

# Racial Diversity and Exclusionary Zoning: Evidence from the Great Migration

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## **Abstract**

Why do cities adopt and maintain laws that restrict land use, creating a shortage of affordable housing? Dominant explanations emphasize the economic incentives of homeowners to preserve their property values. The origins and racially disparate impacts of these laws suggest another motivating factor: the desire to maintain and further racial segregation by white residents. I characterize for the first time the extent of exclusionary zoning in the United States: across over 100 of the largest cities in the country, the median city allows multi-family housing to be built on only 12% of residential land. Then, leveraging exogenous factors for Black migration to Northern cities from 1940 to 1970, I show that increasing racial diversity causes cities to zone less land for multi-family housing. Analysis of public opinion surveys during this time period shows the Great Migration caused a racial backlash among urban white voters, which translated to policy action. This evidence suggests that exclusionary zoning was adopted to maintain racial segregation and that opposition to multi-family housing cannot just be explained by desire to maintain property values. I rule out alternative explanations of increased homeownership rates, different city institutions, or differences in federal intervention driving variation in zoning. These findings show how racial threat can be channeled into racialized public policy and provide a new explanation for inequality in housing markets today.

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# 1 Introduction

Land use restrictions in urban areas of the United States, in particular the prohibition of high-density housing, have many pernicious effects. These laws cause high home and rent prices, making housing unaffordable to lower-income and increasingly middle and upper-income families (Glaeser, Gyourko and Saks 2005). Because the benefits of appreciating property values are not equally shared, land use restrictions contribute to economic inequality (Piketty and Zucman 2014). They also widen racial inequality by maintaining racial segregation (Rothwell and Massey 2010) and drive partisan polarization (Trounstine 2018). As urban job centers become prohibitively expensive, they have reduced the ability of families to move to opportunity (Chetty et al. 2014). This constrained mobility has effects not just on low-income families, but reduces aggregate economic output (Hsieh and Moretti 2019). Many urban areas, while once a place of opportunity for the poor to climb the economic ladder (Glaeser, Gyourko and Saks 2005), have become increasingly inaccessible.

Each incorporated municipality and county in the United States has regulations restricting how private landowners use and build on their land.<sup>1</sup> Differences in land use regulations necessarily reflect the geographic and demographic features of the area. But on the whole, the United States is an outlier relative to other countries in the prevalence of policies allowing only single-family homes on large lots of valuable urban land (Hirt 2015). These restrictions raise the price of housing by mandating large, expensive homes, and by restricting overall supply in high-demand areas.

Many explanations for the prevalence exclusionary land use point towards homeowners, who oppose new development to protect the financial value of their home (Fischel 2001). Even after accounting for demographic differences, homeowners participate in local politics at higher levels than renters (Hall and Yoder 2018), express more anti-development attitudes generally (Einstein, Palmer and Glick 2018), and are more spatially sensitive (Hankinson 2018) than renters. A focus on economic self-interest motivating homeowners, who are a minority in many of the largest cities in the United States, misses outright racial hostility behind exclusionary land use policies.

I argue that during a critical juncture between 1940 and 1970—when the demographic makeup of cities was rapidly changing due to the Great Migration, explicit racial segregation was being

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<sup>1</sup>Even Houston, the largest city in the United States without zoning, has restrictions on form (e.g. building heights, setbacks from the street) and use (e.g. maximum occupancy, required parking spaces) that approximate the effects of zones.

outlawed, and cities' capacity to craft detailed zoning plans increased—cities turned to land use controls to exclude multi-family housing, and the lower-income families who live in them, from most residential neighborhoods. I show that cities that were more impacted by the Great Migration ban multi-family housing on a higher percentage of their residential land. City governments enacted these policies in response to racially conservative white voters who demanded racial segregation. Zoning codes which had previously allowed dense multi-family housing in most neighborhoods were revised to mandate a majority of land be set aside for single-family homeowner housing. This slowed new housing production, particularly of multi-family housing, and raised rents and home values in the long-term when growth began to exceed allowable supply.

I test whether the Great Migration caused cities to zone less land for affordable multi-family housing with an original geospatial dataset of zoning in over 100 of the largest American cities. I find that exclusionary zoning is widespread: the median city in the sample allows apartments only on 12% of residential land. I match summary measures of exclusionary zoning to data on city-level demographic change from the Great Migration. Using an instrumental variables strategy to predict Black migration from exogenous factors, I show that the Great Migration causes the median city to zone 2.5% less residential land area for multi-family housing, nearly a quarter of the median. These zoning restrictions reduce the production of new multi-family housing and increase the share of income that families spend on rent.

While zoning adoption became widespread in American municipalities in the early 20th century, cities did not widely ban multi-family housing. Early zoning laws focused primarily on separating housing from industrial and commercial uses. Attempts to use zoning to mandate racial segregation were struck down by court rulings, leaving enforcement of segregation to private actors: lenders, developers, and landlords. After World War II, new suburban municipalities, containing only single-family homes, were built from scratch (Jackson 2018) and connected to existing employment centers by a massive highway expansion (Nall 2015). Existing dense cities, built before automobile transportation, reduced the permissible uses of land, allowing only single-family homes to be built homes in areas that formerly allowed apartment buildings. I argue that they did so in part as a reaction to increasing racial diversity and a desire to preserve segregation.

Two complementary changes were reshaping the racial dynamics of non-Southern cities during this time period: a massive migration of African-Americans out of the rural South and the end of

legally enforceable racial segregation. Between 1940 and 1970, over 3.5 million African Americans left the rural South for the urban North, Midwest, and West in the second wave of the Great Migration. They settled in cities where the machinery of racial discrimination in housing markets—redlining excluding non-White neighborhoods from lending, restrictive covenants preventing home sales to non-Whites, and racial discrimination by landlords, including public housing agencies (Rothstein 2017)—was being dismantled by federal and state action.

This research sheds light on why the United States is uniquely restrictive of land use—its unique racial politics, and in particular, the timing of Black migration during a period of federal civil rights action and increased attention to city planning. They also explain the puzzle of why large cities—politically liberal and historically a magnet for the poor seeking economic opportunity—are so exclusionary. Restrictive land-use policies, which remain largely intact today, lie at the root of housing affordability and segregation concerns in cities today. Exclusionary land-use has caused an underproduction of housing in many growing cities, the cost of living and preventing low-income families from accessing the economic, social, and health benefits of cities.

## 2 Background

Zoning is a core institution of local governments, regulating the physical makeup of a city. Yet, for much of American history, land use was not regulated in a comprehensive way, if at all. Municipalities in the United States first adopted comprehensive zoning ordinances in the late nineteenth century, and almost all cities did so by 1935. Lawmakers designed the earliest zoning ordinances in the United States to explicitly racially segregate non-white residents,<sup>2</sup> a practice that was deemed illegal in 1917 (*Buchanan v. Warley* 1917). In the decades following, nearly every city in the United States adopted a comprehensive zoning ordinance primarily focused on separating commercial, industrial, and residential uses.

Zoning prescribes the legal uses of land, thereby affecting its value. Directly restricting uses decreases the value of land. Take, for example, land on top of an oil field where building an oil rig is prohibited, or oceanfront property where only one home per acre is allowed. Without these restrictions, landowners could maximize the value of the land by building oil rigs and tapping the

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<sup>2</sup>Modesto (1885) and San Francisco (1890) had zoning codes designed to segregate Chinese residents by banning laundries, a common occupation among Chinese immigrants at the time.

oil field, or developing many homes and selling them to multiple buyers, respectively. In this case zoning restricts the value of the land.

But zoning can also increase property values by restricting uses of neighboring lots. Neighbors can engage in private covenants to ensure that they abide by common standards, but only governments can ensure universal compliance and enforcement. Downzoning, when an update to the zoning code reduces the possible uses or intensity of uses in an area, can increase the value of nearby land in two ways. First, by restricting undesirable uses that generate negative externalities, such as fraternities that have loud nightly parties, downzoning makes neighboring property more attractive. The second method is indirect: in the long-term, when large areas of a city are downzoned, supply may no longer meet demand for housing, and prices of the constrained supply of units will rise.

Scholars have provided a number of economic and political explanations for why comprehensive zoning arose when it did. First, economic developments made zoning necessary to protect property values. The rise of urban manufacturing and the associated public health and nuisance problems led to regulations on the siting of industrial buildings (Clingermayer 1993). Zoning was viewed by progressive-era reformers as a way to regulate public health and impose order on sprawling cities (Toll 1969; Trounstein 2018). Both residents, who did not want to live next to noisy and polluting factories, and factory owners, who did not want to face complaints and lawsuits from neighbors, favored a separation between residential and industrial uses. At the same time, development of streetcars and, later, automobiles enabled cities, and later whole regions, to expand on the periphery and for workers and jobs to be located outside of the city center (Fischel 2001). As the possibilities for locating homes and businesses expanded, property owners sought to ensure less variation in possible neighbors. Finally, as large-scale residential development became more common, developers sought legal enforcement of common neighborhood standards after they had subdivided and sold land (Weiss 1986). Realtors and individual property owners had long been content with spot zoning of individual properties, but large-scale developers sought control over the entire neighborhoods they were creating from scratch.

The potential of zoning as a public policy tool was also evident to politicians and groups seeking to promote racial segregation. Many of the proponents of zoning in the federal government in the 1920s were avowed segregationists, (Rothstein 2017) although documents encouraging states and

cities to adopt zoning make no reference to race. How and when cities adopted zoning also points to a link between segregation and zoning: cities with segregated schools adopted zoning ordinances earlier than those without, indicating a link between zoning and formal segregation (Trounstein 2018). And early zoning codes promoted racial segregation by zoning Black neighborhoods near industrial zones and for higher residential densities (Shlay and Rossi 1981; Shertzer, Twinam and Walsh 2016; Rothstein 2017, p.50). When racial zoning was outlawed in 1917, cities like Atlanta which had previously used zoning districts named for white and colored inhabitants kept the same boundaries and simply changed the district name, to R1 and R2, respectively (Silver 1991).

Despite these roots, exclusionary residential zoning—zoning designed to economically segregate neighborhoods by mandating expensive homes—was not a particularly widespread feature of early zoning ordinances. These laws were primarily focused on separating industrial and commercial uses from residential areas. To the extent that zoning ordinances had exclusive residential districts, they made up a very small portion of the land area of a city. For instance, 4.8% of the land in Los Angeles and 2.9% of the land in Chicago was zoned for exclusive single-family use in their first zoning codes (in 1933 and 1923, respectively) (Whittemore 2012; Flint 1977). Of course single-family homes were banned or rare in these zones, but higher densities were not banned outright, allowing apartments to exist next to single-family homes.

The many private mechanisms available to enforce segregation may explain why exclusionary zoning was not commonplace in early zoning ordinances. Racial covenants, which prevented the sale of homes to non-whites, covered a majority of property deeds in many cities and remained a constraint on integration even after they became legally unenforceable in 1948 (Brooks 2011). Lending practices that priced in existing racial makeup and the presence of multi-family housing prevented neighborhoods from integrating. While these discriminatory institutions were not as impenetrable as racial zoning, they were nearly as effective: slum clearance, neighborhood planning, private deed restrictions, and racially charged real estate practices all served the cause of segregation as effectively as racial zoning (Silver 1991).

How did zoning become a principal tool of exclusion then? First, private mechanisms to enforce segregation were outlawed by civil rights legislation. Second, cities increased their planning capacities, allowing more specialized zoning. And finally, the Second Great Migration brought millions of African-Americans to non-Southern cities.

Exclusionary zoning became widespread as the federal government was slowly chipping away at private and public housing discrimination. Private racial covenants, prohibiting home sales to non-white families, were the primary private method of housing segregation. They became widespread around the time that cities first adopted comprehensive zoning ordinances and remained legal and enforceable until 1948. While restrictive covenants were declared unenforceable in 1948, private owners could still adhere to their terms until their full outlawing in 1968. The federal government, active as a lender and landlord, also had a large role in promoting housing discrimination. The Home Owners Loan Corporation (HOLC) explicitly factored racial composition into its ratings of neighborhoods' suitability for home loans. Again, these discriminatory practices were not outlawed until 1968, when the Fair Housing Act made discrimination in housing sales, rentals, and loans, illegal.

At the same time, cities' planning capacities and possibilities were growing, making zoning a sharper tool. The Works Progress Administration and later the Federal Housing Agency paid for land use surveys of cities, giving planning officials data on the structures and uses for every lot in their cities. During World War II, emergency planning and rationing of building materials brought building to a near halt. Cities recognized that the looming housing shortage and economic slowdown after the war's conclusion would necessitate a massive homebuilding program, and planned accordingly (ICMA 1944). The opportunity to secure funds also led cities to adopt stricter residential zoning—the FHA's lending criteria included both existing land use and zoning (Weiss 1987). Finally, legal changes in the 1950s eliminated the need for cities to justify their zoning decisions for public health reasons, making it easier for them to exclude multi-family housing (Mangin 2014). In sum, this contributed to an explosion in the scope of zoning policy after World War II as reflected in newspaper coverage in Figure 1.

As private segregation mechanisms were being outlawed and city planning capacity was increasing, the largest internal migration in American history was at its peak. Between 1940 and 1970, 3.5 million African-Americans left the rural South for urban areas in the rest of the country. The first wave of Great Migration from 1915-1930 was similar in scale but paused when economic opportunities in the North decreased during the Great Depression. African-Americans left the South in response to violent oppression under Jim Crow and because of poor economic opportunities

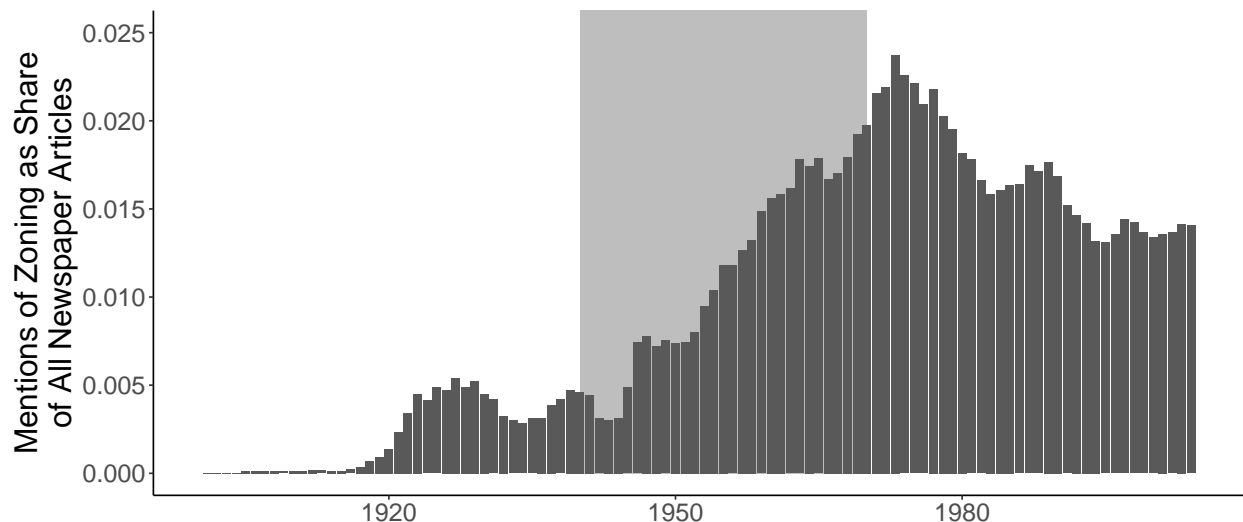


Figure 1—**The Post-War Zoning Boom**

*Note:* Plot shows the percentage of newspaper articles containing mentions of zoning by year. For each city, the number of articles mentioning zoning per year is divided by the number of total articles in that year. Plot shows average across all cities. Period 1940-1970 shaded in grey.

*Source:* newspapers.com

relative to those in the North.<sup>3</sup> I exploit variation in which cities received migrants and to identify a relationship between increasing racial diversity and exclusionary zoning.

The Great Migration drastically changed American cities, exacerbating declines caused by post-War federal investments in new suburban municipalities. African-American arrivals to central cities caused white city residents to leave for neighboring suburban municipalities (Boustan 2010). White residents who were displeased with the changing makeup of their cities but who did not act by moving also reacted harshly. They subjected African-Americans migrants, fleeing the racial violence of the South, to riots, bombings, and arson when they attempted to move into white neighborhoods (Wilkerson 2011)). White families, unwilling to share public goods with African-American families, were more likely to send their children to private school (Derenoncourt 2019). White voters also mobilized politically to use the law to enforce their preferences. When voters went to the polls in 1964 to vote on a ballot proposition reversing an open housing court decision in California, areas that became more Black over the previous two decades were more likely to vote in favor of overturning the law (Reny and Newman 2018).

The departure of white residents to the suburbs in response to increasing racial diversity also

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<sup>3</sup>See (Tolnay 2003) for a comprehensive review of the literature on the causes and timing of the Great Migration.

affected the public finance of municipalities they fled. Cities that changed more as a result of the Great Migration had lower tax receipts, cut spending on education, public health, and poverty, and assumed more municipal debt (Tabellini 2018). One exception to the decline in spending on law enforcement, where the Great Migration caused cities to spend more on policing and to incarcerate more people (Derenoncourt 2019).

Amid white flight, city governments were concerned about losing residents and revenues. Zoning, which provides security to property values (Fischel 2001), was a natural tool with which to stabilize real estate and slow white outflows. Politicians have two main incentives to increase property values. First, revenues derived from property taxes will increase with higher property values, lessening budget constraints. Second, re-election seeking politicians can also benefit electorally from voters who reward them for their property value increases (Larsen et al. 2019). While this logic holds for homeowners, renters may be hurt from property value increases, but homeowners are both more numerous in most cities and more likely to vote in local elections (Fischel 2001; Hall and Yoder 2018).

In this paper, I examine the effects of the Great Migration on land use, a policy area closely linked to racial residential integration. I show that municipal governments reduced the amount of residential land available for multi-family housing construction in response to the Great Migration. I argue that they did so to maintain racial segregation, a demand of white voters who were more racially conservative in cities that had larger Great Migration-induced racial change. Unlike prevailing views of land use politics, which emphasize the role of the federal government (Rothstein 2017) or real estate interests (Molotch 1976), this explanation links voters and representative institutions to policy changes. Unlike explanations that focus on federal policies applied across the country or behavioral mechanisms like NIMBYism, varying levels of racial diversity can explain why some cities are more exclusionary than others.

### **3 Data and Empirical Strategy**

#### **3.1 Migration Instrument**

The 3.5 million African-Americans who left the rural South for urban areas in the rest of the country did not choose their destinations randomly. Migrants left the South in greater numbers

when conditions were worse and went to cities where they thought they would have a better life. The latter consideration could plausibly correlate with land use policies—for instance, cities that have higher quality and less expensive housing may be a draw for migrants. To overcome these concerns and causally identify the effect of demographic change on municipal land use policy, I use a shift-share or Bartik instrument (Altonji and Card 1991), an identification strategy developed in the migration economics literature first applied to the Great Migration by Boustan (2010).<sup>4</sup>

The shift-share instrument creates predicted migration levels for each city by interacting predicted Black outmigration from Southern counties with the probability of going to any given Northern city. First, I predict the number of migrants I expect to leave each county in the South in each decade from 1940-1970 based on pre-1940 economic covariates. Then, I assign these outmigrants to cities in the North based on prior migration patterns. Summing up the predicted arrivals from each county at the city level yields a predicted number of migrants to each city.

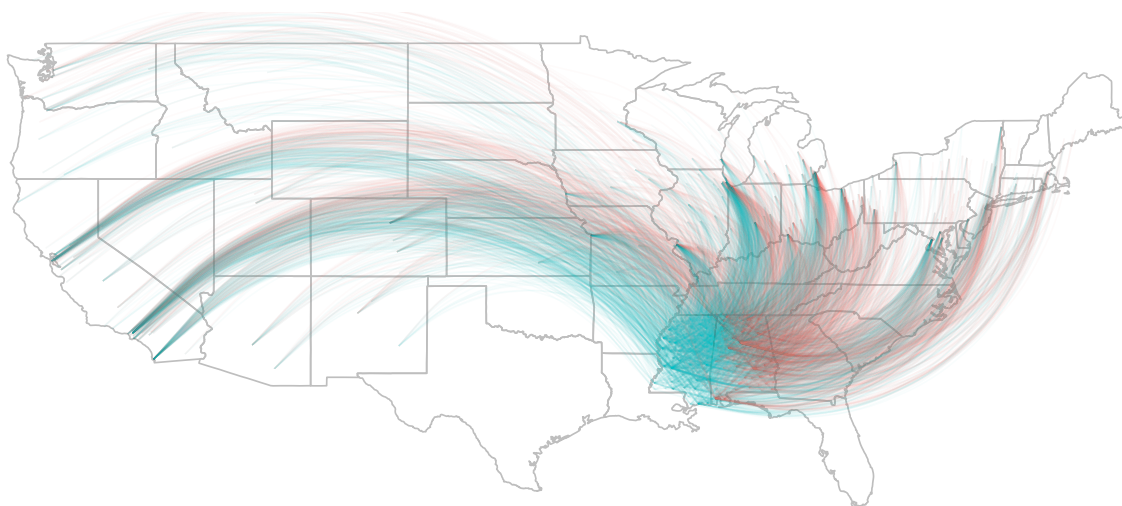
I exploit differences in local economic conditions to capture when and where African-American migrants leave counties in the South. Since one of the primary reasons for the Great Migration was to seek higher-paying and better jobs in the North, we would expect differences in the Southern economy to predict outflows. However, to avoid bias in the instrument, I cannot use contemporaneous economic conditions and must use pre-treatment measure that predict later economic performance, such as agricultural suitability or transportation infrastructure. These factors vary considerably across counties in the South and therefore produce different predictions for outmigration at different times. For instance, mechanization of tasks that Black labor formerly performed is highly predictive of workers leaving the South (Fligstein 1981) and areas that cultivated different crops (e.g. cotton vs. tobacco) mechanized at different times.

Using a set of pre-treatment measures of local economic conditions from (Boustan 2016) and net county migration by race (Gardner and Cohen 1992; Bowles et al. 2016), I select the best predictors for county-decade outflows using lasso. I then sum the fitted values from the lasso predictions to generate the total number of predicted migrants to each city. I follow (Derenoncourt 2019) in using lasso to select the best predictors of outmigration for each county-decade, decreasing mean-squared error by 50% relative to OLS predictions using selected covariates in (Boustan 2010).<sup>5</sup>

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<sup>4</sup>See Appendix A.7 for more information about the prevalence and applications of shift-share instruments in economics and political science.

<sup>5</sup>Table A.5 shows the reduction in MSE for each decade relative to OLS predictions and lasso predictions using



**Figure 2—Migrants from Nearby Counties Settle in Different Places**

*Note:* Plot shows county-city flows from 1935 to 1940 for all African-American residents of Alabama and Mississippi in 1935. The proportion of Black departures to each city from each county is used to assigned shares of future departures.

