Inside the Black Box of 'White Flight': The Role of Suburban Political Autonomy and Public Goods

Leah Platt Boustan
Harvard University
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Abstract: Why did white households relocate to the suburbs in response to black in-migration, despite the presence of many all-white neighborhoods *within* segregated cities? By moving to the suburbs, residents could avoid compromising with black arrivals on property taxes and public expenditures and sending their children to diverse public schools. I use housing prices to reveal the marginal willingness to pay for this suburban autonomy by comparing neighboring blocks that fall on either side of city-suburban borders in 1970. I also match blocks to their nearest high school. Identification arises from the fact that the local electorate and/or school system changes discretely at these borders, while housing and neighborhood quality shift more continuously. To account for fixed differences in the housing stock, for example due to zoning, I also examine relative *changes* in housing prices across borders over time. Housing prices in diverse jurisdictions are worth 1.5-3.0 percent less than their suburban neighbors. The correlation between race and poverty – and the resulting increase in city property tax rates – accounts for half of this relationship. Parental preferences for white classmates in local public schools are also important.

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I. Introduction

In the decades following World War II, American cities underwent a period of rapid suburbanization, driven primarily by the mobility of white households.[1] White suburbanization was, in part, a response to the growing black presence in central cities (Frey, 1979; Grubb, 1982; Boustan, 2005).[2] Over four million African-Americans left the rural South over this period, settling primarily in central cities. In previous work, I show that, if not for the resulting increase in urban diversity, the growth in white suburbanization from 1940 to 1970 would have been 20 percent lower.[3]

Establishing a relationship in the aggregate between black in-migration and white suburbanization leaves open the deeper question of *why* white households chose to leave racially diverse central cities. Various models of the urban location decision emphasize different answers. Traditional land use theory imagines a household choosing its distance from an employment center, with longer commuting times compensated with lower land prices on the periphery (Alonso, 1964; Muth, 1969; Mills, 1972). In this framework, new migrants – irrespective of their race – may have increased housing prices in the central city, where supplies

[1] In 1940, 40 percent of white residents in the average metropolitan area (SMSA) lived outside the central city. By 1970, the mean white suburban share had increased to 65 percent. These figures are based on the 104 SMSAs with more than 250,000 residents in 1970. For comparison, I establish common central city and metropolitan area boundaries in both decades. In particular, I reassign suburban land annexed by the center city back to the suburban ring (Bogue, 1953; US Census, 1960, 1970). Without accounting for annexation, the mean white suburban share in 1970 was only 55 percent.

[2] Other factors affecting relocations to the urban periphery include rising household incomes (Margo, 1992), the baby boom (Frey, 1984), and the reduction in commuting costs associated with the construction of the interstate highway system (Baum-Snow, 2005).

[3] In Boustan (2005), I document a positive correlation between changes in central city racial composition and white suburbanization. Recognizing that black migrants may have been attracted to cities by the same economic factors underlying the demand for suburban residence (for example, rising wages), I develop an instrumental variables procedure that assigns black migrant flows from southern states to northern cities using pre-established settlement patterns. Even after accounting for migrant location choices, I find that 'white flight' was a quantitatively important cause of postwar suburbanization.

of land were fixed and the elasticity of housing supply was relatively low. Higher relative prices in the center would then encourage the marginal resident to relocate to the suburbs.[4]

In contrast, models of segregation emphasize the choice between a set of neighborhoods with varying degrees of racial diversity (Schelling, 1972; Cutler, Glaser, Vigdor, 1999). In the postwar period, whites disliked living near blacks; in a Gallup poll conducted in 1958, 44 percent of white respondents indicated that they would relocate if a black family moved next door (Ellen, 1999, p. 107). By expanding the size of existing black enclaves, in-migration increased the proximity of the average white resident to black areas. In this framework, white households might relocate to avoid local interactions with black neighbors.

A third family of models focuses on the choice between politically autonomous jurisdictions within a metropolitan area, each of which offers a distinct bundle of public goods (Tiebout, 1956; Ellickson, 1971; Fernandez and Rogerson, 1996). By remaining within the central city, white urban residents had to engage in *civic* interactions with black newcomers via the ballot box and/or the public school system. Black arrivals changed the identity of the median city voter, in some cases by enough to affect local policy.[5] Preferences on issues ranging from education to redistribution to public safety may have varied by race, or by income, which was highly correlated with race.[6]

The goal of this paper is to separate the demand for suburban political autonomy from either relative price- or neighborhood-based explanations for white flight. Historical accounts of suburbanization emphasize white racism and the resulting aversion to living near black families

[4] In this model, the marginal resident was likely to be white. Whites were wealthier than blacks. The rich have a higher demand for housing and thus benefit disproportionately from lower prices on the periphery. Furthermore, at the time, the rich were also more likely to commute by car (Leroy and Sonstelie, 1983). Thus, the rich had both a higher demand for housing and a comparative advantage in commuting (Glaeser, Kahn, and Rappaport, 2000).
[5] Black migrants were just as likely to vote in northern elections in the 1960s as their white urban counterparts (American National Election Study, various years).
[6] Even if preferences do not differ across racial groups, voters may placed a lower weight on maintaining "other people's" neighborhoods or educating "other people's" children (Cutler, Elmendorf and Zeckhauser, 1993).

(Sugrue, 1996, Meyer, 2000). However, because central cities were already highly segregated, avoiding black neighbors did not require a suburban address. Conservative estimates indicate that more than half of Census tracts in central cities were entirely white in 1940.[7] The desire to avoid civic interactions with black newcomers provides another motive for leaving diverse cities – one that may have applied even to families living in all-white enclaves.

The demand for political distance from black migrants will be reflected in a willingness to pay for housing units in predominately white municipalities and/or school districts. However, suburban residents also have, on average, fewer black neighbors, and are located farther from the city center, two factors that may also influence housing prices. To isolate the role of political autonomy, I exploit the division of urban space into separate jurisdictions, comparing housing prices on either side of municipal borders.[8] Narrowing the window of comparison to adjacent blocks also helps to control for unobserved differences in housing and neighborhood quality; suburbs tend to have a newer housing stock, larger lots, more open space, and safer streets than their urban counterparts. The empirical design is described more fully in section II.

While houses on adjacent blocks are more comparable than the median unit in the city and suburbs, differences may remain – for example, due to variation in local zoning that regulates average lot size or density. To eliminate *fixed* disparities in housing quality, I consider changes in the housing price differential across these borders by decade from 1950 through 1970.

The panel sample of jurisdictional borders used in the analysis is outlined in section III. Section IV reports the relationship between housing prices on neighboring blocks and the racial

[7] For tracts with fewer than 25 black residents, the true number of black residents is suppressed. To be conservative, I code these tracts as having 24 black residents, which gives a lower-bound on the share of tracts that are predominately white.

[8] This methodology applies the common notion of a regression discontinuity to the spatial dimension. In a similar fashion, Black (1999) uses the boundaries of school attendance areas in Massachusetts to study the market value of elementary education. However, Kane, Staiger and Samms (2003) question the assumption of comparable neighborhood quality across borders, noting that test scores are correlated with housing characteristics across district border in their Charlotte, NC data.

composition of their respective jurisdictions. In the 1970 cross-section, a 13 percentage point difference in the jurisdiction's black share (the sample mean) is associated with a 3.0 percent decline in housing values on the diverse side of the border. There is no discernable effect on rents. When adding variation over time, the coefficient is 30 percent smaller in absolute value, but is still statistically significant.

The racial composition of the nearest high school has an independent effect on housing prices across sample borders, which, in most cases, also demarcate school districts.[9] Before the implementation of school desegregation plans in the 1970s, the separation of neighborhoods by race created *de facto* segregation in local elementary schools, while large public high schools, which drew students from many neighborhoods, were more diverse.[10] I use data from the Office of Civil Rights to determine high school racial composition, and employ GIS software to match each border area to its closest high school.[11] The increase in the black share of the student body associated with crossing the mean border (20.5 percentage points) leads to an additional 0.7 percent decline in housing prices, and, through household mobility results in the loss of around one middle- or high-school aged child from the average block of 113 residents.

In 1970, the income of the median black family was only 61 percent of its white counterpart. While the demand for suburban residence could reflect "white flight" – if preferences for public goods vary by race, or if parents are concerned about the race of their children's classmates *per se* – it is also consistent with a flight of the middle class. Section V demonstrates that the correlation between race and class fully accounts for the estimated

[9] All municipal borders in the sample overlap with school districts, with the exceptions of Long Beach-Lakewood and Richmond-El Cerrito, CA; Berwyn-Cicero and Skokie-Evanston, IL; and McKeesrock and Stowe, PA.
[10] One measure of racial integration is the dissimilarity index, which indicates the share of black students that would need to switch schools in order for each school's racial composition to mirror that of the school district as a whole. For the mean school district in my sample, elementary schools have a dissimilarity index of 0.51, while high schools have a far lower index value of 0.31.
[11] Reber (2005) uses the Office of Civil Rights data to estimate the effect of desegregation plans on school-level racial segregation and white enrollment. She generously shared her electronic school-level files with me.

"homogeneity premium" in 1960. By 1970, the willingness to pay for homogeneity increased, and half of this larger estimate remains even after controlling for various income and educational characteristics of jurisdiction residents.

I consider three categories of public decisions that may account for this residual race effect in 1970, including spending on education, neighborhood infrastructure (sanitation, parks, and road maintenance), and public safety, but none of these indicators explain the increased willingness to pay for racially homogeneity as such. A more plausible explanation is the outbreak of race riots in the 1960s, which may have heightened white's desires to avoid political interactions with blacks in the center city.[12]

The overall welfare effects of white suburbanization during this period are ambiguous. On the one hand, the decentralized control of American metropolitan areas provided an array of public bundles, each of which commanded a price in terms of tax rates and housing prices. In this context, the relocation of whites with the means to buy into independent jurisdictions might have been the optimal response to an influx of poor, black migrants to central cities. However, the abandonment of cities, and the resulting loss of the middle-class tax base, may have imposed externalities on those left behind. Baumol (1967) argues that suburbanization heightened the urban fiscal crises of the 1960s and 1970s. Furthermore, suburbanization contributed to increased racial segregation *between* the central city and its suburban ring (Fischer, et. al, 2004). Bayer, McMillan and Rueben (2005) demonstrate in a general equilibrium framework that eliminating residential segregation by race in 2000 would have halved black-white disparities in the

[12] In comparing across cities, Collins and Margo (2004) find that the occurrence of a riot depressed urban property values between 1960 and 1970. My sample is heavily weighted toward cities with intense riot activity. 36 of the 57 borders are taken from a metropolitan area ranked among the top ten in riot severity during the 1960s (in order: Los Angeles, Detroit, Newark, Chicago, Cleveland, New York City).

consumption of local public goods, including school quality and public safety.[13] Inter-jurisdiction segregation, and the resulting disparity in public services, may help explain why black graduation rates and labor market outcomes are lower in segregated metropolitan areas today (Cutler and Glaeser, 1997), a relationship that emerged only in the postwar period (Collins and Margo, 2000).

