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WHITE SUBURBANIZATION AND AFRICAN-AMERICAN HOME OWNERSHIP,
1940-1980

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ABSTRACT

Between 1940 and 1980, the homeownership rate among metropolitan African-American households increased by 27 percentage points. Nearly three-quarters of this increase occurred in central cities. We show that rising black homeownership in central cities was facilitated by the movement of white households to the suburban ring, which reduced the price of urban housing units conducive to owner-occupancy. Our OLS and IV estimates imply that 26 percent of the national increase in black homeownership over the period is explained by white suburbanization.

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I. Introduction

In 1940, 19 percent of African-American households living in metropolitan areas were homeowners. By 1980, the metropolitan black owner-occupancy rate had risen to 46 percent, an increase of 27 percentage points (see Table 1). The dramatic expansion in black owner-occupancy between 1940 and 1980 was not part of a secular trend; indeed, the black home ownership rate changed very little from 1900 to 1940, and was virtually unaltered between 1980 and 2010 (Collins and Margo, 2011).

Of course, as Table 1 demonstrates, metropolitan white households also increased their owner-occupancy rate substantially between 1940 and 1980. Among whites, this increase was associated with a substantial geographic shift from central cities to the suburbs. The suburban housing stock was (and is) predominately composed of single-family dwellings, the housing structure type most conducive to owner-occupancy during the period (and today). As a result, owner-occupancy rates for suburban households, white or black, were always higher than those of central city dwellers throughout the period.¹ A shift-share analysis using the figures in Table 1 establishes that 59 percent of the overall increase in white owner-occupancy in metropolitan areas between 1940 and 1980 can be explained by the rising share of white households living in the suburban ring.² In contrast, the geographic shift to the suburbs can explain only *seven* percent of the overall rise in black homeownership between 1940 and 1980 and none whatsoever from 1940 to 1960. Rather, for black households, the primary proximate cause of the postwar

¹ In 1960, 79 percent of suburban housing units were detached, single-family dwellings. Over 80 percent of single-family dwellings were owner-occupied in that year, compared with fewer than 20 percent of multi-family dwellings (see Table 2 for more detail on the relationship between structure and tenancy type). In recent decades occupancy rates in multi-family dwellings have risen because of the spread of condominium ownership. There were essentially no condominiums in the United States prior to 1960 and the ownership form had only begun to diffuse by the 1970s (Lasner, 2012).

² In a shift-share analysis, the direct effect for whites of the shift to the suburbs is equal to the owner-occupancy rate of whites living in the suburban ring in 1940 (0.522, see Table 1) multiplied by the increase in percent suburban between 1940 and 1980 (0.355). The product is 0.171, which accounts for 59 percent of the overall increase in white owner-occupancy ($= 0.171/0.288 \times 100$ percent).

rise in metropolitan homeownership was a substantial increase in rates of owner-occupancy within central cities.³

We argue that postwar white suburbanization and rising black homeownership in central cities were not independent phenomena but that the former – white suburbanization – was a causal factor in the latter – rising black owner-occupancy. In particular, we document that the rise in black owner-occupancy in central cities was not uniform across the country but increased faster, on average, in metropolitan areas that experienced greater white outflows to the suburbs. The positive relationship between rising black ownership and white suburbanization is highly robust and persists when instrumenting for white suburbanization with the construction of the interstate highways, suggesting that the relationship is causal.

We propose that white suburbanization contributed causally to the growth in black owner-occupancy through the economic functioning of the postwar urban housing market. In 1940, before mass suburbanization, African-American city dwellers faced relatively high housing prices and rents due to informal barriers that prevented blacks from settling in white neighborhoods, thereby restricting black housing supply (Kain and Quigley, 1972; King and Mieszkowski, 1973; Cutler, Glaeser, and Vigdor 1999). As whites began leaving central cities the user costs of owner-occupancy faced by African Americans relative to renting decreased and black households responded by increasing their level of homeownership. The effect was particularly strong in those central cities that featured a substantial pre-existing stock of

³ For blacks, the effect of the increase in owner-occupancy rates in the central city in the shift-share analysis is the share living in central cities in 1980 (0.724) multiplied by the change in black owner-occupancy rate in central cities between 1940 and 1980 (0.271). The product is 0.196, which accounts for 73 percent of the overall rise in black metropolitan owner-occupancy ($=0.196/0.270 \times 100$ percent). If the same calculation is performed for the 1940 to 1960 period, the product is 0.146, which accounts for 80 percent of the overall rise in the black metropolitan owner-occupancy. Beginning in the 1970s, African-Americans started to suburbanize, a trend that accelerated after 1980. As Table 1 shows, the overall rate of black owner-occupancy was approximately constant between 1980 and 2010 but within central cities or the suburbs, owner-occupancy was lower in 2010 than in 1980. The constancy of the overall rate can be attributed entirely, therefore, to black suburbanization after 1980.

detached, single family dwellings occupied by white homeowners prior to postwar white suburbanization.⁴

A large literature has attributed historical and contemporary racial disparities in home ownership to racial differences in “permanent” income and access to mortgage finance and to housing market discrimination (see, for example; Gyourko, Linneman, and Wachter, 1999; Deng, Ross, and Wachter, 2003; Gabriel and Rosenthal, 2005; Haurin, Herbert, and Rosenthal 2007). Changes in each of these factors likely contributed to the rise in black homeownership in the mid-twentieth century. Labor economists, for example, have documented substantial gains in African-American real incomes and educational attainment between 1940 and 1980 (Smith and Welch 1989; Donohue and Heckman 1991), attributes that are positively related to owner-occupancy. A vast expansion in mortgage finance took place between 1940 and 1980, some of which reached African-American households, despite “redlining” and other discriminatory practices of the era (Collins and Margo 2011; Fetter, 2013). Fair housing legislation aimed at eliminating housing market discrimination was passed at the federal level in 1968, and similar laws preceded the federal act in some states and cities. However, none of these factors plausibly account for the strong geographic relationship we observe at the metropolitan area level between black central city homeownership and white suburbanization.⁵

⁴ It is usually more efficient (that is, user costs are lower) when the owner of a detached, single-family dwelling is also the occupier (Henderson and Ioannides, 1983; Glaeser and Shapiro, 2003). We discuss this relationship in more detail in section II.

⁵ There are three reasons why these conventional explanations for the racial gap in home ownership cannot explain the observed relationship between white suburbanization and black owner-occupancy. First, we show that this relationship holds even after controlling for median income at the city level or for household income in a sample of black households in central cities. Second, both the postwar expansion of mortgage finance and the federal fair housing laws occurred throughout the nation, not in select metropolitan areas with above-average levels of white suburbanization. Finally, we observe the suburbanization effect prior to 1970, before the federal fair housing law could have had much impact. Similar laws passed at the state and local level prior to 1968 are also thought to have been largely ineffective; see Collins (2004).

