Engines of Uplift: The Local Returns of HBCUs for Black Americans in the South, 1870–1940[*]

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December 11, 2025

[PRELIMINARY DRAFT]

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Abstract

We assess the causal impact of Historically Black Colleges and Universities (HBCUs) on the educational and occupational outcomes of Black Americans in the U.S. South from 1870 to 1940. Drawing on digitized data on HBCU founding dates and locations, combined with full-count U.S. census records, we implement a staggered difference-in-differences approach to compare counties that had an HBCU opening with those that did not. We find that the establishment of HBCUs improved educational outcomes for Black Americans and helped reduce racial disparities in school attendance and literacy. HBCUs also contributed to increased occupational skill levels, facilitating a shift away from agricultural employment toward higher-skilled occupations. The findings highlight the crucial role of HBCUs in advancing Black socioeconomic mobility in the postbellum South.

JEL Codes: I23, J15, J24, N31, N32

[*]We thank the outstanding research assistance from Sihan Mao. Hung acknowledges generous financial support from the National Science and Technology Council (NSTC 114-2410-H-194-003).

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1 Introduction

Historically Black Colleges and Universities (HBCUs) have long been central to higher education in the Black American community. In 2021, Black students accounted for 75% of HBCU enrollment. Although these institutions enroll only around 1.5% of all U.S. college students, they educate nearly 9% of all Black college students nationwide. HBCUs have an impressive record of producing influential Black leaders across diverse fields, including W. E. B. Du Bois (Wilberforce), Spike Lee (Morehouse College), Martin Luther King, Jr. (Morehouse College), and Kamala Harris (Howard University). Although recent research has explored the contemporary challenges of HBCUs, their profound historical influence, particularly during periods when Black Americans faced considerable obstacles to education and upward mobility, remains an essential yet often overlook part of American history.

This paper examines the causal effect of HBCU expansion on the educational and occupational outcomes of Black Americans who grew up in the U.S. South between the late nineteenth and early twentieth centuries. Specifically, we analyze how the establishment of an HBCU within an individual's home county influenced access to education. Following the empirical strategies of Card (1999) and Currie and Moretti (2003), we leverage the geographically uneven expansion of HBCUs to estimate how increased access to higher education influenced later educational and labor market outcomes.

According to the Higher Education Act of 1965, HBCUs are defined as institutions established before 1964 with the primary mission of educating Black Americans. Following the Civil War, philanthropic groups, religious organizations, and the Freedmen's Bureau—a federal body tasked with supporting newly emancipated Black individuals—led to the rapid expansion of HBCUs, especially during the Reconstruction era. The Morrill Act of 1890 further accelerated this growth by creating land-grant colleges for Black students. Nearly three-quarters of all HBCUs were founded between 1865 and 1910. Using data on this expansion and full-count U.S. census records, we investigate how HBCU openings between 1870 and 1910 shaped county-level educational and occupational outcomes for Black Americans from 1870 through 1940.

To estimate these effects, we draw on within-county variation in educational and occupational outcomes observed before and after the establishment of an HBCU. Our design exploits cross-county comparisons between counties that have ever hosted an HBCU and those that have not. We include county and year fixed effects to account for unobserved factors. To address potential biases that arise from staggered timing in event studies, we use the estimator proposed by Callaway and Sant'Anna (2021).

HBCU establishments are not random; historical narratives emphasize the pivotal influence of northern churches and philanthropies in determining their locations. Although the panel de-

sign can account for time-invariant county attributes and period-specific common shocks, differences in confounders may place counties with and without HBCUs on divergent long-run trajectories. To address this concern, we construct a matched sample using several county characteristics as of 1870, especially those factors highlighted in historical accounts.

Our findings reveal a positive association between the establishment of HBCUs and educational outcomes for Black Americans at the county level. Restricting the analysis to individuals who continuously resided in the same county over the preceding decade, we find a statistically significant and substantial effect on school enrollment for Black youth: the attendance rates rise by 1.4 and 0.6 percentage points for the 18-21 and 22-25 age groups, representing 17% and 40% improvements relative to the mean attendance in control counties, respectively. These effects correspond to roughly 8-19% of the school attendance gains observed among rural Black Americans aged 7-17 residing in counties with Rosenwald schools, as estimated by Aaronson and Mazumder (2011).

The establishment of HBCUs also enhanced Black Americans' occupational status. In counties hosting HBCUs, average occupation scores increased by 19.5% relative to the mean in control counties. HBCU openings induced a notable shift away from the agricultural sector. Specifically, the share of Black workers in farming declined by 3.7 percentage points (or 7.3% of the control mean). The impact is noteworthy, considering that, between 1870 and 1940, the share of Black Americans employed in agriculture ranged from 45% to 73%. Concurrently, HBCUs facilitated a reallocation toward non-agricultural sectors, as the shares of high-skilled workers (professionals, technicians, clerical, sales, and craftsmen) significantly increased by 16.1%. Although the estimated effect on the share of unskilled workers is imprecise, its magnitude remains nontrivial. Share of unskilled workers (operatives, laborers, and service workers) in counties with HBCUs was 6.8% higher than in counties that never hosted an HBCU.

Our results are not predominantly driven by in-migration. While HBCUs may have attracted higher-skilled individuals, potentially inflating our estimated effects, our results remain robust even after controlling for population growth as well as changes in urbanization and Black population shares. Nonetheless, the effects on occupation scores attenuate by 30%, suggesting a positive selection of Black American in-migrants. To further address concerns of selective migration, we restrict our analysis to individuals who resided in their birth state and to those living continuously in the same counties for at least a decade. The estimated effects remain consistent within these subsets, reinforcing our primary conclusions. Collectively, HBCU establishments not only enhanced the educational and occupational outcomes of local Black residents but also served as a magnet for higher-skilled Black migrants.

We further examine the impact of HBCU establishments on racial inequality in educational

and labor market outcomes. In counties with HBCUs, the disparity in white-Black enrollment rates narrows by 0.5 to 0.9 percentage points, though the estimates are imprecise; these effects roughly mirror 12% to 22% of those found in the Rosenwald school context. While the estimated effect of HBCUs on Black literacy rates is statistically insignificant, access to these institutions substantially reduces the white-Black literacy gap by approximately 7 to 8 percentage points, or 28% to 33% of the average literacy rate in control counties for the 15-25 and 25-35 age groups, respectively. These improvements are particularly meaningful given the severe educational exclusion of Black Southerners in the Antebellum era, when only 16.5% of Black males were literate in 1870.

To our knowledge, this is the first study that estimates the local educational and occupational outcomes for Black Americans exposed to HBCU establishments during the late nineteenth and early twentieth centuries, an era of stark labor market barriers due to discrimination and segregation. The extant literature has primarily centered on the detrimental effects of racial residential segregation on educational outcomes (Cutler and Glaeser, 1997; Card and Rothstein, 2007). These studies show that Black individuals who grew up in more segregated areas are less likely to graduate from college, pursue professional occupations, or achieve higher earnings.

Relatively few studies directly examine the role of HBCUs. Notable exceptions include Fryer and Greenstone (2010), who document diminishing wage returns associated with HBCU attendance from the 1970s through the 1990s. Price et al. (2011) also examine how HBCU enrollment influences labor market outcomes for Black Americans. More recently, evidence presented by Koch and Swinton (2023) suggests that HBCUs enhance upward mobility for low-income and first-generation Black Americans compared with proximate non-HBCUs. Likewise, in the contemporary context, Price and Viceisza (2023) analyze differences in educational, economic, social mobility, and health outcomes among Black Americans attending HBCUs versus non-HBCUs, exploring potential mechanisms for the positive associations between HBCU attendance and subsequent life outcomes after adjusting for college preparedness. Leveraging a large student-level panel dataset tracking Black American students from high school through age 30, Edwards et al. (2025) document positive effects of HBCU enrollment on bachelor's degree completion rates and household income at age 30, arguing that broad-access HBCUs are the primary driver of these gains.

While the broader literature acknowledges the significance of historically Black institutions, it largely concentrates on student selection into HBCUs (Freeman and Thomas, 2002), the economic returns to HBCU attendance (Albritton, 2012; Elu et al., 2019), and the ongoing development of HBCUs (Bracey, 2017; Johnson et al., 2017). By contrast, we illuminate the historical significance of HBCU expansion for Black communities during a critical period of transition and constraint.

2 Background

Drawing on full-count U.S. Census data, over four million enslaved Black Americans lived in Southern states before the Civil War, where laws strictly prohibited them from receiving any form of education. Few secondary and post-secondary educational institutions served Black Americans before the war, and most of those that existed, such as Cheney University, Lincoln University, and Wilberforce University, were located outside the South.[1]

The end of the Civil War expanded educational opportunities for newly freed Black Americans. During the Postbellum era, the Freedmen's Bureau as well as various religious organizations and philanthropists helped establish schools and colleges for Black students in the South (Donohue et al., 2002). Numerous churches and denominations, including the American Baptist Home Mission, the American Missionary Association, the African Methodist Episcopal Church, the Methodist Episcopal Church, and the African American Episcopal Zion Church, were instrumental in creating and supporting Black colleges and universities (Rovaris, 2005). Institutions such as Dillard University, Morehouse College, Spelman College, and Tougaloo College, all of which maintain religious affiliations, initially functioned as seminaries with a strong emphasis on religious education before evolving into colleges that offered agricultural and vocational programs (Redd, 1998; Rovaris, 2005).

