Engines of uplift: the local returns of HBCUs for Black Americans in the South, 1870–1940

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Abstract: We study how the establishment of Historically Black Colleges and Universities (HBCUs) affected Black Americans' schooling and occupations in the postbellum South, using a newly digitized HBCU data set and full-count census data within a staggered difference-in-differences and matching framework. HBCU openings raised school enrollment among Black American youth, narrowed white–Black literacy gaps, increased occupational scores, and shifted Black workers from agriculture into higher-skilled jobs. These effects remain sizable when restricting to non-movers and accounting for population dynamics, indicating that local human capital formation, rather than selective migration, drives the long-run gains.

Key words: HBCUs, higher education, occupational mobility, racial inequality
JEL classification: I23, J15, J24, N31, N32

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Introduction

Historically Black Colleges and Universities (HBCUs) have long been central to higher education in the Black American community. In 2022, Black students accounted for 76% 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), Kamala Harris (Howard University), Spike Lee (Morehouse College), and Martin Luther King, Jr. (Morehouse College). Although recent research has explored the contemporary challenges of HBCUs, their profound historical influence, particularly during periods when Black Americans faced major obstacles to education and upward mobility, remains an essential but often overlooked 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 in an individual's home county influenced educational access. 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 for Black Americans.

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 and use the estimator proposed by Callaway and Sant'Anna (2021) to address potential biases arising from staggered timing in event studies.

HBCU establishments are not random; historical narratives emphasize the crucial influence of northern churches and philanthropies in determining their locations (Lovett, 2015). Although the panel design can account for time-invariant county attributes and period-specific shocks, differences in confounders may place counties with and without HBCUs on divergent long-run paths. 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 increase 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 improved the occupational status of Black Americans. In counties hosting HBCUs, average occupation scores increased by 20% 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 dropped by 3.7 percentage points (or 7.3% of the control mean). The impact is noteworthy, given that between 1870 and 1940 the share of Black Americans employed in agriculture ranged from 45% to 73%. In parallel, HBCUs facilitated a reallocation to non-agricultural sectors, as the shares of high-skilled workers (professionals, technicians, clerical, sales, and craftsmen) increased by 16%. Although the estimated effect on the share of unskilled workers is imprecise, its magnitude remains nontrivial. The 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 primarily driven by in-migration. While HBCUs may have attracted higher-skilled individuals, potentially inflating our estimated effects, our results remain robust after controlling for population growth and 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 about selective migration, we restrict our analysis to individuals who resided in their birth state and to those who lived continuously in the same counties for at least a decade. The estimated effects remain consistent within these sample subsets, reinforcing our main conclusions. Collectively, HBCU establishments not only enhanced the educational and occupational outcomes of local Black residents but also served as magnets for higher-skilled Black migrants.

We further examine the impact of HBCUs 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.

In addition, we investigate how HBCU establishments relate to the formation of Black middle-class neighborhoods and to the spatial distribution of higher-skilled Black American workers using the 1940 Census. We classify an enumeration district as middle class if its average years of education—computed over both white and Black residents—exceeds either the county median or the 75^{th} percentile. Our findings show that counties with HBCUs have more middle-class neighborhoods than those without HBCUs, and that high-skilled Black workers and Black Americans with a high school diploma are more concentrated in Black middle-class neighborhoods in counties with HBCUs. This pattern points to a positive association between HBCU establishments and the emergence of Black middle-class neighborhoods, which in turn may foster positive neighborhood interactions and expand economic opportunity among Black Americans.

We believe that 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 existing literature on contemporary racial segregation has mainly focused on the detrimental effects of 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 metropolitan areas are less likely to graduate from college, pursue professional occupations, or earn higher earnings.

Evidence on HBCUs' effects on Black American socioeconomic outcomes remains limited, but recent research documents meaningful impacts. Fryer and Greenstone (2010) find diminishing wage returns from HBCU attendance during the 1970s through the 1990s. In contrast, Price, Spriggs, and Swinton (2011) show that HBCU graduates achieve higher long-term earnings and exhibit stronger racial identity and self-esteem. More recent work supports these positive effects: Koch and Swinton (2023) find that HBCUs enhance upward mobility for low-income and first-generation Black Americans compared to comparable non-HBCU institutions.[1]

While most research recognizes the importance of historically Black institutions, it predominantly focuses on student selection into HBCUs (Freeman and Thomas, 2002), the economic returns to HBCU attendance (Albritton, 2012; Elu, Ireland, Jeffries, Johnson, Jones, Long, Price, Sam, Simons, Slaughter, and Trotman, 2019), and their ongoing institutional development (Bracey, 2017; Johnson, Gray, Gray, Richardson, Rainey-Brown, Triplett, and Bowman, 2017). In contrast, our study highlights the historical significance of HBCU expansion, which reshaped Black communities during an era of limited opportunity and persistent struggle for social and economic advancement.

