision to change business services difficult to isolate to market conditions as opposed to national political forces. In particular, the *Brown v. Board* decision of 1954 and the Montgomery Bus Boycott of 1955 focused national attention on racial discrimination.

are also discussed in Cook et al. (2023).

4.1.2 Instrumental Variables

The World War II Instrument: The first instrument we use is the count of White casualties in World War II by county.[32] These data come from Ferrara (2022) and include the number of casualties identified by matching the WWII Enlistment Records to the WWII Honor List of the Dead and Missing for the Army and Army Air Force. While these data exclude enlistees who served in the Navy, Marines, and the Coast Guard, they cover the majority of serviceman deaths. We view the WWII casualties as generating exogenous variation in the Black-to-White consumer ratio that stems from different levels of White consumers in 1940.

Our primary focus is on how changes in the composition of consumers affect firms' choices to discriminate. By estimating our main specification in changes, we assume that we appropriately control for all other time-invariant county-level factors, including any fixed differences in the level of White discrimination across counties. Our model, the historical literature, and economic intuition give rise to the possibility that other factors that correlate with wartime mobilization could also have affected the decision of a firm to discriminate. These factors, which include the possibility that $\tilde{\eta}$ was changing and that the war affected racial attitudes, either directly or through the use of the G.I. Bill are considered extensively in Section E5 of the Online Appendix.

The Black Migration Instrument: The Black migration instrument is comprised of both shifts (the change in migration patterns) and shares (the stock of existing migrants). To claim that the exclusion restriction holds, we need exogeneity in either the shifts or the shares. Constructing the shifts based on predicted migration flows that are generated from shocks to Southern county characteristics helps ensure that this assumption is satisfied by the exogeneity of the shifts (Borusyak et al., 2021). Our IV is most closely connected to that of Derenoncourt (2022), with two primary differences. First, our unit of analysis is the county rather than the commuting zone, and second, we instrument for the ratio of Black to White consumers rather than the share of Black residents. More formally, the migration IV, Z_c is constructed as:

$$Z_c = \frac{\sum_{j=1}^{J} \pi_{jc}^{1940} \times \hat{M}_j^{1950-1940}}{\text{White Pop}_{1940}},$$

where π_{jc}^{1940} is the share of migrants from county j (in the South, 1935) who live in county c

[32] 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).

(in the North, 1940), computed using the 1940 full count census. $\hat{M}_j^{1950-1940}$ is the *predicted* number of migrants from county j between 1940 and 1950. We use the predicted migration flows from Derenoncourt (2022). Specifically, these flows were constructed based on the following equation:

$$M_j^{1950-1940} = \boldsymbol{P_c^{1940}\Omega} + \upsilon_c, \tag{10}$$

where the matrix $\boldsymbol{P_c^{1940}}$ includes the set of origin county push factors in 1940 used by Boustan (2009).[33] To improve prediction, Derenoncourt (2022) shrank the set of push factors included in $\boldsymbol{P_c^{1940}}$ using a LASSO algorithm.[34] We use her predicted number of migrants from county j between 1940 and 1950, $\hat{M}_j^{1950-1940}$.

Using predicted migration flows instead of actual migration flows strengthens the validity of the migration share instrument; however, for these shifts to be truly exogenous, we require the additional assumption that the Southern push factors were orthogonal to Northern pull factors. While this assumption is plausible, just as we do with the WWII instrument, in Section E5 of the Online Appendix we present an additional set of specifications that control for other factors that may pose additional threats to the identification strategy.

4.2 Hotels as an Exemplary Test of the Model

When we analyze the relationship between the firm ratio and the consumer ratio, we report results for all three types of establishments but, as noted above, we view the hotel analysis as the exemplary case. Importantly, hotels were firms that discriminated at the extensive margin by definition—they discriminated by not providing lodging to Black customers, as opposed to second-class service that other business types could employ.[35] Therefore, increases in non-discriminatory hotels represent a clear and genuine increase in access to non-discriminatory services for Black consumers, which closely aligns with the model presented.[36]

[33]The original set of push factors included: the percent acreage in cotton, the percent tenant farms, the share of the labor force in agriculture, an indicator for being in a tobacco-growing state, the interaction between the tobacco-growing indicator and the share in agriculture, per capita WWII spending, the share of the labor force in mining, an indicator for being in a mining state (OK and TX), and the interaction between the mining indicator and the share of the labor force in mining.

[34]For 1940, the algorithm selected the percent tenant farms, the share of the labor force in agriculture, per capita WWII spending, the percent acreage in cotton, the interaction between the tobacco-growing indicator and the share in agriculture, the mining indicator, and the interaction between the mining indicator and the share of the labor force in mining.

[35]Hotels were seen as an area of discrimination that could "taint" Whites with Black association, despite the separation of individual rooms. For example, in his statement before the House Committee on the Judiciary, Edgar S. Kalb, Manager of the Beverly Beach Club said "I think if I did not want to go into a hotel that had mixed patronage, that was a publicly owned hotel, that I certainly should have the right to go in a privately operated place that furnished and solicited only those that I chose to associate with (U.S. House Committee on the Judiciary, 1963)."

[36]In case of discrimination along the extensive-margin, movement to non-discriminatory service provision is akin to entering the non-discriminatory market.

The reality for most other types of establishments was that racial discrimination existed along a continuum, where some firms were able to engage Black customers in second-class and inferior ways. This was most prominent in restaurants, where some would deny all Black business and others would allow Black customers to sit in segregated portions of the establishment or pick up food for takeout. Service practices ranged from full and complete discrimination to marginalized service to full integration in ways that made it difficult for customers to discern the practices of specific establishments.[37] Gas stations rarely denied Black customers from purchasing gas but commonly denied them use of facilities such as auto repair or use of restrooms. These types of discrimination present an empirical problem, since the Green Books listed establishments that would keep Black travelers from "running into difficulties, embarrassments, and to make [their] trips more enjoyable" (Green, 1949). As such, hotels are closest to the canonical thinking about racial discrimination and also the most tractable type.

There is also an argument for focusing on hotels that is grounded in the primary informational problem the Green Books aimed to solve. Together, formal and informal accommodations were the most frequently listed type of establishment in the Green Books and, in many respects, the reason the Green Books were created was to provide a solution for where to find overnight lodging. Without the information provided in the Green Books, Black customers would need to search extensively for hotels that would serve them, which could take weeks of correspondence by mail and telephone (Sorin, 2020; Taylor, 2020). Consequently, we believe accommodations to be more accurately surveyed than restaurants, gas stations, and other types of businesses, thereby minimizing measurement error.

