Segregation, Discrimination, and Firm Entry: Evidence from Post-war African-American Movie Theaters

Ricard Gil *
Justin Marion †

November 2014

Abstract

Segregation in public accommodation was an important feature of African-American life prior to the civil rights movement and among other things adversely affected minority access to business and culture. In this paper we study so-called Negro movie theaters in the post-war era, documenting the effects of racial discrimination and other forces on theater location. The predicted effects of racial bias on entry by theaters is ambiguous. It reduces entry of black-owned theaters by limiting the access to key inputs, while at the same time driving black customers away from white theaters and toward African-American theaters. We find that the effects of racial bias appear to be nonlinear. For much of the country, a greater degree of racial bias is associated with more African-American theaters, though the region with the strongest negative racial attitudes saw far fewer theaters. While Southern states both score higher on quantitative measures of racial bias and had a greater concentration of theaters, our structural estimates of firm entry suggest that the greater number of African-American theaters in the region is due to lower fixed costs in Southern states. Further evidence comes from the effect of competition from white theaters. In general, the presence of white theaters has little impact on African-American theater entry, however as a county's education rises, the presence of white theaters crowds out African-American theaters. This suggests that white theaters are a closer substitute in more racially tolerant areas. From these results, we draw implications for the effect of discrimination and segregation on business enterprise and minority consumption of differentiated products.

*Carey School of Business, John Hopkins University. ricard.gil@jhu.edu.
†University of California, Santa Cruz. marion@ucsc.edu

1 Introduction

Prior to the civil rights movement, segregation was an important feature of African-American life, particularly in Southern states. Access to business and culture was significantly impacted both by Jim Crow laws mandating segregation along racial lines, as well as by the practices of business owners that either explicitly or implicitly excluded blacks. Such segregation in access to public accommodations persisted despite legislation in many areas that attempted to preserve equal access. A long literature has sought to understand the effects of segregation along racial and ethnic lines in residential location, schooling, and occupation. However, the effects of explicit segregation in access to business and culture is far less well understood, possibly due to data limitations from the era when such segregation was more prevalent.

In this paper, we utilize unique data consisting of a comprehensive annual census of African-American movie theaters in the post-war era. We use this setting to understand the effects of discrimination and segregation on Black enterprise and the access of African-Americans to business and culture. As suggested by many previous authors, the effects of discrimination and segregation on a variety of outcomes are not theoretically clear. As with de facto residential segregation, more explicit segregation in commerce could protect minority businesses from competition by white-owned firms, as suggested by Cutler and Glaeser (1997) and Glazer and Moynihan (1963). This benefits minority business owners and indirectly their employees. However, discrimination also reduces access to key inputs such as credit, which would adversely affect entry. The effects on African-American movie consumers is similarly ambiguous. As in Waldfogel (2003), where increasing returns leads to preference externalities in radio, segregation could increase the number of theaters that target movies to African-American consumers. On the other hand, even if segregation increased entry of African-American theaters, black movie consumers may still have had reduced consumption opportunities since theaters are differentiated vertically as well as horizontally. Anecdotal evidence suggests that on average African-American theaters of the era were lower quality along several dimensions such as air conditioning, cleanliness, and technology.[1]

The data we use consist of a comprehensive listing of all movie theaters and their location for most years between 1950 and 1955. Importantly, this census indicates whether a particular theater was designated for African-American customers. We begin by establishing some facts regarding the location of African-American theaters. While the early 1950s saw several key

[1] As silent movies were being phased out, they were less likely to have the equipment necessary to exhibit movies with sound.

victories in the civil rights movement, such as the 1954 decision in Brown v. Board of Education limiting segregation in public schools, the number of African-American theaters was not in decline. The stability of the number of theaters during this era stands in contrast to white theaters, which were in decline due to the advent of television and the exodus of the population to the suburbs.

Unsurprisingly, the number of African-American theaters grows along with the size of the black population, and a greater number of theaters per black resident is observed in areas with higher incomes, greater education, and in states with fewer black residents working on farms. Notably, county-level variation on television entry is uncorrelated with African-American theaters, suggesting that television may not have been a viable alternative for black households in this era. While African-American theaters were observed in all regions of the U.S., at each population level they were more common in the South and Midwest.

It is informative to consider to what extent the geographic pattern of theater location matches with patterns of racial bias. Using the General Social Survey from the early 1970s and lynching counts by state from the turn of the 20th century, we form measures of racial discrimination. We show that theaters are less likely to enter in states where negative racial bias is stronger. However, this result is driven entirely by the region with the strongest racial attitudes, the East South Central region comprised of Kentucky, Tennessee, Alabama, and Mississippi. For most of the U.S. there is a positive relationship between racial bias and movie theater location. These results may reflect the conflicting effects of racial bias and forced segregation. Moderate levels of racial bias in a region, and thereby either de jure or de facto segregation, could allow for entry by black-owned business as African-American customers are driven to accommodating theaters. Extreme racism and its adverse effects on inputs necessary to entry may outweigh this effect.

White theaters to some extent were a substitute to segregated theaters for black movie customers. We find that African-American theater entry is negatively correlated with the number of contemporaneous white theaters, however is positively correlated with lagged white theaters. White theaters were often converted into theaters targeting black audiences, and so the presence of many white theaters may have eased the entry of African-American theaters. The negative contemporaneous correlation between white and black theaters suggests that African-American theaters may have had to compete with white theaters for customers. A surprising fact is that this result is concentrated in Southern states, where one would have presumed that white theaters would have been unavailable to African-American customers.

We then apply the well-established methodology of Bresnahan and Reiss (1989, 1990, and

1991) to separately identify the effect of region, discrimination, and competition from white theaters on variable profits and the fixed cost of entry of African-American theaters. We use demographic and market size information from the decennial U.S. census to estimate variable profits of movie theaters in different markets with different number of movie theaters. Bresnahan and Reiss (1991) conjecture that in markets with an observed number of entrants, further entry is unprofitable. By examining what market size is profitable for a single entrant, and then subsequently how further entry is induced by higher market sizes, it is possible to separately identify fixed from variable costs.

Our findings suggest that discrimination both reduces variable profits and increases the fixed cost of entry for African-American theaters. Furthermore, per person variable profits for Southern theaters are similar to those of theaters in Western and Midwestern states. Instead, fixed costs in Southern states are lower conditional on discrimination, which seems to drive the greater entry of African-American theaters.

Our results cast doubt on the notion that segregation encourages minority enterprise through a protection from competition mechanism. These results are important, as entrepreneurship is a commonly cited mechanism for how racial and ethnic segregation could lead to positive outcomes for minorities.

Waldfogel (2003) suggests that in markets with differentiated products and increasing returns, the presence of other individuals with similar tastes in the same market confers an externality. A small number of movies were produced targeting black audiences. Also, movie theaters could and did decline to screen movies with offensive racial content. Lastly, many African American theaters of the day also showed live entertainment, offering a different dimension of differentiation. A common prediction in the Bresnahan and Reiss model is that the required per-firm number of residents must rise in the number of firms, since competition drives down per-resident variable profits. However, with differentiated theaters, this may not be true. We in fact find that the number of residents-per-theater does not increase rapidly.

The past literature on the effects of segregation points toward conflicting forces of racial concentration on minority well-being.[2] Segregation has a negative impact since it may limit access to quality jobs, mentors and peers, and public goods. On the other hand, segregation could lead to a mixing of incomes within the racial groups. If there are spillovers across skill groups, this would benefit low-income blacks. Also, residential segregation may protect Black-owned enterprises locating within the racial enclave allowing for greater entrepreneurship. According to the

[2]See Cutler and Glaeser (1997) and Borjas (1998) among others.

spatial mismatch hypothesis of Kain (1968), this could improve employment opportunities.

The estimated effects of the impact of residential segregation in the empirical literature is similarly mixed across a wide range of settings and empirical approaches, as noted by Cutler, Glaeser, and Vigdor (2008). Cutler and Glaeser (1997) find that living in a segregated city leads to lower incomes, reduced schooling, increased idleness, and increased incidence of single motherhood for blacks compared to whites. On the other hand, Collins and Margo (2000) find that segregation may not have had negative implications prior to the 1970s. Cutler, Glaeser, and Vigdor (2008) find that residential concentration has mixed effects for first-generation immigrants, with the effect positive for the more highly educated. Borjas (1995) suggests that the socioeconomic background of residents in a child's neighborhood may be responsible for apparent ethnic human capital spillovers.

Fairchild (2008) studies segregation and entrepreneurship specifically, finding that the clustering of minority residents is associated with greater rates of self-employment, though greater interactions between races (a reduction in "exposure" segregation) also increases the likelihood of business ownership. Fischer and Massey (2000) also find that residential segregation reduces the likelihood of minority entrepreneurship.

We do not directly explore the question of general theater's exclusion of minority customers. Such exclusion may be related to discriminatory views of these theaters' customers. Research by Holzer and Ihlanfeldt (1998) suggests that racial bias by a firm's customers affects the hiring of minority workers by the firm. Discrimination attitudes in the population in our setting would seem therefore to create opportunities for African-American theaters. If white theaters shun black customers as a result of this discrimination, this drives those black customers to African-American theaters.

Theater owners may wish to exclude minority customers due to their own racial bias. An important question is the extent to which competition constrains supplier's ability to do so. Li (2014) studies the commercial sex market in Singapore, finding that prostitutes charge different prices to customers based on race, though competition ameliorates this effect. On the other hand, Graddy (1995) examines discrimination in the Fulton fish market, finding that even in this highly competitive environment pricing according to race persists. Charles and Guryan (2008), studying labor market discrimination, point out that discrimination is only relevant for the marginal firm, so that discrimination can persist for the average firm even in the face of competition.

The paper is structured as follows. Section 2 reviews the evolution of segregation and

discrimination laws in the US from the early 20th century to 1950. This section also describes the US movie industry during those years. In Section 3, we describe the data used in this paper. Section 4 presents our reduced form results, while in Section 5 we introduce our structural model of entry a la Bresnahan and Reiss (1991) and describe our results. Finally, Section 6 concludes.

2 Background and Institutional Details

2.1 Segregation and Jim Crow laws

Segregation in public accommodation was an important feature of African-American life for much of the 19th and 20th century. While de jure segregation was particularly prevalent in Southern states, segregation was used in practice over much of the U.S. In the years following Reconstruction, even in the South integrated public accommodation in some types of facilities was common. For instance, Woodward (1974) describes integrated bars, soda fountains, and public transportation in Charleston, South Carolina, though this did not extend to facilities such as hotels and hospitals. In the late 19th century, segregationist practices became more widespread and often legislated. The landmark 1896 Supreme Court decision in Plessy v. Ferguson established the constitutionality of separate-but-equal accommodations for different races.

There was a substantial degree of variation in segregation-related laws over time and across jurisdictions. However, this variation is unlikely to be useful in academic research studying the effects of segregation, as laws mandating segregation tended to be piecemeal and local.[3] Many Northern states passed laws at various points in time banning segregation in public accommodation. However, these laws were often ignored, imperfectly enforced, or interpreted in such a way that allowed for the continued exclusion of blacks.

Segregation in public accommodation was not only a Southern phenomenon. While Jim Crow laws mandating the segregation of races in public accommodation were more common in the South, informal and to a lesser degree formal segregation was routinely practiced outside of the South, as recounted by Woodward (1974).[4]

Despite several notable judicial victories for the civil rights movement, the practice of seg-

[3]For instance, one local statute may enact segregation in public transportation, while another may be later enacted that covers hospitals. An example cited by Woodward (1974) was a Birmingham law making illegal mixed race games of dominoes or checkers.