*Source:* 1940 full-count census (Ruggles et al. 2018)

To assign predicted migration levels to destinations, I use prior flows of African Americans leaving the rural South as the best prediction of where migrants will go. Since people leave to go places where they have family and social networks, it is likely that these prior migration patterns predict future ones. Using the complete-count US Census from 1940, which asks county of residence in 1935, I create a matrix of migration from Southern counties to non-Southern cities during these 5 years.<sup>6</sup> Figure 2 illustrates these data for the states of Mississippi and Alabama. Neighboring states and even counties send different shares of their migrants to different cities. For instance, the greater share of migrants to Chicago from Mississippi and the greater share of migrants to New York from Alabama are visible to the eye. Chicago receives nearly 10% of the Black population that left Mississippi between 1935 and 1940, but about 3% of the population that left Alabama, a neighboring state. On the other hand, Detroit receives nearly 6% of the Black population that left South Carolina between 1935 and 1940, but only 3% of Mississippi's out-migrants.

To get a predicted number of migrants for each city, the proportion of migrants from each county to each city is then simply interacted with the predicted number of leavers from each county to generate a value for each county-city pair. These are summed at the city level across counties and decades to generate predicted Black in-migration for each city.

Using the predicted inflows of Black population to each city I construct a measure to capture city-level change due to the Great Migration. I calculate Black population growth from 1940 to 1970 as:

$$\hat{GM} = \frac{\Delta pop_{Black}}{pop_{1940}}$$

$\hat{GM}$  is the independent variable used in all analyses in the main text, representing a reduced form estimate of the Great Migration. Since it captures the effect of Black population growth scaled by 1940 population, it captures similar scale changes in both small and large cities. While the majority of the Great Migration travelled to large metropolises like New York and Chicago, smaller cities may have a larger value of  $\hat{GM}$  due to their smaller denominator. A large percent

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other covariate sets. Table A.5 shows the covariates used to outflows in each decade

<sup>6</sup>I use the 5% microdata sample of the 1960 Census to augment to the full-count 1940 data for cities with more than 100,000 inhabitants. Using these migration cross-tabs to predict 1960-1970 migration increases the strength of the instrument and accounts for the changing class composition of Black migrants in later decades (Sears and McConahay 1973). Results using only the 1935-1940-derived shares are shown in Appendix ??

change in a small city may be more noticeable to residents, politicians, and business than an absolute change in a larger city.

### 3.2 Estimation

To estimate the effects of the Great Migration on my outcomes of interest, I estimate a series of OLS, reduced form, and two-squared least stage regressions to identify the effect of the Great Migration on various outcomes. The OLS and reduced form equations take the form, respectively:

$$Y_i = \alpha + \beta GM_i + \gamma X_i + \epsilon_i$$

$$Y_i = \tilde{\alpha} + \tilde{\beta} \hat{GM}_i + \tilde{\gamma} X_i + \epsilon_i$$

Where  $Y_i$  is the outcome variable (e.g. land use restrictiveness) for city  $i$ ,  $GM_i$  is the actual Great Migration change for city  $i$  for the OLS regression and  $\hat{GM}_i$  is the predicted Great Migration change.  $X_i$  is a matrix of pre-treatment control variables, specifically 1935-1940 Black migrants as a share of total population and when available, pre-treatment (1940) measures of the dependent variable. For the primary analysis of the effects of the Great Migration on exclusionary zoning, I use the share of single-family homes in 1940 as the pre-treatment control since zoning map data from the 1920s and 1930s is not systematically available.

To calculate two stage least squares estimates (2SLS), I use the coefficient from the first stage equation:

$$GM_i = \eta + \delta \hat{GM}_i + \epsilon_i$$

to generate fitted values  $\tilde{GM}$ , which are used in the second-stage equation:

$$Y_i = \eta + \beta \tilde{GM}_i + \zeta X_i + \epsilon_i$$

When outcome data are available for multiple years after 1970, I use a similar model as the base specification, but with the addition of year fixed effects and clustered standard errors at the city level:<sup>7</sup>

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<sup>7</sup>When these multi-year data are available, I graphically present estimates for individual years to show changes over time in addition to the pooled estimates. Pooled estimates of the OLS and 2SLS specifications are shown in

$$Y_{it} = \tilde{\alpha} + \tilde{\beta}\hat{GM}_i + \tilde{\gamma}X_i + \tilde{\eta}_t + \epsilon_i$$

Throughout the paper, I graphically present the reduced form estimates of predicted migration change on various outcomes. I present OLS and 2SLS estimates in tabular form alongside the reduced form results in Appendix A.9. While the reduced form estimates and the 2SLS results are often very similar, the OLS results frequently diverge and sometimes even hold the opposite sign. These differences speak to the selection problem that arises from migration due to characteristics of cities' land use policies and housing markets. While  $\hat{GM}$  is overall a strong predictor for  $GM$ , the cases where they diverge appear to be highly consequential for estimating its effects on land use policies and outcomes.

### 3.3 Dependent Variables

I assess the effect of the Great Migration on a number of dependent variables relating to land use regulation, city demographics, housing production, public opinion, municipal political institutions, and federal expenditures. These data are briefly described below, and in more detail in the Appendix.

First, I assemble the first comprehensive dataset of zoning maps and ordinances for 107 cities to measure my primary dependent variable: the amount of residential land on which multi-family homes are allowed, a key constraint on density and the availability of affordable housing (Shertzer, Twinam and Walsh 2016; Monkkonen 2019). For all 197 non-Southern cities at the center of a commuting zone listed in the 1940 Census, I attempt to retrieve the most recent zoning map shapefiles. These data come from municipal government city planning offices or direct correspondence with planners; I am unable to retrieve maps for some cities because they are either not digitized, not available to the public, or prohibitively expensive to purchase. The final  $n$  for the zoning map data is 107 central cities.<sup>8</sup>

I calculate the percentage of land area for each zone and match these zones to their use and dimension regulations in the zoning code. From chapters of the zoning code on use regulations, I am able to categorize zones as single-family residential, two-family residential, or multi-family

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Appendix A.9.

<sup>8</sup>Table A.4 shows the differences across various covariates between cities with and without zoning map data available.

residential.<sup>9</sup>

Variables on city characteristics come primarily from the Census. Pre-treatment data on city demographics, homeownership, and housing prices in 1940 are aggregated and calculated from the 100%-count US Census. Data on the number of single- and multi-family homes in 1940 are digitized from the Census of Housing. Data from 1950 and 1960 on demographics, homeownership, housing prices, and the housing stock come from the ICMA City and County books. Decennial data from 1970-2010 and yearly data from 2009-2016 on the same set of variables come from NHGIS tabulations of the Census and the American Community Survey, respectively.

Data on the number of housing permits issued yearly by each city come from the US Census Building Permits Survey (1980-2017). These comprehensive data are supplemented by data from the ICMA City and County Books for assorted years when they are available (1942, 1948, 1950, 1955, 1964, 1970, 1975, 1976, and 1981).

Data on city municipal institutions such as the size, composition, and seat type of city councils, come from the ICMA Form of Government survey for 1981-2011 and from 1973 (Aiken and Alford 1984). I further digitize the 1941 ICMA City and County Year Book to obtain pre-treatment measures of size and type of city councils. Data on displacements, expenditures, and site plans for federal urban renewal projects come from the Digital Scholarship Lab (2019) and (Collins and Shester 2013).

Finally, data on public opinion come from the American National Election Survey cumulative file spanning 1956-1998. I select all questions in the cumulative file that ask about race or racialized policies, and construct an additive index with scaled versions of all questions. Since the smallest geographic unit identified in the ANES is county, I subset these data to respondents who identified living in the ‘Central City’ and match them to the largest city in each county.

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<sup>9</sup>I categorize a zone as multi-family residential if it is listed as such or if it allows more than two dwellings per lot by right. Mixed-use zones that allow both multi-family residential and commercial or office are counted as multi-family residential. Conditional uses and uses requiring a variance or other special dispensation are not counted. Accessory uses are not counted. In some cases, single family and multi-family zones make up all the land zoned for residential use, other cases have duplex or townhouse zones.

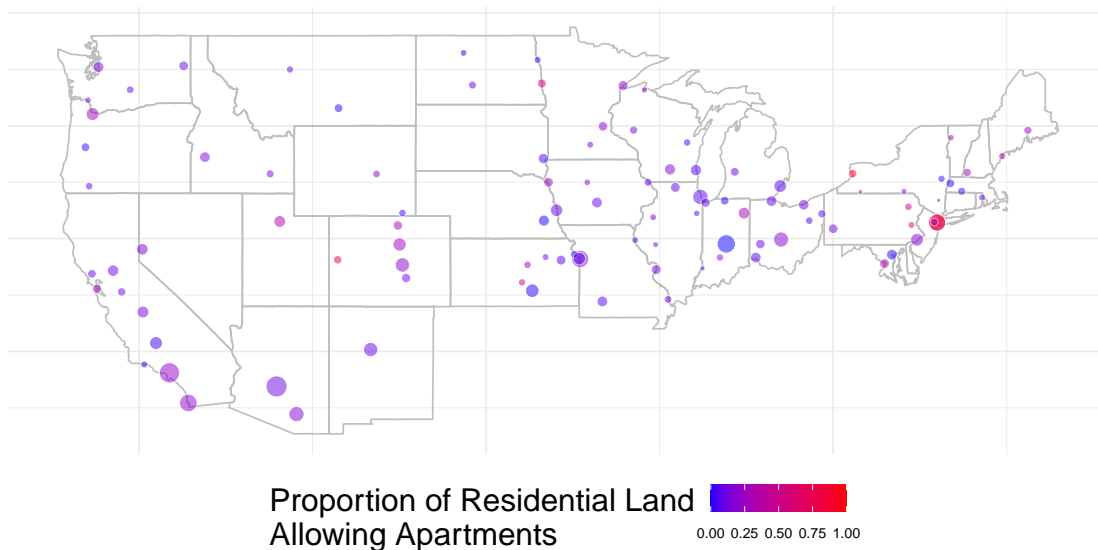


Figure 3—**Exclusionary Zoning in the United States Today**

Map shows proportion of residential land set where apartments are allowed for 107 cities based on most recent zoning map data. Size of points indicate land area of the city. The median city allows apartments on only 12% of residential land.

## 4 Results

### 4.1 Describing Exclusionary Zoning

Figure 3 shows the percentage of residential land where multi-family homes are allowed in central cities across the United States; the proportion of residential land on which multi-family housing can be built is indicated by the color gradient, the land area of the cities is indicated by the size of the circles. The median central city in the United States allows apartments on only 12% of the residential land. Even global metropolises with millions of residents such as Los Angeles, Chicago, and Philadelphia, allow multi-family housing to be built on less than a quarter of their residential land. The nationwide figure is likely even lower, given that I only examine cities that were incorporated as of 1940 and suburban municipalities incorporated in the post-war period are even more exclusionary.

These data differ from commonly-used measures of land use regulation in the economics and urban planning literatures (e.g Gyourko, Saiz and Summers 2008; Pendall, Puentes and Martin 2006). Using surveys administered to city government planners and other city officials, existing measures look at many different local and state regulations that relate to land use and develop-

ment. They capture important regulations such as supply restrictions, boards from which approvals needed, delays associated with projects, and state legislative and court involvement on land use regulation. These items differ from the exclusionary zoning measure used in this paper in that while they measure the difficulty of development, zoning measures the *possibility* of development. Without multi-family zoning, no reduction in the number of public meetings, state-level environmental regulations, or any other barrier will allow the development of multi-family homes.

Empirically, the exclusionary zoning measure in this article captures a different dimension of land-use restrictiveness than existing regulatory measures. I correlate the percentage of land zoned for multi-family use with Wharton Residential Land Use Regulatory Index (WRLURI), the most commonly-used of these measures, in Figure A.1, finding no relationship ( $b=0.003$ ,  $p=0.86$ ). Survey data has also focused on dimensional requirements in residential zones, an important constraint on development density (Mawhorter and Reid 2018). Even if multiple dwelling units are allowed on a lot, dimensional requirements that require a low lot footprint, impose height limits, or mandate a maximum density of units per acre can constrain development. I examine the relationship between citywide single-family zoning and dimensional requirements in the most common single-family zone in Figure A.1. In cities that are nearly entirely single-family zoned, minimum setbacks and lot sizes are higher, but there is no correlation with height limits, maximum density, or lot coverage. This suggests that instead of operating as substitute, use and dimensional restrictions go hand in hand, especially in the most exclusionary jurisdictions.

Geographic constraints on developable land interact with land use restrictions to affect housing supply elasticity (Saiz 2010). However, constraints may spur cities to zone more densely on available land. Conversely, in space-constrained jurisdictions with environmentally sensitive surroundings, interest groups may push to reduce nearby density to reduce impacts on open space. I find little support for either of these possibilities—there is a only weak relationship between the amount of land unavailable for development and the percentage of residential land zoned for multi-family use ( $b=0.16$ ,  $p=0.09$ ).

## 4.2 Effect of Racial Diversity on Exclusionary Zoning

I provide the first evidence of the racial diversity driving exclusionary zoning, showing that cities zoned less land for multi-family residential use in response to the Great Migration. Using the

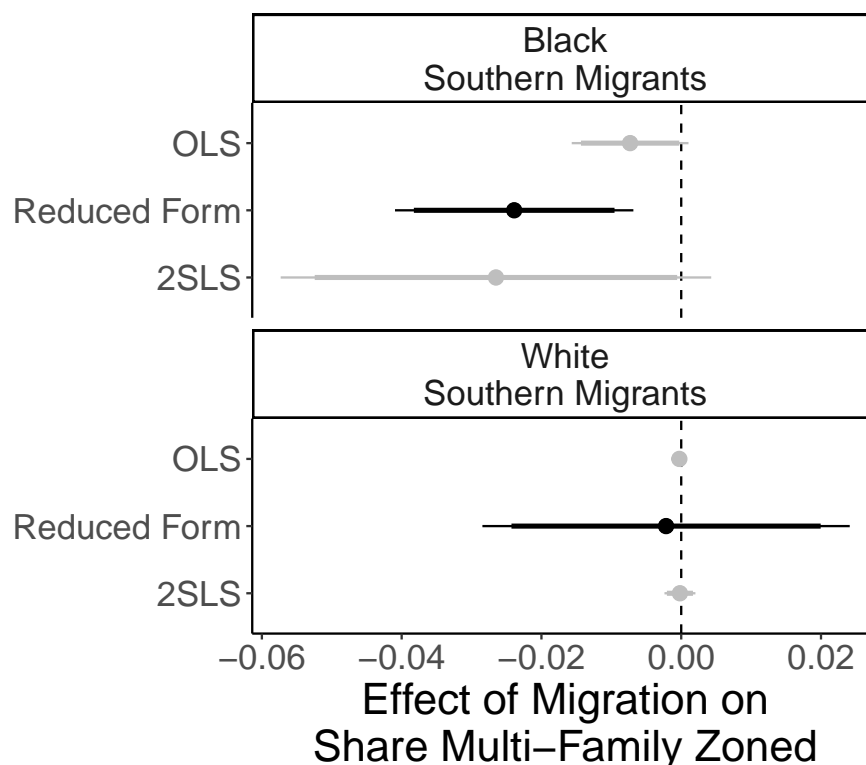


Figure 4—**Cities Zone Less Land for Multi-Family Housing in Response to Black Migration, No Effect of White Migration**

*Note:* Figure shows OLS, reduced form, and 2SLS estimates of Black and white population change (as a share of total 1940 population) from Southern migration on percentage of residential land zoned for multi-family housing. Points represent regression estimates and bars represent 95% confidence intervals. Regressions control for percentage of housing stock that was single-family in 1940 and share of Black (white) population that migrated from the South from 1935-1940, and use robust standard errors.  $N=107$ .

*Source:* Zoning data collected by author. Great Migration instrument constructed with population and migration data from 1940 full-count census (Ruggles et al. 2018), 1970 Census tabulations (Manson et al. 2020), and Southern agricultural data (Boustan 2016).

plausibly exogenous predictions of Black population growth in Northern cities from the Great Migration from 1940-1970, I estimate that the median large city, which saw a 2.5% growth in Black population as a share of total 1940 population zoned 3% less land for multi-family use than had there been no increase in racial diversity. Given the median large city allows multi-family housing on only 12% of residential land, this decrease is substantively significant.

Figure 4 shows the main finding of this article. In the top panel, the three regression bars show the OLS estimate of actual Black population growth on the percentage of residential land zoned for multi-family use; the second bar shows the reduced form estimate of predicted Black population

growth; the third bar shows the two-stage least squares estimate using predicted Black population growth as an instrument for actual Black population growth. I discuss the preferred reduced form estimate in the text and present graphical evidence of reduced form estimates in subsequent sections of the article. Estimates of the Great Migration’s effect on multi-family zoning are scaled to reflect the median city’s Black population growth of 2.3%.

To control for pre-treatment zoning and land use, I digitize the 1940 Census of Housing tables on housing type, calculating the share of dwellings that are single-family homes (detached or attached). This measure correlates with exclusionary zoning today, is the best proxy for a pre-treatment measure of my dependent variable in the absence of comprehensive zoning map data from 1940. Although much of the housing in cities in 1940 was built before zoning, these data describing actual land use largely mirrored zoning at the time. If anything, first-wave zoning codes ‘overzoned,’ allowing widespread multi-family housing development, reducing housing costs and leading to demands from property-owners and developers for more restrictive zoning (Whittemore 2012).

To address concerns that the effect on zoning from Black southern migrants is driven by some characteristics of the migrants other than their race, the bottom panel shows the effect of white southern migration on the same measure of multi-family zoning. Using a shift-share instrument constructed using the same procedure as for Black migrants, I show that white southern migration cannot explain differences in exclusionary zoning today. White migrants, who came from the same rural counties of origin as Black migrants, were similarly impoverished and unskilled due to their backgrounds in the Southern agricultural economy. They left the South for similar economic reasons as Black migrants and put the same stresses on Northern cities’ labor and housing markets when they arrived. The effect of Black migrants, but not white ones, on exclusionary zoning strongly suggests that the policy differences can be attributed to the racial preferences of citizens who worked to enact them.

### 4.3 Public Opinion Mechanism

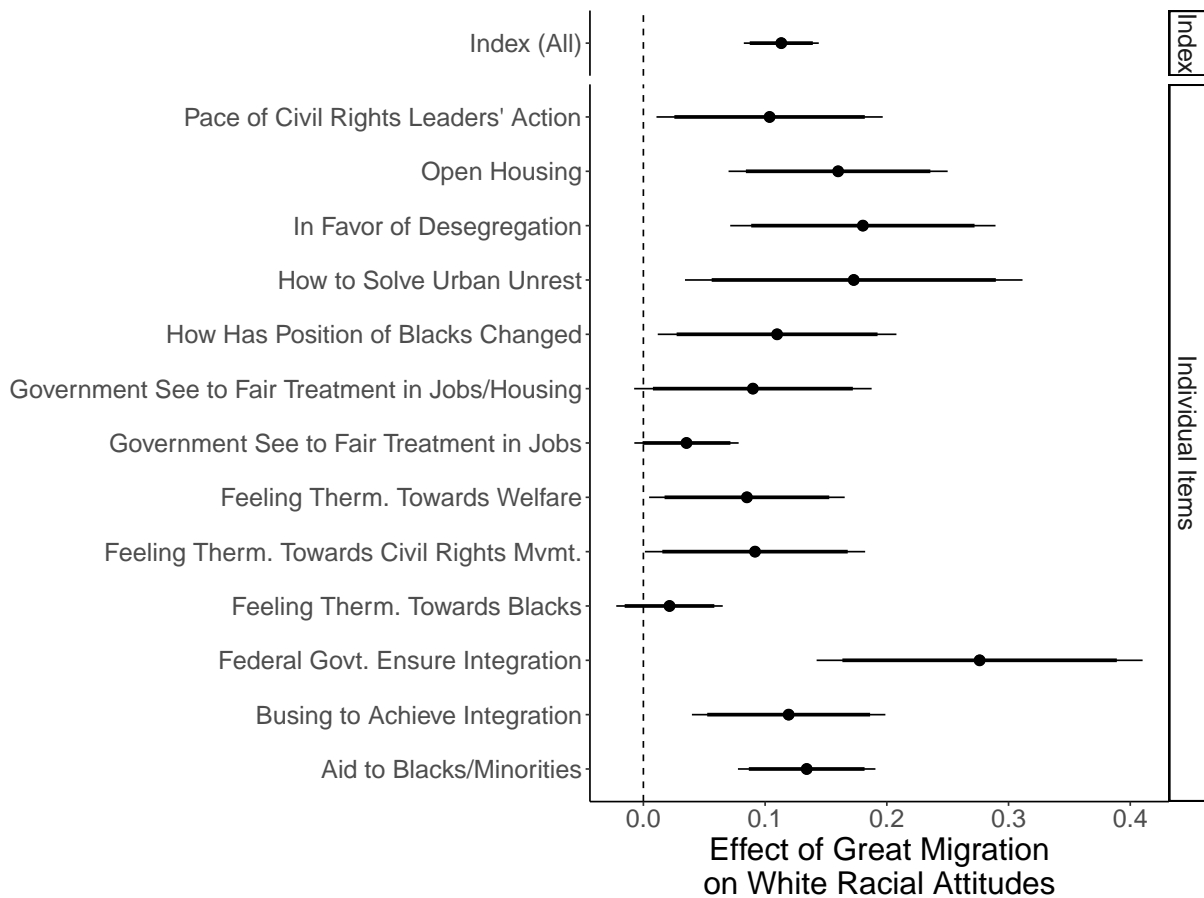
I argue, and present evidence, that the most plausible explanation for the effect of increasing diversity on exclusionary zoning is through racially conservative whites demanding policy changed to protect their neighborhoods from integration. Whites, who either wanted to remain in racially

homogeneous neighborhoods, worried about their property values, or both, would be more likely to demand exclusionary zoning in cities that changed more as a result of the Great Migration. Since there are unfortunately no survey questions from this time period about zoning, affordable housing, or related issues, I use all other questions on issues pertaining to race. I present the results for each individual item and for an index of all items.

I find evidence that white attitudes on race became more conservative in response to the Great Migration. I use four decades of public opinion data from the American National Elections Study (ANES) cumulative file, where voters are identified at the county level, and then classified as living in the central city, suburbs, or a rural area. I subset the white respondents who live in the central city and match them to county-level migration predictions to assess the effect of the Great Migration change on public opinion on race.

Figure 5 shows the effect the Great Migration on responses to all policy questions and feeling thermometers asked about race, scaled to a 0-1 scale where positive values are more racially liberal. Using an index of all items listed on the y-axis, from 1956 to 1998, I find that white public opinion in the median city is 11% more conservative on policies related to race. The direction and magnitude of these results is consistent for all individual items and for each survey year when estimated in separate regressions (see Figure A.16).

