Was Postwar Suburbanization 'White Flight"? Evidence from the Black Migration

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Abstract: The wave of suburbanization in the decades following World War II coincided with the arrival of four million African-American migrants to cities in the North and West. This paper asks how much of the observed suburbanization in this period can be attributed to a "white flight" from increasingly diverse central cities. I begin by establishing a positive correlation between changes in central city racial composition and the corresponding fraction of whites living in the suburban ring within metropolitan areas over time. Recognizing that black migrants may have been attracted to particular destinations by exactly those economic factors that encourage suburbanization (e.g., income growth), or by lower prices for central city housing in the wake of white departures, I develop an instrumental variables procedure that predicts black migration into northern/western cities. The instrument first establishes the state-of-origin profile of a city's black migrant stock in 1940, and then uses these shares to weight the predicted national growth rates of black migrant communities by southern state, where the predictions are based on a series of county-level agricultural variables. Even after accounting for migrant location choices, I find that white urban residents did relocate to the suburban ring in response to black arrivals, particularly in the 1950s. My estimates suggest that 30 percent of postwar white suburbanization can be attributed to changes in urban racial diversity.

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I. Introduction

In the decades following World War II, American cities underwent a period of rapid suburbanization, driven almost entirely by the relocation of white households to the suburban ring. While only 44 percent of white residents in the average metropolitan area lived outside the central city in 1940, the mean white suburban share increased to 68 percent by 1970.[1] The flow to the suburbs has been attributed to a number of causes, including rising household incomes (Margo, 1992); the suburban bias of Federal Housing Administration mortgages (Jackson, 1985, p. 213-17, Gelfand, 1975, p. 216-22); the construction of federal and state roads and the spread of automobile commuting (LeRoy and Sonstelie, 1981, Lewis, 1997, p. 71-92); and the deterioration of schools, the tax base, and general safety in the central city (Frey, 1979). In addition, post-War suburbanization coincided with a wave of black migration to urban areas from the rural South. The four million black migrants who arrived in the North and West during this period disproportionately settled in central cities.[2] As a result, the percentage of central city population made up of African-Americans in the average northern/western metropolitan area increased from four to 15 percent.

The simultaneous flow of blacks into central cities and relocation of whites to the suburban ring gave rise to the pattern of "chocolate cities and vanilla suburbs" that has persisted until today.[3] Yet, despite the conventional wisdom that suburbanization was, in part, a response to the changing racial composition of the central city, the relationship between these two

[1] These figures are based on the sample of 68 northern/western SMSAs used in this analysis. The inclusion of southern SMSAs would make the contrast even more striking; the South had the lowest levels of suburbanization in 1940, and converged on the rest of the country between 1940 and 1970 (see Edmonston, 1975, Tables 5-5 and 5-6).
[2] In 1960 and 1970, the Census asked individuals about their place of residence 5 years earlier. From aggregate mobility data, one can determine the share of in-migrants who settled in the central city versus suburban ring by race. For the 39 SMSAs in the sample for which such data is available in 1970, for instance, an average of 74 percent of black arrivals between 1965-69 settled in the central city, compared to 32 percent of white in-migrants.
[3] This evocative metaphor originated in the George Clinton song "Chocolate City" (1975), and was first used to describe racial residential segregation in the social science literature by Farley, et al. (1978). For more on this and other cultural expressions of white flight, see Avila (2004).

population trends remains an open question. While the shifting center of urban gravity from core to periphery was a century-long process, fueled by a complicated mixture of political, economic and technological factors, this paper will focus on one such potential cause: the changing racial balance between the homogenous suburbs and their increasingly multi-racial central cities. How much of the observed suburbanization in the post-War period can we attribute to a "white flight" from black urban arrivals? If the black migration had been slower, or more evenly distributed across cities in the North/West, would urban space look different today?

In comparing patterns of population change across metropolitan areas, there is a noticeable correlation between increases in black population in the center and the relocation of whites to the suburban ring. Figure 1 plots the relationship between changes in a city's racial composition and the fraction of whites in the surrounding metropolitan area who live in the suburban ring for a sample of 68 northern/western SMSAs for each decade between 1940 and 1970. Shifts in racial composition are measured as the change in the absolute number of black central city residents over a decade (from t to t+9) divided by that city's total population at time t.[4] The upward slope evident in all three decades suggests that increases in urban black population are correlated with larger flows of whites to the suburbs, though this relationship is largely attenuated by the 1960s.[5] The magnitude of this relationship is substantial in the earlier decades, implying that a one standard deviation increase in a city's black population is associated with half a standard deviation increase in white suburbanization in the 1940s and the 1950s.

[4] A more obvious metric of the increased presence of black residents in central cities may be changes in the share of the city's population that is black [(# black_t /# population_t) - (# black_{t-1} /# population_{t-1})] . However, this measure has an obvious simultaneity bias: the black share of the population will mechanically increase as whites leave the central city for any reason, even if absolute number of black residents stays the same.

[5] Fitting a series of regression lines indicates that a one percentage point increase in the share of a city's population that is black (measured relative to initial population) is associated with a 0.82 (s.e. = 0.14) percentage point increase in the fraction of whites who live in the suburban ring in the 1940s, a corresponding 0.85 (s.e. = 0.15) in the 1950s, and only 0.29 (s.e. = 0.15) in the 1960s.The summary statistics needed to interpret these and other exercises are presented in Table 1.

The causal interpretation of this positive relationship between black in-migration and white suburbanization requires caution. On the one hand, this correlation may reflect the tendency of white households to abandon cities receiving large numbers of black migrants ("white flight"). However, this pattern could also arise from the location decisions of black migrants themselves; migrants may have been attracted to particular cities either by certain economic characteristics underlying the demand for suburban living – e.g., rising incomes, centrally-located manufacturing jobs – or by cheaper central city housing left in the wake of white suburbanization ("migrant location choice").

To recover the effect of white flight, I design an instrumental variables (IV) procedure that isolates a stream of "chain migrants" to a northern city – i.e., those migrants who follow existing channels northward rather than choosing the best northern location only after observing a set of current, city-specific economic shocks.[6] The validity of the procedure rests upon three features of the black migration experience: (1) black migration followed transportation routes and community networks from particular southern states to specific cities in the North/West (Grossman, 1989), (2) the black out-migration rate from a given southern state was sensitive to local agricultural conditions (Alston, 1981; Fligstein, 1981), and (3) southern regions experienced agricultural transformations at different times (Wright, 1986). As a result, northern cities will experience large in-migrations when southern states well-represented in their existing African-American community undergo negative agricultural shocks, an event that is plausibly uncorrelated with local economic conditions. The mechanics of building the instrument are as follows: I first determine the share of the black migrant stock in a northern city as of 1940 who

[6] For the importance of family and community ties in the migration decisions of southern blacks, see Grossman (1992). Carrington, Detragiache, and Vishwanath (1996) present a general model of chain migration, wherein "pioneer" migrants reduce the moving cost for followers.

were born in each southern state.[7] I then use this city-specific state-of-birth profile to weight the growth rates of the *national* stock of black migrants from each southern state in subsequent decades. To calculate the national growth rates, I rely on both actual and predicted black out-migration from each southern state, where the predictions are based on a set of agricultural variables at the county level.[8] After instrumenting for migrant location choices, I still detect a strong positive relationship between changes in city racial composition and the white suburban share, which I interpret as an estimate of white flight. Overall, I find that white flight accounts for 30 percent of the observed white suburbanization in the postwar decades.

The remainder of the paper is organized as follows: the next section describes the economic processes behind the "white flight" and the "migrant location choice" hypotheses. Section III addresses the debate in the urban literature over how best to measure suburbanization – in particular, whether one ought to rely on the political boundary between a city and its suburbs, or whether one ought to construct pure measures of dispersion – and introduces the measure used in this paper. Section IV describes the estimation strategy and the IV approach, the results of which are presented in Section V. The final section concludes.

II. White Flight vs. Migrant Location Choice

As Figure 1 demonstrates, northern cities experience higher than average bursts of suburbanization in periods of black in-migration. However, the direction of the relationship is

[7] For the purposes of this paper, the South includes the following states: AL, AR, FL, GA, KY, LA, MS, NC, OK, SC, TN, TX, VA and WV. DE and MD, both of which received a large flow of migrants, are included in the North/West. The instrument's construction underscores the need to limit the sample of cities to the North and West. Because the vast majority of black migrants into southern cities came from areas in the surrounding state, it is particularly hard to separate periods of black in-migration from times of rapid economic change.