[4]At the turn of the 20th century, Northern visitors to the South were often struck by the degree of mixing of races. In the years between the world wars, Ku Klux Klan membership rose dramatically, a phenomenon experienced outside the South to a greater extent. Also, as black residents of the south moved north during the great migration, their destination was often to residentially segregated urban areas in Northern cities.

regation remained entrenched in many areas of the country in the post-World War II years. In 1954, the Supreme Court in Brown v. Board of Education ruled unconstitutional the practice of segregation in public schools, though the practice continued both in education and public accommodation for several more years. The Civil Rights Act of 1964 marked the end of the segregation era.

2.2 Movie theaters

Segregation was still a relevant feature of movie theaters during the time of our data, the early 1950s. Movie theaters for white audiences often either completely barred admission to black customers, or would offer worse seating to only a portion of the screenings. While segregation was often met with resistance from civil rights groups such as the NAACP in some cities, the practice was still common, and often extended to barring entertainment with black performers.[5] Movie theaters specifically targeting African-American audiences were differentiated both vertically and horizontally from theaters for white audiences. African-American theaters were often smaller and lower quality. It was rarer, for instance, for an African-American theater to be air conditioned, and in the early years of cinema it was less likely for an African-American theater to have sound.[6] To some extent African-American theaters were also horizontally differentiated from white theaters. While the majority of films screened by African American theaters were also movies shown in white theaters, African American theaters could target to some extent movies with all-black casts, or movies featuring black protagonists. Prior to the 1950s several independent companies produced "race films" with partially or entirely black casts, and in the 1950s, Hollywood began producing movies with African-American protagonists.

This could be particularly relevant since white theaters in some cases refused to show movies with mixed casts. Similarly, anecdotal evidence indicates that African-American theaters often refused to show movies depicting African-Americans in a negative light.[7] Also, not surprisingly, Africa-American theaters were often located in neighborhoods with greater concentrations of

[5]Even in major cities with significant African-American populations, segregation was practiced by theaters well into the 1950's. For instance, Headley (1999, 2006) documents segregation lasting until at least 1953 in Washington, D.C. and around the same time or later in Baltimore.

[6]Some of the African-American theaters located in the suburbs of DC used to be older reconverted white theaters that projected second-run movies and therefore vertically differentiated with neighboring general theaters. Further evidence of vertical differentiation comes from the construction cost of the theaters. Headley (2006) lists construction costs of theaters in Baltimore. Many were built in teens, twenties, and thirties. The Regent theater was built in 1915 for a cost of $10 thousand, and was remodeled in 1920 for $50 thousand, with an $18 thousand organ added in 1922. The Ritz, originally a white theater that was later converted to an African-American theater, cost between $75 and $100 thousand. Another theater was converted from a store at a cost of $5000.

[7]As an example, The Regent Theater in Baltimore canceled showings of Belle Starr in 1949, and earlier had refused to show the Song of the South. (Headley, 2006)

black residents. Finally, theaters of the era often showed live music or plays, which provided a further source of horizontal differentiation between white and black theaters, and also between African-American theaters.

3 Data

3.1 Movie theater location

We use an original data set comprised of movie theater information from yearly issues of the Movie Yearbook between 1945 and 1955. This Yearbook published annually a *de facto* census of theaters in the US as well as a directory of US theatrical firms with 4 or more theaters. Importantly for our purposes, the Movie Yearbook also contained a listing of all theaters by city and state that were designated for African-American customers.

Because most of the theaters from the data no longer exist, or were located in cities or towns that are no longer independent municipalities, we complemented the data with information from www.cinematreasures.com. The information on this site allowed us to find the approximate location of theaters and check whether changes in theater name that may have occurred during the sample period.

3.2 County characteristics

We combine these data with county-level information from the 1950 and 1960 decennial U.S. censuses. County-level information is used since many theaters are located in smaller towns for which demographic data is unavailable in the census from those years. We utilize demographic information on median age, income, education, and employment information including labor force participation and unemployment. Since theaters located in less densely populated areas are likely to enjoy lower profits per resident due to travel cost, we also utilize information on county area in square miles.

The theater list is at the city level, while the census data is at the county level, which causes a problem for cities that spread over several counties. To overcome this issue, we treat those cities as a unit of observation in our empirical work, and assign demographic data based on a population weighted average of the counties comprising the metro area. This is not an important issue in the structural estimation, since the counties contributing most to identification in the Bresnahan and Reiss framework are smaller markets.

To measure black demographic characteristics, we use the 1% sample from IPUMS to obtain

median years of schooling, median age, labor force participation rate, and portion of black households residing on a farm at the state level. We also wish to measure the access that potential entrants had to capital. To do so, we use the dollar volume held in 1950 in savings and loan association accounts located in the county.

The introduction of television represents competition for movie theaters, and its importance likely differs for theaters catering to black customers. To measure the importance of television, we use county level data on the number of television stations from Gentzkow (2006).

3.3 Discrimination measures

We utilize two measures of the degree of racial bias in the white population. Our first measure comes from the 1972 and 1976 waves of the General Social Survey (GSS), where respondents were asked a series of questions regarding racial attitudes. The survey solicited respondents' views on interracial marriage, segregation along racial lines in schools, and residential segregation.[8] The scale of the potential responses varies across questions. Following Charles and Guryan (2008), we form an index of racial bias at the individual level by averaging the standardized responses to these questions. We then average this index across all individuals in the subregion.

There are two main drawbacks of the data for our purposes. First, the GSS was initiated in 1974, which is well after the last year of our data on African-American theaters. Racial attitudes change over time, and so this will be measured with error. Second, and perhaps more importantly, if attitudes respond endogenously to theaters specifically or other factors correlated with theater entry, this measure will be biased. In an ideal situation we would observe a pre-existing measure of racial bias.

To form such a measure, we utilize data on the number of lynchings by state. These data were collected by the Tuskegee Institute, and document the location of each lynching recorded in press reports and other accounts between 1880 and 1930. These data have been used previously by Fryer and Levitt (2012) to examine whether the Ku Klux Klan engaged in hate crimes. We will use these data as an instrument for the racial bias measures formed from the GSS.

[8]The wording of the questions are as follows: "White people have a right to keep African-Americans out of their neighborhoods if they want to, and (Negroes/Blacks/African-Americans) should respect that right." 1= strongly agree, 2=agree slightly, 3=disagree slightly 4=strongly disagree. "Do you think white students and Black students should go to the same schools or to separate schools?" 1=same 2=separate. 'Do you think there should be laws against marriages between African-Americans and whites?" 1=yes, 2=no.

3.4 Summary statistics

The location of African-American theaters was naturally driven by the spatial distribution of the African-American population. A substantial number of states had no African-American theaters, and many more had only one such theater statewide. These states were not simply parts of the country with a history of integration. Rather, these were exclusively the areas with few African-American residents. Of the nineteen states with the lowest black population share, fourteen had no African-American theaters, while the other five had only one. In total, fifteen states had no African American theaters, with the only one of these states not ranking in the bottom twenty of the black population share being Nevada.

In Table 1 we provide summary statistics of the theater and census data overall and by region. There was approximately one African-American theater for every three counties in 1950, though only 14 percent of counties have an African-American theater. This is because some counties with large concentrations of black population had many theaters. Counties in the South were almost twice as likely as the average county to have an African-American theater. One-quarter of counties in the South have a theater, compared to 5.6 percent of Midwestern counties, 3.9 percent of Northern counties, and 3.8 percent of counties in the West. While Midwestern counties are far less likely to have a theater, the average county in the Midwest has more African-American theaters than the average Southern county. This is due to the concentration of the African-American population in a few large metropolitan areas in the Midwest.

During the early 1950s, the number of movie theaters was shrinking. The average county in the United States had 6.92 white theaters in 1950, and this number had fallen to 5.6 by 1955. (Most counties had at least one movie theater.) In contrast, theaters for blacks were growing modestly during the same time frame.

The black population was growing rapidly during the 1950s. The average county saw a 26.7 percent increase in the African-American population during the decade. This is important if theater owners are forward looking when making entry or exit decisions. Despite the concentration of theaters in the South, the average county in this region experienced slower growth in the black population than the nation as a whole. This reflects the general migration patterns of blacks during this era, who were generally moving out of the South.

The South is notable along several other dimensions. The racial discrimination index is substantially higher in the South as compared to other regions. Blacks in Southern counties were also younger, less educated, and more likely to reside on a farm. This was also true of the broader Southern population, who had incomes substantially lower than the rest of the country.

The average county in the South had a median income approximately 0.5 log points below the average Midwestern and Northern county.

Finally, the growth in importance of television during this era is notable. The average county in 1950 had 0.6 TV stations in 1950, which more than tripled in only six years to 2.03 stations per county in 1956. The rate of growth was a bit slower in the Midwest, only because the TV presence there was already strong – the average Midwestern county had 1.3 stations in 1950 compared to 1.5 in each of the other regions.

4 Reduced Form Results

In this section, we describe the variables that correlate with theater entry at the county level. The structural analysis that follows will identify the channels by which these variables operate, specifically the extent to which the variables are associated with market size, variable profits per person, or fixed costs.

We begin by showing the relationship between theater entry and population, and how that pattern varies across regions and over time. Due to quasi-fixed costs such as projection equipment and building space, theaters likely experienced increasing returns to scale over some range of viewers. The relationship between market size and population is therefore unlikely to be linear. We expect theaters to be unlikely to enter with few residents in the relevant market. Once a sufficient market size is attained, entry is induced, however with further increases in market size the slope of the theater-market size gradient is unclear. Because marginal cost is low, a single movie theater could potentially serve a large share of the market. However, theater differentiation could encourage movie theater entry even with modest increases in market size.

In Figures 1-4, we show the relationship between African-American theaters and black population, and the relationship between general theaters and total population. In Figure 1, we plot the number of theaters against population for each county. In the left panel, we show the pattern for general theaters, while in the right panel we show the pattern specifically for black theaters and black population. We observe two phenomenon for both general and black theaters. First, the relationship between theaters and relevant population is fairly linear for larger markets. Second, for smaller markets the theater-population gradient is much steeper, implying overall a concave relationship between theaters and population.

In Figure 1, we also distinguish by region. African-American theaters occur in each region of the country, though are clearly most prevalent in the South. Thus the phenomenon of the African-American theater was not entirely the result of Jim Crow. While racial attitudes

were more progressive outside of the South, African-American theaters were still an important cultural institution in these areas. The West had very few African-American residents, though its two metropolitan areas with large black populations, San Francisco and Los Angeles, had a quantity of black theaters in line with similarly sized areas in other regions. Even though two of the most populous areas by black population were in the North (New York ranked first in the number of African American theaters), we will document in subsequent empirical work that both the North and the West had fewer theaters per black resident than the South and Midwest.

To examine more carefully the theater-population gradient, we look at areas with fewer residents. In addition to providing more clear graphical evidence, focusing on these areas will provide a sense of the data in the population range that will be more valuable in the structural estimation to follow, which makes most intensive use of variation in ranges of the data with few entrants. In Figure 2, we plot the average number of theaters by relevant population bin for those areas with less than 80 thousand residents. We see that an area supports more general theaters per resident than African-American theaters per black resident. This is potentially due to general theaters serving as a substitute for black theaters.

It is possible that this fact is more pronounced in regions of the country where African-American theaters are less important. In Figure 3, we plot by region the average number of theaters by population bin. Counties located in the South and Midwest have similar numbers of African-American theaters conditional on population, perhaps twice as many as in the West and North. As we would expect, there are few counties in the West with substantial African-American populations, and we do not observe populations above 40 thousand black residents (outside of San Francisco and Los Angeles). A similar story emerges for the North. Even conditional on population, counties in these regions have relatively fewer African-American theaters. It is also instructive to compare the theater-population gradient for African-American theaters with the relationship with general theaters. There are more general theaters per capita than there are African-American theaters per black resident, even in regions where African-American theaters are prevalent. Note that these correlations are unconditional. Southern counties have fewer theaters, perhaps due to being generally poorer. Despite the lower incomes in the South, there are more African-American theaters than one would expect given the population size.