Are these differential attitudes due to opinion change, where urban whites react to the arrival of African-Americans and change their opinions, or sorting, where Great Migration cities see more white flight and those that stay are more conservative? To answer this question, I examine the attitudes of suburban respondents, who do not face the same threat of integration. Running the same analysis on suburban and rural respondents in Figure A.15, I find consistent null effects of the Great Migration on racial attitudes outside of cities. This suggests that the differences in attitudes we observe are due to a reaction to changing demographic contexts in cities, not geographic sorting. Whites who left for the suburbs were more conservative in general, but not more or less conservative depending on the level of Black migration to the city they fled. In fact, if the sorting mechanism were at work, it would likely produce the opposite effect: a more liberal white population. Cities with more liberal redistributive policies are more likely to see segregation across municipal boundaries, rather than within them (Trounstein 2018), leading us to expect more sorting in liberal areas. Additionally, white flight to the suburbs was primarily among wealthier whites who can afford the



**Figure 5—Whites Hold *More Racially Conservative* Attitudes in Cities with Larger Black Population Growth from Great Migration**

*Note:* Figure shows the reduced form effect of the predicted percent change in Black population on white attitudes on racial issues. Points represent regression estimates; bars represent 95% confidence intervals. Regressions control for share of Black population that migrated from the South from 1935-1940 and respondent age, income, and education; use year fixed effects; use robust standard errors; and are clustered at the county level. Migration instrument is constructed at the county level, unlike all other analyses which use city-level instrument. ANES data are subset to white respondents who live in the central city of the county. N=5,313 across 51 county clusters. See Figure A.17 for which items are asked in which years. Index is an average of all items available for each year, scaled to a 0-1 range.

*Source:* Public opinion data from ANES Cumulative File (American National Election Studies and Stanford University 2015). Great Migration instrument constructed with population and migration data from 1940 full-count census (Ruggles et al. 2018), 1970 Census tabulations (Manson et al. 2020), and Southern agricultural data (Boustan 2016).

housing price premium, and who are more likely to be conservative.

How do attitudes on race, and specifically open housing and integration, translate into zoning policy? Land use is a natural policy area to expect responsiveness at the local level. Along with education and policing, land use decisions are made primarily by local elected officials. Given the limited set of policy areas that local governments have control over and the inextricable link between land use and race in a diverse city, observable changes in public opinion at the city level would lead to changes in land use policy in a responsive system. On the other hand, variation in public opinion across cities would not produce variation in zoning policy through federal or state law.

One mechanism by which public opinion could shape policy outcomes is through elections, yet I find no evidence of the Great Migration reshaping partisan political competition in cities. Figure A.18 shows that the Great Migration had no effect on Democratic mayoral vote share. This is surprising given that an increase in the African-American electorate would usually translate to increase Democratic vote share. One explanation is that within the Democratic primary electorate, African-American votes were not always contested depending on institutional features, like election types and frequencies

Overall, these results are consistent with existing findings showing a white backlash to the Great Migration, particularly on issues of housing integration (Reny and Newman 2018). By linking these attitudinal changes to policy changes, I show how municipal governments pursued the aims of their voters when outright segregation was no longer an option.

## **5 Alternative Explanations**

### **5.1 Municipal Government Institutions**

Another possible mechanism by which the Great Migration may have led to increased exclusionary zoning is by changing municipal government institutions to better block new affordable housing. I test this by looking at whether cities are more likely to have at-large representatives, who are more likely to address global concerns like housing affordability, or district-based representatives, who are more likely to cater to the 'not in my backyard' sentiments of their constituents (Hankinson and Magazinnik 2019).

Changes in electoral systems have also been used to dilute the voting power of racial minorities and cities change their electoral systems in response to the Great Migration. Segregated minorities may have considerable electoral power in a district-based system, but can have their preferred candidates shut out in an at-large system, depending on the context (Welch 1990; Trounstein and Valdini 2008). In cities impacted by the Great Migration, cities with smaller councils and at-large representation like Detroit saw fewer African-American representatives than large, ward-based councils in cities like Chicago (Grant 2020).<sup>10</sup>

I test whether cities that become more diverse from the Great Migration have more at-large representation on their city councils. Using data collected from the ICMA Form of Government survey reported every five years from 1981-2006 and newly digitized data on city councils from the 1941 Municipal Year Book, I find that the Great Migration had a positive, but substantively negligible, effect on the percentage of seats that are elected at-large. Figure shows estimates of the effect of the Great Migration on city council type for survey years between 1981-2016, all controlling for 1940 pre-treatment values. The plot shows, on the right hand-side, individual estimates for each year when data is available, and on the left-hand side, a precision-weighted average of all the estimates. The results from a pooled regression with clustered standard errors at the city level can be found in Appendix A.10.

The yearly regressions show a statistically, but not substantively, significant positive effect of the Great Migration on the number of seats elected at-large. For the median city, 3.7% more seats are elected at-large. However, given the median city in the sample has 8 seats on their council, a city would need to be in the 91st percentile of predicted Black population to shift one seat from district-based to at-large. This makes it unlikely that many cities experienced an actual change in their council’s composition. While this provides limited evidence for a shift to at-large seats to dilute Black political power, there is no evidence that the variation in exclusionary zoning due to the Great Migration can be explained by local representative institutions.

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<sup>10</sup>I find that Black population growth due to the Great Migration weakly increased Black representation on city councils. Figure A.14 shows that the median city saw the proportion of Black city council members increase by 1.8% in the median city.

## 5.2 Homeowner Power

Another common explanation for exclusionary zoning is the power of homeowners, who are more conservative and participate more in local politics (Fischel 2001). Absent a direct test of homeowner power, I test whether homeownership rates changed in cities impacted by the Great Migration. I find evidence against the mechanism of increased homeownership driving exclusionary zoning. The Great Migration has a null effect on homeownership rate, as shown in Figure A.9. This is driven by differential homeownership rates by race—I find substantial increases in Black homeownership (Boustan and Margo 2013) and no significant change in white homeownership. As a result of white flight, African-Americans were better positioned to purchase, rather than rent, their homes. However, unlike the white residents who they replaced, they likely were less supportive of exclusionary policies, making changes in homeownership an unlikely driver of zoning changes.

## 5.3 Federal Intervention: Urban Renewal

Finally, I examine the role that federal urban renewal projects could have played in precipitating zoning changes in Great Migration cities. Urban renewal, set into motion by the Housing Acts of 1949 and 1954, prompted cities to conduct extensive land use surveys and create new plans to attract federal money. These plans primarily involved identifying blighted neighborhoods and demolishing them for renewal, but also may have led to the protection of neighborhoods through downzoning.

Using data on urban renewal projects, I examine the effect of the Great Migration on urban renewal spending and project types. I find that the Great Migration causes no differences in urban renewal spending per capita, making it unlikely that targeted interventions are changing land use more in some cities than others. Table A.21 shows the results of the regression of change in Black population growth due to the Great Migration on urban renewal spending and project priorities. I first regress urban renewal funding from two different sources, measuring the total dispersed to cities and the total funds approved per capita. Both measures of expenditures yield null results. I then look at whether change in Black population growth due to the Great Migration has effects on the percentage of project land re-used for various categories.

Even without differences in expenditures of project types, the interaction of urban renewal and the Great Migration could have contributed to the prevalence of exclusionary zoning. The

increased salience of public housing, largely housing African-Americans by the end of the Great Migration since white residents had many more exit options, could have sparked a backlash among whites in neighboring areas. Neighbors of housing projects could have a racial backlash to African Americans in their proximity (Enos 2016), mobilizing to prevent future low-income housing from being constructed. Another explanation for how urban renewal is connected to downzoning and housing affordability is that residents feared that their neighborhood would be claimed for urban renewal next and pushed for low-density zoning to prevent their area from being redeveloped. Wealthy urban neighborhoods were particularly successful at fighting urban renewal projects in their neighborhoods (Mohl 2002; Brinkman and Lin 2019).

## 6 Downstream Effects

### 6.1 Segregation

Beginning in the 1990s, residential segregation in the United States began to rise again after falling due to the effects of civil rights legislation. Scholars have argued that land use restrictions, including zoning, are a major driver of this phenomenon

I show that the link between land-use restrictiveness and segregation can be explained by rising racial diversity. Again exploiting differences in Black population growth, Figure 6 shows the effect of the Great Migration experienced by the median Northern city on levels of Black-white segregation from 1980-2010. The measure of segregation is the dissimilarity index, which can be interpreted as the proportion of the Black population in a given Census tract that would need to move to match the distribution of the Black and white population in the city as a whole. The index is calculated as:

$$D = \frac{1}{2} \sum_{i=1}^N \left| \frac{b_i}{B} - \frac{w_i}{W} \right|$$

where  $D$  is the dissimilarity index for a city,  $N$  is the total number of Census tracts,  $b_i$  ( $w_i$ ) is the Black (white) population Census tract  $i$  and  $B$  ( $W$ ) is the total Black (white) population in the city.

Figure 6 shows that in the median central city with a Black population growth of 2.3% from 1940-1970, Black-white dissimilarity was between 6 and 10% higher between 1980 and 2010. That is, between 6 and 10% of the Black population in the city would need to move to match the

proportion of Black population citywide in each tract. This substantial effect on segregation links the findings of this paper, that increased racial diversity leads to zoning restrictions, and existing findings on racial segregation, that land use restrictions increase citywide and regional segregation.

## 6.2 Housing Production

Exclusionary zoning's intent is to prevent multi-family housing and non-residential uses from being built in protected neighborhood. Does the prevalence of single-family exclusive zones constrain overall housing supply by limiting it to a handful of neighborhoods? I investigate whether increased exclusionary zoning decreased multi-family future housing production using yearly data on housing permitting from 1980 to 2018. I find that in response to increases in Black population growth due to the Great Migration, cities permitted fewer total new housing units and fewer multi-family units as a share of all new housing. The effect persists over decades.

The yearly estimates in Figure 7 show consistently lower permitting rates from 1970-2000 in cities that have a greater increase in the Black population. Overall, I estimate that cities fewer new units of multi-family 1980 to 2018 due to restrictive zoning from adopted in reaction to the Great Migration. Back of the envelope calculations suggest that over 40,000 new units of affordable housing were not built ever year as a consequence, or nearly 1.9 million total units over this time period. Over the same time period, these cities permitted 3.4 million new units of multi-family housing, meaning that absent the Great Migration and zoning restrictions imposed in reaction to it, the largest cities in the United States would have permitted over 50% more multi-family housing. This constraint on multi-family house-building has exacerbated affordability concerns in housing markets across the country, both by preventing new affordable multi-family units from being built, and by restricting supply overall.

These results on housing permitting are robust to other measures of the housing stock. Due to exclusionary zoning and underproduction of new housing: housing stock is older in cities that saw larger Black population growth due to the Great Migration and the share of single-family homes is higher. In Figure A.11 I show that the share of homes built in the last decade is 1.3% lower in the median Black population growth city. In Figure A.12 I shown that the share of single-family homes is 1.2% higher in the median city.

While a decrease in overall housing production could be due to a number of economic factors

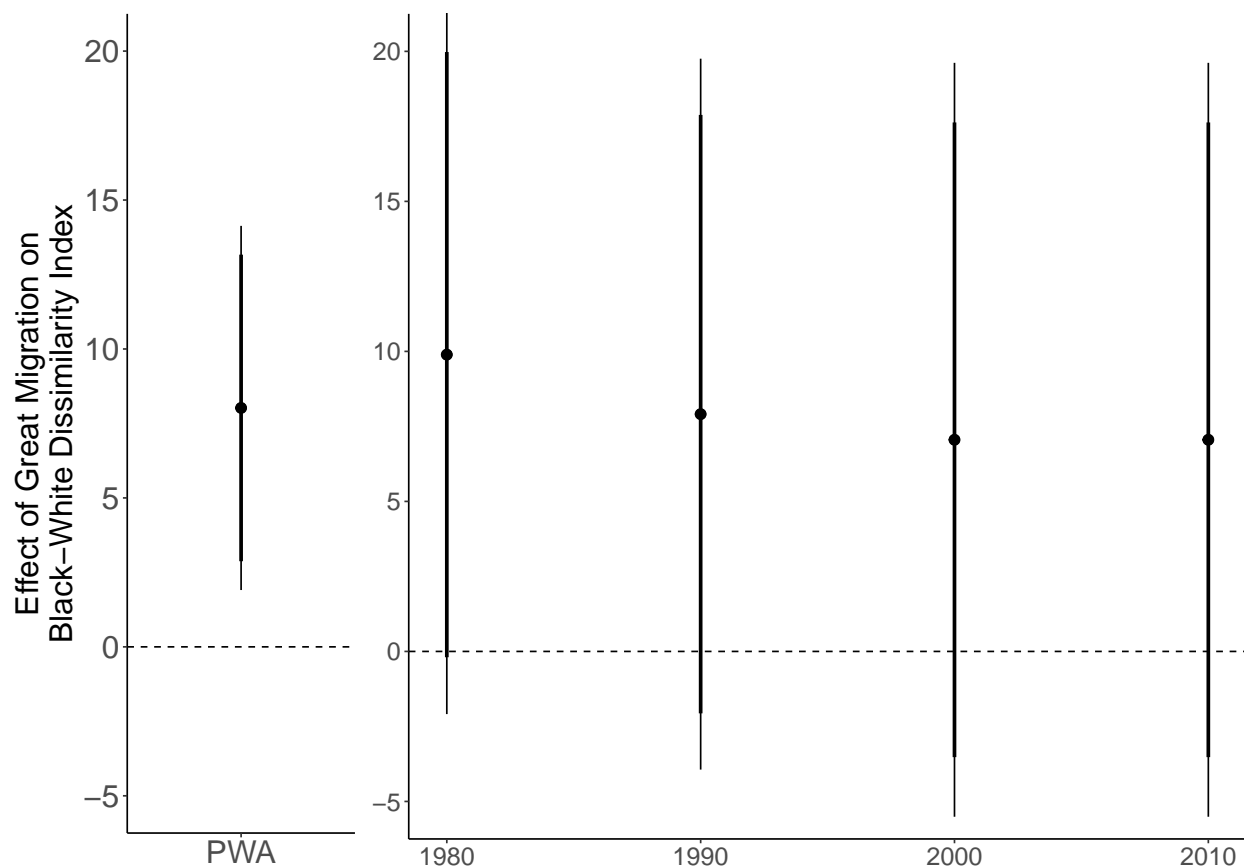
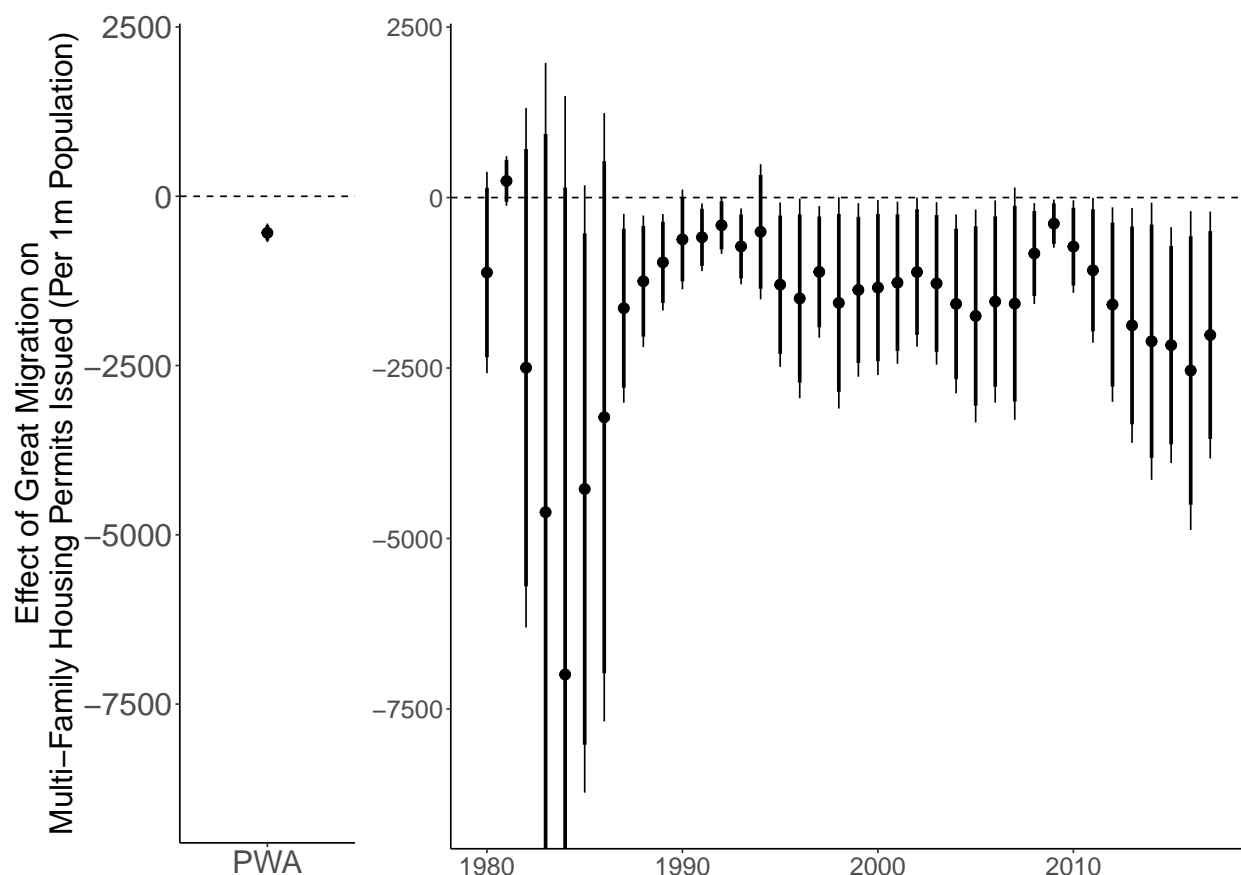


Figure 6—**Great Migration Causes Increased Levels of Segregation**

*Note:* Figure shows the reduced form effect of median Black population growth due to the Great Migration on a measure of Black-white segregation, the dissimilarity index. Points represent regression estimates and bars represent 95% confidence intervals. Regressions run separately for each year using robust standard errors. Regressions control for 1940 Black-white dissimilarity index and share of Black population that migrated from the South from 1935-1940. Panel on the left shows precision-weighted average of yearly point estimates.

*Source:* Dissimilarity index data provided by John Logan. Great Migration instrument constructed with population and migration data from 1940 full-count census (Ruggles et al. 2018), 1970 Census tabulations (Manson et al. 2020), and Southern agricultural data (Boustan 2016).



**Figure 7—Reaction to the Great Migration Causes Fewer New Units of Multi-family Housing to Be Permitted from 1970s to 2010s**

*Note:* Figure shows the reduced form effect of median Black population growth due to the Great Migration on the number of new permits for new multi-family housing units issued scaled by 1940 population totals. Points represent regression estimates and bars represent 95% confidence intervals. Regressions run separately for each year using robust standard errors. Regressions control for share of Black population that migrated from the South from 1935-1940. Panel on the left shows precision-weighted average of yearly point estimates. See Appendix A.10 for pooled estimates using all years post-1970.

*Source:* Permitting data from 1980-2016 from HUD and from ICMA City and County Books for 1942, 1948, 1950, 1955, 1964, 1970, 1975, and 1976. Great Migration instrument constructed with population and migration data from 1940 full-count census (Ruggles et al. 2018), 1970 Census tabulations (Manson et al. 2020), and Southern agricultural data (Boustan 2016).

related to the Great Migration, namely lower economic growth due to white flight and underinvestment in public goods, exclusionary zoning is the most likely explanation for the decrease in multi-family share of all units. In the short run, the Great Migration could have contributed to lower housing production by reducing demand. As whites left central cities for outlying municipalities, vacancy rates increased and home values decreased, reducing the profitability of new construction. If this were the case, we would expect to see all housing permitting decrease, including single family homes. I test this and find null effects of the Great Migration on the permitting of single family homes over the same time period. Over the long term as housing prices recovered and demand for housing increased in some cities impacted by the Great Migration, the zoning changes put into place are the more likely culprit for the undersupply of new multi-family housing.

## 7 Discussion and Conclusion

Taken in sum, these results provide evidence that exclusionary zoning is not merely the result of homeowners seeking to maximize their property values, but also the policy manifestation of a backlash to rising racial diversity. Exclusionary zoning became widespread in period when cities' Black populations were rapidly increasing. Cities that had larger Black population growth have more exclusionary zoning. Whites in these cities have more conservative racial attitudes, including on questions about free housing and integration.

This paper contributes to a growing literature using quantitative tools to study large questions of American political development and the political economy of race (e.g. Acharya, Blackwell and Sen (2018); Trounstein (2018)). While this paper deals with the effects of a decades-old transformation, it provides insights for contemporary trends and an example of how racial threat is translated from attitudes to policy. As the United States continues to urbanize and suburban areas and smaller cities undergo similar demographic transitions as large cities did from 1940-1970, understanding the political consequences of these changes is especially urgent.

What changed in the 1970s to end the Great Migration and begin the march towards widespread housing unaffordability? As the economic advantage of the North decreased and Jim Crow was dismantled in the South, Black migration from the South slowed and eventually reversed. One explanation is that as workers and jobs became mobile due to the growth of the interstate highway system that the continuation of existing urban growth patterns—central business districts, water-

front industry and shipping—needed to be prescribed in zoning codes (Fischel 2004). Others have noted the 1970s as a critical juncture when growth patterns in urban areas slowed due to the rise in citizen voice (Brooks and Liscow 2019).

The rise in citizen voice could be a result of changes in citizen behavior or increased government responsiveness to these voices. I provide evidence suggesting the latter is unlikely—electoral systems in cities do not change as a result of the Great Migration and homeowners do not grow in number. However, white residents do change their attitudes on race in response to the Great Migration, and may become more vocal about expressing them.

The rise in citizen voice is often associated with the interests of wealthy, liberal, city-dwellers, leading to portrayals of liberal cities as hypocritical for supporting general redistribution not addressing their local housing affordability problems.<sup>11</sup> Some accounts pin the drive for restrictive zoning to new arrivals in the 1970s and 1980s who brought the ethos, and legal restrictions, of suburban life back to city centers (Mangin 2014). I show that the link between liberal cities and land use restrictiveness is not a causal one, but rather due to common underlying factors. The Great Migration both made cities more liberal, primarily through changing increasing the African-American share of the electorate, and more restrictive of land use. While white liberal city-dwellers are more racially conservative in response to increasing diversity, they are still far more racially liberal, and supportive of integration, than their suburban and rural counterparts.

What about the South? Because of the identification strategy exploiting the Great Migration, my analyses omit cities in the Southern United States. The South as a region has the lowest levels of land use regulation the highest housing production, and the lowest housing costs. This is not necessarily due to the fact that cities in the South were losing Black population during 1940-1970—in fact, Southern cities were also receiving large waves of migration from rural areas nearby. Instead, a more likely explanation is that direct racial discrimination was possible in the South for longer than in the rest of the country. While white flight and conflicts over shared public goods were common in Southern cities, the responses were more often municipal secession or privatization than zoning reform (Kruse 2013). However, land use policy in Southern municipalities merits further study, especially given the possibility that growing Latino population share in the Southwest cause lead to similar backlash behavior.

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<sup>11</sup>e.g. "America's Cities are Unlivable. Blame Wealthy Liberals," (Manjoo 2019)

This study also does not speak to the numerous suburban municipalities that were not yet incorporated in 1940. Many of these municipalities were created with the express purpose of disallowing non-white residents entirely (Self 2005). These municipalities have, on average, more restrictive land use regulations than cities built up before the automobile with robust public transportation and dense, multi-family housing. While the area zoned for multi-family housing in large urban municipalities is low, many suburban municipalities disallow multi-family housing entirely.

