

# The Great Migration and Southern Labor Market Inequality

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## Abstract

This paper studies the Great Migration—the early-20th century mass migration of Black Americans out of the U.S. South—and its impact on Southern local labor markets. To isolate the impacts of migration from potentially correlated economic impacts of local push factors, we construct a shift-share style “demand-pull” instrument, exploiting variation in preexisting Southern out-migration patterns in 1900–10 and labor demand changes in the North in 1910–1940. We estimate that counties with one percentile higher out-of-South migration during 1910–1940 had \$0.03 (0.5%) higher average Black weekly wages in 1940. We find no effects on White wages, resulting in a reduction in the racial wage gap. Reduced Black labor supply and improved human capital accumulation are investigated as potential mechanisms. The results provide novel evidence of how the Great Migration impacted the Southern communities migrants left.

*JEL:* J15, J24, J61, N32

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# 1 Introduction

In one of the largest movements of people in U.S. history, six million Black Americans left the South between 1910–1970 in the phenomenon now known as the Great Migration ([U.S. National Archives and Records Administration, 2021](#)). Fleeing the racial violence and oppression of the Jim Crow South and in pursuit of better economic opportunities for their family and future generations, they went to the North and West. The Great Migration transformed the landscape of American society with far-reaching demographic, economic, and political ramifications across the U.S. ([Boustan, 2016](#); [Collins, 2021](#); [Derenoncourt, 2022](#); [Calderon et al., 2023](#); [Tabellini, 2019](#); [Gardner, 2020](#); [Wilkerson, 2011](#)). While outcomes for migrants and the places they went have been the subject of much research, there is a dearth of empirical evidence quantifying how this large demographic movement affected the Southern communities the migrants left. This paper estimates the Great Migration’s impacts on Southern local labor market outcomes and inequality.

The potential impacts of the Migration are not obvious. Depending on the extent of positive selection into migration, the large loss of population could have had negative consequences for local economic development, as well as for efforts to enact change through collective political action. Some Black thought-leaders in the early-20th century, including Booker T. Washington, Frederick Douglass, and Carter G. Woodson, spoke out against leaving the South, fearing that those choosing to migrate were leaving their communities behind for the worse rather than staying to fight for better opportunities where they were ([Wilkerson, 2011](#); [Woodson, 1918 \(2004\)](#)).

On the other hand, the mass movement of people exercising their rights to “vote with their feet” could have spurred positive change. In Isabel Wilkerson’s chronicle of the Great Migration, *The Warmth of Other Suns*, she writes:

*[The Great Migration] would transform urban America and recast the social and political order of every city it touched. It would force the South to search its soul and finally to lay aside a feudal cast system. ...And more than that, it was the first big step the nation’s servant class ever took without asking. ([Wilkerson, 2011](#))*

Black wages in the Jim Crow south were held significantly lower through an oppressive system rather than due to competitive market forces. Leaving this system in large numbers

might have helped to force Southern employers to improve conditions and wages to keep the Black employees they relied on from leaving. The migrants North gained higher wages for themselves but inadvertently lowered wages for incumbent Northern Black workers in the process due to increased labor supply (Boustan et al., 2010; Boustan, 2016)—did an opposite effect benefit the Black workers who chose to remain in the South? Moreover, to the extent that an economic system so dependent on artificially “cheap” labor might have been a poor strategy for long-run growth, the loss of labor could help spur more efficient re-allocations to capital leading to future economic benefits (Hornbeck and Naidu, 2014).

This paper finds evidence aligning with the latter view, that the Great Migration had positive impacts for Black workers remaining in the South.<sup>1</sup> We estimate that counties with more out-of-South migration during the First Wave of the Great Migration (1910–1940) had higher Black wages in 1940, with no difference for white wages, resulting in reduced racial wage inequality. Loss of Black population share leading to improvements from a tightening labor market is a plausible mechanism.

We employ recent advances in historical data-linking for our analysis. We use the Census Tree links (Buckles et al., 2023; Price et al., 2021) to link individuals between censuses and identify migrants. The Census Tree is the largest database of record links among the historical U.S. censuses created to date, created using machine learning methods to extend the hundreds of millions of real links input by users of the genealogy platform FamilySearch.org. The Census Tree has significantly higher matching rates than previous linking efforts (82%–86% for men in our study period) and is more representative of the total population than previous links, particularly for women and the Black population.

Using these linked data, we construct county migration rates for the Black and White populations.<sup>2</sup> Migration out of the South to Northern and Western/Midwestern states (“out-of-South migration”) was similar and relatively low for both Black and White Southerners in 1900, just before the Great Migration began. As World War I ramped up, surging labor demand left a void in labor supply that Black workers were able to fill, and they began moving North in large numbers. County Black out-of-South migration rose from under 3% in 1900-10 to nearly 8% in 1920-30, before falling in the 1930s when the Great Depression

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<sup>1</sup>We define the South as the states of the former Confederacy—Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Texas, Virginia—plus Kentucky, Oklahoma, and West Virginia. The census-defined South region also includes Delaware, Maryland, and the District of Columbia, but we exclude these states since they were net receivers of Southern migrants, as other researchers have done (Boustan, 2016).

<sup>2</sup>We define migration rates here as the number of residents in year  $t$  living elsewhere in the following year  $t+10$  census, divided by the year  $t$  population.

brought an end to the First Wave of the Great Migration (Figure 2).<sup>3</sup> White out-of-South migration, however, only increased from 3% to 4% during this time. As a result, the net out-migration rate for Black Southerners increased from close to 0 to approximately 7% at the 1920–30 peak, whereas for White Southerners it remained just above or below 0 in each decade.

We first examine who the migrants were. Impacts of migration to the origin location could depend on the characteristics of those selecting into migration. If migrants are positively selected, the loss of high skilled labor could have long run negative impacts for growth and may mechanically lower the average observed economic status of Black individuals in the area; if migrants are negatively selected, opposite effects are possible. We find both Black men and women migrating out of the South were positively selected on literacy, but there was relatively little selection on pre-migration occupation scores, particularly after comparing individuals from the same origin location. Selection on literacy was persistent throughout the first wave, compared to both the general population and other (within-South) migrants, which could indicate the particular importance of gaining information from sources such as *The Chicago Defender*, a Black newspaper which is often credited with helping Southerners learn of opportunities outside the South.

Despite any positive selection, we find out-of-South migration was positively associated with Black wages in 1940, even after controlling for baseline occupation scores. Migration could be correlated with other factors that also impact economic outcomes. For example, Boustan et al. (2020) show natural disasters through the 20th century cause increased county out-migration and lower property values. Hornbeck and Naidu (2014) and Feigenbaum et al. (2020) both estimate increases in out-migration resulting from the destruction of natural disasters the Great Mississippi Flood and the boll weevil infestation, respectively, but ultimately find positive long-run impacts. Given the Great Migration’s context, the naive OLS estimate of the impact of migration on 1940 outcomes could be biased and capture impacts of these other push factors.

To isolate the impacts fo the migration on Southern economic outcomes we construct a shift-share instrument, which we describe as a “demand-pull” instrument. The instrument leverages a matrix of preexisting migration patterns between each county-to-county pair in 1900–1910, before the Great Migration began, combined with changes in Northern labor demand. Since shocks in Northern destinations are plausibly orthogonal to shocks in Southern

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<sup>3</sup>The Great Migration is generally thought of as taking place in two waves, the first in 1910–1940, and the second in 1940–1970. Our focus is on the first.

origins, the instrument interacts the changes in Northern destinations labor demand with preexisting origin-destination migration patterns to predict the out-migration flows in Southern origins. Using the preexisting migration patterns as the levels of exposure, the instrument assigns in-flows of Southern-born Black migrants in Northern destinations to Southern origins. Researchers including [Boustan et al. \(2010\)](#), [Tabellini \(2019\)](#), and [Derenoncourt \(2022\)](#) use a similar strategy of adapting the classic shift-share instrumental variable design to the Great Migration context. They predict increases in the Northern Black population based on preexisting migration networks and Southern out-migration. Our demand-pull instrument is similar to those used in these papers, but in “reverse.”

We estimate that Black weekly wages were \$0.03 higher (0.5% of the mean) for every percentile increase in out-of-South migration between 1910–1940, with smaller negative and statistically insignificant impacts on White wages. As a result, racial wage inequality, measured as the ratio of Black divided by White wages, improved by .003 for each percentile increase in migration. The improvement in wages was shared by both men and women, with even larger impacts for women.

A placebo test of our instrument adds confidence the results are not driven by unobservables correlated with the or by differing pre-trends. Specifically, we estimate the impact of the instrument on economic outcomes in 1900 and 1910, finding no effect on Black occupation scores and inequality. We also find results are robust to a range of additional controls.

One potential explanation for the results is that the Great Migration counties lost Black population share, tightening the supply of low wage workers. The increased competition for labor could have improved Black workers’ bargaining power and led to a rise in wages or working conditions. We find the Great Migration did not have much of a differential effect on total population growth, conditional on baseline controls, but it did decrease the Black population share. The share of below-median-wage jobs that were held by Black workers also decreased.

Another way the migration could have had economic benefits for the sending communities is the potential for migrants to send remittances back, which could help families invest in their children increase human capital in the area. For example, [Theoharides \(2018\)](#) finds out-migration from the Philippines lead to increases in secondary school enrollment in the sending areas. We do not find effects on the average years of schooling for adults ages 18–40 in 1940, conditional on baseline outcomes. However, we find school enrollment for Black male teens ages 14–17 increased, and their participation in the labor force decreased. Few

Black children remained in school past 8th grade in the early 20th century, and many Black teenagers, particularly men, would work to help provide for the family. One explanation is that remittances from the North could delay the need for teen boys to work and allow them to stay in school longer. The fact we only find impacts on education for the younger generations and not working aged adults could suggest delayed effects, or it could be that those who benefited with more education ended up migrating themselves, as indicated by the persistent selection on literacy we find. Regardless, changes in human capital do not appear to be a driver of the effect on adult wages we find.

The results provide the first empirical estimates of the causal estimates of the Great Migration on Southern labor outcomes. Our findings add to the historical narrative of the Great Migration by providing supporting empirical evidence of potential impacts suggested by historians, and they further our understanding the historical evolution of Southern economic outcomes and macroeconomic convergence. Looking forward, or analysis of the Great Migration provides an example of how out-migration might impact low-wage, oppressed communities in other parts of the world and in the future.