In Figure 5 we show how the number of theaters has changed over time. The average number of general theaters declined during the early 1950s across the population distribution,

with the most notable decline occurring between 1952 and 1954. By contrast, the number of African-American theaters stayed fairly stable, or even increased when black population increased. Several forces could potentially explain these divergent trends. These data coincide with the rise of television, which may be a more important substitute for movies for white audiences. Also, the increased degree of labor force participation during the early fifties may have lead to less free time, while the improving economic conditions of African-Americans may have counteracted prevailing trends of exit by theaters. Lastly, anecdotal evidence suggests that the exit of a general theater sometimes facilitated African-American theater entry, as exiting theaters that before targeted general audiences were often acquired to serve African-American audiences. The exiting of whites from center cities and toward suburbs may have also contributed to the exit of general theaters and indirectly the entry of African-American theaters.

We examine these hypotheses by estimating a cross-sectional regression specifying the reduced form relationship between the number of theaters in a county and a variety of covariates. We estimate the following specification separately for general-audience theaters and African-American theaters.

$$y_i = \alpha + \beta X_i + \epsilon_i \tag{1}$$

where y_i is the number of theaters per 1000 population in county i. We take the relevant population for the theater under consideration, so that general theaters are per 1000 total population while African-American theaters are normalized by the African-American population. We also consider a specification of the change in theaters per 1000 population between 1950 and 1955:

$$\Delta y_i = \alpha + \beta \Delta X_i + \epsilon_i. \tag{2}$$

Since the source for the county population is the decennial census, we linearly interpret the 1955 population from the 1950 and 1960 census years.

The results of estimating equation (1) for African-American theaters is shown in Table 2. In the specification shown in column 1, we include covariates describing the characteristics of the general population in the county, measures of the black population of the state, and the racial discrimination index previously described. African American theaters were less likely to locate in areas of the country with more racial bias. The coefficient on the racial bias index suggests that a one standard deviation increase in racial bias leads to 0.05 fewer theaters per 1000 black residents, a 0.15 standard deviation decrease. This is substantial, even more so when considering that the mean county has only 0.048 theaters per 1000 black residents.

A few other coefficients are worth mentioning. First, higher median county income is associated with more African-American theaters. Second, a more educated population is associated with more African-American theaters per black resident, though the point estimate is not statistically significant. The predicted effects of these variables is not clear. To the extent that population income and the income of blacks are related, this would lead to greater demand for movies. On the other hand, it is possible that greater levels of education are associated with a more tolerant population, which would allow for both integrated theater audiences and thereby reduced need for African American theaters. The other statistically significant estimate in this specification is the coefficient on the South indicator variable. Southern counties have approximately one additional African-American theater for every 4167 black residents. Variables measuring the status of African-American residents of the state are largely insignificant.

As previously discussed, the racial discrimination index is not ideal since its components are measured well after the years spanned by the theater data. We take an instrumental variables approach, using the number of lynchings by state from 1880-1930 as an instrument for the racial discrimination index. This approach will address concerns that racial bias responded endogenously to the location black theaters.[9] The IV estimate of the coefficient on the racial discrimination index is -0.48, more than twice as high as the OLS estimate. If racial attitudes are endogenous to the location of theaters, this result indicates racial attitudes may in fact be softened by the presence of African-American theaters.

The GSS survey only contains information on a respondent's region of residence, which means that there are effectively only nine observations of the racial bias index. An alternative approach to including the index in the regression is simply to examine the theaters by fine region directly. In Figure 6, we provide a scatter plot of average residual theater location within region against the region's racial bias index. The residual theater location is obtained by taking the average residual by finely defined region from estimates of the base specification of African-American theaters per thousand black residents as shown in column (1), without the inclusion of the racial bias index as an independent variable.

The scatter plot indicates that the negative estimated relationship between racial discrimination and theater location is driven entirely by the East South Central region, comprised of Kentucky, Tennessee, Alabama, and Mississippi. These states exhibit strong racial bias, as well as fewer African-American theaters than one would expect given the size of the black population

[9]Lynchings and the racial discrimination index are strongly correlated. The t-statistic on lynchings in the first-stage regression is 16.66. Lynchings are exclusively a Southern phenomenon according to these data. One standard deviation more Southern lynchings is associated with a racial discrimination index that is 0.53 standard deviation higher.

and the socioeconomic characteristics of the county. For the rest of the U.S., there is in fact a modestly positive relationship between racial bias and theater location.[10]

The evidence presented in this figure is consistent with the conflicting effects that segregation has on the entry of businesses catering to black customers. In particular, increased segregation could allow such enterprises to survive, though only to a point. If discrimination is sufficiently strong, its adverse effects on credit access and other inputs to entry tend to dominate.

Some areas of the country may be unlikely to see African-American theater entry regardless of the characteristics of residents or their viewpoints. For instance, the effectiveness of state legislation banning segregation in public accommodation is unmeasured. The specification shown in column 3 of Table 2 restricts the sample to those states where at least one African-American theater has entered. The results are qualitatively similar to the specification without this sample restriction. The number of African-American theaters per thousand black residents is positively correlated with the education level of a county, and negatively related to county age. Another measure of the economic well-being of the county, the labor force participation rate, is positively related to the number of theaters. The coefficients on the median education and age of the state's black population is actually negative. Finally, a more agrarian black population, as measured by the portion of black households living on a farm, is negatively associated with the number of theaters per resident.

In column 4, we show a specification including more detailed region effects. Doing so precludes identification of the racial bias index, which only varies at the sub-region level. Adding these controls has little effect on the sign or magnitude of the other estimated coefficients.

Theaters for white audiences may represent a substitute for black movie customers, and African-American theaters may face a more difficult time entering areas of the country with more white theaters. This is a key element of the story that segregation shields from competition minority-owned enterprises or those businesses catering to African-American customers. In column 5, we show estimates of a specification that includes the number of white theaters in operation in the county. We find that a greater number of white theaters is not associated with fewer African-American theaters. The coefficient is in fact positive, though statistically insignificant. This may indicate that counties with many white theaters have other factors making entry easier, such as lower fixed cost or unobserved taste for movies. Moreover, the presence of white theaters may directly influence the entry of African-American theaters, which would sometimes occupy formerly white theaters.

[10]The specification from which the residuals are obtained does include the coarse region controls – dummy variables for South, West, and Midwest. The pattern in the figure is qualitatively the same if these regions are excluded.

In this specification we also control for the number of television stations, which also represents competition for African-American theaters. The number of theaters is uncorrelated with television station availability in the county. This suggests either that television is either not a substitute for the experience of African-American theaters, or that television ownership was not yet prevalent in the African-American community.

While our primary specification fails to find an impact of the presence of white theaters on African-American theater location, the degree to which the presence of white theaters facilitates entry or alternatively represents competition could depend on the characteristics of the county. In particular, counties with more tolerant population within a state could lead to greater African-American acceptance in theaters. In the specification shown in column 6, we interact the number of white theaters with the county's median education level, and we indeed find a negative coefficient on the interaction term. The direct effect of white theaters is significantly positive, and the sign of the effect of white theaters turns negative when the county median education level exceeds 10.29 years. This level of schooling is a little more than one standard deviation above the average county. This result suggests that white theaters may represent competition for African-American theaters in counties with high levels of education.

The other interaction term we consider is between education and the South region dummy variable. We find that education of the general population has a stronger positive effect in the South than in other regions.

We further investigate the role of white theaters in Table 3. Here we use temporal variation to tease out the two conflicting hypotheses of how white theaters affect the location of African-American theaters. We hypothesize that contemporaneous white theaters represent competition for African-American theaters, while conditional on the current number of white theaters, more lagged white theaters indicate opportunities for conversion into African-American theaters, thereby reducing fixed costs of entry.

In the first column of Table 3, we present the results of regressing the number of African-American theaters in 1955 on the number of white theaters in the county in 1950 and 1955. Consistent with our hypothesis, we find that African-American theater location is positively correlated with the number of white theaters in 1950, though negatively correlated with the number of white theaters located in the county 1955.

A surprising result is that this effect is concentrated in Southern counties. In columns 2 and 3, we display estimates separately for Southern counties and counties outside of the South. Taking the U.S. as a whole, each 1955 white theater is associated with 0.012 fewer African-American

theaters per thousand black population in a county in 1955, and each 1950 white theater 0.017 more African-American theaters. The effects of both 1955 and 1950 white theaters are much larger in the South as in the rest of the country. As a robustness check, we also run similar specifications with 1950 African-American theaters as the dependent variable. We see that the coefficients are much smaller. One exception is the coefficient on 1950 white theaters in the South, which is positive and statistically significant. We suspect that this could indicate a common shock in taste for movies that affected all theaters, although this may only account for a small portion of the positive correlation between African-American and white theaters.

In Table 4, we estimate a set of specifications that describe the relationship between county covariates and the location of white theaters. One purpose of this estimation is to compare the estimated coefficients with those for black theaters. The racial discrimination index is conceivably correlated with unobserved variables such as social capital that suppresses the entry of both white *and* black theaters and is not due to the adverse effects of racial bias on black theater entry. We find that the coefficient on the racial discrimination index in the white theater regression is statistically insignificant across all specifications. While the point estimates are of a similar magnitude as in the specification for African-American theaters, the coefficients are much smaller compared to the mean of the left-hand-side variable. The lack of a correlation between discrimination and white theater location suggests that racial bias has ramifications primarily for African-American theaters.

In contrast to the results on African-American theaters, higher income and greater growth in market size do not translate into more white theaters. The coefficient on the growth in market size, as measured by the change in the size of the total population, is negative and statistically significant. One possible explanation is due to the characteristics of growing areas. Growing areas have more TV stations, are more educated, have higher labor force participation, are more densely populated, and tend to be located in the West and North. Growing areas also tend to have larger African-American populations than shrinking regions. The negative coefficient on population growth, however, remains once these variables are accounted for. One potential explanation for this finding is that in our data larger theaters enter counties of high population growth, but we cannot directly address this because we do not observe theater capacity for all theaters.

The effect of TV stations is also different for white and African-American theaters. While we see that more TV stations in a county in 1956 is significantly negatively related to the number of white theaters, the number of TV stations is uncorrelated with the number of African-American

theaters.

Another notable result is the effect of the size of the black population on the number of white theaters. We see a statistically significant negative relationship between these two variables. This may reflect unobserved socioeconomic status of counties with large African-American populations.

5 Empirical Model of Entry

To quantify the impact of segregation and discrimination on firm entry, we employ the entry model of a static game with complete information by Bresnahan and Reiss (1990, 1991a,b) (BR hereafter). BR show that the combination of observed market structure and a reduced-form profit function with an entry game is informative about firms' profitability.[11] As in BR, we model the US movie theater industry in the 1950s as a homogeneous-goods industry with identical potential entrants.[12] Suppose we observe a discrete number of firms, N, in a given market, m. We introduce a parameterized profit function for a firm in market m as

$$\Pi_{N,m} = V_N(\mathbf{X}_m; \alpha, \beta) S(\mathbf{Y}_m; \lambda) - F_N(\mathbf{W}_m; \gamma) + \epsilon_m,$$

where V_N is the variable profits per consumer in the market, S is the market size function capturing the number of customers in the market, and F_N is the entrant's fixed costs of entry. The first term, $V_N * S$, represents the total variable profits for a firm. The parameters α, β, λ, and γ are to be estimated, and $\mathbf{X}_m, \mathbf{Y}_m$, and $\mathbf{W}_m$ are the market-level demand shifters, market-size shifters, and cost shifters. The term ϵ_m is a zero-mean iid normally distributed error term assumed to capture the factors that affect the profits and are unobserved by the econometrician. Because the variance of the error term is not separately identified from the scale of the parameters, we normalize the variance to one.