[8] The number of actual net black migrants from each southern state *s* were estimated using forward census survival ratio techniques by Gardner and Cohen (1971) for the 1940s and by Bowles, et al.'s (1990) for 1950s and 60s. This method is discussed in more detail in section IV.

not clear. This section will discuss the residential location choices of white city residents or prospective black migrants that may have given rise to this pattern.

White city residents may have had both racial and non-racial motivations for moving to the suburbs as black migrants arrived in central cities. Most simply, whites may have been averse to personal interactions with black neighbors. As the black share of a city's population grows, there is a higher probability of a black family moving onto any one block. Whites with a distaste for interracial interaction can respond to this black in-migration either by moving to a homogeneous suburb, or by attempting to preserve the racial character of their urban neighborhood.[9] In this sense, suburbanization and further urban segregation are substitutable technologies for preserving a white-only environment. While relocating to the suburbs is a household decision, policing neighborhood composition requires some form of collective action. In the case of Detroit, Sugrue (1996) documents that residents "defended" their neighborhoods with intimidation, political action, and even violence.[10] This qualitative picture is consistent with the fact that segregation was associated with a *higher* black-white housing price differential in the 1940s and 1950s, suggesting that central city segregation acted to restrict the supply of housing available to African-Americans (Cutler, Glaeser and Vigdor (1999)).

Even for white households that were able to isolate themselves within the city, the arrival of black migrants changed urban constituencies and thus the nature of public decision making. White residents now had to negotiate with southern black arrivals via the political process on almost every public choice, including the property tax rate, redistributive spending (e.g.,

[9] Another cost that black neighbors may have imposed on white urban residents is a greater difficulty in securing mortgages. Some historians argue that the Federal Housing Administration was less likely to insure private loans in racially diverse neighborhoods (see, e.g., Stuart (2003)).

[10] Sugrue (1996) documents the founding of 192 white neighborhood associations in Detroit between 1943 and 1965. The tactics of these associations varied from collecting signatures against open housing ordinances to vandalizing the newly-purchased homes of black families in white neighborhoods. Over 200 incidents against black homes (including picketing, window breaking and arson) were recorded in Detroit over this period. See especially chapters 8 and 9.

hospitals, housing, social services), and the allocation of civil services jobs. Preferences for the level of spending on public goods and the allocation of that spending across neighborhoods may vary by race. As a result, residents of racially fractionalized cities may have been less willing to levy taxes for public provision, as Alesina, Baqir and Easterly (1998) demonstrate empirically for contemporary cities. The desire to congregate near those with similar preferences over local public goods, as in Tiebout model of residential sorting, may have spurred white moves to suburban towns. Furthermore, while city neighborhoods often maintained their own, relatively homogeneous elementary schools, urban residents may have had to send their children to mixed-race high schools. In this case, the lure of the suburbs would not simply be the geographic distance it affords from black neighbors, but also their existence as separate political jurisdictions. Political autonomy offered suburban residents local control over the provision of public services and the school system, as well as the ability to use zoning policy (e.g., restrictions on multi-family dwellings, minimum lot sizes) to exclude lower-income residents, a device used to enforce *de facto* racial segregation.[11]

Alternatively, the black migrant stream, directed as it was toward central cities, may have influenced white residential location choices through its effect on urban housing prices. In this case, the term "white flight" may be somewhat of a misnomer, as current city residents (most of whom happened to be white) responded to the heightened prices of central city housing, irrespective of the race of their neighbors. Assuming that housing supply was less than perfectly elastic, population growth in the central city will bid up the price of urban housing. As the relative price of urban housing increases, the wealthiest of the city's current residents – at the

[11] On this practice, see Jackson (1985), p. 241-243.

time, most of whom were white – will depart for the suburbs.[12] The new equilibrium division of the white population between city and suburb again depends on the housing supply response. If little suburban housing is built in response to the induced demand, rising prices in the suburb will moderate the white flight. By contrast, if suburban housing supply is highly elastic, the adjustment to black in-migration will primarily occur through the movement of people, rather than prices.

The migration of blacks to Chicago in the 1940s, for instance, has been associated with rising prices and crowding in the center city. The combination of a Depression-era building freeze and an influx of black workers to fill jobs in war industry, resulted in the low vacancy rate of 3.9 percent in 1940, which fell further to an unprecedented 0.9 percent by 1942. At war's end, the housing market responded, building nearly 700,000 new units in the next fifteen years, most of which were single-family homes in the suburban ring.[13]

The "migrant location choice" hypothesis reverses the direction of the interaction in the housing market. Now it is the departure of a city's existing residents for the suburban periphery that lowers demand for and thus prices of housing in the city center. These lower housing prices may have drawn prospective black migrants to particular northern destinations. While there have been no quantitative studies of the role of housing costs – or wages, for that matter – in attracting southern black migrants to particular cities, housing prices have been shown to be an important

[12] Mills (1972) has shown that income elasticity of housing demand is higher than the income elasticity of the marginal cost of commuting, richer households will tend to locate further away from the city center. This is because the rich have a higher demand for housing, and therefore benefit disproportionately from lower housing prices on the periphery. Even if the above condition does not hold, the rich will out-bid the poor for suburban land during periods of transportation innovation, when only the rich, who have a higher value of time, find it worthwhile to adopt the new, faster, but more expensive commuting technology (LeRoy and Sonstelie, 1983). This was the case in the 1940s and 1950s, when the rich owned private cars and the poor still relied heavily on public transportation.

[13] The historical relationship between black migration and the Chicago housing market in the 1940 and 50s is aptly retold in Hirsch (1983). See especially pp. 16-29. While housing markets were racially segmented in Chicago, as in many cities at this time, black migration could still have exerted upward pressure on housing prices in white neighborhoods as crowded black areas expanded along their borders into "white" territory.

determinant of interregional migration in the 1980s (Gabriel, Shack-Marquez and Wascher, 1992). In a case study of neighborhood transition in the Boston area, Gerald Gamm argues that black migrants were attracted to the lower housing prices in Dorchester and Roxbury, two neighborhoods abandoned by Jewish residents on their way to the suburbs. He describes the transition process thusly: "in the early 1920s…middle-class white ethnics forged their paths from urban neighborhoods to the suburbs…Only after the urban exodus had nearly run its course, emptying apartments and lowering rents" did blacks arrive in any great numbers (Gamm, 1999, p. 16, 27).

The goal of the paper, then, will be to differentiate between the "white flight" and "migrant location choice" hypotheses. I should emphasize that I will not be able to further distinguish here between the possible motivations behind white residential choices – e.g., racial antipathy, Tiebout sorting, or interactions through the housing market. In the next section, I will introduce the measure of suburbanization that will be used in the empirical analysis.

III. Measuring Suburbanization using Political and Administrative Boundaries

The most common measures of suburbanization in the urban economics literature fall into two categories: (1) the suburban population share, based on population counts within the center city and suburban ring of an urban area, as defined by their administrative borders, and (2) population density gradients, which measure the rate at which population density falls with distance from the city center. According to proponents of the density gradient, its main virtue is its invariance to the political limits of a city, which are arbitrary and tend to vary widely across areas and over time. The justification for estimating population density gradients derives from the Alonso-Muth-Mills model of a monocentric city, in which the main trade-off underlying residential

location choice is one between commuting costs – it is assumed that all workers are employed in a central business district – and the lower price of housing on the periphery (e.g., Mills, 1972). In the featureless urban plane envisioned by this model, it is unclear why a growing black population would encourage white households already living two miles distant from a black enclave to move an extra mile or two away.

In the case of white flight, however, the appeal of the suburbs may lie precisely in their political separation from a diverse city, with the concomitant ability to make local decisions about taxation and public goods. In this context, then, an ideal measure of suburbanization must take jurisdictional divisions into account, while at the same time taking seriously the possibility of endogenous changes to the city/suburb boundary over time. In particular, the 1950s and 60s was a period of renewed annexation activity, which was arguably a political response to the changing color of urban constituencies.[14] Such annexation would *dampen* measured suburbanization by enlarging city borders at the expense of the suburban ring. On the other hand, as urban areas grow outward, the Census Bureau periodically expands the official SMSA to include formerly rural counties. These administrative additions *inflate* measured suburbanization by introducing entirely "suburban" counties to an urban area.