Approximately 70% of HBCUs were founded in the three decades following the Civil War. This period saw the establishment of many prominent HBCUs, including Howard University, Morehouse College, Dillard University, and Florida A&M University. At the same time, more than 200 private educational institutions opened in the South to offer basic literacy skills and elementary education to freed Black Americans (Fryer and Greenstone, 2010). These skills were especially crucial because enslaved people in the Antebellum South had been legally denied formal schooling. According to the full-count 1870 Census, only 16.6% of Black Americans aged 16 to 55 in the South were literate, compared with 56.6% of Black Americans living outside the South.

The Morrill Act of 1862 allocated federal land to state governments to establish colleges focused on agriculture and mechanical arts.[2] However, after Reconstruction, Black Americans in Southern states remained largely excluded from these land-grant colleges. To mitigate racial disparities in access to higher education, Congress enacted the Second Morrill Act in 1890, man-

[1] Five institutions were established before the Civil War: Cheney University, University of the District of Columbia, Lincoln University, Wilberforce University, and Harris Teachers College. Notably, the University of the District of Columbia originated as the Normal School for Colored Girls, known as Miner Normal School. It was later consolidated with Teachers College, Federal City College, and Washington Technical Institute in 1977.

[2] The federal government granted each state 30,000 acres for each senator and representative in Congress; the land was to be sold to finance colleges specializing in "agriculture and the mechanic arts" (Bracey, 2017).

dating states to provide higher education opportunities for Black students.[3] In response, Southern states established separate institutions for Black students to keep receiving federal funds for their predominantly white colleges. Consequently, Southern states institutionalized a racially segregated higher education system while preserving millions of dollars in federal funding for white land-grant institutions (Museus et al., 2015; Harper et al., 2009).

Among the 131 historically Black colleges and universities established over time, seventeen hold land-grant status.[4] Most of these institutions, such as Florida A&M, Kentucky State, and North Carolina A&T universities, were founded or merged with pre-existing colleges between 1890 and 1900. These HBCUs concentrated mainly on vocational education, unlike many white land-grant colleges that also emphasized liberal arts programs. Many HBCUs began as Normal schools, training teachers for segregated public school systems.[5] The expansion of high schools for Black Americans in Southern cities and the growing demand for teachers attracted many Black students to enroll in HBCUs, fostering strong ties between Black public schools and these institutions (Roebuck and Murty, 1993).

Despite the promise of the Second Morrill Act, public HBCUs remained severely underfunded after the 1890s, with state appropriations twenty six times lower than those provided to white institutions. For example, Delaware State University received no state funding during the 1890s. In Alabama, white land-grant colleges received approximately $65,000 annually, while Black land-grant institutions received only about $4,000, according to a 1919 Federal Bureau of Education report (Jenkins, 1991). Although Black land-grant colleges sought to offer college-level training in agriculture and mechanical arts, chronic underfunding limited their resources and the quality of education they could provide (Crosby, 1903; Klein, 1931; Jones, 1917).

Beyond offering vocational and basic academic training, HBCUs were crucial in fostering racial pride and self-esteem among their students. They also served as centers of progressive political activism within the Black community (Mbajekwe, 2006). As more Black Americans attained formal higher education, HBCU graduates became influential advocates for civil rights efforts and racial justice.[6] Many prominent Black scholars and activists emerged from HBCU's premises; for instance, Martin Luther King Jr. attended Morehouse College, while Andrew Young Jr. was

[3] "No money shall be paid out under this act to any State or Territory for the support and maintenance of a college where a distinction of race or color is made in the admission of students, but the establishment and maintenance of such colleges separately for white and colored students should be held to be a compliance with the provisions of this act if the funds received in such State or Territory be equitable." (Second Morrill Act 1890, U.S.C 322)

[4] One land-grant HBCU, the University of the Virgin Islands, formerly known as the College of Virgin Islands, founded in 1962, is located outside the continental United States.

[5] As the Reconstruction period ended, educational opportunities for Black students at white institutions were curtailed, and segregation in education became more entrenched.

[6] Williamson (2008) describes how Black college students organized activism in Mississippi, with the Student Nonviolent Coordinating Committee playing a central role nationwide (Albritton, 2012).

an alumnus of Howard University. Online Appendix Table B1 lists selected Black leaders who attended or graduated from HBCUs.

3 Data

We utilize on comprehensive, full-count individual-level data from the decennial United States censuses spanning 1870 to 1940, which we integrate with newly digitized information on the establishment dates and locations of HBCUs. We add in county-level demographic and socioeconomic characteristics drawn from these historical censuses. We further enrich the analysis with contextual measures capturing agricultural output, transportation networks, religious institutions, Union Army presence, and local political outcomes, compiled from a range of historical sources. All variables are harmonized to the 1900 county boundaries using the crosswalks developed by Ferrara et al. (2024), ensuring spatial consistency and mitigating the challenges posed by county boundaries shifting over the analysis period.

Historically Black Colleges and Universities

According to the Higher Education Act of 1965, HBCUs are formally designated as institutions established before 1964 with the principal mission of educating Black Americans. We digitize comprehensive lists of HBCUs by compiling information from multiple sources, including reports from the National Center for Education Statistics (NCES) (Hill, 1985; Hoffman, 1996; Provasnik and Shafer, 2004) and prior research (Bracey, 2017; Lovett, 2015). While NCES documentation provides extensive operational statistics, it occasionally omits institutions that later closed or merged. To address these gaps, we supplement NCES data with additional archival and secondary sources and, when possible, record information on institutional closures and mergers.

Between 1837 and 1965, a total of 131 HBCUs were established, with nearly three-quarters founded between 1860 and 1910. Our dataset records each institution's name, founding location (including state, county, and city), and year of establishment. These details are cross-validated against official school websites for consistency, and we document changes in institutional location when available. Figure A1 illustrates the geographic distribution of HBCUs across the Southern states, while Table 1 summarizes the number of HBCUs founded and the number of counties registering their first HBCU establishment by decade.

U.S. Census

We draw on full-count U.S. Census data from 1870 to 1940 to measure educational and economic outcomes among Black Americans, along with a range of county-level demographic characteristics, including total population and the shares of Black, urban, and foreign-born residents, sourced

Table 1: Expansion of HBCUs

Periods	# of HBCUs		# of Counties with HBCUs	
	All US	South	South	Sample
Before 1870	34	28	22	-
1870-1880	19	19	17	17
1880-1890	20	19	14	14
1890-1900	19	19	12	12
1900-1910	9	9	6	6
1910-1920	5	5	3	-
1920-1930	7	5	2	-
1930-1940	1	1	1	-
After 1940	17	16	-	-
Total	131	121	77	49

Note: This table describes the expansion of the historically Black colleges and universities (HBCUs) by decade, reporting both the total number of HBCUs established and the number of counties in which an HBCU was founded for the first time during each period. The list of HBCUs, including locations and years of establishment, is digitized from the National Center for Education Statistics (NCES) reports (Hill, 1985; Hoffman, 1996; Provasnik and Shafer, 2004) and previous studies (Bracey, 2017; Lovett, 2015). To ensure consistency, geographic boundaries are harmonized to 1900 counties to construct a balanced panel of Southern counties from 1870 to 1940. Our analysis sample comprises 49 treated counties, excluding those where an HBCU was established before 1870 or after 1910.

from IPUMS USA (Ruggles et al., 2024).[7] Our analysis focuses on Black American males residing in Southern counties, with occupational outcomes examined for individuals aged 16–55. For educational outcomes, we investigate the impacts of HBCUs across multiple age groups.[8]

In our analysis, we focus on enrollment rates, literacy rates, and occupational status, given the absence of wage and educational attainment data before 1940. To measure enrollment rates, we calculate school attendance rates for Black American males in each age group. Literacy rates capture the share of individuals able to read and write within specified age groups.[9]

[7]The 1890 Census records were lost to fire, precluding construction of 1890 county-level characteristics.

[8]We restrict the sample to males because female labor force participation and educational attainment were substantially lower during the late nineteenth and early twentieth centuries, particularly among Black American females. The Southern region, as defined by the Census Bureau, includes the District of Columbia and sixteen states: Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia.

[9]Specifically, we study HBCUs' impacts on enrollment rates for Black American males aged 6-9, 10-13, 14-17, 18-21, and 22-25, and on literacy rates for those aged 15-25, 25-35, 35-45, and 45-55.

Occupational status serves as a stable proxy for human capital and long-term economic outcomes, offering a consistent metric for comparison across decades. Historical studies often employ Census-defined occupational scores (Abramitzky et al., 2014), which assign to each occupation its median 1950 wage income.[10] While useful for historical comparison, this metric assumes constant wage rankings across time and space and does not capture racial wage disparities—an important limitation in the context of the late nineteenth and early twentieth centuries.

To account for the heterogeneity in human capital within occupations across race, region, and time, we further employ the occupation-based human capital indices constructed by Song et al. (2020) and Ward (2023).[11] For cross-sectional analyses, we also compute county-level average wage incomes for Black American workers in 1940.

Other Sources

To capture variation in infrastructure, institutional presence, and local conditions, we integrate several complementary datasets. Transportation access is measured using railroad data from Atack (2015, 2016), which record whether each county had an operational railroad and the total railroad mileage within that county. We additionally calculate each county's distance to the nearest steamboat-navigable river and the total navigable river length as of 1865. From Downs and Nesbit (2015), we obtain measures of Union Army presence, including the distance to the nearest occupation site, the duration of occupation, and the median number of stationed troops between 1865 and 1872.

Religious institutions played a vital role in advancing Black education after the Civil War. To examine their relationship with HBCU establishment, we use data from Haines (2010) that report the number of churches and adherents among major denominations, such as Baptist, Episcopal, Methodist, and Presbyterian, across Southern counties in 1870.

