Market Access and Migration: Evidence from the Panama Canal Opening during the First Great Migration*

Sebastian Galiani[1], Luis F. Jaramillo[2], and Mateo Uribe-Castro[†3]

[1]University of Maryland and NBER

[2]University of Maryland

[3]Universidad del Rosario

May 15, 2023

1 Introduction

Between 1910 and 1939, around 1.5 million African Americans from Southern states moved to the West and North in the first wave of what became known as the Great Migration (Wilkerson, 2020). Motivated by depressed labor markets, poor living standards, disenfranchisement, and violence, migrants from the American South slowly led the country's demographic change in the 20th century. The Great Migration improved migrants' living conditions and reduced black-white gaps in economic status (Collins and Wanamaker, 2014). However, arriving locations changed well beyond their racial composition. The local white population moved out of cities into suburbs (Boustan, 2010; Shertzer and Walsh, 2019) and property values and fiscal revenues took a toll (Tabellini, 2019). Local governments increased policing and focused on incarceration but did not improve other public goods (Derenoncourt, 2022).

*Draft prepared for World Clio 2023. Online Appendix available here. Do not cite or circulate. We are grateful to participants at URosario Political Economy Workshop for helpful comments and suggestions.

†Corresponding author (mateo.uribe@urosario.edu.co).

How did African American migrants decide where to go? Recent empirical evidence finds that migrants moved to places where they had established social networks (Stuart and Taylor, 2021). Historical accounts point at the role of both labor agents who recruited early migrants and Northern newspapers distributed in the South (Gottlieb, 1997; Grossman, 2011; Wilkerson, 2020). Networks, agents, and newspapers were all useful in reducing moving costs and uncertainty about the labor market in potential destinations (Carrington et al., 1996). Furthermore, Collins (1997) and Boustan (2016) emphasize the role that stronger labor markets outside the South played on motivating black migration decisions. In this paper, we present a novel pull factor that influenced the migration decisions of African Americans through its effect on local labor markets.

We show how Southern African American migrants systematically chose localities with better access to domestic and international markets. We do so by exploiting a historical coincidence: the Panama Canal finally began operations in 1920, when the first wave of the Great Migration was already underway. Contemporary newspaper articles already highlighted the benefits of the Canal on exposed counties, especially in the West, and tradable goods industries (e.g., The Economist, 1921; The New York Times, 1923). Moreover, Maurer and Rauch (2020) show that the Canal increased exposed US counties' employment and wages.[1] We argue that the exposure reduction in transportation costs energized labor markets, which attracted a higher influx of Black migrants from the South. Specifically, we show there was disproportionately high Southern-born black migration to places that benefitted relatively more from the opening of the Panama Canal.

For each county, we compute the exposure to consumers and producers elsewhere through the transportation network available in 1920. In practice, we calculate Market Access, a trade cost-weighted average of the size of the markets to which a place might have had access in 1920. We do so under two alternative scenarios: one where the Panama Canal is open and one where it is closed.[2] The difference between both measures represents the gains in Market Access due to the Canal. Notice that by measuring Market Access gains in this fashion, we are isolating the gains from the Canal construction from other changes in the transportation network that might be complementary to the Canal and might also drive internal migration. Since the Canal opened when the Great Migration was already

[1]Recent literature emphasizes the positive effect of transportation infrastructure on economic activity and productivity at the local level. See work on the impact of highways (Jaworski and Kitchens, 2019; Asher and Novosad, 2020), railroads (Atack et al., 2010; Donaldson and Hornbeck, 2016; Donaldson, 2018; Hornbeck and Rotemberg, 2021), and canals (Galiani et al., 2022).

[2]This definition follows the economic geography literature, e.g. Redding and Venables (2004); Donaldson and Hornbeck (2016); Hornbeck and Rotemberg (2021).

ongoing, we should only see differential migration between high and low Market Access gains counties after 1920 and not before.

We show that counties with higher Market Access due to the Panama Canal received an influx of Southern-born African Americans in the 1920s and 1930s but not before the Canal was fully operational. These estimates come from a difference in differences strategy where we allow the treatment—changes in Market Access—to have a differential effect by decade. Our empirical setting uses full-count Census of Population data between 1900 and 1940, aggregated to the county level, and focuses on non-Southern counties. Our definition of the South follows Bazzi et al. (2021): all states that seceded from the Union before the Civil War, plus Oklahoma.

We focus on non-Southern counties with at least one African American born in the South in 1900 to account for general migration patterns following pre-existing social networks. We consider this set of counties as the potential set of places Southern Black migrants might choose from. Within that set, we estimate whether increases in economic opportunities via increased Market Access affect location decisions. We show that one standard deviation higher Market Access gain led to a 23.7% higher number of African Americans born in the South as a share of the total population, relative to the average non-Southern county in 1920 (0.11 percentage points). Crucially, there is no difference in Southern migration (of any race) in 1900, 1910, and 1920.

One potential concern is that Market Access gains due to the Canal are correlated with pre-existing networks of Southern African Americans. Such might be the case if geography or internal transportation networks drove initial settlements (Stuart and Taylor, 2021). First, we show that there is no correlation between the share of Southern African Americans living outside the South in 1900, 1910, and 1920 and the Market Access changes due to the Canal. Second, we estimate and control for the decade-to-decade predicted flows of the Great Migration (Bazzi et al., 2021). Our results on the effect of Market Access changes on the Great Migration are robust to controlling for predicted migration. In other words, we find that changes in Market Access due to the Panama Canal increased the migration of African Americans beyond what initial migrant networks would predict.

We show that Southern blacks were the only group influenced by better economic opportunities driven by improved Market Access. This is relevant since African Americans were not the only group leaving the South. Bazzi et al. (2021) and Collins and Wanamaker (2015) document considerable outflows of Southern whites to the North and West. We perform analogous exercises for Southern whites and European migrants. We do not find evidence that either group was differentially migrating to counties with improved Market Access after 1920.[3] These results align with Collins and Wanamaker, who find that economic opportunity influenced Southern black men more than their white peers. Our focus is different in that we study receiving places while they emphasize individual migrants over time.

We find that Market Access gains translated into higher inflows during the first wave of the Great Migration in counties with tighter labor markets. Specifically, we show that our results are concentrated in places with low unemployment rate in 1900 and 1910. Given that Southern black migrants encountered more barriers when trying to enter Northern and Western labor markets, as documented by Boustan (2016) and Derenoncourt (2022), the opportunities arising from the Panama Canal were more successful in attracting migrants to areas where there was a shortage of local workers.

Additionally, the effect of Market Access on migration was concentrated in more urban counties and counties ahead in the process of structural transformation. In other words, our results are stronger for places with more developed manufacturing and services sectors. Moreover, we find a similar result for one of the industries anecdotally most affected by the Canal: lumbering (Rockwell, 1971). Places with a higher population share involved in the lumber trade had a higher effect of Market Access gains on migration than places with a less established lumber sector. Our evidence aligns with anecdotal evidence from family histories of black, Southern loggers moving West (Marsh, 2015; Crawford, 2008). After agriculture in the American South, lumbering was the second largest employer of black workers (Wright, 1986). This result highlights the role of labor markets as pull factors in migration location decisions.

Our paper contributes to the literature that asks how better economic opportunities drove migration location decisions in the context of the Great Migration. Collins (1997) and Carrington et al. (1996) pioneering work showed that despite attractive labor markets in the North and West, African Americans started migrating *en masse* only after international migration was restricted. Stuart and Taylor (2021) empirically estimate the effect of migrant networks on the location decisions of African American migrants. We show how labor market opportunities driven by better Market Access influenced internal migration during the first wave of the Great Migration, even after controlling for potential migration based on migration networks.

[3] We interpret the (lack of) result for European migrants with caution since the restrictions to international migration during this period allowed Southern black migrants to take advantage of improved labor markets outside of the South (Collins, 1997; Abramitzky et al., 2019).

With our setting, we also contribute to the literature studying the effect of transportation infrastructure on migration. The construction of railroads, roads, and canals reduces transportation costs which influences migration for two reasons. First, transportation infrastructure reduces the direct costs of migration. In other words, migrants use the existing transportation network to move from one place to another. Second, transportation infrastructure increases economic activity and labor demand (Michaels, 2008; Duranton et al., 2014). Morten and Oliveira (2018) rely on a trade model to disentangle between both. They find a positive effect of increased trade opportunities on migration when studying highway construction in Brazil. Our paper's setting is unique because the Panama Canal generated considerable variation in trade opportunities without reducing directly the migration costs for Southern African American migrants, who used mostly the internal transportation network, as opposed to oceanic transportation (Wilkerson, 2020).

More generally, our paper also contributes to the economic history of the Great Migration. One set of works look at individual migrants to study selection into migration and individual-level effects of migration for migrants and their descendants (Margo, 1990; Collins and Wanamaker, 2014; Black et al., 2015; Eriksson and Niemesh, 2016; Eriksson, 2019; Baran et al., 2022; Derenoncourt, 2022). Other scholars focus on how migration affected receiving localities on several economic, social, and political dimensions (Boustan, 2010, 2009, 2016; Boustan and Tabellini, 2018; Muller, 2012; Calderon et al., 2022; Tabellini, 2019; Shertzer and Walsh, 2019; Bazzi et al., 2021). We add to this literature by focusing on the set of potential destinations that migrants could choose and studying how these decisions are influenced by the trade opportunities brought about by the Canal.