We model the market size function $S(\mathbf{Y}_m; \lambda)$ as

$$S(\mathbf{Y}_m; \lambda) = black\_pop_m + \lambda_1 black\_pop\_growth_m + \lambda_2 white\_pop_m + \lambda_3 SEA\_black\_pop_m.$$

To normalize the market size in units of current town population, we set the coefficient of

[11] Because some markets may be off equilibrium, in this paper we ask what we are able to learn from the data by assuming an observed number of firms in a market as an equilibrium outcome.

[12] The entry literature has extended this baseline BR framework in several dimensions. Berry (1992) introduces firm heterogeneity and Mazzeo (2002) and Seim (2006) do so with product differentiation.We choose the original BR methodology because we lack sufficient theater-level information to incorporate the firm-specific characteristics that affect profitability of firms.

black_pop to one and let V_N contain a constant term, which is α_1 in the following Eq.(3). *Black_pop_growth* stands for growth of black population of the county, *white_pop* is the white population in the country and *SEA_black_pop* is the black population in the rest of the county's State Economic Area (SEA).

The variable profits per consumer in the market, $V_N(\mathbf{X}_m; \alpha, \beta)$, is given as

$$V_N = \alpha_1 + \mathbf{X}_m\beta - \sum_{n=2}^{N} \alpha_n, \tag{3}$$

where $\alpha_1 + \mathbf{X}_m\beta$ stands for monopolist profits and α_n is the degree to which variable profits decrease with the number of entrants. The $\mathbf{X}_m$ is a vector of variables that affect profits per customer. We include the racial discrimination index of the region, county median education, county median age, the number of general theaters per 1000 inhabitants, the log of the county area, number of TV stations in the county, and coarse region dummies. We also include the black labor force participation rate, black median education, and black median age, measured at the state level. Finally, we model the fixed costs $F_N(\mathbf{W}_m; \gamma)$ as

$$F_N = \gamma_1 + \mathbf{W}_{L,m}\gamma_L + \sum_{n=2}^{N} \gamma_n, \tag{4}$$

where γ_n is the degree to which fixed costs increase with the number of firms in the market. The demographic variables that exogenously affect costs, $\mathbf{W}_m$, consist of two groups of variables. The first group of variables is composed of the racial discrimination index, the number of general theaters per 1000 inhabitants and the Savings and Loan (S&L) capital per person in the county. These variables are supposed to measure differences across counties in the cost of capital. The second of set variables are proxies for differences in land prices across counties and these are the log of the county area and regional dummies.

The BR model relies on an equilibrium condition: if we observe N theaters in market m, it must be that in equilibrium $\Pi_N \geq 0$ and $\Pi_{N+1} < 0$ for market m. For instance, the probability of observing markets with no firms equals

$$\Pr(\Pi_1 < 0) = 1 - \Phi(\overline{\Pi}_1),$$

where $\Phi(.)$ is the cumulative normal distribution function and $\Pi_1 = \overline{\Pi}_1 + \epsilon_m$.[13] Assuming average profits decrease with firm entry in equilibrium ($\overline{\Pi}_1 \geq \overline{\Pi}_2 \geq \overline{\Pi}_3 \geq ...$), the probability of

[13] We estimate the profits of markets with three or more stations in a market by setting $\Pr(\Pi_3 \geq 0) = \Phi(\overline{\Pi}_3)$.

observing N in equilibrium is

$$\Pr(\Pi_N \geq 0 \text{ and } \Pi_{N+1} < 0) = \Phi(\overline{\Pi}_N) - \Phi(\overline{\Pi}_{N+1}).$$

By assuming ϵ_m is an iid draw across markets, an ordered probit yields the model parameter estimates.[14]

BR defines the "entry threshold," the minimum market size required to support the exact N firms, as

$$S_N = \frac{F_N}{V_N},$$

which we obtain by equating Π_N to zero and solving for S. Essentially, this ratio establishes that the market size (number of consumers) necessary to meet the break-even point at which N firms are present in the market is directly proportional to the size of the fixed cost and inversely proportional to the magnitude of the variable profit per consumer. S_N can increase for a given number of stations either due to a fall in variable profits per customer (V_N) or an increase in the fixed costs (F_N). We estimate the population entry thresholds by

$$\hat{S}_N = \frac{\hat{F}_N}{\hat{V}_N} = \frac{\widehat{\gamma}_1 + \overline{W}\widehat{\gamma_L} + \sum_{n=2}^{N} \widehat{\gamma}_n}{\widehat{\alpha}_1 + \overline{X}\widehat{\beta} - \sum_{n=2}^{N} \widehat{\alpha}_n},$$

where the bar over each variable stands for the sample mean of the variable. The estimated per-station entry thresholds are $\hat{s}_N = \hat{S}_N/N$.

The separate identification of fixed costs from variable profits is based on two strong assumptions. First, we assume the $\mathbf{X}_m$ variables we choose only impact variable profits but not fixed costs, whereas the $\mathbf{W}_m$ variables affect only fixed costs. In reality, however, some variables may affect both, and in our specifications several variables are common to both $\mathbf{X}_m$ and $\mathbf{W}_m$.

The second assumption is the functional form of the profit function: the determinants of variable-profits enter the profit function as an interaction with the market size, whereas the fixed-costs determinants $\mathbf{W}_m$ enter the profit function in such a way that those determinants will impact the fixed costs regardless of the population in the market. Although we believe the functional form represents a good approximation of the profit function, this form is to some extent an arbitrary one, and we cannot rule out the possibility that the model is misspecified.

[14] We assume each market is isolated both in demand and costs so we can treat each observation as an equilibrium outcome from the game. This approximation may not be appropriate in some local markets. Given the nature of the contents and movies by African-American theaters, however, we believe the market overlap is not likely to be an issue for the data.

5.1 Results

Table 6 shows the structural parameters that correspond to the profit model above using data only from counties located in the South, West and Midwest.[15] This table contains two columns, one column for 1950 data and another column for 1955 data. We exclude the α_4 from both specifications because there are not that many counties in the data with four or more African American theater and therefore we choose to focus on the entry of the first, second, and third or more African-American theaters at the county level. Even though there are variables that clearly only affect variables profits or costs, we include all demographic variables that may affect both sides in both the variable profits and the costs function.

The estimated competitive effects, α_1 and α_3 in Table 6, imply an entry of an additional firm will reduce the per-firm variable profits. The parameters show that there is no statistical difference between first and second entrants (perhaps due to differentiation) but further entrants (third and so on) lower variable profits. This pattern suggests that variable profits becomes smaller with N as we would expect. Similarly, all the additional entry effects on the fixed costs, $\gamma_1 - \gamma_3$ are positive, implying later entrants face higher fixed costs of entry.

Other results show that larger increases in county black population between 1950 and 1960, more black population at the SEA level, and larger white population are associated increase the market size relevant for African-American theaters, thereby encouraging entry. Variables profits are positively associated with median age in the county, the number of white theaters per 1000 inhabitants and the median black age in the county, and are negatively associated with median black education at the county level and the number of TV stations in 1954. Theaters in counties located in the Midwest and the South do not seem to have significantly different variable profits on average from theaters located in the West.

Racial discrimination apparently discourages entry by raising fixed costs, while having only a modest positive and statistically insignificant impact on variable profits. The fact that African-American theaters are more likely to enter Southern counties despite the degree of racial bias in this region is due to lower fixed costs. The South indicator in the fixed cost equation is negative and statistically significant.

Access to financial capital is estimated to lower the cost of entry. Other variables in this equation do not have a statistically significant impact on fixed cost, though the sign of the

[15] Northern counties were dropped from the structural estimation because few counties have more than one theater. This makes identifying 2 and 3 theater entry thresholds difficult. Only five Northern counties have one theater and only five have more than one theater (with numbers 2, 9, 10, 20 and 53 respectively). 169 out of a total of 179 counties in the North did not have any African-American theaters.

estimated coefficients is in the direction we would expect. Lagged white theaters lower entry cost, and fixed costs are lower in larger counties. We take the latter measure to be indicative of lower population density, conditional on market size.

5.2 Entry thresholds

With the estimated structural parameters, we can construct an entry threshold $S_N = \frac{F_N}{V_N}$ for each number of theaters in a market from estimates of fixed costs and variable profits. We estimate values for average variable profits and fixed costs for every year in our sample (1950 and 1955) and for counties with one, two, and three or more theaters.

Table 7 displays these estimated entry thresholds S_N which represents the absolute size of population needed to support a given number of African-American theaters N. We find that the entry thresholds increase with the number of theaters. The population thresholds reported in Table 7 suggest that triopoly theaters need between 33,000 and 38,000 people in a county located in the Midwest and West in both 1950 and 1955, whereas those theaters need only 23,000 people if located in a county in the South for both 1950 and 1955. This pattern shows that Southern counties required a smaller market size to support a given number of theaters. This is due to the lower fixed costs in this region.

Similarly, we can also look at the per-firm entry threshold, which is obtained by dividing the market size thresholds, S_N, by the number of firms: $s_N = S_N/N$. Depending on the nature of competition and the extent of differentiation of movie theaters, the estimated per-firm thresholds can either increase or decrease in the number of theaters. The last three columns of Table 7 shows a distinctive pattern. The number of consumers per firm increases with entry as we would expect in the South, going from 6,400 and 5,800 in a monopoly to 7,700 and 7,900 in a triopoly in 1950 and 1955, respectively. However, this pattern reverses in the Midwest and West counties in our data as the number of consumers decreases with entry for both years 1950 and 1955. In both regions the numbers are close to 19,000 for a monopoly and 11,000 for a triopoly.

The fact that the per firm entry threshold declines with the number of entrants in the Midwest and West is surprising, as is the fact that this pattern is reversed in Southern counties. For an homogenous good, one would expect that per firm thresholds would rise due to competitive effects placing a downward pressure on price. A possible explanation for our findings is one where segregation and discrimination in the South was such that the white and African-American movie viewers were truly segmented and therefore entry in those markets was homogenous in that theaters competed for all their potential customers in their respective markets. However,

counties located in the Midwest and the West were not as segregated as those in the South and theater entry was not homogenous as theaters tried to horizontally differentiate from each other by specializing in certain movie genres or serving very small, concentrated African-American communities.

In summary, our findings seem to indicate that the market segmentation that comes together with segregation induces more homogenous entry with head-to-head competition than in alternative cases where segregation and discrimination is less acute. When segregation is less important and African-American theater entrants compete with general theaters (that accept all audiences), entrants choose to specialize and differentiate geographically or in the product space from others needing a lower number of consumers to survive and achieve non-negative profits.

6 Conclusion

In this paper we study segregated movie theaters in the early 1950s, presenting facts about theater location. Little systematic empirical evidence exists regarding this important historical institution. To the extent that segregation in movie theaters is representative, we can draw broader conclusions regarding the impacts of segregation on African-American life in the post-war era. Segregation in public accommodation has important effects on African-American well-being, employment, and business ownership. Southern counties have more African-American theaters than one would expect given the size and socio-economic status of the black population. A possible conclusion is that segregation has a positive effect on theater entry. However, our findings also indicate that the discrimination underlying segregation had negative effects on movie theater entry, despite the possibility that it may shield African-American theaters from competition. Furthermore, we estimate that Southern counties have lower fixed costs of entry for theaters rather than receiving greater profits per potential customer, suggesting that segregation is not playing a positive role in African-American theater entry. We conclude that segregation on the whole reduces consumption opportunities for African-American movie-goers, and does not encourage entrepreneurship among potential African-American theater owners.

7 References

Berry, S. T. (1992) "Estimation of a Model of Entry in the Airline Industry," *Econometrica*, Vol. 60, No. 4, pp. 889-917.