Our findings are based on a new panel dataset of household counts that we construct for 98 metropolitan areas from 1940 to 1980 by race, location (central city or suburb), and ownership status that corrects for changes over time in central city boundaries. Our baseline OLS estimate implies that every 1,000 white departures from the typical central city generated 87 black owner-occupiers.

The OLS estimate may be biased away from zero – that is, may be too large in absolute value – in the presence of reverse causality, say because rising black incomes encouraged black households to buy units in white neighborhoods, thereby prompting “white flight” to the suburbs (Card, Mas, Rothstein, 2008; Boustan, 2010). Conversely, the OLS estimate may be biased towards zero, for example, because of measurement error. We address endogeneity by instrumenting for the number of white households in the central city with features of the Interstate Highway System. New road construction encouraged white households to move to the suburbs by reducing the cost of commuting from bedroom communities to downtown firms. We use Baum-Snow’s (2007) detailed dataset on highway construction to compute the predicted number of completed highway rays passing within one mile of each central city by decade. Our IV estimate of the effect of white departures on black homeownership is slightly larger but not significantly different from our OLS estimate, suggesting that any endogeneity bias is small. Using the IV coefficient we find that, nationwide, 26 percent of the increase in black owner-occupancy in central cities between 1940 and 1980 can be attributed to white suburbanization.

We provide further evidence consistent with our housing market story by documenting heterogeneity in the relationship between white suburbanization and black ownership across cities. We find that the estimated treatment effect depends positively on the initial stock of single-family dwellings conducive to owner-occupancy in the central city. Furthermore, we show

that the national estimates are driven by cities that were losing white population to the suburbs over this period, cities that, for historical reasons, attracted relatively large numbers of black residents. Some suburbanization, especially in the South and West, did not lead to population loss in the city center but instead was a byproduct of general regional growth; in these growing cities, the housing market effect we have in mind is not present.

Aside from its contribution to our understanding of racial owner-occupancy gap, our paper also contributes to a large literature in economics and sociology on the effects of residential segregation on African-American outcomes. Cutler and Glaeser (1997) argue that, theoretically, neighborhood segregation can be either beneficial or harmful to minority groups. Much of the prior literature has found evidence of the latter; blacks living in more segregated metropolitan areas have suffered from low earnings and educational attainment, at least since 1970 (Massey and Denton, 1993; Cutler, Glaeser, and Vigdor, 1999; Collins and Margo, 2000; Ananat, 2011). Our paper demonstrates that white suburbanization, a major source of segregation between city and suburb during the period of analysis, may have had a “silver lining” in that it facilitated black owner-occupancy in an era when broader opportunities for black wealth accumulation were limited. Homeownership contributes to wealth accumulation at the household level (Green and White 1997; Turner and Luea, 2009) and is an important factor in reducing the overall black-white wealth gap (Blau and Graham, 1990; Charles and Hurst, 2002). Indeed, despite the fiscal crises that befell some cities in the late 1960s and 1970s, the value of black owner-occupied housing in central cities appreciated at a rate equal to the general metropolitan housing stock (2.6 percent average annual) from 1940 to 1980 (Collins and Margo 2003).

II. White Suburbanization and Black Central City Homeownership: A Conceptual Framework, 1940-1980

This section provides a series of historical and conceptual arguments that together establish a possible connection between white departures from central cities and rising rates of urban black homeownership in the mid-twentieth century.

First, from 1940 to 1980, white urban households relocated to the suburban ring while black urban households remained in the central city. Suburbanization was driven, in large part, by rising real incomes after World War II and by the construction of the new Interstate Highway System (Margo, 1992; Baum-Snow, 2007). Table 1 illustrates that the share of white metropolitan households living in the suburban ring increased from 36 to 68 percent over our period, while the share of black metropolitan households in the suburbs rose only from 19 to 28 percent. Although black households had lower incomes, on average, than their white counterparts, the racial disparity in suburbanization rates cannot be explained by differential income levels.⁶ Instead, low rates of black suburbanization can likely be attributed to formal and informal barriers against black entry into predominately-white suburban towns.⁷

Second, despite being weighted toward multi-family apartment buildings, the housing stock in central cities was composed of a combination of single-family and multi-family units. In the urban core, land is expensive relative to capital. As a result, housing tends to be densely constructed in order to economize on land use. That said, except in isolated cases – Manhattan is

⁶ For example, in 1960, we estimate that a 10 percent increase in income (or, around \$4,000 in 2010 dollars) among metropolitan whites was associated with a 1.2 percentage point rise in the likelihood of living in the suburbs; this relationship is strongly statistically significant (see also Margo 1992). However, a 10 percent increase in income for metropolitan blacks (\$2,200) raises the likelihood of living in the suburbs by only 0.02 percentage points, a vanishingly small amount that cannot be statistically distinguished from zero.

⁷ There is considerable qualitative evidence that, in the mid-twentieth century, overt acts of racial discrimination constrained black housing choices, especially in suburban areas (see, for example, Sugrue, 1996 and Wiese, 2004). Prior to the passage of federal legislation in 1968, private individuals in many states – real estate agents, bankers, owners of housing developments – were legally free to steer black customers away from white neighborhoods or to refuse to sell or rent property to black households outright (McAllister, 2009).

the prime example – there are neighborhoods of single family dwellings in every central city. In 1960, for example, the middle of our period, 44 percent of white households in central city neighborhoods lived in detached, single-family units (see Table 2).

Third, detached single family units are more likely to be owner-occupied, both in theory and in empirical fact. Theory suggests that the optimal contractual form for detached, single-family dwellings is owner-occupancy (Henderson and Ioannides, 1983; Glaeser and Shapiro, 2003). Because landlords are unable to fully monitor tenants, the externality of efficient care of the property can only be internalized if the owner of the dwelling is also the occupant. The public-goods aspects to the maintenance or upgrading of multi-family dwellings imply that individual owners may be tempted to free ride on the effort of others. The user cost to the renter in this case may be less than the user cost under owner-occupancy subject to the free-riding problem.⁸

Consistent with these theoretical arguments, there is a very strong empirical relationship between structure type and ownership rates. Table 2 presents the ownership-structure type patterns for white and black households living in central cities in 1960; this relationship is nearly identical in the suburbs and is stable across decades.⁹ Ownership falls monotonically with the number of separate housing units at a given address. 83 percent of white residents in detached single-family dwellings are owner-occupiers, compared to only 8 percent of white residents in

⁸The externality can be mitigated by legal arrangements such as cooperatives or condominiums. Historically, cooperatives were very limited in the United States, and condominium ownership only began to diffuse in the 1970s; see Lasner (2012).