II. Using Housing Prices to Analyze the Demand for Suburban Residence

Unlike simple consumer goods, housing units are composed of a set of characteristics – attributes of the unit itself, of the neighborhood in which the unit is located, and of the jurisdiction – each of which commands a separate price (Kain and Quigley, 1975). In theory, one can isolate each price with the right data and experimental design, and, by so doing, gain insight into the demand for a variety of non-market goods that are implicitly traded through the housing market. This technique is known as hedonic pricing, and follows from Rosen's (1974) seminal work; recent examples of this approach include Black's (1999) analysis of the value of elementary education and Chay and Greenstone's (2005) examination of the cost of air pollution.

A. An Econometric Framework

One challenge to implementing a hedonic model in this setting is that housing quality and neighborhood amenities tend to be strongly correlated with the demographic characteristics of a jurisdiction. To minimize this source of bias, I compare housing units on adjacent blocks that fall on opposite sides of a jurisdictional border.[14] For this application, which requires detailed

[13] More generally, Benabou (1996) has argued that, with decentralized public finance, suburbanization can lead to inequality in educational inputs between jurisdictions which, in some cases, may reduce aggregate efficiency.
[14] While for ease of exposition, I will occasionally refer to city/suburban borders, a third of the borders in the sample divide two suburbs.

geographic information, I rely on published block-level means of housing values/rents from the Census of Housing.[15] Starting with a single time period (1970), I posit that housing values/rents per room are a function of the racial or socio-economic composition of the jurisdiction in which the unit is located, as well as a series of neighborhood and block level controls. In particular, I estimate the following equation:

$$\ln(\text{price per room}_{inbj}) = \alpha + \beta\ \text{jurisdiction}_j + \gamma\ \text{neighborhood}_n + \Phi'\ \text{block}_i + \theta'\ Z_b + \varepsilon_{inbj} \quad (1)$$

where *i, n* and *j* index blocks, tracts, and political jurisdictions, respectively, and *b* is a subscript common to both sides of a "border area."[16] The equation contains a vector of border area dummy variables (Z_b), which indicate all blocks that fall on either side of a given jurisdictional border. Z_b absorbs unobserved characteristics that are shared by houses on both sides of the border – for example, the presence of a large street, a bus line, or a commercial strip. The remaining coefficients are estimated only from variation *within* border areas. Conceptually, this specification relates mean difference in housing prices across borders, adjusted for observed characteristics, to differences in jurisdiction-level attributes.

To clarify geographic terms, Figure 1 presents a schematic illustration of two jurisdictional borders in the Chicago metropolitan area. The upper pair is composed of tracts from Chicago and Evanston, IL, and the lower pair from Chicago and Oak Park, IL. Nested within each tract is a grid of blocks. The sample includes only those blocks that are themselves adjacent to the border. All blocks in the city of Chicago are coded as being in the same

[15] In the Census, housing values and rents are based on self-reports. Kain and Quigley (1972) argue that owner reports are reliable. However, self-reports may vary across jurisdictional borders if some towns assess properties more regularly, thus providing owners with updated information.

[16] Because the dependent variable is measured at the block level, I weight the regressions by the number of owner-occupied or rental units represented. I cluster standard errors by jurisdiction, the level at which the demographic variables of interest varies.

jurisdiction ($j = 1$), whereas blocks in Evanston and Oak Park are located in distinct jurisdictions ($j = 2$; $j = 3$). In contrast, adjacent blocks are assigned to the same "border area" even if they fall in different jurisdictions. In the figure, the Chicago/Evanston border is coded as $b = 1$, and the Chicago/Oak Park border is $b = 2$.

I allow housing prices to respond to various characteristics of the jurisdiction, including the share of its residents that are black, living below the poverty line, or holding a college degree, as well as residents' median family income. Because black migrants were more likely to settle in large cities, all specifications include the jurisdiction's total population. Population size itself has a negative effect on housing prices, implying that the benefit of economies of scale in public services are outweighed by the loss of citizen voice and oversight (Alesina, Baqir, and Hoxby, 2004).

If, as was hypothesized above, preferences over public decisions vary by race, we would expect to see a larger concentration of black families on the more diverse side of borders. In this case, a price differential associated with jurisdiction-level racial composition may actually be picking up a response to immediate neighbors. I control for the share of residents in the housing unit's larger neighborhood (tract) and immediate area (block) that are black. Note that the racial composition of the surrounding tract may also be a proxy for the race of students enrolled at the local elementary school. In addition, all regressions include a vector of block-level characteristics of the housing stock (X_i).[17]

[17] Block-level measures of housing quality include the share of units that are owner occupied, in single family units, vacant, or deemed "unsound" (that is, lacking some aspect of indoor plumbing). I measure block density as the average number of residents per unit. I also include an indicator for the presence of group quarters (for example, college dormitories or retirement homes).

B. Relaxing the Identification Assumption

In the hedonic pricing framework, lower housing prices on the diverse side of jurisdictional borders is interpreted as a true willingness to pay for a homogenous electorate. However, this price disparity may simply reflect a continuous and increasing housing quality gradient with distance from the city center, or, more worryingly, might indicate a discontinuous jump in housing quality at the border.

There are a number of reasons why housing quality might change abruptly at a jurisdictional border. First, some suburban towns passed zoning ordinances that effectively price out poor families from their housing market. Such regulations, including bans on multi-family units or large lot size requirements, may increase the average quality of the housing stock, thus inducing a negative correlation between racial diversity and unobserved quality.[18] More generally, by 1970, many of these borders had been in place for over a century. Any local policy that raised property values in one municipality may have changed the incentives for home maintenance, renovation, and upkeep, eventually resulting in sharp changes in housing quality.

To eliminate confounding differences in housing quality at the border, I introduce data from two previous decades, and evaluate *changes* in the housing price gap as the jurisdiction-level racial profiles evolve over time (for example, due to black in-migration). We can now relax the assumption of an identical housing stock at the border, but must instead assume that the quality of the housing is not differentially declining on one side versus the other. I pool data from 1950, 1960, and 1970 and estimate:

$$\ln(\text{price/room}_{inbjt}) = \alpha + \beta\ \text{jurisdiction}_{jt} + \gamma\ \text{neighborhood}_{nt} + \Phi'\ \text{block}_{it} + \theta'\ Z_b + \gamma Y_t + \Psi'\ (Z_b \text{ x } Y_t) + \varepsilon_{inbjt} \quad (2)$$

[18] Zoning rules that apply only to *new* construction should not differentially affect housing quality across the borders in this sample, most of which were already built up by the 1920s, when the first zoning laws were passed. Bans on multi-family use, on the other hand, apply both to new construction and to conversion of existing units.

where Y_t is an indicator variable for the Census year.[19] The interaction term (Z_b x Y_t) allows common, unobserved neighborhood characteristics to change over time. For example, the border street might be widened or a new bus line could be added to the area. In this context, the border area dummy variables (Z_b) now absorb fixed differences in jurisdiction-level attributes, and β is estimated from decadal *changes* in these characteristics. To be more concrete, consider that, in 1970, the difference in the black population share across the mean border in the sample was 13.2 percent. 5.2 percentage points of this total was added in the 1960s. The first estimation procedure uses variation in the cumulative difference in the black population share across borders, while the latter uses only the incremental difference from 1960 to 1970.

III. Collecting Housing Prices Along Jurisdictional Borders

The Census Bureau began dividing urban space into comparable geographic units in 1940, carving cities into tracts and further subdividing tracts into blocks. By 1960, the Bureau had blocked every urban jurisdiction with more than 50,000 residents and a subset of their largest suburbs. By 1970, all urbanized areas were fully overlaid with Census blocks.[20] Because of the stronger data restrictions in 1960, I start with a sampling frame of the 25 largest central cities in that year. Within these metropolitan areas, I identify 55 political boundaries for which block-level data is available on both sides of the border. Using a combination of Census block maps

[19] While the 1970 block data are available electronically, the 1950 and 1960 data were entered from published volumes, which contain a much smaller set of quality characteristics. As a result, in 1950, $block_{it}$ includes only the share of the housing units with a black household head. The 1960 data add the share of units deemed unsound, an indicator for group quarters, and the residents per unit measure of density.

[20] The one exception is the Pittsburgh urbanized area, which was fully blocked in 1960. For consistency, I do not include borders containing the smallest jurisdictions in the Pittsburgh metropolitan area. I chose an arbitrary cut-off of 10,000 residents, though the results are not sensitive to changes in this value.

and historical US Geological Survey 1:24,000 maps, I rule out seven borders that were obstructed by a railroad, four-lane highway, body of water, or large tract of industrial land.[21]

The first panel of Table 1 classifies this initial sample by region and metropolitan area. By comparing those metropolitan areas with at least one border in the sample (panel A) to those without (panel B), it is clear that this procedure under-represents the South, whose cities had fewer large, long-established suburbs than their northern counterparts. Only one of the seven southern SMSAs in the frame is captured in the sample (Atlanta, GA). Because the white mobility response to black in-migration likely differed by region, I drop Atlanta from the analysis.[22] To increase precision, I introduce data along 11 additional borders in northern/western metropolitan areas without a large central city. These borders are listed in the second panel of Table 1. The final sample includes 57 jurisdictional borders, the complete universe of unobstructed jurisdictional borders in the North and West for which Census block data is available in 1960. 20 of these borders can be extended back to 1950.