Borjas, George J. (1995) "Ethnicity, Neighborhoods, and Human Capital Externalities," *American Economic Review* 85:3, p. 365-390.

Boustan, Leah Platt. (2010) "Was Postwar Suburbanization "White Flight"? Evidence from the Black Migration," *The Quarterly Journal of Economics* 125:1, p. 417-443.

Bresnahan, Timothy F. and Peter C. Reiss. (1988) "Do Entry Conditions Vary across Markets?" *Brookings Papers Economic Activity* 3, p. 833-882.

———- (1990) "Entry in Monopoly Markets," *Review of Economic Studies* 57, p. 531-553.

———- (1991) "Entry and Competition in Concentrated Markets," *Journal of Political Economy* 99:5, p. 977-1009.

Charles, Kerwin Kofi and Jonathan Guryan. (2008) "Prejudice and Wages: An Empirical Assessment of Becker's *The Economics of Discrimination*, *Journal of Political Economy* 116:5, p. 773-809.

Collins, William J. and Robert A. Margo. (2000) "Residential Segregation and Socioeconomic Outcomes: When did Ghettos Go Bad?" *Economic Letters* 69:2, p. 239-43.

Cutler, David M. and Edward L. Glaeser. (1997) "Are Ghettos Good or Bad?" *The Quarterly Journal of Economics* 112:3, p. 827-872.

Cutler, David M., Edward L. Glaeser, and Jacob L. Vigdor. (2008) "When are ghettos bad? Lessons from immigrant segregation in the United States," *Journal of Urban Economics* 63:3, p. 759-774.

Fischer, Mary J. and Douglas S. Massey. (2000) "Residential Segregation and Ethnic Enterprise in U.S. Metropolitan Areas," *Social Problems* 47:3, p. 408-424.

Fryer, Roland and Steven Levitt. (2012) "Hatred and Profits: Under the Hood of the Ku Klux Klan," *The Quarterly Journal of Economics* 127:4, p. 1883-1925.

Gentzkow, Matthew. (2006) "Television and Voter Turnout," *The Quarterly Journal of Economics* 121:3, p. 931-972.

Gil, Ricard. (2014) "Does Vertical Integration Decrease Prices? Evidence from the Paramount Antitrust Case of 1948," forthcoming *American Economic Journal: Economic Policy*.

Glazer, Nathan and Daniel Moynihan. Beyond the Melting Pot (Cambridge, MA: MIT Press, 1963).

Graddy, Kathryn. (1995) "Testing for Imperfect Competition at the Fulton Fish Market," *The Rand Journal of Economics*, 26, 75-92.

Headley, Robert K. (1999) *Motion Picture History in Washington, DC: An Illustrated History of Parlors, Palaces and Multiplexes in the Metropolitan Area, 1894-1997*, McFarland &

Company, Inc., Publishers.

Headley, Robert K. (2006) *Motion Picture History in Baltimore: An Illustrated History and Directory of Theaters, 1895-2004*, McFarland & Company, Inc., Publishers.

Holzer, Harry and Keith Ihlandfeldt. (1998) "Customer discrimination and employment outcomes for minority workers," *Quarterly Journal of Economics* 113, p. 835-867.

Kain, John F. (1968) "Housing Segregation, Negro Employment, and Metropolitan Decentralization." Quarterlv Journal of Economics 82:2, p. 175-97.

Li, Huailu. (2014) "Does Competition Eliminate Discrimination? Evidence from the Commercial Sex Market in Singapore," manuscript.

Mazzeo, Michael J. (2002) "Product Choice and Oligopoly Market Structure," *RAND Journal of Economics*, Vol. 33, No. 2, pp. 221–242.

Seim, Katja. (2006) "An Empirical Model of Firm Entry with Endogenous Product-type Choices," *RAND Journal of Economics*, Vol. 37, No. 3, pp. 619-640.

Waldfogel, Joel. (2003) "Preference Externalities: An Empirical Study Of Who Benefits Whom In Differentiated-Product Markets," *Rand Journal of Economics* 34:3, p. 557-568.

Woodward, C. Vann. (1974) *The Strange Career of Jim Crow*, New York: Oxford University Press.