To assess county-level economic development, we draw on agricultural data from Haines et al. (2018) to estimate the shares of cotton, sugar, and tobacco production. Local political preferences are captured using county-level presidential election data from Clubb et al. (2006) for 1870. Finally, we gauge the prevalence of racial violence through the number of documented lynching incidents after 1880, recorded by Seguin and Rigby (2019).

[10] The Census-defined occupation score (OCCSCORE) assigns median 1950 wage income values to occupations harmonized with the 1950 Census occupational classification (OCC1950).

[11] Ward (2023) constructs a human capital index ranging from 1 to 100, measuring the average human capital of each occupation. The index is based on full-count censuses from 1850 to 1940, supplemented by census samples and the American Community Survey for later decades. Prior to 1940, the index relies on mean literacy rates within occupation, race, region, and cohort cells; since 1940, the measure reflects the average years of education.

4 Empirical strategy

We estimate the effects of HBCU establishment using an event study framework. Given that the outcomes of interest are observed both before and after the establishment of HBCUs, we can examine the validity of the parallel trends assumption. However, counties with and without HBCUs may exhibit different local characteristics, as the the decision to locate HBCUs may be linked to the growth potential of local economies. Consequently, counties with distinct pre-establishment profiles may follow divergent trajectories in economic and educational outcomes following HBCU establishment. To address these concerns and strengthen the causal interpretation of our findings, our preferred specification incorporates a matching approach, which allows us to more effectively account for observable differences between treated and untreated counties.

Event study

To estimate the causal effects of HBCU establishment, we exploit within-county variation (comparing periods before and after HBCU openings) and between-county differences, specifically contrasting counties with and without HBCUs. County and year fixed effects are included to account for unobserved, time-invariant county characteristics and to control for common temporal shocks affecting Southern counties.

Nonetheless, the staggered nature of HBCU expansions may bias estimates in canonical two-way fixed effects difference-in-differences (DiD) regressions. Recent advancements in the DiD literature underscore that heterogeneity in treatment timing can bias estimates and obscure causal interpretations (Borusyak et al., 2024; Callaway and Sant'Anna, 2021; de Chaisemartin and D'Haultfoeuille, 2020; Goodman-Bacon, 2021; Sun and Abraham, 2021). In such designs, the canonical two-way fixed effects regressions mix comparisons between treated, never-treated, and differently-timed treated units. Comparisons between early- and late-treated units can result in average treatment effects with the opposite sign of all individual-level treatment effects due to "negative weighting" issues.

To address these concerns, we implement the estimator proposed by Callaway and Sant'Anna (2021). This estimator is particularly appropriate for our context, as the determinants of HBCU location choices are unclear and the method relies on a less restrictive parallel trends assumption.[12]

We examine the local impacts of HBCUs from 1870 to 1940. We restrict attention to counties that saw their first HBCU opening between 1870 and 1910, thereby excluding the 1860 Census, which fails to accurately enumerate the Black population owing to the undercounting of enslaved

[12] As highlighted in Roth et al. (2023), the estimator of Borusyak et al. (2024) builds its baseline from aggregated pre-treatment periods, requiring parallel trends throughout the entire pre-intervention history. In contrast, the Callaway and Sant'Anna (2021) estimator compares each group's outcomes to the immediate pre-treatment period, requiring parallel trends only in that narrow window.

individuals. For counties with multiple HBCU openings, we focus on the first establishment in each "ever-treated" county.[13] Due to the small number of HBCU foundings after 1910, we exclude six counties where the first HBCU was established between 1910 and 1940.[14]

Formally, we estimate the dynamic effects with the following regression specification:

$$Y_{ct} = \alpha_c + \gamma_t + \sum_{\tau} \beta_\tau \cdot \mathbb{1}\left[t - H_c = \tau\right] + \epsilon_{ct} \tag{1}$$

where Y_{ct} denotes the outcomes for county c in census year t. $\mathbb{1}$ is an indicator for having ever received an establishment of HBCUs. H_c denotes the first census year after county c experienced the first HBCU opening. By incorporating county (α_c) and year (γ_t) fixed effects, we estimate the impacts of HBCU establishments by comparing outcome changes in treated counties to those in never-treated counties. Standard errors are clustered at the county level. Additionally, we apply weights using the county population in every period t.

Identification relies on the validity of the parallel trends assumption: counties destined to receive HBCUs and those never treated must exhibit comparable pre-treatment trends. The location of HBCUs is unlikely to be random, as evidenced in Figure 1, which depicts how the 1870 characteristics vary across counties that ever had and never had an HBCU. To mitigate bias from these observable differences, we construct a matched sample leveraging an extensive set of pre-existing county characteristics, drawing upon both historical records and prior empirical research.

Matching Approach

Historical narratives indicate that HBCU locations in the immediate postbellum South may have been influenced by proximity to Union Army occupation, church presence, exposure to northern philanthropies, and other local attributes (Bracey, 2017; Lovett, 2015). Exposure to such northern influences varied widely across Southern counties, shaped by accessibility via waterways, ports, and railroads. Missionaries and denominational conferences often concentrated near major transport routes.[15] Previous studies also suggest that missionaries frequently accompanied the Union Army and assisted freedmen during the Civil War, and that the degree of local resistance during

[13] Of the 49 counties in which at least one HBCU was established, 10 counties experienced the opening of more than one institution. For institutions whose locations changed over time, we determine a county's "treated" status based on the year when the college or university began operations there. For example, Paul Quinn College was originally established in Austin, Texas (Travis County) in 1872, moved to Waco (McLennan County) in 1877, and relocated again to Dallas (Dallas County) in 1900. Each of these counties is considered a treated county, as Paul Quinn College was the first HBCU to operate in each location.

[14] The treatment group comprises 49 counties. Table 1 shows treated counties by decade of their first HBCU opening.

[15] Discussions on the siting of Freedmen's Bureau's field offices also highlight the proximity to areas with large Black populations and transportation hubs to maximize the impacts of relief effort (Chyn et al., 2024).

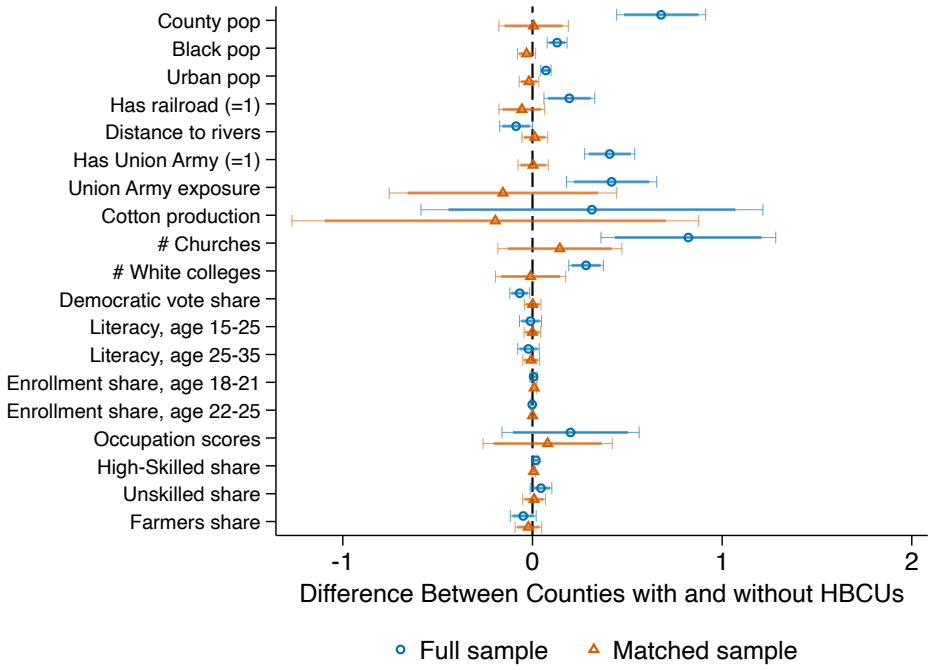


Figure 1: Differences in 1870 County Characteristics between Treated and Control Counties

Note: This figure illustrates the differences for 1870 county characteristics between counties that ever hosted HBCUs and those that never hosted an HBCU. Circles and triangles denote the raw differences and the difference between the treated counties and their five nearest neighbors, matched based on propensity scores. The solid lines display the 90% and 95% confidence intervals. County-level populations and the volume of cotton production are in logs. Distance to the nearest navigable river is measured in 100 miles. Exposure to the Union Army reflects the duration of occupation (in years), rescaled by distance (in 100 miles) to the nearest occupation site.

Reconstruction may have also impacted the likelihood of an HBCU being established.[16]

We employ a matching approach based on these pre-existing county characteristics to enhance the comparability between counties that eventually hosted an HBCU and those that never did. Specifically, we compile measures of transportation accessibility, Union Army presence, church exposure, and political affiliation as of 1870, as detailed in the Online Appendix. To further capture differences in educational resources and economic development across counties, we also account for the number of predominantly white colleges and universities existing in 1870, as well as the volume of cotton production by county.

Figure 1 illustrates the differences in these 1870 characteristics between counties that ever-

[16]Research on land-grant colleges suggests that institutional siting was sometimes as good as random (Moretti, 2004; Kantor and Whalley, 2014). For instance, historical accounts show that the selection of land-grant college sites was frequently determined by factors such as close votes, donations, or even chance events, rather than by systematic differences in local economic conditions (Andrews and Smith, 2025; Liu, 2015).

hosted and never-hosted an HBCU.[17] In the full sample, counties that ultimately hosted HBCUs were more populous and with more Black American residents. They also had greater exposure to the Union Army and churches in 1870, better access to transportation infrastructure, more white colleges, and lower shares of Democratic votes. Except for cotton production, these pre-treatment characteristics differ significantly between ever- and never-treated counties, and these gaps cannot be attributed solely to state-level differences. It is worth mentioning that there are no significant distinctions in the educational and occupational outcomes of interest between the treated and control counties in 1870.