[1]Additional recent studies corroborate these benefits. Price and Viceisza (2023) find that HBCUs deliver equal or better long-run outcomes for Black students than non-HBCUs, despite serving more disadvantaged students and operating with fewer resources. Edwards, Ortagus, Smith, and Smythe (2025) using a longitudinal data set that follows Black Americans from high school through age 30, find that HBCU enrollment increases bachelor's degree completion and household income at age 30.

I. Background

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.[2]

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, Heckman, and Todd, 2002). 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). Early institutions such as Dillard University, Morehouse College, Spelman College, and Tougaloo College 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 all HBCUs were founded in the three decades following the Civil War. During this period, prominent HBCUs such as Howard University, Morehouse College, Dillard University, and Florida A&M University emerged, alongside over 200 private schools offering basic literacy skills and elementary education to freed Black Americans (Fryer and Greenstone, 2010). These efforts addressed severe educational deprivation for enslaved people in the Antebellum South, who had been legally barred from 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.[3] However, after Reconstruction, Black Americans in the Southern states remained largely excluded from these land-grant colleges. To reduce this inequity, Congress passed the Second Morrill Act in 1890, mandating states to provide higher education opportunities for Black students as a condition for continued federal support.[4]

[2]Five institutions for higher education 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.

[3]Under the Morrill Act, the federal government granted each state 30,000 acres of land for every senator and representative in Congress, with the proceeds from these land sales designated to fund colleges specializing in "agriculture and the mechanic arts" (Bracey, 2017).

[4]"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).

In response, Southern states established separate institutions for Black students, thereby preserving federal funds for predominantly white colleges while formally entrenching a segregated higher education system (Harper, Patton, and Wooden, 2009; Museus, Ledesma, and Parker, 2015).

Among the 131 HBCUs established over time, seventeen hold land-grant status.[5] 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 offered liberal arts education. Many HBCUs began as Normal schools, training teachers for segregated public school systems.[6] The expansion of high schools for Black Americans in Southern cities and the increased 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 chronically underfunded after the 1890s, with state appropriations twenty-six times lower than those provided to white institutions. For instance, 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, severe underfunding limited their resources and educational quality (Crosby, 1903; Jones, 1917; Klein, 1931).

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 pursued higher education, HBCU graduates became influential advocates for civil rights and racial justice.[7] Martin Luther King Jr. (Morehouse College) and Andrew Young Jr. (Howard University) exemplify these trajectories. Online Appendix Table B1 lists Black leaders educated at HBCUs.

II. Data

We use full-count individual-level data from the decennial U.S. censuses spanning 1870 to 1940, combined with newly digitized information on the establishment dates and locations of HBCUs. We supplement these data with county-level demographic and socioeconomic characteristics drawn from these historical censuses. In addition, we include measures of

[5]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.

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

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

agricultural output, transportation networks, religious institutions, Union Army presence, and local political outcomes, compiled from various historical sources. All variables are harmonized to the 1900 county boundaries using the crosswalks developed by Ferrara, Testa, and Zhou (2024), ensuring spatial consistency and mitigating challenges arising from shifts in county boundaries during the study period.

Historically Black Colleges and Universities

Under the Higher Education Act of 1965, HBCUs are formally designated as institutions established before 1964 with the primary mission of educating Black Americans. We assemble a novel data set with the establishment dates and geographic locations of HBCUs that remain operational, as well as those that ever merged or closed. Specifically, we manually digitize a comprehensive list 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 (Lovett, 2015; Bracey, 2017). Because NCES reports occasionally omit institutions that subsequently merged or closed, we supplement NCES data with archival and secondary sources and, where possible, record the timing and nature of institutional mergers and closures.