Along these lines, we contribute to a recent literature the studies which factors in potential destinations affect migration location decisions. These can be economic, social, or political (Grogger and Hanson, 2011; Campo et al., 2022; Parsons et al., 2020; Bracco et al., 2018; Khanna et al., 2021). We show how access to international and domestic markets influenced the location decisions of migrants in one of the most important migration waves in American history.

2 Historical Context

Transportation infrastructure shapes local economic activity by bringing input and output markets closer. The construction of roads, railroads, and canals all over the world dynamized employment and led to higher productivity through the reallocation of factors of production to places that were previously isolated (Asher and Novosad, 2020; Donaldson and Hornbeck, 2016; Donaldson, 2018; Hornbeck and Rotemberg, 2021). The Panama Canal was not an exception. Galiani et al. (2022) find that Canadian counties that benefited from greater Market Access had higher manufacturing production, used more inputs, and improved their productivity. For the United States, Maurer and Rauch (2020) show that improvements in Market Access due to the Panama Canal translated into faster population growth, more employment, and higher wages.

Built with geopolitical goals in mind, the Canal effectively reduced the physical and economic distance between US shores and trade partners. Before 1920, when the Canal fully started operations, shipments between both coasts had to go either through the North American transportation network, railroads in Mexico or Panama, or around the continent's southernmost tip. Maurer and Yu (2008) estimate that the distances between the US West and East coasts fell by about 51%, between the US East coast and Asia decreased by 32%, and between the US West coast and Europe fell by 43%. Alongside sizeable differences in rates between overland and waterborne transportation, the reduction in distance implied a sharp decrease in transportation costs in the context of increased protectionism (Williamson, 2013).

For illustration, take the lumber industry. Rockwell (1971) documents that the average shipping rate for one ton from Portland, Oregon to New York City via the railroad network was 18.49(13.66) over the 1920s (1930s).[4] The rate using the Panama Canal was \$9.69 (\$6.23). These figures imply cost savings of circa 50%. By 1923, the New York Times recognized that the change in transportation costs brought "great export opportunities" for Oregon and other Western states. The newspaper emphasized that it was possible for "products originating in Oregon for export via the Columbia River and passing through the [Panama] Canal to compete for Atlantic seaboard trade with the Mississippi Valley." (The New York Times, 1923). This development in the lumber sector coincides with the migration movement of African Americans out of the South, already underway from the mid-1910s.

The lumber industry case is representative of how new opportunities brought about by the Canal attracted black migrants from the South. One of those migrants was Amos Marsh, Sr., an African American log cutter from Jackson Parish, Louisiana. Motivated by the dire economic conditions, overt discrimination, and political violence, he moved with his family to Wallowa County, Oregon, in 1939.[5]

[4]Constant 1925 US Dollars.

[5]"If the South had worked for us farming and the [Ku Klux] Klan hadn't been ridin', I never would have

His story, compiled by Marsh (2015), illustrates three essential facts of the Great Migration. First, the move to Oregon answered to better economic opportunities in the West. As Marsh puts it, "that was where the work was." Furthermore, the racial wage gap was not nearly as large as the one in the South.[6] Second, companies in the West used family networks of the original workers to recruit new workers in the South. Such was the case of the Bowman-Hicks Lumber Company, where Marsh worked as a head logger. Third, Oregon's white population reacted negatively to the arrival of these migrants. For instance, in 1924, the State's Labor Commissioner received a petition to stop the Bowman-Hicks Company from recruiting African American workers.

Beyond this anecdotal evidence, we systematically document how places that benefited from more exposure to markets attracted African American migrants from the South. As Collins and Wanamaker (2014, 2015) find, the first generation of migrants improved their economic standing. Those migrants, as in Marsh's journey, helped recruit or provided information through family and social networks, which consolidated the migration movement (Stuart and Taylor, 2021). Unfortunately, the Great Migration prompted white-flight, urban segregation, and lower fiscal revenues (Boustan, 2010; Tabellini, 2019; Shertzer and Walsh, 2019). Moreover, these responses translated into lower provision of public goods and increased policing, which severely curtailed social mobility and reduced the potential of the descendants of the migrants (Derenoncourt, 2022).

3 Estimating the Effect of the Panama Canal on Migration Location Decisions

3.1 Data

This paper draws data from two different exercises. First, we use GIS data on the transportation network available in 1920 and transportation costs estimates by mode to estimate Market Access changes due to the Panama Canal. Second, we use data from 5 full count Census of Population from IPUMS 1900 to 1940 (Ruggeles et al., 2021) to measure the magnitude of the first wave of the Great Migration. Our area of interest is US counties located outside the South. We define the South as all states that seceded from the Union

left Louisiana." (Marsh, 2015).

[6] Another case study of the Quincy Mill in Northern California finds that the company "gave equal pay to its white and black employees and many African American men worked in skilled positions nearly impossible to gain the southern mills." (Crawford, 2008).

before the Civil War, plus Oklahoma (Bazzi et al., 2021). Within that area, we concentrate on the 1,225 counties where one or more black people born in the South lived in 1900. Since we use the full count Census of Population between 1900 and 1940, we end up with 6,125 observations.

Market Access

We follow the economic geography literature to measure how much each county benefited from the Panama Canal through changes in Market Access. We define it as the trade-cost weighted average of the income-adjusted population of all possible destinations d that trade with county c.

$$MA_c = \sum_{d \neq c} \tau_{cd}^{-\theta} L_d Y_{cd} \tag{1}$$

Where τ_{cd} is the iceberg trade cost between county c and destination d, L_d is destination d population, Y_{cd} is the GDP per capita of the country where d is located relative to the US's GDP per Capita, and θ is the elasticity of trade to trade-costs. The trade cost τ is computed as:

$$\tau_{cd} = 1 + \frac{t_{cd}}{\bar{P}} \tag{2}$$

Where t_{cd} is the cost of moving one ton of products from county c to destination d and $\bar{P}$ is the average transportation cost per ton. Therefore, estimating each county's market access requires a definition of the possible set of destinations D and estimations of t_{cd}, $\bar{P}$, and θ.

We assume each county has access to all other counties in the US and Canada, plus countries in the rest of the world. We use data from 63 countries outside North America whose GDP and population data is available for (circa) 1920 (Maddison project). The destinations in our sample account for 86% of the global population in 1920.

Access to those locations is given by a transportation network that includes (i) the railroads, canals, waterways, and wagon routes in the United States and Canada by 1920 and (ii) ocean liners between North American ports and ports in our set of destinations. Here we complement the work of Atack et al. (2010) and Donaldson and Hornbeck (2016) by including Canadian transportation infrastructure and allowing for the connection of ports through the oceans. We do so by using the information on actual distances between ports and key global chokepoints, including the Panama Canal, from the United States

Navy (1911, 1917, 1920, 1931, 1943).[7] We allow direct routes between ports – whenever possible– or routes passing through these chokepoints. We limit the Panama Canal routes to ports for which The Panama Canal Records report some shipping activity up to 1939.

For each mode of transportation in the network, we build estimates of rates using wheat as a reference, collecting data from historical sources (Department of Agriculture, 1906; Interstate Commission, 1913; Georgian Bay Canal Commission, 1916; Fogel, 1964). In the case of the United States, we compute average rates of 0.626 cents per ton-mile for railways, 0.260 cents per ton-mile for waterway transportation, 22.639 cents for wagon routes, and 0.052 cents per ton-mile for ocean liners. Routes using the Suez Canal and the Panama Canal paid, respectively, a flat toll fee of $1.48 and $0.95 per ton (The Panama Canal Company, 1971). All rates are in constant, 1910 United States dollars.

We use Dijkstra's algorithm (Dijkstra, 1959) to compute the transportation costs, $t_c d$, between each county and each destination. These use the transportation network and the rates described above. We follow Hornbeck and Rotemberg (2021), who estimate the county-level changes in Market Access due to railroad construction, and set $\bar{P} = 35.7$ and $\theta = 2.79$. A more detailed description of our Market Access computation is given in Galiani et al. (2022).

We measure the Market Access gains due to the Panama Canal by comparing our Market Access estimates using the transportation network in 1920 and MA estimates using a counterfactual network in 1920 that does not include routes through the isthmus. Notice that the only difference between both estimates is the possibility of shipping goods through the Canal. All other features of the network remain fixed. This is not an unreasonable assumption since the railroad network was already developed by the 1920s.

$$\Delta ln(MA_c) = ln(MA_c|Canal) - ln(MA_c|NoCanal)$$

Where $ln(MA_c|Canal)$ is the natural logarithm of Market Access of county c in 1920 with the transportation network that includes the Panama Canal and $ln(MA_c|NoCanal)$ is its equivalent without the Panama Canal. Figure 1a shows the variation in our covariate of interest.