⁹ We find qualitatively similar relationships between structure type and ownership in 1930 and 1980. Data on units in the structure is not available in 1940; however, we are able to examine a somewhat similar census variable reporting the number of households living at the same address in 1930 (this variable cannot distinguish ownership status for detached versus attached single family units, unlike the variable for 1960 and 1980). In 1930, 58 percent of white central city households living at a single-household address were owner-occupiers, compared to only 9 percent of white households living at an address with three or more households. In 1980, 85 percent of white central city households living in a detached, single-family unit were owner-occupiers, compared to 12 percent of white households in a building with three or more units.

buildings with three or more housing units. Despite lower overall levels of homeownership for blacks, a similar relationship between structure type and owner-occupancy holds for black households.¹⁰

Fourth, as white households left central cities at mid-century, the demand for and prices of centrally-located single-family units declined because whites left behind an existing housing stock that was highly durable. As Glaeser and Gyourko (2005) argue, housing supply is inelastic in the face of declining demand given that it takes 20 to 30 years for a typical housing unit to depreciate sufficiently to be removed from the housing supply. Therefore, white departures are expected to reduce housing prices in the central city through a decline in demand.¹¹ Table 3 demonstrates that white departures from central cities are associated with reductions in the median value of owner-occupied housing and the ratio of median housing values to median rents.¹² For the typical city, which lost 25,700 white households from 1940 to 1980, white departures resulted in an \$1,850 decline in the price of owner-occupied housing (in 2000 dollars), leading the ratio of prices to annual rents to fall by one-fifth of a standard deviation. As our hypothesis predicts, the effect of white departures on the price of owner-occupied housing is driven by the loss of white homeowners, rather than white renters.¹³

¹⁰ Although very strong, it is important to note that the relationship between structure type and ownership status is not absolute; at any point in time, some single-family detached units will be rented. Such rentals may be transitory while the owner waits for a bona fide buyer or while the owner is living elsewhere for some period of time.

¹¹ White movement to the suburbs would not necessarily be expected to lead to a corresponding increase in suburban housing prices. Housing developers would likely respond to heightened demand by constructing new units in the suburban ring until the price of suburban housing returned to construction costs.

¹² The housing values and rents are not adjusted for the quality of the housing stock, both because the available Census data on housing quality is poor (including only average number of rooms and average year of unit construction) and because, in some years, no quality measures are available at all. Therefore, the observed relationship between white departures and declines in housing prices could be due, in part, to changes in the quality of housing stock as whites leave the central city.

¹³ These findings are consistent with Cutler, Glaeser and Vigdor (1999) who demonstrate that increases in residential segregation driven by white departures from integrated areas are associated with falling rents faced by black renters because white departures free up housing supply for black residents.

Fifth, in addition to lowering the price of single-family units in the central city, white departures may have influenced the level of discrimination that prospective black home-buyers face in the city. If the white households that chose to relocate to the suburban ring were those most averse to racial diversity, their departures may have lowered the likelihood that a black homebuyer would have encountered a discriminatory home-seller, thereby expanding the share of the housing stock open to potential black purchase.

Sixth, the falling price of single-family units in the central city coupled with possible declines in housing discrimination would together increase black homeownership in the central city. The probability of being an owner-occupier depends, in part, on the price of owner-occupied units relative to rents. Consider a simple user cost model of owner-occupancy, which holds that:

$$\text{Pr}(\text{owner-occupancy}) = f(Z, \text{permanent income, relative user cost of owner-occupancy}) \quad (1)$$

where Z includes demand shifters such as marital status, family size and the age of the household head (see, for example, Rosen, 1979 and Goodman, 1988). The probability of owner-occupancy is assumed to increase with permanent income and decrease with the relative user cost of owner-occupancy. In this case, a decline in the relative price of single-family dwellings in the central city would encourage some households to shift from renting into ownership. Low-income or low-wealth households that face credit constraints, as many black households certainly were at the time, may be particularly sensitive to changes in the relative price of owner-occupancy.¹⁴ In

¹⁴ To get a sense of the relative incomes of blacks and whites in 1940, consider that, in the typical metropolitan area, only 23 percent of black renters earned above than the 25th percentile of the white homeowners' income distribution and thus could plausibly be in the market for a home purchase. This share was slightly higher in robust industrial

our empirical work, we control for demand shifters and measures of permanent income by using either aggregate or individual-level measures of household income and additional demographic and socio-economic indicators. In some specifications, we add direct indicators of the relative user cost of owner-occupancy as measured by the ratio between median housing values and median rents.

To summarize this logic, we argue that white departures from the central city reduced demand for existing single-family units in the central city, thereby lowering the price of centrally-located housing conducive to owner-occupancy. As the relative cost of ownership declined, some black households that were on the margin between renting and ownership became homeowners.

Berry (1976) and Hirsch (1998) provide detailed historical evidence of the proposed relationship between white suburbanization and black homeownership at work in a single metropolitan area, Chicago. Prior to World War Two, the black population in Chicago grew substantially but black neighborhoods were geographically constrained and housing prices in the ghetto were high relative to household income. After the war, “there was a vast increase in housing available in the [suburban ring], and... rapid residential relocation [of white households] produced a substantial sag in demand in areas of traditional minority residence” (Berry, p. 417). Hirsch (p.28) confirms that “as vacancies began to appear around established black communities in the late 1940s and 1950s, black ‘pioneers,’ eager to escape ghetto conditions and both willing and able to compete economically for the inner-city housing becoming available, moved into previously all-white neighborhoods.” Local officials in Chicago estimated that “for every 100 units built in the suburbs... 15 dwelling units [in the city shifted] from white to black

cities like Milwaukee, WI and Pittsburgh, PA (around 30 percent) and was highest in small cities in the West such as Portland, OR.

occupancy” (cited in Hirsch, p. 28). Berry classifies 76 percent of the housing transactions in central city Chicago from 1968 to 1972, a four year period of (very) rapid change, as sales from white to black households. He calculates that approximately 37,000 black households in the central city purchased their own home over this period as a result of this turnover.

Although the evidence from Chicago is consistent with our argument, it is based on a single case study and it is not clear whether it can be generalized to other cities. In the next section, we use a newly constructed panel data set of metropolitan areas to estimate a broader treatment effect of white suburbanization on black central city homeownership in a large set of cities. Later in the paper we extend the empirical analysis to consider heterogeneous effects across cities.

III. Empirical Analysis

A. Data and estimating equations

Our primary dataset consists of newly-collected aggregate counts of black and white households by location in the metropolitan area (central city or suburb) and tenure status (renters and owners). We compile these figures for 98 metropolitan areas over five Census decades (1940 to 1980).¹⁵ A key feature of our data is that the geographic area of the central city and the surrounding suburbs are held constant over time using the 1950 central city boundary. Annexation of peripheral land was a common means of city growth during the 1950s and 1960s. As a city expands in land area, the number of white households in the central city rises mechanically, potentially masking any white mobility out of neighborhoods near the urban core. It is important, therefore, to correct for these boundary changes. To do so, we follow Baum-

¹⁵ Our sample includes metropolitan areas that either: (1) were anchored by one of the 100 largest cities in 1940 or (2) had at least 250,000 residents by 1980. Note that the sample has fewer than 100 areas because some metropolitan areas have more than one central city.

Snow's (2007) division of Census tracts into those inside and outside of the 1950 city boundaries. We then use tract data from 1960, 1970 and 1980 for Census tracts inside the 1950 city to calculate geographically consistent counts of households living within the 1950 central city boundaries.¹⁶ By this definition, any household living outside of the 1950 central city is considered to be suburban, even if the land on which it resides was later annexed into the city.