The second column of Table 1 indicates the number of borders found in each of the 16 metropolitan areas in the sample. New York City and Los Angeles alone account for 27 of the sample borders. Their over-representation is not due to their size alone.[23] Both the New York

[21] Ruling out obstructed borders improves the plausibility of the identifying assumption, namely that housing and neighborhood quality shift continuously across jurisdictional borders. However, eliminating borders that are separated by, say, industrial land raises the question of endogenous border formation. Municipalities can erect bulwarks against unwanted populations by zoning for industrial use along their borders or constructing large roadways with limited ability for pedestrian crossing. Cicero, IL is infamous for its ethnic and racial exclusivity (Keating, 1988). It may be no coincidence, then, that the Chicago/Cicero border is obstructed by industrial land. As a result, the selection of borders into the sample will favor jurisdictions that are the *least* hostile to new arrivals, thus working against finding a housing price decline at the border.

[22] Contrary to the rest of the country, increases in the black population share of central cities has no effect on the white suburban share of the surrounding metropolitan area in the South in this period (Boustan, 2005). According to the political channel suggested here, the southern response may have been muted because of black disenfranchisement and the presence of racially-segregated school systems.

[23] New York City and Los Angeles contribute nearly 50 percent of the borders in the sample, while, in 1960, they contained only 20 percent of the population living in the top 25 cities.

City and Los Angeles regions were highly fragmented and contained multiple central cities (e.g., Newark, NJ; Anaheim, CA), thus increasing their probability of inclusion.[24]

IV. The Willingness to Pay for Racially Homogeneity: Evidence from Housing Prices

In this section, I document that houses located in racially diverse jurisdictions commanded lower prices in the 1950s and 1960s than otherwise identical units in more homogenous areas. Not surprisingly, I find that home values also responded to the income and education levels of jurisdiction residents, both of which are negatively correlated with racial composition. In the next section, I will parse the demand for a predominately white electorate into its class-based and racial components. For now, my goal is simply to establish that the empirical willingness to pay for demographic characteristics of the jurisdiction is not an artifact of unobserved housing quality differences across borders.

A. Testing for Differences in Observed Housing Attributes Across Borders

I begin by testing the maintained assumption of neighborhood continuity using the available measures of housing quality in the 1960 and 1970 Census of Housing. Each row in Table 2 represents a different regression, equivalent in structure to equation (1), for which the dependent variable is a block-level housing characteristic and the main variable of interest in the jurisdiction's black population share. (Cross-border means and standard deviations of jurisdiction-level variables are presented in the first panel of Appendix Table 1. The second panel contains summary statistics of block-level variables.) There is no significant variation across borders in the share of units that are in single family structures or are owner occupied.

[24] Indeed, in 1970, the Census Bureau subdivided the New York City SMSA into four parts (New York City, NY; Jersey City, NJ; Newark, NJ; and Clifton-Paterson-Passaic, NJ) and split the Los Angeles SMSA in two (Los Angeles-Long Beach and Anaheim-Santa Ana-Garden Grove).

Furthermore, in 1960, the diverse side has significantly *lower* density, measured as residents per housing unit, though this gap disappears by 1970. That, on these observable metrics, the housing stock is no worse – and some cases better – on the diverse side of borders is *prima facie* evidence against the reach of zoning, which tends to regulate against multi-family use and high-density development.

However, there is still reason for caution: a marginally larger share of housing units on the diverse side of borders are deemed "unsound" (that is, lacking some aspect of indoor plumbing, such as a flush toilet or running water). The reported coefficient indicates the effect on housing prices of an increase from zero to 100 percent in the jurisdiction's black population share. A more reasonable comparison is the mean cross-border difference in the black jurisdiction share (8 percent in 1960; 13 percent in 1970). While the relationship in both years is small, accounting for less than 0.05 of a block-level standard deviation in the share unsound, it underscores the possible existence of unobserved quality differences.

B. Housing Prices and Jurisdiction-level Demographics: Across Borders and Over Time

With caveats about quality in mind, I turn now to the analysis of housing prices. I begin with a simple exercise in Figure 2. One jurisdiction in each pair is classified as "diverse" and the other as "homogeneous" according to their relative black population shares. I then plot the mean housing value (controlling for observable housing characteristics) by distance away from the jurisdictional border in both directions.[25] Distance is measured using a series of block tiers, with the first tier adjacent to the border, the second adjacent to the first, and so on. Housing prices are

[25] To be more precise, I graph coefficients from a regression of the log of housing values per room on a series of indicator variables for distance to the border, with the omitted category being the first set of blocks adjacent to the jurisdictional border on the "homogeneous" side. Thus, all values are *relative* to this first tier. The regression also includes a full set of block-level housing characteristics.

uniformly higher on the homogeneous side of the border, drop by around 3.5 percent as one crosses the border, and then remain at this lower level for the next four blocks. The decline at the border is unique large and significantly different from zero.

By collapsing racial composition into two categories – homogenous and diverse – Figure 2 ignores variation in the size of the racial composition gap across borders. Figure 3 plots the size of this gap at each jurisdictional border in the sample. A number of pairs, primarily at borders between two suburbs, share nearly identical racial compositions, while a few neighboring jurisdictions exhibit vast differences. The largest gap is between Compton and Long Beach, CA (66 percentage points), followed by Newark-Irvington, NJ and Detroit-Dearborn, MI.

Is the size of the racial composition gap correlated with the size of the housing price gap? Figure 4 graphs the cross-border difference in housing prices, again adjusting for observable housing characteristics, against the difference in the black population share (in logs). Each point on the scatter diagram represents one of the 57 borders in the sample, and the size of the circle indicates the number of housing units in the underlying data. It is clear from this graph that the larger the difference in the racial composition between the neighboring towns, represented by the right-most values along the X axis, the more negative the difference in housing prices at the border.

A more formal analysis of this relationship is contained in Table 3, which presents regression coefficients from the estimation of equation (1). Equation (1) relates the cross-border difference in housing prices to the difference in jurisdiction-level population characteristics. I divide the housing market by tenure status, with either housing values or rents measuring the willingness to pay for jurisdiction-level characteristics. The vacancy rate at a point in time is another indicator of demand, revealing the average time between a unit being listed for rent or

sale and that unit being filled (higher vacancy = lower demand).

The first column allows housing prices and rents to respond to the linear difference in the black population share; the second column considers its logarithm. The coefficients in the log-log specification can be interpreted as an elasticity, or the percentage change in housing prices for a one percent increase in the black population share. Across the mean border, the black population share increases 300 percent (from 4.4 to 17.6 percent), which leads to an estimated 3.0 percent decline in housing values. The estimated response in the linear case is not as strong (1.8 percent). Given the wide disparity in the cross-border differences in racial composition (Figure 3), a linear specification seems overly restrictive.

Homeowners are also willing to pay to live in a jurisdiction whose fellow residents are well-educated or well-to-do (columns 3-5). Consider again the change in residents' characteristics associated with crossing the mean border. Increasing the median family income or share of residents with a college degree would increase housing values by around 2 percent, while such an increase in the poverty rate would decrease housing values by 3 percent. It is also revealing that the relationships between socio-economic characteristics and housing prices, on the one hand, and vacancy rates on the other take on opposite signs. That is, despite the higher housing prices found in jurisdictions with richer residents, available houses are sold more quickly, leaving fewer vacancies at any given time.

Renters appear to have systematically different preferences over the composition of the local electorate (row 3). Rents are *higher* in jurisdictions with a larger black share and a lower median income.[26] This disparity by tenure status is consistent with three explanations. First, the median renter was more likely than the median homeowner to be black and to have a low income

[26] The one exception is the share of residents holding a college degree, an attribute valued by both homeowners and renters.

(Collins and Margo, 2001). These individual attributes may be associated with different preferences over public decisions. In addition, owning a home has both consumption and investment value, and thus even infra-marginal homeowners rationally take the preferences of the median homebuyer into account when selecting their location (Epple and Romer, 2001). The same is not true of renters. Home values will also capitalize expectations about future trends, including the continued bifurcation of racial residential patterns between cities and suburbs.

The differential effects of jurisdictional attributes on home values and rents suggests against the presence of an underlying gradient in housing quality, at least one that is common across tenure status. To further rule out this alternative hypothesis, I compare the coefficient obtained at the true border to a set of similar comparisons across "placebo" borders wholly within the city or the suburb. For the placebo exercise, I imagine the border shifted one block towards or away from the city center, and compare housing prices on adjacent blocks. The tier that is closest to the central city in any given comparison is assigned the city's demographic profile. If the estimate at the actual border merely reflected relative neighborhood decline, we would expect negative coefficients of a similar magnitude for each of the placebo experiments. Instead, as the first column of Table 4 indicates, the true estimate stands out as being the only coefficient that is negative and significantly different from zero. The second column emphasizes the importance of access to block-level data. An estimate of the "homogeneity premium" derived from a comparison of mean home values in entire *tracts* on opposite sides of the border would be indistinguishable from the general decline in housing quality with proximity to the central city.[27]

[27] Because I only collected block level data for tracts immediately adjacent to the border, I simulated this tract-level exercise by splitting large tracts in two. In the second column of Table 4, the true border estimate contrasts the first through fourth block tiers on either side of the border, while the placebo estimates compare tiers one through four with tiers five through eight.

Comparisons at placebo borders cannot account for potentially confounding zoning policy, which may result in abrupt changes in housing quality at true political boundaries. For this, I add data from 1960 (and 1950, when possible), and examine how the gap in housing values *changes* when differences in jurisdiction-level characteristics narrow or widen. For comparison, the first row of Table 5 re-estimates the basic specification in 1970, using only the control variables available in earlier census years. The second and third rows add over time variation, starting with a balanced panel of borders from 1960 and 1970, and then adding available data from 1950. In both cases, the estimated relationship between home values and the black share of the jurisdiction falls between 30 and 50 percent, depending on whether it is entered linearly or in logs, but the resulting coefficients are still significantly different from zero. The coefficient on median family income falls by 20 percent.[28] Some portion of the estimated willingness to pay for racial homogeneity may, instead, be picking up unobserved differences in housing quality. However, even these smaller coefficients result in an economically meaningful relationship: for a 13.2 percentage point (or 300 percent) gap in the black population share, homes on the diverse side of the border are worth, on average, 1.5-2.0 percent less.