We construct a matched sample based on propensity scores estimated using a logit model with the aforementioned 1870 county characteristics.[18] In our preferred specification, each treated county is paired (with replacement) with its five closest control counties based on propensity scores.[19] The resulting matched sample consists of 49 treated counties (those with HBCUs) and 141 unique control counties. Figure 2 illustrates the geographical distribution of both groups across the full and matched samples.

5 HBCUs' impacts on Black Americans in the South

We estimate the effects of HBCU establishments on educational and occupational outcomes for Black American males in Southern counties from 1870 to 1940. To identify causal effects, we focus on the timing of the first HBCU opening and compare the changes in outcomes of interest between counties that ever received an HBCU and those that never did, employing the staggered difference-in-differences estimator proposed by Callaway and Sant'Anna (2021).

To mitigate concerns regarding potential compositional differences across counties, we residualize individual-level outcomes by regressing them on age and nativity. The county-level aggregation of these residuals isolates variation attributable to HBCU establishment rather than demographic heterogeneity across counties. Our preferred specification relies on the matched sample.

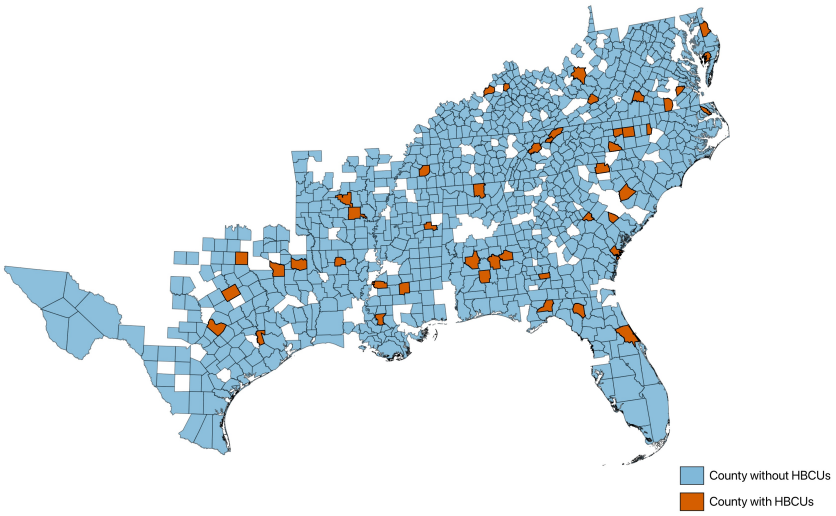
We further extend the analysis to explore racial inequality and spatial diffusion. Specifically, we assess the extent to which HBCUs altered white-Black disparities in educational and occupational status. Moreover, assess whether the influence of HBCUs attenuates with increasing geographic distance from campus locations, thereby providing insights into their localized versus

[17] Table B2 in the Online Appendix presents the county-average and the differences in the 1870 county characteristics between counties with and without HBCUs.

[18] Table B3 in the Online Appendix reports the results of logit estimation.

[19] Figure A2 depicts the distributions of the propensity scores for counties with and without HBCUs. As a robustness check, we compare our results using full samples and matched samples that include the nearest, five, and ten nearest neighbors and find the estimated impacts robust to these alternative samples (Figure B5 in the Online Appendix).

(A) Full Sample



(B) Matched Sample

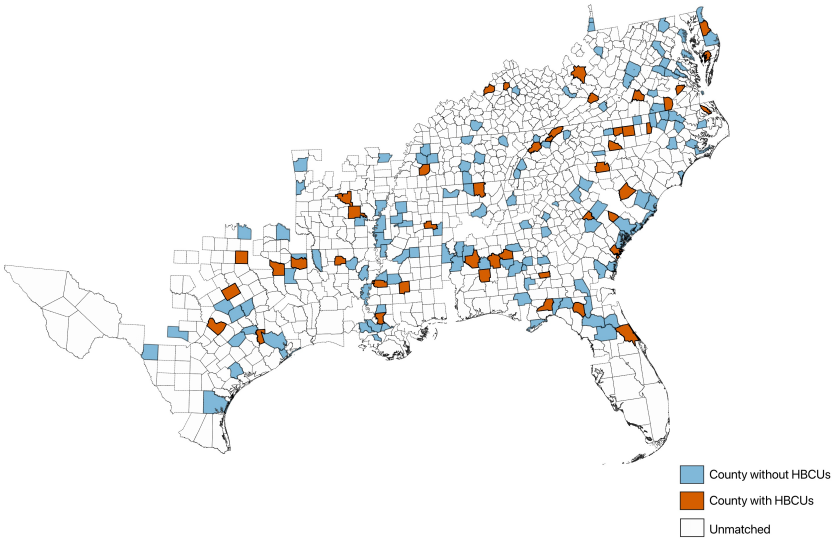


Figure 2: Counties With and Without HBCUs in Full and Matched Samples

Note: This figure displays maps of counties with and without HBCUs based on the 1900 county boundaries. Panel A identifies all counties in the study, including 49 counties that had at least one HBCU established between 1870 and 1910 (treated counties) and 1,037 counties where no HBCUs were established (control counties). Panel B focuses on counties in the matched sample, where the control group consists of 141 unique counties selected as the five closest propensity score matches (with replacement) for each treated county.

Table 2: HBCUs and Educational Outcomes

	Black males				White males			
	Enrollment rate		Literacy		Enrollment rate		Literacy	
	18-21	22-25	15-25	25-35	18-21	22-25	15-25	25-35
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
HBCUs	0.014**	0.006**	0.028	0.042	0.012	0.001	-0.010	-0.014
	(0.007)	(0.003)	(0.028)	(0.030)	(0.012)	(0.004)	(0.026)	(0.015)
Control Mean	0.084	0.015	0.628	0.617	0.176	0.029	0.909	0.919
Observations	1,968	1,968	1,968	1,968	1,968	1,968	1,968	1,968

This table reports the average treatment effects of HBCU establishment on Black Americans' educational outcomes at the county level from 1870 to 1940. Enrollment rates are the share of individuals in age groups 18-21 and 22-25 who attended schools at the time the Census enumerated. We measure literacy rates for males in two age groups: aged 15-25 and 25-35. The results are estimated following Equation 1 and using the matched sample, in which each treated unit is compared to its five nearest control neighbors (with replacement). Statistical significance is denoted by: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

regional impacts.

Educational outcomes

We measure educational performance using school enrollment and literacy rates, as censuses before 1940 provide limited data on educational attainment. Enrollment rates capture the share of Black males aged 18–21 and 22-25 attending school, while literacy rates pertain to Black males aged 15–25 and 25-35 at the county level.[20]

Access to educational institutions appears positively associated with school attendance of Black American youth, as shown in Table 2. The impacts are statistically significant, and the magnitude of the effects is substantial. HBCU establishments raise the enrollment rates by 1.4 and 0.6 percentage points (16.67% and 40% relative to other Southern counties without HBCUs) for Black American males aged 18-21 and 22-25, respectively. HBCUs' impact on literacy rates is positive, though imprecisely estimated.[21]

Unlike modern colleges, many early HBCUs provided primary education, aiming to address the systematic exclusion of Black Americans from formal schooling in the pre-Civil War era. Notably, only 16.5% of adult Black males were literate in 1870. Our analysis reveals a positive, though

[20]We present the results on enrollment and literacy rates for different age groups in Table B4 in the Online Appendix.

[21]Given the lack of educational attainment information in the U.S. Census before 1940, previous studies often rely on literacy rate as one of the educational outcomes. However, extant literature and official reports discuss the accuracy of the Census data on literacy rate and its comparability across time and birth cohorts (Collins and Margo, 2006).

insignificant, association between HBCU establishment and county-level literacy rates.[22] It is worth noting that part of the estimated effects might reflect changes in the population composition at the county level. For instance, the founding of HBCUs may have drawn migrants from nearby counties or states, thereby influencing observed enrollment and literacy rates through population shifts rather than institutional effects alone. We discuss these population dynamics and their potential implications in detail in a subsequent section.

Labor market outcomes

HBCU establishments helped advance occupational mobility for Black Americans by increasing employment in fields requiring higher levels of human capital. As shown in Table 3, HBCU openings increased the average occupational score of Southern Black males by 1.126 units, corresponding to 19.50% of the mean in other Southern counties without HBCUs. This positive effect persists throughout the study period (as seen in panel A of Figure 3). Consistent patterns emerge for educational attainment and wage income in the 1940 Census. Table A1 indicates that Black Americans in counties with HBCUs had more years of education and higher annual and hourly earnings in 1940. We take these findings as suggestive, given the cross-sectional nature of the analysis.

We then investigate Black Americans' occupational choices. Following Katz and Margo (2014), we define high-skilled occupations, including professional, technical, clerical, sales, and craftsmen, and unskilled workers, such as operatives, laborers, and service workers. Our results in Table 3 reveal that HBCU establishments significantly increase the employment shares of high-skilled workers; the high-skilled workers' share in counties with HBCUs is 0.9 percentage points (16.07% relative to control counties) higher than that in the control counties. The impact persists, as shown in Figure 3, panel B. We also find the positive association between HBCUs and unskilled workers, though the effect is imprecisely estimated.