On the 50th anniversary of New York’s 1916 comprehensive zoning ordinance, a legal scholar remarked, “we had better recognize that the humble zoning ordinance is probably of direct concern to more people than any other statute” (Sussna 1966). Yet, another half-century later, we still have paltry empirical evidence of how cities zone, why they do so, and what the distributional effects are. This study provides the first comprehensive data collection of municipal zoning and an explanation for the differences in land use restrictiveness. In doing so, I explain the current zoning policies and linked housing affordability crisis in cities across the United States.

One interpretation of these findings is that the contemporary housing affordability crisis is simply an accident of unintended consequences. However, the consequences of mass downzoning were foreseen by urban planners at the time. In the environmental impact report for San Francisco’s 1977 downzoning, authors write “if housing costs are increased as a result of extensive downzoning, the proposed controls would only exacerbate the current situation, especially for low and moderate income households... Over the long run if negative impacts become apparent, changes can be made in the proposed zoning. Even though cities underproduced new multi-family housing for decades, cities did not move to liberalize their zoning codes. Only that the negative impacts of exclusionary zoning have spread beyond the poor to prevent middle and upper-class families from being able to afford housing have debates on zoning changes begun.

New research grappling with the political causes of housing affordability speaks to why decades-old changes in zoning caused by the Great Migration are so difficult to reverse. As the complexity of land use planning grew during the post-War period, more opportunities for public participation were built into the process. Yet, these institutions are marked by starkly unequal participation by race, age, and housing status (Einstein, Palmer and Glick 2018; Yoder 2020). The scale of local decision-making in the American federal system means that regional affordability concerns are not prioritized while local NIMBY interests dominate. Within cities, the patterns of Great

Migration-era exclusionary zoning concentrate the only potential for development in a handful of low-income communities of color or formerly industrial areas. This makes debates over new housing development occur primarily between developers and low-income residents fearful of displacement (Been, Ellen and O'Reagan 2018). Finally, the resurgence of overtly racial appeals to voters has made clear that the threat of integrated neighborhoods continues to motivate political action

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## A Appendix

### A.1 Measuring Exclusionary Zoning

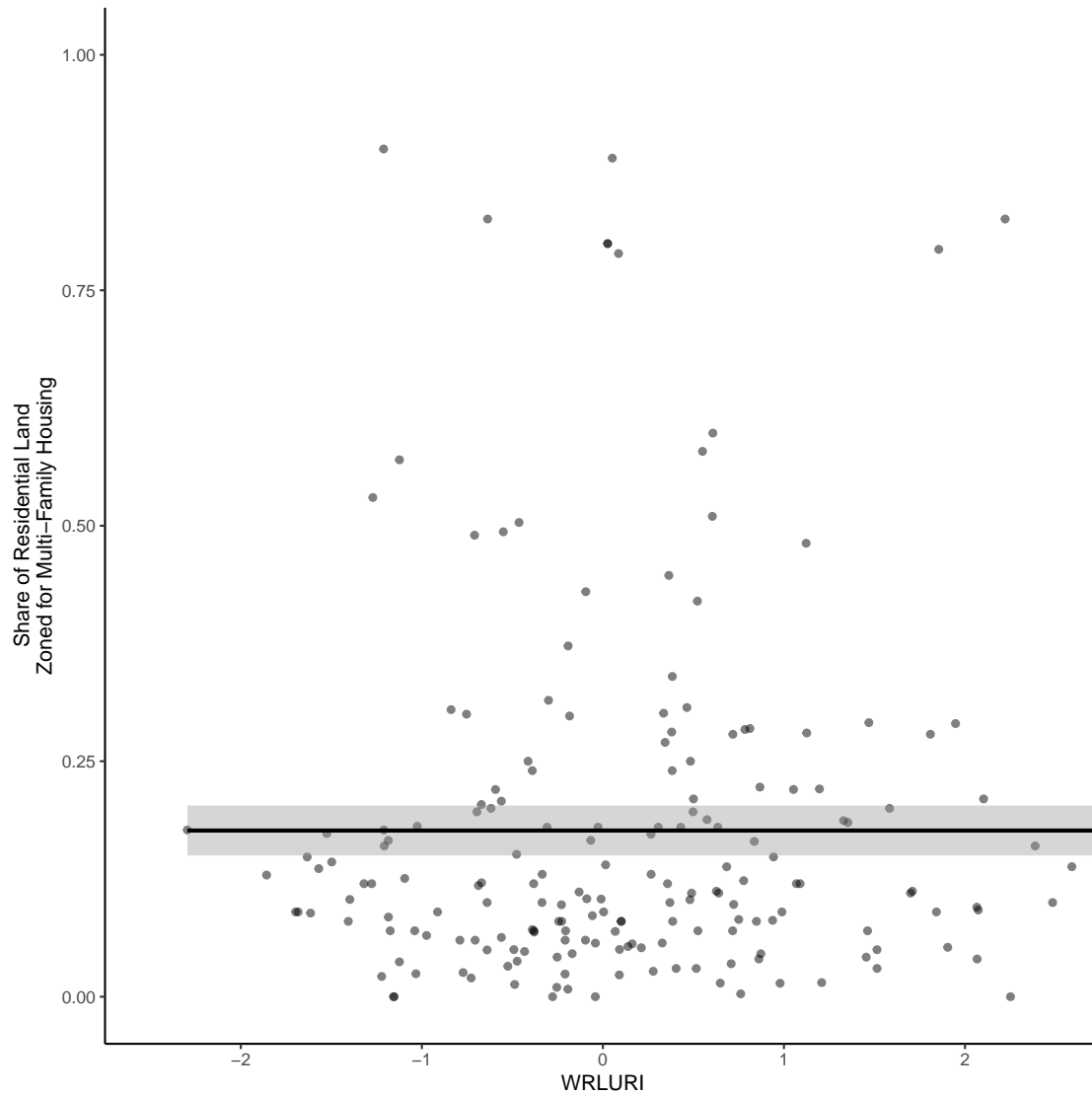
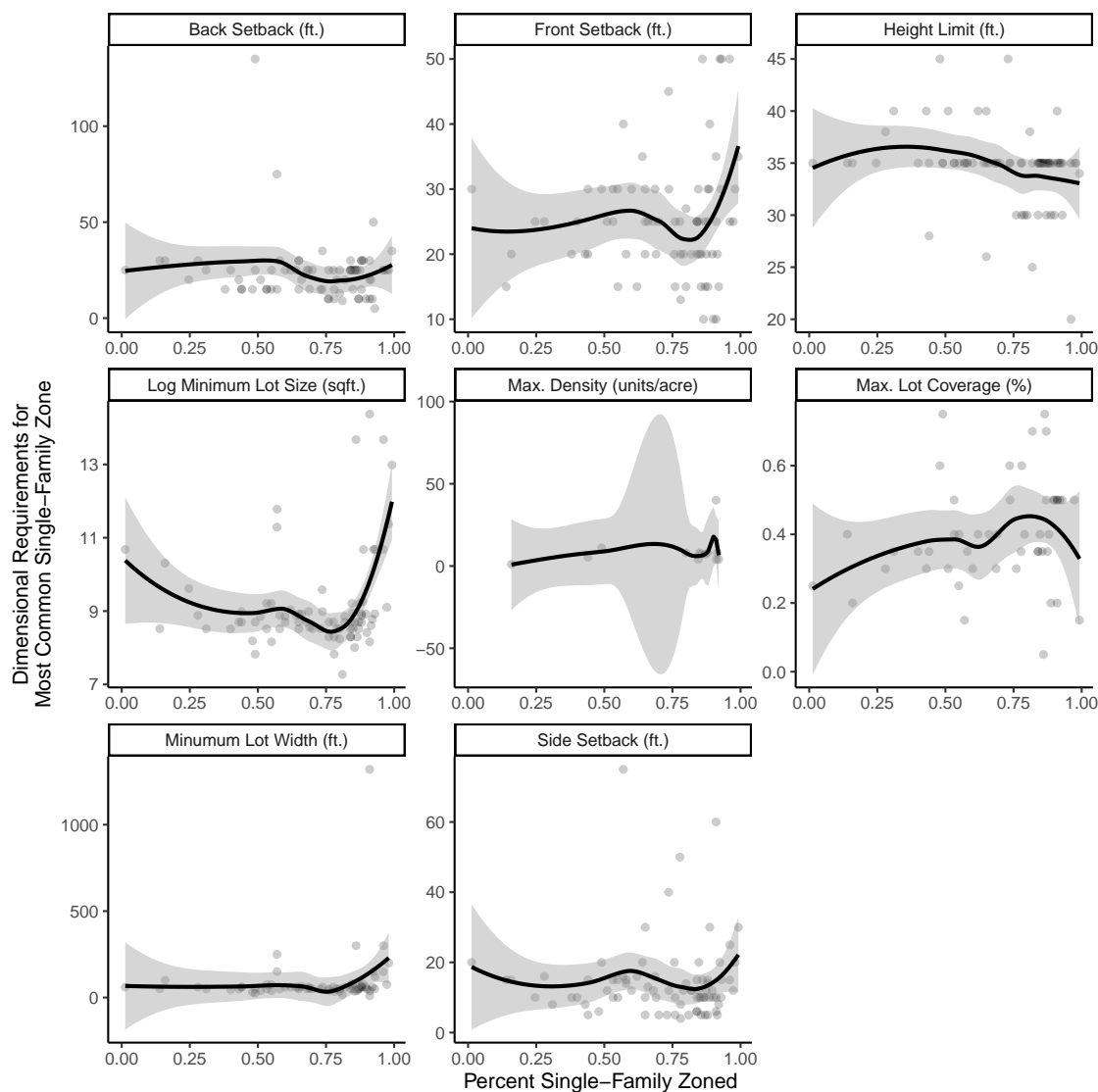


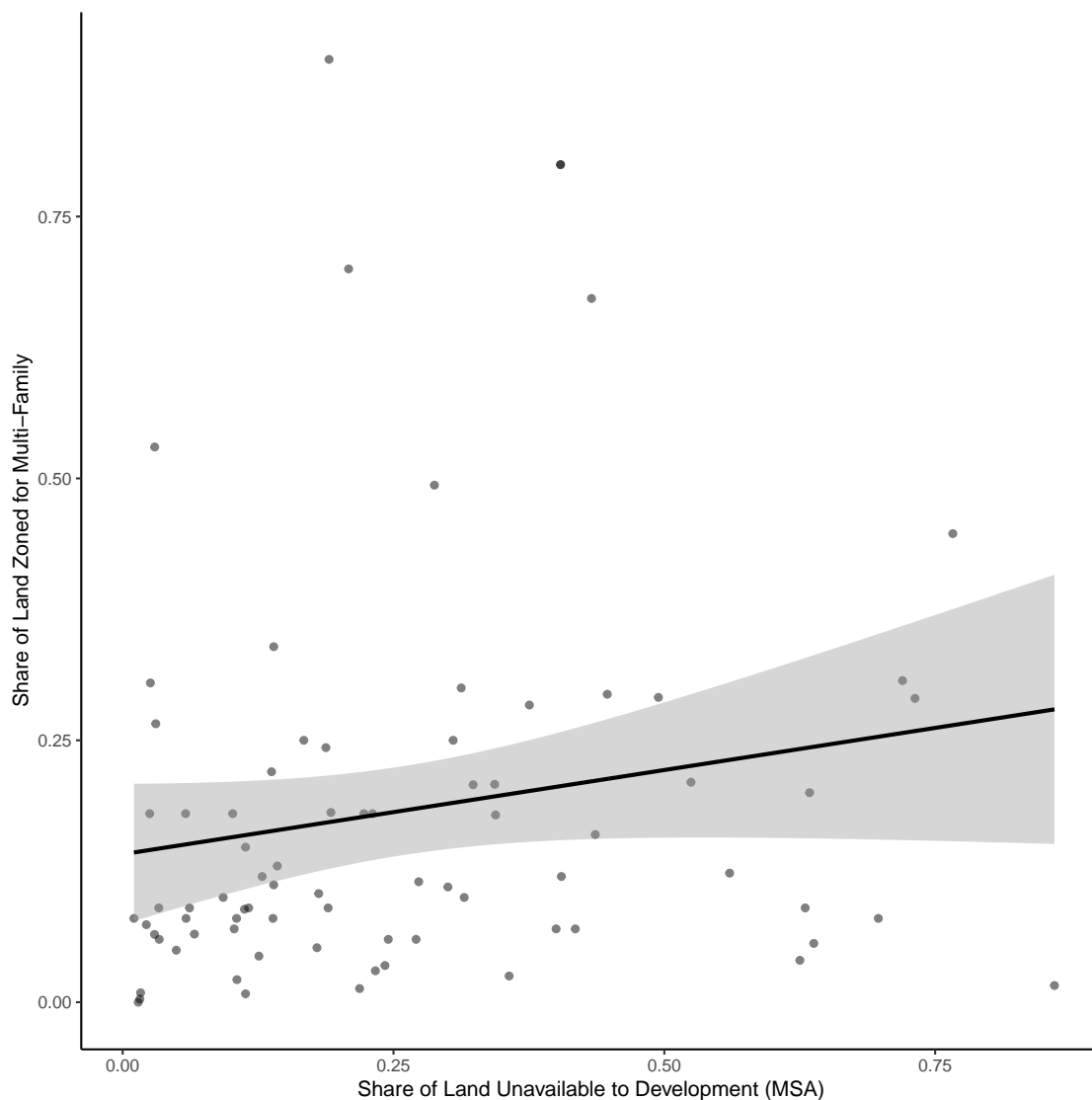
Figure A.1—No Correlation Between Exclusionary Zoning and WRLURI

*Note:* Figure shows correlation between the Wharton Residential Land Use Regulation Index (WRLURI) (Gyourko, Saiz and Summers 2008) and exclusionary zoning.



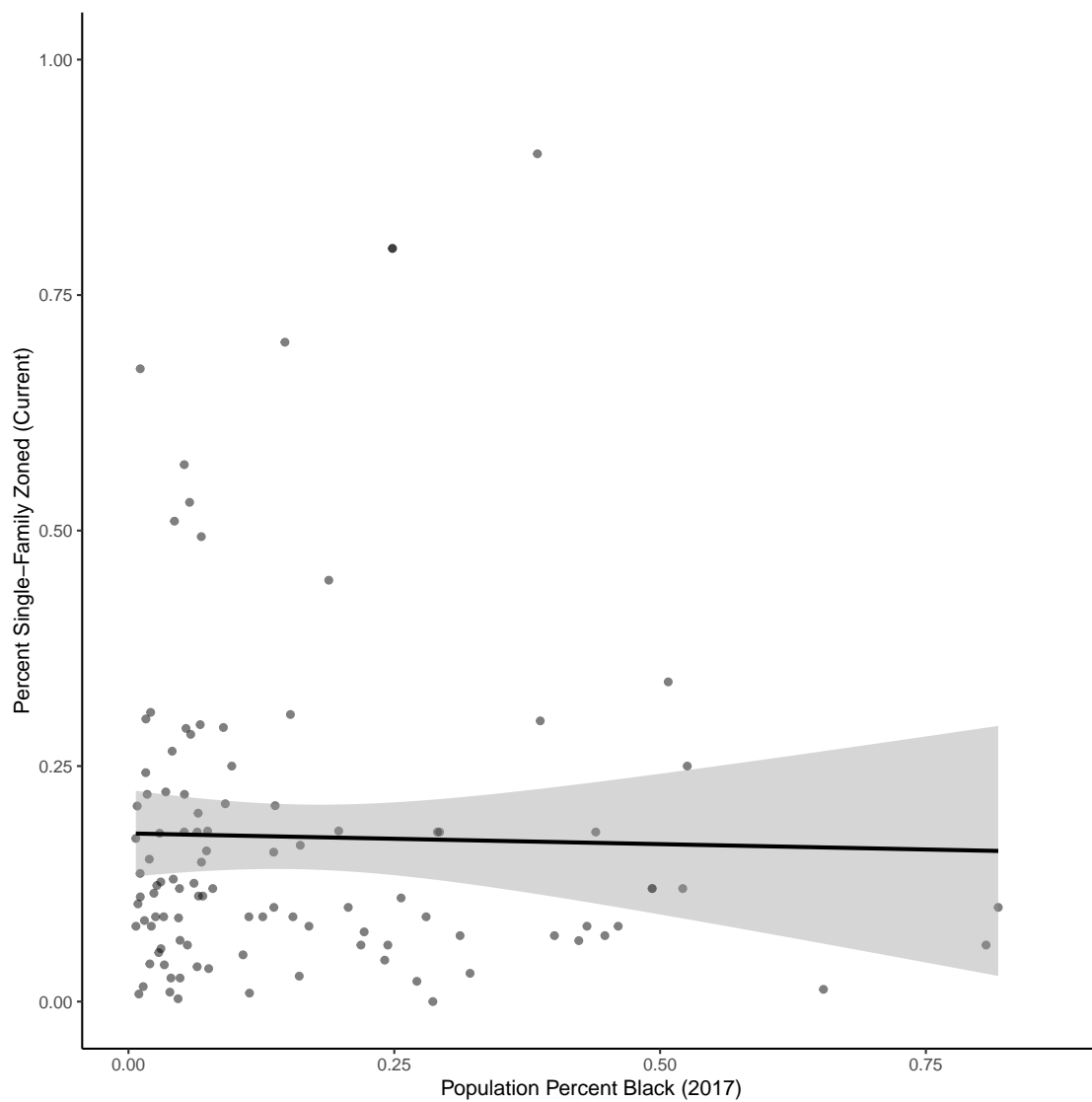
**Figure A.2—Most Exclusionarily Zoned Cities Also Have Exclusionary Dimensional Requirements**

*Note:* Figure shows correlation between share of exclusive single-family zoning and dimensional requirements for the most common single-family zone. Dimensional data for California collected by the Turner Center California Residential Land Use survey; dimensional data for Connecticut collected available online; data for other states collected by author. *Source:* (Mawhorter and Reid 2018)



**Figure A.3—Positive Relationship Between Share of Land Unavailable for Development and Multi-Family Zoning**

*Note:* Figure shows correlation between the share of land in an MSA that is unavailable for development (Saiz 2010) and exclusionary zoning in the central city of the MSA. Cities where land is more constrained by geographic features (e.g. bodies of water, steep hills) zone a higher proportion of residential land for multi-family use, since less total land is developable.



**Figure A.4—No Correlation Between Exclusionary Zoning and Black Population Share**  
*Note:* Figure shows correlation between Black population share and exclusionary zoning.

Variable	Map Available Mean	Map Not Available Mean	P-value
Log Population	11.91	10.64	0
City Liberalism	-0.2	-0.12	0.08
Percent City Council At-Large	0.4	0.46	0.39
Percent Black	0.15	0.12	0.19
Percent Homeowner	0.51	0.55	0
Percent Single-Family Housing	0.59	0.63	0.14
Percent Vacancy	0.1	0.12	0.02
Region: Midwest	0.49	0.68	0.01
Region: Northeast	0.19	0.16	0.67
Region: West	0.31	0.12	0
WRLURI	0.07	-0.72	0

Table A.4: **Characteristics of Cities with Zoning Map Data**

*Note:* Table shows characteristics of cities for which zoning map data is available and unavailable. P-values are for t-test for difference-in-means.

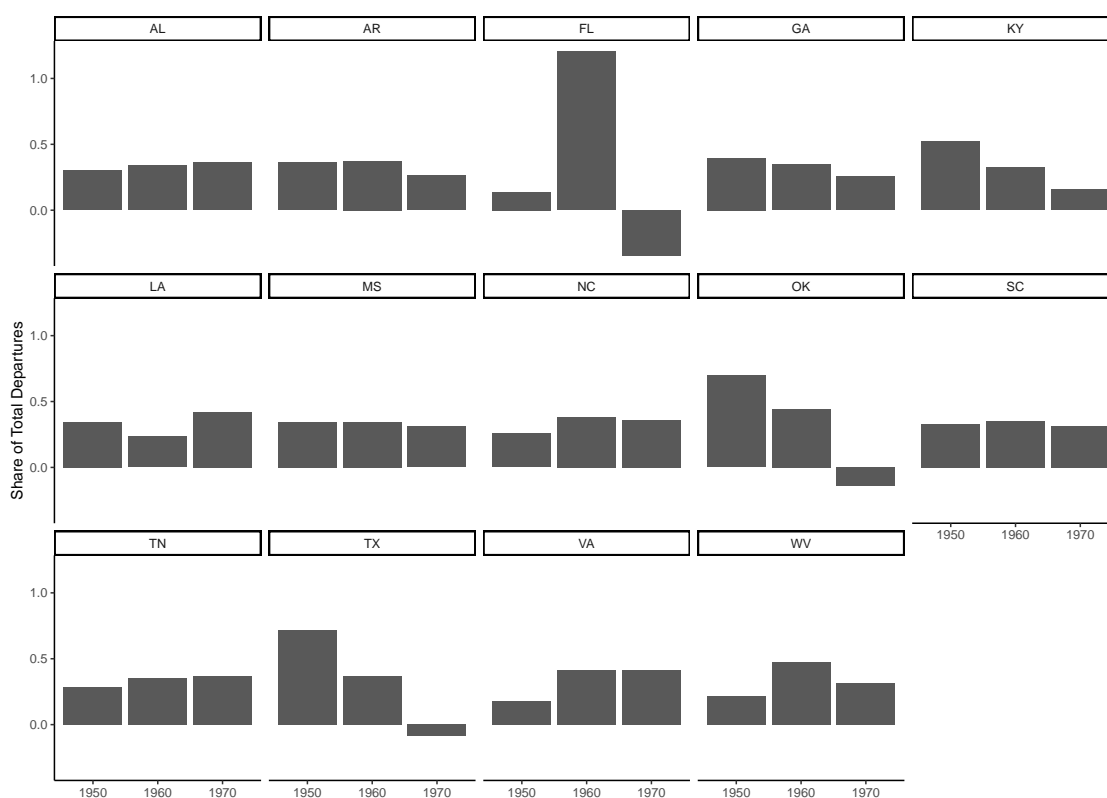
## A.2 Black Out-migration From the South

To construct the shift-share migration instrument, I use various data on Southern population changes and economic conditions, which I summarize in this section.

Figure A.5 shows the proportion of Black state out-migration in each decade from each Southern state. The heterogeneity in timing that states exhibits illustrates one of the motivating facts for using a shift-share instrument and making separate predictions by decades. Florida and Texas, the two largest and fast-growing states in the South during this period in fact exhibit *negative* Black out-migration between 1960 and 1970, tracking the growth of the sunbelt and the beginning of the reverse Great Migration.

Table A.5 shows the covariates used in each decade to predict actual Black county out-migration. Using 1,622 counties across 14 states in the South, I pair actual data on Black out-migration with covariates on Southern economic conditions. I use Lasso with 10-fold cross-validation to select the optimal set of predictors for each decade. Table A.5 shows the coefficients on each predictor for each decade, where blank cells indicate that a covariate is not used. Some covariates are measured after 1940 and are excluded from the 1940-1950 model.