If annexation and metropolitan area expansion were unrelated to black in-migration, these boundary changes would add noise to my measure of suburbanization, but would not bias the results in any particular direction. However, there is good reason to expect that these changes may be correlated with black migration patterns. First, if black migrants are attracted to growing cities (i.e., cities that are also attracting other internal migrants), black migration may be positively associated with metropolitan expansion. In terms of annexation, the correlation could

[14] For the rise and fall of annexation as a political tool in the late nineteenth and early twentieth centuries, see Jackson (1985), p. 138-156. Dye (1964) discusses the return to annexation in the 1950s and 60s.

go in either direction: Austin (1999) finds that cities with large black populations were more likely to annex neighboring land in the 1950s, perhaps due to the desire of white city residents or politicians to retain a white majority. In contrast, Alesina, Baqir and Hoxby (2004) argue that racial diversity reduces the number of successful annexations, particularly in states that require both jurisdictions to agree to a consolidation.

To correct for these changes in boundary definitions over time, I create an adjusted white suburban share based on a common set of city and metropolitan area borders in every decade. I fix central city boundaries in 1940, before any of the potentially racially-motivated annexations of this period took place. For this modification, I rely on Census estimates of the number of residents who *would have* lived in central cities if not for annexation; the estimates are derived from block-level data on the number of dwelling units affected by the switch in jurisdictional control.[15] To approximate the number of whites among this population, I assume that the population of the annexed area had the same white share as the suburban area as a whole, though the results are unchanged by alternately assuming that the annexed population had the white share of the central city. I account for metropolitan area expansion by maintaining a common county-based definition for an SMSA in every decade. In particular, I reassign the 1970 county definition for metropolitan areas to earlier years, which allows me to identically treat the suburbanization that occurred through filling in existing counties and through adding new ones.[16] My sample thus becomes the set of 68 urban areas in the North/West classified as SMSAs in 1970.

[15] Estimates for the 1940s are in Bogue (1953). The calculations for the 1950s and 1960s are included in the Census Characteristics of the Population volumes.
[16] The 1970 SMSA county composition can be found at http://www.ipums.org/usa/volii/tgeotools.html. Because SMSAs in New England often include fractions of counties, I use the New England County Metropolitan Area (NECMA) definitions instead.

To qualify as an SMSA, an urban area must have a central city or cities with 50,000 residents. In many cases, the Census designation of the central city seems arbitrary; for instance, Albany, Schenectady, and Troy, NY are each considered central cities of a unified SMSA, whereas Cambridge, MA is simply part of the Boston metropolitan area, and thus technically a "suburb." I classify central cities in two ways: first, following the Census Bureau's categories, and then defining any urban place with more than 50,000 residents in 1940 as part of the central city.[17] The results do not differ qualitatively, with the second method producing slightly larger and more precise estimates. I present results from the first measure in the paper, as they are the most comparable with other studies of suburbanization.

IV. Estimating the Relationship between Race and Suburbanization

A. An Econometric Framework and Sources of Bias

According to the "white flight" hypothesis, white residents of the central city experience a large black presence in the population as an urban disamenity due either to personal racism or political dissimilarity. The larger the share of the central city's population that is black, the higher the probability of having a black neighbor and the larger the proportion of black voters in the electorate. As a result, we might expect the fraction of whites in metropolitan area *i* who live in the suburban ring ($\%WS_{it}$) to vary with the share of the central city population that is black ($\%CB_{it}$). This relationship can be expressed as:

$$\% \, WS_{it} = \alpha_t + \beta \ (\% \, CB_{it}) + \eta_i + \varepsilon_{it} \qquad (1)$$

As I described above, $\% \, CB_{it}$ is defined as the number of black residents of the central city at time *t* divided by the city's total population in the previous decade, to avoid incorporating the

[17] For New England, I use all urban places with more than 50,000 residents in 1940 in both samples.

mechanical, positive relationship between white suburbanization and the city's black population share. β thus indicates the average increase in the white suburban share associated with a one percentage point increase in the black share of a metropolitan area

The error structure in equation (1) has two components: η_i, which indicates fixed attributes of metropolitan area *i*'s history or geography, and ε_{it}, which includes all relevant SMSA characteristics at time *t*, e.g., the current state of its transportation infrastructure and the location of industry and retail employment. If this relationship is estimated for a cross-section of cities, β will be biased if the relative size of a city's black population is correlated, either positively or negatively, with fixed aspects of a city that are themselves associated with the degree of suburbanization. These may include the initial size of the black population, the city's size, its regional location, and the extent of its manufacturing base. By adding a set of SMSA dummy variables, I can absorb these fixed attributes and identify β from changes in the black population share within a city over time.

Another problem with cross-sectional comparisons is the need to adjust for differences in relative city size. All else equal, a city with a larger land area relative to its suburban ring will contain a larger share of the metropolitan area's population. This concern prompted Bradford and Kelejian (1973) to propose an alternative measure of suburbanization: the *ratio* of the suburban share in population to the suburban share in land. A higher ratio implies either a larger population living in a suburban area of a given size, or an equivalently-sized suburban population squeezed into a smaller suburban ring. However, as Bradford and Kelejian note, growing cities tend to expand along the periphery, increasing the suburban land share and thus making the area's population appear more concentrated. To avoid this countervailing effect, they include the change in the suburban land share over the previous decade on the right hand side of

their estimating equation. However, as Mills (1992) has pointed out, changes in the suburban land share is itself an alternate measure of suburbanization; thus, its inclusion on the right hand side renders it impossible to interpret the partial effects of race on residential patterns. By comparing an SMSA only to itself over time, I avoid this pitfall associated with interpreting contrasts across diverse metropolitan areas.

As I described above, incorporating a set of SMSA dummy variables into the estimation eliminates biases due to fixed aspects of a city or metropolitan area. However, even in a panel context, β may suffer from two sources of bias: black migrants may be attracted to or repelled from particular cities by unmeasured, time-variant area characteristics (omitted variables). β will be biased upward if black migrants were attracted by aspects of a metropolitan area that encourage suburbanization, particularly rising incomes[18] or centralized manufacturing employment.[19] However, β will understate the true relationship between black in-migration and white suburbanization if migrants preferred to settle in cities that were slow to suburbanize. The same features that encouraged whites to stay in some cities more than others – urban amenities, and relatively high quality public goods (e.g., decent schools, efficient transportation) – may have attracted prospective black migrants. Furthermore, the growth of suburbs often exacerbated racial residential segregation in a metropolitan area. Black migrants may have sought to avoid segregated cities, which have been associated with negative labor market and education outcomes (Cutler and Glaeser, 1997).[20] Finally, as I described in section II, the interpretation of β

[18] The relationship between income growth and suburbanization is empirically important. Margo (1992) argues that rising median incomes can account for 40 percent of the suburbanization that occurred between 1950 to 1980.
[19] Steinnes (1977) and Thurston and Yezer (1994) find that a concentration of manufacturing employment in the central city encourages suburbanization, perhaps because the noise and pollution of factories outweigh the desire to live close to manufacturing employment.
[20] Collins and Margo (2000) argue that the negative effect of segregation on African-American outcomes (particularly, idleness and single motherhood) emerged only in the 1970s. However, as their results indicate, segregation was associated with reductions in relative black income in the 1940s and 1950s, which may have been enough to deter black migrants from settling in highly segregated areas.

is complicated by the possible presence of reverse causality, if black migrants were attracted to particular cities by lower housing costs left in the wake of white suburbanization.

B. Building an Instrument for Racial Composition using Elements of the Southern Black Migration

As we have seen, the location choices of black migrants preclude the interpretation of β as a straightforward estimate of white flight. In order to isolate the reaction of white households to a change in the racial composition of the central city, I need to identify a exogenous stream of black migration unaffected in the timing or direction of their moves by the prevailing economic conditions in destination cities. While immigrants tend to settle in areas with high wages and low housing costs (Borjas, 2001; Gabriel, Shack-Marquez and Wascher, 1992), they are also more likely to locate near friends and relatives (Carrington, Detragiache, and Viswanath, 1996; Bartel 1989). The black migration was no exception; African-Americans leaving the South tended to follow train routes or community networks northward. At the regional level, blacks who settled in the Northeast originated predominantly in the South Atlantic, those in the Midwest were from states along the Mississippi river, while recent westerners often hailed from Texas and Oklahoma. Even within regions, the source states of the black migrant stock exhibits considerable variation across cities. The instrument uses these unique state-of-origin profiles (w_{ns}) to weight the *national* growth rates of the black migrant stock from each southern state by decade ($g_{st,t+10}$). The predicted growth rate in the black population due to "chain" migration alone is then:

$$\text{Predicted growth rate}_{nt,t+10} = pg_{nt,t+10} = \sum_{s=1\ldots14} (w_{ns} \times g_{st,t+10}) \qquad (2)$$

I then apply the predicted growth rate for the 1940s to the city's actual black population in 1940, advance this predicted black population forward using the 1950s growth rate, and so on. With the inclusion of SMSA fixed effects, the instrument is based entirely on over-time variation in the growth rates of the migrant stock from different southern states at the national level. This method is akin to a strategy used by Bartik (1991) to instrument for local labor demand. Bartik establishes the industrial composition by SMSA, and then applies the national growth rates in employment by industry to each area according to these shares. Unlike other suggested instruments for immigration to a metropolitan area – e.g., the lagged share of the population that is foreign-born (Altonji and Card (1991)) – this approach does not rely on persistent characteristics of a city, which will tend to predict migration shocks to the same places in every period. In this example, New York City has a consistently high stock of foreign-born residents, while Peoria, IL does not; thus, it is hard to disentangle estimated "migration effect" from the other aspects of cities with large immigrant communities.