## 1.1 Related Literature

The Great Migration has been a prominent research topic in economics and social sciences with a wide range of related outcomes studied ([Collins, 2021](#)), and a particular interest in how the migrants fared and the changes they precipitated for their destinations. Research has found that migrants tended to benefit economically from the move through higher wages for themselves relative to the South, but they increased competition and lowered wages for incumbent Black northerners ([Boustan et al., 2010](#); [Boustan, 2016](#)). While [Alexander et al. \(2017\)](#) and [Leibbrandt et al. \(2019\)](#) find the children of migrants had improved economic outcomes relative to children of those remaining in the South, [Derenoncourt \(2022\)](#) shows Great Migration commuting zones exhibited lower economic mobility for Black children born two generations later in the 1980s, potentially resulting from backlash effects leading to increased segregation and policing. Other economic and social impacts the Migration has been found to have had on destination cities include increased suburbanization from “White flight” ([Boustan, 2010](#)); declines in public spending and tax revenues ([Tabellini, 2019](#)); and higher support for the civil rights movement and the Democratic Party ([Calderon et al., 2023](#)).

There is a lack of empirical evidence on the migration’s impacts on the South. In a

recent review, [Collins \(2021\)](#) suggests more research is needed in this area:

*it makes sense that studies of the Great Migration tend to focus on the migrants themselves and on the receiving cities in the North and West. But the implications for those who stayed in the South are also significant and merit more attention. There is much more to learn about how outmigration shaped Southern labor markets, demography, economic growth, and political economy.*

To our knowledge, only two papers attempt to empirically quantify the impacts of the Great Migration on economic and social outcomes in the South ([Hornbeck and Naidu, 2014](#); [Feigenbaum et al., 2020](#)); both do so indirectly by studying the impacts of natural disasters in the context of the Migration, arguing it was a key mechanism for changes. [Hornbeck and Naidu \(2014\)](#) study the Mississippi Flood of 1927 and find flooded counties more quickly advanced out of agriculture, with evidence suggesting migration and the changing supply of lower-skilled labor was an important mechanism. [Feigenbaum et al. \(2020\)](#) find crop destruction from the boll weevil caused decreases in racial violence and oppression, with migrants “voting with their feet” proposed as a mechanism. These papers focus on the impacts of natural disasters and argue that migration was a potential mechanism for the impact. We instead focus on the role of migration itself resulting from pull factors, independent of the impacts from natural disasters and other push factors. Our results are consistent with these results suggesting migration was a mechanism for positive economic impacts.

Our results also relate to the evidence on migrant selection in the Great Migration. In earlier work, [Collins and Wanamaker \(2014, 2015\)](#) describe migrant selection using a sample of men linked between the 1910 and 1930 censuses. They find migrants were positively selected on pre-migration earnings, but the magnitude of selection was not large. Leveraging the Census Tree Links allows us to construct a much larger linked sample and track both men’s and women’s location trajectories, allowing us to expand the population of interest and include more detailed comparisons (e.g., within-town selection). We also find migrants were positively selected, and this selection was partially but not fully explained by local average outcomes.

In addition, our findings complement our understanding of the selection of internal migration in the early twentieth century more broadly. While [Zimran \(2022\)](#) studies the internal migration patterns and selection of US-born white males from 1850 to 1940, we present new evidence on migration behavior for both male and female Black populations.

A broader literature investigates the effects of out-migration and potential brain drain. In an international context, out-migration has often been thought to be detrimental to development due to a loss of high skilled workers, the “brain drain” ([Docquier and Rapoport, 2012](#)). However, recent studies have also found potential benefits of skill biased out-migration on origin outcomes ([Docquier and Veljanoska, 2020](#)); for example, [Theoharides \(2018\)](#) finds migration out of the Philippines increased local origin secondary school enrollment. We add to this evidence by focusing on the potential impacts of internal migration on sending communities. Some research has focused on the impacts of forced out-migration (e.g., in war) ([Becker and Ferrara, 2019](#)). While our context is similar in the sense that migrants were often fleeing violence, it differs in that those in the forced migration literature are usually moved systematically without choice or through destruction of their homes.

## 2 Historical Background

Between 1910 and 1970, approximately six million Black Americans moved out of the U.S. South in the phenomenon now known as the Great Migration ([U.S. National Archives and Records Administration, 2021](#)). It was one of the largest movements of people in U.S. history, with economic, social, and political ramifications reverberating across the country. The Great Migration is typically thought of as taking place in two parts: the First Wave (the subject of this paper) during 1910–1940, and the Second Wave during 1940–1970.

Beginning around 1915, as World War I escalated, there was a surge in unmet labor demand resulting from the confluence of three forces: (1) as war efforts ramped up, industrial demand significantly increased; (2) many prime working age men were sent off to the war, leaving jobs vacant; and (3) immigration was drastically reduced due to war disruptions and rising xenophobia, further tightening the labor supply. Black workers were able to take the opportunity to fill the labor void, and they quickly began migration North to do so. As pioneering Black southerners put down roots and northern employers continued to need workers, migration networks were established with friends and family migrating to join the job boom ([Boustan, 2016](#); [Wilkerson, 2011](#)). Moreover, the need to hire Black workers to fill jobs during World War I introduced many non-southern firms to their first experiences hiring Black employees, which might have changed racial employment decisions and facilitated more hiring in the following years ([Whatley, 1990](#)).

These conditions laid the foundation for continued mass internal migration over the

subsequent decade even after World War I had subsided. Further immigration restrictions may have helped stimulate demand for southern Black labor as well. The Emergency Quota Act of 1921 and the Immigration Act of 1924 implemented quotas that significantly limited the amount of annual immigration from many countries, putting an end to the largely open immigration policy the U.S. had toward Europe for the past century and restricting a key source of labor in the industrial North and Midwest ([Abramitzky et al., 2023](#)). The Black out-migration rate from the south doubled each decade, from just over 2% in 1900–1910 to 8% in 1920–1930, during the first wave of the Great Migration ([Boustan, 2016](#)).

The First Wave of the Migration ended during the Great Depression of the 1930s, when internal migration generally saw a sharp decline as economic prospects diminished across the country. Black Americans faced disproportionately high unemployment during the Depression, with few opportunities to move for better fortune. Once World War II began, a similar dynamic of war-induced labor demand ignited the migration again; southern Black out-migration peaked at 14% in 1940–1950 and slowly declined each decade thereafter through the Second Wave during 1940–1970 ([Boustan, 2016](#)).

## 3 Data

We use data from the 1900–1940 full count Censuses, accessed through IPUMS ([Ruggles et al., 2021](#)). The analysis is focused on the southern states, which we define as the states of the former Confederacy—Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Texas, Virginia—plus Kentucky, Oklahoma, and West Virginia.<sup>4</sup>

### 3.1 Geographies

Counties are the main geographic unit of analysis. We restrict our sample of counties to those with at least 1,000 population and 10% Black population share in 1900. County boundaries shifted over time, especially in less populated areas. To create consistent counties over time, we use the county borders in place in 1900 and assign each individual in the later Censuses to the boundaries in a multi-step process that employs both the counties

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<sup>4</sup>The census-defined South region also includes Delaware, Maryland, and the District of Columbia. We exclude these states since they were net receivers of southern migrants.

recorded in the Censuses as well as sub-county locations identified from the Census Place Project ([Berkes et al., 2023](#)). The Census Place Project geolocates the Census population by identifying their sub-county location (e.g., city, town), providing longitude and latitude. We identify an individual's 1900 county as follows:

- (i) First, we map 1910–1940 boundaries to 1900 based on area. For all individuals in counties at least 99% contained within a 1900 boundary are assigned to the county. About 90%–95% of individuals are assigned to counties this way.
- (ii) For counties less than 99% contained in a 1900 boundary, we assign them to a county based on the latitude and longitude of the sub-county location in the Census Place Project data. Most of the individuals missing a 1900 county from step (i) are assigned to a county this way.
- (iii) The Census Place Project geolocates nearly all (about 95%) of the individuals in 1910–1940, but approximately 1%–2% of the full count population in each of these years remained without a 1900 county boundary assignment after step (ii). For these individuals, we assign them to the 1900 county with the most area overlap.

Counties can cover broad geographic areas containing important sub-county heterogeneity. They also can divide larger cities along borders not relevant for the current analysis, and have less ability to distinguish between cities of varying sizes in an area. To examine places (e.g., town, cities) instead of county-sized regions, we use data from the Census Place Project ([Berkes et al., 2023](#)). The Census Place Project geolocates nearly all individuals in the full count censuses to their sub-county locations, defined as any location with a finer geography than county borders (not just official census-defined places), based on the place names recorded in census manuscripts. Over 69,000 unique places are geocoded across the census years, each with a latitude and longitude, and over 95% of all census observations during our 1900–1940 period are geolocated.

To create consistently defined geographies over time, the authors cluster the unique place names, which change over years, into clusters based on closeness and population. These clusters account for shifting place borders and annexations/subsumed suburbs, providing a data driven definition of local areas. [Berkes et al. \(2023\)](#) provide multiple cluster definitions with varying parameters for how aggressively to cluster places. We use the largest defined clusters ( $K=500$ ) as our main geographic unit for the study, hereafter referred to simply as Places.

We focus on mid-size Places—those with 2,000–20,000 population in 1900 and with at least one observation in each of the 1900–1940 censuses—and with at least 10% Black population in 1900. We examine the X larger cities with over 20,000 population separately.

## 3.2 Migration

To identify migration, we first link individuals across censuses using links from the Census Tree Project ([Buckles et al., 2023](#); [Price et al., 2021](#)), which is the largest database of record links among the historical U.S. censuses created to date. The Census Tree creates high quality links by using real links input by users of the genealogy platform FamilySearch.org. These 317 million census-to-census pairs linked by FamilySearch users are then used to train a machine learning algorithm to create additional links. The result is a database of individual between-census links with significantly higher matching rates than previous linking efforts; in the 1900–1930 censuses, 82%–86% of all men and 74%–79% of all women are linked to their observation in the following census 10 years later. Because of this much higher match rate, the Census Tree is more representative of the total population than previous links, particularly for women and the Black population.

Even with the relatively high level of representativeness, the sample of linked individuals from the Census Tree links still lack perfect representation of the population. We therefore create weights for the inverse probability of linkage and use these weights when calculating county aggregates.

We define a migrant as someone living in a different county or Place and at least 100 miles away when they are observed in the following census 10 years later. Out-of-South migrants are those living in the South in the base year but not 10 years later; within-South migrants are those migrants remaining in the South. We also examine Place and county migrants, defined as those living in a different Place or county 10 years later but with no further distance restriction. We define in-migrants similarly.

To calculate migration rates, we divide the total number of out- (and in-) migrants between years  $t$  and  $t+10$  and divide by the total population in  $t$ . We calculate migration rates overall and separately for the Black and White populations.