[7] These chokepoints are the Panama Canal, Suez Canal, Cape Horn, Cape of Good Hope, Singapore, the Strait of Gibraltar, and Bishop Rock.

Measuring the Great Migration

Our primary variable of interest is the number of Black people born in the South in each Census year as a share of the total county population in 1900. We measure it using data from five full-count Census of Population, from 1900 to 1940 (Ruggeles et al., 2021). To ensure that county boundaries are consistent over time, we use 1890 county boundaries and match counties on subsequent censuses using the Eckert et al. (2020) method that assumes the population is uniformly distributed over space. We focus on 1,758 counties located outside the South. Since the Great Migration relied heavily on migrant networks, we zoom in to the 1,225 counties with at least one black person born in the South by 1900. Our sample includes 89.8% of the US population and 99.7% of the Black population living outside the South in 1900. Similarly, we can measure the number of Southern-born whites and European immigrants living in each non-Southern county over time.

To measure potential migration by decade, we follow Bazzi et al. (2021) and estimate the predicted migration flows to each non-Southern county as follows:

$$p_{ct} = \frac{1}{T_{c,1900}} \sum_j s^j_{c,1900} D^j_t$$

Where $s^j_{c,1900}$ is the number of blacks born in Southern state j that lived in non-Southern county c in 1900, as a share of the total number of black people born in Southern state j that lived outside the South. D^j_t is the decade-to-decade change in the number of black people born in Southern state j that live outside the South. Finally, we scale this prediction by $T_{c,1900}$: county c's total 1900 population. In other words, we estimate predicted migration using 1900 population shares and decadal change in the outmigration from each Southern state.

We complement our analysis by measuring the literacy rate of people older than ten, labor force participation, the share of workers employed in agriculture, manufacturing, and services, and the urban population from the Census. Given the anecdotal evidence about the impetus the Panama Canal gave to lumber industries, we measure the share of the labor force in each county that works in the wood and lumber industries. Figure A.1 summarizes the variation in economic structure and development in 1910, right around the time the Great Migration was starting and before the Panama Canal began operations.

3.2 Empirical Framework

Our main empirical specification estimates differences in migration of Southern African Americans between counties that benefited more from the Panama Canal and counties that benefited less within a given year relative to 1920, the year the Canal effectively started commercial operations. The total black population born in the South living on county c on Census year t, as a share of the total county population in 1900, y_{ct}, is regressed on the change in Market Access due to the Canal interacted with decade dummies, d_j below, for 1900, 1910, 1930, and 1940:

$$y_{ct} = \sum_{j=1900}^{1940} \beta_j d_j \times \Delta Ln(MA_c) + \gamma X_{ct} + \delta_{st} + \delta_c + \epsilon_{ct} \qquad (3)$$

We control for county and state-by-year fixed effects, δ_c, δ_{st} respectively, in our preferred specification. We compare counties within a given state in a given year and control for unobservable county characteristics that do not vary over time. This specification is similar to the empirical framework in Hornbeck and Naidu (2014). All specifications control for total county population and total black population in 1900, interacted with Census year dummies. In other specifications, we control for predicted migration at the county level, which varies by decade from 1910 to 1940. Notice that by construction, the predicted migration is only correlated with the share of African Americans born in the South living in non-Southern states in 1900. Changes in predicted migration depend on the State mix of Southern migrants and push factors from Southern states. As we discuss below, neither component is correlated to gains in Market Access due to the Panama Canal at the county level.

The identification assumption is that, in the absence of the Canal, counties that beneffited more from the Panama Canal would have received the same influx of Southern African American migrants than counties which did not benefit from the Canal. We cluster standard errors at 300km-by-300km squares from an arbitrary grid to account for spatial correlation.

4 Results: Market Access and the Great Migration

Table 1 reports the differences in the share of the Black population born in the South by the gains in Market Access due to the Panama Canal. We find that counties that benefited more from the Panama Canal increased their Southern Black population relative to counties that benefited less from the Canal, only after 1920. Specifications in Panel A allow the treatment effect from the Canal to vary over time, while specifications in Panel B group years in two periods: before and after 1920. While coefficients in Panel B allow us to summarize the results over time, we prefer specifications in Panel A since they provide information about the time-varying effect of our causing variable. In this setting, the treatment happens simultaneously for all counties, after 1920, but the treatment effect is allowed to be different for different decades.

We standardize coefficients to interpret them as the effect of increasing the gains in Market Access from the Canal in one standard deviation. For instance, from Column (1) Panel A, increasing the Market Access gains from the Canal by one standard deviation would increase the number of Southern blacks as a share of the population by 0.103 percentage points in 1930, 10 years after the Canal started operations. That is equivalent to an increase of 21.2% relative to the average non-Southern county in 1920. The effect is persistent and similar for 1940.

The Online Appendix shows that our results are robust to different assumptions that change our Market Access gains measure and dropping one non-Southern state at a time. Specifically, we report that the main results remain the same when using extreme values of $\bar{P}$ and θ and when we estimate Market Access gains using 1910 population levels instead of 1920.

Consistent with the identification assumption, we do not find any difference between counties that gained more and counties that gained less exposure to markets from the Panama Canal before it opened. Coefficients from 1900 and 1910 are very small and not statistically different from 0. These coefficients imply that the growth in the number of Southern blacks was not different by the level of Market Access gains between 1900 and 1920 or between 1910 and 1920. This is important since the Great Migration was underway during the 1910s. In other words, the number of Southern African Americans living outside the South evolved similarly in counties that would eventually benefit from the Canal and in counties that would not benefit from it until the Canal started operations.

One concern is that places that benefited more from the Canal had a different initial mix of migrant networks that would lead them to receive a higher influx of Southern African Americans over time. Beyond the fact that coefficients from 1900 and 1910 are close to 0, Table 1 reports that the main estimates do not change considerably when controlling for our shift-share estimate of potential migration in Columns (2) and (4). The Market Access gains effect on migration goes beyond what traditional migrant networks could predict.

Additionally, in Table 2, we report that changes in Market Access in 1920 are not correlated with county characteristics in 1900, 1910, or 1920. Related to our predicted migration control, we show no within-state correlation between the share of the Black or southern-born Black population and MA gains from the Canal. Columns (5) to (10) show that counties that benefited from the Canal were not systematically different in 1900, 1910, or 1920 in their urban status or economic structure.

4.1 Market Access and Economic Opportunities

Table 3 reports that the effects of the increase in Market Access due to the Panama Canal are only experienced by Black Southern migrants, despite a simultaneous "other Great Migration" (Bazzi et al., 2021). Southern whites were also leaving the South for places with more robust labor markets in large numbers during the first decades of the 20th century. Columns (1) and (2) of Table 3 reproduce Columns (1) and (2) of Table 1, while Columns (3) and (4) perform an analogous empirical analysis changing our focus to the county-level share of Southern whites. Our sample increases since there are more counties with at least one Southern-born white living than counties where at least one Southern black lived in 1900. However, the effect of the Panama Canal does not translate into more Southern white migration. According to results in Column (3), there was already a higher influx of Southern born whites to counties that ended up benefitting from the Canal before it even started operations. Moreover, results are not robust when focusing on within-State variation in Column (4).

These results are consistent with Collins and Wanamaker (2014), who find that black migrants are more responsive to economic conditions in the potential destination than white migrants. This difference might explain why we only find a positive effect of the gains from the Panama Canal for black migrants.

Finally, Columns (5) and (6) repeat the exercise for European born population as share of 1900 county population. This result is expected: since the US restricted international migration in the 1920s (Abramitzky et al., 2019; Collins, 1997), we should not see a significant effect of Market Access gains on European migration. Moreover, coefficients are close to zero in magnitude and relative to the average share of European born population.

We show that Southern black migrants chose places that benefited more from the increase in Market Access due to the Panama Canal over places that benefited less. We argue that places that benefited from the Canal had more attractive labor markets for migrants than other places (See Section 2). In the United States, improvements in Market Access led to higher land values in agriculture (Donaldson and Hornbeck, 2016) and higher levels of manufacturing activity (Hornbeck and Rotemberg, 2021). Moreover, Maurer and Rauch (2020) show that improvements in Market Access due to the Panama Canal improved the manufacturing and services sector more than agriculture. Are migration patterns during the first half of the 20th century consistent with the economic geography findings?

We show that the treatment effects of Market Access on the migration of Southern African Americans are concentrated in places with more developed manufacturing and services sector. Table 4 reports differences in treatment effects by groups formed according to the 1900 county-level economic structure. Even columns reproduce our preferred empirical strategy for places below the median county in 1900 in terms of specific characteristics. Odd columns restrict the analysis to places above the median. For instance, Column (2) focuses on counties where the share of the population working in agriculture in 1900 is higher than for the median county. Overall, the effect of increased Market Access on migration is only present in places ahead in the process of structural transformation: places with lower participation in agriculture and higher participation in manufacturing and services.