Between 1837 and 1965, a total of 131 HBCUs were established, with nearly three-quarters founded between 1860 and 1910. Our data set records each institution's name, founding location (including state, county, and city), and year of establishment. We cross-validate this information against official school websites for accuracy and 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. The data, sourced from IPUMS USA (Ruggles, Nelson, Sobek, Fitch, Goeken, Hacker, Roberts, and Warren, 2024), include county-level demographic characteristics, such as total population and the shares of Black, urban, and foreign-born residents.[8] Our analysis focuses on Black American males residing in Southern counties, with occupational outcomes measured for individuals aged 16–55. For educational outcomes, we analyze the impact of HBCUs across multiple age groups.[9]

[8]Because the 1890 Census records were destroyed in a fire, it is not possible to reconstruct county-level characteristics for that year.

[9]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.

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 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. The analysis sample comprises 49 treated counties, excluding those where an HBCU was established before 1870 or after 1910. Source: Hill (1985); Hoffman (1996); Provasnik and Shafer (2004); Bracey (2017); Lovett (2015).

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 across age groups 6-25. Literacy rates capture the share of individuals able to read and write within specified age groups.[10]

Occupational status serves as a stable proxy for human capital and long-term economic outcomes, offering a consistent metric for intertemporal comparison. Historical research often employs Census-defined occupational scores (Abramitzky, Boustan, and Eriksson, 2014), which assign each occupation its median wage in 1950.[11] While this approach facilitates comparability across decades, it implicitly assumes invariant wage rankings across periods and locations and fails to account for racial wage disparities—an important shortcoming for

[10]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.

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

studies of the late nineteenth and early twentieth centuries.

To account for the heterogeneity in human capital within occupations across race, region, and time, we employ the occupation-based human capital indices constructed by Song, Massey, Rolf, Ferrie, Rothbaum, and Xie (2020) and Ward (2023).[12] For cross-sectional analyses, we also compute county-level average wage incomes for Black American workers in 1940.

Other Sources

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

Religious institutions played a decisive 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 use agricultural data from Haines, Fishback, and Rhode (2018) to estimate the shares of cotton, sugar, and tobacco production. Local political preferences are captured using county-level presidential election data from Clubb, Flanigan, and Zingale (2006) for 1870. Finally, we proxy for the prevalence of racial violence through the number of documented lynching incidents after 1880, recorded by Seguin and Rigby (2019).

III. Empirical strategy

We estimate the effects of the establishment of an HBCU using an event study framework. Since the outcomes of interest are observed before and after the establishment of HBCUs, we can examine the validity of the parallel trend assumption. However, counties that host HBCUs may differ systematically from those that do not, as the siting of HBCUs could be linked to educational demand and the growth potential of local economies. Thus, counties with different pre-establishment profiles may exhibit divergent trajectories in economic and educational outcomes following an HBCU establishment. To address these concerns and strengthen the

[12]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. For individuals observed in censuses prior to 1940, the index relies on the average literacy rates within occupation, race, region, and birth cohort cells; since 1940, the measure reflects the average years of schooling.

causal interpretation of our findings, we adopt a matching specification that more effectively accounts for observable differences between counties with and without HBCUs.

Event study

To estimate the causal effects of an 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. We include county and year fixed effects 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 (de Chaisemartin and D'Haultfoeuille, 2020; Callaway and Sant'Anna, 2021; Goodman-Bacon, 2021; Sun and Abraham, 2021; Borusyak, Jaravel, and Spiess, 2024). For staggered treatments, the canonical two-way fixed-effects regressions mix comparisons across never-treated, early-treated, and late-treated units. Comparisons between early- and late-treated units can yield average treatment effects with the opposite sign of the 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 well-suited to our setting, as the determinants of HBCU location choices are unclear, and the method relies on a less restrictive parallel trend assumption.[13] Still, we show that our main estimates remain robust when we use alternative estimators from the DiD literature.

We examine the local impacts of HBCUs from 1870 to 1940 and restrict attention to counties that saw their first HBCU opening between 1870 and 1910. We exclude the 1860 Census because it does not provide reliable measures of the Black population due to the systematic undercount of enslaved individuals. In counties with multiple HBCU openings, we consider only the first establishment to define treatment status.[14] Due to the small number of HBCU foundings after 1910, we exclude six counties where the first HBCU was established between 1910 and 1940.[15]

[13]As highlighted in Roth, Sant'Anna, Bilinski, and Poe (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.