In addition, HBCU openings induce a substantial reduction in the proportion of Black individuals engaged in agricultural labor; for instance, the share of farmers declined by 3.7 percentage points, representing a 7.31% decrease relative to the agricultural occupational distribution in control counties. Within two to three decades following HBCU establishments, the local occupational composition among Black American males significantly shifted away from the agricultural sector, as suggested in panels B through D of Figure 3.[23]

[22] Figure B3 in the Online Appendix presents the heterogeneous effects of HBCUs on educational outcomes for each group with different establishment timings.

[23] In the Online Appendix, Figure B4 depicts the heterogeneity by opening decade, while Figure B5 presents the robustness using alternative matched samples.

Table 3: Impacts of HBCUs on Labor Market Outcomes

	Occupation score (1)	High-skilled share (2)	Unskilled share (3)	Farmers share (4)
Panel A: Matched sample				
HBCUs	1.126***	0.009**	0.024	-0.037*
	(0.317)	(0.004)	(0.018)	(0.021)
Control Mean	5.774	0.056	0.351	0.506
OccScore Mean		6.382	5.849	5.847
Observations	1,974	1,974	1,974	1,974
Panel B: Full sample				
HBCUs	1.556***	0.010**	0.029*	-0.049**
	(0.301)	(0.004)	(0.017)	(0.020)
Control Mean	5.802	0.056	0.356	0.498
OccScore Mean		6.431	5.860	5.873
Observations	7,514	7,514	7,514	7,514

Note: The table reports HBCUs' impacts on Black American males' labor market outcomes using the staggered difference-in-differences with the matched and full samples. High-skilled occupations include professional, technical, clerical, sales, and craftsmen; unskilled workers are operatives, laborers, and service workers; farm workers include farmers, farm managers, and farm laborers. Statistical significance is denoted by: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Many HBCUs began with relatively small student bodies, and initial student body size may explain the lagged effects. To assess the heterogeneous effects by institution sizes, we compile early enrollment records wherever available, since the a lack of systematic statistics for HBCUs' enrollment in early years.[24] However, the results suggest the differences in HBCUs' impacts between large and relatively small institutions are insignificant.

Our findings regarding the decreasing employment share in the agricultural sector are not inconsistent with the mission of land-grant Black institutions, which aimed to train students in agriculture and mechanical arts. Of note, only 12 of 49 first-opening HBCUs in our sample were designated as land-grant institutions.[25] Two factors may explain the observed decline in the agricultural sector. First, impacts of non-land-grant institutions could outweigh the potential positive

[24]Early-year enrollment data recovered for 56 of 131 institutions, and the sizes of the student body varied substantially across institutions. For instance, Savannah State University, Georgia's first public HBCU, enrolled only eight students at its 1890 opening. By contrast, Alcorn State University in Mississippi had 179 students in 1871. The heterogeneity analysis focuses on those institutions with data.

[25]The following land-grant institutions were the first to be established in their respective counties: Alabama A&M University, Alcorn State University, Delaware State University, Florida A&M University, Fort Valley State University, Kentucky State University, Prairie View A&M University, Southern University and A&M College, University of Arkansas at Pine Bluff, University of Maryland Eastern Shore, Virginia State University, and West Virginia State College.

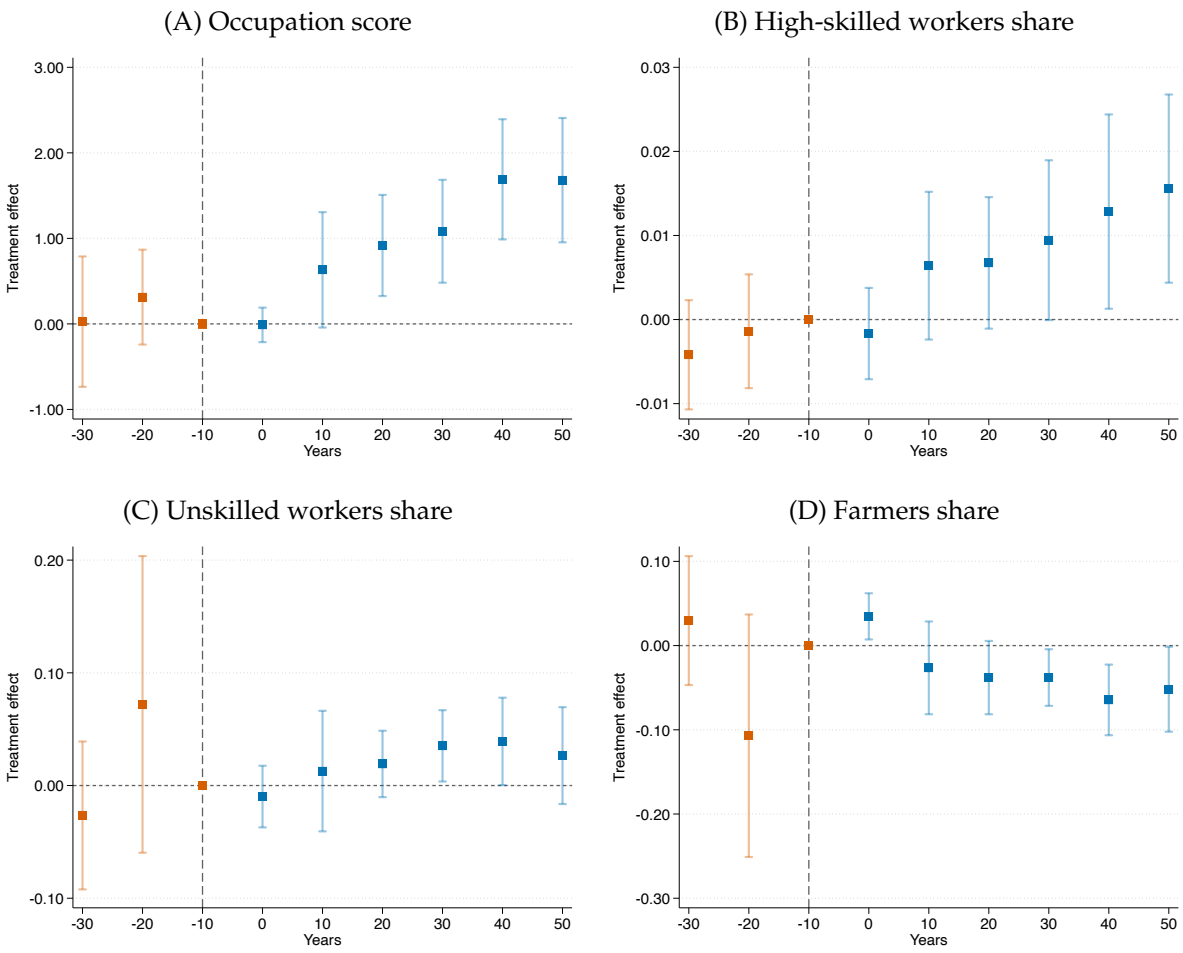


Figure 3: HBCUs and Labor Market Outcomes

Note: This figure illustrates event-study results for the impact of HBCUs on Black Americans' occupational outcomes from 1870 to 1940, using the estimator proposed by Callaway and Sant'Anna (2021). The analysis focuses on HBCU establishments between 1870 and 1910, defining the first establishment year in a county as the treatment time. Outcomes are constructed for Black males aged 16 to 55 residing in Southern counties. The sample includes counties that have ever hosted at least one HBCU and their five nearest neighbors based on propensity scores. Squares represent the estimated effects for each period, with bars indicating 95% confidence intervals. Effects are relative to the census year before treatment (Year -10), and "Year 0" denotes the first census year after a county receives its first HBCU.

associations between land-grant HBCUs and employment in the agricultural sector. Second, as historical accounts suggest, many agricultural and mechanical (A&M) institutions faced financial constraints that limited their ability to provide collegiate training in these fields (Crosby, 1903; Klein, 1931; Jones, 1917).

Lastly, we assess the degree of spatial localization in the spillover effects of HBCUs by examining the attenuation of these effects at the sub-county level. Using data from the Census Place Project (Berkes et al., 2023), we geolocated Southern Black Americans at the township level

and computed the distances from each township to its nearest HBCU. Evidence highlights the highly localized nature of HBCUs' economic impacts, while also emphasizing the limited spatial diffusion of their influence on occupational mobility. Specifically, proximity to HBCUs is associated with HBCUs' positive impact on occupation scores. Towns that were closer to HBCU campuses experienced more pronounced declines in farming occupations. Such localized effects are perhaps unsurprising, given the substantially higher costs of travel prevailing during such historical periods.[26]

Population dynamics

While our analyses focus on HBCUs' local impacts, we should consider population growth and compositional changes as relevant factors influencing the interpretation of HBCUs' effects. To begin with, HBCUs may have been established in counties exhibiting higher growth potential and, consequently, greater educational demand. Although our matched sample controls for initial differences between counties with and without HBCUs as of 1870, the estimated effects may nonetheless partially reflect underlying disparities in population dynamics. Additionally, the establishment of HBCUs likely attracted skilled in-migrants, such as faculty and staff, to these counties. As a result, in-migration may inflate the estimated effects on educational and occupational outcomes.

To address these issues, we first account for differences in population growth and changes in demographic compositions between counties with and without HBCUs by controlling for the log of county population, Black population share, and urban population share in our implementation of the doubly robust estimator of Sant'Anna and Zhao (2020). This extension allows us to compare treated and control counties that have experienced similar changes in population size and demographic composition. Our results on educational and labor market outcomes remain robust to these controls (Figure 4). However, differential population growth or shifts in demographic structure account for approximately 30% of the increases in occupation scores. Moreover, once differences in population dynamics are considered, the effect of HBCUs on the share of agricultural workers is rendered insignificant, suggesting that urbanization may underlie this result.