There can be two interpretations of this finding. First, Collins and Wanamaker (2014) show that Southern black migrants are disproportionally drawn from manufacturing and services industries and that people living on farms are considerably less likely to migrate. Since the pool of migrants is biased toward the secondary and tertiary sectors, they might choose places where those sectors are more developed. In other words, migrants can be selecting themselves to areas that are both more developed and benefited more from the Canal. Another interpretation is that places further ahead in the structural transformation process benefited more from the increase in Market Access than places more specialized in agriculture. Therefore, those places are the ones to draw migrants. Our approach cannot disentangle them, but both likely play an important role in migration location decisions.

Additionally, we show that migration was concentrated in places specialized in lumber and wood products. This result is interesting since, anecdotally, one of the sectors that took advantage of lower transportation costs due to the Panama Canal was precisely lumber (Rockwell, 1971). Moreover, (Wright, 1986, p. 203) identifies the lumber industry as the second most important employer of black workers after agriculture. Columns (7) and (8) show that precisely the effects of increased Market Access on migration were higher in places where the lumber industry employed more workers than the average in 1900.

5 Conclusion

The Great Migration significantly changed American demography. Previous contributions highlighted that migrants and receiving localities were affected. The results from this episode in American history have considerable implications for how we understand current racial gaps in economic and political outcomes. We contribute to these lines of research by highlighting how migrants chose where to move. Specifically, we focus on how exposure to markets, by dynamizing labor markets, served as a pull factor during the Great Migration. We exploit the Panama Canal opening as a historical coincidence. With the migration wave already under way, we ask whether places that benefitted more from the Canal received a systematically higher influx of migrants.

We find that changes in Market Access due to the Panama Canal increased the migration of African Americans during the first wave of the Great Migration out of the American South. These effects go beyond what pre-existing migrant networks would predict and do not extend to Southern-born whites or European migrants. Despite the simultaneous occurrence of another Great Migration, we find that the improved economic opportunity brought by the Canal led to differential migration by these two ethnic groups. Our findings are stronger for counties that were ahead in the process of structural transformation and for those that specialized more in lumber industry, which was the second largest employer of Southern African Americans. Taken together, our results suggest that the opening of the Panama Canal had a relevant role in shaping the location of the African American population in the United States over the twentieth century.

References

R. Abramitzky, P. Ager, L. P. Boustan, E. Cohen, and C. W. Hansen. The Effects of Immigration on the Economy: Lessons from the 1920s Border Closure, Dec. 2019.

S. Asher and P. Novosad. Rural Roads and Local Economic Development. *American Economic Review*, 110(3):797–823, Mar. 2020.

J. Atack, F. Bateman, M. Haines, and R. A. Margo. Did Railroads Induce or Follow Economic Growth?: Urbanization and Population Growth in the American Midwest, 1850–1860. *Social Science History*, 34(2):171–197, 2010. Publisher: Cambridge University Press.

C. Baran, E. Chyn, and B. A. Stuart. The Great Migration and Educational Opportunity. *Philadelphia FED WP 22-04*, page 89, 2022.

S. Bazzi, A. Ferrara, M. Fiszbein, T. P. Pearson, and P. A. Testa. The Other Great Migration: Southern Whites and the New Right, Nov. 2021.

D. A. Black, S. G. Sanders, E. J. Taylor, and L. J. Taylor. The Impact of the Great Migration on Mortality of African Americans: Evidence from the Deep South. *The American Economic Review*, 105(2):477–503, Feb. 2015.

L. Boustan and M. Tabellini. Black Out-Migration and Southern Political Realignment. *Working Paper, Harvard Business School*, 2018.

L. P. Boustan. Competition in the Promised Land: Black Migration and Racial Wage Convergence in the North, 1940-1970. *The Journal of Economic History*, 69(3):755–782, 2009. Publisher: [Economic History Association, Cambridge University Press].

L. P. Boustan. Was Postwar Suburbanization "White Flight"? Evidence from the Black Migration. *The Quarterly Journal of Economics*, 125(1):417–443, Feb. 2010. Publisher: MIT Press.

L. P. Boustan. *Competition in the Promised Land: Black Migrants in Northern Cities and Labor Markets*. Princeton University Press, Oct. 2016.

E. Bracco, M. De Paola, C. P. Green, and V. Scoppa. The effect of far right parties on the location choice of immigrants: Evidence from Lega Nord Mayors. *Journal of Public Economics*, 166:12–26, Oct. 2018.

A. Calderon, V. Fouka, and M. Tabellini. Racial Diversity and Racial Policy Preferences: The Great Migration and Civil Rights. *Review of Economic Studies*, page 55, 2022.

F. Campo, M. Mendola, A. Morrison, and G. Ottaviano. Talents and Cultures: Immigrant Inventors and Ethnic Diversity in the Age of Mass Migration. *Journal of the European Economic Association*, 20(5):1971–2012, Oct. 2022.

W. J. Carrington, E. Detragiache, and T. Vishwanath. Migration with Endogenous Moving Costs. *The American Economic Review*, 86(4):909–930, Sept. 1996.

W. J. Collins. When the Tide Turned: Immigration and the Delay of the Great Black Migration. *The Journal of Economic History*, 57(3):607–632, 1997. Publisher: Cambridge University Press.

W. J. Collins and M. H. Wanamaker. Selection and Economic Gains in the Great Migration of African Americans: New Evidence from Linked Census Data. *American Economic Journal: Applied Economics*, 6(1):220–252, Jan. 2014.

W. J. Collins and M. H. Wanamaker. The Great Migration in Black and White: New Evidence on the Selection and Sorting of Southern Migrants. *The Journal of Economic History*, 75(4):947–992, Dec. 2015. Publisher: Cambridge University Press.

J. Crawford. Working the Quincy Mill: African American lumber mill workers in Northern California, 1926-1955, 2008. URL https://www.blackpast.org/african-american-history/working-quincy-mill-african-american-lumber-mill-workers-northern-california-1926-195

E. Derenoncourt. Can You Move to Opportunity? Evidence from the Great Migration. *American Economic Review*, 112(2):369–408, Feb. 2022.

D. Donaldson. Railroads of the Raj: Estimating the Impact of Transportation Infrastructure. *American Economic Review*, 108(4-5):899–934, Apr. 2018.

D. Donaldson and R. Hornbeck. Railroads and American Economic Growth: A "Market Access" Approach. *The Quarterly Journal of Economics*, 131(2):799–858, May 2016.

G. Duranton, P. M. Morrow, and M. A. Turner. Roads and Trade: Evidence from the US. *The Review of Economic Studies*, 81(2):681–724, Apr. 2014.

F. Eckert, A. Gvirtz, J. Liang, and M. Peters. A method to construct geographical crosswalks with an application to us counties since 1790. Technical report, National Bureau of Economic Research, 2020.

K. Eriksson. Moving North and into jail? The great migration and black incarceration. *Journal of Economic Behavior & Organization*, 159:526–538, Mar. 2019.

K. Eriksson and G. Niemesh. Death in the Promised Land: The Great Migration and Black Infant Mortality. *SSRN Electronic Journal*, 2016.

S. Galiani, L. F. Jaramillo, and M. Uribe-Castro. Free-Riding Yankees: Canada and the Panama Canal, Aug. 2022.

P. Gottlieb. *Making Their Own Way: Southern Blacks' Migration to Pittsburgh, 1916-30*. University of Illinois Press, 1997.

J. Grogger and G. H. Hanson. Income maximization and the selection and sorting of international migrants. *Journal of Development Economics*, 95(1):42–57, May 2011.

J. R. Grossman. *Land of Hope: Chicago, Black Southerners, and the Great Migration*. University of Chicago Press, Mar. 2011.

R. Hornbeck and S. Naidu. When the Levee Breaks: Black Migration and Economic Development in the American South. *The American Economic Review*, 104(3):963–990, Mar. 2014.

R. Hornbeck and M. Rotemberg. Railroads, Reallocation, and the Rise of American Manufacturing. Working Paper 26594, National Bureau of Economic Research, 2021. Series: Working Paper Series.

T. Jaworski and C. T. Kitchens. National Policy for Regional Development: Historical Evidence from Appalachian Highways. *The Review of Economics and Statistics*, 101(5):777–790, Dec. 2019.

G. Khanna, W. Liang, A. M. Mobarak, and R. Song. The Productivity Consequences of Pollution-Induced Migration in China, Jan. 2021.

R. A. Margo. "To the Promised Land": Education and the Black Exodus. In *Race and Schooling in the South, 1880-1950: An Economic History*, pages 109–128. University of Chicago Press, Jan. 1990.

P. A. Marsh. A Black Logger's Journey: Jackson Parish, Louisiana, to Wallowa County, Oregon. *Oregon Historical Quarterly*, 116(4):500–521, 2015.

N. Maurer and C. Yu. What T. R. Took: The Economic Impact of the Panama Canal, 1903–1937. *The Journal of Economic History*, 68(3):686–721, Sept. 2008. doi: 10.1017/S0022050708000612.

S. Maurer and F. Rauch. Economic Geography Aspects of the Panama Canal. 2020.

G. Michaels. The Effect of Trade on the Demand for Skill: Evidence from the Interstate Highway System. *The Review of Economics and Statistics*, 90(4):683–701, Nov. 2008.