Figure 1: Theaters by population, 1950

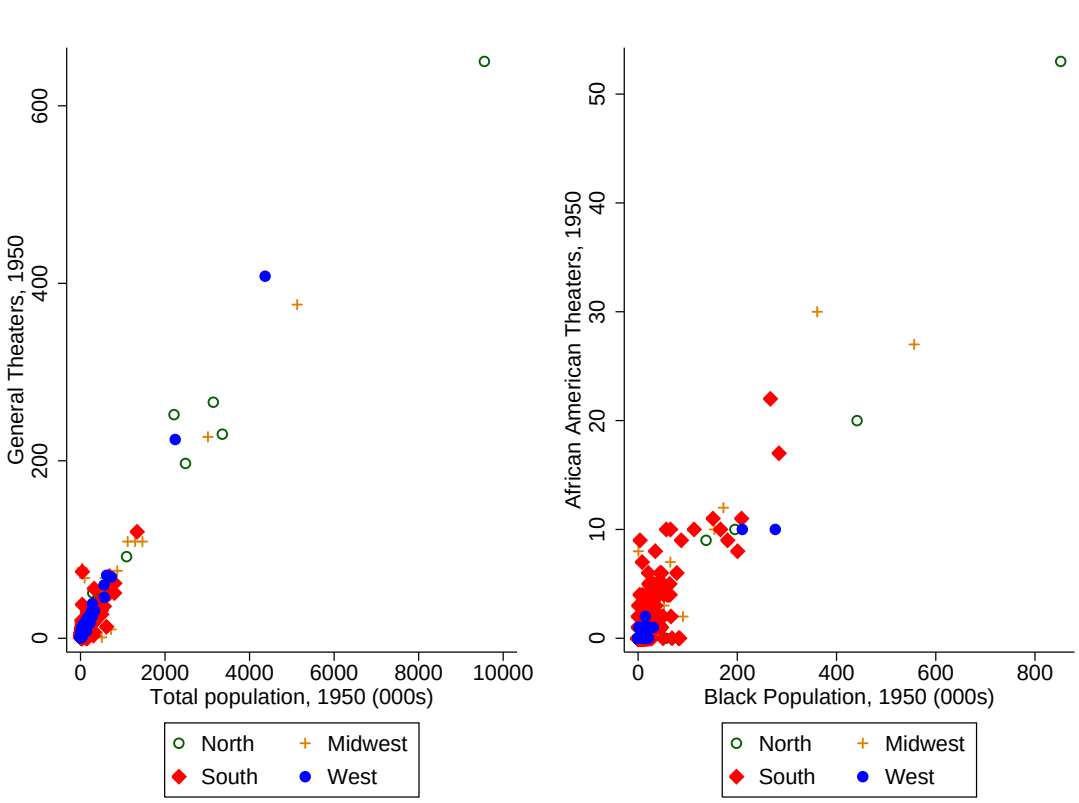

Figure 2: Theaters by population, 1950

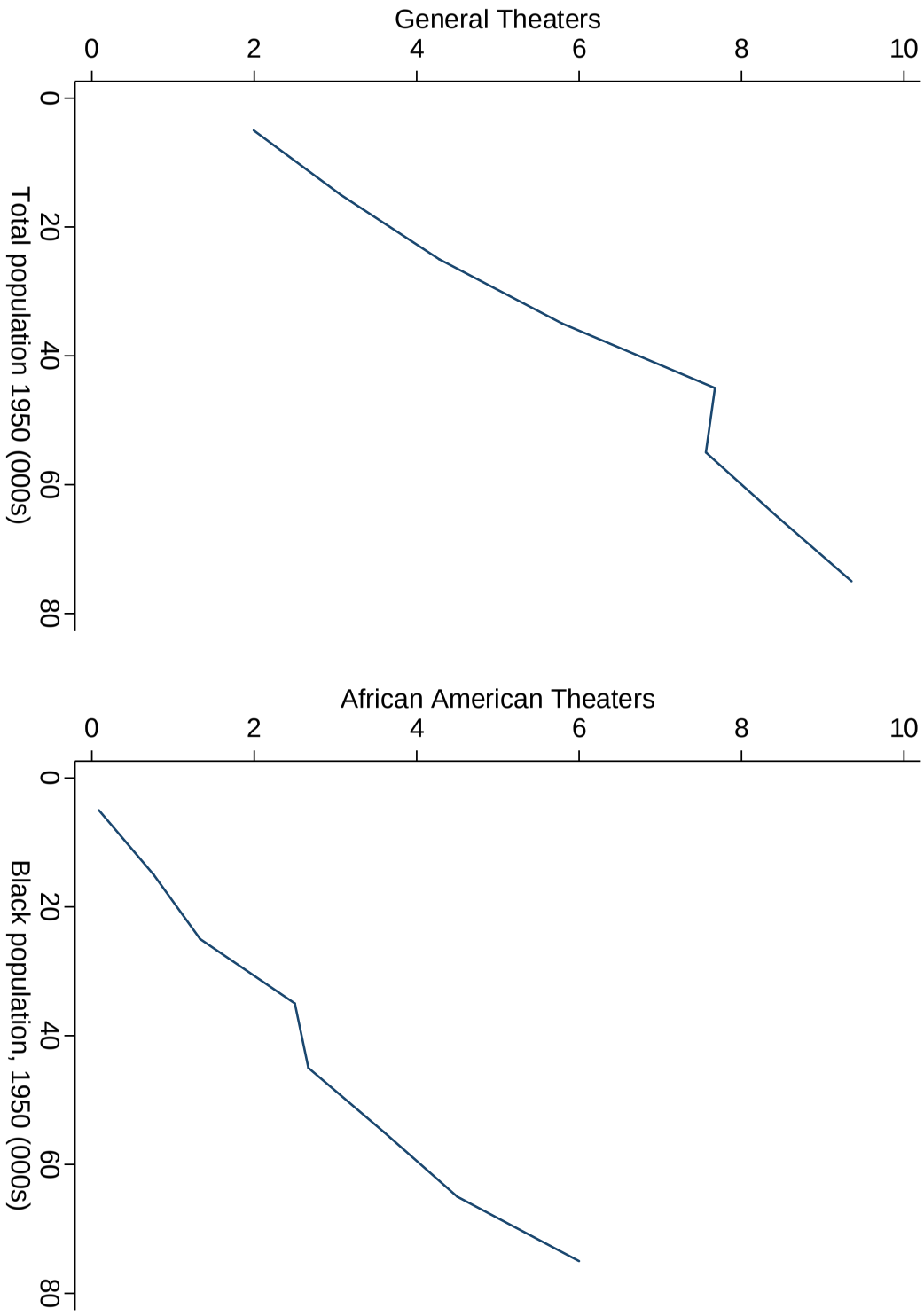

Figure 3: Theaters by population and region, 1950

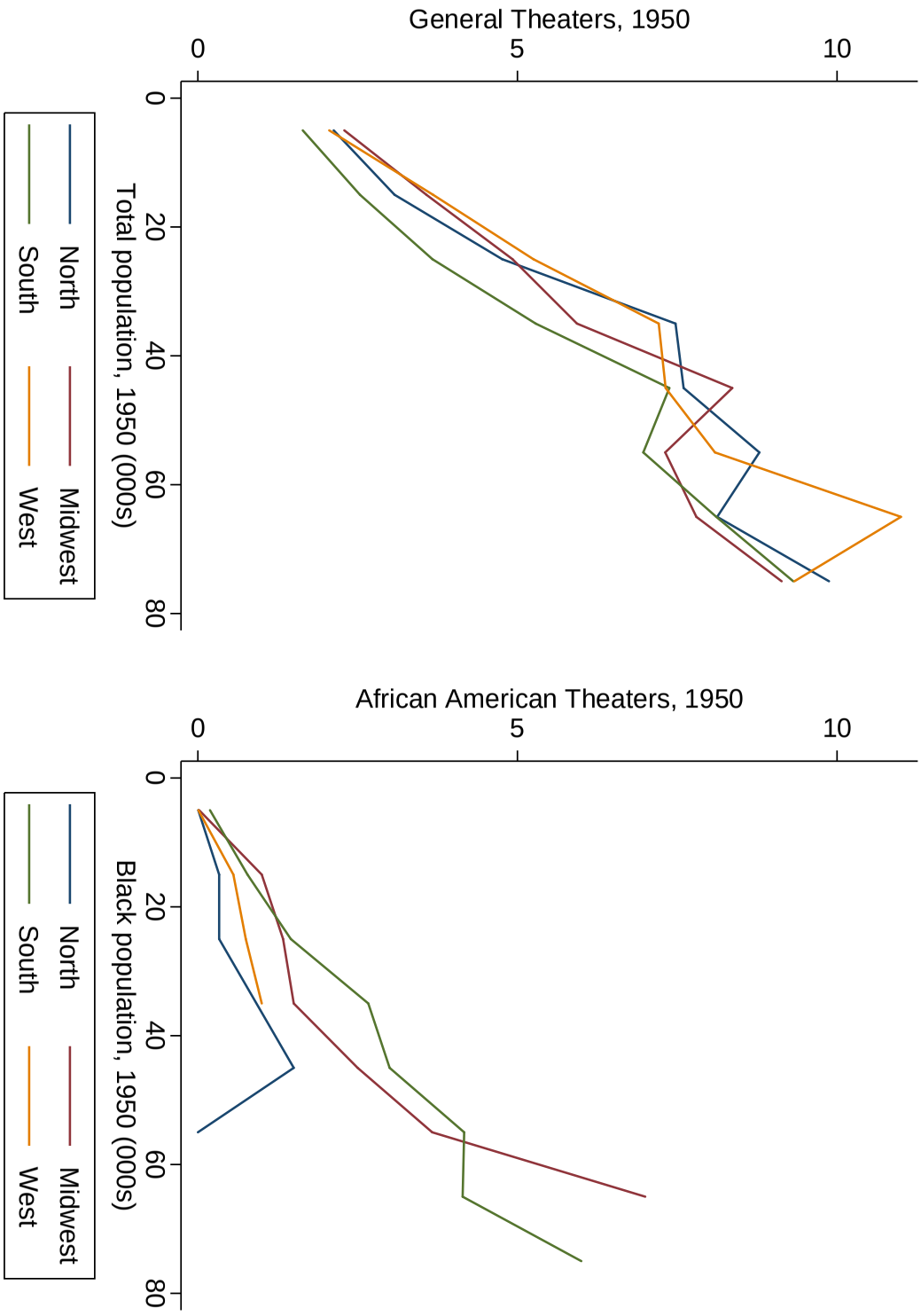

Figure 4: Theaters by population and year

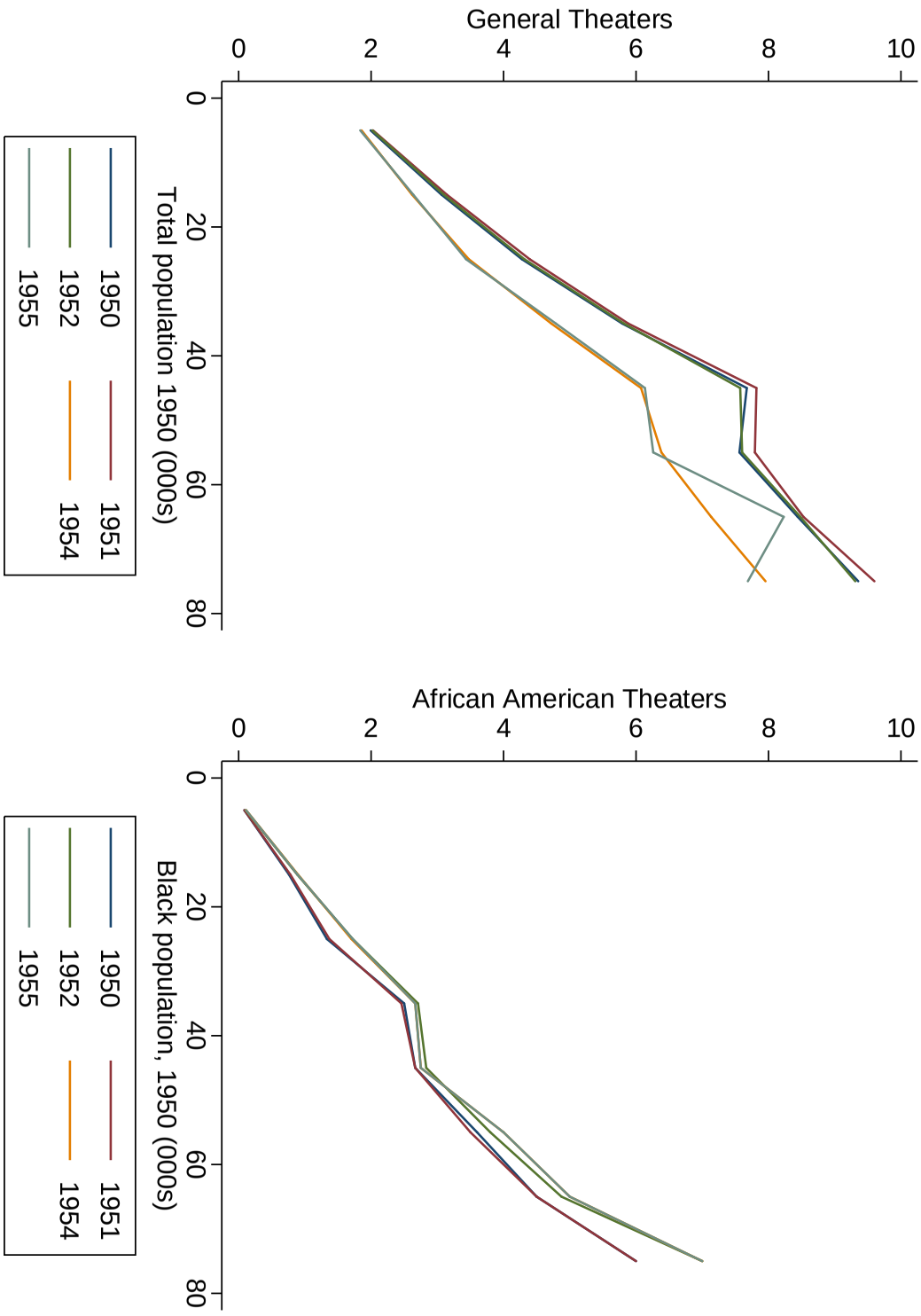

Figure 5: Theaters by population, 1950-55 change

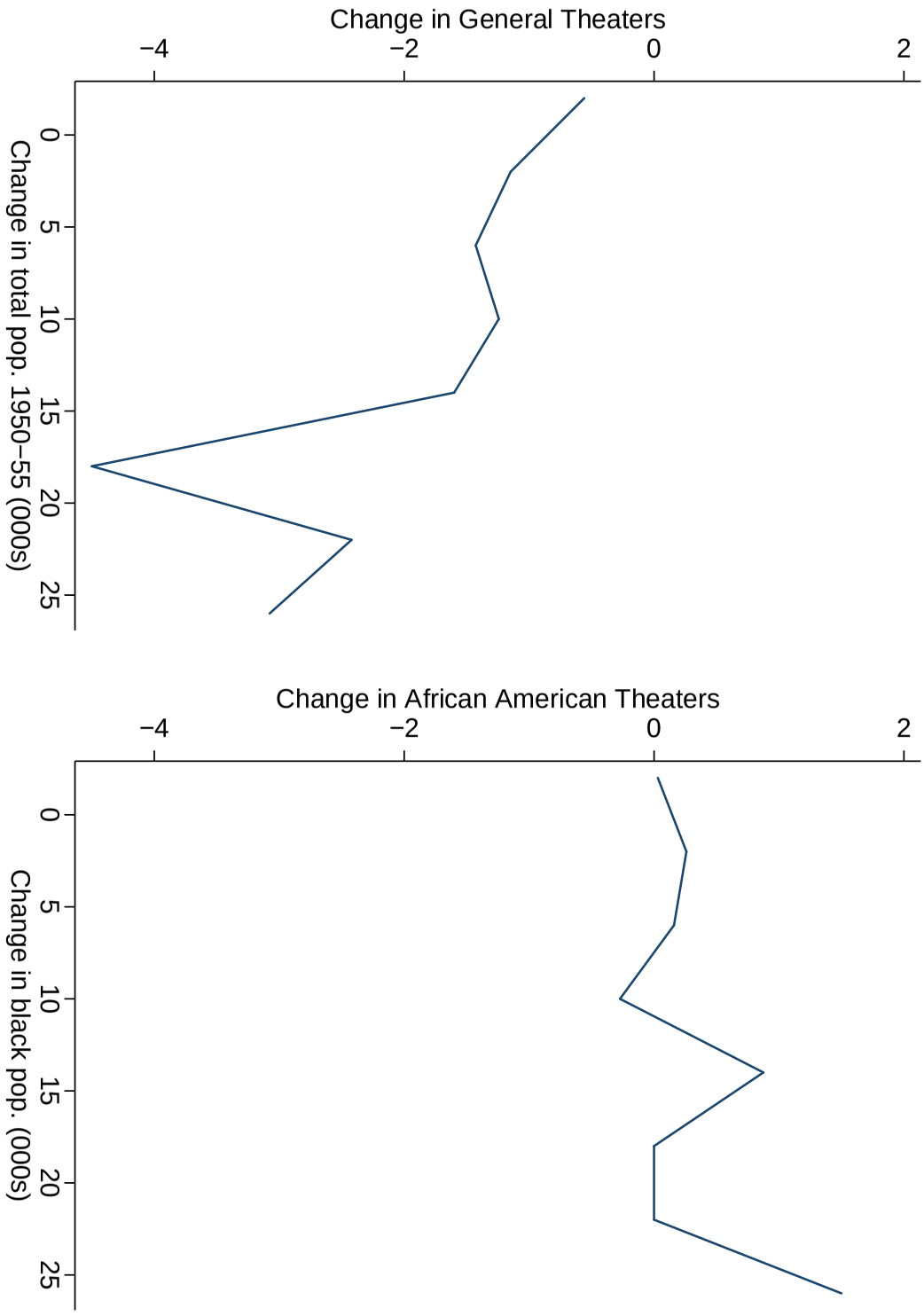

Figure 6: Residual African-American Theaters and Racial Bias by Region

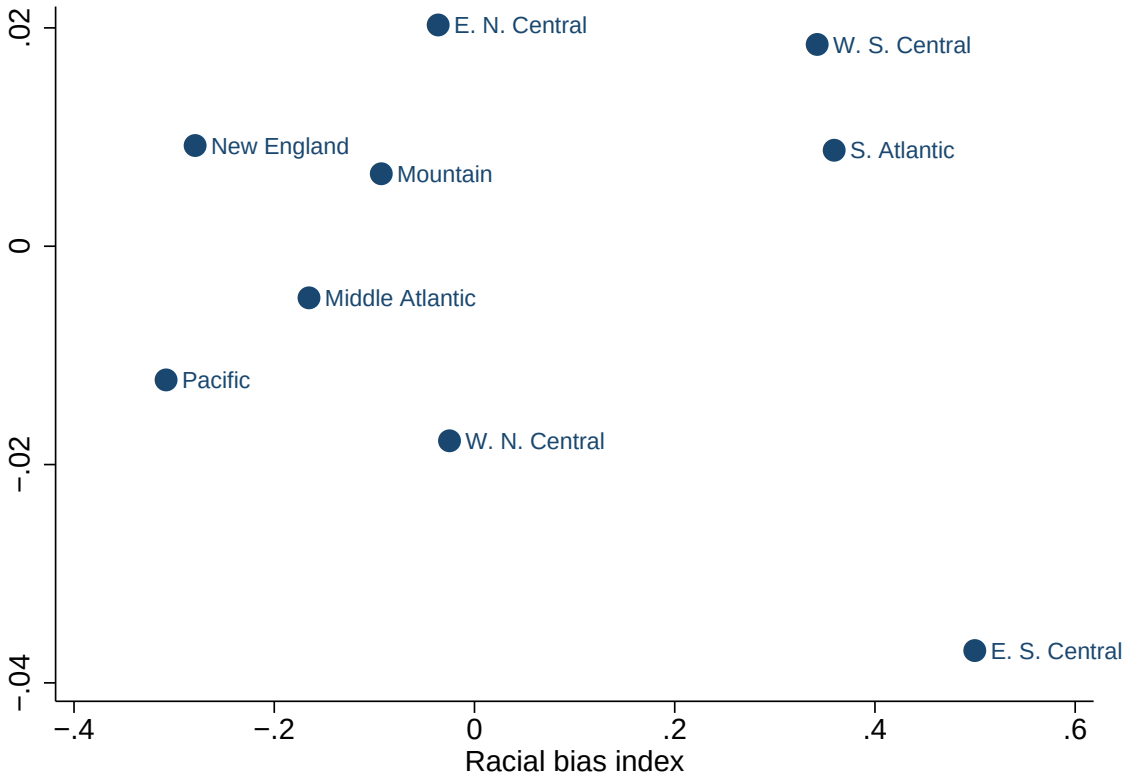

Table 1: Summary statistics by region

	Midwest	North	South	West	Total
African-American Theaters, 1950	0.56	0.17	0.52	0.093	0.36
	(4.36)	(1.61)	(1.46)	(0.78)	(1.81)
African-American Theaters, 1955	0.54	0.18	0.61	0.096	0.40
	(4.02)	(1.61)	(1.62)	(0.82)	(1.83)
Has African-American Theater, 1950	0.056	0.039	0.26	0.038	0.14
	(0.23)	(0.19)	(0.44)	(0.19)	(0.35)
White Theaters, 1950	21.7	6.78	4.68	7.69	6.92
	(59.6)	(17.9)	(6.87)	(25.9)	(21.8)
White Theaters, 1955	16.4	5.34	4.00	6.48	5.61
	(44.6)	(12.4)	(5.87)	(18.6)	(16.0)
Total population, 1950 (000s)	222.7	52.4	36.8	56.2	57.1
	(828.0)	(233.3)	(76.3)	(273.4)	(281.2)
Black population, 1950 (000s)	11.8	2.93	8.12	2.86	6.05
	(74.0)	(25.5)	(18.9)	(19.0)	(28.4)
% change black pop 1950-1960	51.4	54.2	10.7	76.3	26.7
	(23.4)	(72.8)	(27.0)	(42.7)	(44.3)
Racial discrimination index	-0.20	-0.030	0.39	-0.17	0.14
	(0.054)	(0.0056)	(0.066)	(0.10)	(0.25)
Median age, blacks	30.4	30.6	24.7	30.6	27.7
	(10.3)	(8.90)	(2.40)	(6.47)	(7.00)
Median education, blacks	7.96	7.92	5.81	7.79	6.88
	(0.92)	(0.39)	(1.01)	(2.09)	(1.51)
Portion of HH on farm, blacks	0.087	0.029	0.27	0.023	0.15
	(0.26)	(0.043)	(0.14)	(0.034)	(0.17)
Log median income	7.94	7.83	7.41	7.97	7.66
	(0.16)	(0.25)	(0.39)	(0.22)	(0.40)
Median age, all	31.5	30.9	26.3	28.4	28.4
	(2.40)	(2.95)	(3.41)	(3.78)	(3.91)
Median education, all	9.56	9.25	7.94	10.1	8.75
	(1.06)	(0.82)	(1.20)	(1.19)	(1.36)
Labor force participation rate	0.38	0.37	0.34	0.37	0.36
	(0.034)	(0.030)	(0.041)	(0.040)	(0.040)
Unemployment rate	0.058	0.034	0.030	0.057	0.037
	(0.021)	(0.043)	(0.15)	(0.027)	(0.11)
Population density	0.50	0.096	0.15	0.056	0.14
	(2.91)	(0.44)	(0.75)	(0.43)	(0.97)
TV stations, 1950	1.32	0.55	0.55	0.51	0.60
	(1.72)	(0.92)	(0.97)	(1.13)	(1.07)
TV stations, 1956	2.72	1.94	1.92	2.26	2.03
	(1.78)	(1.10)	(1.22)	(1.46)	(1.29)

A unit of observation is a county unless it is part of a city that spans multiple counties. In this case the MSA is the unit of observation. Area characteristics are from 1950 unless otherwise noted. The index of racial discrimination is the mean of the within-region average standardized responses from racial attitude questions in the 1972 and 1976 General Social Surveys related to interracial marriage, schooling segregation, and residential segregation index. The average percent change in the black population was calculated weighting by the size of the 1950 black population.

Table 2: Area characteristics and the location of African-American theaters

	(1) OLS All	(2) IV All	(3) OLS > 0 theater	(4) OLS All	(5) OLS All	(6) OLS All
Index of racial discrimination	-0.20	-0.48*	-0.26*			
	(0.12)	(0.22)	(0.12)			
Log median income	0.060**	0.040	0.055	0.044*	0.042	0.012
	(0.024)	(0.034)	(0.038)	(0.023)	(0.023)	(0.019)
Median age	-0.0014	-0.0025	-0.0023	-0.0012	-0.00081	-0.0027*
	(0.0012)	(0.0019)	(0.0014)	(0.0011)	(0.0010)	(0.0012)
Median education	0.0085	0.011	0.015	0.011	0.011	0.0080*
	(0.011)	(0.012)	(0.015)	(0.010)	(0.010)	(0.0042)
Labor force participation rate	-0.035	-0.0079	0.033	0.0098	-0.025	0.074
	(0.15)	(0.16)	(0.14)	(0.14)	(0.16)	(0.13)
Unemployment rate	0.016	0.011	0.012	0.013	0.0095*	0.0095
	(0.0097)	(0.0070)	(0.0085)	(0.0073)	(0.0047)	(0.0061)
Population density (000s per sq mi)	-0.00093	-0.00039	-0.0019	-0.0010	-0.031	-0.036*
	(0.0030)	(0.0030)	(0.0034)	(0.0029)	(0.022)	(0.019)