4.3 The Relationship Between Prices and Black-friendly Businesses

The second goal of our empirical analysis is to understand the separate role of product quality, discrimination, and market structure on the prices that firms charged African American clientele. Unfortunately, comprehensive data on prices in all industries by discriminatory practice is not available. For some industries, such as gas stations, there is little evidence that the prices were different for Black consumers (Bay, 2021). As we noted earlier, this would reflect the fact that, for some industries, discrimination worked to restrain the types of services offered, not the price of the product offered to Black customers. For industries such as restaurants, determining price differences between discriminating and non-discriminating firms is difficult. One would need to control for numerous factors that would explain differences in prices, many of which are unobserved. For instance, we would need to know

[37] Sorin (2020) notes that, even in cities with legal restrictions on racial discrimination in restaurants, Black customers continued to be denied equal dine-in service by the majority of establishments in the 1950s.

whether the restaurant discriminates at the intensive margin by offering take out but not seating to African American clientele. To investigate this issue, we turn to comprehensive data on hotel prices.

Observing the prices at Black-friendly hotels alongside those of other hotels in a local area is a novel advance in understanding prices for discriminatory and non-discriminatory firms. This is the first evidence we are aware of to directly measure price differences by a firm's discriminatory practices. The Green Books did not list the price of services, except in rare circumstances. Even the Censuses of Business did not include information on the average prices charged for services. To obtain a sample of prices that varies by discriminatory and non-discriminatory status of the establishment, for each decade (1940, 1950, and 1960), we compile the largest set possible of non-discriminatory establishments by supplementing the Green Book establishments with other competing travel guides for African American tourists, which we then match to a national hotel directory that listed prices. Other guides that existed for Black travelers around the same period the Green Books were published include, but are not limited to: Grayson's Guide (1936-1946); Go, Guide to Pleasant Motoring (1952-1959); the Travel Guide (1961-1962); Travelguides (1946-1963); Hackley and Harrison's Hotel and Apartment Guide for Colored Travelers (1930-1931), the Department of the Interior's Directory of Negro Hotels and Guest Houses (1939 & 1941). Though none of these publications lasted as long as the Green Book publication, nor were they as popular as the Green Books (Taylor, 2020), we digitize a number of these additional guides in an attempt to increase our match rate between Black-friendly businesses and the directory containing prices. We select guides based on whether they were published in the years surrounding 1940, 1950, and 1960, and whether we were able to locate them. More detailed information on the guides we chose can be found in Section B1 of the Online Appendix. In total, we digitize 7 additional guides: the 1939 and 1941 Department of the Interior Guides for Black Travelers, the 1950 Wisconsin Black Business Directory, the 1952 and 1959 Go Guide To Pleasant Motoring, and the 1950 and 1962 Travel Guides.

After merging all of these travel guides together (with our existing Green Book guides as well), and removing duplicate establishments, we match this comprehensive set of non-discriminatory establishments to an additional national historical directory, *The Official Hotel Red Book and Directory*.[38] The Hotel Red Book was published for the American Hotel Association (A.H.A.) of the United States and Canada by the A.H.A. Directory Corporation. It began in 1896 and, according to Ingram (1996), the Red Book was near comprehensive

[38] After deduplicating, there are no new establishments from the Department of Interior Guides or the Wisconsin Black Business Directory. The establishments in each non-discriminatory publication are matched to the closest decade of Red Book data.

until the 1930s, at which point it began to grow more selective. However, we can view the Red Books as providing us with a large set of hotels that met a basic criterion for quality of service. Crucial to our analysis, the Red Books published room rates, in addition to the name, address, and number of rooms at each establishment.

We use a matching procedure to link non-discriminatory establishments to the Hotel Red Books (this is described in detail in Section B3 of the Online Appendix). An example of one such match between a Green Book and Red Book publication is found in Figure B.1 of the Online Appendix. In this example, Carthage Hotel in Carthage, North Carolina was listed in both the 1940 Green Book and 1940 Red Book. From the additional information in the Red Book, we can see that this hotel had 34 rooms, charged an American minimum plan of $2.50 and a European minimum plan of $1.50. The difference between American and European prices is that American prices included all meals, while European prices did not include any meals. Because Carthage Hotel did not have a star next to its listing, we also know that it was not a member of the A.H.A., nor was it an A.H.A. National Member. The A.H.A. rating relates to quality and was included in the 1940 and 1950 Red Books, but not the 1960 edition.

The mix of European and American prices listed in the Hotel Red Books requires us to make choices about what to include in our measure of prices. Our main specification uses the minimum European price listed, however, since not all hotels have a European price, we also show results in the Online Appendix that use a composite price that combines all available price information. Overall, our analysis includes 26,372 establishment-year observations, of which 571 are Black-friendly, which corresponds to about 2% of the sample. This is consistent with the work of Bay (2021) who reports that 2% of hotels served Black clientele prior to 1964. However, given that we have multiple waves of data, we can see that the share of establishments that were non-discriminatory increased from 0.7% in 1940 to 8.2% in 1960 (see Table B.1 of the Online Appendix). Table B.2 of the Online Appendix presents descriptive statistics for the hotel characteristics of discriminatory and non-discriminatory establishments in our price data. Here, we see that there were differences, but not always in the way that one might expect. For example, non-discriminatory hotels were more likely to be accredited by the A.H.A. and generally had more rooms than discriminatory hotels.

5 Results

We present our results in three sections, each of which corresponds to examining a different element of consumer discrimination. Our first set of empirical results examines the equilibrium relationship between the firm ratio and the consumer ratio, as predicted by the theoretical model. Then, we examine whether market conditions, proxied by whether

firms are in high or low density markets, impact the behavioral response of firms to variation in the consumer ratio. Finally, we turn to our third and final aspect of consumer discrimination—price differentials between non-discriminatory and discriminatory markets. Here, we examine whether the price differences across markets are related to the concentration of firms in each market.

5.1 Consumer Discrimination and the Firm Ratio

The Firm Ratio is Increasing in the Consumer Ratio: Panel A of Table 1 displays OLS estimates of the relationship between the firm ratio and the population ratio for each of the three industries in our analysis: formal accommodations (hotels and motels), eating and drinking establishments, and gas stations.[39] As discussed previously, this specification does not account for the endogenous nature of population change. Columns (1)-(3) show the relationship for the whole country, which is consistent with the use of the WWII instrument, and columns (4)-(6) display results for the counties where the migration instrument is applicable (those outside of the South). All columns are restricted to the counties that are included in each edition of the Census of Business. In all instances there is a positive, but sometimes imprecise, relationship between the population ratio and the firm ratio. For example, we can roughly interpret column (4) as saying, outside of the South, a 10% larger increase in the Black-to-White population ratio is associated with a 2.6% larger increase in the non-discriminatory to discriminatory firm ratio for the hotel industry. While the positive relationship is consistent with the predictions of the model, the endogeneity between firm and population ratios is a serious concern.