V. White Flight, or Flight of the Middle Class?

The previous section demonstrated that housing prices fall on the racially diverse side of jurisdictional borders. Black migrants were systematically poorer than white residents. Income differences aside, they may have disagreed with the existing urban population on matters of local policy. Either factor would be sufficient to generate a gap in housing prices at the border. In this section, I attempt to empirically distinguish between these two channels, which I call the "class-

[28] The concept of an absolute "poverty line," which takes into account income, family size, and the ages of family members, was only developed in the 1960s, and thus cannot be included in the panel estimation.

race correlation" and the "residual race effect." Before doing so, let us consider, for the sake of illustration, how a price gap might emerge at the border in either case.

First, imagine that blacks and whites draw from an identical income distribution, but that for some historical or cultural reason have different views on how best to spend the money in the public coffers.[29] Both black and white households live in a monocentric city with a central business district to which all workers commute, illustrated in the first panel of Figure 5. The city is divided in two jurisdictions, a diverse central city, with both black and white residents, and a homogeneous suburb. Let policy be set by the median voter in each jurisdiction, so that the bundle of public goods in the city and the suburbs differ. The suburban bundle is preferred by all white residents. To be in spatial equilibrium, a white resident must attain an equal level of utility in all locations. She decides between three locations: stay in the city, where she is closer to the central business district, but receives the city public bundle; move just across the suburban border, and gain access to the suburban bundle at no additional commuting cost; or move further into the suburban periphery. At the border, she receives her preferred public bundle with no additional transportation costs. To equalize utility, this windfall must be compensated with a higher housing price.

Now, let's entertain a different thought experiment.[30] Again, imagine a metropolitan area populated by two groups (blacks and whites), now distinguished by their income, with blacks poorer than whites. The poor live in the city, and buy smaller housing units, while the rich live in

[29] There is historical evidence that blacks and whites had different views about the provision of public services. The best individual-level data come from the *Racial Attitudes in 15 Cities* survey conducted in 1968 (Campbell and Schuman, 1997). Even after controlling for education, income and occupation, black respondents were more likely than whites to express dissatisfaction with public schools, parks and recreation facilities, and police response. However, after controlling for neighborhood racial composition (that is, comparing blacks and whites who live in racially mixed areas), many of these race-specific differences disappear. Instead, it appears that anyone who lives in a mixed neighborhood, regardless of their own race, perceived city services to be inadequate.

[30] This example draws on Hamilton (1975).

larger houses in the suburbs.[31] A schematic representation of these two jurisdictions is presented in the second panel of Figure 5. Imagine that their preferences for public goods are identical, and thus that the bundle of public goods provided is the same everywhere in the metropolitan area. Public services are funded locally and revenue is generated through property taxation; towns must maintain a balanced budget. Because the city has a lower tax base, it must set a higher tax *rate* to generate enough revenue per person to fund the desired bundle. The houses at the border are depicted as equal sized, which conforms with the empirical evidence. To be in equilibrium, equivalent houses must command the same price everywhere. Because the house on the city side of the border has a higher tax rate, it must be compensated with a lower market price.

A. Separating Race from Class

In theory, either black-white differences in preferences for public goods or in income levels are sufficient to generate a gap in housing prices at city-suburban borders. The data inform us about the relative importance of these two channels. First, we should ask: are the lower incomes associated with a higher black population share sufficient to explain the estimated homogeneity premium? Table 6 addresses this question by augmenting equation (1) with jurisdiction-level income variables and looking for changes in the estimated "homogeneity premium." In 1960, including the share of the population with a college degree or the median family income (rows 2 and 3) drives the coefficient on the black share to zero, or beyond.[32] In other words, after accounting for the correlation between race and income, homeowners were not willing to pay to live in a predominately white jurisdiction in 1960.

[31] I will leave the theoretical reason for *why* the poor tend to live in the city aside for the moment. On this question, see Glaeser, Kahn, and Rappaport (2000).

[32] The first row of Table 6 re-estimates the relationship between housing prices and the black population share alone in 1960 and 1970. The regressions omit block-level controls that are not available in 1960 along with the jurisdiction-level population, to which the "homogeneity premium" is not robust in 1960.

In contrast, in 1970, half of homogeneity premium can be attributed to socio-economic factors, but a detectable race effect still remains. Interpreting the point estimates alone suggest that the higher poverty rate or lower median income that accompanies a black in-migration leads to a 1.5 percent decline in housing values, while the racial identity of the migrants accounts for the remaining 1.5 percent decline. However, the standard errors are large enough in some specifications that we cannot reject that the residual race effect is much smaller (on the order of 0.6 percent). Thus, while we can be confident that the lower income levels of the new black arrivals induced a demand for suburban residence, we should be more cautious in interpreting the suburban mobility as "white flight."

I outlined a scenario above by which the redistributive nature of property taxation could generate a housing price gap at the border. Here, I will show that the empirical relationship between property taxes and poverty across borders is large enough to explain the class-race correlation. Assume that property taxes are fully capitalized into housing values. The higher poverty rate associated with the mean change in racial composition (3.0 percentage points) leads to a 3.6 percent increase in the real property tax rate.[33] To compare this annual increase in property tax burden to the one-time break on the housing price, let's consider a numerical example. The average property tax rate in the sample is $21.8 per $1000, and the mean housing value is $113,000. A 3.6 percent increase in the property tax rate would translate into $86 in additional taxes each year (= $21.8 x $113 x .036). The net present value of this negative annuity is $1800. The one-time housing price decline of 1.5 percent is worth $1650. These two values

[33] The real property tax rate facing a homeowner is a product of the nominal rate – or, dollars due to the public coffer per $1,000 in assessed value – and the assessment-to-market value ratio. Details on the collection of historical property tax rates are in Appendix Table 2. The empirical relationship between poverty rates and property taxes is estimated from a regression relating the log of cross-border differences in property taxes to differences in poverty rates. The coefficient is 12.065 (s.e. = 4.812). I drop one outlier (Clifton-Montclair, NJ), for which the difference in property taxes ($24.83/1000) is nearly double that of the next largest gap in the sample.

are remarkably close, and suggest that the higher property taxes levied in poorer jurisdictions can account for the entire estimated income channel.

In fact, the higher property tax rate observed in poorer jurisdictions reflects some combination of the pure redistribution effect – that is, the need to set a higher tax rate to fund the same bundle of public goods – and the selection of a different optimal bundle of goods by the poorer median voter. In my sample, poor jurisdictions spend no less per student than rich ones on education, perhaps because of transfers from the state, but allocate more for non-educational purposes, including redistribution.

B. Explaining the Residual Race Effect

Even after accounting for the associated reduction in residents' income levels, a higher black population share alone still leads to a 1.5 percent decline in housing values in 1970. In looking for a set of public decisions to explain this residual race effect, a plausible candidate must be both: (1) positively correlated with the racial composition of a jurisdiction after controlling for income, and (2) negatively correlated with home values. More formally, we can think of these mediating public goods as omitted variables from the regression of housing prices on jurisdiction-level demographics.[34] Thus, to search for potential candidates, I add a series of public goods variables, measured in expenditures per capita, to the augmented regression (which includes both the black population share and the poverty rate).[35]

[34] That is, we can define an omitted public good Z as being a component of the residual race effect if both the coefficient of a regression of Z on the black population share X ($\Sigma x_t z_t / \Sigma x^2_t$) and the coefficient of the regression of housing values Y on the public good Z ($\Sigma z_t y_t / \Sigma z^2_t$) are positive.

[35] A full list of historical expenditure sources are presented in Appendix Table 2. Residents ultimately value the quality or quantity of public goods while, as researchers, we often have access only to expenditures or other inputs into the public production function. Expenditures are a noisy measure of the quantity of public goods if the cost of provision varies by municipality, perhaps because of corruption and public-sector unionization, or because of compensating differentials in wages. For example, teachers in inner-city districts may command higher wages to compensate for larger class sizes and more disruptive students. Furthermore, the level of expenditure may reflect the

The results are presented in Table 7.[36] Education spending is not correlated with home values, and so naturally cannot explain the residual race effect. This finding corresponds to the empirical regularity that spending on schools does not translate into improved student outcomes (Hanushek, 1996). With this weak measure, then, we cannot rule out that unmeasured differences in education quality contribute to the demand for racial homogeneity.[37] Homeowners dislike non-educational spending, which includes expenditures on neighborhood improvements (roads, parks, and sanitation), redistribution, public safety, and general administration (row 3 *in toto*, and then rows 4-7 by separate category).[38] However, after controlling for income, racial composition is not correlated with any of these spending categories, and thus, again, this set of measures cannot explain the residual race effect.

The second panel considers an alternative measure of public safety – arrest rates, a potential indicator of police effectiveness.[39] In theory, a racially diverse population can reduce police effectiveness, for example if residents are less likely to cooperate with officers of a different race in providing eyewitness accounts (Donohue and Levitt, 2001).[40] Because crime rates are highly correlated across space, we can reasonably assume that the victimization rate on

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intransigence of the underlying problem that the public sector is trying to solve; for example, school districts with ill-prepared students may hire more teachers to produce the same quantity of education.

[36] The first row of Table 7 re-estimates the basic specification using the smaller set of border areas (55) for which both jurisdictions have complete expenditure data. The results are qualitatively unchanged.

[37] To the best of my knowledge, there are no systematic historical data on test scores, a common measure of education quality.

[38] If homeowners on the border can free ride on the public expenditures of a neighboring jurisdiction – for example, by visiting a suburban park – these estimates may understate the demand for such facilities and thus *overstate* the mismatch between the preferences of the median homeowner and that of poor residents.

[39] The FBI collects data on seven index crimes, four violent crimes (murder, rape, assault and robbery) and three property crimes (burglary, larceny and vehicle theft). Because the arrest rate varies between crimes – from 0.77 for murder to 0.11 for larceny – it is not clear *a priori* which rate best measures police productivity. I use the principal factor from the arrest rates of three crimes: murder, assault, and burglary. Because arrest rates are only recorded on both sides of 39 borders, I re-estimate the base specification for this diminished sample in the second panel of Table 7. Due to the smaller size, the black share is not robust to the inclusion of the poverty rate. I thus estimate the effect of each characteristic separately.

[40] In 1970, police departments did not reflect the racial composition of the cities that they patrolled. 20 percent of the population but only 6 percent of the police officers were black in the 314 cities with the largest police and fire departments (McCrary, 2005).

neighboring blocks is of a similar magnitude, despite the jurisdictional boundary (Glaeser, Sacerdote, and Scheinkman, 1996). However, city residents cannot call on the suburban police to respond to crimes or emergencies, and thus has an interest in maintaining the effectiveness of the city force.[41] Accordingly, I find that residents value a police department that can "close" cases (Table 7, panel 2). However, the arrest rate does not help explain the demand for a racially homogenous jurisdiction.