[14]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 the college or university began operations in that county. For example, Paul Quinn College was originally established in Austin, Texas (Travis County) in 1872, moved to Waco (McLennan County) in 1877, and 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.

[15]Table 1 presents the 49 treated counties by the decade in which they received their first HBCU opening.

Formally, we estimate the dynamic effects of HBCU establishments 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 of 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 based on county population in each 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. Nonetheless, the location of HBCUs is unlikely to be random, as evidenced by Figure 1, which shows how the 1870 characteristics vary across counties that ever had an HBCU and those that never did. 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 foundations in the immediate postbellum South may have been influenced by proximity to Union Army occupation, the presence of churches, 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.[16] Prior 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 the Reconstruction era may have also impacted the likelihood of an HBCU being established.[17]

We implement 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 Section II. To further account for variation in educational resources and economic development across

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

[17]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 (Liu, 2015; Andrews and Smith, 2025).

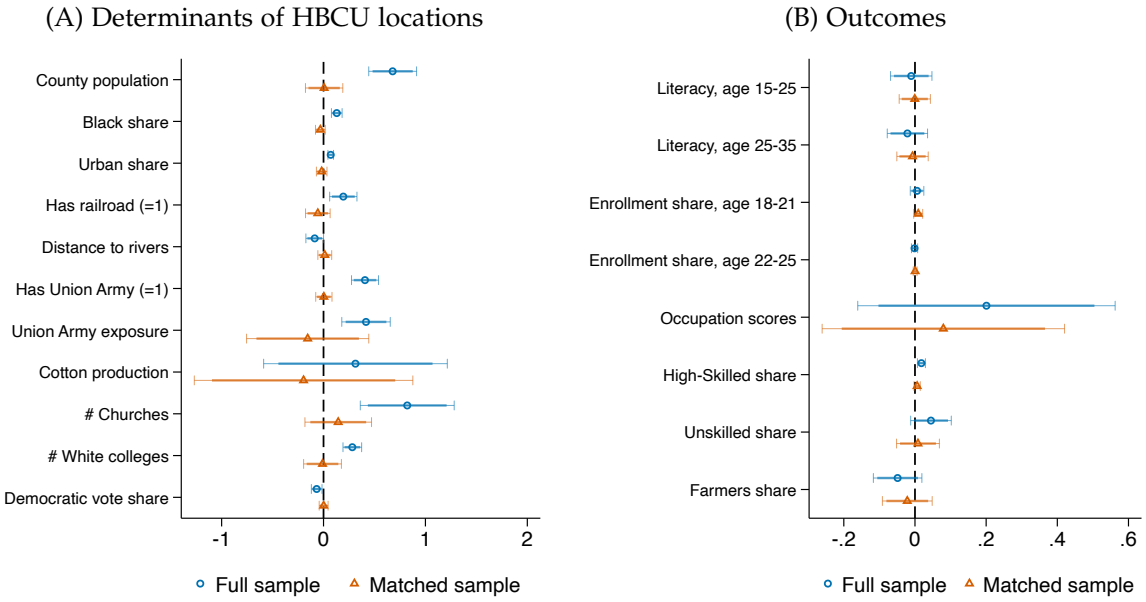


Figure 1: Differences in 1870 county characteristics between treated and control counties

Note: The figure compares 1870 county characteristics between counties that ever hosted an HBCU and those that never did. Each characteristic is regressed on an indicator equal to one for treated counties with state fixed effects. Circles and triangles denote, respectively, raw differences across all counties and differences between treated counties and their five nearest propensity-score-matched neighbors. The x-axis shows the magnitude of these differences, and solid lines indicate the 90% and 95% confidence intervals. County-level populations and cotton production volumes are in log form. Distance to the nearest navigable river is measured in 100-mile units. Exposure to the Union Army captures the duration of occupation (in years), rescaled by distance (in 100-mile units) to the nearest occupation site.

counties, we include the number of predominantly white colleges and universities in 1870, county-level cotton production, and state fixed effects.

Figure 1 illustrates the differences in these 1870 characteristics between counties that ever hosted an HBCU and those that never did.[18] In the full sample, counties that hosted HBCUs were more populous, had larger Black populations, exhibited greater exposure to the Union Army and religious institutions, and enjoyed better transportation accessibility. They also hosted more predominantly white colleges and had lower Democratic vote shares. With the exception of cotton production, these pre-treatment characteristics differ significantly between ever- and never-treated counties, and these gaps cannot be explained solely by state-level variation. Notably, we observe no significant differences in the educational or occupational outcomes of interest between counties with and without HBCUs in 1870, as reported in Figure 1, panel B.