For our main analysis, we pool household counts from 1940 to 1980 and estimate:

$$\text{NUM_BLACK_OWN}_{ijt} = \beta(\text{NUM_WHITE})_{ijt} + \Gamma X_{ijt} + \alpha_i + \delta_t + (\lambda_j \cdot \delta_t) + \varepsilon_{ijt} \quad (2)$$

where the subscript i indexes metropolitan areas, j indicates the state, and t is the Census year. NUM_BLACK_OWNS is the number of black households in the central city of metropolitan area i who are owner-occupiers and NUM_WHITE is the total number of white households in that city. Because metropolitan areas differ in population size, the vector X contains three population controls – the number of black households in the city; the number of white households in the metropolitan area; and the number of black households in the metropolitan area.¹⁷ We also include metropolitan area (α_i) and Census year (δ_t) fixed effects, along with interaction between state and Census year ($\lambda_j \cdot \delta_t$).

The coefficient β indicates how the number of black homeowners changes with increases or decreases in the number of white households in the central city. The magnitude of β is easily interpretable as the number of units that are converted into black owner-occupied housing for

¹⁶ This approach is not affected by changes in Census tract coverage over time because all of the central cities in our sample were fully tracted by 1960, the year in which we start using tract data to recreate the 1950 central city boundaries. The Census Bureau did add tract coverage in suburban areas and in smaller cities from 1970 onward (see Rosenthal, 2008 for details on the expansion of Census tract coverage over time).

¹⁷ In particular, it is necessary to control for the number of black households in the central city because an increase in this number is mechanically related to the number of black owner-occupants. The coefficients of the population control variables are not reported in the tables but are available from the authors on request.

every white household that leaves the central city. We predict that black homeownership will increase as white households leave the city (that is, $\beta < 0$).

As a robustness check, we conduct an analysis with household-level records from the Integrated Public-Use Microdata Series (IPUMS) in 1940 and 1980. Limitations of the micro data prevent us from incorporating observations in the intervening years (1950 through 1970).¹⁸ Our sample includes nearly 47,000 African-American households that lived in a central city in one of the 98 metropolitan areas from our aggregate dataset that can be consistently identified in the micro-data in 1940 and 1980.

In our household-level regressions, we stack the micro data from 1940 and 1980 and estimate:

$$I(\text{OWN})_{kit} = \gamma(\text{NUM_WHITE})_{jt} + \Gamma X_{ijt} + \Delta Z_{kit} + \alpha_i + \delta_t + \varepsilon_{kit} \quad (3)$$

where k indexes households in the central city of metropolitan area i at time t .¹⁹ $I(\text{OWN})$ is an indicator function equal to one if a sample household owns the home that it occupies and Z is a vector of characteristics of the household head. These household-level controls include a quadratic in the age of the household head, dummy variables for the head's gender, marital status, and educational attainment, and the logarithm of household income. Standard errors are

¹⁸ Homeownership status is not reported in the 1950 IPUMS. The 1960 IPUMS does not identify the metropolitan area in which a household resides. In 1970, one sample identifies a household's metropolitan area but not its location within the area (central city versus suburb), while the other does not identify the metropolitan area of residence.

¹⁹ In 1980, the Census adopted the "householder" definition of household headship – the household head was the person who either owned the home or, if the dwelling was rented, the person in whose name the unit was leased. Prior to 1980, the Census did not adopt a formal rule linking headship to ownership although it is widely presumed by scholars that, in the case of owner-occupied housing, the owner was designated as the household head; see Collins and Margo (2011).

clustered by metropolitan area. In this regression we expect that $\gamma < 0$; that is, as more whites leave the central city, the probability of black homeownership increases.²⁰

B. OLS estimates: White departures from cities and black homeownership

We begin our empirical analysis with the aggregate household data. The first columns in Table 4 report estimates of β from OLS regressions of the household counts specification in equation 2. Regressions contain metropolitan area and year fixed effects and allow each state to have its own time trend. In the basic specification, we find that, for every 1,000 white household departures from the central city, 87 black households transition into homeownership. Column 2 controls for median family income and the price-to-rent ratio, both measured at the city level.²¹ Adding these controls reduces the coefficient interest by 10 percent but it is still large and statistically significant. As we would expect from the arguments presented earlier and the evidence in Table 3, raising the price of owner-occupied units relative to rental rates reduces the number of black homeowners, although this relationship is not precisely estimated. In column 3, we separately enter the number of white owner-occupiers and the number of white renters in the city on the right-hand side. Reassuringly, black homeownership is more strongly related to the departure of white owners than to the departure of white renters. We would not expect the coefficient on white renters to be zero because 30 percent of white renters lived in detached, single-family units conducive to owner-occupancy in 1960.²²

²⁰ At the metropolitan area level, the dependent variable in specification (3) is equivalent to the black owner-occupancy rate, not the count of black homeowners. As noted in the text, however, we control for the number of black households in the central city in specification (2) and thus the empirical analyses are conceptually similar.

²¹ Note that the median family income and price-to-rent ratio variables are measured for the actual city boundaries. We cannot measure these variables using consistent 1950 boundaries because both income and housing prices are reported as medians at the tract level, which cannot then be aggregated up to the (constant) city level.

²² We also estimated the relationship between white departures and black homeownership on a decade-by-decade basis. The strongest association between these variables occurs in the 1960s, during which 1,000 white departures is associated with 134 new black homeowners. This pattern is consistent with the fact that, in this decade, the racial

C. Predicted highway rays as an instrument for white departures

OLS estimates will be biased if white location decisions are directly influenced by black homeownership or are correlated with unobserved characteristics of the city that also predict black homeownership. A correlation between white suburbanization and black homeownership could arise if, for example, the demand for black homeownership increases and the housing stock in black neighborhoods is not conducive to owner-occupancy, leading prospective black homeowners to move into white neighborhoods. White households concerned about living near black neighbors may then move to the suburbs, generating a positive relationship between black homeownership and white suburbanization and biasing the OLS estimates upward (that is, too large in absolute value). Alternatively, the coefficient may be biased towards zero by measurement error.