M. Morten and J. Oliveira. The Effects of Roads on Trade and Migration: Evidence from a Planned Capital City, 2018.

C. Muller. Northward Migration and the Rise of Racial Disparity in American Incarceration, 1880–1950. *American Journal of Sociology*, 118(2):281–326, Sept. 2012.

C. R. Parsons, T. Reysenbach, and J. Wahba. Network Sorting and Labor Market Outcomes: Evidence from the Chaotic Dispersal of the Viet Kieu, Dec. 2020.

S. Redding and A. J. Venables. Economic geography and international inequality. *Journal of International Economics*, 62(1):53–82, Jan. 2004.

A. E. Rockwell. The Lumber Trade and the Panama Canal, 1921-1940. *The Economic History Review*, 24(3):445–462, 1971. Publisher: [Economic History Society, Wiley].

A. Shertzer and R. P. Walsh. Racial Sorting and the Emergence of Segregation in American Cities. *The Review of Economics and Statistics*, 101(3):415–427, July 2019.

B. A. Stuart and E. J. Taylor. Migration Networks and Location Decisions: Evidence from US Mass Migration. *American Economic Journal: Applied Economics*, 13(3):134–175, July 2021.

M. Tabellini. Racial Heterogeneity and Local Government Finances: Evidence from the Great Migration. *SSRN Electronic Journal*, 2019.

I. Wilkerson. *The Warmth of Other Suns: The Epic Story of America's Great Migration*. Penguin UK, Aug. 2020.

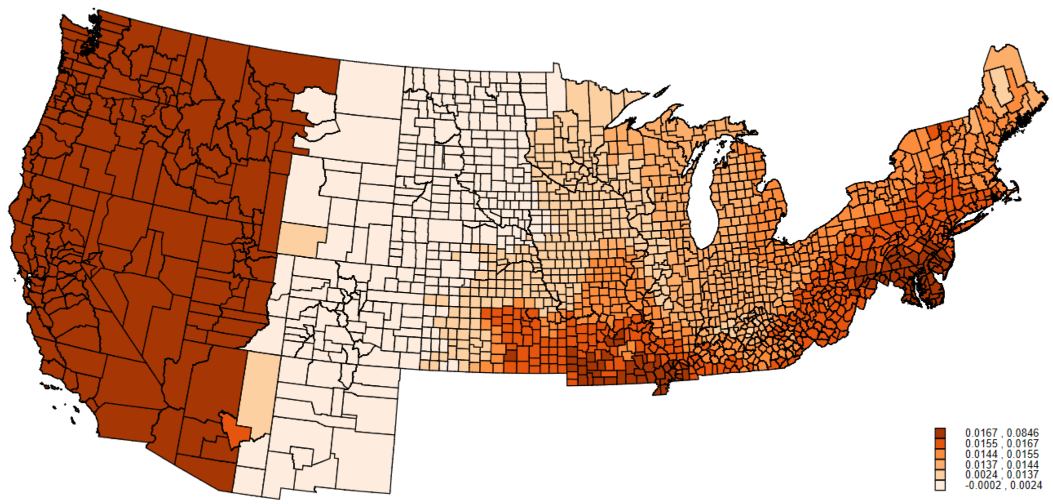
J. G. Williamson. *Trade and Poverty: When the Third World Fell Behind*. MIT Press, Jan. 2013.

G. Wright. *Old South, New South: Revolutions In The Southern Economy Since The Civil War*. Basic Books, Jan. 1986.

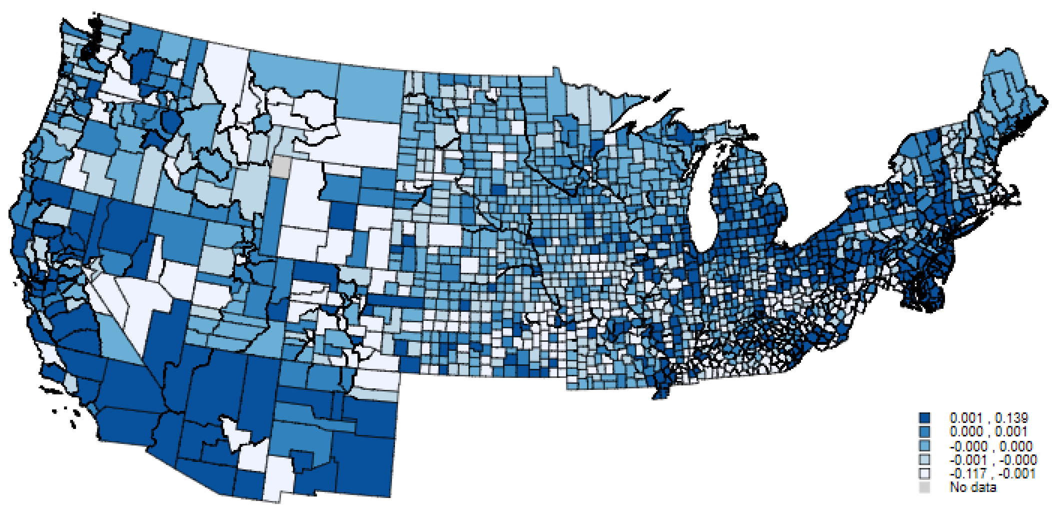
Figures and Tables

Figure 1: Market Access due to the Panama Canal and First Great Migration

(a) Change in Market Access due to the Panama Canal



(b) Δ African Americans Born in Southern States Share of Total Pop., 1940-1910



Note: Figure (a) shows the variation in Market Access gains in 1920 due to the Panama Canal opening. Gains in Market Access in 1920 are the difference between actual Market Access and counterfactual Market Access if trade routes through the Panama Canal did not exist in 1920. For more details see Section 3.1. Figure (b) shows the 1910 to 1940 change in the African American population born in Southern States living in non-Southern counties.

Table 1: Panama Canal and Migration of Southern Born African Americans

Dependent Variable:	African Americans Born in the South as Share of 1900 Tot. Population			
	(1)	(2)	(3)	(4)
Panel A: Year Dummies $\times \Delta Ln(MA_{1920})$				
1900 $\times \Delta Ln(MA_{1920})$	0.030		0.006	
	(0.025)		(0.071)	
1910 $\times \Delta Ln(MA_{1920})$	0.010	0.011	-0.013	-0.008
	(0.022)	(0.022)	(0.062)	(0.061)
1930 $\times \Delta Ln(MA_{1920})$	0.103***	0.102***	0.158**	0.155**
	(0.034)	(0.034)	(0.073)	(0.073)
1940 $\times \Delta Ln(MA_{1920})$	0.154***	0.155***	0.266**	0.272**
	(0.047)	(0.047)	(0.119)	(0.119)
N	6,125	4,900	6,125	4,900
Mean Dep. Var.	0.485	0.554	0.485	0.554
Year FE	X	X		
County FE	X	X	X	X
State x Year FE			X	X
Predicted Mig.		X		X
Coord. Poly.	X	X		
r2	0.745	0.831	0.749	0.833
Panel B: After 1920 Dummy $\times \Delta Ln(MA_{1920})$				
After$_{1920}$ $\times \Delta Ln(MA_{1920})$	0.115***	0.123***	0.215*	0.217**
	(0.043)	(0.041)	(0.114)	(0.106)
N	6,125	4,900	6,125	4,900
Mean Dep. Var.	0.485	0.554	0.485	0.554
Year FE	X	X		
County FE	X	X	X	X
State x Year FE			X	X
Predicted Mig.		X		X
Coord. Poly.	X	X		
r2	0.858	0.881	0.859	0.883

Note: Dependent variable for all specifications is the number of African Americans born in the South living on each non-Southern county for each decade between 1900 and 1940 divided by total population in 1900. Coefficients are standardized for moving from the 25th to the 75th percentiles in the distribution of gains in market access in 1920. Columns (1) and (2) control for a second order polynomial on latitude and longitude, interacted with year dummies. Predicted Migration is estimated using the 1900 share of African Americans born in each Southern state and the change in Southern born African Americans living outside the South between Census. All specifications control for total population and total black population in 1900, each interacted with year dummies. In Panel B, After$_{1920}$ is a dummy variable equal to one from 1920 onwards. Standard errors clustered at 300km x 300km cells from an arbitrary grid in parenthesis. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 2: Gains from Panama Canal Are Not Related to 1900, 1910, 1920 Characteristics