Panel B of Table 1 shows the first stage relationship of the IV specification, where the Black-to-White population ratio is regressed on either White casualties in columns (1)-(3) or the migration instrument in columns (4)-(6). The results for both instruments in all industries show a strong first-stage relationship. Taking the lower bound of these estimates would imply that a 10% increase in White casualties is associated with a 0.1% higher Black to White population ratio in the years following World War II, while a 10% increase in predicted Black migration would result in a 0.5% increase in the Black/White population ratio. The F-statistics for the first stage are found in the final row of the table and suggest that our instruments are strong across all specifications. For the WWII instrument, they are above 100, and for the Black migration instrument they are above 20.

Panel C displays the reduced form relationship between the instruments and the firm ratio. Here, we see that White casualties are positively related to the firm ratio for hotels

[39] The first stage, reduced form, and second stage are depicted graphically in the form of binned scatterplots in Section D of the Online Appendix.

and eating and drinking establishments, and the migration instrument is positively related to the firm ratio for hotels, eating and drinking establishments, and gas stations, although only the estimate for hotels is statistically significant.

The IV results are presented in Panel D of Table 1. Column (1) shows that for a 10% increase in the Black-to-White population ratio, the hotel firm ratio would increase by 2.2%. Columns (2) and (3) show increases in the restaurant and gas station firm ratios as well, but they are smaller in magnitude than hotels (0.6% and 0.1%, respectively), and in the case of gas stations the estimate is not statistically significant. This is consistent with our earlier point that the nature of discrimination in restaurants and gas stations would lead both to be less responsive to changes in the consumer ratio than hotels. Turning to the migration instrument, we see a similar pattern. Column (4) shows that, outside the South, a 10% increase in the Black/White population ratio increases the hotel firm ratio by 7.9%. For restaurants and gas stations, the magnitudes are smaller than for hotels (2.1% and 0.9%, respectively) and neither is statistically significant.

Robustness to Functional Form, Market Definitions, and Alternative Explanations: As expected, when we run an overidentified model, where we include both instruments in the model simultaneously, the magnitude of the estimates lie between those obtained using just the WWII or Black migration instruments (Table E.1 of the Online Appendix). The results are similar when we estimate the model using levels (Table E.2 of the Online Appendix). They are substantially more precise when we estimate the model using percentiles of the distribution of the firm ratio, consumer ratio, and instruments (Table E.3 of the Online Appendix). Restricting to counties that had some positive level of migration yields estimates that are larger in magnitude, and generally more precise (Table E.4 of the Online Appendix). This latter restriction renders our sample more comparable to the work of Derenoncourt (2022), who focused on destination commuting zones during the Great Migration. Finally, we obtain qualitatively similar estimates for the hotel industry when we expand the definition of the market to include neighboring counties (Table E.5 of the Online Appendix).[40]

The results in Table 1 are consistent with the idea that business owners factored the demand from potentially discriminatory majority consumers into their decisions to discriminate. In particular, by using the number of White casualties from World War II and Black migration patterns as instruments for the Black-to-White population ratio, we are able to isolate this as a potential channel through which population change in local markets im-

[40]We perform this check for hotels, as eating and drinking establishments and gas stations served both local residents and visitors.

pacted the desegregation of firms in America. That being said, other theories relating to social change and income growth among the African American population certainly provide plausible alternatives and several of the factors we mentioned previously may threaten the exclusion restriction. In section E5 of the Online Appendix, we provide a detailed examination of several alternatives to the market conditions hypothesis which we summarize briefly here.

Table E.6 presents results using the WWII casualties instrument and Table E.7 presents results using the Black migration instrument when we control for various confounders. Since each of our instruments yields considerably different treatment effects which may be due in part to the different geographies examined, we first check whether the WWII casualties instrument yields similar estimates to the Black migration instrument when we restrict to regions outside the south. Indeed, the estimate is much closer in magnitude for the hotel industry, but as with the national sample, the results for restaurants and gas stations are smaller than for hotels and neither is statistically significant. We then show that our results using the WWII casualties instrument are robust to the inclusion of controls for the share of farmland in 1940, the number of manufacturing workers in 1940, changes in Black income and labor force participation, changes in the number of NAACP chapters, changes in the White population, and changes in the total number of firms. Focusing on potential confounders that are important for the Black migration instrument, we show that our results using this instrument are robust to the inclusion of controls for the share of the Black population with a high school degree, the number of manufacturing workers in 1940, the fraction of the Black population who migrated within and across states, the change in Black income and labor force participation, the change in the number of NAACP chapters, and the change in the total number of firms.

5.2 Consumer Discrimination and Market Concentration

Thus far, we have established a robust causal relationship between changes in the Black-to-White consumer ratio and the ratio of non-discriminatory to discriminatory firms. While this is consistent with the model of consumer discrimination presented earlier, and robust to a number of potential concerns, there are additional checks that can further establish the role of consumer discrimination as the primary mechanism for these results. In this section, we consider an additional factor motivated by the narrative history of racial discrimination.

This narrative supports the idea that firms were concerned about consumer defection to competitors (Wright, 2013). In a canonical story, a lunch counter in a downtown business district was concerned that non-discrimination would drive a significant share of their White customers to other firms who continued to discriminate. Implicit in those stories,

however, is a relationship between market power and incentives to discriminate. Intuitively, firms with significant market power could exploit that power and more easily dismiss the concerns of their discriminating White consumers. At one bookend, market power can blunt discriminatory preferences and force consumers to accept non-discriminatory businesses if there is only one local provider of the service. In a market with few competitors, changes in the customer base reflect new potential customers that a firm with greater monopoly power can secure with less worry of losing customers with discriminatory preferences. In a more competitive market, faced with the same changes in market composition, concerns about the potential loss of White customers could make firms reluctant to change practices if the relative loss of White customers far outweighed the gains to integration.[41]

We consider this empirically in Table 2, where we analyze the response to market composition changes by market concentration. Here, we use a measure of market concentration that is directly linked to the threat of White consumers defecting: the number of discriminatory firms scaled by White population in 1940. We partition this measure at the median to analyze the effects of changes in the consumer ratio on the changes in the firm-ratio above and below this median level of market concentration.[42] We estimate each regression separately, by industry, in Table 2.