To address endogeneity bias, we look for an instrumental variable that is correlated with the share of whites living in the suburban ring but is otherwise uncorrelated with the black homeownership rate. We instrument for the white suburban share using the predicted number of interstate highway rays built within one mile of the central city between 1950 and 1980 (PREDICTED_RAYS). The original plan for the Interstate Highway System was drafted in 1947 with the dual goals of serving national defense and inter-city commerce. Baum-Snow (2007) determined the total number of rays that were assigned to each central city in the 1947 plan. After the plan was established, local politicians could lobby the federal government to build extra highway miles through their city and were more likely to do so if there was a high demand for suburbanization in their area. Therefore, we predict the number of completed rays in each city i at time t by interacting the number of assigned rays in the 1947 plan with the national share

barriers in mortgage finance and in residency in certain neighborhoods began to break down. That being said, we find no relationship between white departures and black homeownership from 1970 to 1980.

of highway construction completed by date t . Our assumption is that the national rate of highway construction is not influenced by the demand conditions in any one city.²³

Our first stage regression relates the number of white households in the central city to the predicted number of highway rays passing through the city, controlling for metropolitan area and Census year fixed effects and the full set of population controls in equation 2:

$$\text{NUM_WHITE}_{it} = \rho(\text{PREDICTED_RAYS})_{it} + \Phi X_{ijt} + \alpha_i + \delta_t + \varepsilon_{it} \quad (4)$$

Baum-Snow (2007) demonstrates that this instrument is correlated with overall population loss from central cities; thus, not surprisingly, we find a strong first stage relationship between predicted highway rays and white departures. The fourth column of Table 4 (last row) presents our estimate of ρ from equation 4. The coefficient is negative and large; each new planned highway that we predict to be built through the central city leads to the departure of 8,000 white households from the central city (on a base of around 100,000). The F-statistic on predicted highway rays is 16.94, well above the conventional value of 10 used to judge an instrument's strength.

The fourth column of Table 4 (first row) presents the IV coefficient of white departures using predicted highway rays to instrument for the number of white households in a city. The IV coefficient is slightly larger (in absolute value) than its OLS counterpart, but the two estimates cannot be statistically distinguished from each other. According to the IV estimate, every 1,000 white household departures from the central city generates 108 new black homeowners. The typical city lost 25,700 white households from 1940 to 1980 and gained 10,400 black

²³ Because construction of the interstate highways began in 1954, we set the number of highway rays in every city at zero in 1940.

homeowners. By our IV estimate, white departures would have generated 2,700 new black homeowners ($= -108 \cdot -25.7$), which can explain 26 percent of the growth in black homeowners ($= 2,700/10,400$); if instead we use the OLS estimate, white departures can explain 21 percent of the growth in black homeownership ($= 2,200/10,400$).²⁴

The identifying assumption for the instrumental variables procedure is that highway construction is only related to black homeownership through its effect on white departures. Some scholars argue that interstate highways tended to be built through black neighborhoods, thereby reducing the stock of housing available to black households (Sevilla, 1971; Frieden and Sagalyn, 1989; Lewis, 1997). The evidence cited in these earlier studies, however, is largely anecdotal. In a recent paper, Collins and Shester (2013) show that urban renewal projects, similarly accused of clearing black neighborhoods, had no effect on a city's black population share or its degree of racial residential segregation. In addition, if highways did reduce opportunities for black homeownership, we would expect the estimated effect of white departures in the IV specification to be smaller in absolute value than its OLS counterpart, yet we find the opposite.

D. Household-level data on black homeownership, 1940 and 1980

The individual characteristics of black households that settle in cities that are losing white population may be systematically different from those of black households in growing areas. We address this concern in Table 5 by using the 1940 and 1980 micro data to control for household-level characteristics. In particular, we estimate the relationship between the probability of black

²⁴ Over this period, around 50 percent of white households in central cities were homeowners, suggesting that the typical city lost roughly 13,000 white owner-occupiers ($= 25,700 \cdot 0.50$). If every new black homeowner moved into a housing unit recently vacated by a white owner, then 80 percent of vacated units would be filled by new black homeowners ($= 10,400/13,000$), leaving only 20 percent vacant or converted into a rental unit. If, instead, some portion of new black homeowners moved into newly constructed units in growing central cities, then perhaps up to 40 percent of the units vacated by whites remained vacant or were converted to rental occupancy. These patterns are consistent with the high transaction cost of converting a unit conducive to owner-occupancy into a rental unit, due both to structure type and to the reinforcing factors of lot size and zoning regulations.

homeownership (equivalent to the black homeownership rate at the aggregate level) and the number of white households living in the central city from equation 3, controlling for other aspects of the city and metropolitan population.

The first column of Table 5 estimates the main relationship in the micro data without adding household-level controls. In this case, we find that 1,000 white departures increase the black homeownership rate by 0.05 percentage points. For comparison with the aggregate data, column 2 presents a weighted regression, ensuring that each city, rather than each individual, is counted equally. The strength of the estimated relationship increases to 0.08 percentage points. Column 3 then includes our extensive set of household characteristics. Including these controls reduces the estimate by around 15 percent to 0.07 percentage points but we still find a large and statistically significant relationship between white departures and the black homeownership rate.²⁵ The coefficients in the individual-level regressions are nearly identical to those derived from a regression of the *aggregate* black homeownership rate on the number of white households living in the central city (coeff. = -0.00079, s.e. = 0.00033).²⁶ Finally, in column 4, we add the city-wide ratio of median home values to median rents. Adding this measure of housing price pressure cuts the responsiveness of the black homeownership rate to white departures in half, suggesting that a portion of the effect of suburbanization on black homeownership can be explained by the price mechanism outlined in the conceptual framework.²⁷

²⁵ Results are qualitatively similar if we instead use probit estimation (coeff. = -0.00086, s.e. = 0.00026).

²⁶ The implied response to white departures is smaller in regressions that use the homeownership *rate* as a dependent variable than in the main specification, which uses homeownership *counts*. The typical city in our sample had 42,000 black households in 1980. According to coefficients from the homeownership rate regressions, the loss of 1,000 white households from the central city would have increased the black homeownership rate by only 34 households (= 42,000 * 0.0008), which is only half as large as the point estimates in Table 4. This discrepancy can be explained by the fact that white departures had a greater effect on black homeownership in cities with a large black population (see Table 6), a pattern that generates larger point estimates in the ownership count specification. The two estimates would be reconciled in a city with around 100,000 black households (87 = 109,000 * 0.0008).

²⁷ Prospective black homeowners may be more responsive to the value of below-median homes. Information on the distribution of housing values for each of our cities can be computed from the 1940 and 1980 IPUMS; in particular,

E. Heterogeneous effects of white departures by city type

We find a sizeable relationship between black central city homeownership and white suburbanization nationwide over the period 1940 to 1980. This section explores variation in the strength of this relationship across metropolitan areas.

Table 6 examines how the core relationship between the number of white households and the number of black homeowners in a city varies across different subsamples. In the first column, we interact the change in the number of white households with two features of the housing market: the share of units that are owner-occupied and the black share of all households (as a proxy for the black share of prospective homebuyers). We measure these characteristics in 1940, before the rise of either white suburbanization or black homeownership, to capture initial differences in housing markets across cities.

We expect the relationship between white departures and black homeownership to be stronger in cities with a large initial stock of units conducive to owner-occupancy. If the housing stock is instead primarily made up of rental units, the effect of white departures will be attenuated. We find that cities with a larger initial stock of owner-occupied housing experience a sharper increase in black homeownership for every white departure. In 1940, the urban owner-occupied share ranged between 15 and 55 percent. This 40 percentage point difference in initial owner-occupancy is associated with an additional 147 black owners for every 1,000 white departures ($= -367 \cdot 0.4$).