Median black age	0.00040	0.00062	-0.0025	0.00067	0.00076	0.00072
	(0.0010)	(0.0011)	(0.0071)	(0.0010)	(0.0010)	(0.00097)
Median black education	-0.0045	-0.0034	-0.014	-0.0050	-0.0044	-0.0053
	(0.0040)	(0.0040)	(0.0077)	(0.0041)	(0.0035)	(0.0039)
Portion of black households on farm	-0.10	-0.11	-0.21*	-0.094	-0.087	-0.094
	(0.100)	(0.10)	(0.11)	(0.11)	(0.10)	(0.099)
% change in black pop, 1950-60	0.0000084	-0.000013	-0.000017	0.000039	0.000034	-0.000051
	(0.00011)	(0.00012)	(0.00011)	(0.00010)	(0.000100)	(0.00014)
White theaters, 1950					0.0020	0.014**
					(0.0012)	(0.0059)
Median education*General theaters						-0.0013**
						(0.00056)
Median education*South						0.029**
						(0.0095)
Number of TV stations, 1950					0.00087	0.0025
					(0.0077)	(0.0085)
Midwest	0.052*	0.098**	0.080***			
	(0.027)	(0.040)	(0.016)			
South	0.24***	0.40**	0.27***			
	(0.065)	(0.15)	(0.065)			
West	-0.014	-0.0078	-0.013			
	(0.025)	(0.045)	(0.046)			
Region dummies	No	No	No	Yes	Yes	Yes
Observations	2633	2633	1995	2633	2615	2615
R-Squared	0.021	0.018	0.018	0.024	0.032	0.042

The dependent variable is the average annual count of African-American theaters located in the geographic area in 1950, 1951, 1952, 1954, and 1955 divided by the black population in 1950 in thousands. A unit of observation is a county unless it is part of a city, in which case the MSA is the unit of observation.

The index of racial discrimination is the mean of the within-region average standardized responses from racial attitude questions in the 1972 and 1976 General Social Surveys related to interracial marriage, schooling segregation, and residential segregation index. The IV specification shown in column (2) instruments for this index using the number of lynchings by state from 1880-1930.

Standard errors corrected for clustering at the detailed region level are in parentheses. *,**,*** denote significance at the 10%, 5%, and 1% level, respectively.

Table 3: Effect of white theaters on African-American theaters

	1950			1955		
	(1) All	(2) South	(3) Non-South	(4) All	(5) South	(6) Non-South
White theaters, 1955	-0.00099	-0.0059	-0.0032**	-0.0026	-0.012*	-0.0033**
	(0.0037)	(0.0058)	(0.0014)	(0.0033)	(0.0065)	(0.0014)
White theaters, 1950	0.0030	0.012**	0.0042	0.0039	0.017**	0.0042
	(0.0039)	(0.0050)	(0.0030)	(0.0037)	(0.0062)	(0.0030)
Log median income	0.044	-0.0077	0.064	0.055	0.0094	0.065*
	(0.039)	(0.061)	(0.038)	(0.037)	(0.061)	(0.038)
Median age	-0.0019	-0.0051	-0.00090	-0.0039*	-0.0098**	-0.00091
	(0.0029)	(0.0065)	(0.00084)	(0.0020)	(0.0041)	(0.00084)
Median education	0.0060	0.022	-0.0075	0.0050	0.024	-0.0074
	(0.012)	(0.020)	(0.013)	(0.012)	(0.021)	(0.013)
Labor force participation rate	-0.045	0.11	-0.26	0.19	0.60	-0.26
	(0.36)	(0.61)	(0.35)	(0.38)	(0.59)	(0.35)
Unemployment rate	0.023	0.022	-0.096	0.0022	-0.016	-0.095
	(0.019)	(0.036)	(0.10)	(0.015)	(0.031)	(0.10)
Population density (000s per sq mi)	-0.038	-0.040	-0.034	-0.033	-0.034	-0.034
	(0.026)	(0.027)	(0.041)	(0.026)	(0.026)	(0.041)
Number of TV stations, 1950	0.0034	-0.0045	0.0085	0.00097	-0.0094	0.0083
	(0.0061)	(0.0074)	(0.0097)	(0.0065)	(0.0076)	(0.0096)
Number of TV stations, 1954	-0.0048	-0.0037	-0.0037	-0.0033	-0.00042	-0.0036
	(0.0066)	(0.012)	(0.0070)	(0.0067)	(0.012)	(0.0070)
% change in black pop, 1950-60	-0.049	-3.26	0.022	-0.13	-8.90***	0.021
	(0.071)	(1.89)	(0.040)	(0.17)	(2.72)	(0.040)
Observations	2559	1241	1318	2559	1241	1318
R-Squared	0.044	0.063	0.028	0.053	0.063	0.028

Standard errors clustered at the state level are in parentheses. *,**,*** denote significance at the 10%, 5%, and 1% level, respectively. A unit of observation is a county unless it is part of a city, in which case the MSA is the unit of observation. The dependent variable is the number of African-American theaters per 1000 black population in 1950 and 1955 in columns 1-3 and 4-6, respectively.