To further mitigate the confounding influence of in-migrants, we construct two alternative samples. The first sample restricts the analysis to Black American males who remained in their birth states, thereby excluding potential in-migrants from out of state. The second utilizes linked census data to include only those individuals who resided in the same county during the preceding decade, using the methodology established by Price et al. (2023) to link census records between years t and $(t-10)$ from 1880 to 1940.[27] The estimated effects are robust across these alternative

[26] We discuss the details and present the results in the Online Appendix.

[27] We construct the link between the 1880 and the 1900 censuses, given that the 1890 records are not available. Moreover,

samples, as shown in Figure 4; notably, the effects of HBCUs on occupational scores and the share of high-skilled workers persist and remain statistically significant.

The positive impacts of HBCUs on school attendance among Black American youth are stable throughout the different specifications, though the estimates are imprecise when focusing on residents in their birth state. Taken together, these analyses suggest that in-migration is unlikely to be the primary driver of the observed effects. It is worth noting, however, that while these samples filter out populations with higher migration rates, it is still possible that some in-migrants remain in the analysis sample.

Racial inequality

We further investigate the influence of HBCUs on racial disparities in educational and occupational outcomes. Specifically, we estimate the effects of HBCU establishments on the white-Black difference in school attendance, literacy rates, and occupational scores as measures of racial inequality. Table 4 reports the results; panels A and B present our baseline results and results restricted to the linked sample, respectively.

Our findings reveal that the presence of HBCUs shrinks the racial gap in educational outcomes, although the estimates of Black American youth's enrollment rates are noisy and imprecise. However, the implied magnitude of the effects is nontrivial. The racial gap in enrollment rates for age groups 18-21 and 22-25 narrows by approximately 10% to 35% relative to the control counties. While restricting to the linked sample, the negative association between HBCU establishments and the white-Black difference in enrollment rate for the 22-25 age group is statistically significant, which suggests that counties that host HBCUs may attract inflows of white young workers. Moreover,

HBCU establishments induce substantial reductions in the white-Black difference in literacy. In counties hosting HBCUs, the racial gap in literacy narrows by 7.1-8.1 and 8.7-9.6 percentage points for 15-25 and 25-35 age groups, respectively. This impact corresponds to a reduction ranging from 28.4% to 32.7% relative to the average racial difference in counties that never hosted an HBCU—a sizeable effect, especially given the limited educational opportunities available to Black Americans during the Antebellum era. Despite facing substantial financial constraints, HBCUs made meaningful contributions to reducing racial disparities in educational attainment.

Moreover, the findings indicate that HBCU establishments, if anything, also increase occupation scores for white males. Nonetheless, the effects are imprecisely estimated. Combining the findings in Table 3, the results may suggest that Black American and white male workers' occu-

we do not link the 1860 and 1870 censuses because the 1860 census includes only free Black Americans.

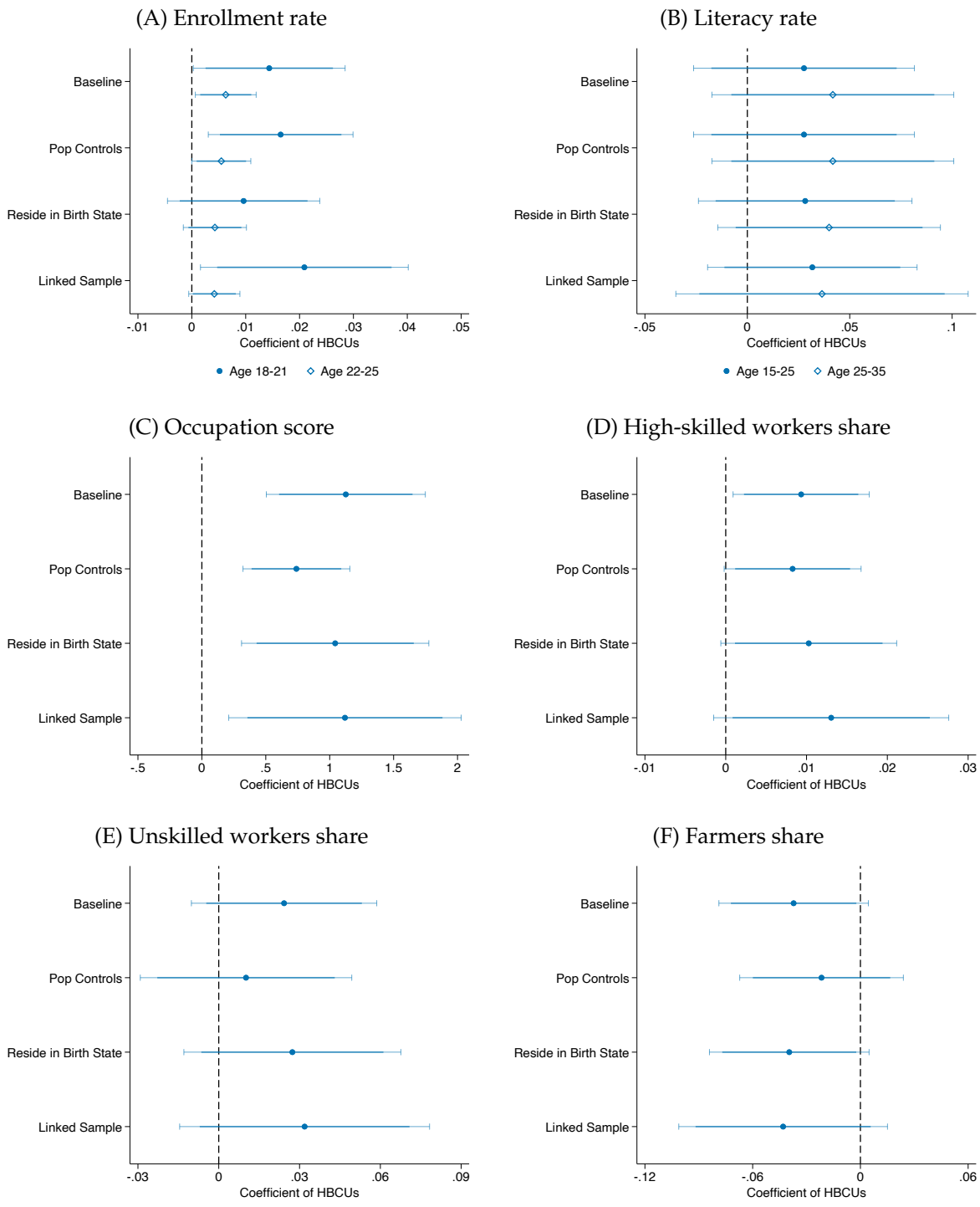


Figure 4: Population Dynamics

Note: This figure illustrates the average treatment effect of HBCU establishment on Black Americans' educational and occupational outcomes from 1870 to 1940. The baseline results replicate the findings in Tables 2 and 3. To account for population dynamics, we further control for (log) county population, Black population share, and urban population share. In addition, we restrict the sample to individuals who remained in their birth state, and those who resided in the same county between census years t and $t-10$, using the linking methodology of Price et al. (2023). The markers denote the average treatment effect, and the solid lines display the 90% and 95% confidence intervals in each specification.

Table 4: HBCUs and Racial Inequality

	White-Black difference				
	Enrollment		Literacy		Occupation
	18-21	22-25	15-25	25-35	scores
	(1)	(2)	(3)	(4)	(5)
Panel A: Matched sample					
HBCUs	-0.009	-0.005	-0.071**	-0.087***	1.213
	(0.009)	(0.003)	(0.032)	(0.028)	(0.931)
Control Mean	0.088	0.014	0.250	0.266	29.675
Observations	1,970	1,970	1,970	1,970	1,974
Panel B: Matched sample, in same county between two census years					
HBCUs	-0.017	-0.007**	-0.081**	-0.096***	1.037
	(0.013)	(0.003)	(0.033)	(0.032)	(2.318)
Control Mean	0.091	0.015	0.283	0.320	28.491
Observations	1,882	1,882	1,882	1,882	1,916

Note: This table reports the average treatment effects of HBCU establishment on the racial gaps in enrollment rates for age groups of 18-21 and 22-25, literacy rates for age groups of 15-25 and 25-35, and occupation scores at the county level between 1870 and 1940. We estimate the causal effects following Equation 1. Panel A reports the results for the matched sample, while Panel B restricts the sample to the stayers between census years. Statistical significance is denoted by: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

pation scores grow at a similar rate in counties ever hosted HBCUs. The presence of HBCUs may prompt compositional changes in the local labor market, generating spillover effects that benefit the white male population. Additionally, white workers may be occupational complements to Black Americans; as the latter acquire greater human capital and enter lower-skilled positions, white workers may increasingly specialize in and ascend to higher-skilled occupations.

6 Robustness checks

Counties with distinct pre-existing schooling infrastructures may exhibit divergent trajectories in both educational and occupational outcomes. Our matched sample does not explicitly control for such county differences, as such factors may be endogenous to our analysis. For instance, while counties with more educational resources may have been more likely to attract an HBCU, the presence of an HBCU may itself shape subsequent educational outcomes in the county.