We then construct a matched sample using propensity scores estimated from a logit model with the aforementioned 1870 county characteristics. In our preferred specification, each

[18]The Online Appendix Table B2 presents the county averages and the differences in the 1870 county characteristics between counties with and without HBCUs.

treated county is matched (with replacement) to its five nearest 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 displays the geographical distribution of both groups in the full and matched samples.

IV. Effects of HBCUs on Black Americans in the South

We begin by examining the impact of HBCU establishments on the educational attainment and labor market outcomes of Black American males in Southern counties from 1870 to 1940.[20] Our primary analysis is based on the matched sample. We then confirm the robustness of our results among stayers, ensuring that the estimated effects are not driven by selective migration after the opening of an HBCU. Next, we extend the analysis to consider white–Black disparities in educational and occupational outcomes. Finally, we examine whether the establishment of HBCUs is associated with the emergence of Black middle-class neighborhoods.

Educational outcomes

We measure educational attainment using school enrollment and literacy rates, as censuses before 1940 do not provide data on years of schooling. Enrollment rates are defined as the share of Black men aged 18–21 and 22–25 attending school, while literacy rates are measured for Black men aged 15–25 and 25–35 at the county level.[21]

As shown in Table 2, access to HBCU institutions is positively associated with school attendance among Black youth. The effects are statistically significant and economically meaningful. The establishment of an HBCU increases enrollment rates by 1.4 and 0.6 percentage points for Black American men aged 18-21 and 22-25, respectively (i.e., 16.7% and 40% relative to Southern counties without HBCUs). The estimated effects on literacy rates are positive but imprecisely estimated.[22]

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. We estimate a positive but statistically insignificant association between HBCU establishment and county-level

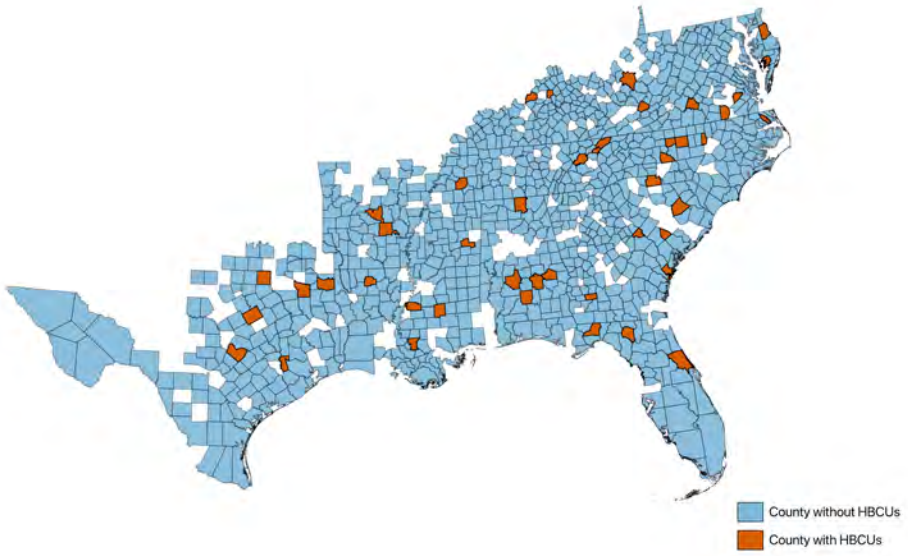
[19]We report the results of the logit estimation in the Online Appendix Table B3. Figure A2 displays the distributions of the propensity scores for counties with and without HBCUs. As a robustness check, we compare our results using full samples and matched samples that include the nearest, five, and ten nearest neighbors, and find that the estimated impacts are robust across these alternative samples (see Online Appendix Figure B5).

[20]To mitigate concerns of potential compositional differences across counties, we residualize individual-level outcomes by regressing them on age and nativity. We then aggregate these residuals to the county level, allowing us to isolate variation attributable to HBCU establishment rather than demographic composition.

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

[22]Because the U.S. Census did not report years of schooling prior to 1940, most earlier studies use literacy rates as a proxy for educational outcomes. However, as noted in prior research and contemporary reports, the accuracy and temporal comparability of Census literacy data remain subject to debate (Collins and Margo, 2006).