Using Lasso generates more accurate predictions than existing approaches to constructing Great Migration shift-share instruments. Table A.5 shows the mean-squared error of predicted Black out-



**Figure A.5—Actual Black Out-migration by Decade**

*Note:* Plot shows the proportion of Black departures from each Southern state by decade. Proportions sum to 1 for each state. Predicted outmigration may be negative for some decades (see FL, OK, and TX from 1960-1970) based on net population change.

*Source:* Great Migration instrument constructed with population and migration data from 1940 full-count census (Ruggles et al. 2018), 1970 Census tabulations (Manson et al. 2020), and Southern agricultural data (Boustan 2016).

	1940-1950	1950-1960	1960-1970
\$ from AAA, 1933-37, per capita	-10	-8	3
av. size farms (cropland/farms)	13	11	2
av. water content, soil	-7,787	-6,681	
Cacre_plant	-0.31	-0.26	-0.27
% soil that is clay	3		-8
Cotton_bales	-0.03	-0.03	-0.02
=1 if dustbowl county	-1,052	-1,070	-790
max. elevation	0.34	0.29	0.14
diff: highest-lowest elevation	-0.11	-0.06	-0.11
k factor, soil loss	11,027	10,110	3,903
% miners, 1935	-73	-70	-75
months - extreme dry, 1930s	-21	-20	-15
months - extreme wet, 1930s	10	12	16
Manufacturing establishments 1958			3
organic material in soil	223	218	103
av. precipitation, 1930s	-337	-364	-311
permeability, soil inches per hour	271	251	115
Agriculture: % tenant farms 1959			-2,190
% urban 1960			-19
Black pop. previous decade	0	0	-0.18
# rivers, pass through 5-10 counties	-154	-151	-94
# rivers, pass through 21-50 counties	-90	-65	-43
# rivers, pass through 51+ counties	-347	-330	-13
# named summits	-4	-4	-4
# swamps	-10	-10	-4
Agriculture: land in farms (000 acres) 1959			-0.78
depth of soil in inches	-46	-45	-15
av. temp, 1930s	9	3	29
Total civilian labor force employed 1960			0.13
# named valleys	5	5	3
\$ war contracts, 1940-45, per capita		144	
\$ war industry, 1940-45, per capita		111	29

Table A.5: **Covariates Used in Lasso County Migration Prediction:** Table shows covariates chosen by lasso algorithm to predict Black county out-migration for each decade. Cells are blank when covariates are not used for prediction. Covariates taken from Boustan (2016) replication data. Covariates measured after 1940 used only for predictions in the following decade.

migration for each decade using several approaches. The second column ("OLS (Boustan 2016)") uses predictions from an OLS model using hand-picked covariates used in Boustan (2016), although Boustan rolls up county-level predictions to the state level. The next column uses the same pool of covariates in a Lasso model, reducing the MSE by 25%. The fourth column uses all covariates from the ICMA City and County yearbooks measured before 1940 in a Lasso model, improving MSE shrinkage negligibly. Finally, the last column uses all available covariates (including those measured after 1940 for post-1950 predictions), yielding a nearly 50% improvement in MSE shrinkage over the original OLS approach.

Year	Mean-Squared Error			
	OLS (Boustan 2016)	Lasso (Boustan 2016)	Lasso (Pre-1940)	Lasso (All)
1950	3,781	1,902	2,036	2,031
1960	8,850	5,622	5,484	5,457
1970	8,302	6,225	6,108	2,943
Total	20,933	13,749	13,628	10,431

Table A.5: **Mean-Squared Error of Black County Outmigration Predictions:** Table shows mean-squared error of county-decade predictions of Black outmigration. Second column shows the OLS fitted values calculated in Boustan (2016). Note that these predictions are aggregated to the state level by Boustan. Third column shows the lasso predicted values using the same set of covariates as the previous column. Fourth column shows the lasso predicted values using all covariates measured before 1940. Final column shows the lasso predicted values using all variables available in Boustan (2016) replication data, including variables measured after 1940 such as emergency war expenditures and highway investment.

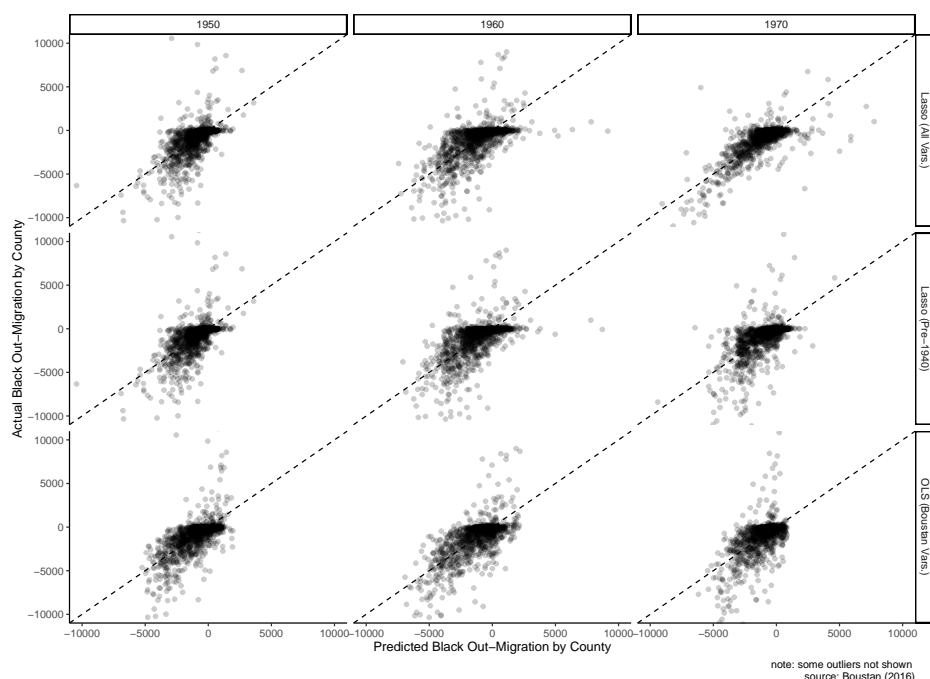


Figure A.6—**Lasso Predictions of Black Outmigration**

*Note:* Plot shows predicted and actual Black outmigration for Southern counties for each county by decade, using three different prediction methods. First row shows predictions using all variables available in (Boustan 2016) replication data. Second row shows predictions using only measures of agricultural suitability measures pre-1940 (all variables include measures of WWII spending and highway spending for later decades). Third row shows predictions using variables used in (Boustan 2016).

*Source:* Great Migration instrument constructed with population and migration data from 1940 full-count census (Ruggles et al. 2018), 1970 Census tabulations (Manson et al. 2020), and Southern agricultural data (Boustan 2016).

### A.3 Black Arrivals in the North

African-American migrants in the North settled primarily in central cities. These cities had greater job opportunities and less expensive rental housing and transportation options than outlying cities or rural areas. Figure A.8 shows the number of Southern Black migrants who left the South between 1935 and 1940 for the 10 largest commuting zones in the North. The bars are shaded by whether migrants settled in central cities (black), outlying municipalities incorporated in the 1940 Census (dark grey), or rural areas in the same county (light grey). In all commuting zones, save Bridgeport CT, a majority of migrants settled in the central city.

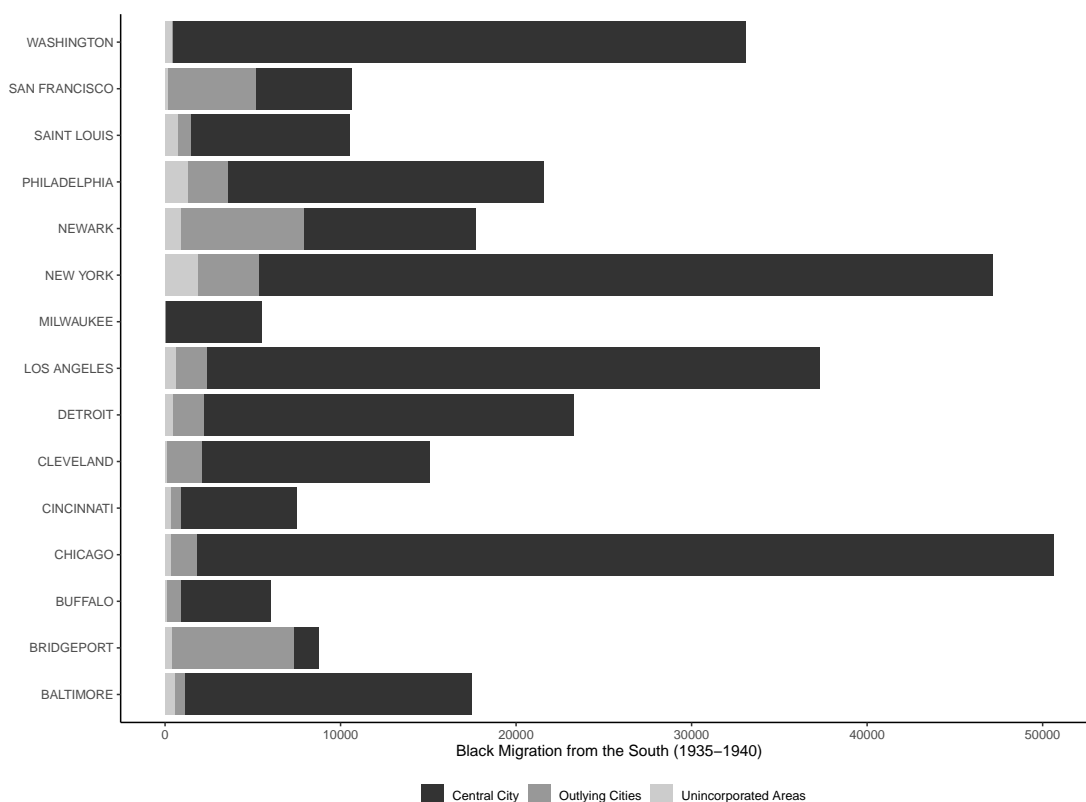
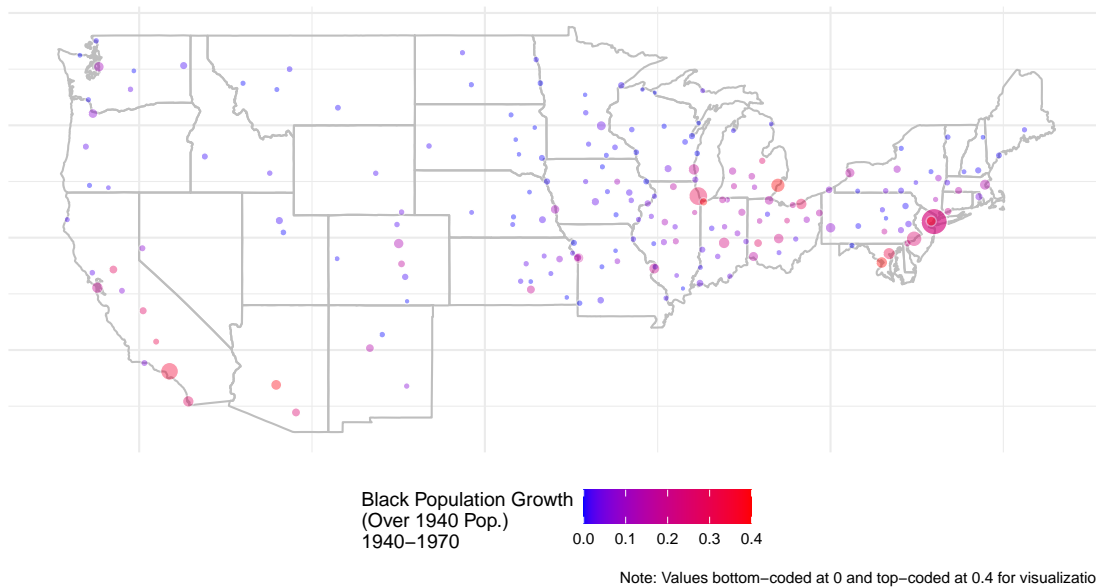


Figure A.7—**Black Arrivals by Commuting Zone, 1935-1940**

*Note:* Plot shows total number of Black Southern arrivals 1935-1940 for the top 15 commuting zones. Black bars indicate number of arrivals to central city in commuting zone, light grey bars indicate number of arrivals to other incorporate municipalities, and lightest grey bars indicate number of arrivals to county remainder.

*Source:* 1940 full-count census (Ruggles et al. 2018)



**Figure A.8—Black Population Growth in Central Cities**

*Note:* Map shows actual Black population growth from 1940–1970 as a share of total 1940 population for 197 commuting zone centers outside of the South. Size of points scaled by 1940 population. Values bottom-coded at 0 and top-coded at 0.4 for ease of presentation.

*Source:* 1940 full-count census (Ruggles et al. 2018)

## A.4 Effects of the Great Migration on City Characteristics

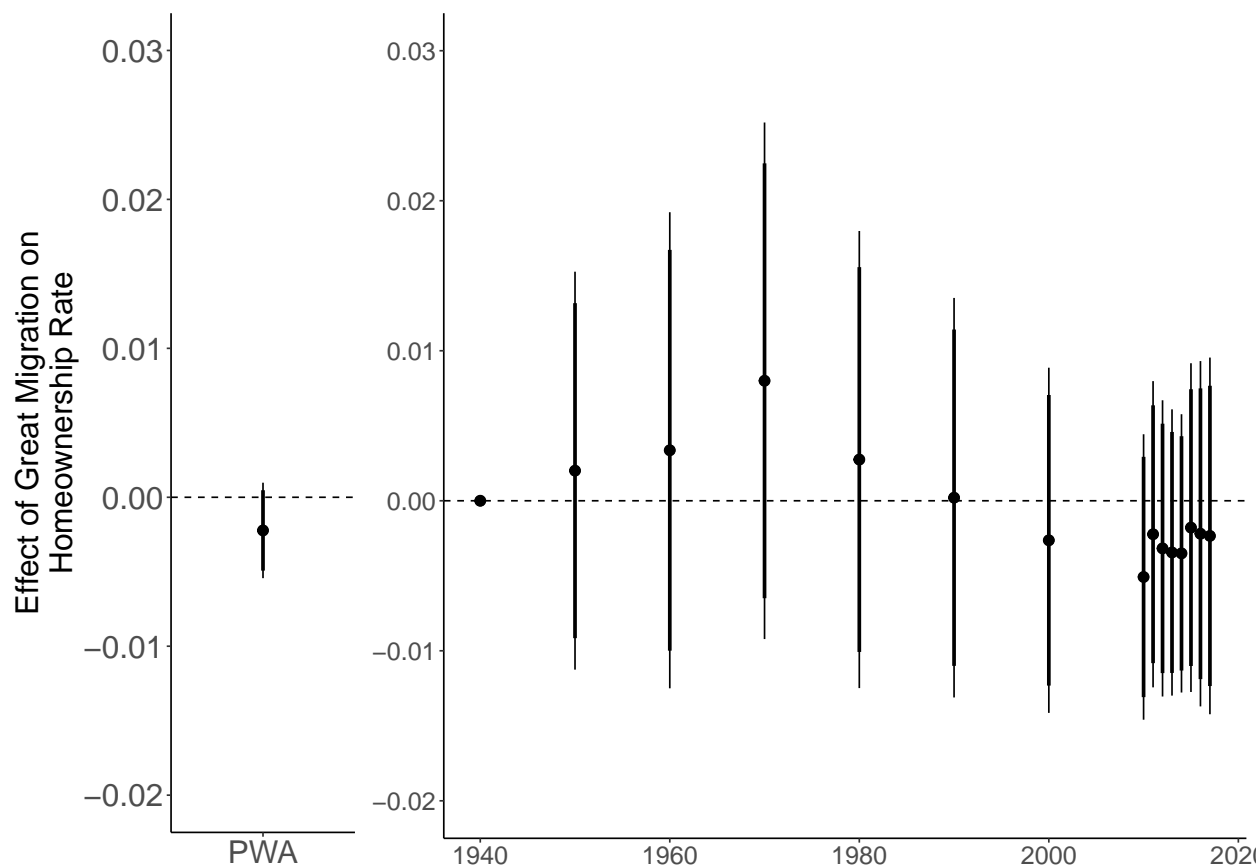


Figure A.9—**Great Migration Does Not Change Homeownership Rates**

*Note:* Figure shows the reduced form effect of predicted Black population growth on homeownership rate. Points represent regression estimates and bars represent 95% confidence intervals. Panel on the left shows precision-weighted average of yearly point estimates. Regressions control for share of Black population that migrated from the South from 1935-1940 and 1940 homeownership rates, and use robust standard errors.

*Source:* Homeownership data for 1940 from full-count census (Ruggles et al. 2018), 1950-1960 from ICMA City and County Books, 1970-2010 from IPUMS NHGIS, and 2009-2016 from American Community Survey. Great Migration instrument constructed with population and migration data from 1940 full-count census (Ruggles et al. 2018), 1970 Census tabulations (Manson et al. 2020), and Southern agricultural data (Boustan 2016).

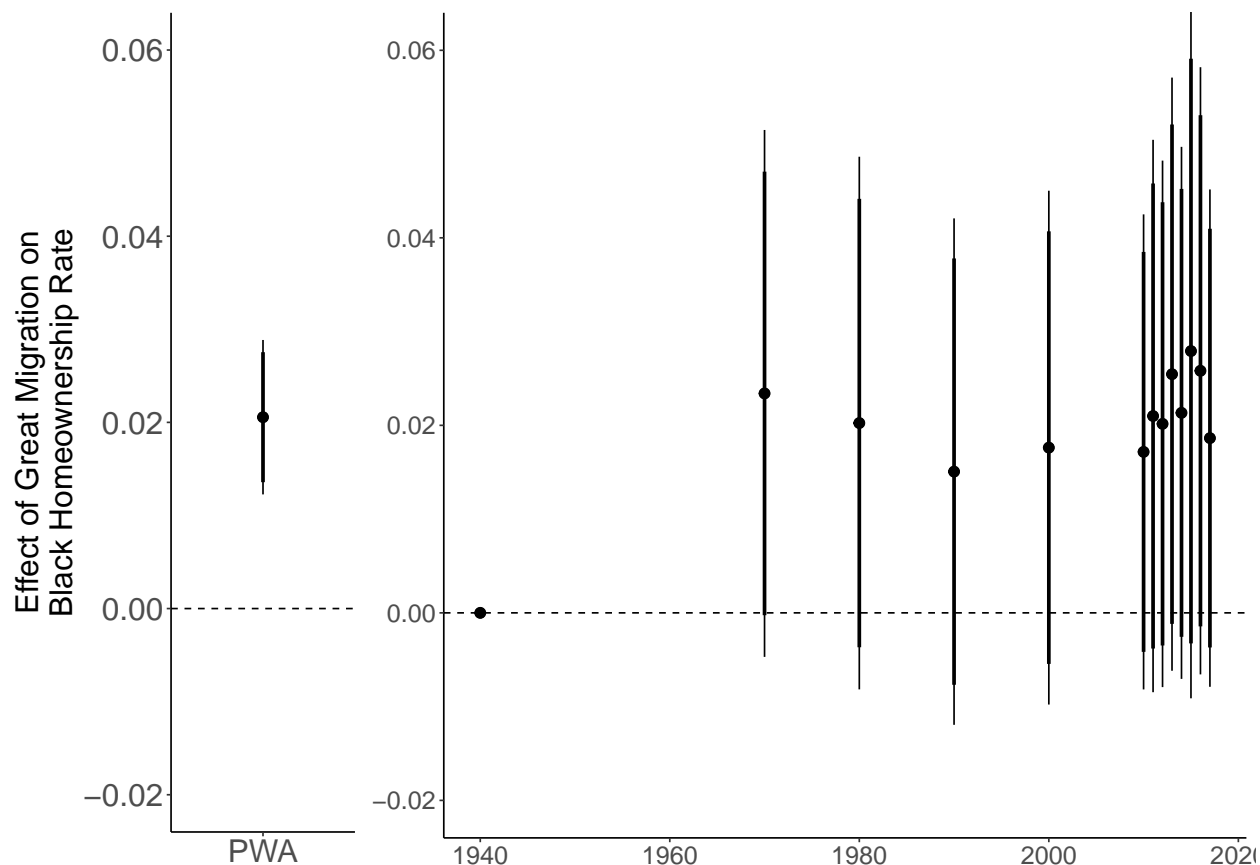
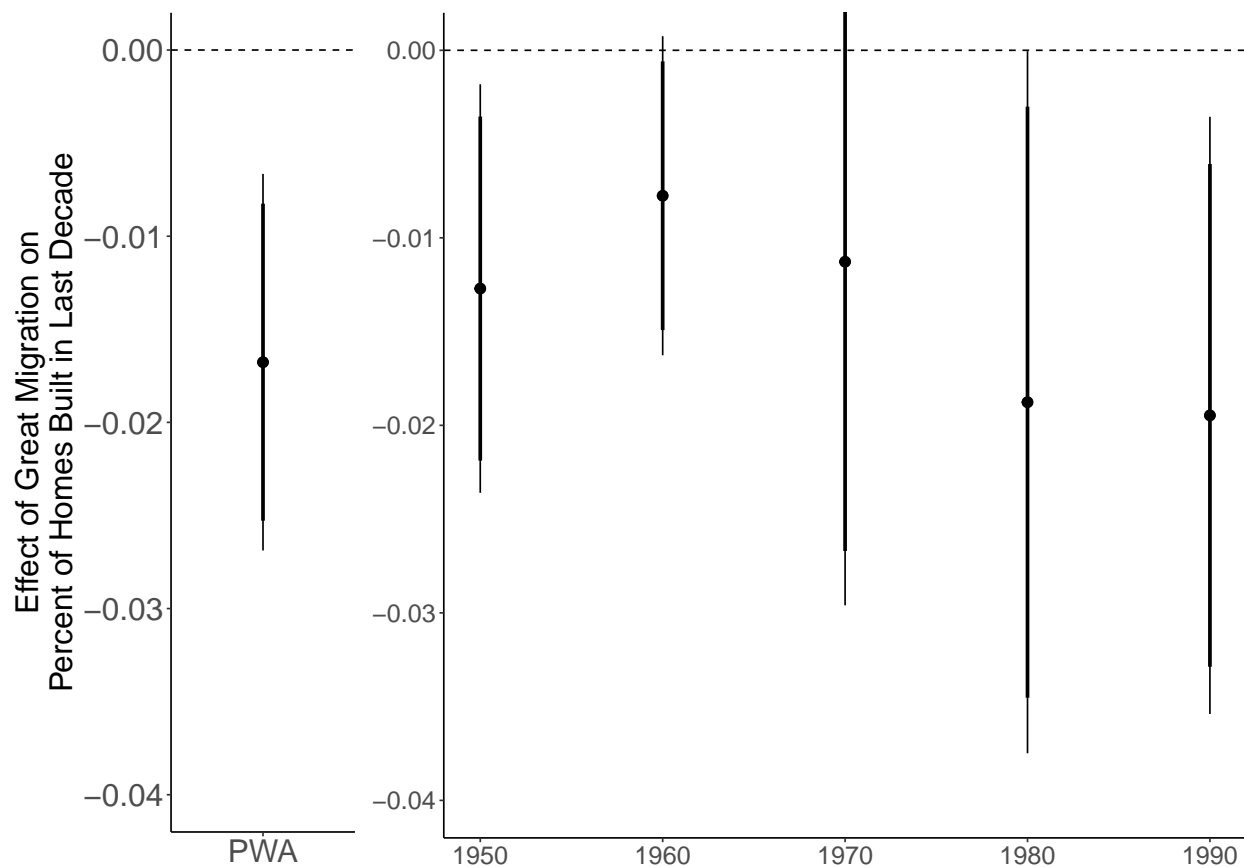


Figure A.10—**Great Migration Increases Black Homeownership**

*Note:* Figure shows the reduced form effect of predicted Black population growth on the Black homeownership rate. Points represent regression estimates and bars represent 95% confidence intervals. Panel on the left shows precision-weighted average of yearly point estimates. Regressions control for share of Black population that migrated from the South from 1935-1940 and 1940 Black homeownership rates, and use robust standard errors.