Table 2 shows uniformly that the least competitive markets have the strongest response to changes in the consumer ratio. Comparing columns (1) and (2), which uses the WWII casualty instrument for the national sample, we see there were positive responses to changes in consumer market shares in regions below the median levels of firm market concentration for all three industries. In these markets, the response to a 10% change in the consumer ratio is 4.7%, 0.77%, and 0.17% for hotels, restaurants, and gas stations, respectively. Each of these estimates is also statistically significant. Also important, even though the results by market concentration are strong for all three sectors, they are strongest for hotels and weakest for gas stations, consistent with the types of discrimination practiced by firms. That is, even in the markets with greater monopoly power, the effect is largest for firms which discriminated at the extensive margin and weakest for firms which discriminated at the intensive margin. In the most competitive markets, the response to changes in the population

[41] Since our analysis focuses on the change to non-discriminatory services, we view the proposition that there is a correlation between discriminatory preferences and market power to be inconsequential. Contemporaneous survey evidence, for example, does not show trends in racial attitudes being more progressive in areas with larger numbers of retail firms. Even at present, attitudes of racial animus are strongest in more remote communities, which typically have lower firm density.

[42] Analysis above and below the median ensures a sufficient sample size for each sub-population. Additional analysis that splits the level of market concentration in thirds also shows that the effects tend to concentrate in the least competitive markets and that the firm response is decreasing in the competitiveness of the market. These results are available upon request.

ratio is negligible across all industries, except for eating and drinking establishments. Even then, it is still that case that for eating and drinking establishments the effect size is larger in less concentrated markets.

The same patterns are observed when we use the migration instrument on the sample of counties located outside the South. Here, the effect of the consumer ratio is substantially larger in the least competitive markets.[43] Overall, this evidence is consistent with strong discriminatory preferences among White consumers, where firm market power blunted the incentives for firms to adhere to the discriminatory preferences of consumers.[44]

5.3 Consumer Discrimination and Prices

Our final set of results examines the relationship between consumer discrimination and the prices charged in each type of market, while taking into consideration the role of market concentration in generating such price differences. Existing models of consumer discrimination that neglect the role of competition between firms predict that White consumers pay to discriminate by accepting higher prices in the discriminatory market. As we discussed earlier, the overall density of firms in the discriminatory market could put downward pressure on prices, thereby outweighing any such price effects. We use our novel data on the prices of establishments by discriminatory status to offer a comprehensive analysis of price differences and the role of consumer discrimination in the presence of market concentration in generating them. Our analysis proceeds in three steps. First, we show that the basic relationship between the number of establishments in a market and the prices in that market holds in our price data. Next, we provide evidence that Black-friendly establishments charged higher prices than discriminatory ones. Finally, we show that these price differentials are related to the differential degree of competition across markets.

The relationship between prices and the number of firms: The results of estimating equation 8 can be found in Table 3. The first two columns display the results for prices in levels and the next two display them for the log of prices. Odd columns control for the county population and its square, the share of the population that is Black, and year and plan type fixed effects. Even columns include the full set of controls and county fixed effects.

[43] In unreported specifications, we estimate a fully interacted model to test for statistical differences between the effect sizes observed between columns (1) and (2), and (3) and (4). Given the noise with which the historical data is measured, statistical tests will only detect very large differences in effect sizes. Thus, the only difference that is statistically significant below the 10% level is the difference for hotels using the WWII instrument (p-value of 0.02). The differences for hotels using the migration instrument and eating and drinking establishments using the WWII instruments had p-values of 0.16, and 0.19, respectively.

[44] As before, by "strong preferences" we mean that some White consumers held discriminatory preferences and other White consumers did not have a distaste for segregated consumption.

This table uses the European minimum price and Table F.1 of the Online Appendix shows that these results hold when we use the composite price.

In each case, the estimate on the number of establishments is negative and statistically significant. This result suggests that in more competitive markets—as proxied by the number of firms in that market, conditional on population and its square—prices tend to be lower.[45] However, the price differentials are small in magnitude. Taking the estimates from the specifications in logarithms suggests that every additional establishment in a county is associated with a 0.1% reduction in the price. This estimate is the same whether we use the composite or European minimum price and is not sensitive to the addition of the extended set of controls. To put the magnitude in perspective, the average county in our data had 5 establishments, while the median county had 2. There was relatively large dispersion: the standard deviation in establishments was 12 and 10% of county×year observations had 10 or more establishments.

Prices in discriminatory and non-discriminatory markets: Having established that prices were lower in places with more competition, we turn to our analysis of price differences between Black-friendly establishments and those that discriminated. A consistent feature in the narrative of racial discrimination is the observation that non-discriminatory services were typically more expensive than their discriminatory counterparts. That is, Black customers noted that they routinely overpaid for services offered by non-discriminatory firms.[46] Testing this conjecture is difficult because it requires us to separately identify the role of market structure from taste-based discrimination on the part of firm owners. Typically, models of firm-owner discrimination assume that firm owners with discriminatory preferences will accept Black patrons, but only if they are compensated by charging them higher prices than what they charge White consumers. In this sense, models of firm-owner discrimination generate differential pricing between customers of different races, but a distinction is that they focus on different prices within the same firm. Thus, in order to examine the role of consumer discrimination, our analysis has to focus on a subset of firms that we know did not price differentially. The Red Books affords us the ability to shut down this channel of discrimination on the part of firm owners, as they were national directories that did not distinguish between hotels that were friendly towards African Americans and those

[45] This result also holds if we estimate the model separately for the non-discriminatory and discriminatory markets, though, the estimates for the non-discriminatory market are statistically imprecise.

[46] In the context of the theoretical model, price differences could also be a function of racial differences in travel and information costs, t, for Black and White consumers. The narrative record shows that Black travelers faced significant costs with respect to securing information on non-discriminatory businesses (Sorin, 2020; Hall, 2023). In both instances, the prices in the non-discriminatory market would be greater than those in the discriminatory market.

that excluded them, nor did they list separate prices for consumers of different races. Thus, for the set of Red Book establishments that we match to our Black-friendly businesses, we can be confident that we have identified a set of establishments that served Black clientele and White clientele on an equal basis and where firm owner discrimination was not present.

Figure 3 shows the average minimum European price at non-discriminatory (Black-friendly) and discriminatory (Not Black-friendly) hotels in our matched data. Here, we see evidence that Black-friendly businesses charged higher prices in 1950 and 1960. Table 4 reports regression estimates from equation 9 of the natural logarithm of the minimum European price on an indicator for whether the hotel was non-discriminatory.[47] Column (1) displays the coefficient estimate on the indicator for whether the hotel was non-discriminatory ("Black Friendly"), conditional on year and plan type fixed effects.[48] Here, we see that non-discriminatory hotels were roughly 22% more expensive than discriminatory ones. Columns (2) and (3) add state and county fixed effects, respectively, each of which reduces the magnitude of the coefficient estimate slightly, though it remains statistically significant and economically important. In column (4), we add establishment-level controls, which includes an indicator for whether the hotel was accredited by the AHA, the number of rooms by type (rooms, suites, apartments, cottages, or missing room information), and whether the establishment name contained "hotel" or "motel". These controls further reduce the coefficient estimate, though it continues to suggest that Black consumers paid considerably more—upwards of 10%—for public accommodations.