Two sources of data from the 1940 Census help to establish a state-of-origin profile for the black migrant stock in northern cities. The 1940 Census asks individuals about their state of birth and state of residence five years prior. Aggregate data on individual's state of birth by current city of residence and race[21] is available for 36 northern/western cities and on state of residence in 1935 for 53 such cities.[22] From these city counts, I construct two sets of weights, the first based on the share of recent black arrivals (1935-39) who migrated from each southern state, and the second based on the share of long-standing black migrants (1915-34) who were born in

[21] Both sources provide tallies for non-whites rather than for blacks, a trivial distinction with regard to non-whites born in or recently residing in the South, an overwhelming majority of whom were black in 1940.

[22] The reduction in the city samples is due to reporting restrictions for published Census data. Tabulations of residents' location in 1935 is available for cities with a population of 100,000 or more in 1940. Information on the states of birth of current residents is only reported by race for cities with at least 1,000 non-white residents in 1940. To the extent that the white reaction to black in-migrants was systematically stronger or weaker in cities that already had an established black community by 1940, the estimates from this sample may not be representative of the average experience.

each southern state. I calculate the second set of weights by subtracting the number of recent arrivals from each southern state from the total migrant stock from each state in 1940, under the assumption that most black migrants originated their move from their own state of birth. Deriving weights from recent arrivals has the benefit of a larger and less-selected sample. However, if local economic shocks in the latter half of the 1930s persist into the 1940s, it is harder to make the case that an instrument based on such weights meets the exclusion restriction – namely, that the instrument be uncorrelated with the error term in the second stage – in that decade.[23]

For illustration, Table 2 presents the state-of-origin profiles for long-term and recent black migrants in three large cities: Chicago, New York and San Francisco. Southern states that contribute more than 5 percent of the black migrant stock are highlighted in bold face. As described above, the majority of black migrants to New York hail from the South Atlantic, particularly Virginia and the Carolinas. The largest senders to Chicago are Mississippi and Alabama, while San Francisco draws from Louisiana and Texas. While the sending pattern looks qualitatively similar between the long-term and recent migrants, the South Atlantic (with the exception of Florida) consistently contributes a smaller share of migrants after 1935, made up by a large share from Florida, Tennessee, Arkansas and Oklahoma.

These state-of-origin weights are then applied to decade growth rates in the national stock of black migrants from each southern state. The stock of black migrants from a particular southern state *s* is defined as all individuals born in, but currently living outside, state *s*. I

[23] Say, for example, that agricultural conditions in Mississippi favored black out-migration in the 1930s and that Chicago was more economically vibrant than surrounding cities during that time. We would then expect a large flow of black migration from Mississippi to Chicago in the 1930s, resulting in a large weight on Mississippi. Thus, if Mississippi's agricultural situation continues through the 1940s, the instrument will predict another large flow to Chicago. However, a portion of this predicted flow is due not to exogenous transportation routes or family networks but to the fact that Chicago was booming in the late 1930s, a condition which may persist into the 1940s.

calculate the growth in this stock over a decade using both actual out-migration from that state, and predicted out-migration based on agricultural push factors alone. For the actual number of net black migrants from each southern state, I rely on estimates by Gardner and Cohen (1971) for the 1940s and by Bowles, et al.'s (1990) for 1950s and 60s that are based on forward census survival ratio techniques.[24] Briefly, this approach compares the actual population of a race-sex-age cohort in a county at time *t* to a counterfactual population determined by applying the cohort's national survival ratio to its population in the county at time *t-10*. The difference between the actual and predicted population counts are attributed to in- or out-migration. Figure 2 plots the national growth rates from each southern state deviated from decadal averages. Note that no single state has a growth rate consistently above or below the decadal average, suggesting that the instrument will not always predict large in-migrations to the same cities. Furthermore, neighboring states frequently have unrelated, or even opposing, growth rate trends; for example, the stock of Mississippians grows sharply in the 1940s and 1960s, but only slowly in the 1950s, while the opposite is true of Alabama and Arkansas.

With a few exceptions, no northern city contains more than two percent of the black migrant stock from any source state in 1940.[25] Thus, the economic booms and busts of individual cities are unlikely to influence the growth rate of the national black migrant stock. However, regions may experience correlated shocks, and thus one might be reasonably concerned that over-time variation in national growth rates are driven in part by the pull factors that the instrument is designed to eliminate. To address this concern, I recalculate the instrument,

[24] I thank Michael Haines for providing a cleaned electronic version of this data.
[25] Large cities and cities close to the South are the exception. For example, in 1940 Baltimore absorbed ten percent of black migrant stock from Virginia. New York received around ten percent of the stock from four South Atlantic states (Florida, North Carolina, South Carolina and Virginia). The other examples, each at around five percent, are Chicago-Arkansas, Chicago-Mississippi, Chicago-Tennessee, Detroit-Alabama, Detroit-Tennessee, Indianapolis-Kentucky, Kansas City-Oklahoma, Los Angeles-Louisiana, Los Angeles-Tennessee, Philadelphia-Virginia, and St. Louis-Arkansas.

replacing the actual net black migration numbers with predicted out-migration based on southern "push" factors alone. I begin by modeling the variation in net migration rates by decade across southern counties using information on the area's agricultural economy, along with certain sources of depression- or war-related federal spending, that may have affected the incentive of black migrants to enter or leave. I then use coefficients from these regressions to predict each county's out-migration rate, which I apply to the pool of blacks in that county at the beginning of the decade to estimate the net number of black out migrants. Finally, I aggregate the predicted number of migrants to the state level, and use this predicted number of out migrants to calculate growth rates by state.[26]

The agricultural variables used to predict rates of black migration include the cotton percentage of planted land, the percent of the labor force in agricultural production, and the share of farmers operating as tenants. During this period, the traditional sharecropping system was giving way to more fluid wage labor arrangements. The shift from tenancy to wage work increased the scale of production on many cotton plantations, inducing planters to invest in capital, such as the mechanical harvester, which further displaced agricultural labor.[27] The degree of agricultural mechanization in the county is measured here by proxy with the number of tractors per acre of planted land. Historians of this period have emphasized the role of federal cotton policy in unintentionally spurring northward migration. The Agricultural Adjustment Act (AAA) of 1933 gave cotton growers an incentive to leave fields fallow, a burden they tended to impose on their tenants who turned instead to wage labor or migration. To capture the effect of

[26] While intra-state migration should "net out" when aggregating *actual* county-level migration to the state level – that is, migrants who leave one county only to enter another in the same state will have a zero net effect – the same may not be true with *predicted* migration. Thus, the predicted state aggregates may erroneously include and assign to the North some internal state migrants.

[27] For a more thorough description of this process, see Wright, p. 226-238 and Fligstein, p. 137-151. A narrative account of the connection between Southern agricultural change and the Northern migration can be found in the first chapter of Lemann's *The Promised Land* (1991).

federal policy, I include the total AAA spending per capita from 1933-37, as well as the per capita appropriations for war contracts from 1940-45, which may have attracted black workers to the county.[28] While Fligstein (1981) shows that both the lagged level and changes in agricultural variables have significant effects on black migration, I include only the former out of concern that contemporaneous changes in the southern economy may be a *response* to, rather than cause of, migration. Consider the cotton share; planters may scale back cotton production if wages rise after losing part of their labor force to northern industry.