### 3.3 Outcomes

The main outcomes are county average weekly wages by race and the Black/White wage gap in 1940. We estimate weekly wages based on the census recorded wage and salary income for the past year and the number of weeks worked last year. We restrict the sample for estimating wages to those working in a wage/salary position and for at least 4 weeks. We define inequality as the ratio of Black over White weekly wages.

Income data were not collected in the censuses before 1940. To proxy for income in earlier years we use an occupational income score. We use the IPUMS-defined occupation score, which assigns a score based on 1950 income data.<sup>5</sup>

## 4 Description of the Migration

In 1900, the Black population was highly concentrated in the South (Figures 1 and A1); 86% of the total U.S. Black population lived in the region (Table A1). By 1940, after the Great Migration’s First Wave, that number had dropped to 73% living in the South, and in 1970, when the Great Migration had ended, less than half (48%) did. Many counties experienced a loss Black population relative to their total population (Figure 1).

Figure 2 shows county-level migration rates during 1900–1940, calculated as the number of county residents in year  $t$  living elsewhere 10 years later, divided by the population in  $t$ . The rate of migration out of the South to North, Midwest, or Western states (hereafter “out-of-South migration”) for both Black and white Americans was just under 3% in 1900-10, before the first wave of the Great Migration began. Within-South migration and migration into the South was higher for white Americans. County net migration was positive (i.e., greater out-migration than in-migration) for Black Southerners starting in the Great Migration, whereas the net migration rate remained just above or below 0 for white Southerners.

The migration out of the South was geographically broad. In 1900, few counties had out-of-South migration rates higher than 2%, mostly in the bordering states (Figure 3). During 1910–1940, most counties averaged over 2.5% out-of-South migration.

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<sup>5</sup>A description of the occupation score construction is provided on the IPUMS website: <https://usa.ipums.org/usa/chapter4/chapter4.shtml>.

## 4.1 Migrant Selection

We next examine who the migrants were. Table 1 shows migrants were disproportionately ages 18–39, more likely male, and less likely to be married in the pre-migration observation year. Migrants out of and within the South generally came less from farms than the total population, but out-of-South migrants were more often from urban areas than both the total population and other (within-South) migrants. Out-of-South migrants also had higher literacy rates, whereas within-south migrants had slightly lower rates than the general population. Finally, migrants had higher labor force participation rates and pre-migration occupation scores than the average in the population, and out-of-South migrants' average occupation scores were slightly higher than within-South migrants'.

The impacts of migration to the origin location depend on the degree of selection into migration on productive economic characteristics. If migrants are positively selected, the loss of high skilled labor could have long run negative impacts for growth and may mechanically lower the average observed economic status of Black individuals in the area; if migrants are negatively selected, opposite effects are possible. A simple Roy model would suggest that migrants would likely be higher skilled, educated, or otherwise positively selected if returns to such characteristics are relatively higher in the destination, which was likely the case for Black workers in the South.

Figure 4 shows migrants were positively selected one baseline literacy (reading and writing); out-of-South migrants were approximately 6 percentage points more likely to be literate than the rest of the Southern population. Comparing individuals within the same county or Place reduces the magnitude of selection to about 4pp. Comparing just among migrants rather than the total adult population (i.e., comparing out-of-South and within-South migrants), we find very similar selection on literacy. The magnitudes are very similar for both men and women.

Great Migration men were less likely to be labor force participants before migrating, possibly due to people moving for their first job, as there is no difference once comparing just among migrants. On the other hand, Great Migration women were more likely to be in the labor force than the rest of the population but less likely than other migrants. For those in the labor force, those joining the Great Migration had slightly higher pre-migration

occupation scores, about 1–2 points higher on a scale of 1–100.

Overall, the amount of selection into the Great Migration on observable pre-migration economic outcomes was relatively low, emphasizing the broad nature of the migration. The individual characteristic most persistently associated with out-of-South migration was literacy. Figure 5 shows the selection on literacy existed at the turn of the century and persisted throughout the First Wave of the Great Migration, though it decreased during the period of reduced mobility in the Great Depression. It could be that migrating North required more acquisition of information than for following the familiar networks within the South, and those with better ability to read and write were more able to learn of Northern opportunities or communicate across the distance. For instance, historians have noted the importance of the distribution of the *Chicago Defender*, a Black newspaper, in the South as a key source of information about opportunities outside the South.

## 5 Estimating Out-Migration Impacts: A Demand-Pull Instrument

Our goal is to estimate the impact of the Great Migration on Southern labor market outcomes, specifically average wages in the White/Black wage inequality. We estimate the effect of aggregate migration out of the South during 1910–1940 ( $GM$ ) on average economic outcomes in county  $c$  in 1940

$$y_{c,1940} = \alpha + \beta GM_{c,1910-40} + X'_{c,1910}\Gamma + \varepsilon_c. \quad (1)$$

$GM$  measures the sum of the Black out-of-South migration rates during 1910–1940

$$GM_{c,1910-40} = \sum_{t=1910}^{1930} \frac{\text{Out-of-South migrants}_{c,t,t+10}}{\text{Black population}_{ct}}. \quad (2)$$

Figure 6 shows  $GM$  is somewhat skewed. We follow a similar strategy as in (Derenoncourt, 2022) and define  $GM$  as the *percentile* of aggregate migration.

The Great Migration is associated with higher Black wages in 1940, as shown in Table 2. There is not an association with White wages, and the Black/White wage ratio is slightly higher in Great Migration counties.

Flows of outmigrants from Southern areas were likely to correlate with both the economic opportunities in Northern cities (pull factors) and the conditions in the origin counties (push factors). For example, [Boustan et al. \(2020\)](#) show natural disasters through the 20th century cause increased county out-migration and lower property values. [Hornbeck and Naidu \(2014\)](#) and [Feigenbaum et al. \(2020\)](#) both estimate increases in out-migration resulting from the destruction of natural disasters the Great Mississippi Flood and the boll weevil infestation, respectively. Hence, the OLS estimator for,  $\beta$ , the effect of out-of-South migration on local economic outcomes, could be biased, reflecting both the impact of migration and the impacts of push factors.

To isolate the demand-pull factors from push factors and estimate the impacts of out-of-South migration we construct a Bartik/“shift-share”-style instrument ([Bartik, 1991](#); [Blanchard and Katz, 1992](#); [Altonji and Card, 1991](#)), which we refer to as the “demand-pull” instrument. The instrument leverages a matrix of preexisting migration patterns between each county-to-county pair in 1900–1910, before the Great Migration began. Since shocks in Northern destinations are plausibly orthogonal to the shocks in Southern origins, the instrument interacts the changes in Northern destinations labor demand with preexisting origin-destination migration patterns to predict the out-migration flows in Southern origins. Using the preexisting migration patterns as the levels of exposure, the instrument assigns in-flows of Southern-born Black migrants in Northern destinations to Southern origins.

[Boustan et al. \(2010\)](#), [Tabellini \(2019\)](#), and [Derenoncourt \(2022\)](#) use a similar strategy of adapting the classic shift-share instrumental variable design to the Great Migration context. They predict increases in the Northern Black population based on preexisting migration networks and Southern out-migration. Our demand-pull instrument is similar to that used in these papers, but in “reverse.”

The demand-pull instrument exploits two sources of variation: (i) cross-sectional variation in 1900–1910 migration network strength between each Northern and Southern county pair, and (ii) time series variation in labor demand in Northern counties between 1910–1940. We provide graphical examples to illustrate these variations. Exposures to positive labor demand shocks in Northern counties depend on the preexisting out-migration networks. The variation in the preexisting out-migration networks ensure that specific ties between particular Northern destinations and the outcomes of interest in the South do not drive the estimated out-migration effect.

Figure 7 illustrates the variations in the preexisting out-migration networks for selected

counties in 1900. Panels A and B show the networks for counties with high and low out-migration rates, respectively. Though the Midwest was a popular destination for many Southern counties, the levels of exposure varied across Southern origin counties. The variations in Northeastern and West destinations were more pronounced across origin counties. Moreover, Southern residents also chose to migrate to different destination states within a state. For instance, Fulton, Georgia's residents had broader migration ties with several Northeastern and Midwest states than those in Early, Georgia. In addition, within North Carolina, destinations for residents in Tyrrell county only concentrated in Northeastern states, while many people in Forsyth county also migrated to several Midwest state.

Figure 8 presents the time-varying variation in outflows of residents, both the actual (solid line) and the predicted (dashed line) share, from selected Southern-origin counties. Though the states of Illinois and New York were popular destinations on average, the out-migration patterns vary by origin counties. While Alleghany, Virginia experienced mainly out-migration shocks to New York, out-migrants to Illinois accounted for higher outflows from Clarke, Georgia. Similarly, the patterns of migrant outflows were salient between Dade, Florida and Madison, Alabama. Outflows of migrants to New York increased steadily in Dade, Florida, nonetheless, very few migrants from Madison, Alabama chose New York as their destination. The demand-pull instrument extends this example to all county-to-county pairs.

We predict Southern county  $c$ 's aggregate out-of-South migration as

$$\widehat{GM}_{c,1910-40} = \sum_{t=1910}^{1930} \frac{1}{B_{ct}} \sum_d \lambda_{cd}^{1900-10} \times \Delta B_d^{t,t+10} \quad (3)$$

where  $\lambda_{cd}^{1900-10}$  is the share of 1900–1910 in-migrants in Northern destination  $d$  that came from Southern origin  $c$ ,  $\Delta B_d^{t,t+10}$  is the change in the Southern-born Black population in Northern destination  $d$  between censuses  $t$  and  $t+10$ , and  $B_{ct}$  is the Black population in origin  $c$  in year  $t$ .

We use the predicted  $\widehat{GM}$  to instrument for migration in equation (1) using two-stage least squares. To focus on variation from changes in the North, we control for the baseline (1900–1910) Black out-of-South migration rate. Since migrants were more likely to come from urban areas and less likely to be from farms, we control for the baseline share of the county population living in an urban area and on farms. Finally, to account for common state-level factors, such as general proximity to the North or state policies, we include state fixed effects to compare counties within states.

The identification strategy requires the instrument to be orthogonal to characteristics that are correlated with changes in economic outcomes between 1910–1940, after conditioning on the baseline controls. There could be correlated unobservables, or Great Migration counties might have been on a different trend before the migration. To provide support for the identifying assumption, we perform a placebo/pre-trend check testing whether the instrument predicts the economic outcomes and trends before 1910.

Table 3 shows the instrument does not predict Black occupation scores or score inequality in 1900 and 1910, before the Great Migration. These results add confidence to the validity of the instrument. While the instrument passes this placebo check, we control for these baseline values in the estimating equations to focus on changes in economic outcomes.