(A) Full sample



(B) Matched sample

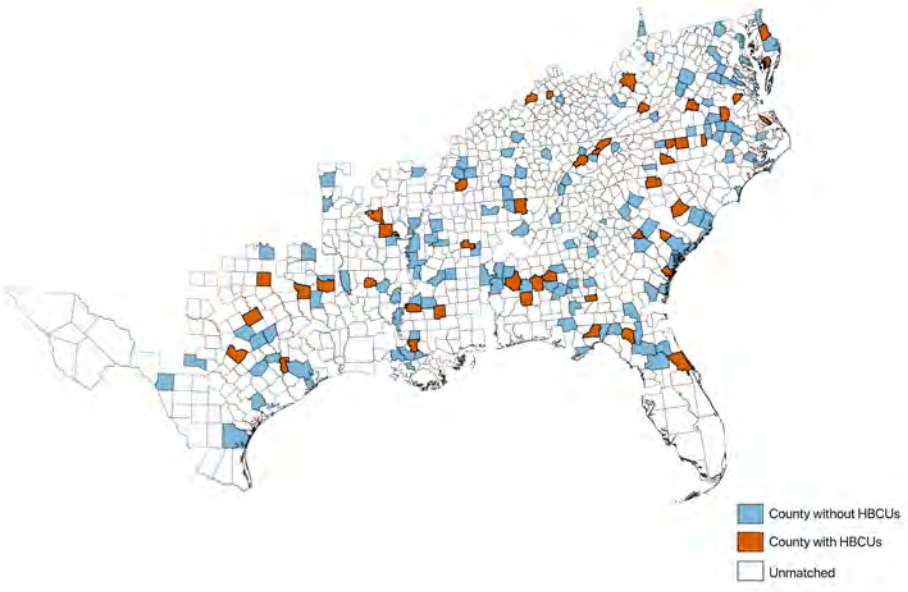


Figure 2: Counties with and without HBCUs in full and matched samples

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 with at least one HBCU established between 1870 and 1910 (treated counties) and 1,037 counties without HBCUs (control counties). Panel B focuses on counties in the matched sample, where the control group comprises 141 unique counties selected as the five closest propensity-score matches (with replacement) for each treated county. Source: Hill (1985); Hoffman (1996); Provasnik and Shafer (2004); Bracey (2017); Lovett (2015) and authors' calculation.

Table 2: Effects of HBCUs on 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

Note: This table reports the average treatment effects of HBCU establishment on the educational outcomes of Black Americans at the county level, 1870–1940. Enrollment rates are defined as the share of individuals aged 18–21 and 22–25 who were attending school at the time of the Census. Literacy rates are measured for males aged 15–25 and 25–35. The estimates follow Equation (1) on the matched sample, where each treated unit is paired (with replacement) to its five nearest control neighbors.

literacy rates.[23] Part of this relationship may operate through changes in county population composition: the founding of an HBCU may have attracted migrants from neighboring counties or states, thereby affecting observed enrollment and literacy patterns through selective migration rather than solely through institutional impacts. We discuss these population dynamics and their implications in greater detail in a subsequent section.

Labor market outcomes

We document that HBCU establishments facilitated upward occupational mobility for Black Americans by increasing employment in relatively high–human-capital occupations. Table 3 shows that HBCU openings increased the average occupational score of Southern Black males by 1.13 units, corresponding to 19.5% of the mean in other Southern counties without HBCUs. The estimated gains persist and intensify throughout the study period (panel A of Figure 3).

Consistent patterns emerge for the long-run outcomes in 1940: Black American residents of HBCU counties exhibit higher annual and hourly earnings, with Black American workers earning approximately 2.8% higher annual wages and 9.5% higher hourly wages than their counterparts in non-HBCU counties (Table A1). HBCU establishments are also positively associated with years of schooling among Black Americans. Although the effect is imprecise, the magnitude is nontrivial: HBCU establishments increase schooling by 0.9 years, approximately 10.9% of the mean in control counties. We take these findings as suggestive, given the cross-sectional design.

We then examine Black Americans' occupational choices. Following Katz and Margo (2014), we classify professionals, technicians, clerical workers, sales workers, and craftsmen as high-

[23]The Online Appendix Figure B3 presents the heterogeneous effects of HBCUs on educational outcomes across different establishment timings.