The relationship between white departures and black homeownership may also depend on the racial composition of the pool of prospective homebuyers. If whites constitute the majority of

we calculated the ratio of home values at the 25th percentile to median rents across cities in the 1940 and 1980. We find a very similar effect of each ratio on black homeownership in these years. In particular, the coefficient on the median-median ratio is -0.012 (s.e. = 0.005) and the coefficient on the 25th percentile-median ratio is -0.014 (s.e. = 0.006). These figures imply that a one standard deviation increase in the price-rent ratio would reduce black homeownership by 7.2 percentage points.

prospective homebuyers, white sellers can easily find white buyers without needing to compromise on price. However, if many prospective homebuyers are black, sellers who chose to limit their market to white buyers would incur a large price penalty for doing so and, thus, sellers would more likely opt to sell to black buyers. Indeed, we find that white departures have a stronger effect on black homeownership in cities with a large initial black household share. In 1940, the black urban household share ranged between zero and 50 percent. This 50 percentage point difference in initial racial composition is associated with an additional 144 black owners for every 1,000 white departures ($= -289 \cdot 0.5$).

The final heterogeneous effect that we explore concerns the role of overall white population growth or decline.²⁸ The arguments outlined in section 2 identify white suburbanization with literal departures of whites from the central city. This is an accurate description for many of the industrial cities of the Northeast and Midwest that attracted black immigrants during the first (World War One) and second (World War Two) waves of the “Great Migration” from the rural South. However, in growing metropolitan areas in the South and the West, the white population – both city and suburban -- expanded through in-migration. The treatment effect we are interested in would arguably be strongest in cities that were losing white residents, rather than in cities that were otherwise expanding and adding new housing units.

The third and fourth columns of Table 6 examine this hypothesis explicitly by splitting the sample into metropolitan areas that experienced net gains or losses in the white central city population from 1940 to 1980. Consistent with a simple model of housing supply with durable

²⁸ Following up on footnote 14, we also explored the impact of variation across cities in the proportion of black households with income higher than the level at the 25th percentile among white owner-occupiers. In particular, we included an interaction term between this variable and the number of white households leaving the central city using the specification reported in Table 6. The coefficient on the interaction term is positive, meaning that white departures have a smaller impact on black home purchases in areas where black income is high; this finding is consistent with the idea that blacks in some areas faced credit constraints. However, the standard error is quite large and so we hesitate to interpret this finding (coeff. = 44.16; st. err. = 148.56).

housing, we find essentially no relationship between the number of white households in a city and black homeownership in areas that were gaining white population. For the typical growing city, the estimates suggest that 1,000 white departures were associated with 6 fewer black homeowners, a tiny and statistically insignificant relationship.²⁹ In other words, white arrivals do not compete with existing or new black residents for owner-occupied housing, presumably because, in these growing cities, new units are being constructed to house the expanding population.

In contrast, there is strong relationship between the number of white households and black homeownership in cities that were losing white population over our period. For the typical city with net white population loss, 1,000 white departures were associated with 222 additional black homeowners.³⁰ As we have argued, as white households left these cities and the housing stock remained, a portion of the vacated units were sold to prospective black buyers. It is important to recognize that a sizeable majority of urban black households over our period – 75 percent in 1980 – lived in such cities and, thus, potentially, was “at risk” of experiencing the particular pathway into homeownership emphasized in this paper. .

Among the 53 cities that lost white population from 1940 to 1980, the strength of the relationship between white departures and black homeownership varied according to initial housing market characteristics. Figure 1 uses the coefficients from the third column of Table 6 to predict the number of new black homeowners for every 1,000 white departures by city. 1,000 white departures would lead to only 50 new black homeowners in New York City, in which 15

²⁹ The typical growing city had an initial housing stock that was 37 percent owner-occupied and was 10 percent black in 1940.

³⁰ Similarly, the typical declining city had an initial housing stock that was 34 percent owner-occupied share was 10 percent black in 1940.

percent of the housing stock was made up of owner-occupied units in 1940.³¹ On the other extreme, 1,000 white departures generated 450 new black homeowners in Birmingham, AL, a city with a high black population share (41 percent) and a larger share of owner-occupied units (29 percent) in 1940.

Figure 2 combines the predicted strength of white suburbanization by city from the prior figure with the actual number of white departures over the 1960s. According to our estimates, 3,000 black households in the typical city became homeowners due to white departures during the 1960s. However, in a few cities over 10,000 new black homeowners were created by white suburbanization over this decade. One such city happens to be Chicago, the subject of Berry's (1976) original study; Detroit and Oakland (CA) are other examples. These three cities were characterized by sizeable central city black populations during the period, a large number of white departures from the urban core, and a city housing stock initially conducive to owner-occupancy – prime examples of the effect documented in this paper.

IV. Concluding Remarks

The share of metropolitan white households living in the suburbs increased from approximately one-third in 1940 to two-thirds in 1980. Over the same period, the rate of homeownership among black households living in central cities more than doubled from 15 percent to 42 percent. This paper argues that there was a causal link between white suburbanization and rising black homeownership. As white households left central cities, the price of housing units conducive to owner-occupancy fell and many black households on the

³¹ Central cities exhibited tremendous variation in the share of housing units that were owner-occupied in 1940. The mean owner-occupied share in that year was 36 percent with a standard deviation of 8 percent. At the low end were old cities in the Northeast, including New York City, Boston and Hartford, CT. At the high end were small cities in the Midwest (Fort Wayne and South Bend, IN) and the West (Tacoma, WA).

margin of renting and ownership chose to become homeowners. Although city neighborhoods were residentially segregated by race, black and white neighborhoods were interconnected through the urban housing market. We estimate that, on average, around 100 black households became homeowners for every 1,000 white households leaving the central city between 1940 and 1980.

The effect of white suburbanization on black owner-occupancy in central cities was largely confined to the mid-twentieth century for three historical reasons. First, the “Great Migration” of African-Americans from the rural South to industrial cities in the North and West began during World War One and peaked in the decade of World War Two (Gregory, 2005). By mid-century, metropolitan areas like Detroit, Cleveland, Pittsburgh, and Chicago had substantial black populations living in their central cores. Secondly, the particular timing of changes in transportation technology and infrastructure facilitated mass white suburbanization only after World War Two. Had technical advances in the internal combustion engine and the development of America’s highway system occurred a half century earlier, the prospective home buyers interested in these centrally-located homes would likely have been immigrants from Europe. Thirdly, black households eventually gained access to the suburbs. Beginning in the 1970s, increasing numbers of middle-class urban black families in search of owner-occupied housing could (and did) access the suburbs directly, as Table 1 shows. To such families, a home in the suburbs was arguably a more desirable as a place to live and as an investment than remaining in the central city, particularly in cities that had experienced net outflows of whites between 1940 and 1980, where our estimates show that “treatment effect” of white suburbanization on black homeownership were largest historically.