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Dep. Var:	% Black	% Southern Black	% Southern White	% European	Urban Share	Literacy Rate	Share of Labor Force in... Agric.	Manuf.	Serv.	Lumber
					Panel A: 1900 Census					
$\Delta Ln(MA_{1920})$	0.090	0.037	0.026	-0.068	0.006	0.003	-0.001	-0.000	-0.001	0.000
	(0.083)	(0.036)	(0.158)	(0.189)	(0.006)	(0.002)	(0.001)	(0.001)	(0.001)	(0.000)
N	1,224	1,224	1,224	1,224	1,224	1,224	1,224	1,224	1,224	1,224
Mean Dep. Var.	3.086	0.407	2.163	9.427	0.220	0.919	0.169	0.024	0.086	0.004
r2	0.507	0.086	0.344	0.610	0.548	0.586	0.590	0.581	0.554	0.287
					Panel B: 1910 Census					
$\Delta Ln(MA_{1920})$	-0.065	0.007	0.055	-0.183	0.007	0.003	-0.021**	-0.001	-0.007	0.000
	(0.109)	(0.042)	(0.106)	(0.202)	(0.006)	(0.002)	(0.008)	(0.001)	(0.004)	(0.000)
N	1,224	1,224	1,224	1,224	1,224	1,224	1,224	1,224	1,224	1,224
Mean Dep. Var.	2.960	0.402	2.101	9.220	0.265	0.943	0.166	0.033	0.101	0.006
r2	0.496	0.111	0.358	0.592	0.626	0.550	0.619	0.540	0.542	0.325
					Panel C: 1920 Census					
$\Delta Ln(MA_{1920})$	-0.034	-0.002	0.214**	-0.090	0.010	0.002	-0.029	-0.002	-0.011	0.000
	(0.091)	(0.042)	(0.095)	(0.154)	(0.008)	(0.001)	(0.023)	(0.002)	(0.008)	(0.000)
N	1,224	1,224	1,224	1,224	1,224	1,224	1,224	1,224	1,224	1,224
Mean Dep. Var.	3.372	0.836	2.284	7.517	0.296	0.960	0.228	0.053	0.139	0.005
r2	0.406	0.153	0.401	0.603	0.640	0.571	0.223	0.397	0.351	0.397

Note: Coefficients are standardized for moving from the 25th to the 75th percentiles in the distribution of gains in market access in 1920. All specifications include State fixed effects and control for log population and log urban population. Specifications in Panel A, B and C are identical except for that they use data from 1900, 1910, and 1920, respectively. Standard errors clustered at the State level are shown in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 3: Panama Canal and Migration By Group

Dep. Var:	% Southern Black		% Southern White		% European	
	(1)	(2)	(3)	(4)	(5)	(6)
1900 $\times \Delta Ln(MA_{1920})$	0.030	0.006	0.101***	-0.108	0.029	0.127**
	(0.025)	(0.071)	(0.028)	(0.071)	(0.042)	(0.064)
1910 $\times \Delta Ln(MA_{1920})$	0.010	-0.013	0.063***	-0.091**	-0.039	0.003
	(0.022)	(0.062)	(0.019)	(0.045)	(0.030)	(0.049)
1930 $\times \Delta Ln(MA_{1920})$	0.103***	0.158**	0.008	-0.001	-0.019	-0.011
	(0.034)	(0.073)	(0.013)	(0.026)	(0.018)	(0.032)
1940 $\times \Delta Ln(MA_{1920})$	0.154***	0.266**	0.075***	0.069*	-0.057*	-0.027
	(0.047)	(0.119)	(0.023)	(0.036)	(0.030)	(0.043)
N	6,125	6,125	8,729	8,729	8,733	8,733
Mean Dep. Var.	0.485	0.476	1.957	1.953	10.763	10.766
Year FE	X		X		X	
County FE	X	X	X	X	X	X
State x Year FE		X		X		X
Coord. Poly.	X		X		X	
r2	0.745	0.749	0.921	0.934	0.934	0.944

Note: Coefficients are standardized for moving from the 25th to the 75th percentiles in the distribution of gains in market access in 1920. Standard errors clustered at 300km x 300km cells from an arbitrary grid in parenthesis. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 4: Heterogeneity by 1900 Characteristics

Dep. Variable:	African Americans Born in Southern States as % of Population											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Sample 1900:	Agric. Workers		Manuf. Workers		Service Workers		Lumber Workers		Urban Pop.		Unemployment	
Below or Above Median?	Below	Above	Below	Above	Below	Above	Below	Above	Below	Above	Below	Above
$1900 \times \Delta Ln(MA_{1920})$	-0.006	0.027	0.028*	-0.048	0.016	0.017	0.002	-0.042	0.021	0.101	-0.018	-0.007
	(0.067)	(0.017)	(0.016)	(0.085)	(0.020)	(0.068)	(0.024)	(0.078)	(0.055)	(0.104)	(0.060)	(0.012)
$1910 \times \Delta Ln(MA_{1920})$	-0.011	-0.009	0.011	-0.059	0.015	-0.009	-0.018	-0.047	-0.010	0.144	-0.025	-0.009
	(0.061)	(0.014)	(0.013)	(0.074)	(0.015)	(0.062)	(0.019)	(0.069)	(0.049)	(0.098)	(0.052)	(0.011)
$1930 \times \Delta Ln(MA_{1920})$	0.189**	-0.008	-0.018	0.236**	0.038	0.132*	0.003	0.207**	0.037	0.326**	0.146**	0.000
	(0.077)	(0.034)	(0.023)	(0.104)	(0.042)	(0.067)	(0.039)	(0.094)	(0.035)	(0.161)	(0.067)	(0.009)
$1940 \times \Delta Ln(MA_{1920})$	0.317**	0.036	0.012	0.400**	0.073**	0.253**	0.058	0.339**	0.082**	0.529**	0.260**	-0.004
	(0.129)	(0.042)	(0.016)	(0.180)	(0.035)	(0.110)	(0.053)	(0.161)	(0.038)	(0.259)	(0.107)	(0.008)
N	4,370	4,380	4,370	4,375	4,365	4,375	4,370	4,380	4,550	4,200	4,375	4,365
Mean Dep. Var.	0.408	0.273	0.187	0.495	0.298	0.384	0.242	0.440	0.246	0.444	0.496	0.186
r2	0.691	0.800	0.659	0.780	0.764	0.711	0.641	0.789	0.755	0.728	0.771	0.689

Note: Dependent variable for all specifications is the number of African Americans born in the South living on each non-Southern county for each decade between 1900 and 1940 divided by total population in 1900. Coefficients are standardized for moving from the 25th to the 75th percentiles in the distribution of gains in market access in 1920. Columns vary by the sample of counties they include. Columns divide counties in groups above and below the median value in 1900 of counties' characteristics given in Row 3. For instance, Column (2) focuses on counties with agricultural share of the labor force below the 1900 median. All specifications include county and year fixed effects and control for 1900 total and black population, both interacted with year dummies. Standard errors clustered at 300km x 300km cells from an arbitrary grid in parenthesis. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Online Appendix

Appendix A Supporting Figures and Tables

Table A.1: Main Results Including All Non-Southern Counties

Dependent Variable:	African Americans Born in the South as Share of 1900 Tot. Population			
	(1)	(2)	(3)	(4)
1900 $\times \Delta Ln(MA_{1920})$	0.022		0.012	
	(0.015)		(0.043)	
1910 $\times \Delta Ln(MA_{1920})$	0.009	0.011	-0.003	0.002
	(0.014)	(0.014)	(0.037)	(0.036)
1930 $\times \Delta Ln(MA_{1920})$	0.061***	0.060***	0.086*	0.082*
	(0.022)	(0.022)	(0.047)	(0.046)
1940 $\times \Delta Ln(MA_{1920})$	0.104***	0.105***	0.169**	0.174**
	(0.031)	(0.031)	(0.074)	(0.074)
N	8,783	7,031	8,778	7,027
Mean Dep. Var.	0.347	0.404	0.341	0.397
Year FE	X	X		
County FE	X	X	X	X
State x Year FE			X	X
Predicted Mig.		X		X
Coord. Poly.	X	X		
r2	0.746	0.830	0.749	0.833

Note: Dependent variable for all specifications is the number of African Americans born in the South living on each non-Southern county for each decade between 1900 and 1940. Coefficients are standardized for moving from the 25th to the 75th percentiles in the distribution of gains in market access in 1920. All columns include a dummy variable equal to one if the number of Southern African Americans in 1900 is higher than 0, interacted with year dummies. Columns (1) and (2) control for a second order polynomial on latitude and longitude, interacted with year dummies. Predicted Migration is estimated using the 1900 share of African Americans born in each Southern state and the change in Southern born African Americans living outside the South between Census. All specifications control for total population and total black population in 1900, each interacted with year dummies. Standard errors clustered at 300km x 300km cells from an arbitrary grid in parenthesis. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

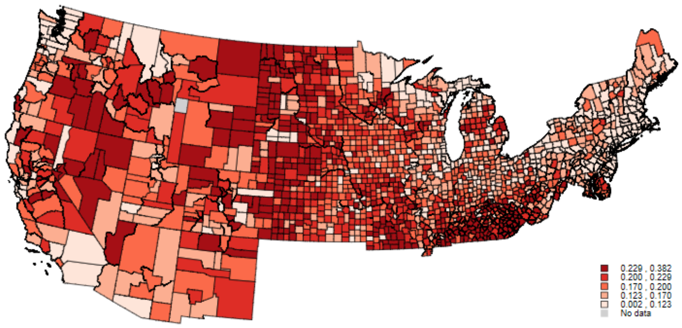
Table A.2: Robustness Check: Different Estimates of MA