*Source:* Homeownership data for 1940 from full-count census (Ruggles et al. 2018), 1950-1960 from ICMA City and County Books, 1970-2010 from IPUMS NHGIS, and 2009-2016 from American Community Survey. Great Migration instrument constructed with population and migration data from 1940 full-count census (Ruggles et al. 2018), 1970 Census tabulations (Manson et al. 2020), and Southern agricultural data (Boustan 2016).



**Figure A.11—Effect of Great Migration on Percentage of Homes Built in Previous Decade**

*Note:* Figure shows the reduced form effect of the predicted change in the percentage of a city that is Black on percentage of homes built in previous decade. Points represent regression estimates, thick bars represent 90% confidence intervals, and thin bars represent 95% confidence intervals. Panel on the left shows precision-weighted average of yearly point estimates. Regressions control for share of Black population that migrated from the South from 1935-1940.

*Source:* Data on home age from ICMA City and County Books and Census tabulations (Manson et al. 2020). Great Migration instrument constructed with population and migration data from 1940 full-count census (Ruggles et al. 2018), 1970 Census tabulations (Manson et al. 2020), and Southern agricultural data (Boustan 2016).

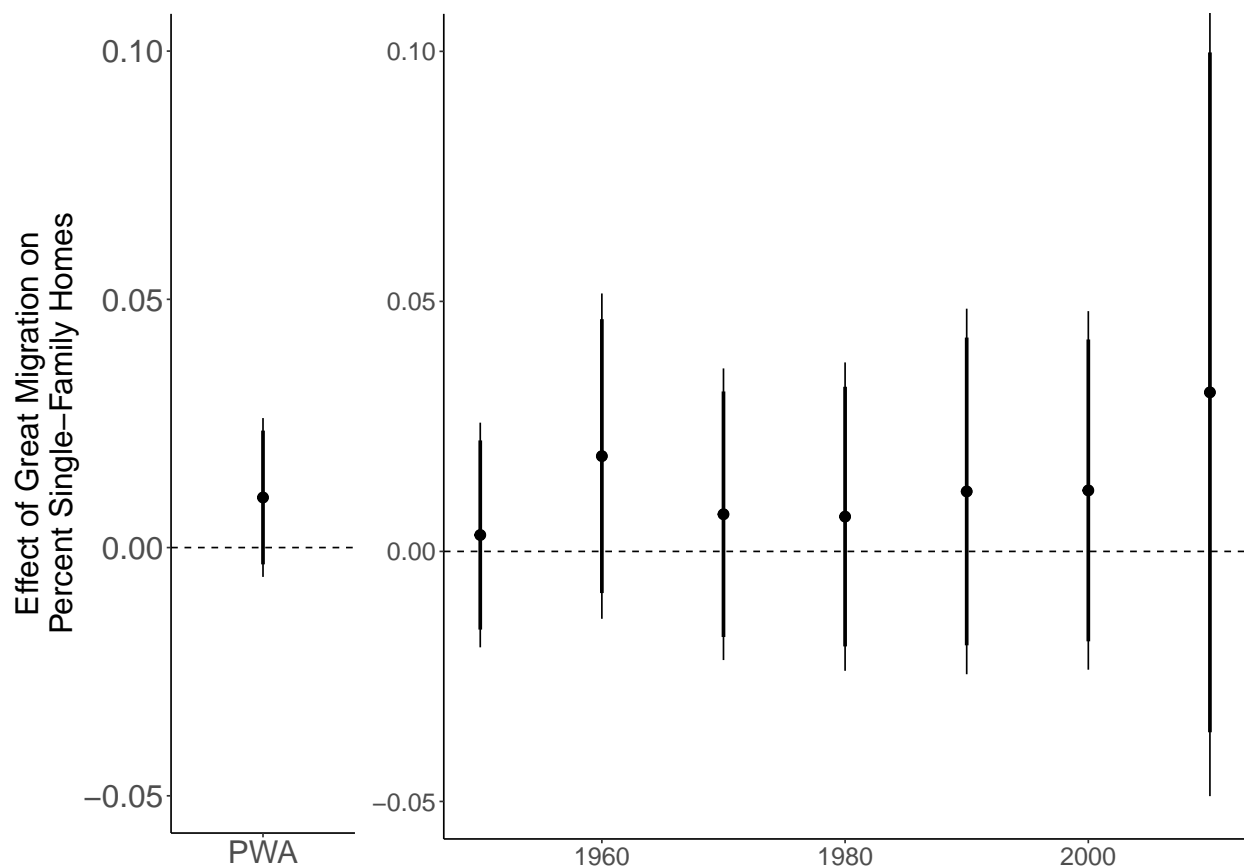
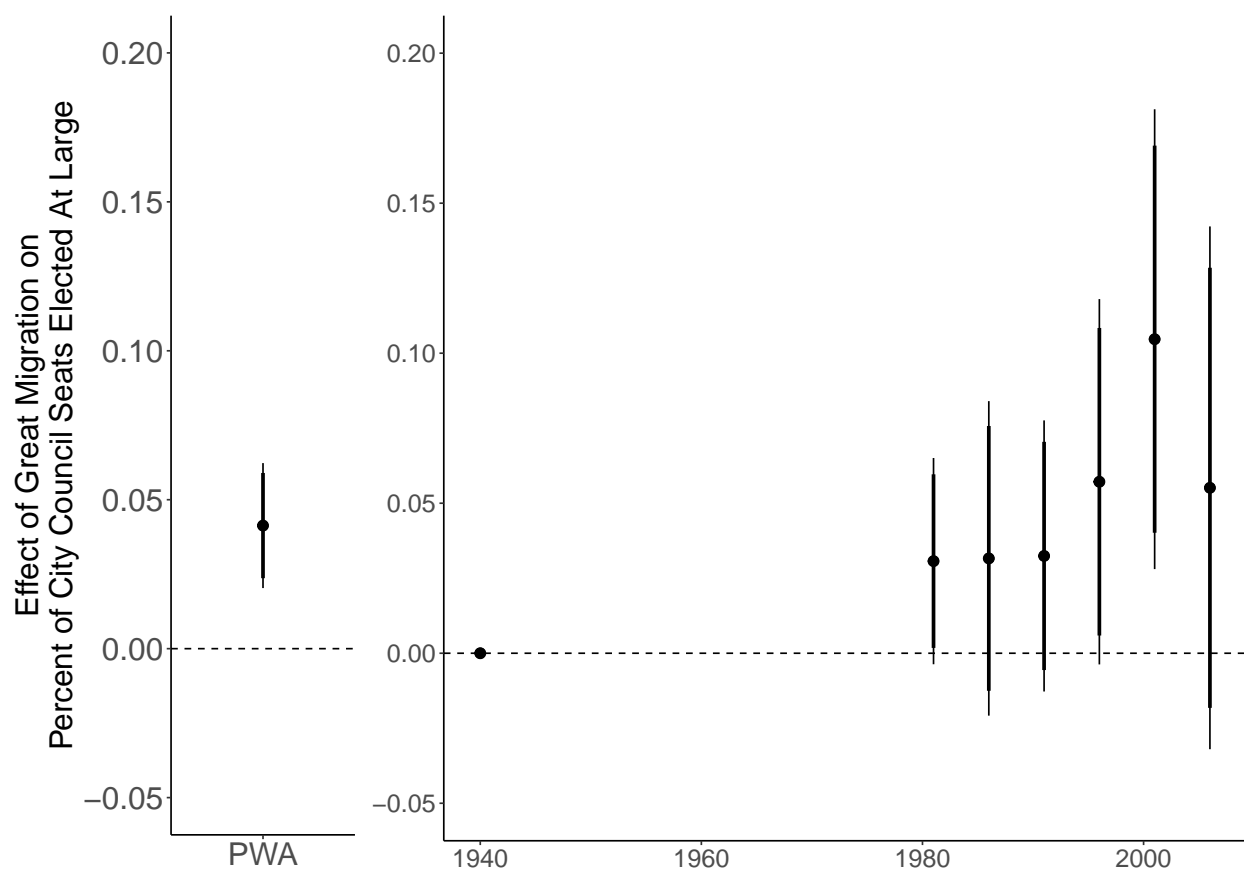


Figure A.12—**Effect of Great Migration on Percentage of Single-Family Homes**

*Note:* Figure shows the reduced form effect predicted Black population growth on percentage of occupied housing units that are single-family homes. Points represent regression estimates, thick bars represent 90% confidence intervals, and thin bars represent 95% confidence intervals. Panel on the left shows precision-weighted average of yearly point estimates. Regressions control for share of Black population that migrated from the South from 1935-1940.

*Source:* Data on home type from ICMA City and County Books and Census tabulations (Manson et al. 2020). Great Migration instrument constructed with population and migration data from 1940 full-count census (Ruggles et al. 2018), 1970 Census tabulations (Manson et al. 2020), and Southern agricultural data (Boustan 2016).



**Figure A.13—Effect of Great Migration on Percentage of City Council Members Elected At Large**

*Note:* Figure shows the reduced form effect of predicted Black population growth on the percentage of city council representatives elected at large, as opposed to district-based. Points represent regression estimates, thick bars represent 90% confidence intervals, and thin bars represent 95% confidence intervals. Panel on the left shows precision-weighted average of yearly point estimates. Regressions control for 1940 share of city council seats elected at large share of Black population that migrated from the South from 1935-1940.

*Source:* Data on city councils from ICMA Form of Government survey and digitized from 1941 Municipal Year Book (The International City Managers' Association 1941). Great Migration instrument constructed with population and migration data from 1940 full-count census (Ruggles et al. 2018), 1970 Census tabulations (Manson et al. 2020), and Southern agricultural data (Boustan 2016).

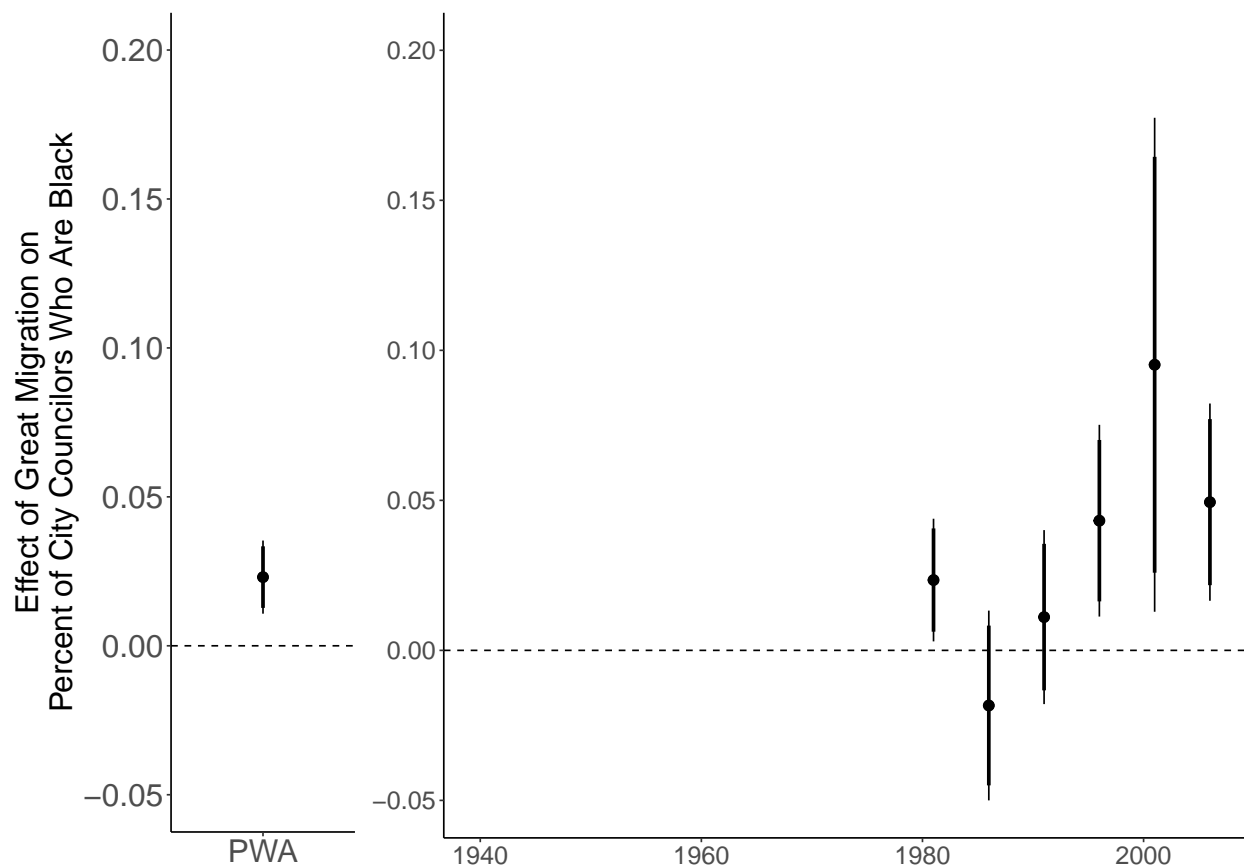


Figure A.14—**Effect of Great Migration on Percentage of City Council Members Who are Black**

*Note:* Figure shows the reduced form effect of predicted Black population growth on the percentage of city council representatives who are Black. Points represent regression estimates, thick bars represent 90% confidence intervals, and thin bars represent 95% confidence intervals. Panel on the left shows precision-weighted average of yearly point estimates. Regressions control for share of Black population that migrated from the South from 1935-1940.

*Source:* Data on home type from ICMA City and County Books and Census tabulations (Manson et al. 2020). Great Migration instrument constructed with population and migration data from 1940 full-count census (Ruggles et al. 2018), 1970 Census tabulations (Manson et al. 2020), and Southern agricultural data (Boustan 2016).

## A.5 Effects of the Great Migration on White Racial Attitudes

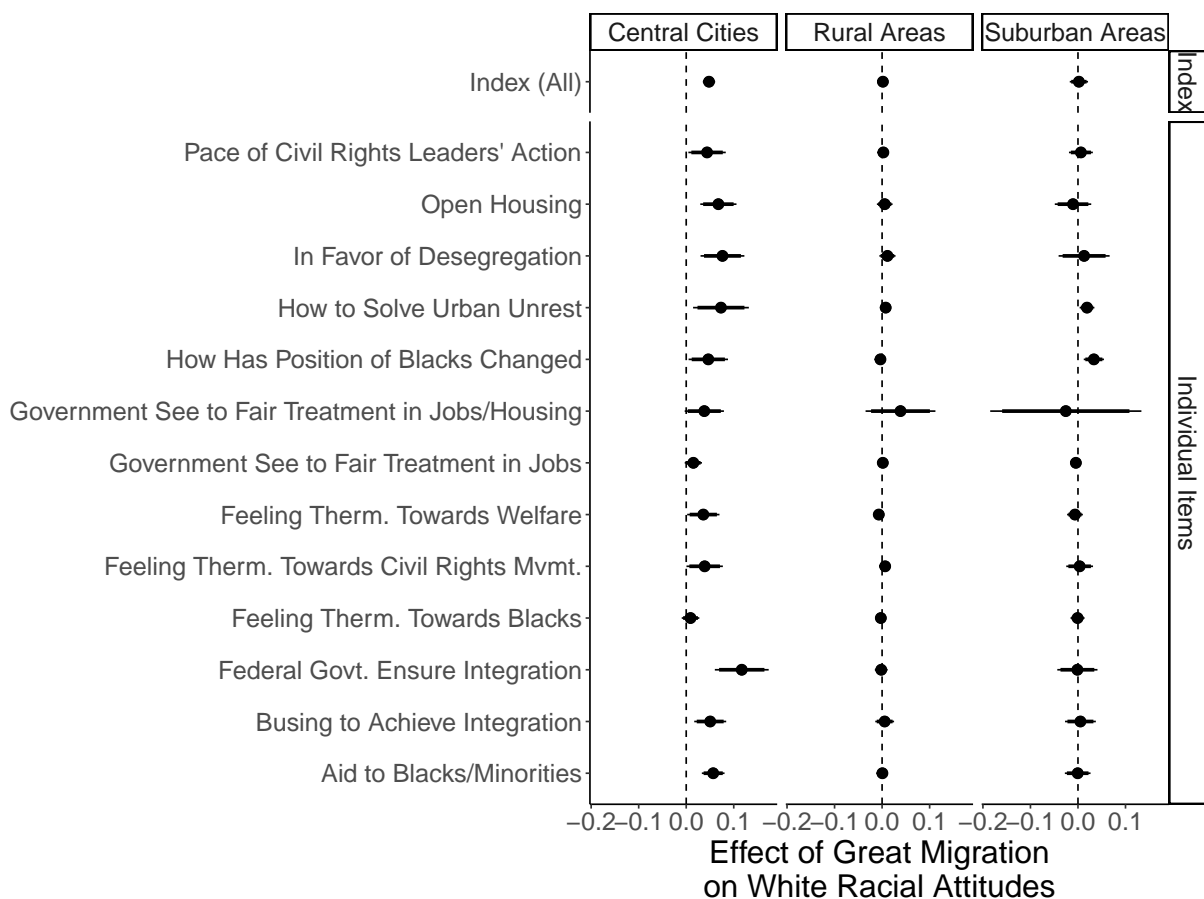
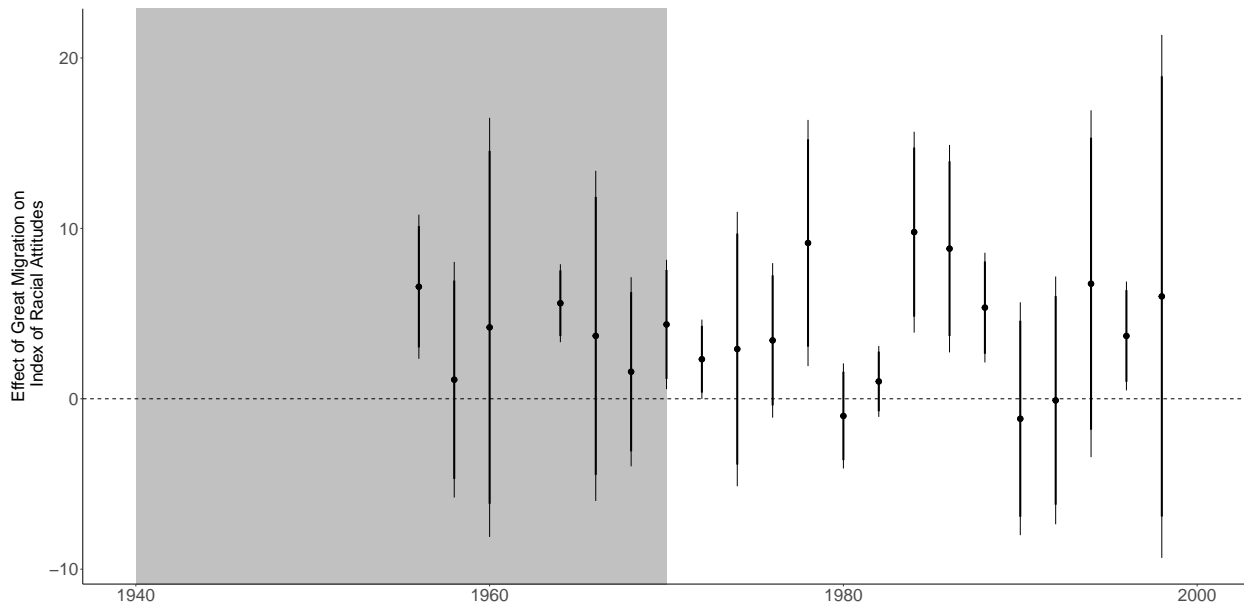


Figure A.15—**Effect of Great Migration on White Racial Attitudes in Suburban and Rural Areas**

*Note:* Figure shows the reduced form effect of predicted Black population growth in central city on index of racial public opinion items on ANES for respondents in central city, suburban areas, and rural areas. Points represent regression estimates, thick bars represent 90% confidence intervals, and thin bars represent 95% confidence intervals. Regressions control for share of Black population that migrated from the South from 1935-1940 and respondent age, education, and income and use robust standard errors. Respondents are subset to self-identified whites and urban residents. Index contains different items in different years—see Figure A.17 for more details.

*Source:* Public opinion data from the ANES cumulative file. Great Migration instrument constructed with population and migration data from 1940 full-count census (Ruggles et al. 2018), 1970 Census tabulations (Manson et al. 2020), and Southern agricultural data (Boustan 2016).



**Figure A.16—Effect of Great Migration on White Racial Attitudes Over Time**

*Note:* Figure shows the reduced form effect of the predicted change in the percentage of a city that is Black on index of racial public opinion items on ANES. Points represent regression estimates, thick bars represent 90% confidence intervals, and thin bars represent 95% confidence intervals. Regressions control for share of Black population that migrated from the South from 1935-1940 and respondent age, education, and income and use robust standard errors. Respondents are subset to self-identified whites and urban residents. Index contains different items in different years—see Figure A.17 for more details.

*Source:* Public opinion data from the ANES cumulative file. Great Migration instrument constructed with population and migration data from 1940 full-count census (Ruggles et al. 2018), 1970 Census tabulations (Manson et al. 2020), and Southern agricultural data (Boustan 2016).