Beyond its influence on jurisdiction-wide decisions, the black share of the population has a direct effect on the racial composition of local public schools. To explore the role of classmates' race on the demand for predominately white municipalities, I match each border area to its nearest high school. School addresses for 1970 are taken from the Elementary and Secondary General Information System (ELSEGIS).[42] Without access to historical attendance area boundaries, I implicitly assume that students would have been assigned to their nearest public school (as the crow flies). Given that the data pre-dates the implementation of northern desegregation plans, many of which required racial balance to take precedence over geographic proximity, this assumption is not entirely inaccurate. However, if school boards gerrymandered districts in order to prevent racially-mixed classrooms, my assignments will be mis-measured.

Racial composition was collected at the school-level by the Office of Civil Rights (OCR). Because schools must be matched, often by hand, between the OCR and ELSEGIS data, I limit

[41] On the other hand, a marginal dollar spent on policing activity may be allocated to dangerous neighborhoods where it has the highest return in deterring potential crimes. Residents on the relatively safe suburban border might therefore perceive spending on the police department as benefiting "other people's" neighborhoods.

[42] Matching border areas to their nearest school requires: (1) locating each school on a city map, (2) calculating the distance between a border area and each school in the district, and (3) selecting the minimum distance among these. Using their 1970 street addresses, I located schools on the 2000 Census electronic road maps with GIS software. The road files are available at http://www.esri.com/data/download/census2000_tigerline/. This process left fewer than 10 percent of schools unmatched. I checked the addresses of all unmatched schools on-line. In some cases, road names had changed from 1970 to 2000; in others, schools had closed in the intervening three decades. The GIS software enables the measurement of distance in miles between the centroid of sample Census tracts and each high school in the proper school district. Border areas with multiple tracts could match to more than one high school. In these cases, I took the average racial composition of the two closest high schools.

this procedure to the 420 high schools in the sample jurisdictions. In this pre-desegregation period, most elementary-aged children attended school in their own neighborhood. I thus use the black share of residents in the Census tract as a proxy for the racial composition of local elementary schools.

Is the desire to send one's children to a high school with white classmates driving the demand for living in a homogeneous jurisdiction? I supplement the basic regression of housing prices (Table 3, column 2) with the share of students at the nearest high school who are black, using only the 52 jurisdictional borders that demarcate separate school systems.[43] The coefficient on the black share of the nearest high school is -0.037 (s.e. = 0.019). At the mean border, the difference in the high school black share is 20.5 percentage points. A difference of this magnitude translates into a 0.7 percent decline in housing prices. However, adding high school racial composition to the equation does not offset the estimated effect of jurisdiction-level black population; the coefficient on the log black population share falls only 15 percent (from -0.013 to -0.011).

Homebuyers include both households with and households without children in the public school system. While the racial composition of local schools has only a modest effect on the price set by the median homebuyer, we can observe a larger impact of school-based racial diversity on residential locations. If aversion to diverse schools were widespread, we would expect to find fewer (white) children in such attendance areas. More specifically, there would be fewer young children in areas that feed into diverse elementary schools and fewer older children in the attendance areas of diverse high schools. I decompose the age distribution at the block level into school-based categories, corresponding to elementary school (age 5-9), middle school

[43] As before, the specification includes all block-level characteristics and the share of the tract's residents who are black. The estimated effect of high school racial composition is not robust to including the poverty rate or other measures of socio-economic characteristics at the jurisdiction level.

(age 10-13) and high school (age 14-17) respectively.[44] I also consider a "control" group of pre-school aged kids (age 0-4). Because many families have more than one child, we should not expect school-related mobility to occur precisely when a single child "ages into" the public schools. Yet, it is still instructive to compare the relative strength of school composition on the residential distribution of children of different ages.

Table 8 presents coefficients from a seemingly unrelated regression in which the dependent variables are the shares of a block's population in each of the school-based age categories. The black share of a tract's residents, a proxy for the racial composition of the local elementary school, reduces the density of elementary and middle school aged children, but has no effect on either their younger or older counterparts. In contrast, the racial composition of the nearest high school only reduces the share of the block that is of middle school or high school age. The regression controls for the black population share and poverty rate at the jurisdiction level. That neither of these school-based measures reduce the share of the population in the youngest age group suggests that the estimates are not merely picking up life cycle effects common to families with children. (In fact, the black share of a tract has a *positive* effect on the density of 0-4 year olds. However, because the block data does not distinguish children by race, this relationship could be due to the age structure of resident black families).

To appreciate the magnitude of these effects, consider a block with 200 residents, 42 of whom would be of school age, divided evenly between the elementary, middle school, and high school categories. The increase in the black share of the nearest high school associated with crossing the mean border translates into the loss of one middle school aged resident and half of a

[44] While all school districts provide separate schools for their youngest and oldest children , there are many types of "intermediate" schools. The most common formats are to group sixth through eighth grade into a middle school, or to combine seventh through ninth grade into a junior high.

high school aged resident. The comparable effects for the black share of the local elementary school are smaller, but still detectable (the loss of two-thirds of a young resident).[45]

VI. Conclusion

In earlier work, I demonstrate that white households relocated to the suburban ring in response to increasing urban racial diversity after World War II (Boustan, 2005). This paper explores the motivation for such white flight, focusing on amenities available *only* to suburban residents – namely, the ability to make collective decisions with a homogeneous electorate and/or send one's children to homogenous schools, even as the racial and class identity of the median city voter changed with black in-migration.

With the rise of the civil rights movement in the 1950s, political constraints prevented northern cities from following a "southern strategy" of disenfranchising black voters or establishing separate school systems and public facilities by race. For northerners keen to avoid civic interactions with black newcomers, moving to a jurisdiction outside the central city was the individual alternative to such collective legal action.[46] By choosing a suburban location, white households could "vote with their feet," effectively selecting their desired bundle of public services even as metropolitan-level racial diversity increased.

To establish the demand for locations in predominately white jurisdictions, I compare prices for housing units on adjacent Census blocks across municipal boundaries in 1970. We know that the composition of the local electorate, and thus the bundle of public goods, changes

[45] There is more variation in neighborhood-level racial diversity within borders than across them. A one standard deviation increase in a tract's black population share (24 percent) would translate into the loss of 1.2 children.
[46] Absent legal barriers, increasing racial diversity may have also prompted white neighborhoods to secede from the central city. In a similar vein, Alesina, Baqir and Hoxby (2004) demonstrated that school districts in counties receiving large black in-migrations during the decades of World Wars I and II were less likely to consolidate with neighboring districts.

discretely at these borders, but, to identify a demand for jurisdictional homogeneity, we must assume that housing and neighborhood quality change more continuously. I demonstrate that observable measures of the housing stock, such as the share of units that are single family, do not vary across these borders. Furthermore, even after using variation over time (1950-70) to control for fixed differences in housing quality, I still find a sizeable relationship between housing prices and jurisdiction-wide racial diversity. For jurisdictions separated by a 13.2 percentage point gap in the black population share (the sample mean in 1970), homes on the diverse side of the border are worth, on average, 1.5 to 3.0 percent less, depending on the source of identifying variation.

Black migrants to northern cities were marked not only for their race; they were also noticeably poorer than existing urban residents, having recently arrived from the rural South. The white suburbanization response can be described, in part, as a flight of the middle class. Half of the estimated "homogeneity premium" can be attributed to a demand for living in a jurisdiction with rich residents, with the associated reduction in property taxes and redistributive spending. Nonetheless, by 1970, race drove a further wedge between city and suburban housing prices. This residual race effect cannot be explained by spending on education, public safety, or other local public goods; nor is it due to the demand for white classmates (which is also in evidence). The timing is consistent with a growing fear of a black presence in urban politics following the 1960s riots.[47]

[47] The first black mayors in American cities, Carl Stokes of Cleveland and Richard Hatcher of Gary, Indiana, were elected in 1967, soon after riots in both of those cities. By the early 1970s, other major cities, including Detroit, Los Angeles, and Washington, D.C., had followed suit.