Table 4: Area characteristics and the location of white theaters

	(1) OLS All	(2) IV All	(3) OLS > 0 theater	(4) OLS All	(5) OLS All
Index of racial discrimination	-0.12	-0.45	-0.21		
	(0.21)	(0.34)	(0.21)		
Log median income	-0.0047	-0.028	-0.010	-0.013	-0.015
	(0.032)	(0.031)	(0.031)	(0.023)	(0.020)
Median age	0.0016	0.00033	0.0039*	0.0013	0.0011
	(0.0023)	(0.0033)	(0.0020)	(0.0024)	(0.0023)
Median education	0.0037	0.0060	0.0037	0.0020	0.0018
	(0.0036)	(0.0042)	(0.0038)	(0.0050)	(0.0050)
Labor force participation rate	0.12	0.15	0.011	0.14	0.14
	(0.19)	(0.21)	(0.19)	(0.21)	(0.20)
Unemployment rate	-0.0049	-0.011	0.0065	0.0022	-0.0011
	(0.027)	(0.037)	(0.023)	(0.021)	(0.020)
Population density (000s per sq mi)	0.0021	0.0022	0.0035	0.0031	-0.00038
	(0.0053)	(0.0051)	(0.0049)	(0.0051)	(0.0051)
% change in pop., 1950-1960	-0.093**	-0.094**	-0.071**	-0.068*	-0.076*
	(0.039)	(0.040)	(0.029)	(0.036)	(0.034)
Black pop (100k), 1950	-0.59**	-0.56**	-0.59**	-0.54**	-2.16***
	(0.20)	(0.21)	(0.20)	(0.22)	(0.37)
Median black age	0.0020*	0.0022*	0.0022	0.00091*	0.00068*
	(0.00088)	(0.0010)	(0.0041)	(0.00042)	(0.00032)
Median black education	0.013**	0.014**	0.014	0.012*	0.012*
	(0.0049)	(0.0052)	(0.0087)	(0.0053)	(0.0058)
Portion of black households on farm	-0.053	-0.067	-0.023	-0.051	-0.043
	(0.048)	(0.063)	(0.083)	(0.056)	(0.044)
1950 African-American theaters					0.030***
					(0.0076)
Number of TV stations, 1950					0.0021
					(0.0039)
Number of TV stations, 1956					-0.0047**
					(0.0016)
Midwest	0.082	0.14*	0.080*		
	(0.051)	(0.060)	(0.042)		
South	0.14	0.33	0.19		
	(0.13)	(0.21)	(0.12)		
West	0.14***	0.15**	0.11*		
	(0.035)	(0.057)	(0.050)		
Region dummies	No	No	No	Yes	Yes
Observations	2881	2881	2351	2881	2863
R-Squared	0.18	0.16	0.15	0.26	0.28

The dependent variable is the average annual count of white theaters located in the geographic area in 1950, 1951, 1952, 1954, and 1955 divided by the black population in 1950 in thousands.

A unit of observation is a county unless it is part of a city, in which case the MSA is the unit of observation.

The index of racial discrimination is the mean of the within-region average standardized responses from racial attitude questions in the 1972 and 1976 General Social Surveys related to interracial marriage, schooling segregation, and residential segregation index. The IV specification shown in column (2) instruments for this index using the number of lynchings by state from 1880-1930.

Standard errors corrected for clustering at the detailed region level are in parentheses. *,**,*** denote significance at the 10%, 5%, and 1% level, respectively.

Table 5: Theater location, 1950-55 changes

	African-American Theaters			White Theaters		
	(1) All	(2) All	(3) >0 theater	(4) All	(5) All	(6) >0 theater
Log median income	-0.051**	-0.049**	-0.052**	-0.37**	-0.16	-0.058
	(0.021)	(0.017)	(0.019)	(0.13)	(0.12)	(0.060)
Median age	0.0064**	0.0057**	0.0075**	0.022***	0.024***	0.021***
	(0.0023)	(0.0022)	(0.0024)	(0.0046)	(0.0042)	(0.0037)
Median education	0.0064	0.0049	0.0086*	0.049**	0.028**	0.028
	(0.0036)	(0.0034)	(0.0038)	(0.017)	(0.012)	(0.023)
Labor force participation rate	-0.16	-0.15	-0.15	0.47	0.49	0.71
	(0.16)	(0.15)	(0.17)	(0.36)	(0.40)	(0.52)
Unemployment rate	0.0065	0.0075*	0.0059	-0.085*	-0.039	-0.062
	(0.0042)	(0.0036)	(0.0044)	(0.040)	(0.036)	(0.045)
Population density	-0.0066	-0.0062	-0.0062	0.0071	0.00011	0.00064
	(0.016)	(0.016)	(0.016)	(0.013)	(0.010)	(0.0099)
TV stations	-0.00088	-0.0011	-0.0014	0.00035	-0.0049*	-0.0028
	(0.0011)	(0.0012)	(0.0015)	(0.0024)	(0.0026)	(0.0023)
White theaters per 1k pop.	-0.059	-0.065	-0.11			
	(0.037)	(0.044)	(0.062)			
White theaters, 1950	-0.00022	-0.00022	-0.00023			
	(0.00014)	(0.00014)	(0.00014)			
African-American theaters per 1k black pop				-0.13*	-0.12	-0.12
				(0.060)	(0.066)	(0.066)
Region dummies	No	Yes	Yes	No	Yes	Yes
Observations	2559	2559	1927	2570	2570	1938
R-Squared	0.018	0.020	0.026	0.11	0.23	0.18

Standard errors are in parentheses. *,**,*** denote significance at the 10%, 5%, and 1% level, respectively. A unit of observation is a county unless it is part of a city, in which case the MSA is the unit of observation. The dependent variable is the change in the number of theaters of the stated type between 1950-55. The right hand side variables are similarly differenced. The 1950-55 change for variables based on decennial census data is linearly interpolated from the 1950-60 change. The change in the number of television stations is calculated from 1950-54, as this variable is observed every two years. count of all theaters located in the geographic area in 1950 divided by the total population in 1950 in thousands. The specifications shown in columns 2 and 4 restrict the sample to those states containing at least one African-American theater.

Table 6: Baseline Model Estimates

	(1) 1950	(2) 1955
λ: Market size equation		
Change in Black population, 1950-60 (000s)	0.77**	0.75**
	(0.32)	(0.31)
White population, 1950 (000s)	0.071***	0.055***
	(0.022)	(0.020)
SEA black population	0.012	0.017**
	(0.0081)	(0.0082)
β: Variable profit equation		
Racial discrimination index	0.060	0.069
	(0.11)	(0.10)
Log median income	-0.00027	0.0060
	(0.017)	(0.017)
Median education, all	-0.0030	-0.00087
	(0.0041)	(0.0042)
Median age, all	0.0039**	0.0038**
	(0.0017)	(0.0017)
1950 White theaters per 1000 pop	0.43***	0.45***
	(0.094)	(0.15)
Log area in sq. miles	-0.012	-0.0086
	(0.0093)	(0.0082)
Black LFP rate	0.10	0.079
	(0.14)	(0.14)
Median black education	-0.016***	-0.012**
	(0.0058)	(0.0056)
Median black age	0.0039*	0.0038*
	(0.0021)	(0.0021)
TV stations, 1950	-0.00064	
	(0.0034)	
Midwest	-0.016	0.0067
	(0.057)	(0.053)
South	-0.056	-0.038
	(0.075)	(0.066)
1955 White theaters per 1000 pop		0.020
		(0.16)
TV stations, 1954		-0.0063**
		(0.0031)
α_1	0.064	-0.049
	(0.15)	(0.13)
α_2		
α_3	0.031**	0.039***
	(0.014)	(0.012)
γ_1	3.87***	3.74***
	(0.86)	(0.71)
γ_2	1.11***	1.02***
	(0.076)	(0.066)
γ_3	0.32	0.32**
	(0.20)	(0.16)
γ: Fixed cost equation		
Racial discrimination index	2.78**	2.42**
	(1.34)	(1.18)
1950 White theaters per 1000 pop	0.50	-0.29
	(0.67)	(0.97)
S&L capital per capita	-0.0010*	-0.00082
	(0.00056)	(0.00060)
Log area in sq. miles	-0.040	-0.060
	(0.096)	(0.090)
Midwest	-0.47	-0.37
	(0.54)	(0.44)
South	-2.82***	-2.72***
	(0.89)	(0.75)
1955 White theaters per 1000 pop		1.36
		(1.19)
Observations	2497	2572
Log Likelihood	-633.7	-729.8

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

This table presents estimates of an ordered probit model of entry. A unit of observation is a county unless it is part of a city, in which case the MSA is the unit of observation. The categories for the ordered probit likelihood function are 0, 1, 2, and 3 or more firms in a county. Northern counties are excluded from the estimation, as few counties in this region have more than one African-American movie theaters. Standard errors are in parenthesis.

Table 7: Entry Threshold Estimates

	Market size thresholds			Per-firm thresholds		
	S_1	S_2	S_3	s_1	s_2	s_3
			Panel A: 1950			
Midwest	18.78927	25.40861	33.52038	18.78927	12.70431	11.17346
South	6.356301	15.05518	23.20977	6.356301	7.527589	7.736591
West	19.70822	25.75004	33.0797	19.70822	12.87502	11.02657
			Panel B: 1955			
Midwest	18.02458	24.0081	33.5971	18.02458	12.00405	11.19903
South	5.809979	13.8911	23.817	5.809979	6.945552	7.939001
West	20.99214	27.21986	38.32767	20.99214	13.60993	12.77589

This table displays the estimated required black population in thousands required to support the stated number of firms. These figures are obtained from the baseline model estimates displayed in Table 6.

A Base specification for other years

Table 8: Area characteristics and the location of African-American theaters

	(1) 1950	(2) 1951	(3) 1952	(4) 1954	(5) 1955
Median age	0.001	0.001	0.000	0.000	0.000
	(0.001)	(0.001)	(0.002)	(0.003)	(0.002)
Median years schooling	0.016	0.015	0.019*	0.021*	0.021*
	(0.009)	(0.008)	(0.010)	(0.011)	(0.011)
Labor force participation rate	0.079	0.074	0.250*	0.273*	0.248
	(0.184)	(0.183)	(0.120)	(0.143)	(0.134)
Unemployment rate	0.017	0.004	0.007	0.008	0.008
	(0.017)	(0.018)	(0.020)	(0.019)	(0.018)
Population density	0.000	0.000	-0.001	-0.000	0.000
	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)
Index of racial discrimination	-0.158	-0.159	-0.241	-0.243	-0.250
	(0.110)	(0.110)	(0.166)	(0.173)	(0.168)
Midwest	0.059*	0.058*	0.071	0.075	0.076*
	(0.030)	(0.030)	(0.039)	(0.041)	(0.040)
South	0.188**	0.188**	0.267**	0.278**	0.279**
	(0.065)	(0.065)	(0.107)	(0.112)	(0.108)
West	0.009	0.009	0.009	0.009	0.008
	(0.024)	(0.024)	(0.033)	(0.034)	(0.034)
Number of TV stations, 1950	0.012	0.011	0.009	0.009	0.009
	(0.008)	(0.009)	(0.008)	(0.009)	(0.009)
Observations	2348	2353	2345	2290	2302
R-Squared	0.014	0.014	0.022	0.022	0.021

Standard errors are in parentheses. *,**,*** denote significance at the 10%, 5%, and 1% level, respectively. A unit of observation is a county unless it is part of a city, in which case the MSA is the unit of observation. The dependent variable is the count of African-American theaters located in the geographic area in 1950 divided by the black population in 1950 in thousands. The index of racial discrimination is the average of the standardized responses from the racial attitude questions in the 1972 and 1976 General Social Surveys related to interracial marriage opposition index, schooling segregation index, and residential segregation.