Dependent Variable:	African Americans Born in the South as Share of Tot. Population					
	(1)	(2)	(3)	(4)	(5)	(6)
MA Estimate	Main	Fixed Pop. 1910	$\bar{P} = 35.7$ $\theta = 1$	$\theta = 9$	$\theta = 2.79$ $\bar{P} = 17.5$	$\bar{P} = 71$
1900 $\times \Delta Ln(MA_{1920})$	0.006	0.006	0.004	0.009	0.008	0.004
	(0.071)	(0.060)	(0.062)	(0.088)	(0.060)	(0.084)
1910 $\times \Delta Ln(MA_{1920})$	-0.013	-0.010	-0.014	-0.013	-0.011	-0.015
	(0.062)	(0.052)	(0.054)	(0.077)	(0.052)	(0.073)
1930 $\times \Delta Ln(MA_{1920})$	0.158**	0.126**	0.140**	0.194**	0.124**	0.200**
	(0.073)	(0.061)	(0.065)	(0.090)	(0.061)	(0.089)
1940 $\times \Delta Ln(MA_{1920})$	0.266**	0.217**	0.234**	0.329**	0.212**	0.334**
	(0.119)	(0.100)	(0.105)	(0.147)	(0.099)	(0.144)
N	6,120	6,120	6,120	6,120	6,120	6,120
Mean Dep. Var.	0.476	0.476	0.476	0.476	0.476	0.476
r2	0.749	0.748	0.748	0.749	0.748	0.749

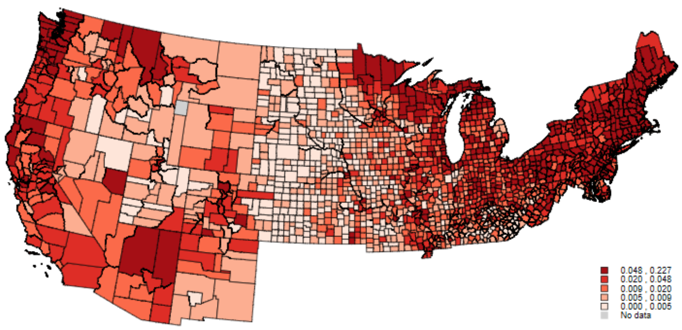
Note: Dependent variable for all specifications is the number of African Americans born in the South living on each non-Southern county for each decade between 1900 and 1940 divided by total population in 1900. Coefficients are standardized for moving from the 25th to the 75th percentiles in the distribution of gains in market access in 1920. All specifications include county and state by year fixed effects. Column (1) reproduces main results from Table 1-Column (3). Column (2) uses a measure of changes in MA driven by the canal that fixes population at 1910 (pre canal) levels. Columns (3) and (4) use extreme parameters of θ, while leaving $\bar{P}$ fixed at the same value than Column (1). Columns (5) and (6) fix θ at the same value of Column (1) and show results for extreme values of $\bar{P}$. Standard errors clustered at 300km x 300km cells from an arbitrary grid in parenthesis. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure A.1: County-level Economic Structure, 1910

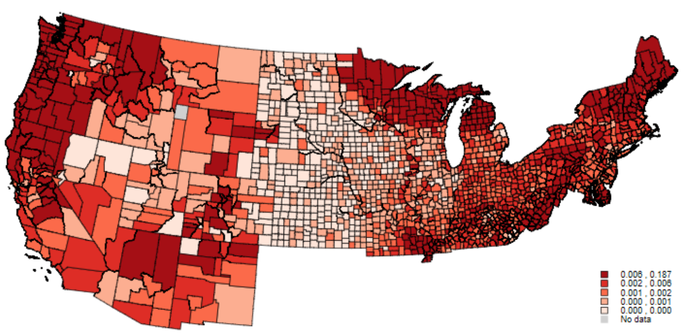
(a) Agricultural Workers (Share of Population)



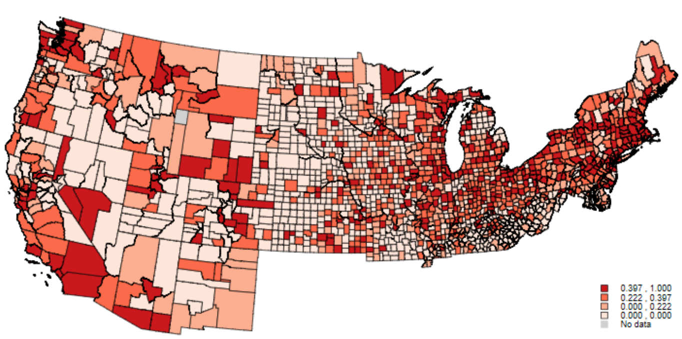
(b) Manufacturing Workers (Share of Population)



(c) Lumber and Wood Products Workers (Share of Population)



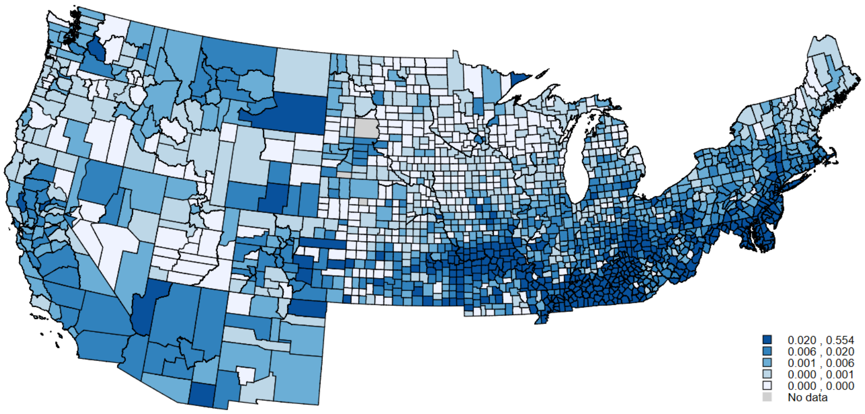
(d) Urban Population (Share of Population)



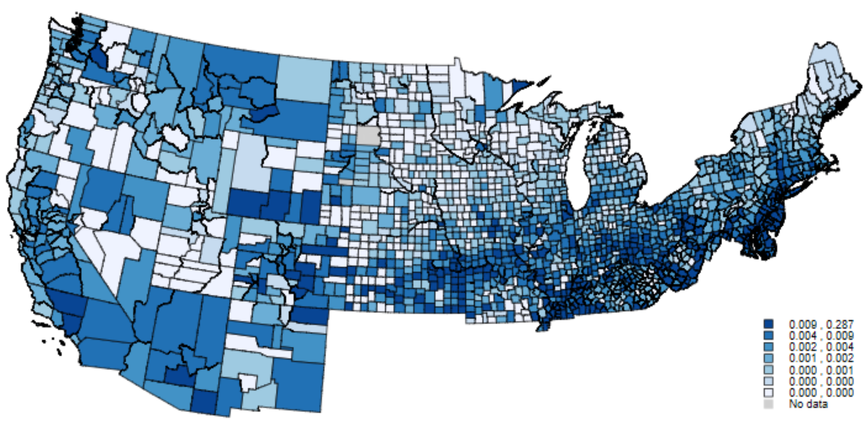
Note: All figures come from 1910 Census of Population. Notice color categories vary by subfigure.

Figure A.2: African American Population in 1900

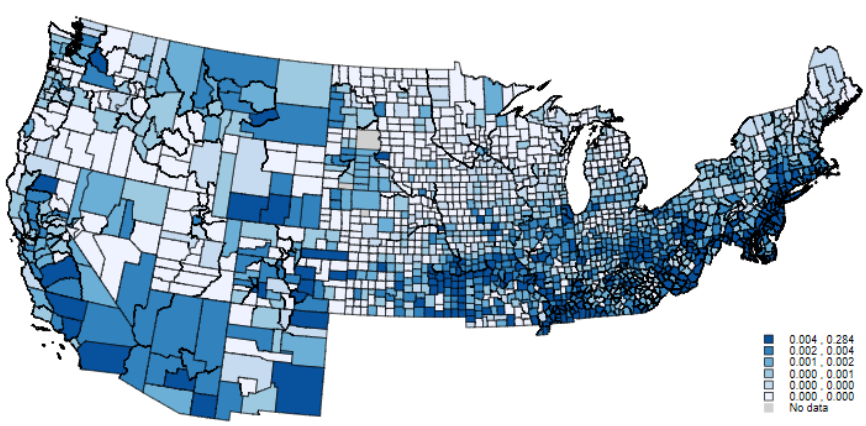
(a) African Americans (Share of Total Population)



(b) African Americans Born out of State (Share of Total Population)



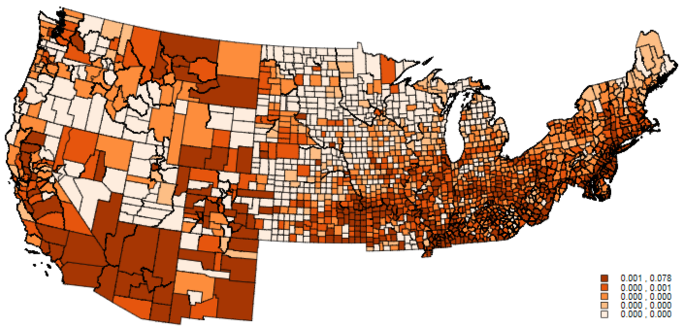
(c) African Americans Born in Southern States (Share of Total Population)



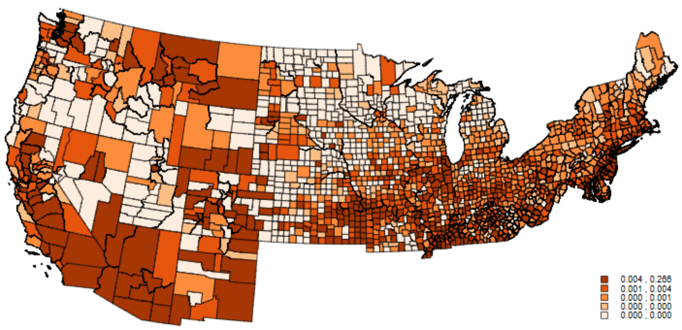
Note: All sub-figures are from the 1900 full-count census data. Notice the color categories are not uniform between the sub-figures.