In Table 3, I present the total effect of each variable at the regional mean for the South as a whole and for two sub-regions, the South Atlantic and the Mississippi Delta. A negative value implies that the variable is associated with out-migration from the county. (The coefficients themselves are difficult to interpret, due to a series of interaction terms allowing the effects to vary between cotton and non-cotton counties, and between the South Atlantic and rest of the South, and are reported in Appendix Table 1.) The average southern county experienced an out-migration of 16 per thousand black residents per decade in the three postwar decades. All else equal, a county with the mean cotton share of planted land has an additional out-migration rate of 32 per thousand in the 1940s, and 10 per thousand in the 1950s and 1960s. This effect is stronger in the Mississippi region than in the South Atlantic due to its larger cotton shares. The other quantitatively important factors associated with out-migration are the tenancy rate and the percent of the labor force employed in agriculture. After controlling for this set of agricultural variables, the per capita AAA spending in the county is associated with *in*-migration, but the

[28] I thank Price Fishback and Shawn Kantor for sharing their data on appropriations through the AAA, which is recorded in the US Office of Government Reports (1940). The remainder of the southern county data were taken from the electronic versions of the City and County Data Books, with the exception of cotton acreage. Information on cotton acreage is available electronically for some states from at the National Agricultural Statistical Service's historical data website (http://www.usda.gov/nass/pubs/histdata.htm) and others at the website of the Population and Environment in the US Great Plains project of the ICPSR (http://www.icpsr.umich.edu/PLAINS/). The remainder were collected by hand from the Censuses of Agriculture.

interactions between the AAA and the cotton percentage is negative, which accords with the fact that the program offered incentives for cotton planters to keep land fallow. Allocations from the AAA may also be picking up other fixed aspects of counties – their political connections, their crop mix, etc. – because the "effect" of the 1930s spending persists throughout the period.

I end with four alternative instruments: those with weights based on long-term (1915-34) and recent (1935-39) migrants, and those based on actual and predicted out-migration from southern states. I report the set of coefficients from first stage regressions in Table 4, first pooling all years of data, and then for decade-by-decade contrasts; each regression includes metropolitan area and decade dummy variables. All coefficients are significant at the five percent level, and in general a one percentage point increase in the predicted black population in a northern city is associated with a 0.5 percentage point increase in the actual black share of the population. The strongest predictions are for the instruments using actual migration from the south weighted by the state-of-origin profile for recent black migrants; the other estimates, while smaller, are not statistically distinguishable. Perhaps contrary to expectation, the instruments are weakest in predicting in-migration in the 1940s, the decade immediately after the shares were established. However, as Wright (1986) argues, in the booming 1940s, blacks were attracted to the North by the prospect of industrial employment. While these opportunities had largely dried up by the 1950s, the stream of black migrants did not, as many southerners followed family and communities members northward. It stands to reason that the instrument would have its strongest predictive power in a period of predominantly chain-based migration.

The next section will present results that use this instrumental variables approach to estimate the causal effect of black in-migration on white residential location. It is important to keep in mind when interpreting the IV results that this set of instruments will not recover the

average effect of changes in the black population share on white suburbanization, but rather identifies the effect of a particular stream of rural black migrants whose moves were influenced by changes in the cotton economy (a "local average treatment"). White households may respond differently to black in-migrants from large southern cities, or to stage migrants who stopped in another northern city along the way, than to blacks arriving from southern plantations.

V. The Role of "White Flight" in the Process of Postwar Suburbanization

In this section, I estimate the causal effect of changes in racial composition in the central city on white relocations to the suburban ring. I then ask how much of the observed increase in suburbanization in the decades after World War II can be attributed to black in-migration. I begin in Table 5 by exploring the correlation between increases in city's black population "share" and in the fraction of whites living in the suburban ring within metropolitan areas over time. These OLS regressions pool the four decades of data underlying the scatter plots in Figure 1. I then instrument for the black share in Table 6 using the four possible permutations, i.e., weighting based on the state-of-origin profile of long-term or recent migrants, and calculating growth rates in the migrant stock by southern state using actual and predicted out-migration.

I begin in Table 5 with the OLS results. The first row contains the estimate of β, the coefficient of interest. Recall that all specifications include a set of SMSA dummy variables, and identifying β from changes in the black population share within a city over time. The regressions consistently show that a one percentage point increase in a city's black population share is associated with between a 0.6 and 0.7 percentage point rise in the fraction of white residents living in the suburban share. In other words, a one standard deviation increase in the black population share (3 percentage points) would have increased the white suburban fraction by the

equivalent of 0.4 of a standard deviation. This relationship is not driven by faster suburbanization among growing cities; adding the metropolitan area's population in column two does not reduce the coefficient on share black. In column three, I explore whether areas that began the period with large black communities or a high degree of suburbanization respond differently to a one percentage point increase in their black population. Having a large black population does not significantly affect an area's response to a new infusion, while already-suburbanized cities (i.e., those with white suburban shares above the national median in 1940) react far less strongly to a one percentage point increase in the city's black share than their less suburbanized counterparts. This finding fits with the convergence of suburban shares across SMSAs over time.

It is not clear *a priori* whether white residential decisions are influenced by absolute or percentage increases in the city's black population share. To address this question, I replace the black population share with its logarithm in column four. The coefficient on the log black population share is only marginally significant. Furthermore, when I interact the logarithm of the black population share with a series of categorical variables for the size of the black population in 1930 by quartile (not shown), the interaction terms monotonically increase with size, suggesting that percentage changes elicits quite different suburbanization responses across cities – a trend consistent with white response to an absolute rather than percentage change in the black population share. Indeed, when I include both the black share and its logarithm in column five, the coefficient on the black share is nearly identical to that in column two, while its logarithm has no explanatory power.

In Table 6, I use the preferred specification from the first column of Table 5 to instrument for changes in racial composition. The instruments rely on two sets of weights, the first of which (those based on long-term migrants) can be calculated for 36 of the 68 cities in the sample, and

the second (based on recent migrants) for 53 of these cities. I thus begin in the first and fourth columns of the table by re-estimating the OLS regression using these diminished city samples. Focusing on the first row, which pools the four decades of data, it is clear that the larger cities in this reduced samples are less responsive to a one percentage point increase in their black populations (0.37 and 0.56, respectively, instead of 0.65 for the full sample). In rows 2-4, I consider each decade in turn. Reading down columns one and four, it appears that the suburbanization response is strongest in the 1940s and 1950s, and tapered off by the 1960s, when a one percentage point increase in the black population brought only a 0.15-0.26 increase in white suburbanization.

Let us turn now to the IV results for the pooled specification in the first row. Columns two and three contain the instruments based on long-term migrants' (1915-34) states-of-origin while columns five and six use weights based on recent migrants (1935-39). The first thing to note is that three of the four point estimates are larger than the OLS coefficient, and all of them lie within its confidence interval. This statements holds for the decade-by-decade results as well, with the exception of the 1940s, when the coefficients range widely in magnitude and are not significantly different from zero. This pattern is contrary to what we would expect if some portion of the positive relationship between racial changes in the central city and white suburbanization were driven by migrant location choices. Earlier, I hypothesized that black migrants may have been attracted to local economic conditions underlying the demand for suburban living, or to cheaper central city housing left in the wake of the relocation of white households to the suburban ring. In either case, the IV estimates, which eliminate any aspect of the correlation due to migration location choices, should be *less than* their OLS counterparts. If

anything, the reaction of white households to black in-migration – or "white flight" – may be slightly stronger than the simple correlation would suggest.

In the previous section, I discussed various permutations of the instrument – i.e., using the state-of-origin weights for recent vs. long-term migrants, and relying on actual vs. predicted out-migration to calculate national growth rates in black migrant stocks. The results in Table 6 indicate that these various instruments return qualitatively comparable results. Consider first the predicted growth rates, which are intended to eliminate lingering concerns over confounding northern pull factors. The coefficients in columns five and six are based on the same set of weights (recent migrants), but use actual and predicted growth rates respectively. The point estimates are statistically indistinguishable and have equal power; both predict a 0.9 (0.3) percentage point increase in the white suburban share in response to a one percentage point increase in the black population share in the 1950s (1960s).

Another concern is that city-specific weights based on recent migration flows (1935-39) might be affected by endogenous local economic shocks (see footnote 24). To compare the two sets of weights, I re-estimate the model with recent migrant weights using the smaller sample of cities available for long-term migrants (not shown). The resulting point estimate is 0.353 (s.e. = 0.294). Compared to the point estimate in column two, which relies on the long-term migrant shares, this coefficient is slightly smaller and has less statistical power, which is reassuring. If the recent migrant weights reintroduced those local economic conditions that the instrument was designed to avoid – i.e., those that both attracted in-migration and led to suburbanization – we would expect the resulting second stage coefficients to be larger.