To better isolate the effect of HBCU establishment from other forms of educational investment, such as the prevalence of Black primary and secondary schools, we assess the robustness

of our findings using three strategies. First, we control in our specification for the 1870 share of Black American male children aged 7–16 enrolled in school as a proxy for county-level educational resources, and interact these values with census year indicators. Second, we consider the 1870 enrollment share among Black American children aged 7–16 as an additional covariate when constructing the matched sample. Third, we control for the number of selected Rosenwald high schools, noting that the construction of these schools accelerated around 1920 and was concentrated in rural counties; as such, their influence is unlikely to confound our estimates for earlier periods. In addition, since HBCUs are predominantly located in urban counties, our findings should not be substantively affected by differential access to Rosenwald high schools in rural contexts.[28]

Figure 5 compares the baseline estimated effects with those obtained after accounting for variation in local educational inputs. The results indicate that the estimated effects are robust to these alternative specifications, suggesting that our primary results are unlikely to be confounded by differences in schooling provision across counties.

The onset of the Jim Crow era, which began shortly after the end of Reconstruction in 1877, imposed systemic racial segregation and discrimination against Black Americans across the South. State and local laws denied Black citizens equal access to public facilities, quality education, employment opportunities, and suffrage—often enforced through intimidation, poll taxes, literacy tests, and acts of violence. These policies institutionalized white supremacy and entrenched a rigid racial hierarchy well into the twentieth century. Heterogeneity in the intensity of racial discrimination could confound the observed relationship between HBCU establishment and outcomes, as counties characterized by more pronounced discrimination may have been less likely both to host HBCUs and to foster Black advancement. Although political preferences are included among the matching variables, the degree of discrimination prevalent during the Jim Crow period may not be fully captured. To address this concern, we use the number of reported lynching cases as a proxy for county-level racial hostility, incorporating this variable into our analyses. As shown in Figure 5, our results remain robust to this adjustment.

For additional robustness checks, we supplement our analysis with parallel approaches using the staggered DiD estimators Borusyak et al. (2024) and Sun and Abraham (2021). Figure A3 compares our baseline results, estimated with the Callaway and Sant'Anna (2021) estimator, with other estimators and shows that the estimated effects are highly consistent.

[28] We do not have access to a comprehensive list of all Rosenwald high schools that ever existed. Instead, we use a subset identified from records in the National Register of Historic Places.

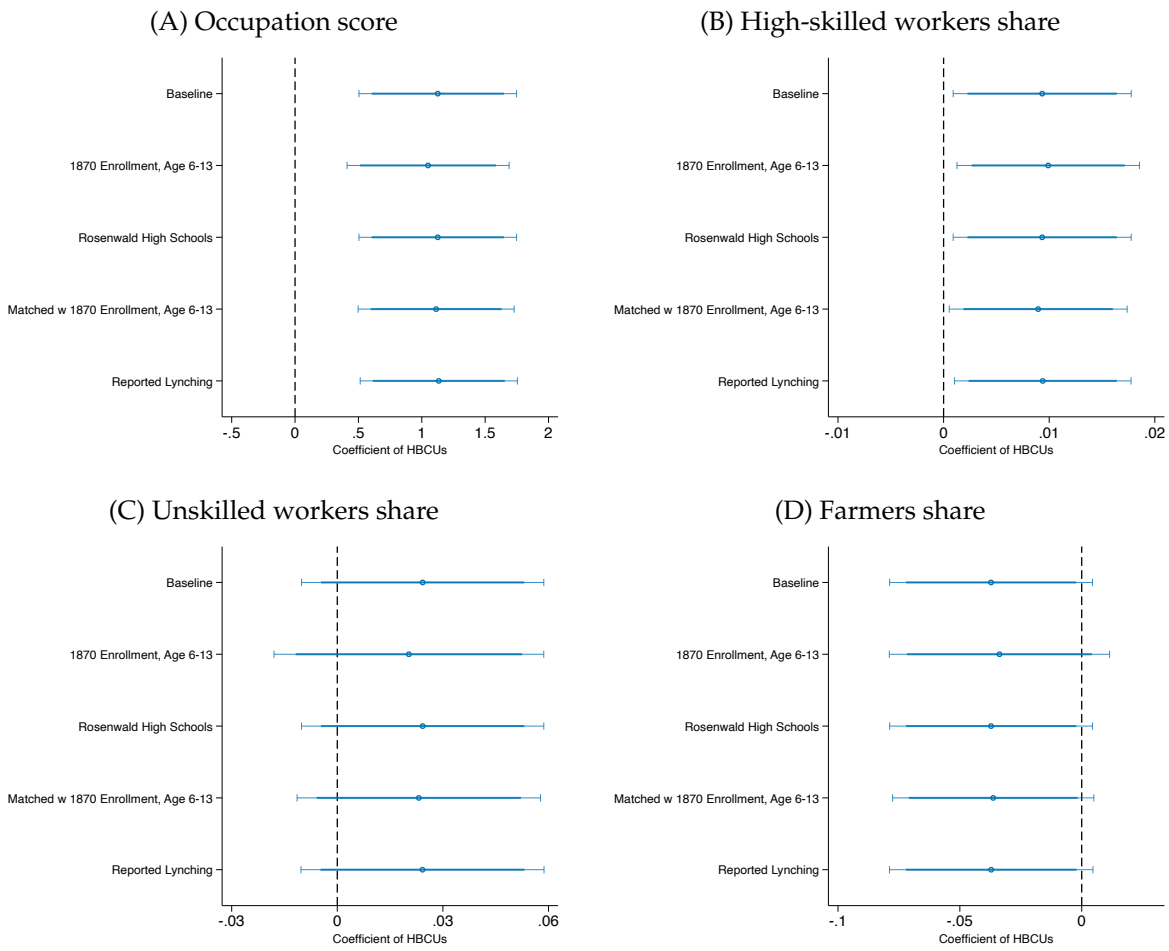


Figure 5: Robustness Checks

Note: This figure presents the average treatment effect of HBCU establishment while accounting for cross-county variation in educational resources and the intensity of discrimination against Black Americans, measured by the number of reported lynching cases. Specifically, we (1) control for the 1870 enrollment rate for Black American children aged 6-13 interacted with Census year dummies, (2) control for the time-varying number of Rosenwald high schools, (3) restrict to the matched sample accounting for the 1870 Black American children's enrollment rate when they were aged 6-13, and (4) include the time-varying number of reported lynching cases. The markers denote the average treatment effect, and the solid lines display the 90% and 95% confidence intervals in each specification.

7 Conclusion

This paper presents novel evidence on the influental role of Historically Black Colleges and Universities (HBCUs) in shaping educational and occupational outcomes for Black Americans in Southern U.S. counties between 1870 and 1940. By compiling and digitizing historical records of HBCU founding years and locations, we estimate the causal effects using the staggered event-study estimator proposed by Callaway and Sant'Anna (2021). Our research design compares outcomes from 1870 to 1940 between counties that witnessed their first HBCU opening between 1870 and 1910 and those that never established such an institution, thereby isolating the consequences

of uneven institutional expansion.

We find that exposure to HBCU establishments is linked to marked improvements in educational outcomes for Black Americans. In counties with HBCUs, enrollment rates for Black American youth aged 18–25 surpassed those in counties without HBCUs. Although literacy rates did not change substantially overall, HBCU establishments significantly reduced racial disparities in literacy between Black and white males. The magnitude of HBCUs' impacts is substantial, given the systemic exclusion of Black Americans from education prior to the Civil War, and underscores the role of HBCUs in mitigating educational inequities.

Our results further demonstrate that HBCU expansion enhanced occupational prospects for Black Americans, fostering a transition away from agricultural work to higher-skilled sectors. Counties with HBCUs experienced a reduced share of Black farmers, alongside increases in high-skilled workers, such as professionals, technicians, clerical, sales, and craftsmen. These results align with HBCUs' mission to provide vocational training and broaden economic opportunities during an era of entrenched racial discrimination.

Critically, these positive local economic effects are not solely attributable to the selective in-migration of higher-skilled individuals seeking educational opportunities. The results remain robust when the analysis accounts for population dynamics and considers only Black Americans who stayed within their home states or did not migrate across counties within the prior decade, suggesting that the improvements primarily reflect local human capital formation, as well as beneficial compositional shifts. Taken together, these results highlight HBCUs' transformative impact on the educational and occupational advancement of Black Americans in the postbellum South.

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Appendix

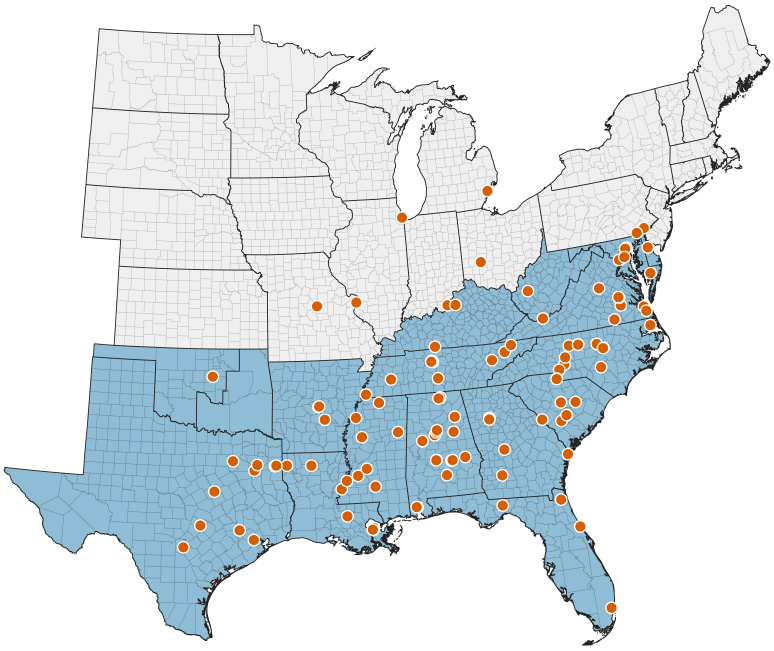


Figure A1: Locations of Historically Black Colleges and Universities

Note: This map shows the locations of HBCUs based on 1900 county boundaries. Each orange dot marks one of the 131 HBCUs, and shaded areas highlight the U.S. South. Most HBCUs were in the South, but some were also founded in the Northeast and Midwest. Two schools—Compton Community College in Los Angeles, CA, and the University of the Virgin Islands—are not shown on this map for clarity.