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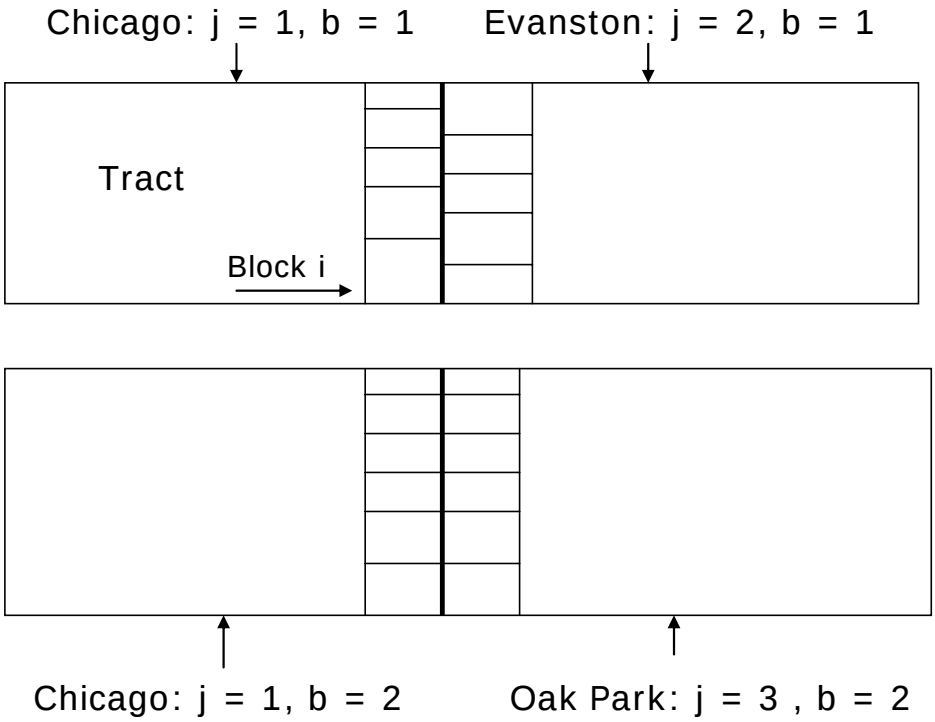
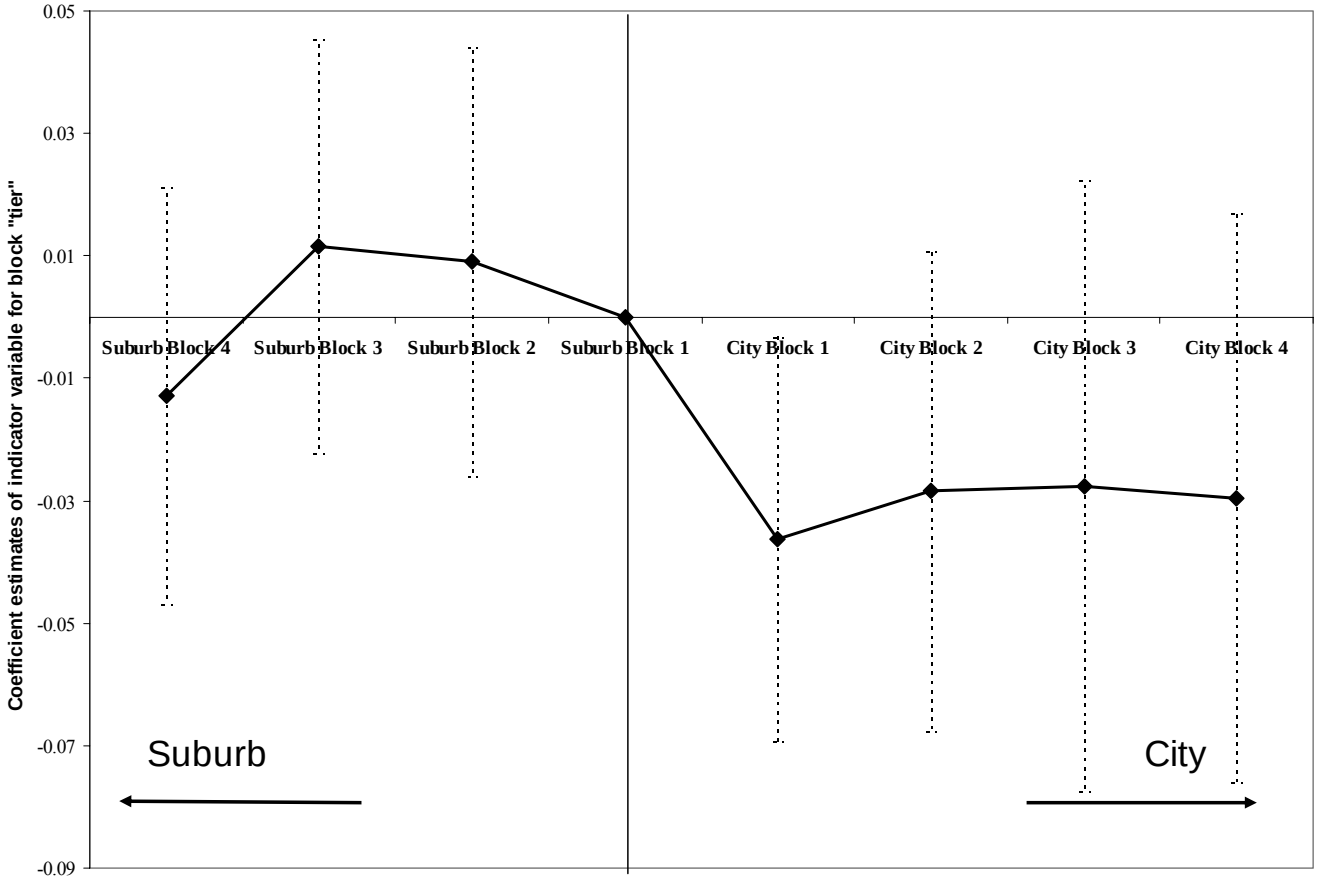
Figure 1: Schematic Diagram of Geographic Terms



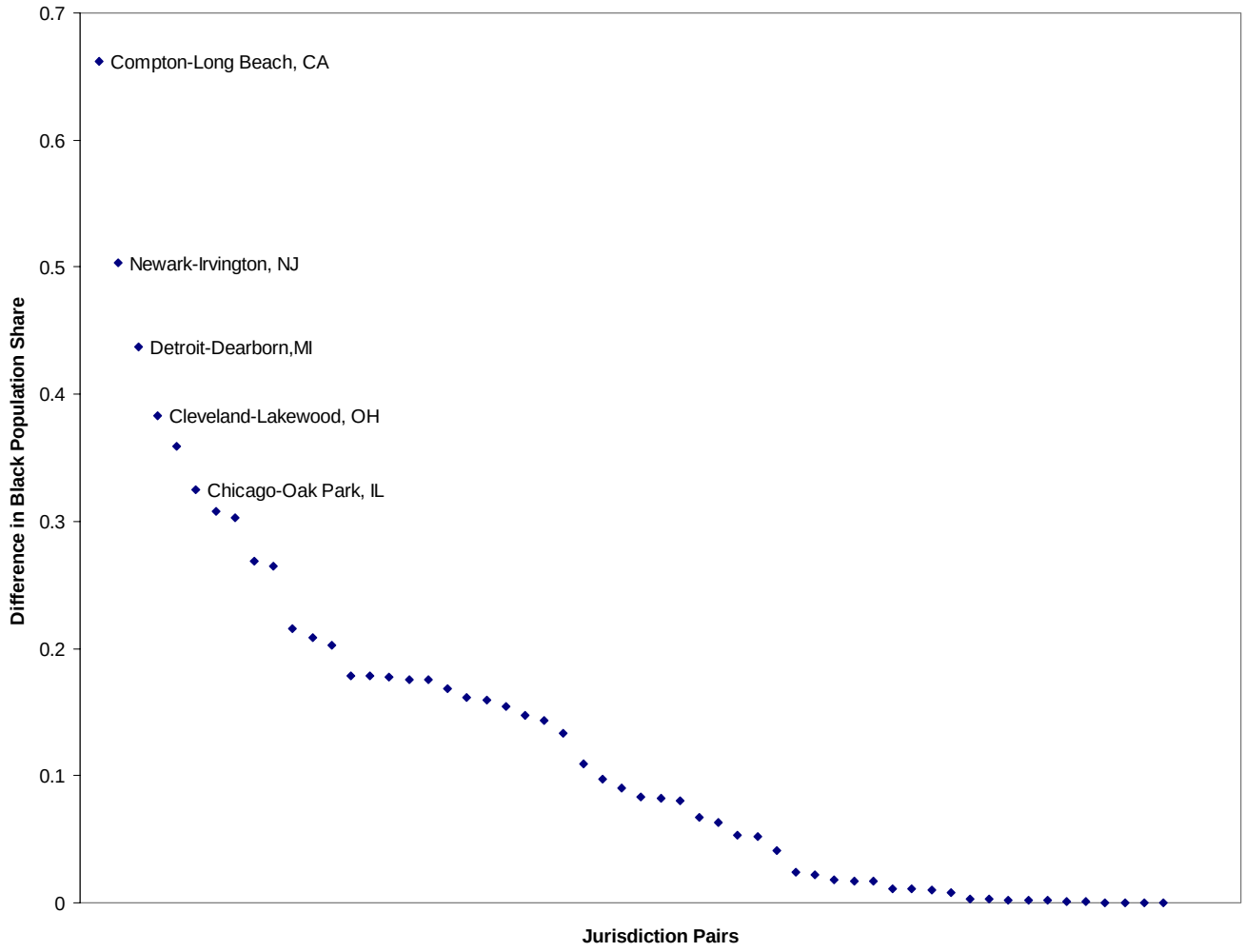
where i = block; b = border; j = jurisdiction

Figure 2: The Discontinuous Fall in Housing Prices on the Diverse Side of Jurisdictional Borders, 1970



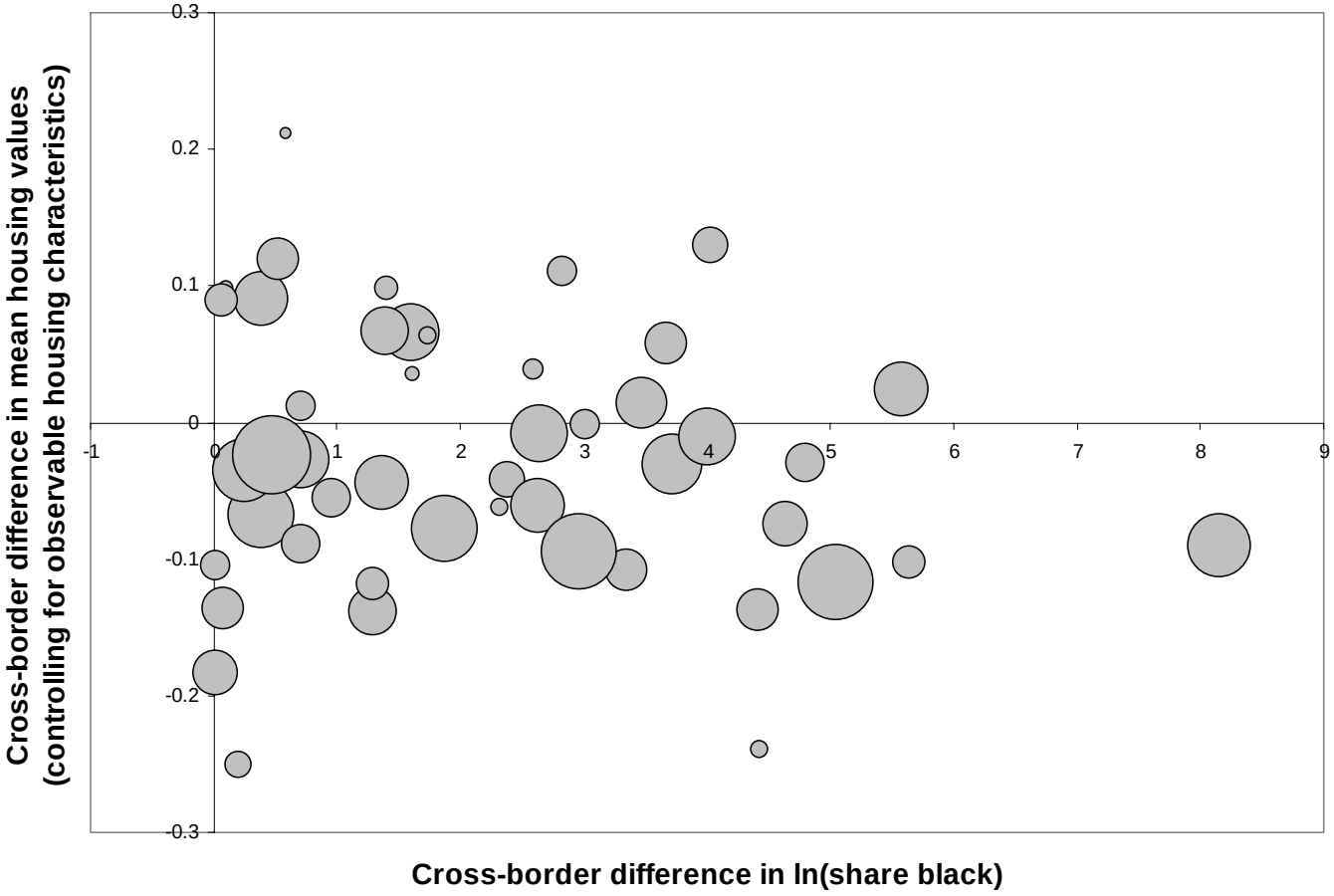
Notes: The label "city" here refers to the more diverse side of a jurisdictional border. Likewise, "suburb" refers to the homogenous side. The points on the graph are coefficient estimates in a regression of the logarithm of housing prices per room on a series of indicator variables for the distance of the block from the border, as well as block-level housing quality variables. Distance from the border is measured in block "tiers," with the first tier including all blocks adjacent to the border, the second "tier" all blocks adjacent to the first, and so on. The first suburban block tier is the omitted category. The block-level housing quality variables are: the share of the block's residents that are black; the share of housing units that are in single-family units, owner-occupied, or vacant; the block density; and an indicator for the presence of group quarters. Also included are the share of the tract's residents that are black.