Figure 9 shows a binned scatter plot of percentiles of predicted versus actual out-of-South migration. There is a strong positive relationship between the two, suggesting a strong first stage. We report the F statistic for excluded instruments from the first stage in each regression table; the F statistic is in the 30–40 range for the baseline and most other analyses.

## 6 Impacts of the Great Migration on Southern Outcomes

Table 4 shows our estimates of the impact of out-of-South migration on Black and White wages in 1940. We estimate that a percentile increase in out-of-South migration between 1910–1940 caused Black wages to be \$0.03 higher (0.5% of the mean) in 1940, with smaller and statistically insignificant impacts on White wages. As a result, racial wage inequality, measured as the ratio of Black divided by White wages, improved by .003 for each percentile increase in migration.

The improvement in wages was shared by both men and women, as shown in Table 5. The impact on wage disparities among was stronger among women, who also faced a more significant racial wage disparity than men on average; the average ratio of Black to White wages was .47 for men and .37 for women.

## 6.1 Potential Mechanisms

One potential reason for the improved wages could be that the large numbers of out-migrants might have helped to force Southern employers to improve conditions and wages to keep the Black employees they relied on from leaving. Research has found that migrants North gained higher wages for themselves but inadvertently lowered wages for incumbent Northern Black workers in the process due to increased labor supply ([Boustan et al., 2010](#); [Boustan, 2016](#)). It might be that out-migration from the South reduced the labor supply and tightened the labor market for Black workers, giving them more bargaining power. Given the fact that, if anything, migrants were positively selected on pre-migration economic outcomes, they might also have left vacant higher paying jobs for stayers to move up into.

We find the Great Migration did not have much of a differential effect on total population growth, conditional on baseline controls, but it did decrease the Black population share. The share of below-median-wage jobs that were held by Black workers also decreased (Table 6).

[Hornbeck and Naidu \(2014\)](#) discuss a somewhat related potential mechanism. They outline a model in which out-migration of low-wage labor, combined with natural disaster flood shocks, leads to a re-allocation to capital that leads to long-run growth relative to areas that did not experience a flood and subsequent labor loss. They find evidence consistent with this view.

Another possibility could be that migrants sent remittances back to family members remaining in the South, which could have been used to support investments in the future generation. [Theoharides \(2018\)](#) find out-migration from the Philippines in a more modern context resulted in higher secondary education in migrants' origin locations, likely stemming from a remittance income effect.

We do not find effects on the average years of schooling for adults ages 18–40 in 1940, conditional on baseline outcomes. However, we find school enrollment for Black male teens ages 14–17 increased, and their participation in the labor force decreased. Few Black children remained in school past 8th grade in the early 20th century, and many Black teenagers, particularly men, would work to help provide for the family. One explanation is that remittances from the North could delay the need for teen boys to work and allow them to stay in school longer. The fact we only find impacts on education for the younger generations and not working aged adults could suggest delayed effects, or it could be that those who benefited with more education ended up migrating themselves, as indicated by the persistent selection

on literacy we find. Regardless, changes in human capital do not appear to be a driver of the effect on adult wages we find. Future work could further investigate the impacts of the Great Migration on educational outcomes for Southern Black children.

## 6.2 Robustness and Limitations

[robustness controls]

[leave one out estimator]

Our study has several limitations worth noting, some of which may be addressed in future drafts.

[northern labor demand - future draft will estimate changes in Black labor force predicted by exogenous factors (e.g., immigration changes, war contracts)]

## 7 Conclusion

This paper finds evidence that the Great Migration had positive economic impacts for Black workers remaining in the South. Counties with more out-of-South migration during the First Wave of the Great Migration had higher Black wages in 1940, with no difference for white wages, resulting in reduced racial wage inequality. Loss of Black population share leading to improvements from a tightening labor market is a plausible mechanism.

The results provide the first empirical estimates of the causal estimates of the Great Migration on Southern labor outcomes. Our findings add to the historical narrative of the Great Migration by providing supporting empirical evidence of potential impacts suggested by historians, and they further our understanding the historical evolution of Southern economic outcomes and macroeconomic convergence. Looking forward, or analysis of the Great Migration provides an example of how out-migration might impact low-wage, oppressed communities in other parts of the world and in the future.

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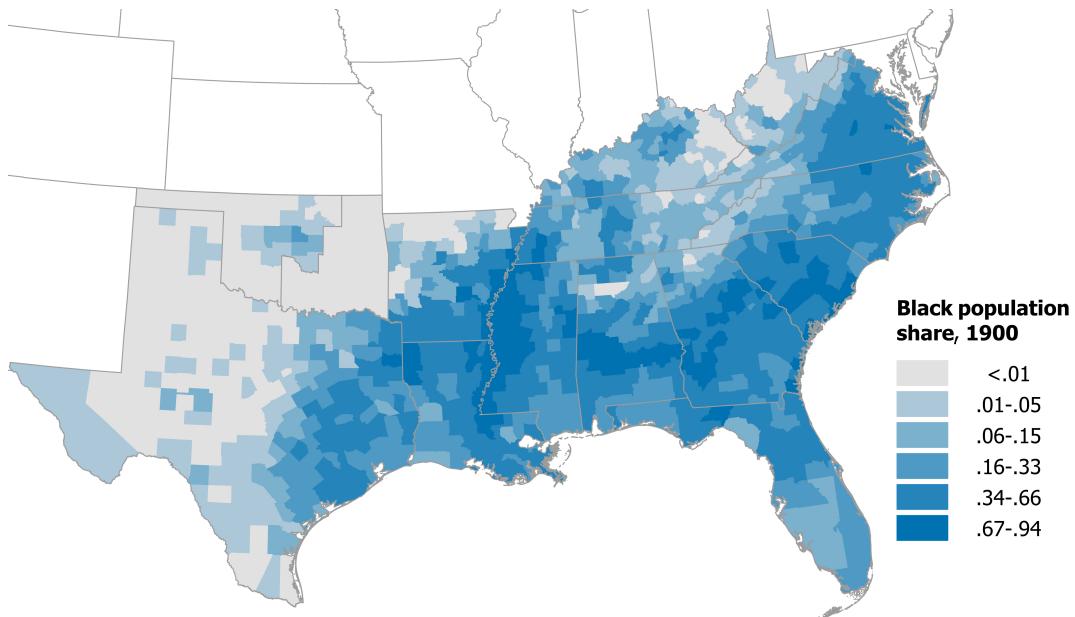
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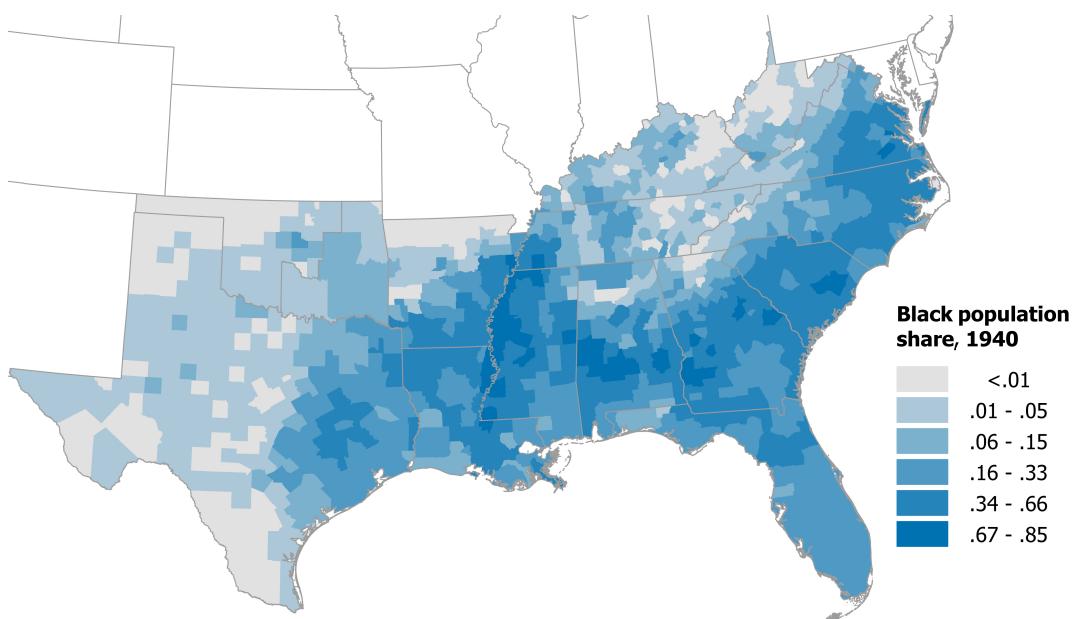
## 8 Figures