This paper has stressed the direct effects of white suburbanization on black homeownership. However, at the neighborhood level, higher rates of homeownership can have positive effects on social capital and may forestall urban decay (Dietz and Haurin, 2003; Rosenthal 2008). A useful extension therefore would be to investigate if the formation of so-called “bad ghettos” after World War Two (see Collins and Margo, 2000) was slower in central cities in which relatively larger numbers of black households became homeowners due to white suburbanization.

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Table 1: Race, Residential Location, and Owner-Occupancy, 1940-1980

	Metro population, Share in suburbs		Black, Share owner-occupier			White, Share owner-occupier		
	White	Black	Total	City	Suburbs	Total	City	Suburbs
1940	0.355	0.194	0.192	0.150	0.349	0.414	0.347	0.522
1960	0.515	0.190	0.374	0.330	0.468	0.661	0.543	0.767
1980	0.682	0.276	0.462	0.421	0.572	0.702	0.561	0.770
2000	0.738	0.382	0.479	0.423	0.570	0.742	0.589	0.796
2010	0.742	0.466	0.457	0.384	0.541	0.720	0.563	0.774

Notes: Authors' computations from IPUMS. Samples include all metropolitan households whose place of residence (city or suburb) was reported.

Table 2: Structure type and homeownership, Central cities in 1960

Housing Type	White, Percentage in	White, Owner rate	Black, Percentage in	Black, Owner rate
Detached Single Family	43.6%	82.9%	31.5%	63.6%
Attached Single Family	8.6	55.1	15.1	35.4
Two Family	13.5	37.3	13.5	25.3
3+ housing units per building	34.3	8.0	39.9	5.6
Total		48.9%		31.1%
Number HH in sample	110,236		19,417	

Notes: Authors' computations from 1960 IPUMS (www.ipums.umn.edu). Samples include all metropolitan households whose place of residence (city or suburb) was reported. Households in mobile homes, trailers, boats, etc. are excluded.

Table 3: White departures and the relative price of owner-occupied housing, 1940-1980

White departures from city = Change in # of white households < 0

Dependent variables:	Value, owner-occupied	Value/rent ratio
1. # white HH in city (<i>1000s</i>)	74.007* (28.351)	0.025* (0.006)
2. # white own in city (<i>1000s</i>)	118.439* (55.802)	0.089* (0.012)
# white rent in city (<i>1000s</i>)	40.431 (46.077)	-0.024* (0.009)
Mean of dependent variable	68,188	13.939
<i>N</i>	488	488

Notes: Regressions follow the format of equation 2 in text. “Value” and “Rent” are median values for the central city. All regressions contain vector of population controls (the number of black households in the central city, the number of black households in the metropolitan area, and the number of white households in the metropolitan area), metropolitan area fixed effects, and state-by-year fixed effects. Standard errors are clustered by metropolitan area and reported in parentheses. Standard errors are clustered by metropolitan area and reported in parentheses. * = significant at the 5 percent level or better. Median value and rent are measured using the actual city boundaries rather than the constant 1950 city boundaries (see footnote 21).

Table 4: White departures and black homeownership in the central city, 1940-80

Dependent variable = Number of black owner-occupier households in city
White departures from city = Change in # of white households < 0

Method	(1) OLS	(2) OLS	(3) OLS	(4) IV
# white HH in city (<i>1000s</i>)	-86.658* (7.351)	-74.939* (9.199)		-107.595* (36.005)
# white own in city (<i>1000s</i>)			-137.56* (15.41)	
# white rent in city (<i>1000s</i>)			-51.15* (11.93)	
Share whites in city				
Median family income		-0.096 (0.061)		
Median value/rent ratio		-154.552 (93.295)		
First stage: Highway rays				-7.795* (1.893)
<i>N</i>	488	390	488	488

Notes: Cells contain the coefficient of interest from equation 2 in text; all regressions contain vector of population controls (the number of black households in the central city, the number of black households in the metropolitan area, and the number of white households in the metropolitan area), metropolitan area fixed effects, and state-by-year fixed effects. Standard errors are clustered by metropolitan area and reported in parentheses. * = significant at the 5 percent level or better. The control variables in column 2 (median family income and price/rent ratio) are measured using the actual city boundaries, rather than the consistent 1950 boundaries (see footnote 21). The first stage coefficient in column 4 reports the coefficient on predicted highway rays from equation 4, the dependent variable of which is the number of white households in the central city (in 1,000s).

Table 5: White departures and the probability of homeownership in a sample of black central city residents, 1940 and 1980

Dependent variable = Indicator equal to one if household is owner-occupier
White departures from city = Change in # of white households < 0

	(1)	(2)	(3)	(4)
# white HH in city (<i>1000s</i>)	-0.00055* (0.00015)	-0.00078* (0.00021)	-0.00073* (0.00021)	-0.00039+ (0.00022)
Weighted	N	Y	Y	Y
Individual controls	N	N	Y	Y
Price/rent ratio	N	N	N	Y
<i>N</i>	45,137	45,137	45,118	45,788

Notes: The sample of black households living in central cities is drawn from the 1940 and 1980 IPUMS. Cells contain the coefficient of interest from equation 3 in text; regressions contain a vector of population controls (the number of black households in the metropolitan area and the number of white households in the metropolitan area), metropolitan area fixed effects, and year fixed effects. Standard errors are clustered by metropolitan area and reported in parentheses. * = significant at the 5 percent level or better. + = significant at the 10 percent level or better. Column 1 weights each individual equally, while columns 2-4 weight each city equally. Individual controls in column 3 include a quadratic in the age of the household head, dummy variables for the head's gender, marital status, and educational attainment, and the logarithm of household income. The price/rent ratio in column 4 divides the median housing value in the central city by the median annual contract rent.