The best causal estimates, then, are in column six, which use *predicted out-migration* from the South and weights based on *recent migration*, which allows for a larger and less-

selected sample of cities. In Table 7, I use these estimates to investigate the quantitative importance of race in explaining white suburbanization patterns in the postwar period. The first column reproduces the IV coefficients from Table 6, which indicate that a one percentage point increase in the black population share leads to a 0.63 percentage point increase in the white suburban share in the average metropolitan area. The black population share in the average city and decade increased by 3.9 percentage points, implying an increase in the white suburban share of 2.5 percentage points due to "white flight" alone (0.63 x 3.9 = 2.5). The actual increase in white suburbanization was 7.9 percentage points for the average city, suggesting that 30 percent of this rise was due to changes in racial composition in the central city. This value is somewhat higher in the 1950s (32 percent) and somewhat lower in the 1960s (20 percent). From this simple exercise, I conclude that white flight explains a substantial portion of white suburbanization, but that this relationship appears to diminish over time.

VI. Conclusion

This paper started with an observation: over the postwar period, there was a positive correlation between changes in racial composition and white suburbanization in northern/western metropolitan areas, a relationship that seemed to corroborate popular accounts and local case studies of white suburbanization as a response to the growing black presence in the central city. To account for the fact that black migrants may have been attracted to cities undergoing a process of suburbanization, either because of cheaper city housing left in the wake of relocations to the periphery, or because of the economic fundamentals underlying the demand for suburban living, I develop an instrument that predict black in-migration to northern/western cities. The instrument predicts growth rates of the black migrant stock by southern state and decade using a

series of agricultural variables, and then weights these growth rates by a unique state-of-origin profile for each northern/western city. Even after accounting for the location choices of black migrants, there is a strong positive relationship between changes in racial composition of central cities and the white suburban share in the surrounding metropolitan area. This "white flight" is strongest in the 1950s, accounting for a third of total white suburbanization, and falls off somewhat by the 1960s.

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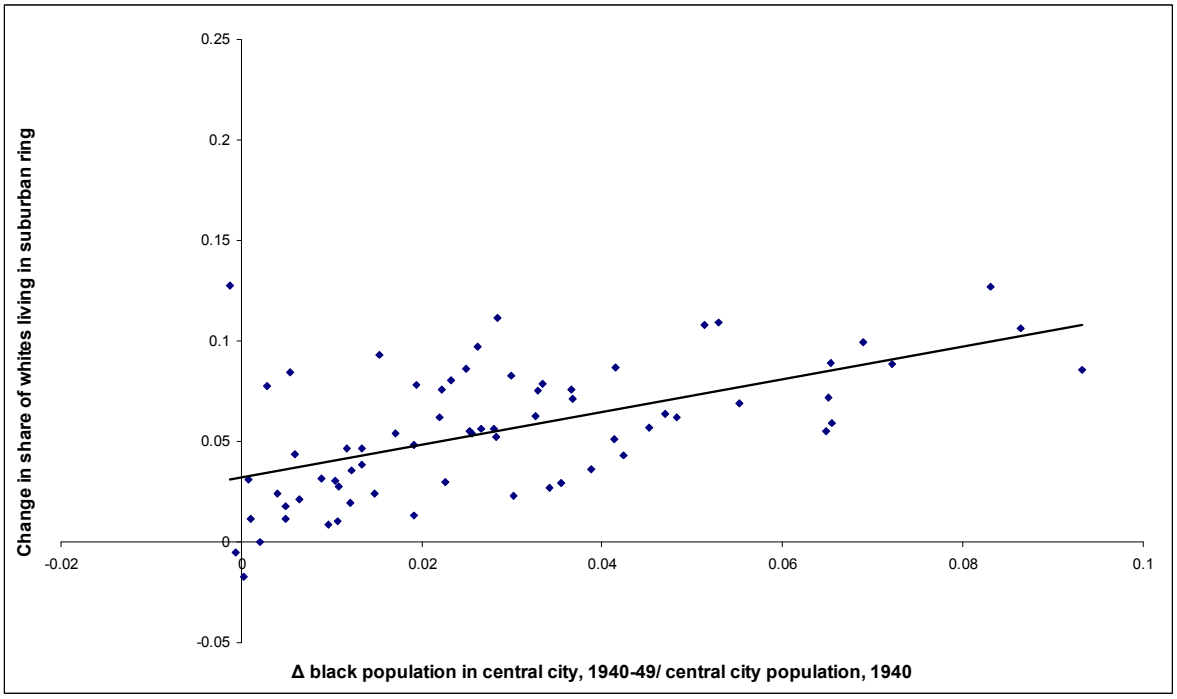
Figure 1: Correlation between changes in central city racial composition and white suburban share by SMSA and decade, 1940-1970

A. 1940-49



B: 1950-59

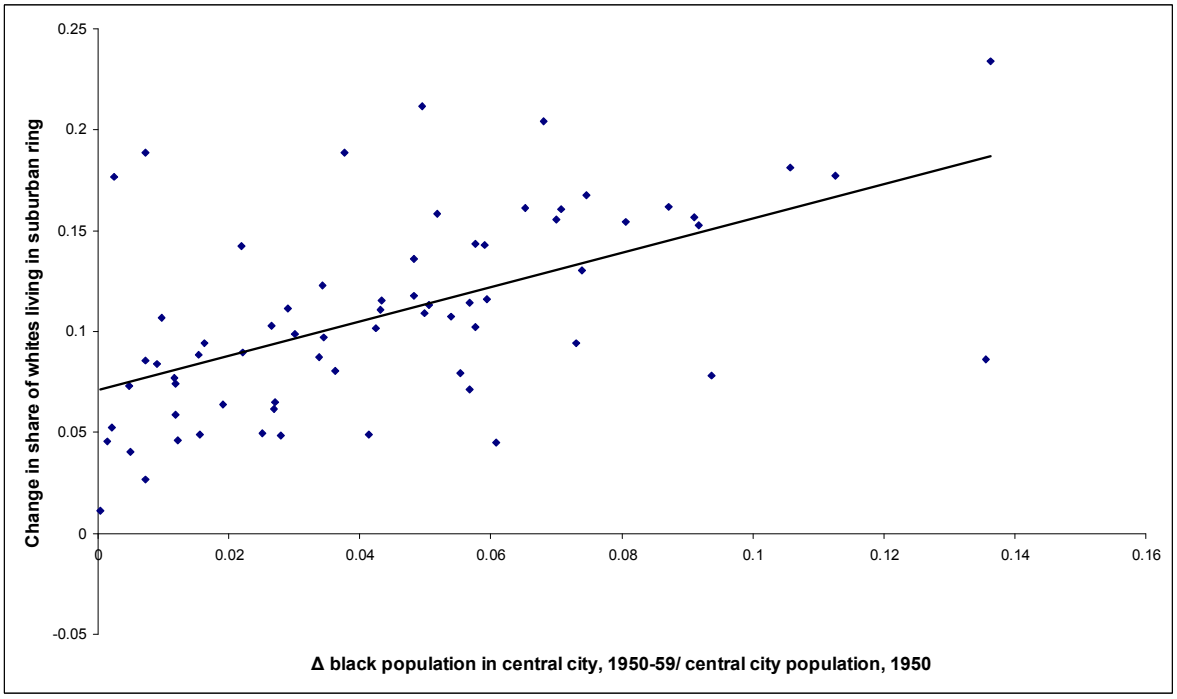
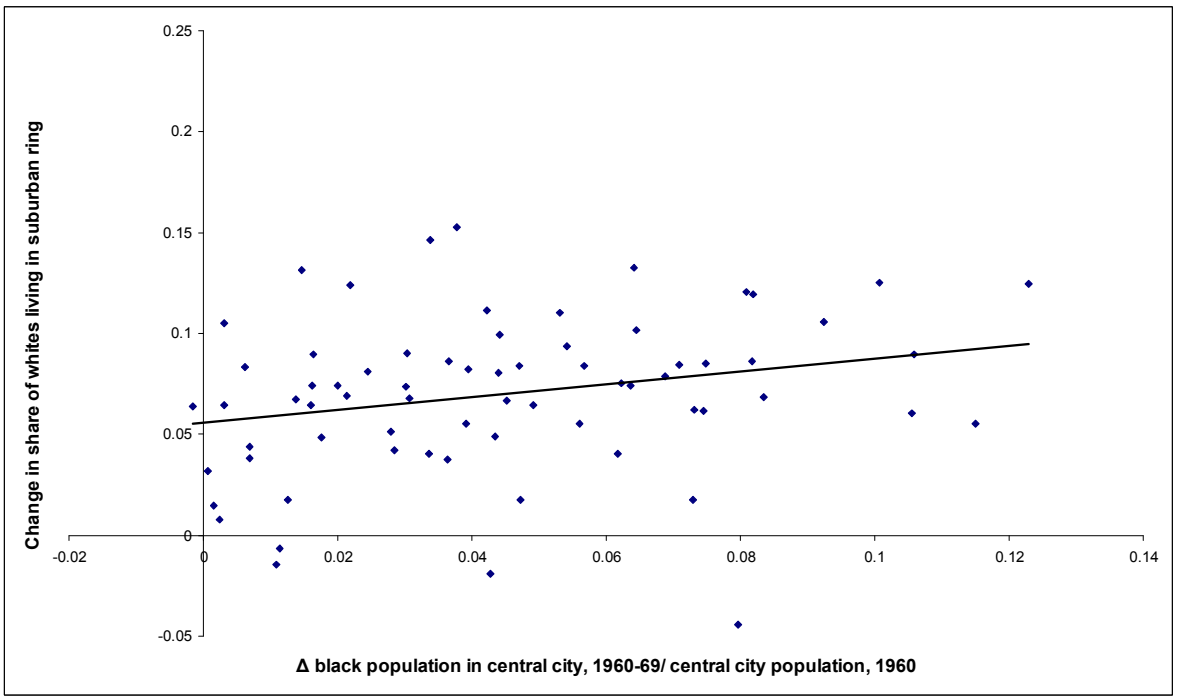