Figure 1: Spatial Distribution of the Southern Black Population in 1900 and 1940

(a) County Black Population Share in 1900

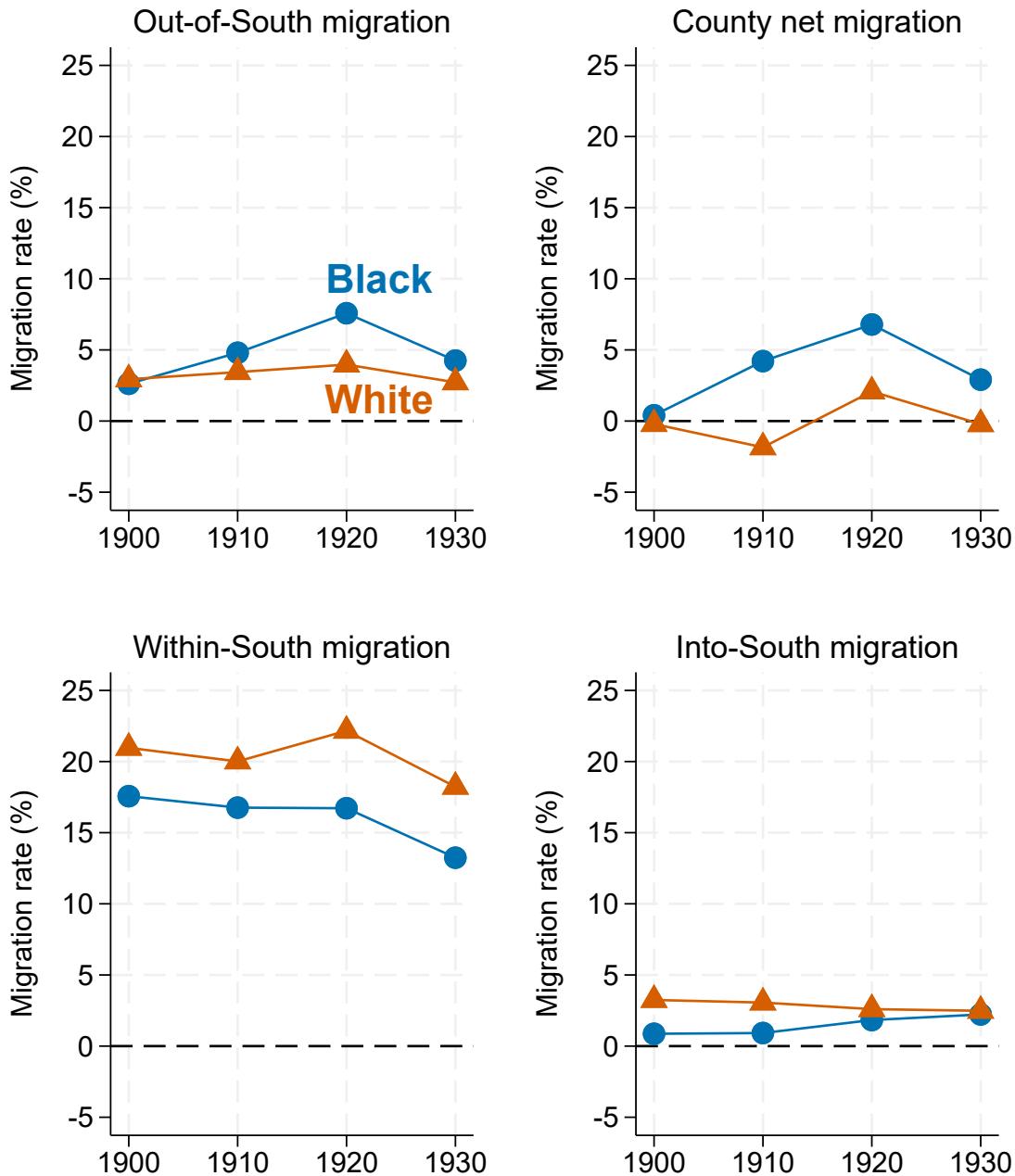


(b) County Black Population Share in 1940



*Notes:* This figure shows each Southern county's Black population share in 1900 and 1940. See Figure A1 for a map of the distribution of the total Black population across all U.S. states.

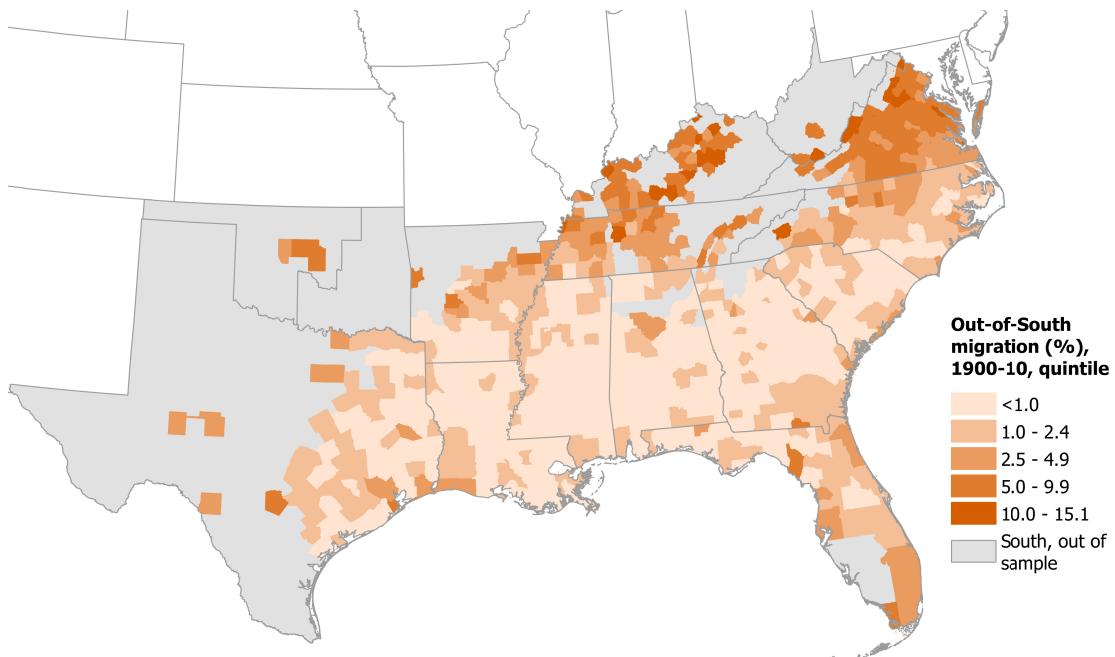
Figure 2: Southern County Migration Trends in 1900–1940



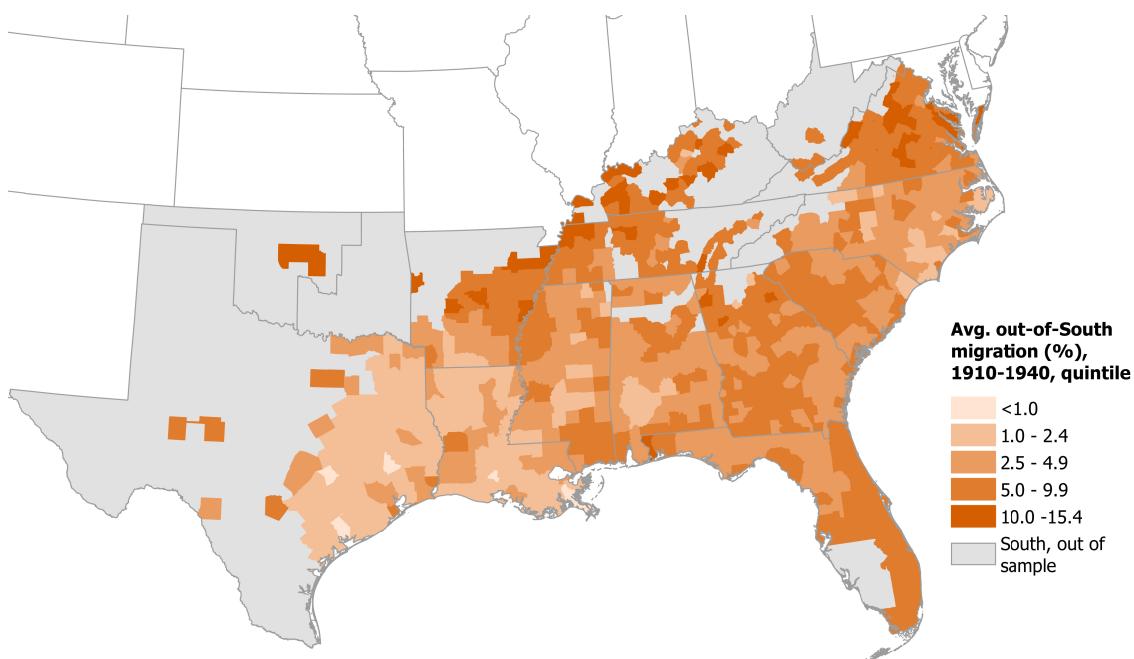
*Notes:* This figure shows trends in southern Black and White county migration rates between 1900 and 1940. Migration rates are calculated as the number of migrants living in the county in year  $t$  and elsewhere in year  $t+10$ . The rates shown are the population weighted means of county-level rates.

Figure 3: Black Out-of-South Migration During the Great Migration's First Wave

(a) County out-of-South migration rate in 1900-10



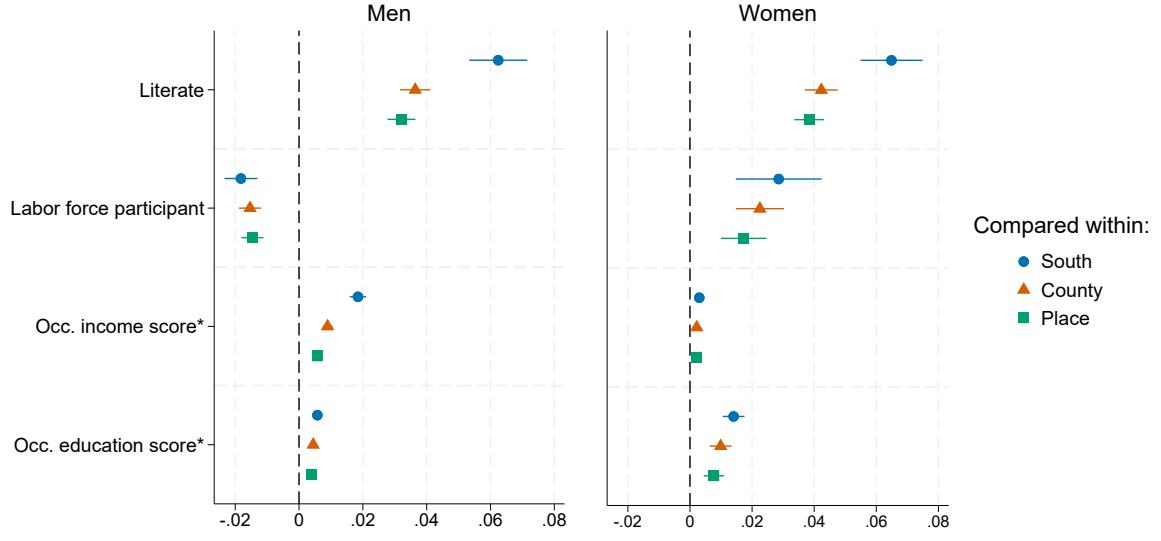
(b) County average of out-of-South migration rate during 1910-20 to 1930-40



*Notes:* This map shows the rate of Black migration out of the South for counties at baseline (1900-10) and during the First Wave of the Great Migration (1910–1940). Migration rates are calculated as the number of migrants during years  $t$  to  $t+10$ , divided by the population in  $t$ .