It is important to note that the price differences we observe are large. Recall, Table B.2 of the Online Appendix shows that, unconditionally, the average European price at discriminatory firms was \$2.25 compared to \$4.70 at non-discriminatory firms. Such price differences could reinforce discriminatory practices among even non-discriminatory White consumers, as those non-discriminatory consumers would solicit discriminatory firms due to the substantially lower prices in those firms.

Our analysis of the price differences between non-discriminatory and discriminatory firms includes a rich set of controls and exploits within-county variation in the pricing decision of firms; however, there still may be concern that an unobservable confounder is driving the price differences we observe. To understand how much of a problem this could be for our estimates, we employ the methodology of Cinelli and Hazlett (2020). The idea behind this methodology is that confounders would need to explain a significant portion of the residual variation in either the treatment or the outcome in order to reduce the magnitude of the

[47] Table F.2 of the Online Appendix compares the coefficient estimate on "Black-friendly" when we use prices in levels, logs, and using both the composite and European minimum prices.

[48] Since we restrict to European prices, the only variation in plan type comes from some hotels that are only open in the summer or the winter.

coefficient estimate to zero. Of course, this leaves open the question of what constitutes a significant portion of the residual variation. Cinelli and Hazlett (2020) suggest that one can leverage contextual knowledge to place meaningful bounds on the likely impact of unobserved confounders.

In our analysis, take as an example, the variable "Any AHA" which is an indicator that equals 1 if the establishment was rated by the American Hotel association in 1940 or 1950 and 0 otherwise. Using the method developed by Cinelli et al. (2020), we obtain that, after accounting for the other controls, a rating by the AHA explains 0.16% of the residual variation in whether the establishment is Black-friendly.[49] This value also serves as a sensitivity statistic regarding the impacts of extreme confounders. That is, a confounder that explains 100% of the residual variance in the log of prices, would only need to explain 0.16% of the residual variance in whether the establishment is Black-friendly in order to bring the coefficient estimate on "Black-friendly" to 0.

Granted, the presence of such an extreme confounder may be unlikely, thus Cinelli et al. (2020) provide a secondary sensitivity statistic that they call the "robustness value." This value, which is 3.87% in our case, tells us that an unobserved confounder that can explain 3.87% of the residual variance in whether the establishment is Black-friendly and the log of the price, would be strong enough to bring the coefficient estimate to 0. Theoretically, such an observed confounder may be possible, but in practice, Cinelli and Hazlett (2020) suggest that we can use the information from the existing model to place bounds on the severity of the omitted variable bias. Figure 4 presents the results of computing these bounds for each of the variables in our analysis. Consider the bounds computed using "Any AHA" as our benchmark variable. The first coefficient estimate, represented by the black square, indicates that a confounder that is as strong as "Any AHA" would be strong enough to reduce the magnitude of the coefficient estimate slightly, but it would not be statistically different from the original estimate, as displayed by the horizontal red dashed line. A confounder that is twice as strong as "Any AHA" would further reduce the coefficient estimate (yellow circle), as would one that is three times as strong (red triangle). Thus, given the degree to which "Any AHA" explains the residual variation in whether the business is listed as Black-friendly and the log of the price, a confounder would need to be substantially stronger in order to explain away the estimate of the price difference at Black-friendly businesses.

We conduct the same exercise using as benchmarks missing rooms, name has "hotel", name has "motel", county population, and the share Black. All adjusted coefficient esti-

[49] Table F.3 of the Online Appendix shows the coefficient estimates associated with the controls. Column (4) is our preferred specification, akin to Column (4) of our Table 9. Column (5) omits county fixed effects and is used in the sensitivity analysis.

mates are found in Figure 4. Using "Any AHA" as the benchmark results in the largest change in coefficient estimates, followed by the share of the county population that is black, and then the county population. Bounding based on missing rooms, name has "hotel", and name has "motel" does not change the coefficient estimate on "Black-friendly" even if the confounder is three times as strong as any of these variables. From this exercise, we conclude that, for a confounder to explain the entire price difference at Black-friendly businesses, it would have to explain much more of the residual variation of whether the establishment is Black-friendly and the log of the price than any of the controls in our analysis.

Retail price differences and relative market concentration: That prices at non-discriminatory hotels were higher is consistent with the large number of firms in the discriminatory market. Indeed, Bay (2021) reports survey results where more than 90% of hotels refused to take business from Black customers. Figure 5 provides additional evidence in support of this point. Drawing inspiration from the stylized model in Section 2.2, this figure relates the price difference between non-discriminatory and discriminatory markets to the difference in market concentration between those markets.[50] To construct the plot, we include only counties that had at least one non-discriminatory and one discriminatory firm. Then, for each county×year that meets this criteria, we compute the average price in each type of market, as well as the number of firms in each market. The vertical axis is the price difference between the non-discriminatory and discriminatory markets ($p^0 - p^1$) in county j at time t and the horizontal axis is the difference in the inverse of the number of firms in each type of market ($\frac{1}{N^0} - \frac{1}{N^1}$). The figure presents a binned scatter plot that has been residualized by year and state indicators. Here, we see a clear positive relationship between the price difference and the difference in market concentration across the two types of markets. Counties where the number of firms is much larger in the discriminatory market than the non-discriminatory market tend to have a larger price markup in the non-discriminatory market. This result also agrees with an extension of our analysis of changes in service, where market concentration measured in thirds, as opposed to above/below median concentration, shows that the effects of increasing access is concentrated in the least competitive markets and that the firm response is decreasing in the competitiveness of the market. This provides further evidence that differential market concentration contributed to the price differences between the discriminatory and non-discriminatory markets.

[50] Specifically, we arrive at this exercise by taking the difference between the equilibrium prices in each market ($p^d_{eq} = c + \frac{t}{N^d}$). We ignore t as it simply acts as a scaling factor in this case.

6 Conclusion

We provide a comprehensive analysis of consumer discrimination in the presence of market competition between firms. We formalize a model in which consumer segregation arises in equilibrium; not as a result of firms forgoing profits, but due to firms' decisions in the face of majority-group customers that harbor a distaste for consuming alongside members of the minority group. In particular, we use our model to explain the preponderance 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 role of consumer discrimination in firms' decisions to serve African American customers during this period. By extension, we show the importance of market competitiveness in enhancing or mitigating the influence of consumer discriminatory preferences more generally.