Figure A.3: Predicted Migration of Southern African-Americans by Decade

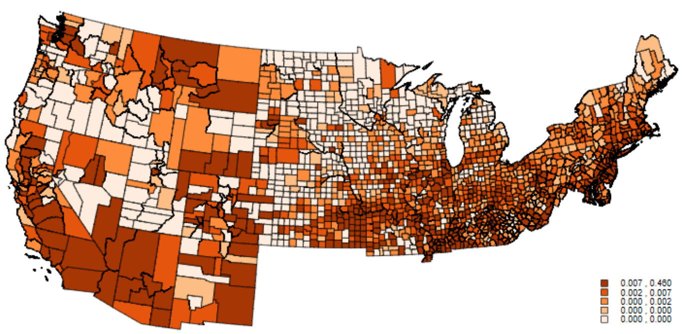
(a) 1910-1900



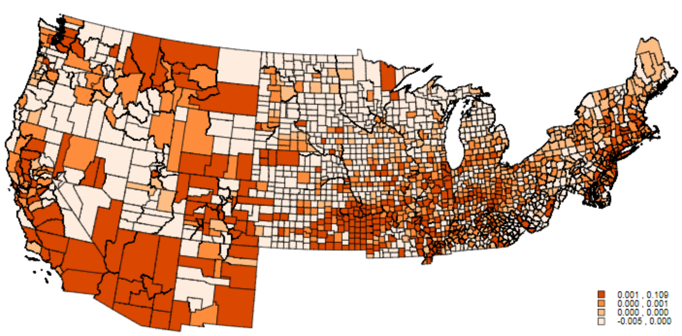
(b) 1920-1910



(c) 1930-1920

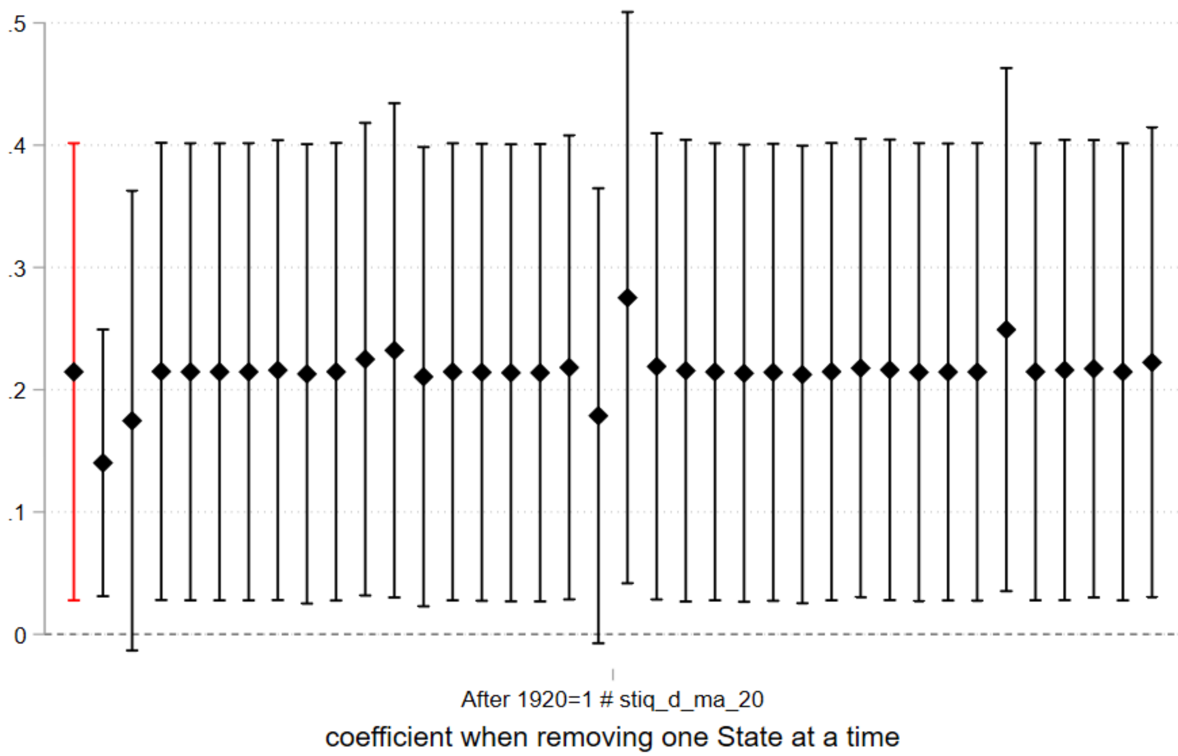


(d) 1940-1930



Note: Predicted migration to county c is given by the sum over all Southern states of the share of African Americans born in State j in 1900 multiplied by each decade's change in African Americans born in Southern State j living outside the South. Notice the color categories are not uniform between the sub-figures.

Figure A.4: Main Result: Robustness to Removing One State at a Time



Note: Figure shows the coefficients and 90% confidence intervals from regressions of the percentage of Southern born African Americans After$_{1920} \times \Delta Ln(MA_{1920})$ controlling for county and state by year fixed effects. Coefficients vary in the underlying sample. First one from left to right (in red) comes from Table 1, Panel B, Column (3). The rest of the coefficients come from regressions where one State is left out. From left to right: Arizona, California, Colorado, Connecticut, Delaware, DC, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, New York, North Dakota, Ohio, Oregon, Pennsylvania, Rhode Island, South Dakota, Utah, Vermont, Washington, West Virginia, Wisconsin, Wyoming.

Table A.3: Panama Canal and Migration of Southern Born Whites

Dependent Variable:	Whites Born in the South as Share of 1900 Tot. Population			
	(1)	(2)	(3)	(4)
Panel A: Year Dummies $\times \Delta Ln(MA_{1920})$				
1900 $\times \Delta Ln(MA_{1920})$	0.101***		-0.108	
	(0.028)		(0.071)	
1910 $\times \Delta Ln(MA_{1920})$	0.063***	0.062***	-0.091**	-0.095**
	(0.019)	(0.019)	(0.045)	(0.046)
1930 $\times \Delta Ln(MA_{1920})$	0.008	0.010	-0.001	0.003
	(0.013)	(0.013)	(0.026)	(0.026)
1940 $\times \Delta Ln(MA_{1920})$	0.075***	0.079***	0.069*	0.075**
	(0.023)	(0.023)	(0.036)	(0.036)
N	8,729	6,983	8,729	6,983
Mean Dep. Var.	1.957	1.946	1.953	1.941
Year FE	X	X		
County FE	X	X	X	X
State x Year FE			X	X
Predicted Mig.		X		X
Coord. Poly.	X	X		
r2	0.920	0.943	0.934	0.951
Panel B: After 1920 Dummy $\times \Delta Ln(MA_{1920})$				
$After_{1920} \times \Delta Ln(MA_{1920})$	-0.013	0.013	0.100**	0.086**
	(0.021)	(0.018)	(0.048)	(0.038)
N	8,729	6,983	8,729	6,983
Mean Dep. Var.	1.957	1.946	1.953	1.941
Year FE	X	X		
County FE	X	X	X	X
State x Year FE			X	X
Predicted Mig.		X		X
Coord. Poly.	X	X		
r2	0.919	0.942	0.934	0.950

Note: Dependent variable for all specifications is the number of Whites born in the South living on each non-Southern county for each decade between 1900 and 1940. Coefficients are standardized for moving from the 25th to the 75th percentiles in the distribution of gains in market access in 1920. Columns (1) and (2) control for a second order polynomial on latitude and longitude, interacted with year dummies. Predicted Migration is estimated using the 1900 share of Whites born in each Southern state and the change in Southern born Whites living outside the South between Census. All specifications control for total population and total black population in 1900, each interacted with year dummies. In Panel B, $After_{1920}$ is a dummy variable equal to one from 1920 onwards. Standard errors clustered at 300km x 300km cells from an arbitrary grid in parenthesis. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$