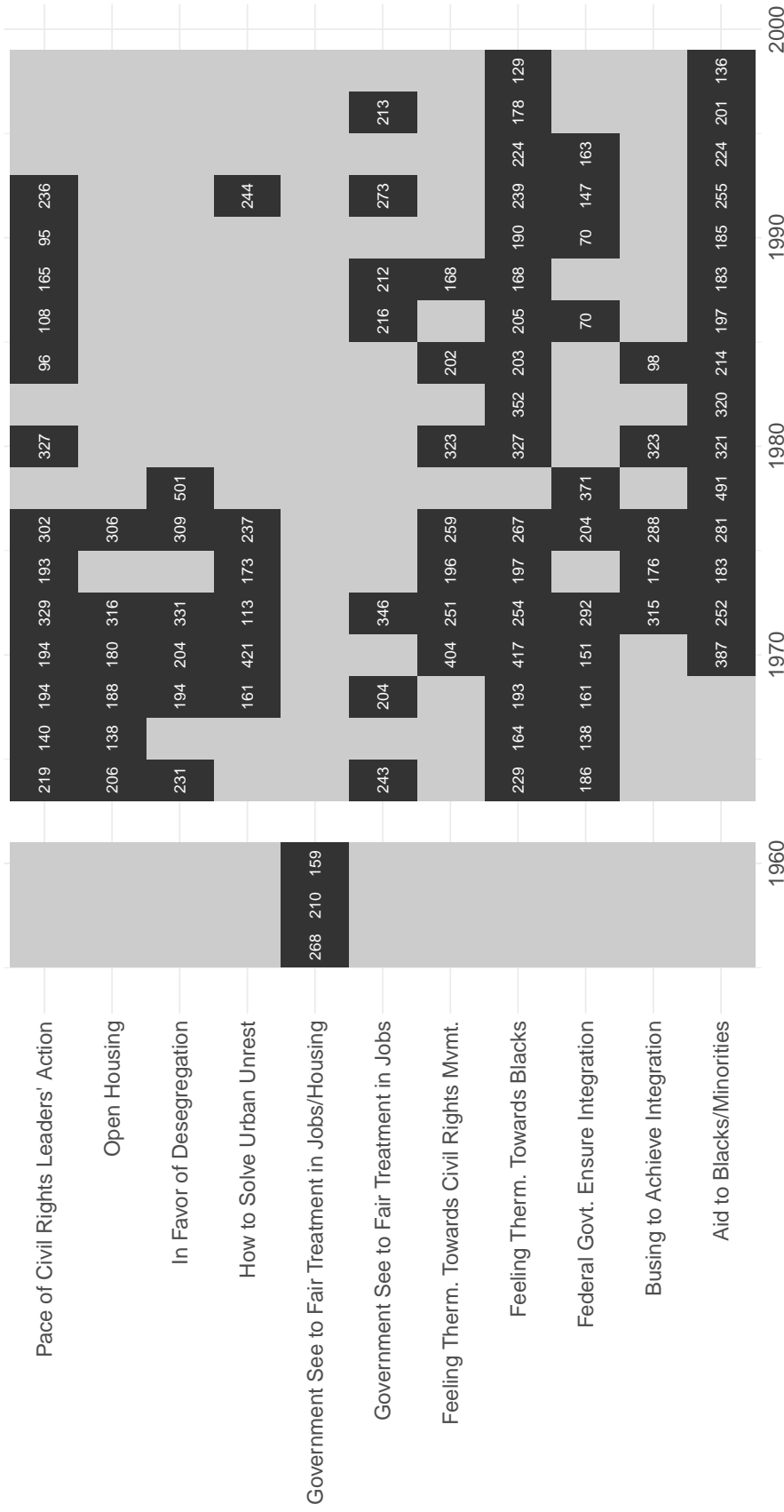


Figure A.17—ANES Respondents by Question/Year: Table shows the number of respondents who identify as white and urban dwellers who respond to each item used in public opinion analysis in each wave of the ANES.

## A.6 Effects of the Great Migration on Election Results

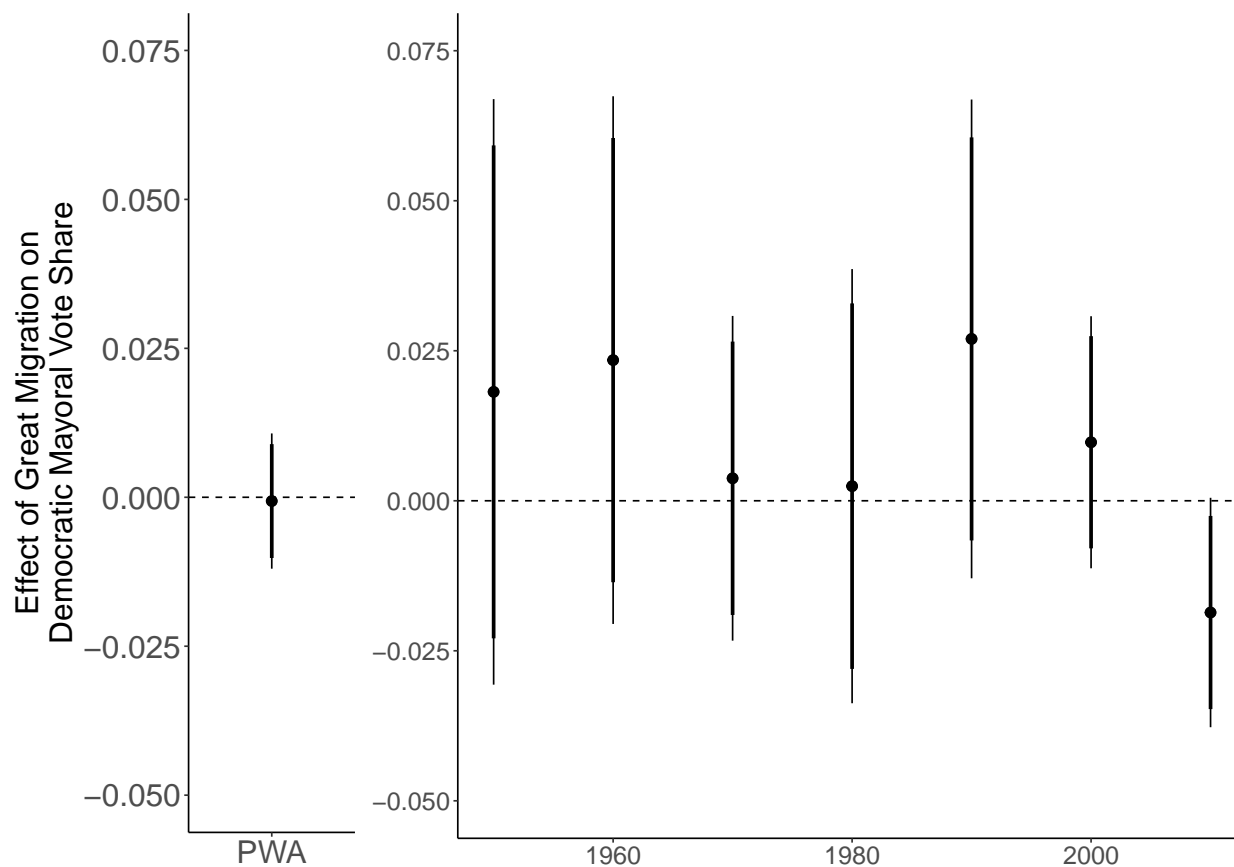


Figure A.18—**Effect of Great Migration on Democratic Mayoral Vote Share**

*Note:* Figure shows the reduced form effect of the predicted Black population change on Democratic mayoral vote share, by decade. Points represent regression estimates, thick bars represent 90% confidence intervals, and thin bars represent 95% confidence intervals. Panel on the left shows precision-weighted average of yearly point estimates. Regressions control for share of Black population that migrated from the South from 1935-1940.

*Source:* Mayoral election data from

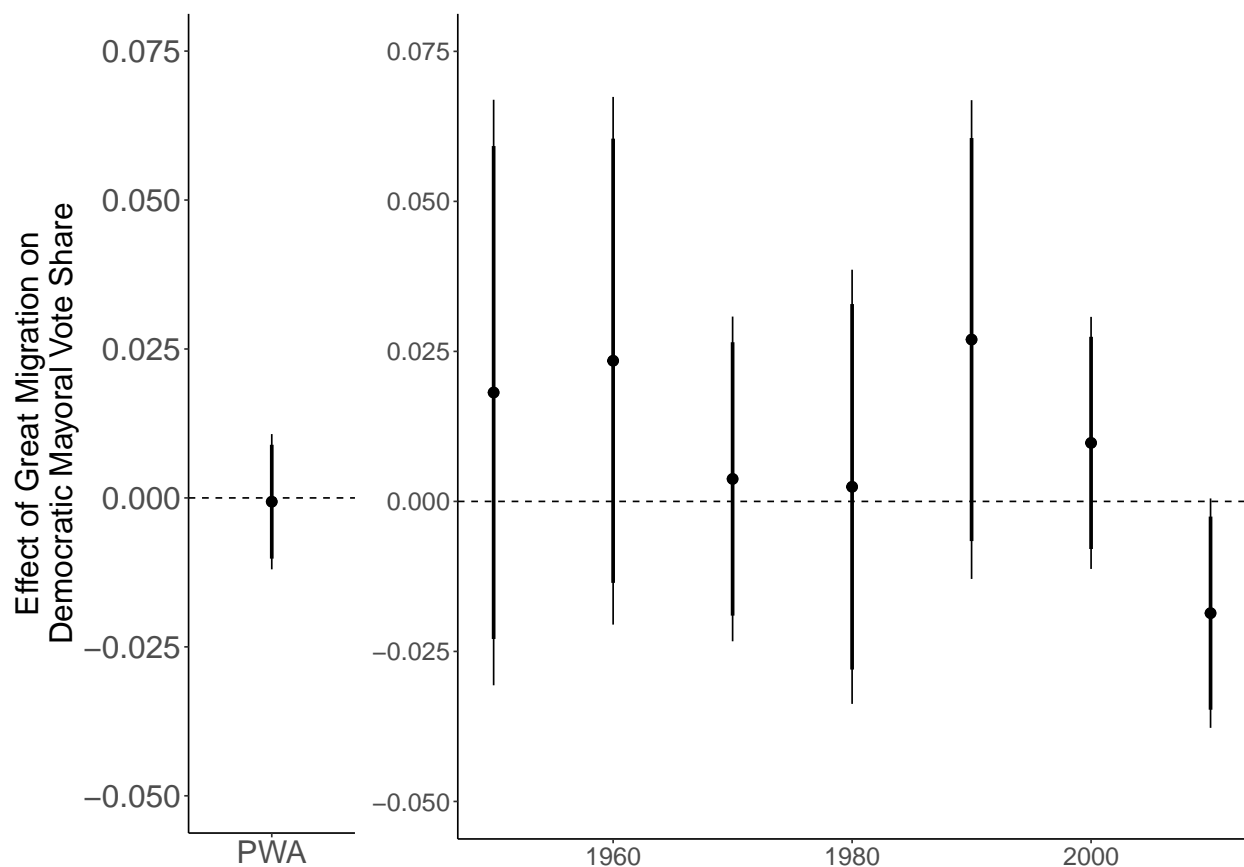


Figure A.19—**Effect of Great Migration on Democratic Presidential Vote Share**

*Note:* Figure shows the reduced form effect of the predicted Black population change on Presidential mayoral vote share. Points represent regression estimates, thick bars represent 90% confidence intervals, and thin bars represent 95% confidence intervals. Panel on the left shows precision-weighted average of yearly point estimates. Regressions control for share of Black population that migrated from the South from 1935-1940. Instrument calculated at county-level to match Presidential vote share data.

*Source:* Presidential election data from Dave Leip's Presidential Atlas. Great Migration instrument constructed with population and migration data from 1940 full-count census (Ruggles et al. 2018), 1970 Census tabulations (Manson et al. 2020), and Southern agricultural data (Boustan 2016).

## A.7 Placebo Tests

In the follow section I conduct two placebo tests: first, to address whether the First Great Migration (1900-1940) has a relationship with pre-existing or current land use. I argue that given the availability of methods to racially segregate under the law, cities did not turn to exclusionary zoning until after explicit racial discrimination is outlawed in the 1940s-60s. Figure A.20 confirms this intuition, showing no relationship between population change due to the First Great Migration and exclusionary zoning today.

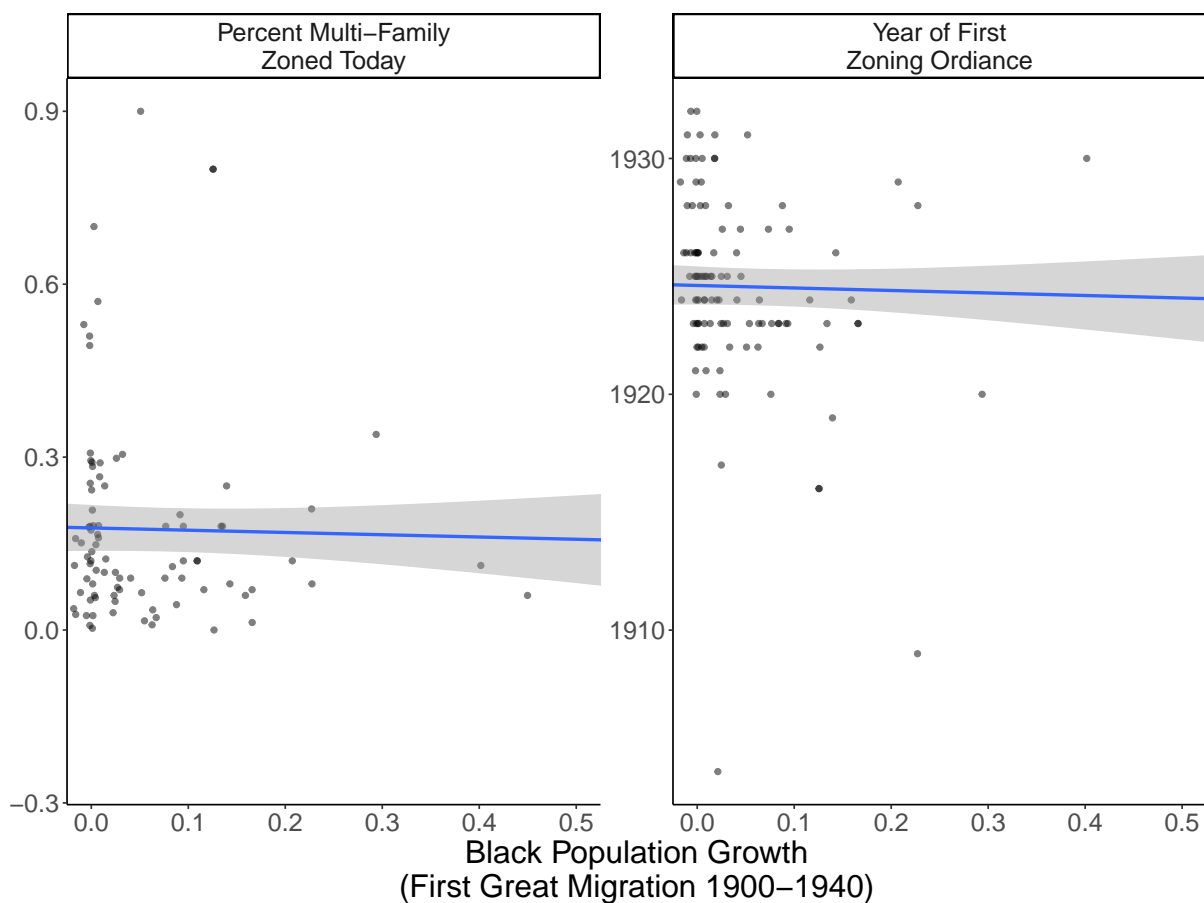


Figure A.20—**Effect of First Great Migration (1900-1940) on Exclusionary Zoning**

*Note:* Figure shows the effect of the change in Black population growth from 1900 to 1940 as the result of the First Great Migration. Points represent regression estimates, thick bars represent 90% confidence intervals, and thin bars represent 95% confidence intervals. Regressions control for 1940 population density.

*Source:* Data from 1940 full-count census (Ruggles et al. 2018) and 1970 Census tabulations (Manson et al. 2020).

## A.8 Prevalence of Shift-Share Designs in the Social Sciences

The table below provides a handful of examples of prominent papers that use shift-share designs. Initially developed by Bartik (1991) and first applied to migration by Card (2001), shift-share designs have proliferated across the economics literature, particularly to answer questions about the effects of trade and migration. (Jaeger, Ruist and Stuhler 2018) characterize its ubiquity: “it is difficult to overstate the importance of this instrument for research on immigration. Few literatures rely so heavily on a single instrument or variants thereof.” Political scientists have been slower to use these designs, with this paper and Fouka et al. (2019) serving as the exceptions, but Boustan and Tabellini (2018) examine white Southern support for segregationist political candidates in response to Black outmigration.

Name	Journal	Citations	Outcome	Instrument
Bartik (1991)	W.E. Upjohn WP	2,655	earnings and wages	development policies
Blanchard et al. (1992)	Brookings WP	3,190	employment	development policies
Card (2001)	J. of Labor Econ.	2,069	labor market outcomes	foreign immigration
Luttmer (2005)	QJE	2,284	perceived relative well-being	development policies
Boustan (2010)	QJE	318	white flight	(Second) Great Migration
Saiz (2010)	QJE	1,368	housing prices	housing stock
Author et al. (2013)	AER	2,541	employment	Chinese exports
Hummels et al. (2014)	AER	453	wages	offshoring jobs
Tabellini (2018)	WP	7	local public finance	(First) Great Migration
Boustan & Tabellini (2018)	WP	n/a	support for segregationists	(Second) Great Migration
Derenencourt (2019)	WP	14	economic opportunity	(Second) Great Migration
Fouka et al. (2019)	WP	12	immigrant assimilation	(First) Great Migration
Jaravel (2019)	QJE	52	price inflation	consumer demand

Table A.20: **Selected Citations of Shift-Share Designs:** representing the canonical uses for estimating the effects of trade and migration, and newer applications.

## A.9 Identification Assumptions and Tests

Recent work (e.g. Jaeger, Ruist and Stuhler 2018; Goldsmith-Pinkham, Sorkin and Swift 2019; Ado, Kolesr and Morales 2019)) has formalized the assumptions of shift-share instruments and developed tests to validate their plausibility. In the following section, I discuss the assumptions in the context of this study.

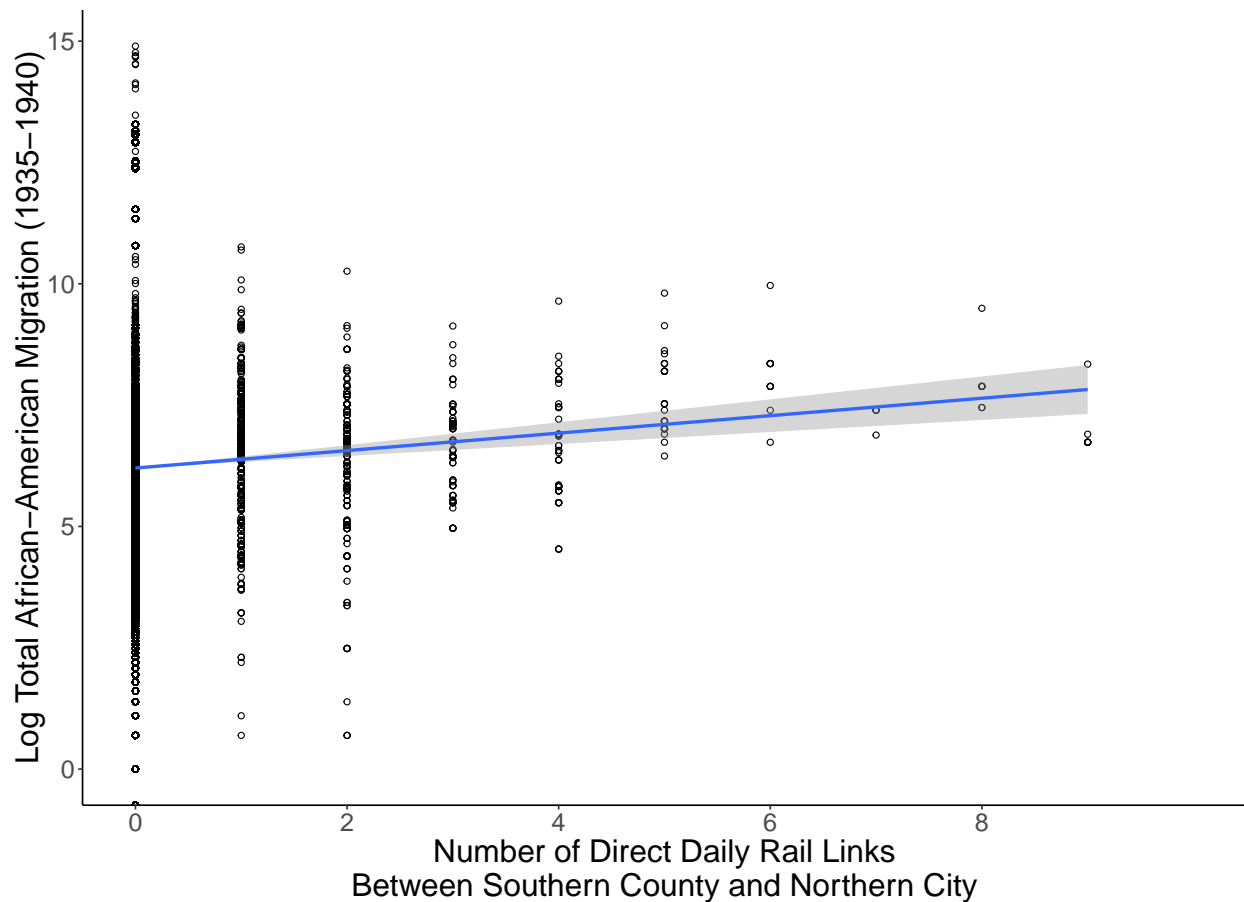
### A.9.1 Exogeneity of Shares

A key identifying assumption is that the shares, the probability of a migration from any given county going to any given city, are random conditional on prior migration.

The historical accounts of the First Great Migration and early periods of the Second Great Migration emphasize the extent to which railroad routes determined migrants' destinations. As Wilkerson writes about a young man trying to venture West: "At daybreak, he hopped the first train that came through. he rode not knowing where he was headed and not, of course, able to ask." (Wilkerson 2011, p. 308). The migration patterns of the Second Great Migration are determined by the patterns of the First Great Migration, but these may be dependent on something altogether unrelated to Black migration, and certainly to housing policy in Northern cities. Although we might be concerned that these rail routes were created with prior migration patterns in mind, the primary purpose of these rail lines was to transport freight, not passengers.

I collect data on all train timetables for routes active before 1940 from [Steamliner Schedules](#), a rail hobbyist website, creating a Southern county-Northern city matrix of daily rail links. Correlating these rail links with the 1935-1940 Census migration figures in A.21, we see that for every additional rail link, 5% more migrants move from that county-city pair. This gives some evidence to the initial exogeneity of the shares at the beginning of the First Great Migration.

(Goldsmith-Pinkham, Sorkin and Swift 2019) suggest "considering the correlation with initial period characteristics, as this reflects the instruments cross-sectional variation." I verify that predicted migration is independent of pre-treatment outcomes in Table A.21. The results show the regression of  $\hat{GM}$  on variables related to city size and land use, Black population and segregation, and housing markets in 1940. The only significant relationships are with Black population share and Black-white segregation, which are highly correlated. Since the shares in the shift-share instrument utilize prior Black migration, it is mechanically true that there would be a correlation with



**Figure A.21—Correlation Between Number of Rail Links and 1935-1940 Black Migration**

*Note:* Figure shows the correlation between the number of daily rail links and log total Black migration between 1935-1940, between Southern counties and Northern cities. The positive correlation suggests that a portion of the shares used to assign migrants to cities in the shift-share instrument are pre-determined by patterns of rail links laid down decades before Black migration to the North began.

*Source:* Data from 1940 full-count census (Ruggles et al. 2018) and Steamliner Schedules.

Black population share.

(Goldsmith-Pinkham, Sorkin and Swift 2019) also suggest checking pre-trends in the dependent variable, which I am unable to do without panel data about land use outcomes.