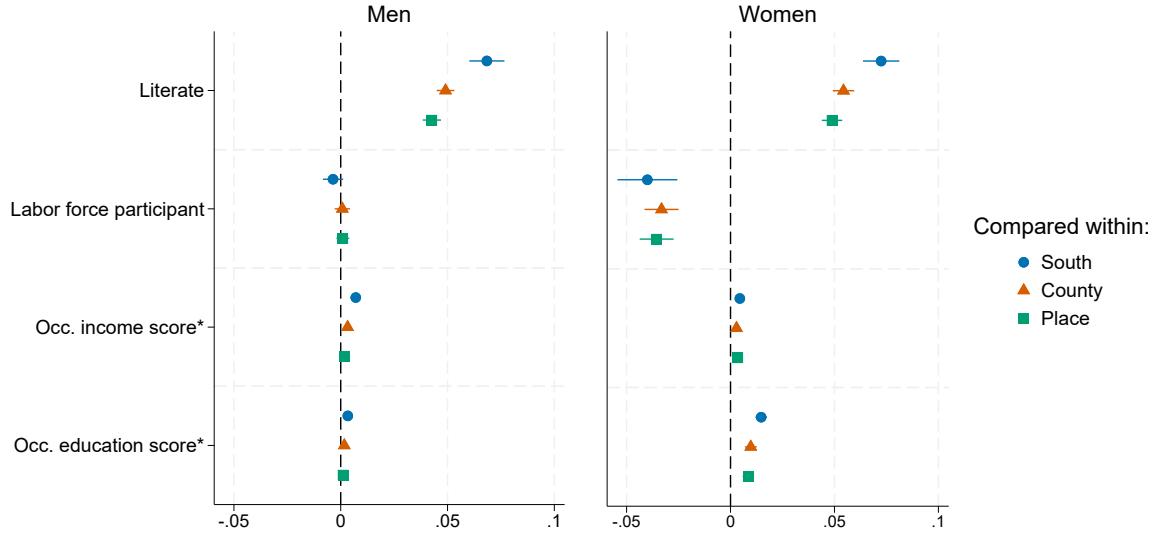
Figure 4: Selection into the Great Migration among Southern Black Adults Ages 18–39

(a) Selection on Observables among All Adults



\* if in labor force.

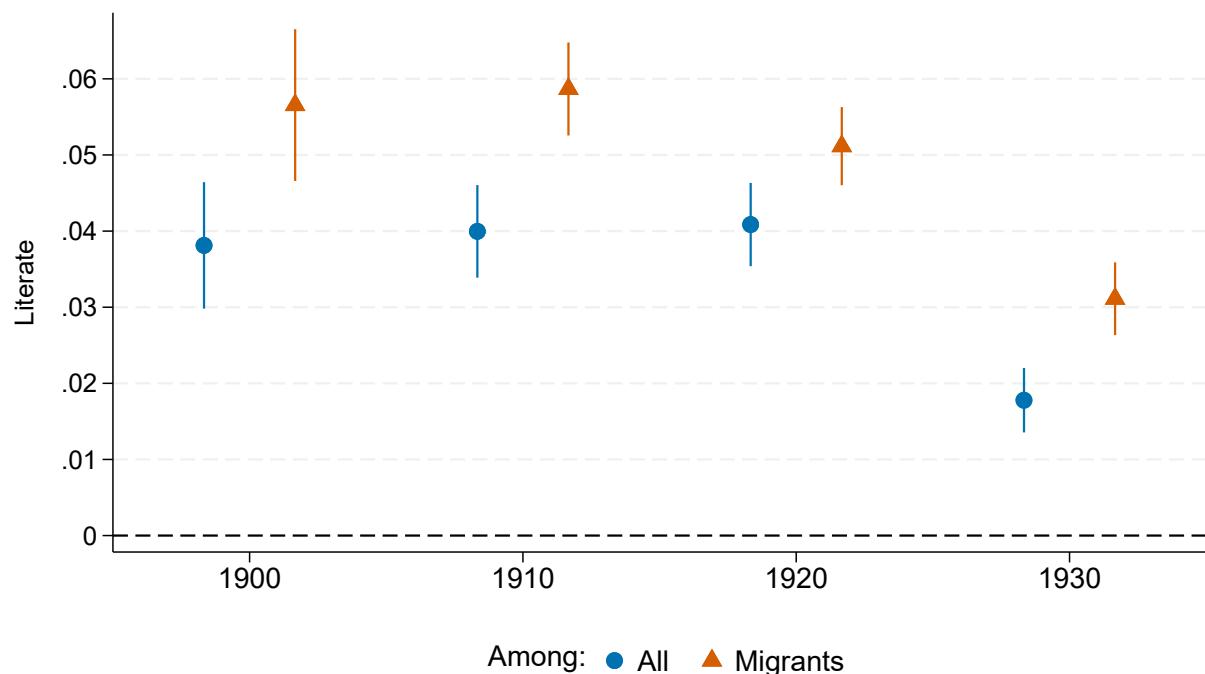
(b) Selection on Observables among Migrants



\* if in labor force.

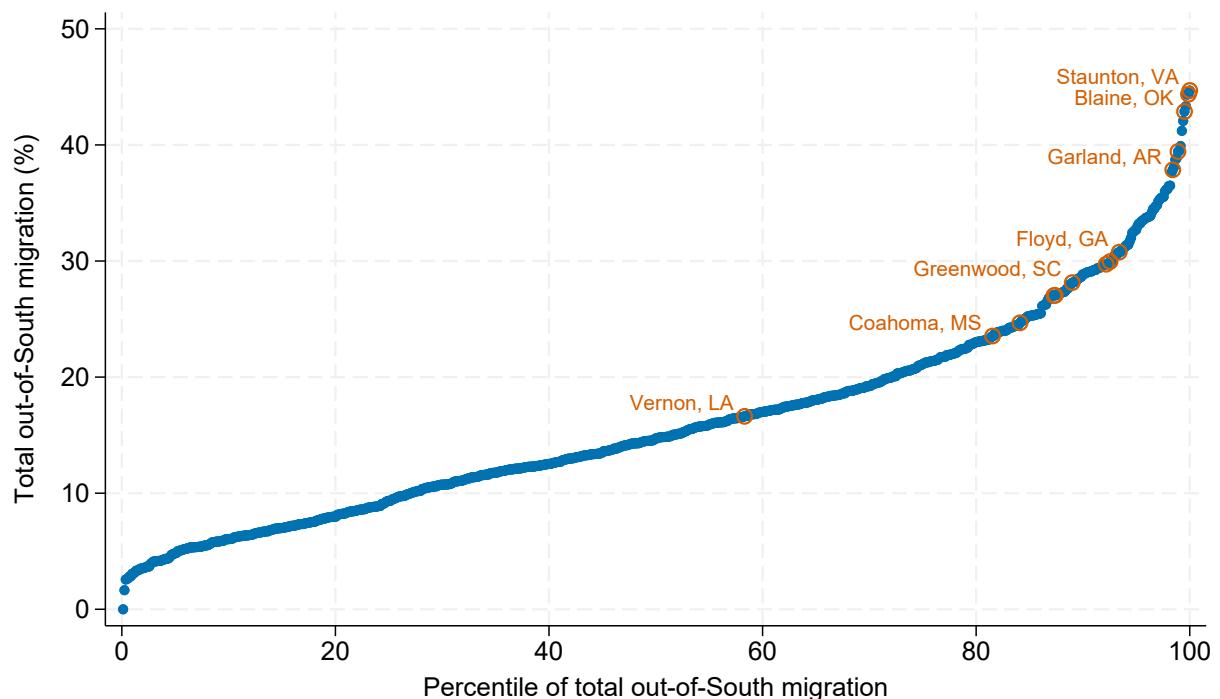
*Notes:* This figure shows selection into out-of-South migration on observable pre-migration characteristics among southern Black adults ages 18–39, observed in the 1910–1930 censuses and linked to the following census. Migrants are defined as those moving at least 100 miles. Each row of the figures shows results from a separate OLS regression of the given characteristic on a binary indicator for out-of-South migration, with controls for age and year fixed effects; each characteristic is estimated in regressions with fixed effects for the various indicated geographies to compared individuals within the same areas. Regressions for men and women are estimated separately. Occupation score estimates are restricted to labor force participants; scores are rescaled from 0–100 (instead of 0–100). Standard errors are clustered by state economic area.

Figure 5: Out-of-South Migrant Selection on Literacy Over Time, Southern Black Adults Ages 18–39



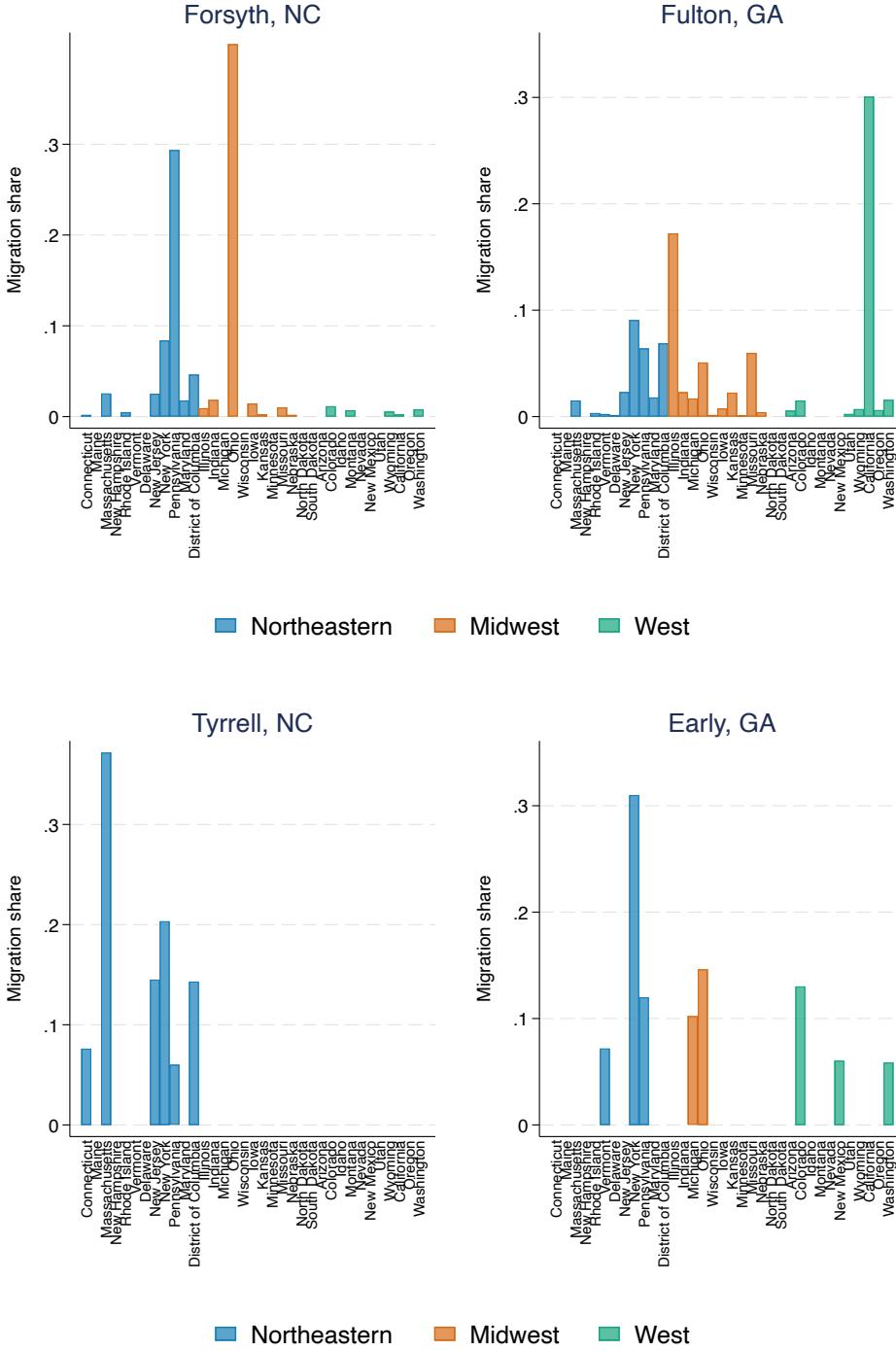
*Notes:* This figure shows selection into out-of-South migration on observable pre-migration literacy among southern Black adults ages 18–39, observed in the 1910–1930 censuses and linked to the following census. Migrants are defined as those moving at least 100 miles. Each point shows the estimate from a separate OLS regression for each year of an indicator of literate regressed on an indicator for out-of-South migration, with controls for age and sex and Place fixed effects. Standard errors are clustered by state economic area.