Figure 3: Cross-Border Differences in Jurisdiction-Level Black Population Shares, 1970



Notes: Each point represents one of the 57 jurisdictional borders in the data, with the difference in the black population share between the two municipalities indicated on the y-axis.

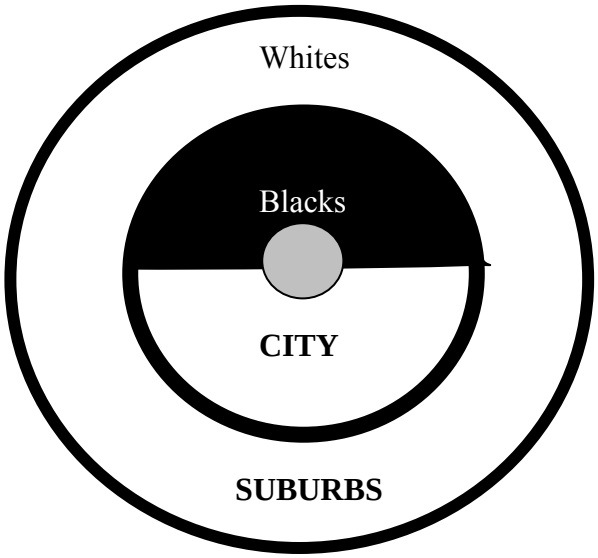
Figure 4: The Relationship between Differences in Jurisdiction-level Racial Composition and Housing Prices Across Borders, 1970



Notes: Each point in the scatter represents one of the 57 borders in the sample, with the size of the circle indicating the number of housing units represented in the data.

Figure 5: The Emergence of a Housing Price Gap at the City/Suburban Border with Black In-Migration: Two Scenarios

Scenario A: Two groups with different preferences over public goods



Scenario B: Two groups with different income levels

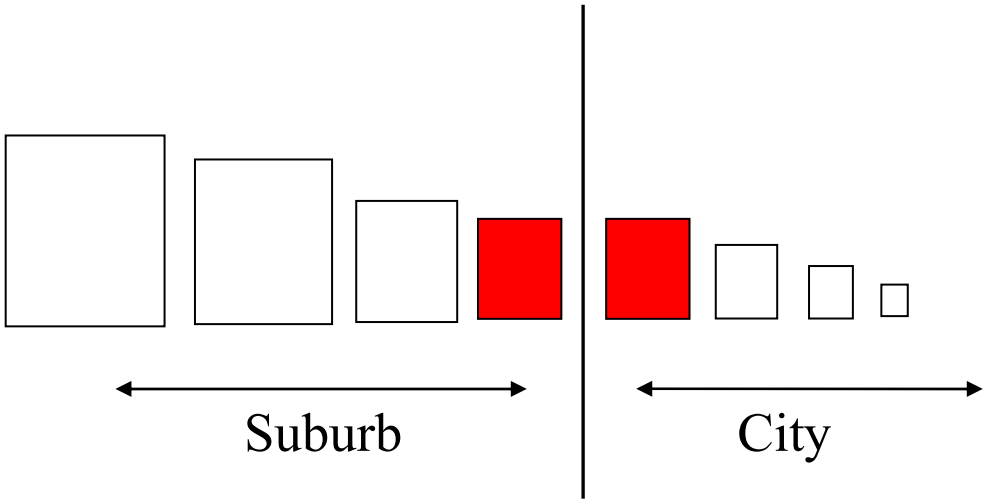


Table 1: Jurisdictional Borders Included in Panel Sample

Region	City	Number of Borders
I. Largest 25 cities in 1960		
A. In sample		
Northeast	Boston	2
	New York†	10
	Pittsburgh	3
Midwest	Chicago†	6
	Cleveland	2
	Detroit	1
	Minneapolis/St.Paul	1
	St. Louis	1
South	Atlanta	1
West	Denver	1
	Los Angeles†	17
	San Francisco†	2
B. Not in sample		
Northeast	Baltimore	
	Buffalo	
	Philadelphia	
Midwest	Milwaukee	
	Cincinnati	
South	Dallas	
	Houston	
	Memphis	
	New Orleans	
	San Antonio	
	Washington, DC	
West	San Diego	
	Seattle	
II. Out of Top 25		
Northeast	Providence	3
Midwest	Dayton	1
	Moline-Davenport, IL-IA	1
	Kansas City, KS-MO	2
West	San Jose	4

Notes: Metropolitan areas marked with † contained secondary central cities in 1960 that are now considered by the Census Bureau to anchor their own, independent metropolitan areas. These are: Newark, NJ; Jersey City, NJ; and Clifton, NJ (New York); Gary, IN (Chicago); Anaheim, CA (Los Angeles); and Oakland, CA (San Francisco). Political borders separate two jurisdictions in the same metropolitan area, and are included in the sample if both jurisdictions have available block-level data in 1960, and if the border was unobstructed by a natural or man-made obstacle.

Table 2: Testing the Neighborhood Continuity Assumption: The Cross-Border Relationship between Housing Characteristics and Jurisdiction-level Racial Composition

	Coefficient on share black in jurisdiction	
Dependent variable	1960	1970
Share single family	---	0.056
		(0.058)
Share owner occupied	0.095	-0.003
	(0.102)	(0.046)
Share no plumbing	0.121	0.011
	(0.097)	(0.006)
Residents/units	-0.919	-0.226
	(0.349)	(0.161)
=1 if any group quarters	0.057	-0.081
	(0.097)	(0.049)
Border dummies?	Y	Y
Block controls?	Y	Y
N	1459	1352

Notes: Each cell represents the coefficient on the jurisdiction-level black population share in a separate regression, the dependent variable of which is listed in the first column. Standard errors are reported in parentheses and clustered by jurisdiction. All regressions are weighted by the number of housing units on the block, with the exception of 'residents/unit,' which is weighted by the number of residents on the block. All regressions include the full set of block-level controls (listed in the first column), with the exception of dependent variable itself, as well as the share of the residents in the Census block and tract that are black and the size of the jurisdiction. Summary statistics for block- and jurisdiction-level variables are in Appendix Table 1.

Table 3: The Relationship between Housing Values/Rents and Jurisdiction-level Demographic and Socioeconomic Characteristics, 1970

	RHS variable of interest (jurisdiction level)				
Dependent variable	Share black	ln(share black)	ln(median income)	Share below poverty	Share college grad
ln(home values)	-0.135	-0.010	0.187	-0.677	0.237
	(0.041)	(0.003)	(0.035)	(0.171)	(0.101)
Share for sale	0.002	-0.000	-0.010	0.034	-0.013
	(0.002)	(0.000)	(0.008)	(0.022)	(0.007)
ln(rents)	0.206	0.013	-0.102	0.522	0.223
	(0.097)	(0.006)	(0.063)	(0.293)	(0.124)
Share for rent	0.028	0.001	-0.025	0.106	-0.037
	(0.008)	(0.0007)	(0.006)	(0.028)	(0.010)
Border dummies?	Y	Y	Y	Y	Y
Block controls?	Y	Y	Y	Y	Y
N (rent/value)	1212/1376	1212/1376	1212/1376	1212/1376	1212/1376

Notes: Each cell represents the coefficient on a jurisdiction-level demographic variable in a separate regression, the dependent variable of which is listed in the first column. Standard errors are reported in parentheses and clustered by jurisdiction. Price regressions are weighted by the number of owner-occupied (rows 1) or rental (row 3) housing units on the block. Vacancy regressions are weighted by the number of units, regardless of tenure. All regressions include the full set of block-level controls, which are: the share of the block's residents that are black; the share of housing units that are in single-family units, owner-occupied, or vacant; the block density; and an indicator for the presence of group quarters. Also included are the share of the tract's residents that are black, and the total jurisdiction population.