Table 3: Effects 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: This table reports the average treatment effects of HBCU establishment on the labor market outcomes of Black Americans at the county level, 1870–1940. High-skilled occupations include professionals, technicians, clerical workers, sales workers, and craftsmen; unskilled workers include operatives, laborers, and service workers; farm workers include farmers, farm managers, and farm laborers. The estimates follow Equation (1) on the matched sample, where each treated unit is paired (with replacement) to its five nearest control neighbors.

skilled occupations, and operatives, laborers, and service workers as unskilled occupations. Our results in Table 3 indicate that HBCU establishments significantly increase the employment share in high-skilled occupations: the high-skilled share in HBCU counties is 0.9 percentage points higher (16.1% relative to control counties). This positive effect persists and grows steadily in the decades following an HBCU establishment (panel B of Figure 3). HBCU openings are also positively, though imprecisely, associated with the share of unskilled workers. In addition, we find a statistically significant increase in the share of Black American teachers, consistent with a central HBCU mission of addressing the rising demand for educators in primary and secondary schools.[24]

HBCU openings further induce a sizable reallocation out of agricultural work. The share of Black American farmers declines by 3.7 percentage points, a 7.3% reduction relative to the agricultural employment share in control counties. Within two to three decades of an HBCU establishment, the local occupational composition among Black American males shifts markedly away from the agricultural sector, as shown in panels B through D of Figure 3. The absence of differential pre-trends across all panels indicates that occupational outcomes

[24]The results for teachers are available upon request.