	Estimate	Std. Error
Population Density	9,978.374	10,501.030
Population	-322,003.100	345,620.900
Black Population Share	0.338	0.055
Black-White Segregation	1.754	0.312
Homeownership Rate	0.070	0.133
Vacancy Rate	-0.053	0.082
Median Rent	101.769	82.911
Median Home Value	31,563.580	15,211.200
Date of First Zoning Ordinance	8.671	6.661

Table A.21: **Placebo Estimates of Great Migration Instrument on Pre-Treatment Outcomes** Table shows placebo regressions of the Great Migration instrument on pre-treatment outcomes that might be unbalanced. All variables measured in 1940 except date of first zoning ordinance.

*Source:* Demographic and housing data from 1940 full-count census (Ruggles et al. 2018), segregation data from Logan and Parman (2015), zoning code data from author’s collection.

### A.9.2 Small Number of Shares Account for Most of Variation

(Goldsmith-Pinkham, Sorkin and Swift 2019) propose a method for calculating “Rotemberg Weights” that indicate which shares get the most weight in the final estimate. Table A.21 shows the calculated weights for the IV regression on exclusionary zoning, shown in Figure 4. The table shows the 10 counties with the largest weights—the “Migration” column shows the actual number of Black migrants that leave each county from 1940-1970, the “alpha” column is the calculated Rotemberg weight for each county share, and the “beta” column is the county-level effect that alpha is weighting.

The table shows that over half the weight is generated by two counties from Texas: Harris (containing the city of Houston) and Dallas. The high weights are likely due to two factors. First, since these counties cover the two largest cities in the South, they send the most Black migrants (Dade County in Florida, containing Miami, and Orleans Parish in Louisiana, containing New Orleans also have large weights). Second, Texas is the largest sender of migrants to California, which has some of the most restrictive zoning in the country. For more information about the

Table A.21

County	State	Migration	alpha	beta
Harris	Texas	-246,971	0.49	-1.97
Dallas	Texas	-158,903	0.32	-3.36
Mobile	Alabama	-50,705	0.08	-0.22
Dade	Florida	-139,933	0.07	0.44
Lubbock	Texas	-10,551	0.04	-1.74
Jefferson	Alabama	-27,287	0.04	-0.07
Durham	North Carolina	-14,707	0.03	-2.59
Jefferson	Kentucky	-44,544	0.03	-2.82
Polk	Florida	-21,683	0.03	-0.06
Orleans	Louisiana	-117,482	0.03	-0.06

Table A.21: **Rotemberg Weights for Shares:** Table shows the Top 10 Rotemberg weight share counties. Migration is the total number of predicted migrants from shift-share instrument; alpha indicates the relative weight in calculating two stage least squares estimate as LATE of weighted treatment effects by departure county share; beta indicates the heterogeneous effect of migration from specific counties. Some counties have negative weight, positive weights sum to 1.95. Weights computed with total migration, rather than Black population growth, as treatment variable.

dynamics of the Great Migration and housing in California, see (Reny and Newman 2018).

Excluding all Texas counties from the main analyses does not substantially change the findings. See Appendix A.11 for a robustness check of the main analyses using a shift-share instrument excluding all Texas counties.

### A.9.3 Conflation of Short-Term and Long-Term Responses

(Jaeger, Ruist and Stuhler 2018) write about the concern that shift-share instruments conflate short and long-term responses to migration, specifically that "the instrument is likely to be correlated with ongoing responses to previous supply shocks." The literature examining the effect of migration on labor markets is primarily concerned with the short-term effects on dynamic labor markets. In contrast, this study is primarily concerned with the long-term effects of migration on slow-moving municipal policy. While systematic data are scarce, comprehensive updates to zoning codes appear to occur on the timeline of decades rather than months or even years. Therefore, we can be less concerned about short-term adjustments to zoning codes affecting future migration. A large concern remains, however, with the use of the 1935-1940 migration shares in the construction of the instrument, which could be dependent on land-use changes occurring during this time. While

this dependence cannot be ruled out, the placebo tests on adoption of comprehensive zoning and 1940 population density in Table A.21 show that there was no systematic relationship in place by 1940.

Finally, I observe whether the instruments are correlated with the error term in the regression using a Sargan overidentification test, failing to reject that null that they are uncorrelated ( $p = 0.69$ ).

#### **A.9.4 Spillover Between Cities**

Like many analyses of geographic units, this study implausibly assumes independence between cities. The case of neighboring cities in a region illustrates the dependence between units well. The zoning of a suburban municipality may be dependent on the migration levels of a nearby central city and the zoning of the central city might be dependent on the level to which whites leave for outlying suburbs. Both of these cases, however, would attenuate the effects that I find on the direct impact of migration on city zoning.

#### **A.9.5 Weak Instruments**

For the two stage least squares analysis, shown in Appendix A.9, I show the first stage coefficient and the results of an F Test for instrument strength. For the zoning, permitting, and mechanisms analyses, a strong first stage indicates that the shift-share predicted migration is a good instrument for actual migration. For the analyses that have fewer units of observation due to the data limitations (housing affordability in Table ?? and public opinion in Table ??), the first stage does not meet convention thresholds for instrument strength. See next section for discussion of the first stage results.

#### **A.9.6 Instrumental Variables Assumptions**

The first stage equation, of actual Black population growth on predicted Black population growth, takes the following form:

$$GM_i = \alpha + \delta \hat{GM}_i + \epsilon_i$$

Where  $\beta$  represents the coefficient on the effect of  $GM_i$ , Black population growth from 1940 to 1970 in city  $i$ . As Table A.21 shows, predicted migration is a strong instrument for Black

population change in cities ( $F \text{ stat} = 74$ ). The first line of the table shows the regression of the total number of predicted migrants on the net change in Black population in each city, indicating that for each Black migrant from the South that arrived between 1940 and 1970, there were 3.8 African-Americans in 1970 from family formation and births. Turning to the percentage change measure, each additional predicted percent increase in Black population growth predicts a 1/3 of a percent increase in the actual increase in Black population growth. This roughly corresponds to the predicted birth rate from the previous regression.

	Estimate	F Statistic
Total Black Population Change	3.881	75.0
Change in Percent Black	0.343	73.8

Table A.21: **First Stage Results**

Table shows first stage results of predicted Great Migration change on actual change. Both regressions control for share of Black population that migrated from the South from 1935-1940.

*Source:* Great Migration instrument constructed with population and migration data from 1940 full-count census (Ruggles et al. 2018), 1970 Census tabulations (Manson et al. 2020), and Southern agricultural data (Boustan 2016)

There may be threats to the validity of the predicted migration instrument since migration was not randomly assigned. I present a series of tests to indicate that the predicted migration instrument that I generate captures as-if-randomness in Great Migration patterns. The placebo regressions in Table A.21 provide suggestive evidence that the instrument is not correlated with prior outcomes related to the dependent variable.

Finally, for instrumental variables analysis, we must assume an exclusion restriction, that predicted migration affects zoning changes only through actual migration. Since predicted migration is made up on Southern county economic factors and pre-1940 migration patterns, both of these must be plausibly unrelated to later zoning changes other than through predicted Black migration. Southern counties economic conditions may affect Northern cities zoning if the South gains comparative advantage in some industries (e.g., if manufacturing common in Northern cities shifts to the South, Northern cities will zone less area for industry). But these changes would also cause changes in migration patterns, as workers moved to staff the new factories. Pre-treatment migration is more plausibly related; cities that received more of earlier waves of the Great Migration

are more likely to change their zoning later, regardless of future migration. However, I believe this is unlikely because as I argue earlier, zoning was not focused on residential exclusion in this time period as more direct methods of racial segregation were available. In short, the risk that zoning changes are confounded by other mechanisms is low.

## A.10 OLS, Reduced Form, and 2SLS Estimates

		% MFH
		<i>First Stage</i>
	$\hat{GM}$	0.62 (0.7)
	F-Stat	49
		<i>Ordinary Least Squares</i>
	$GM$	-0.31 (0.18)
		<i>Reduced Form</i>
	$\hat{GM}$	-1.26 (0.49)
		<i>Two-Stage Least Squares</i>
	$GM$	-2.04 (1.95)
	$N$	107
	Control for 1940 DV	Y
	DV Mean	0.18
	DV SD	0.18

Table A.21: **Full Estimates of the Effect of the Great Migration on Zoning** Table shows first stage, ordinary least squares, reduced form, and two-stage least squares estimates of the effect of the Great Migration. Dependent variable is the the percentage of residential land allowable of three or more multifamily units.

*Source:* Compiled zoning maps and codes

	Urban Racial Attitudes	Suburban Racial Attitudes	Rural Racial Attitudes
	<i>First Stage</i>		
$\hat{GM}$	-0.04 (0.02)	-0.04 (0.03)	0 (0)
F-Stat	23	15	2
	<i>Ordinary Least Squares</i>		
$GM$	0.002 (0.001)	0 (0)	0 (0.001)
	<i>Reduced Form</i>		
$\hat{GM}$	0.052 (0.007)	0.005 (0.011)	0 (0.002)
	<i>Two-Stage Least Squares</i>		
$GM$	0.013 (0.006)	0.001 (0.002)	0 (0.009)
$N$	4247	9390	6466
Cities	48	68	61
Years	1970-1998	1970-1998	1970-1998
Control for 1940 DV	N	N	N
DV Mean	0.508	0.48	0.482
DV SD	0.191	0.18	0.178

Table A.21: **Full Estimates of the Effect of the Great Migration on White Public Opinion,** Table shows first stage, ordinary least squares, reduced form, and two-stage least squares estimates of the effect of the Great Migration.

*Source:* ANES Cumulative File

	Units PC	Single-Family Units PC	Multifamily Units PC	Share MFH
<i>First Stage</i>				
$\hat{GM}$	0.53 (0.55)	0.53 (0.55)	0.52 (0.55)	0.5 (0.54)
F-Stat	29	29	29	30
<i>Ordinary Least Squares</i>				
$GM$	0.06228 (0.03075)	0.0416 (0.02148)	0.01923 (0.01004)	0.08952 (0.30295)
<i>Reduced Form</i>				
$\hat{GM}$	-0.14725 (0.05356)	-0.08348 (0.0331)	-0.05892 (0.02029)	-0.78488 (0.7119)
<i>Two-Stage Least Squares</i>				
$GM$	-0.27951 (0.26751)	-0.15846 (0.15636)	-0.113 (0.10537)	-1.55444 (1.29174)
$N$	6218	6218	5758	5716
Cities	187	187	186	186
Years	1975-2017	1975-2017	1975-2017	1975-2017
Control for 1940 DV	N	N	N	N
DV Mean	0.01204	0.00687	0.00471	0.34914
DV SD	0.02365	0.01539	0.0106	0.29098

Table A.21: **Full Estimates of the Effect of the Great Migration on Housing Permitting**, Table shows first stage, ordinary least squares, reduced form, and two-stage least squares estimates of the effect of the Great Migration.

*Source:* Census of Building Permits

	% Of Homes Built in Last Decade	% Single-Family Home
	<i>First Stage</i>	
$\hat{GM}$	0.98	0.71
	(0.43)	(0.28)
F-Stat	55	59
	<i>Ordinary Least Squares</i>	
$GM$	0.01	-0.04
	(0.03)	(0.06)
	<i>Reduced Form</i>	
$\hat{GM}$	-0.47	0.3
	(0.17)	(0.21)
	<i>Two-Stage Least Squares</i>	
$GM$	-0.48	0.43
	(0.23)	(0.32)
$N$	1211	2941
Cities	403	635
Years	1970-2017	1970-2017
Control for 1940 DV	N	N
DV Mean	0.14	0.6
DV SD	0.09	0.17

Table A.21: **Full Estimates of the Effect of the Great Migration on City Housing Stock**, Table shows first stage, ordinary least squares, reduced form, and two-stage least squares estimates of the effect of the Great Migration.

*Source:* ICMA City and County Books

	# of City Councilors	% Councilors At-Large	% Councilors Black
	<i>First Stage</i>		
$\hat{GM}$	0.11 (0.34)	0.11 (0.35)	0.16 (0.35)
F-Stat	112	112	75
	<i>Ordinary Least Squares</i>		
$GM$	1.09 (3.95)	-1.05 (0.37)	0.43 (0.18)
	<i>Reduced Form</i>		
$\hat{GM}$	-9.51 (15.59)	1.84 (1.01)	0.78 (0.64)
	<i>Two-Stage Least Squares</i>		
$GM$	-90.36 (405.45)	17.11 (61.33)	4.8 (7.58)
$N$	965	958	465
Cities	181	181	169
Years	1981-2006	1981-2006	1981-2006
Control for 1940 DV	Y	Y	N
DV Mean	9	0.54	0.15
DV SD	4.88	0.42	0.16

Table A.21: **Full Estimates of the Effect of the Great Migration on City Council Type and Composition**, Table shows first stage, ordinary least squares, reduced form, and two-stage least squares estimates of the effect of the Great Migration.

*Source:* ICMA Form of Government Survey

	% Of Homes Built in Last Decade	% Single-Family Home
	<i>First Stage</i>	
$\hat{GM}$	0.62	0.49
	(0.63)	(0.54)
F-Stat	31	30
	<i>Ordinary Least Squares</i>	
$GM$	0.15	0.01
	(0.11)	(0.18)
	<i>Reduced Form</i>	
$\hat{GM}$	-0.7	0.3
	(0.3)	(0.61)
	<i>Two-Stage Least Squares</i>	
$GM$	-1.12	0.61
	(0.89)	(1.12)
$N$	465	872
Cities	156	185
Years	1970-2017	1970-2017
Control for 1940 DV	N	N
DV Mean	0.16	0.63
DV SD	0.1	0.15

Table A.21: **Full Estimates of the Effect of the Great Migration on City Housing Stock**, Table shows first stage, ordinary least squares, reduced form, and two-stage least squares estimates of the effect of the Great Migration.

*Source:* ICMA City and County Books

	Approved	Dispersed	Res.	Comm.	Industrial	Street	Public	% Displaced Non-white
<i>First Stage</i>								
$\hat{GM}$	0.42 (0.6)	0.69 (0.82)	0.53 (0.88)	0.53 (0.88)	0.53 (0.88)	0.53 (0.88)	0.53 (0.88)	0.53 (0.88)
F-Stat	47	31	27	27	27	27	27	27
<i>Ordinary Least Squares</i>								
$GM$	13.76 (214.29)	-56.78 (136.41)	0.73 (0.21)	-0.21 (0.21)	-0.18 (0.19)	-0.15 (0.1)	-0.18 (0.14)	1.19 (0.3)
<i>Reduced Form</i>								
$\hat{GM}$	286.61 (941.68)	181.49 (583.1)	-0.86 (0.86)	-0.38 (0.6)	1.09 (0.78)	0.37 (0.28)	-0.23 (0.41)	3.16 (0.99)
<i>Two-Stage Least Squares</i>								
$GM$	678.44 (2520.92)	261.33 (951.63)	-1.62 (4.1)	-0.73 (1.7)	2.07 (4.71)	0.71 (1.32)	-0.43 (0.97)	5.98 (9.34)
$N$	137	123	87	87	87	87	87	87
Control for 1940 DV	N	N	N	N	N	N	N	N
DV Mean	187.9	136.04	0.28	0.18	0.15	0.29	0.11	0.38
DV SD	227.6	126.95	0.21	0.14	0.17	0.08	0.13	0.31

Table A.21: **Full Estimates of the Effect of the Great Migration on Urban Renewal**, Table shows first stage, ordinary least squares, reduced form, and two-stage least squares estimates of the effect of the Great Migration.  
*Source:* (Collins and Shester 2013; Nelson and Ayers 2020)

## **A.11 Robustness to Removing Texas Shares**

The Rotemberg weights calculated in Appendix A.8.2 showed Dallas and Harris counties in Texas making up a large share of the weight on the main zoning result. This section provides a check of the results removing shares from Texas from the instrument. For both Dallas and Harris counties, the largest share out migrants was to Los Angeles; however, these shares were still single-digit percentages. However, given the size of these counties and the large number of predicted outmigrants, these shares ended up being quite substantial. Texas was also a stopover between the deep South and California and other Western states, raising the possibility that migrants who were picked up as living in Texas in 1935 were mid-migration from other states of origin.

The results show largely similar results and only slightly diminished power in the first stage.

		% MFH
		<i>First Stage</i>
	$\hat{GM}$	0.59 (0.72)
F-Stat		44
		<i>Ordinary Least Squares</i>
	$GM$	-0.27 (0.17)
		<i>Reduced Form</i>
	$\hat{GM}$	-1.23 (0.5)
		<i>Two-Stage Least Squares</i>
	$GM$	-2.1 (2.15)
	$N$	107
Control for 1940 DV		Y
DV Mean		0.18
DV SD		0.18

Table A.21: **Full Estimates of the Effect of the Great Migration on Exclusionary Zoning**, Table shows first stage, ordinary least squares, reduced form, and two-stage least squares estimates of the effect of the Great Migration.

*Source:* Compiled zoning maps and codes

	Units PC	Single-Family Units PC	Multifamily Units PC	Share MFH
	<i>First Stage</i>			
$\hat{GM}$	0.5 (0.58)	0.5 (0.58)	0.5 (0.57)	0.48 (0.57)
F-Stat	25	25	25	25
	<i>Ordinary Least Squares</i>			
$GM$	0.07749 (0.0348)	0.05086 (0.02368)	0.02506 (0.01194)	0.12247 (0.27971)
	<i>Reduced Form</i>			
$\hat{GM}$	-0.10972 (0.04083)	-0.06077 (0.02539)	-0.04466 (0.01531)	-0.70705 (0.68572)
	<i>Two-Stage Least Squares</i>			
$GM$	-0.21851 (0.22239)	-0.12103 (0.12705)	-0.08982 (0.08936)	-1.47612 (1.5102)
$N$	6218	6218	5758	5716
Cities	187	187	186	186
Years	1975-2017	1975-2017	1975-2017	1975-2017
Control for 1940 DV	N	N	N	N
DV Mean	0.01204	0.00687	0.00471	0.34914
DV SD	0.02365	0.01539	0.0106	0.29098

Table A.21: **Full Estimates of the Effect of the Great Migration on Housing Permitting**, Table shows first stage, ordinary least squares, reduced form, and two-stage least squares estimates of the effect of the Great Migration.

*Source:* Census of Building Permits

	% Of Homes Built in Last Decade	% Single-Family Home
	<i>First Stage</i>	
$\hat{GM}$	0.59	0.46
	(0.65)	(0.57)
F-Stat	26	26
	<i>Ordinary Least Squares</i>	
$GM$	0.2	0.04
	(0.11)	(0.17)
	<i>Reduced Form</i>	
$\hat{GM}$	-0.58	0.4
	(0.29)	(0.65)
	<i>Two-Stage Least Squares</i>	
$GM$	-0.97	0.88
	(0.81)	(1.37)
$N$	465	872
Cities	156	185
Years	1970-2017	1970-2017
Control for 1940 DV	N	N
DV Mean	0.16	0.63
DV SD	0.1	0.15

Table A.21: **Full Estimates of the Effect of the Great Migration on City Housing Stock**, Table shows first stage, ordinary least squares, reduced form, and two-stage least squares estimates of the effect of the Great Migration.

*Source:* ICMA City and County Books

	# of City Councilors	% Councilors At-Large	% Councilors Black
	<i>First Stage</i>		
$\hat{GM}$	0.04 (0.35)	0.04 (0.35)	0.09 (0.34)
F-Stat	172	173	112
	<i>Ordinary Least Squares</i>		
$GM$	0.23 (3.75)	-1.03 (0.34)	0.33 (0.16)
	<i>Reduced Form</i>		
$\hat{GM}$	-17.2 (17.73)	1.91 (1.03)	0.44 (0.6)
	<i>Two-Stage Least Squares</i>		
$GM$	-413.32 (3681.51)	43.57 (359.65)	4.67 (12.75)
$N$	965	958	465
Cities	181	181	169
Years	1981-2006	1981-2006	1981-2006
Control for 1940 DV	N	N	N
DV Mean	9	0.54	0.15
DV SD	4.88	0.42	0.16

Table A.21: **Full Estimates of the Effect of the Great Migration on City Council Type and Composition**, Table shows first stage, ordinary least squares, reduced form, and two-stage least squares estimates of the effect of the Great Migration.

*Source:* ICMA Form of Government Survey

	% Homeownership	% Black Homeownership	% of Homes Vacant
	<i>First Stage</i>		
$\hat{GM}$	0.45	0.44	0.42
	(0.52)	(0.52)	(0.52)
F-Stat	39	19	32
	<i>Ordinary Least Squares</i>		
$GM$	-0.05	0.07	0.41
	(0.08)	(0.04)	(0.08)
	<i>Reduced Form</i>		
$\hat{GM}$	-0.05	0.44	0.89
	(0.21)	(0.14)	(0.5)
	<i>Two-Stage Least Squares</i>		
$GM$	-0.12	1.02	2.15
	(0.53)	(0.95)	(1.99)
$N$	2341	2341	2321
Cities	186	186	177
Years	1970-2017	1970-2017	1970-2017
Control for 1940 DV	Y	Y	Y
DV Mean	0.55	0.09	0.31
DV SD	0.09	0.04	0.16

Table A.21: **Full Estimates of the Effect of the Great Migration on City Homeownership and Vacancies**, Table shows first stage, ordinary least squares, reduced form, and two-stage least squares estimates of the effect of the Great Migration.

*Source:* NHGIS Census Tabulations

	Approved	Dispersed	Res.	Comm.	Industrial	Street	Public	% Displaced Non-white
	<i>First Stage</i>							
$\hat{GM}$	0.29 (0.59)	0.63 (0.84)	0.47 (0.9)	0.47 (0.9)	0.47 (0.9)	0.47 (0.9)	0.47 (0.9)	0.47 (0.9)
F-Stat	51	26	23	23	23	23	23	23
	<i>Ordinary Least Squares</i>							
$GM$	-30.96 (216.77)	-67.08 (136.13)	0.73 (0.2)	-0.19 (0.19)	-0.18 (0.18)	-0.16 (0.09)	-0.21 (0.13)	1.06 (0.27)
	<i>Reduced Form</i>							
$\hat{GM}$	265 (1012.99)	145.34 (612.1)	-0.88 (0.9)	-0.3 (0.59)	1.11 (0.8)	0.36 (0.31)	-0.29 (0.44)	2.94 (0.9)
	<i>Two-Stage Least Squares</i>							
$GM$	906.33 (4134.6)	229.27 (1078.14)	-1.87 (5.23)	-0.64 (1.89)	2.37 (6.04)	0.76 (1.66)	-0.62 (1.34)	6.27 (11.5)
$N$	137	123	87	87	87	87	87	87
Control for 1940 DV	N	N	N	N	N	N	N	N
DV Mean	187.9	136.04	0.28	0.18	0.15	0.29	0.11	0.38
DV SD	227.6	126.95	0.21	0.14	0.17	0.08	0.13	0.31

Table A.21: **Full Estimates of the Effect of the Great Migration on Urban Renewal**, Table shows first stage, ordinary least squares, reduced form, and two-stage least squares estimates of the effect of the Great Migration.  
*Source:* Collins and Shester, Richmond Digital Scholarship Lab