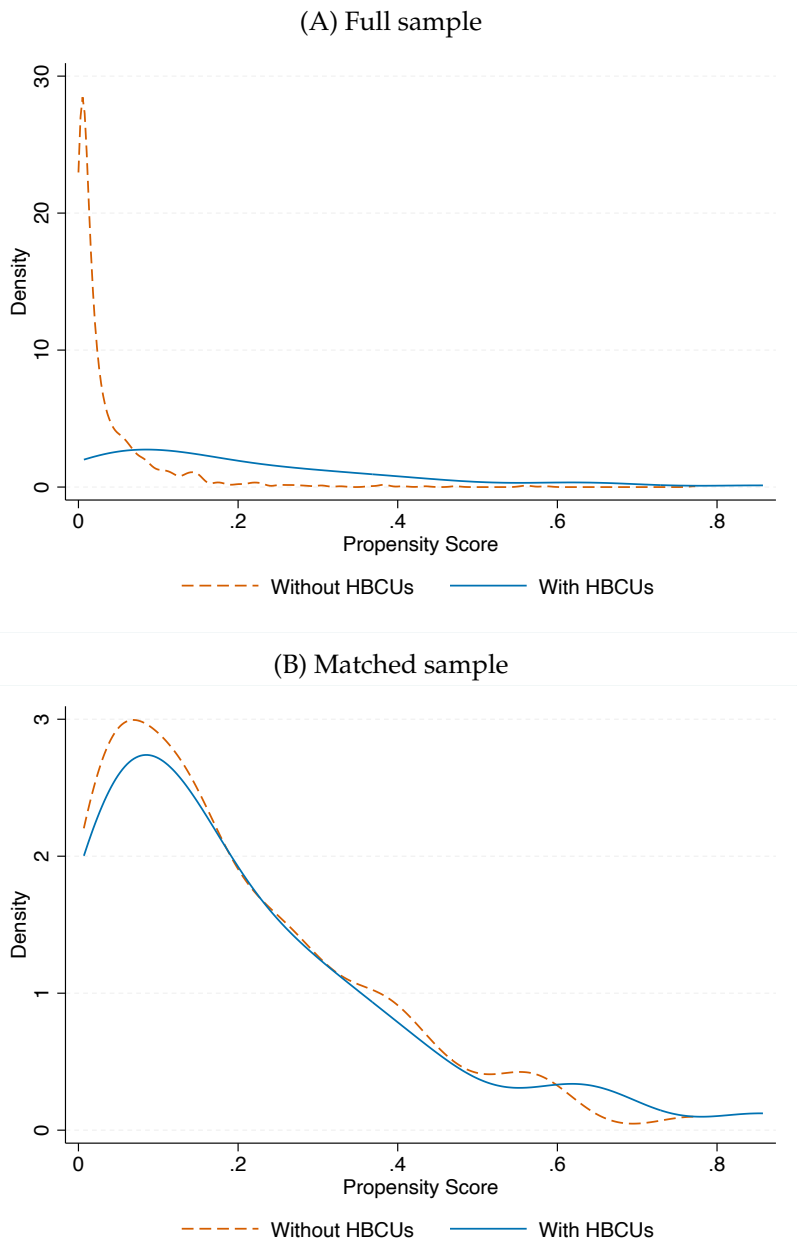


Figure A2: Propensity Score for Counties With and Without HBCUs

Note: This figure depicts the propensity scores for counties with and without HBCUs. Panel (a) presents the density of propensity scores for the full sample: 49 counties that ever hosted at least one HBCU between 1870 and 1910, and 1,037 counties that never hosted HBCU establishments. Panel (b) displays the density of scores for counties with HBCUs and their five nearest neighbors in the matched sample. We construct the propensity score by estimating the logit model with an HBCU indicator on a set of 1870 controls and state fixed effects. Control counties are determined by matching (with replacement) each treated county with its five nearest neighbors by propensity score.

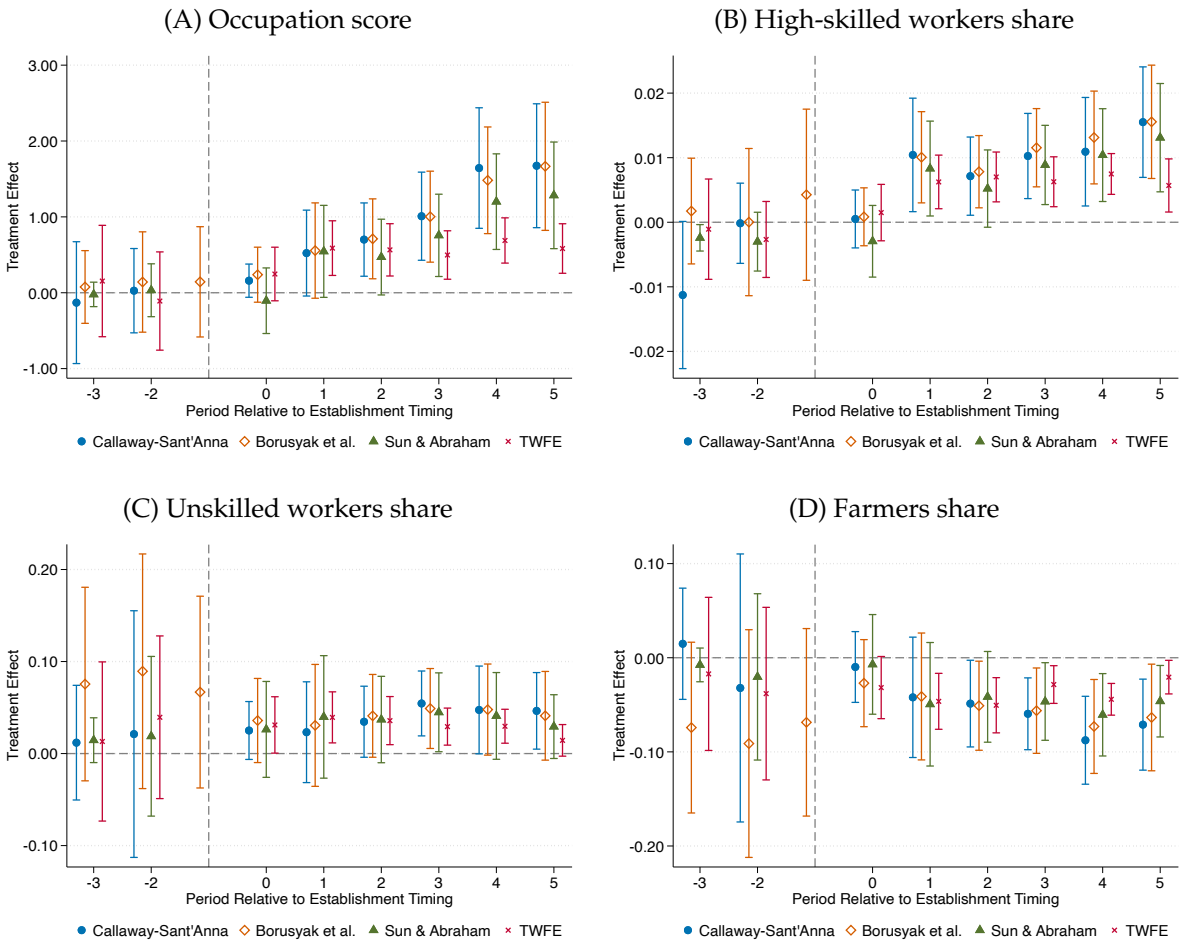


Figure A3: Alternative Staggered Difference-in-Differences Estimators

Note: This figure presents the event-study estimates of occupational outcomes (as reported in Figure 3) using alternative estimators for staggered treatment timing. Specifically, we estimate the results using the estimators proposed by Callaway and Sant'Anna (2021), Borusyak et al. (2024), and Sun and Abraham (2021), and include results from a canonical two-way fixed effects model for reference.

Table A1: HBCUs and the 1940 County-Level Outcomes

	Black			White		
	Annual wage (1)	Hourly wage (2)	Years of education (3)	Annual wage (4)	Hourly wage (5)	Years of education (6)
Panel A: Matched sample						
HBCUs	0.160***	0.188***	0.871	0.256***	0.261***	1.337**
	(0.058)	(0.058)	(0.742)	(0.064)	(0.063)	(0.613)
Mean	5.649	1.987	7.970	6.340	2.723	10.883
Observations	294	294	294	294	294	294
Panel B: Matched sample, in same county between two census years						
HBCUs	0.392**	0.464**	0.907***	0.262***	0.285***	0.415**
	(0.129)	(0.151)	(0.209)	(0.068)	(0.069)	(0.155)
Mean	5.606	1.951	5.230	6.314	2.705	8.466
Observations	290	290	290	291	291	291

Note: This table reports associations between HBCU establishment and the 1940 county-level outcomes for Black American males. Panel A focus on individuals in each population group resided in the treated and the matched counties. Panel B further restricts to individuals who resided in the same county between two census years in the matched sample counties. In this cross-sectional analysis, we focus on the matched sample and include the state fixed effect. The standard errors are robust. Statistical significance is denoted by: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.