Figure 6: Quantiles of Black Out-of-South Migration During 1910–1940



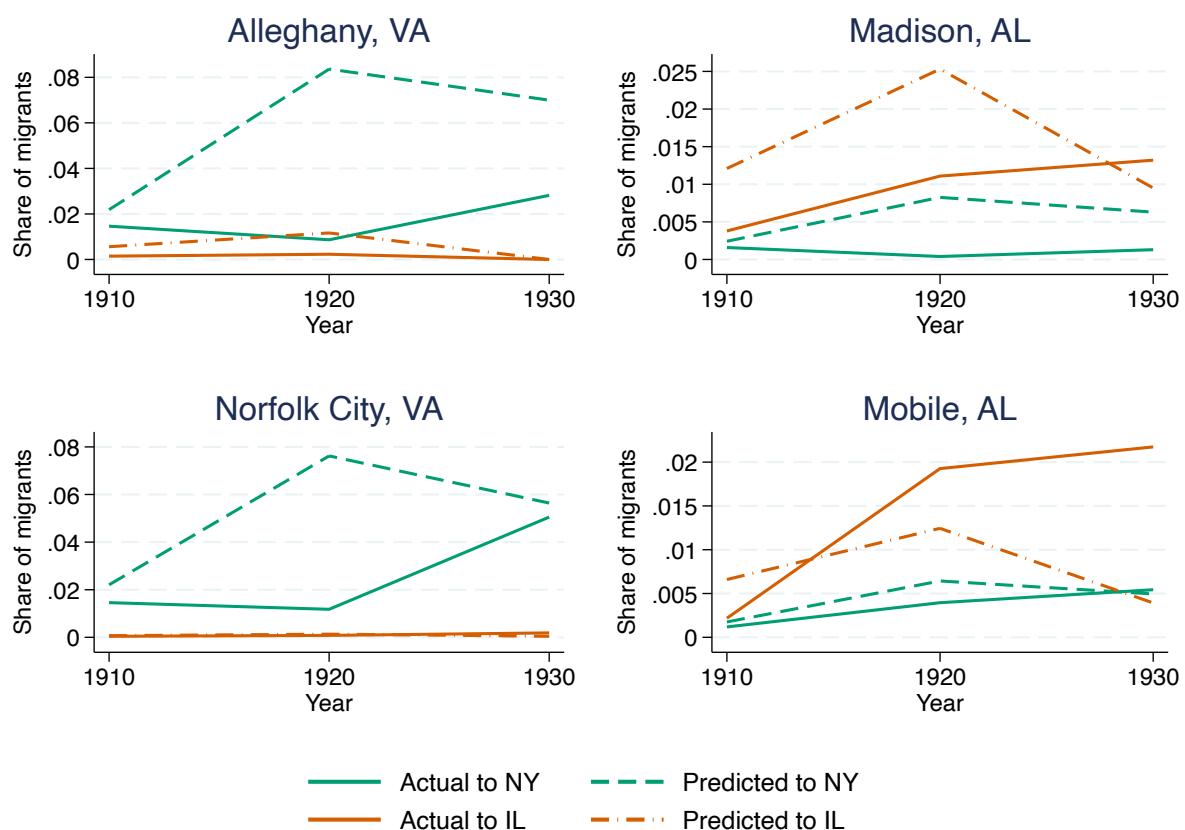
*Notes:* This figure shows the quantile function for aggregate out-of-South migration during 1910–1940 (i.e., the sum of the three 10-year migration rates). The largest migration rate county in each state is highlighted in orange, with select counties labeled.

Figure 7: Example of Preexisting Migration Patterns in 1900–1910



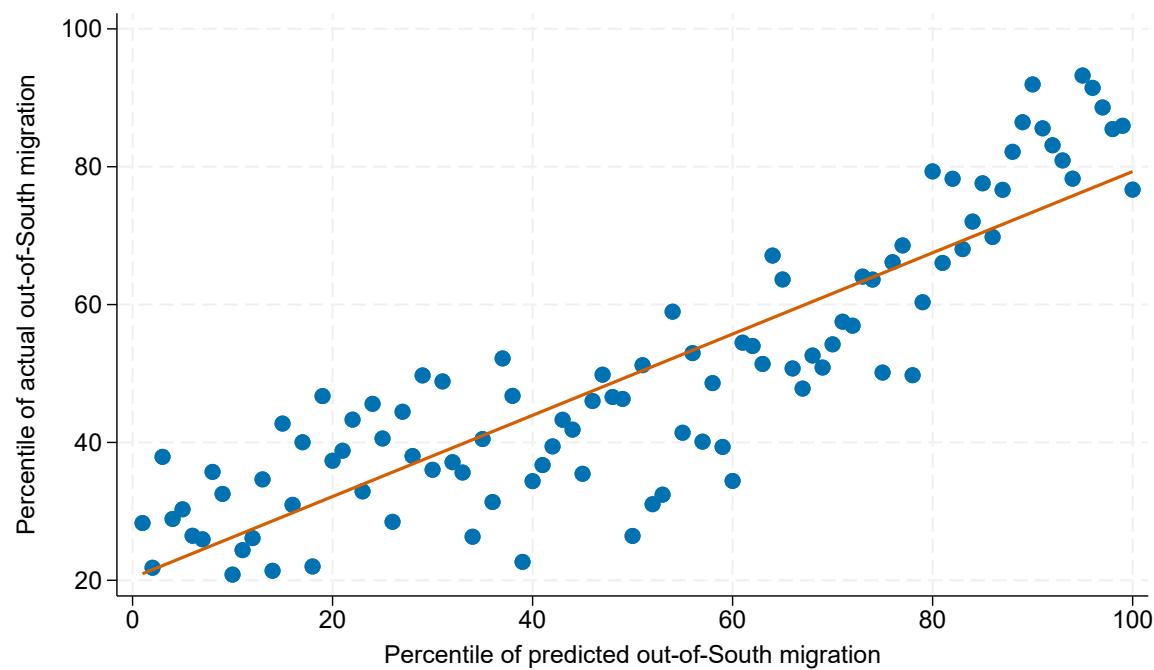
*Notes:* This figure illustrates the 1900 outmigration network in selected Southern counties. The upper and bottom panels include counties with relatively high and low outmigration rates, respectively. We define high (low) outmigration rates if the county's outmigration rate is above (below) the median rate. The figure shows the pattern of out-of-South migrants' destination states. Source: Authors' calculation using IPUMS and Census Tree data.

Figure 8: Example of Predicted and Actual Migration Patterns in 1910–1940



*Notes:* The figure shows the actual and the predicted numbers of outmigrants moved to New York and Illinois states in each decade. The predicted outmigration population is the instrumented migration outflows scaled by the 1900 county Black population. Source: Authors' calculation using IPUMS and Census Tree data.

Figure 9: First Stage: Predicted and Actual Out-of-South Migration, 1910–1940



*Notes:* This figure shows a binned scatter plot of predicted vs actual migration.

## 9 Tables

Table 1: Summary of Southern Black Population Characteristics in 1910–1930

	Out-of-South migrants	Within-South migrants	Total population
Age (years)			
0-10	0.18	0.19	0.26
11-17	0.21	0.18	0.15
18-29	0.34	0.31	0.23
30-39	0.13	0.13	0.14
40-49	0.07	0.09	0.11
50+	0.07	0.10	0.11
Among adults ages 18-39			
Male	0.59	0.59	0.48
Married	0.50	0.50	0.60
Farm resident	0.30	0.33	0.35
Urban	0.45	0.38	0.44
Owner-occupied home	0.26	0.19	0.24
Literate (read + write)	0.85	0.78	0.83
Labor force participant	0.74	0.77	0.70
Occupation score if in LF	14.96	14.28	14.04

*Notes:* This table shows summary statistics for basic characteristics of the Black population by migration status. The sample includes those observed in the 1910–1930 censuses and linked to the following decade’s census, using Census Tree links ([Buckles et al., 2023](#)). Statistics are weighted using inverse probability of linkage weights.

Table 2: Great Migration Association with 1940 Wages and Inequality

	Black wage (1)	White wage (2)	Black White ratio (3)
<i>GM</i>	0.022*** (0.004)	-0.008 (0.007)	0.001*** (0.000)
State fixed effects	Y	Y	Y
Baseline wage control	Y	Y	Y
Outcome mean	6.659	15.917	0.427
R-squared	0.746	0.770	0.612
Counties	816	816	816

*Notes:* \*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .10$ . This table shows OLS estimates of the association between a percentile increase in out-of-South migration during 1910–1940 (*GM*) and average county wages in 1940. Estimates are weighted by 1900 county population. Standard errors are clustered by state economic area. Wages are calculated as average weekly wages based on census-reported past year wage income and weeks worked. Baseline wage controls include 1910 average occupational income scores by race or the Black/White occupation score ratio.