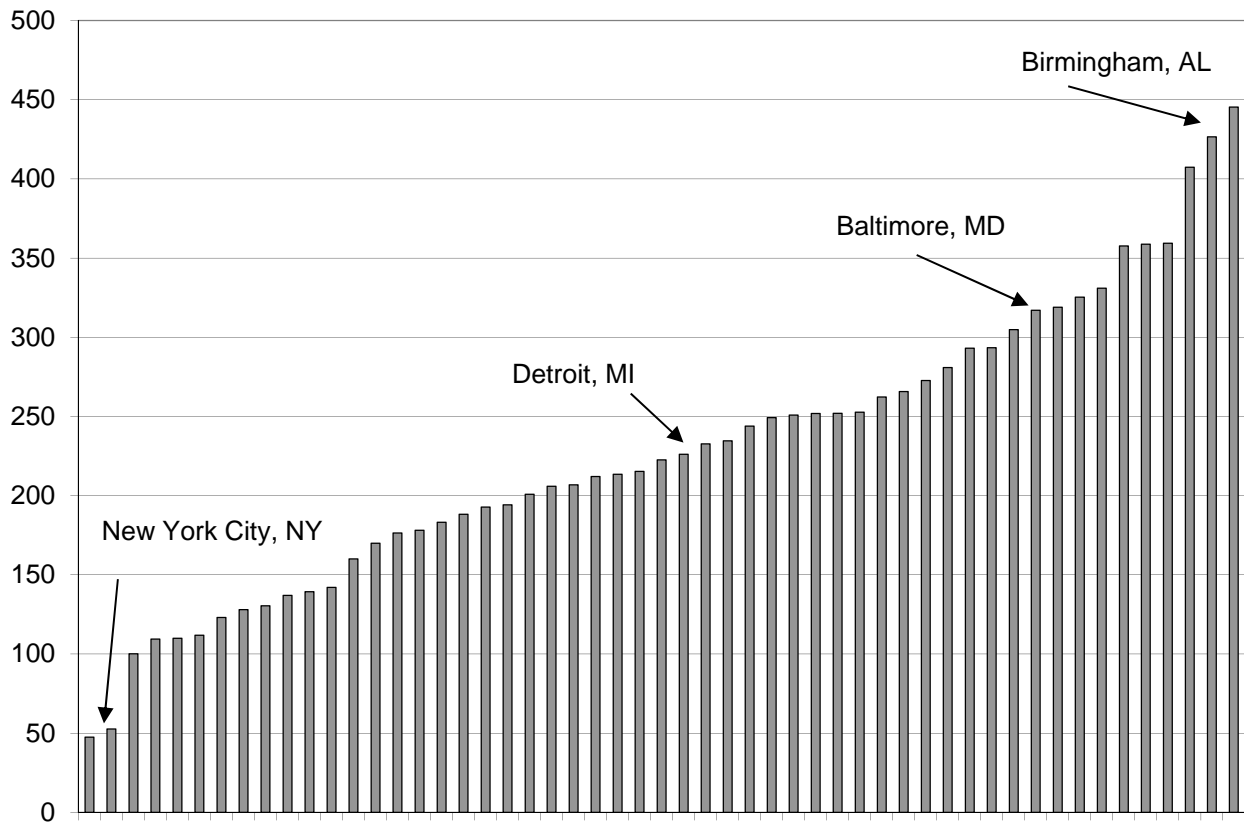
Table 6: Heterogeneity in the relationship between white suburbanization and black homeownership by city type

Dependent variable = Number of black owner-occupier households in city
White departures from city = Change in # of white households < 0

	(1) Full sample of cities	(2) 45 cities that gained population, 1940-80	(3) 53 cities that lost population, 1940-80
# white HH in city	25.440* (18.075)	-31.471 (31.039)	103.503* (14.553)
# white HH * Share owner occ, 1940	-366.947* (60.006)	65.329 (82.329)	-710.148* (97.895)
# white HH * Share black, 1940	-289.105* (132.409)	128.970* (44.876)	-836.531* (233.251)
<i>N</i>	488	224	264

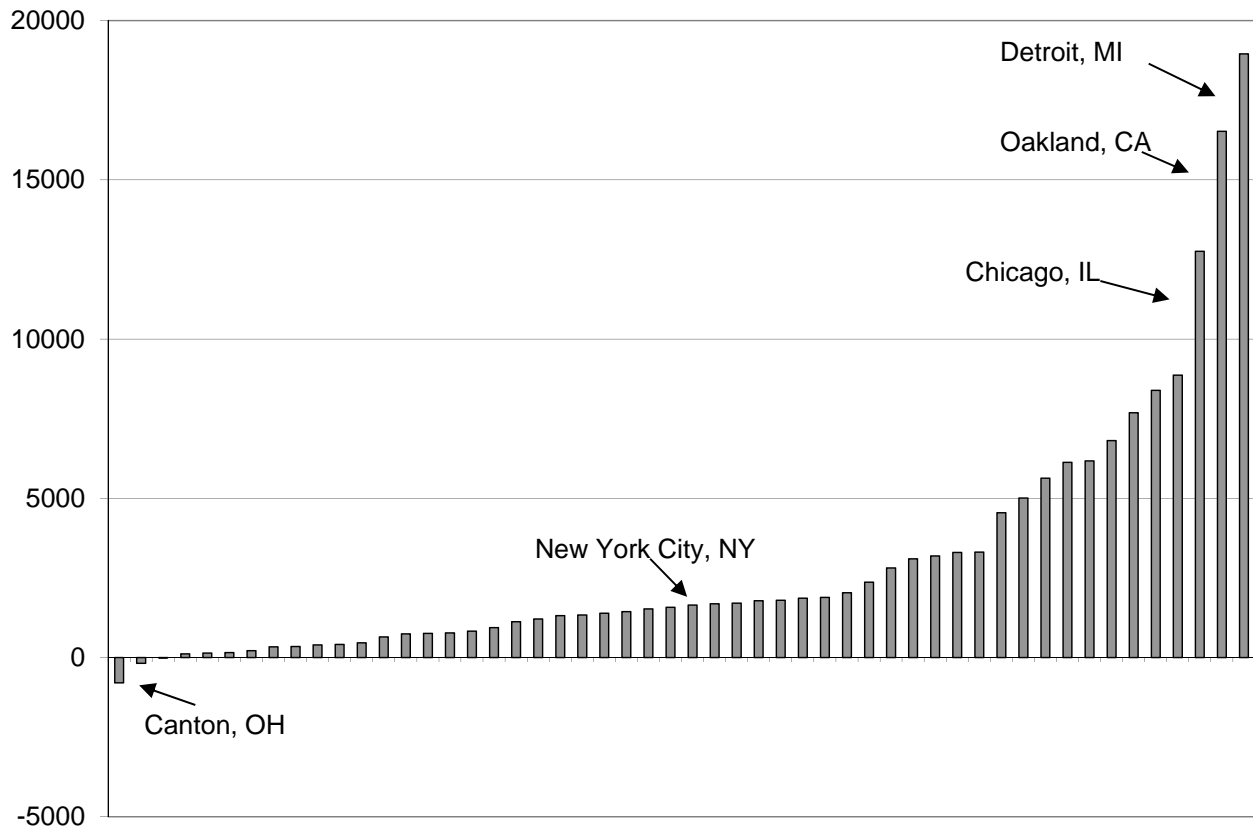
Notes: See notes for Table 4 for details on specification. Standard errors are clustered by metropolitan area and reported in parentheses. * = significant at the 5 percent level or better. The number of white households in the city is entered in 1,000s. The number of white households is interacted with the share of housing units in the central city that were owner-occupied in 1940 (mean = 0.357) and the share of the city population that was black in 1940 (mean = 0.105). Columns 2 and 3 subdivide the sample into cities that experienced a net gain/loss in white population between 1940 and 1980.

Figure 1: Variation in the estimated number of new black homeowners for every 1,000 white departures by city



Notes: Predicted number of new black homeowners per 1,000 white departures for 53 cities with net white population loss based on coefficients in Table 6, column 3.

Figure 2: Variation in the estimated number of new black homeowners generated by white departures from the city, 1960-70



Notes: Number of new black homeowners generated from 1960 to 1970 in response to white departures. Predictions for 53 cities with net white population loss based on coefficients in Table 6, column 3.