Our model generates two primary predictions about firm behavior and pricing that we evaluate empirically in this historical setting. First, in equilibrium, an increase in the ratio of Black-to-White consumers will lead to less discrimination in public accommodations. This notion was proposed by Wright (2013) and we show that the relationship holds in a model-derived specification. We then show that competition between firms muted these effects: increases in non-discriminatory businesses were concentrated in the *least* competitive markets, where firms had more flexibility to move to non-discriminatory service provision without the potential loss of White consumers.

The second prediction of our model relates to the pricing behavior of firms. Typical Beckerian models of discrimination assume that either the consumer or the firm has discriminatory preferences. If the latter, firm owners charge Black customers higher prices to offset the disutility they receive from serving them. If the former, White consumers pay higher prices to avoid the disutility they receive from consuming alongside Black customers. However, when considering the differential degree of competition between firms in the discriminatory and non-discriminatory markets, our model shows that consumer discrimination can actually result in *higher* prices being charged to Black consumers. We examine this empirically by collecting the most comprehensive set of non-discriminatory public accommodations possible, which we match to additional data on the prices charged by each establishment. Together, this yields data on prices for over 26,000 establishment-year observations by the discriminatory status of the business. Consistent with our theoretical predictions, we show that prices were lower in markets with more firms, that prices were higher in the non-discriminatory market, and that the price difference between non-discriminatory and discriminatory markets was increasing in the differential degree of competitiveness between markets. In short, when Black consumers found access to markets, they did so in the least

competitive ones and therefore ones where prices tended to be higher.

Our results show theoretically and empirically how consumer discrimination in light of competition between firms can both uphold a segregated equilibrium *and* result in higher prices for the discriminated group. While our empirical focus is on discrimination in the decades leading up to the passage of the 1964 Civil Rights Act, it is important to note that support for legal racial discrimination continued throughout the country.[51] Further, the insights in our work continue to be relevant for understanding contemporary firm behavior, especially as additional groups who currently lack protected status face increasing risks of discrimination in accessing services from businesses.[52] Our results show that the interaction of market competition between firms for consumers and the discriminatory preferences of those consumers has significant welfare implications for consumers.

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[51] In California, November 1964 saw an uncommonly high voter turnout, over 88%, support the election of President Johnson by a wide margin (50% to 41%), but also the passage of Proposition 14, which overturned California's 1963 Fair Housing Act. Proposition 14, which passed by a 65% to 35% margin and was defeated in only one county, forbade the government from enacting any fair housing legislation and was actively supported by the California Real Estate Association and endorsed by the *Los Angeles Times*. Similar to our results by market concentration, (Reny and Newman, 2018) find that support was strongest in areas with longer tenured households. Although ruled unconstitutional in 1966, it was not formally repealed until 1974.

[52] Recently, firms like Anheuser-Busch and Target have found themselves at the center of large consumer boycotts for supporting LGBTQ consumers (Vox, 2023). In 2023, transgender social media influencer Dylan Mulvaney appeared in a marketing campaign for Bud Light, one of Anheuser-Busch's beer lines. A large boycott led to a precipitous decline in sales during the summer of 2023, estimated to be between 10% and 20%. The decline was large enough that Anheuser-Busch eliminated 2% of its workforce and Bud Light relinquished its status as the market share leader in the U.S. beer market (The Associated Press, 2023). Similar boycotts and threats led Target to pull part of their LGBT Pride collection in May 2023 (Vox, 2023). The legality of firm discrimination against consumers was clarified in June 2023 when, in a 6-3 decision in *303 Creative LLC v. Elenis*, the Supreme Court held that a business owners would not violate Colorado's public accommodations law by refusing to accept business from same-sex couples.

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A Figures

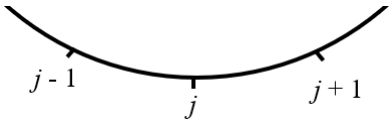

Figure 1: Depiction of firm j's neighborhood in a sub-market.

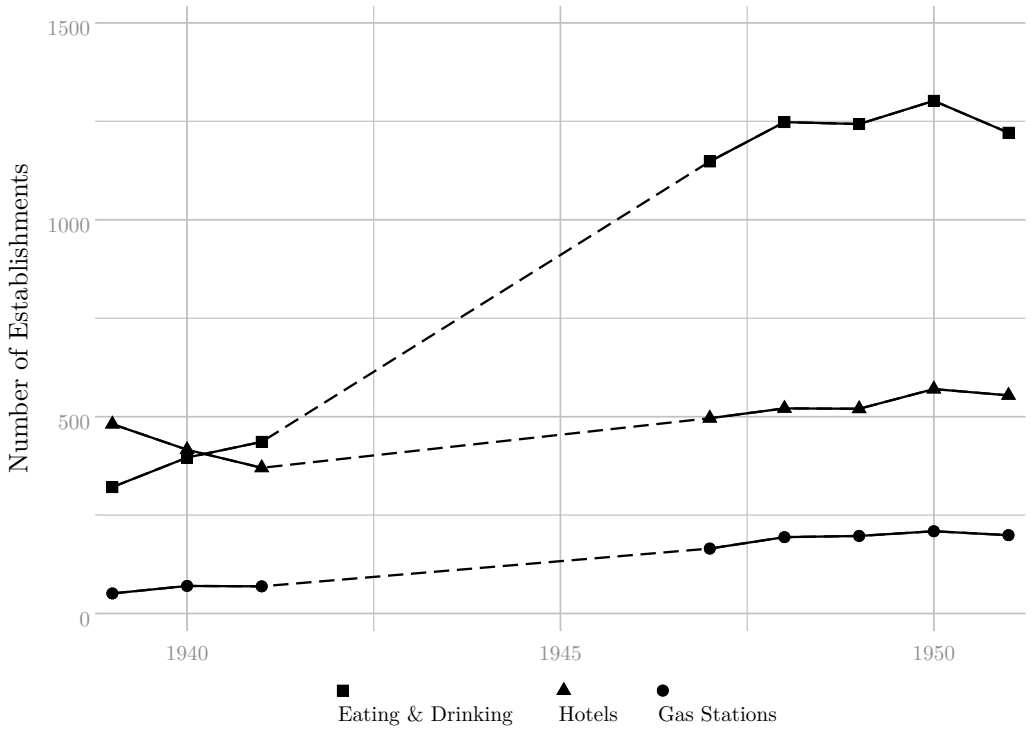

Figure 2: The total number of Green Book establishments by industry over the period of our analysis