Table 3: Placebo Test: Instrument Effect on Pre-Great Migration Outcomes

	Black score		White score		$\frac{\text{Black}}{\text{White}}$ ratio	
	1900	1910	1900	1910	1900	1910
	(1)	(2)	(3)	(4)	(5)	(6)
$\widehat{GM}$	0.004 (0.004)	-0.003 (0.004)	0.017** (0.007)	0.011 (0.008)	-0.000 (0.000)	-0.000 (0.000)
State fixed effects	Y	Y	Y	Y	Y	Y
Baseline controls	Y	Y	Y	Y	Y	Y
Outcome mean	13.769	12.707	17.980	18.688	0.779	0.694
R-squared	0.570	0.601	0.706	0.699	0.414	0.373
Counties	817	817	817	817	817	817

Notes: \*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .10$ . This table shows OLS estimates of the effect of a percentile increase in predicted out-of-South migration during 1910–1940 ( $\widehat{GM}$ ) and average county occupational earnings scores before the Great Migration; scores range (0–100). Estimates are weighted by 1900 county population. Standard errors are clustered by state economic area. Baseline controls include the 1900–10 Black out-of-South migration rate and the shares of the population living in an urban area and on a farm in 1910.

Table 4: Impacts of the Great Migration on Southern Wages and Wage Inequality in 1940

	Black wage (1)	White wage (2)	$\frac{\text{Black}}{\text{White}}$ ratio (3)
$GM^{2SLS}$	0.030** (0.014)	-0.027 (0.028)	0.003*** (0.001)
State fixed effects	Y	Y	Y
Baseline controls	Y	Y	Y
Outcome mean	6.698	15.984	0.428
First-stage F stat.	35.897	36.839	36.290
Counties	816	816	816

*Notes:* \*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .10$ . This table shows 2SLS estimates of the impact of a percentile increase in out-of-South migration during 1910–1940 ( $GM$ ) and average county wages in 1940. Predicted out-of-South migration ( $\widehat{GM}$ ), constructed from 1900-10 migration patterns and 1910–1940 population changes outside the South, is used as an instrument for actual out-of-South migration ( $GM$ ). Standard errors are clustered by state economic area. Estimates are weighted by 1900 county population. Wages are calculated as average weekly wages based on census-reported past year wage income and weeks worked. Baseline controls include the 1900-10 Black out-of-South migration rate, the shares of the population living in an urban area and on a farm in 1910, and the 1910 average occupational income score for the column racial group (or the Black/White ratio in scores).

Table 5: Great Migration Impacts on 1940 Wages by Race and Gender

	Wages among men:			Wages among women:		
	Black	White	Ratio	Black	White	Ratio
$GM^{2SLS}$	0.029*	-0.027	0.003***	0.033***	-0.016	0.005***
	(0.015)	(0.029)	(0.001)	(0.012)	(0.025)	(0.001)
State fixed effects	Y	Y	Y	Y	Y	Y
Baseline controls	Y	Y	Y	Y	Y	Y
Outcome mean	7.984	17.423	0.470	4.455	12.087	0.373
First-stage F stat.	35.897	36.839	36.290	35.897	36.839	36.290
Counties	816	816	816	816	816	816

Notes: \*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .10$ . This table shows 2SLS estimates of the impact of a percentile increase in out-of-South migration during 1910–1940 ( $GM$ ) and average county wages in 1940. Predicted out-of-South migration ( $\widehat{GM}$ ), constructed from 1900–10 migration patterns and 1910–1940 population changes outside the South, is used as an instrument for actual out-of-South migration ( $GM$ ). Standard errors are clustered by state economic area. Estimates are weighted by 1900 county population. Wages are calculated as average weekly wages based on census-reported past year wage income and weeks worked. Baseline controls include the 1900–10 Black out-of-South migration rate, the shares of the population living in an urban area and on a farm in 1910, and the 1910 average occupational income score for the column race and sex group (or the Black/White ratio in scores).

Table 6: Impacts on Black Labor Supply

	% of total pop.	Black LFP (%)		% of low-wage workers	
	Black	Men	Women	Black	White
	(1)	(2)	(3)	(4)	(5)
$GM^{2SLS}$	-0.192*** (0.069)	-0.059 (0.042)	0.064 (0.081)	-0.390** (0.180)	0.281** (0.112)
State fixed effects	Y	Y	Y	Y	Y
Baseline controls	Y	Y	Y	Y	Y
Outcome mean	33.688	86.872	37.215	50.956	47.090
First-stage F stat.	35.162	37.524	35.068	34.952	34.952
Counties	816	816	816	816	816

Notes: \*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .10$ .

Table 7: Impacts on Adult Human Capital Accumulation

	eduyrs							
	a1840_b	a1840_m_b	a1840_f_b	a1840_w	a1840_m_w	a1840_f_w	a1840_b	a1840_m_
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$GM^{2SLS}$	-0.005 (0.011)	-0.001 (0.010)	-0.008 (0.011)	0.011 (0.009)	0.011 (0.009)	0.011 (0.009)	-0.169 (0.131)	-0.137 (0.123)
State fixed effects	Y	Y	Y	Y	Y	Y	Y	Y
Baseline controls	Y	Y	Y	Y	Y	Y	Y	Y
Outcome mean	5.867	5.337	6.354	9.017	8.654	9.379	20.845	17.055
First-stage F stat.	30.480	33.055	28.359	38.962	38.963	38.936	30.480	33.055
Counties	816	816	816	816	816	816	816	816

Notes: \*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .10$ .

Table 8: Impacts on Black Teens Ages 15–17

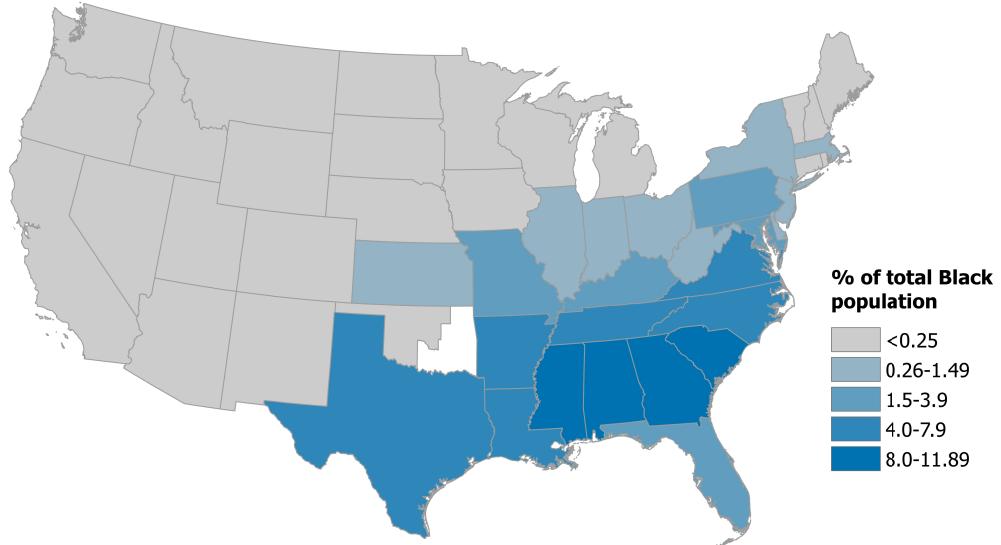
	Average outcomes for Black teens ages 15-17								
	Years educated		In school (%)		In labor force (%)		Wage worker (%)		
	Men	Women	Men	Women	Men	Women	Men	Women	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)		
<i>GM<sup>2SLS</sup></i>	0.012*	0.012*	0.121*	-0.036	-0.285***	-0.098	-0.373***	-0.104	
	(0.007)	(0.007)	(0.073)	(0.076)	(0.087)	(0.088)	(0.097)	(0.071)	
State fixed effects	Y	Y	Y	Y	Y	Y	Y	Y	
Baseline controls	Y	Y	Y	Y	Y	Y	Y	Y	
Outcome mean	5.683	6.679	53.521	59.939	41.623	19.648	36.562	15.048	
First-stage F stat.	37.067	35.879	37.067	35.879	36.263	30.981	36.263	30.981	
Counties	815	815	815	815	815	815	815	815	

Notes: \*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .10$ .

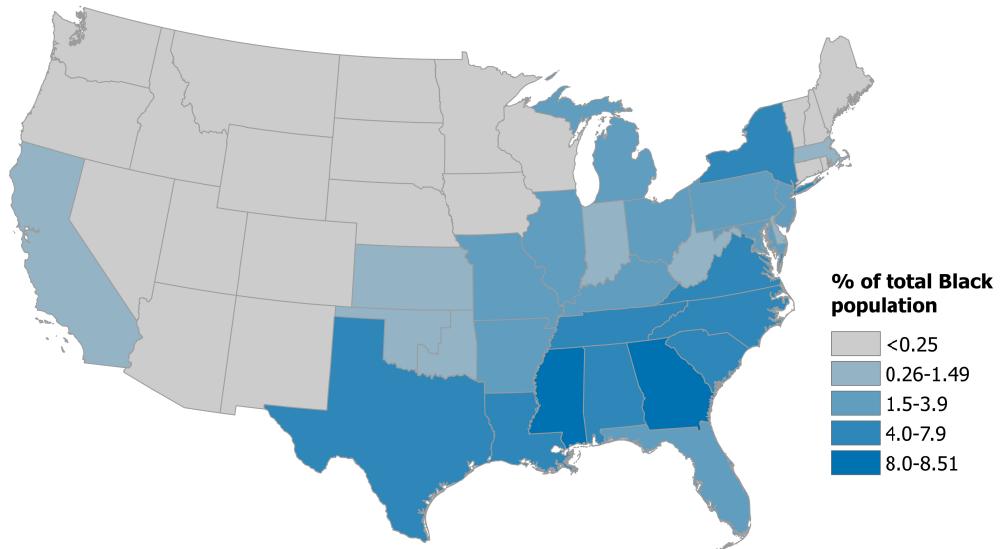
## A Appendix

Figure A1: Spatial Distribution of the Black Americans in 1900 and 1940

(a) Percentage of the total U.S. Black population living in each state in 1900



(b) Percentage of the total U.S. Black population living in each state in 1940



*Notes:*

Table A1: Spatial Distribution of the U.S. Black Population During the Great Migration

Year	% of Black pop. living in region			
	South	Northeast	Midwest	West
1900	86.1	8.3	5.3	0.3
1910	85.1	8.8	5.6	0.6
1920	81.6	10.1	7.5	0.7
1930	75.1	13.3	10.6	1.0
1940	73.3	14.5	10.9	1.3
1950	67.4	16.5	13.0	3.1
1960	54.9	21.3	18.2	5.6
1970	47.5	24.9	20.1	7.5

*Notes:* This table shows the percent of the total U.S. Black population that was living in each Census region in each year from 1900 through the Great Migration. We alter the Census definitions to include Delaware, D.C., and Maryland as Northeast instead of South, to match our definition in the text. Years 1900–1940 use the full count censuses, and year 1950–1970 use the 1% IPUMS census samples.