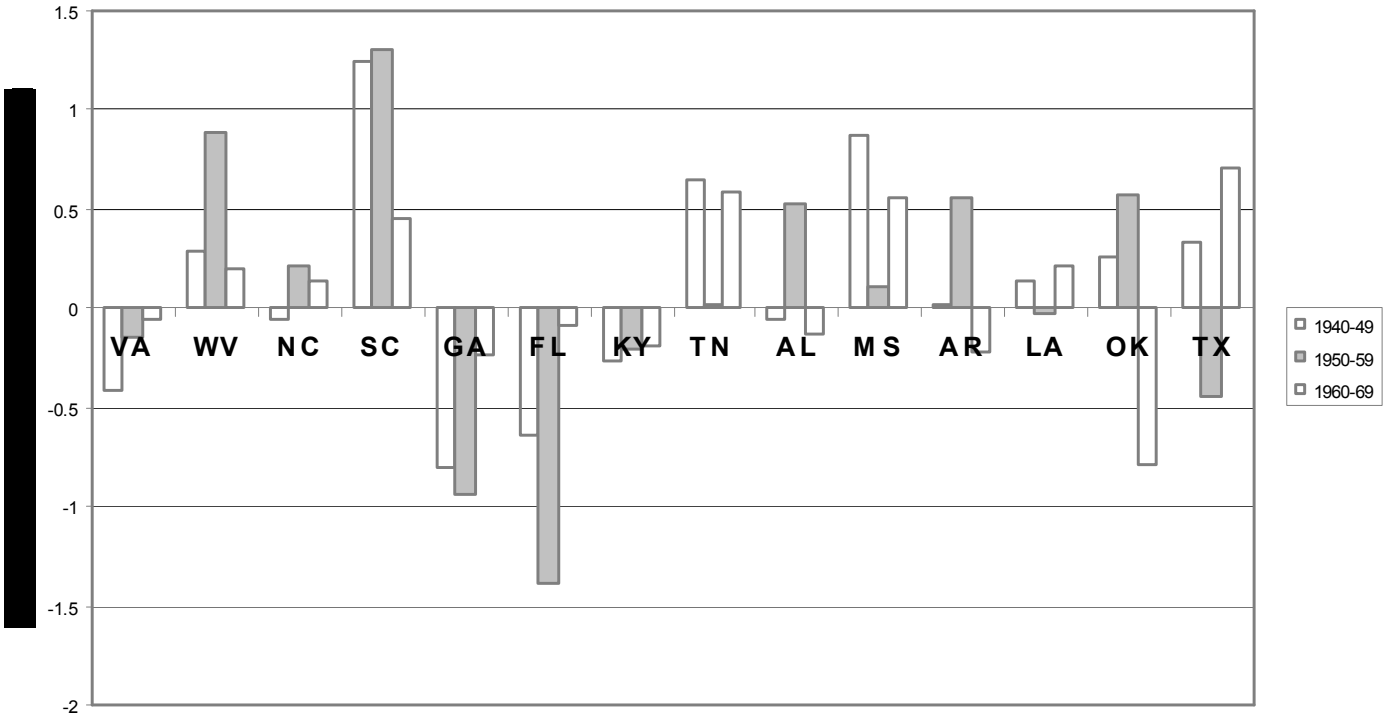
Figure 1, continued

C: 1960-69



Notes: The population counts underlying these figures represent the 68 metropolitan areas in the North/West that had at least 250,000 residents in 1970. The slope of the trend lines and standard errors are, respectively: 0.818 (s.e. = 0.145), 0.849 (s.e. = 0.155) and 0.285 (s.e. = 0.148). My calculations of the white suburban share are based on a fixed set of city and metropolitan area borders in every decade. In particular, I set central city boundaries in 1940, before any of the potentially racially-motivated annexations of this period took place, and reassign the 1970 county definition for metropolitan areas to earlier years. See section III for more details on the definition of the white suburban share.

Figure 2: Growth rates of black migrant stock by state of origin, 1940-1970.



Notes: The stock of black migrants from each southern state is defined as all individuals born in but currently living outside state *s* and is taken from Census State of Birth supplements. The flow of new migrants from each southern state was estimated by forward census survival ratio methods for the 1940s by Gardner and Cohen (1971) and Bowles, et al. (1992) for the 1950s and 1960s. Presented growth rates are deviated from the decadal average for the 14 southern states.

Table 1: Summary statistics, white suburban share and black "share" of the central city, 1940-1970

	White suburban share		Black population "share"		Δ White suburban share		Δ Black population "share"	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Pooled, 1940-1970	0.565	0.159	0.095	0.093	0.078	0.046	0.039	0.030
1940-49	0.507	0.138	0.065	0.053	0.056	0.033	0.029	0.023
1950-59	0.615	0.124	0.111	0.086	0.109	0.049	0.044	0.032
1960-69	0.689	0.115	0.164	0.120	0.071	0.038	0.0451	0.031

Notes: The calculations of the white suburban share are based on a fixed set of city and metropolitan area borders in every decade. In particular, I set central city boundaries in 1940, before any of the potentially racially-motivated annexations of this period took place, and reassign the 1970 county definition for metropolitan areas to earlier years. See section III for more details on the definition of the white suburban share. The black "share" of a city's population is defined as the number of black city residents at time *t* divided by the city's total population at time *t-9* to avoid a mechanical relationship between white suburbanization and the black city share.

Table 2: States of origin for recent and long-term black migrants in four northern/western cities, 1915-1939

	South Atlantic						Mississippi region						Southwest	
	VA	WV	NC	SC	GA	FL	KY	TN	AL	MS	AR	LA	OK	TX
1915-34														
Chicago	0.013	0.002	0.011	0.002	**0.120**	0.009	**0.053**	**0.131**	**0.136**	**0.266**	**0.091**	**0.099**	0.013	0.034
New York	**0.252**	0.005	**0.200**	**0.267**	**0.132**	**0.056**	0.007	0.012	0.029	0.009	0.004	0.015	0.002	0.010
San Fran	0.023	0.003	0.020	0.016	**0.059**	0.012	0.023	0.031	0.044	**0.060**	**0.063**	**0.300**	**0.048**	**0.297**
1935-39														
Chicago	0.009	0.007	0.003	0.008	**0.068**	0.015	0.030	**0.164**	**0.110**	**0.297**	**0.170**	**0.071**	0.018	0.032
New York	**0.179**	0.014	**0.203**	**0.252**	**0.126**	**0.096**	0.007	0.022	0.041	0.013	0.006	0.023	0.003	0.016
San Fran	0.021	0.007	0.002	0.005	0.037	0.023	0.005	0.037	0.030	0.030	**0.106**	**0.245**	**0.120**	**0.331**

Notes: State of birth tabulations for current residents by city and race are taken from the 1940 Census State of Birth supplement. Information on the location in 1935 of current city residents by race are from the 1940 Census Mobility supplement. Southern states that account for five percent or more of a city's black migrant stock are highlighted in bold face.