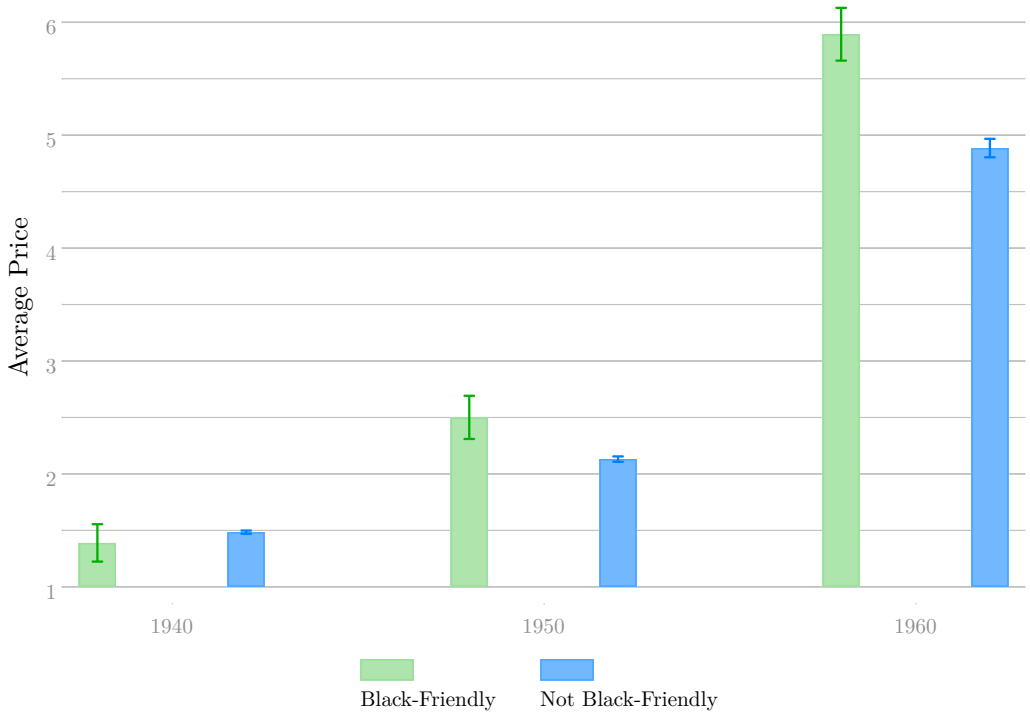

Figure 3: Average minimum European prices for discriminatory (Not Black-friendly) and non-discriminatory (Black-friendly)

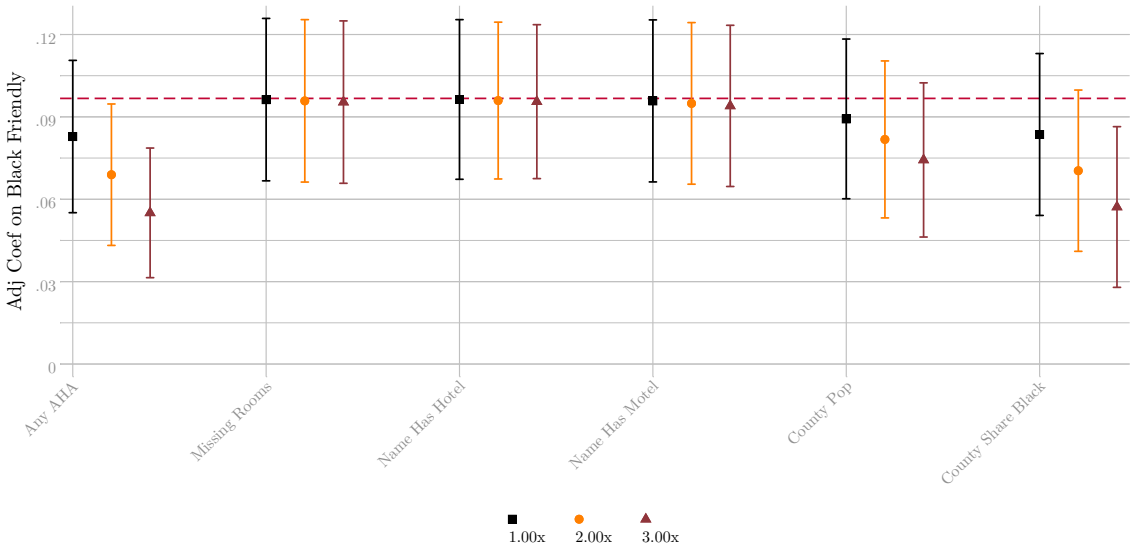

Figure 4: This figure shows adjusted coefficient estimates and 95% confidence intervals for the relationship between Black-friendly businesses and the natural logarithm of the European minimum price. Coefficient estimates have been adjusted using the Stata package "sensemakr" based on the methodology of Cinelli and Hazlett (2020).

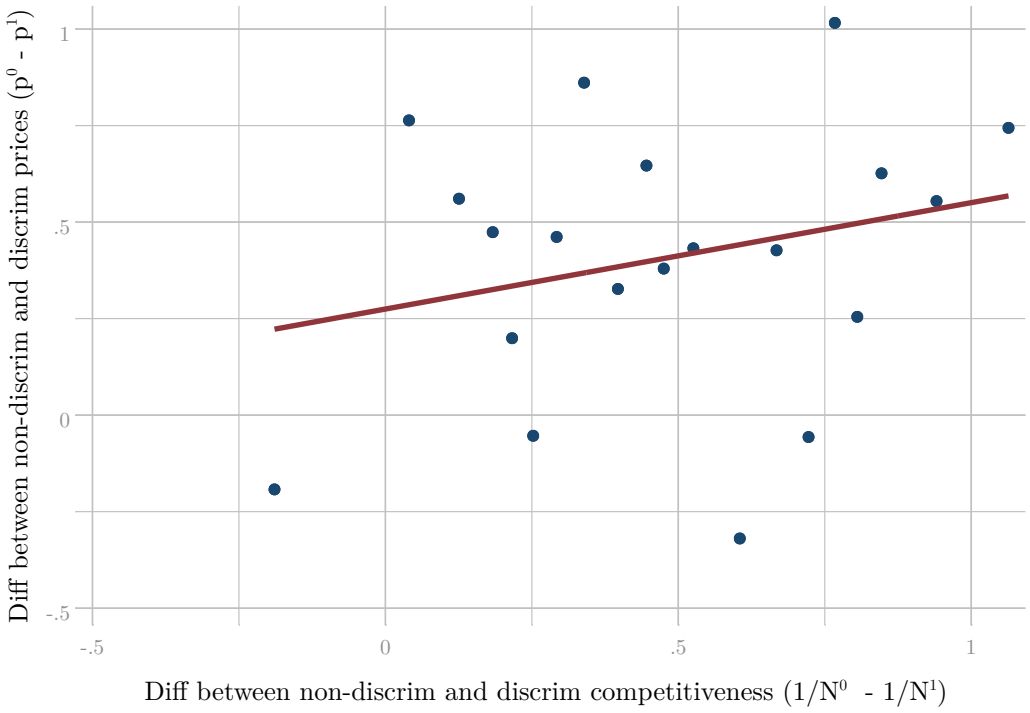

Figure 5: Binned scatter plot of the relationship between price differences across discriminatory and non-discriminatory markets and the degree of competition in both market. The vertical axis shows the difference in the non-discriminatory and discriminatory prices ($p^0 - p^1$) and the horizontal axis shows the difference in a measure of competitiveness between the non-discriminatory and discriminatory markets ($\frac{1}{N^0} - \frac{1}{N^1}$). The figure was residualized by year and state indicators. The underlying unit of observation is the county×year. Only counties with both discriminatory and non-discriminatory firms in a given year were included in the plot.