Table 4: Comparing the Property Value Gap at the Actual Jurisdictional Border to a Series of "Placebo" Borders, 1970

Dependent variable = ln(housing value per room)

	Coefficient on ln(share black) at jurisdiction-level	
	Block-level experiment Placebo = Tier 1 vs. Tier 2	Tract-level experiment Placebo = Tiers 1-4 vs. Tiers 5-8
Actual border n = 1277; 1937	-0.010 (0.004)	-0.010 (0.006)
Suburban placebo n = 874; 1270	0.006 (0.011)	0.007 (0.004)
City placebo n = 952; 1583	0.009 (0.008)	-0.012 (0.003)
Border dummies?	Y	Y
Block controls?	Y	Y

Notes: Each cell represents the coefficient on the black population share at the jurisdiction-level in a separate regression for which the dependent variable is the log of housing values per room. The first row reproduces the actual experiment, comparing blocks across the true jurisdictional border. Rows 2 and 3 report housing price gaps at the suburban and city border respectively. For the block-level placebo exercise (column 2), I create an imaginary border between the first and second block tiers. For the tract-level placebo exercise (column 3), I compare the first four block tiers to the second four, measured by distance from the true border. For all placebo regressions, the tier(s) that are closest to the central city are assigned the city's demographic profile. Standard errors are reported in parentheses and clustered by jurisdiction. Regressions are weighted by the number of owner-occupied housing units on the block. All regressions include the full set of block-level controls, which are: the share of the block's residents that are black; the share of housing units that are in single-family units, owner-occupied, or vacant; the block density; and an indicator for the presence of group quarters. Also included are the share of the tract's residents that are black, and the total jurisdiction population.

Table 5: Changes in Housing Values and Jurisdiction-Level Characteristics Over Time, 1960-70

Dependent variable = ln(home values per room)

	RHS variables of interest (jurisdiction level)			
	Share black	ln(share black)	ln(median income)	Share college graduate
1970 only	-0.170	-0.013	0.236	0.283
n = 1376	(0.039)	(0.002)	(0.029)	(0.105)
1960-70	-0.127	-0.006	0.197	0.327
n = 2842	(0.047)	(0.002)	(0.035)	(0.087)
1950-1970	-0.117	-0.005	0.189	0.311
n = 3163	(0.047)	(0.002)	(0.035)	(0.087)
Block controls?	Y	Y	Y	Y
Border/year dummies?	Y	Y	Y	Y

Notes: Each cell represents the coefficient on a jurisdiction-level demographic variable in a separate regression, for which the dependent variable is the log of housing values per room. Standard errors are reported in parentheses and clustered by jurisdictions. Regressions are weighted by the number of owner-occupied housing units on the block. All regressions include the limited set of controls available in 1950, which are: the share of the block's housing units with a black household head and the share of tract residents that are black. The first row reproduces the cross-border regression in 1970 with this limited set of controls. Regressions in the second and third row pool data from 1950- or 1960-1970 and add a dummy variable for the Census year, and a set of interactions between the Census year and the border area. The second row is a balanced panel of 57 border areas in 1960 and 1970. The third row adds the 20 jurisdictional borders available in 1950.

Table 6: Is the Relationship between Housing Values and Racial Composition Driven by Jurisdiction-Level Differences in Income?

Dependent variable = ln(housing values per room)

	1960		1970	
RHS variables	Share black	Other RHS variable	ln(share black)	Other RHS variable
Alone	-0.123	---	-0.012	---
	(0.067)		(0.003)	
ln(median income)	0.105	0.221	-0.006	0.158
	(0.082)	(0.064)	(0.004)	(0.056)
Share with college degree	-0.019	0.385	-0.011	0.239
	(0.075)	(0.076)	(0.003)	(0.082)
Share below poverty line	---		-0.007	-0.433
			(0.004)	(0.241)
ln(sh. below poverty line)	---		-0.005	-0.044
			(0.004)	(0.018)
Border dummies?	Y		Y	
Block controls?	Y		Y	
N	1461		1381	

Notes: Each cell represents the coefficient on share black or its logarithm from a separate regression for which the dependent variable is the log of housing values per room. In the first row, the only jurisdiction-level variable included is the black population share. Each subsequent row adds an additional jurisdiction-level socio-economic variable (with replacement). Standard errors are reported in parentheses and clustered by jurisdictions. Regressions are weighted by the number of owner-occupied housing units on the block. All regressions include the limited set of controls available in 1960, which are: the share of the block's residents that are black; the share of housing units that are owner-occupied; the block density; and an indicator for the presence of group quarters. Also included are the share of the tract's residents that are black.

Table 7: Can Cross-Border Variation in Public Goods Explain the Residual "Race" Effect in 1970?

Added variables	ln(share black) x 10	Share in poverty	Other RHS variables
Panel 1			
1. Base specification	-0.065	-0.525	---
n = 1293	(0.038)	(0.236)	
2. Total $ per pupil	-0.063	-0.532	0.002
(*in 1,000s*)	(0.039)	(0.238)	(0.003)
3. Non-educational $	-0.063	-0.266	-0.046
per capita (*in 1,000s*)	(0.039)	(0.259)	(0.015)
4. Road $ per capita	-0.096	-0.184	-1.026
	(0.037)	(0.261)	(0.168)
Sanitation $ per capita			0.061
			(0.340)
Park $ per capita			-0.336
			(0.183)
5. Police $ per capita	-0.060	-0.405	-0.144
	(0.036)	(0.316)	(0.188)
Panel 2			
1. Base specification	-0.055	-0.521	---
n = 911	(0.028)	(0.201)	
2.Arrest rate	-0.053	-0.479	0.012
Principal factor: Murder, assault, burglary	(0.027)	(0.200)	(0.003)
Border dummies?	Y	Y	Y
Block controls?	Y	Y	Y

Notes: Standard errors are reported in parentheses and clustered by jurisdiction. Regressions are weighted by the number of owner-occupied housing units on the block. All regressions include the full set of block-level controls, which are: the share of the block's residents that are black; the share of housing units that are in single-family units, owner-occupied, or vacant; the block density; and an indicator for the presence of group quarters. Also included are the share of the tract's residents that are black, and the total jurisdiction population. Sources and notes on the public goods measures are in Appendix Table 2.

Table 8: Preferences for Same-Race Classmates: Evidence from Block-level Age Distributions, 1970

	Dependent variables			
Share black in…	Share age 0-4	Share age 5-9	Share 10-13	Share age 14-17
High school	-0.009	-0.010	-0.025	-0.014
	(0.007)	(0.007)	(0.006)	(0.006)
Tract	0.023	-0.014	-0.013	-0.004
	(0.009)	(0.009)	(0.008)	(0.007)
Border dummies?	Y	Y	Y	Y
Juris. controls?	Y	Y	Y	Y
Block controls?	Y	Y	Y	Y
N	1606	1606	1606	1606

Notes: Coefficients are from a set of seemingly unrelated regressions. Standard errors are reported in parentheses and clustered by jurisdiction. Regressions are weighted by the number of residents on the block. The regressions include the full set of block-level controls, which are: the share of the block's (tract's) residents that are black; the share of housing units that are in single-family units, owner-occupied, or vacant; the block density; and an indicator for the presence of group quarters. They also control the jurisdiction-level black population share and the share of the jurisdiction's residents below the poverty line. Five borders in the sample are excluded because they share a high school district. These are: Long Beach-Lakewood and Richmond-El Cerrito, CA; Berwyn-Cicero and Skokie-Evanston, IL; and McKeesrock and Stowe, PA.

Appendix Table 1: Summary Statistics of Jurisdiction- and Block-level Variables, Across Borders and Over Time

	1970		1960-70
Mean (S.D.)	All jurisdictions	Difference across borders	Difference across borders
Panel 1: Jurisdiction level			
Share black	0.109 (0.146)	0.132 (0.142)	0.052 (0.054)
Share college degree	0.128 (0.087)	0.071 (0.074)	0.079 (0.112)
Median family income, $ 2000	$49,117 ($8.696)	$8,433 ($6,387)	$11,582 ($11,417)
Share below poverty	0.073 (0.036)	0.043 (0.032)	
In $1,000 ($2000): Total $ per pupil	4.653 (1.968)	1.501 (1.976)	
Non-educ $ per capita	0.646 (0.447)	0.274 (0.301)	
$ on roads, per capita	0.042 (0.024)	0.020 (0.022)	
$ on parks, per capita	0.048 (0.037)	0.037 (0.028)	
$ on sanitation, pc	0.032 (0.019)	0.017 (0.016)	
$ on police, per capita	0.093 (0.039)	0.048 (0.036)	
High school level Share black	0.157 (0.269)	0.205 (0.267)	

(table continued…)

Appendix Table 1, continued

	1960	1970
Panel 2:		
Tract level		
Share black	0.044	0.113
	(0.141)	(0.242)
Block level		
Housing variables		
Share single family	---	0.613
		(0.349)
Share owner occupied	0.595	0.588
	(0.322)	(0.309)
Share vacant	---	0.027
		(0.046)
Share lacking plumbing	0.142	0.015
	(0.272)	(0.053)
Residents/unit	3.063	2.983
	(1.116)	(0.979)
=1 if group quarters	0.046	0.027
	(0.210)	(0.162)
Population variables		
Share black	0.028	0.093
	(0.121)	(0.238)
Share age 0-4		0.071
		(0.043)
Share age 5-9		0.076
		(0.046)
Share 10-13		0.066
		(0.042)
Share age 14-17		0.065
		(0.040)

Appendix Table 2: Sources for Jurisdiction-level Public Goods Data

Variable	Source
Current (non-educational) expenditure[1] - on roads - on parks - on sanitation - on police	*Census of Governments*, 1967
Educational expenditure, per pupil[1] - instructional - administrative	*Elementary and Secondary General Information System* (ELSEGIS), 1968-69
Pupil-teacher ratio	*Office of Civil Rights* (OCR) *School District Files*, 1970
Crimes known to the police Crimes cleared to arrest	*Uniform Crime Reports*, 1969
Real property tax rates: [2] - nominal rate - assessment-to-market ratio	*Moody's Municipal and Gov't Manual, 1971* *Census of Governments, 1967*

Notes:
1: Educational spending per pupil is collected both from independent school districts and municipal school systems. Non-educational expenditures are measured at the municipal level. In some states, counties provide some public services as well. Most jurisdiction pairs in the sample fall within the same county, and thus county spending will not produce cross-border variation.
2: The nominal property tax rates are collected from all levels of local government (municipality, county, independent school districts, special districts), if applicable. The real property tax rate facing a homeowner is a product of the nominal rate – or, dollars due to the public coffer per $1,000 in assessed value – and the assessment-to-market value ratio. The *Census of Government* estimates assessment-to-market ratios by jurisdiction from a sample of recent home sales. Ratios are often reported only for the central city and for the "balance of the metropolitan area," thus eliding some variation between towns in the suburban ring.