Table 3: Marginal effect of southern agricultural and economic variables on net black migration rate evaluated at the mean by decade and southern region, 1940-70

(Push factors evaluated at the mean for decade-region; migration rate per 100 in base population)

	All southern	Mississippi Delta	South Atlantic
1940-49			
% acres planted in cotton	-32.2	-49.2	-27.7
% labor force in agriculture	-11.7	-5.3	3.5
$AAA per capita $_{33\text{-}37}$	20.6	5.1	8.4
% tenant	-35.3	-26.2	-32.9
Tractors/acre of planted land	-6.7	-1.4	-8.9
$ WWII per capita $_{40\text{-}45}$	1.9	1.1	2.7
1950-59			
% acres planted in cotton	-9.8	-16.4	-8.4
% labor force in agriculture	-43.5	-43.7	-45.1
$AAA per capita $_{33\text{-}37}$	5.5	4.6	2.6
1960-69			
% planted in cotton	-10.5	-12.4	-11.5
$AAA per capita $_{33\text{-}37}$	15.3	12.9	7.2
% tenant	-24.4	-35.4	-5.1
% LF in manufacturing	-13.7	-29.7	0.3

Notes: Migration rates are based on coefficients for decade-specific models of the determinants of net black out-migration rates by southern county, presented in Appendix Table 1. The Mississippi Delta includes Alabama, Arkansas, Mississippi and Louisiana. The South Atlantic includes Florida, Georgia, the Carolinas and the Virginias. Each estimate calculates the net migration rate associated with mean value of the southern county characteristic for the decade and (sub)region in question.

Table 4: First stage results: Predicting the growth in the black population by northern city using weighted national growth rates of the black migrant stock by southern state, 1940-1970

	Long-term migrants (1915-34)		Recent migrants (1935-39)	
	Actual	Predicted	Actual	Predicted
Pooled, 1940-1969	0.583*	0.461*	0.658*	0.479*
	(0.074)	(0.054)	(0.201)	(0.046)
1940-1949	0.406*	0.217*	0.483*	0.122*
	(0.162)	(0.064)	(0.123)	(0.052)
1950-59	0.706*	0.644*	0.789*	0.661*
	(0.152)	(0.121)	(0.127)	(0.104)
1960-69	0.512*	0.427*	0.567*	0.549*
	(0.125)	(0.108)	(0.110)	(0.086)
SMSA dummies?	Y	Y	Y	Y
Decade dummies?	Y	Y	Y	Y
N	176	176	227	227

Notes: Standard errors are clustered by SMSA, and are reported in parentheses. Coefficients that are significant at the five level are marked with an *. City-specific weights based on the share of long-standing black migrants (1915-34) who were born in each southern state are available for 36 northern/western cities, and underlie the instruments in columns one and two. Those based on recent black arrivals (1935-39) are available for 53 cities and are presented in columns three and four. Columns marked "actual" use the actual estimated black out-migration by southern state to calculate national growth rates, while those marked "predicted" use county-level predictions of the net out-migration rate aggregated to the state level. See Section IV (b) for more details on the instrument's construction.

Table 5: OLS relationship between the black share of a city's population and the white suburban share in the surrounding metropolitan area using SMSA fixed effects, 1940-1970

	(1)	**(2)**	**(3)**	**(4)**	**(5)**
% CB = black "share"	0.687*	0.657*	1.022*		0.646*
	(0.125)	(0.116)	(0.185)		(0.116)
ln(black "share")				0.029**	0.008
				(0.016)	(0.012)
ln (population, SMSA) $_t$		0.113*		0.114*	0.111*
		(0.035)		(0.046)	(0.036)
Black "share" * Black pop, city $_{1930}$			-0.166		
			(0.133)		
Black "share" * White suburban share $_{1940}$			-0.435*		
			(0.112)		
SMSA dummies?	Y	Y	Y	Y	Y
Decade dummies?	Y	Y	Y	Y	Y
N	272	272	272	272	272

Notes: Standard errors are clustered by SMSA, and are reported in parentheses. Coefficients that are significant at the five and ten percent levels are marked with an * and ** respectively. The OLS sample includes 68 northern/western SMSAs over four decades. The black "share" of a city's population is calculated as the number of black city residents at time *t* divided by the city's total population at time *t-9* to avoid a mechanical relationship between white suburbanization and the black city share.

Table 6: Instrumenting for the change in racial composition with aspects of the black migration

	(1)	(2)	(3)	(4)	(5)	(6)
Model:	OLS	IV	IV	OLS	IV	IV
Sample size:	36 cities	36 cities	36 cities	53 cities	53 cities	53 cities
Weights:	---	1915-1934	1915-34	---	1935-39	1935-39
Growth rates:	---	Actual	Predicted	---	Actual	Predicted
Pooled, 1940-1970	0.369*	0.416	0.314	0.563*	0.568*	0.637*
	(0.182)	(0.258)	(0.279)	(0.147)	(0.201)	(0.173)
1940-49	0.559	-0.326	-0.109	0.877*	0.400	1.222
	(0.390)	(0.926)	(0.892)	(0.306)	(0.587)	(0.782)
1950-59	0.530*	0.659**	0.546	0.739*	0.859*	0.888*
	(0.251)	(0.373)	(0.340)	(0.204)	(0.314)	(0.297)
1960-69	0.154	0.305	0.265	0.263**	0.302	0.311**
	(0.170)	(0.258)	(0.267)	(0.138)	(0.192)	(0.162)

Notes: Standard errors are clustered by SMSA, and are reported in parentheses. Coefficients that are significant at the five and ten percent levels are marked with an * and ** respectively. City-specific weights based on the share of long-standing black migrants (1915-34) who were born in each southern state are available for 36 northern/western cities, and underlie the instruments in columns one and two. Those based on recent black arrivals (1935-39) are available for 53 cities and are presented in columns three and four. Columns marked "actual" use the actual estimated black out-migration by southern state to calculate national growth rates, while those marked "predicted" use county-level predictions of the net out-migration rate aggregated to the state level. See Section IV (b) for more details on the instrument's construction.

Table 7: Assessing the quantitative importance of "white flight" in postwar suburbanization

	(1)	(2)	(3)	(4)	(5)
	IV	Mean change, black "share"	White flight (1) * (2)	Mean change, white suburban share	% suburbanization due to "white flight"
Pooled, 1940-1970	0.637	3.9 pp	2.5	7.9	32%
1950-59	0.888	4.4 pp	3.9	10.8	36%
1960-69	0.311	4.5 pp	1.4	7.1	20%

Notes: Column one reproduces the IV estimates using the state-of-origin profile of recent migrants (1935-39) and predicted out-migration by southern state from the sixth column of Table 6. The mean change in the black share and in the white suburban share are calculated for the 53 cities underlying the IV estimates.

Appendix Table 1: Determinants of the net black migration rate from southern counties, 1940-1970

	1940-49	1950-59	1960-69
% planted in cotton$_t$	-122.086**	-25.636**	-96.639**
	(39.073)	(7.486)	(39.175)
% LF in agriculture$_t$	61.079**	-131.04	
	(29.313)	(90.822)	
$ AAA per capita $_{33-37}$	2.200**	0.169	0.470**
	(0.316)	(0.046)	(0.110)
$ AAA * % cotton	-0.900**		
	(0.247)		
$ AAA * % agriculture	-2.039**		
	(0.580)		
Tractors/acre$_t$	-22.323**		
	(9.111)		
Tractors/acre * % cotton	28.290**		
	(14.318)		
% tenant$_t$	-146.81**		-244.856**
	(46.796)		(78.416)
% tenant * % cotton	117.191**		182.444**
	(73.252)		(113.308)
$ WWII contracts per cap $_{40-45}$	36.928**		
	(16.582)		
$ WWII * % agriculture	-86.026**		
	(0.432)		
% tenant * South Atlantic			161.738*
			(81.513)
% LF in manufacturing$_t$			-203.535**
			(64.521)
% manufacturing * South Atlantic			204.884**
			(86.479)
State fixed effects?	Y	Y	Y
N	1313	1335	1283