B Tables

Table 1: IV results for the change in the ratio of non-discriminatory to discriminatory establishments

	WWII IV			**GM IV**		
	Hotels	**Eat/Drink**	**Gas**	**Hotels**	**Eat/Drink**	**Gas**
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: OLS results						
B-W Ratio	0.019	0.010***	0.003			
	(0.021)	(0.003)	(0.002)			
B-W Ratio (GM)				0.258***	0.162***	0.007
				(0.048)	(0.017)	(0.014)
Constant	-0.005	0.001	0.000	-0.050*	-0.000	0.001
	(0.009)	(0.002)	(0.001)	(0.030)	(0.006)	(0.005)
Adjusted R^2	0.010	0.000	-0.004	0.044	0.042	-0.010
N. Obs	1900	3051	3057	1254	1687	1683
Panel B: First stage results						
White Casualties	0.012***	0.016***	0.017***			
	(0.001)	(0.001)	(0.001)			
GM Ratio				0.482***	0.519***	0.520***
				(0.104)	(0.096)	(0.096)
Constant	-0.096***	-0.174***	-0.177***	0.146***	0.031***	0.031***
	(0.011)	(0.012)	(0.012)	(0.020)	(0.009)	(0.009)
Adjusted R^2	0.142	0.172	0.176	0.211	0.216	0.218
N. Obs	1900	3051	3057	1254	1687	1683
Panel C: Reduced form results						
White Casualties	0.003**	0.001***	0.000			
	(0.001)	(0.000)	(0.000)			
GM Ratio				0.378**	0.111	0.045
				(0.178)	(0.071)	(0.057)
Constant	-0.018*	-0.004*	-0.001	-0.039	0.005	0.001
	(0.010)	(0.002)	(0.001)	(0.034)	(0.007)	(0.005)
Adjusted R^2	0.013	0.002	-0.005	0.025	-0.007	-0.010
N. Obs	1900	3051	3057	1254	1687	1683
Panel D: IV results						
B-W Ratio	0.219**	0.057***	0.008			
	(0.094)	(0.016)	(0.008)			
B-W Ratio (GM)				0.785**	0.214	0.086
				(0.379)	(0.132)	(0.109)
Constant	0.003	0.006**	0.001	-0.002	0.000	-0.000
	(0.010)	(0.002)	(0.001)	(0.006)	(0.002)	(0.002)
N. Obs	1900	3051	3057	1254	1687	1683
First Stage F-Stat	101.3	129.2	133.5	21.4	29.1	29.2

Notes: The dependent variable in all columns is the inverse hyperbolic sine of the firm ratio, as defined in Section 3. All columns include state fixed effects. Columns (1)-(3) use the WWII instrument and columns (4)-(6) use the Black migration instrument. Standard errors are in parentheses: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 2: IV results for the change in the ratio of non-discriminatory establishments: Heterogeneity by market concentration

	Below (1)	Above (2)	Below (3)	Above (4)
Panel A: Hotels				
B-W Ratio	0.470***	0.015		
	(0.175)	(0.049)		
B-W Ratio (GM)			0.313**	-0.142
			(0.150)	(0.159)
N. Obs	950	950	627	627
First Stage F-Stat	74.3	33.8	476.9	27.2
Panel B: Eating & Drinking Establishments				
B-W Ratio	0.077***	0.036**		
	(0.025)	(0.019)		
B-W Ratio (GM)			0.062	0.406
			(0.105)	(0.373)
N. Obs	1522	1529	841	846
First Stage F-Stat	95.9	58.8	85.4	3.4
Panel C: Gas Stations				
B-W Ratio	0.017**	0.000		
	(0.007)	(0.014)		
B-W Ratio (GM)			0.082***	0.032
			(0.023)	(0.372)
N. Obs	1526	1531	839	844
First Stage F-Stat	82.8	59.0	30.7	5.9

Notes: The dependent variable in all columns is the inverse hyperbolic sine of the firm ratio, as defined in Section 3. All columns include state fixed effects. Columns (1) & (2) use the WWII instrument and columns (3) & (4) use the Black migration instrument. Market concentration is defined by discriminatory firms per white population. The bottom quantile is in columns (1) & (3); the top quantile is in columns (2) & (4). Standard errors are in parentheses: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 3: Prices and the level of competition in county markets

	Levels		Logs	
	(1)	(2)	(3)	(4)
Number of Establishments	-0.016***	-0.014***	-0.001***	-0.001**
	(0.002)	(0.003)	(0.000)	(0.000)
Adjusted R^2	0.562	0.609	0.617	0.702
N. Obs	26372	26372	26372	26372

Notes: The dependent variable is the European minimum price (in levels or logs). Standard errors in parentheses. Columns (1) and (3) control for the county population and its square, the share of the population that is Black, and year and plan type fixed effects. Columns (2) and (4) control for the county population and its square, the share of the population that is Black, year and plan type fixed effects, whether the establishment was accredited by the AHA, the number of rooms by type (room, apartment, suite, cottage, missing), and whether the name of the establishment includes hotel or motel.

Table 4: Price differences at Black-friendly businesses

	(1)	(2)	(3)	(4)
Black Friendly	0.223***	0.209***	0.177***	0.103***
	(0.018)	(0.022)	(0.020)	(0.020)
Year F.E.	X	X	X	X
Plan Type F.E.	X	X	X	X
State F.E.		X		
County F.E.			X	X
Controls				X
Adjusted R^2	0.501	0.562	0.617	0.702
N. Obs	26372	26372	26372	26372

Notes: Standard errors in parentheses, clustered at the level of the fixed effects. The dependent variable is the natural logarithm of the minimum European price. All columns include year and plan type fixed effects. Controls include whether the establishment was accredited by the AHA, the number of rooms by type (room, apartment, suite, cottage, missing), whether the name of the establishment includes hotel or motel, the county population and its square, and the share of the population that is Black.