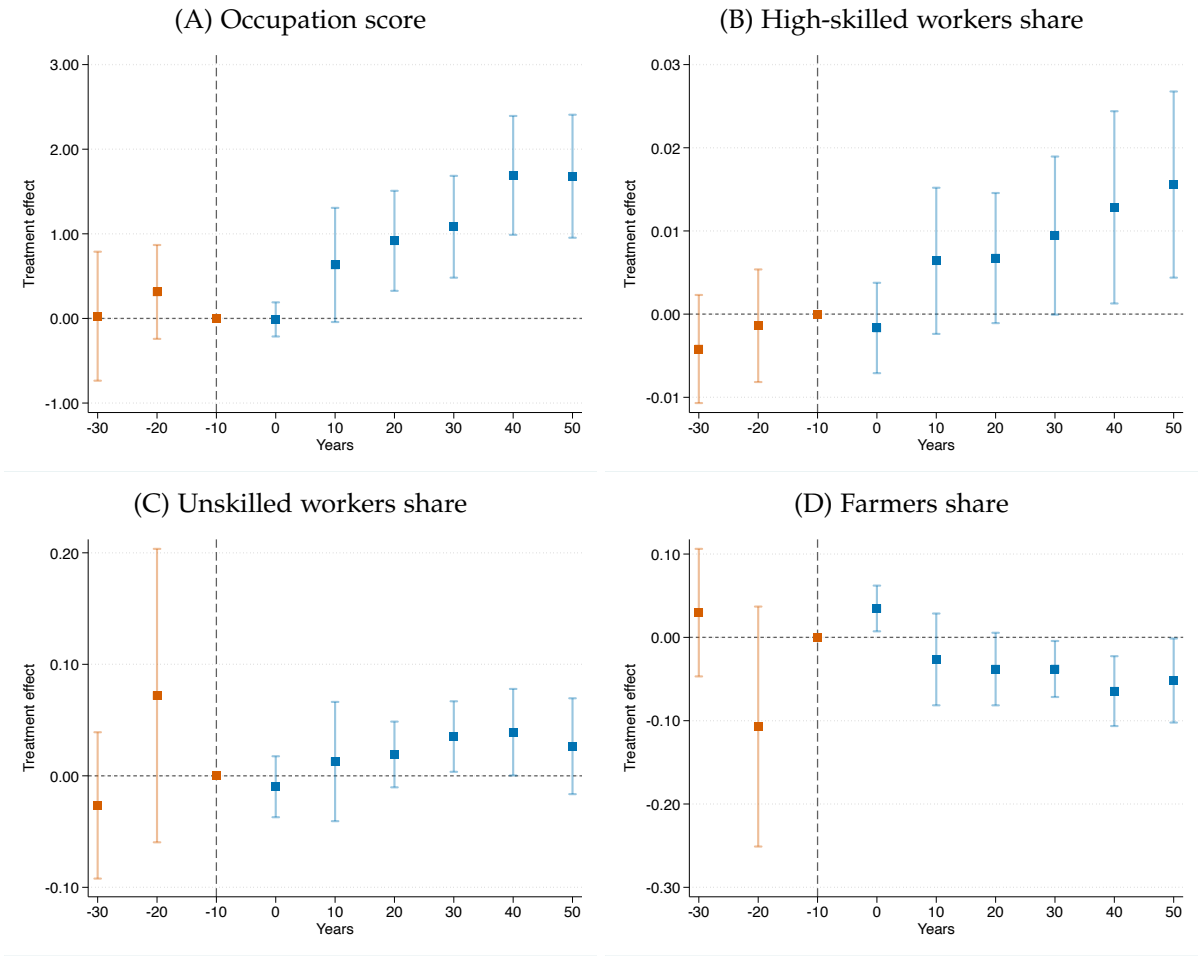


Figure 3: Dynamic effects of HBCUs on labor market outcomes

Note: This figure presents event-study estimates of the impact of HBCUs on the labor market outcomes of Black Americans from 1870 to 1940, using the estimator of Callaway and Sant'Anna (2021). The analysis focuses on HBCUs established between 1870 and 1910, defining a county's first establishment year as its treatment date. 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, along with their five nearest neighbors, based on propensity scores. Squares plot the estimated effects for each period, with bars denoting 95% confidence intervals. Effects are shown relative to the census year before treatment (Year -10), and "Year 0" denotes the first census year after a county's initial HBCU opening.

were similar between treated and control counties prior to HBCU establishment.[25] While the missions of land-grant Black institutions prioritized agricultural and mechanical training, our results are not inconsistent with that emphasis. In practice, only 12 of the 49 first-opening

[25]The Online Appendix Figures B4 and B5 present the heterogeneity by opening decade and robustness checks using alternative matched samples, respectively. We also explore heterogeneity by the size of student bodies across institutions, compiling early enrollment records wherever available, given the absence of systematic statistics on HBCU enrollments in the early years. The results show no statistically significant differences in impacts between larger and smaller institutions. For brevity, we present the results in the Online Appendix.

HBCUs in our sample held land-grant status.[26] Two mechanisms may account for the net decline in agricultural employment. First, effects from non–land-grant institutions may outweigh any positive association between land-grant HBCUs and agricultural work. Second, as historical accounts highlight, many agricultural and mechanical institutions faced severe financial constraints that limited their ability to provide collegiate-level training in these fields (Crosby, 1903; Klein, 1931; Jones, 1917).

Lastly, we study the spatial extent of HBCU spillovers by examining how effects attenuate within counties. Using township-level data from the Census Place Project (Berkes, Karger, and Nencka, 2023), we geolocate Southern Black Americans and compute the distance to the nearest HBCU. The evidence indicates that HBCU impacts are highly localized, with limited spatial diffusion of gains in occupational mobility. Townships closer to HBCU campuses exhibit larger increases in occupational scores and sharper declines in farming employment. Such localized effects are consistent with the high travel costs and limited transportation infrastructure that characterized this historical period.[27]

Population dynamics

Although our primary focus is on the local impacts of HBCUs, it is important to account for population growth and compositional changes that may influence the interpretation of our results. HBCUs may have been established in counties with greater growth potential and stronger demand for education. While our matched sample design controls for initial differences between HBCU and non-HBCU counties in 1870, residual heterogeneity in subsequent population dynamics could still influence the estimated effects. Additionally, the establishment of HBCUs likely attracted skilled in-migrants—such as faculty, staff, and students—leading to positively selected inflows that may inflate observed gains in educational and occupational outcomes.

To address these concerns, we control for log county population, the Black population share, and the urban population share in our implementation of the doubly robust estimator of Sant'Anna and Zhao (2020). This approach allows us to compare treated and control counties conditional on similar trajectories in population size and composition. Our results on educational attainment and labor market outcomes are largely robust to these adjustments (Figure 4). However, we estimate that differential population growth or demographic shifts account for roughly 30% of the increase in occupational scores. Once these population dynamics are controlled for, the impact of HBCUs on the share of agricultural workers becomes statistically insignificant, suggesting that urbanization underlies much of this adjustment.

[26] In our sample, 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.

[27] We discuss the analysis and results in detail in the Online Appendix.

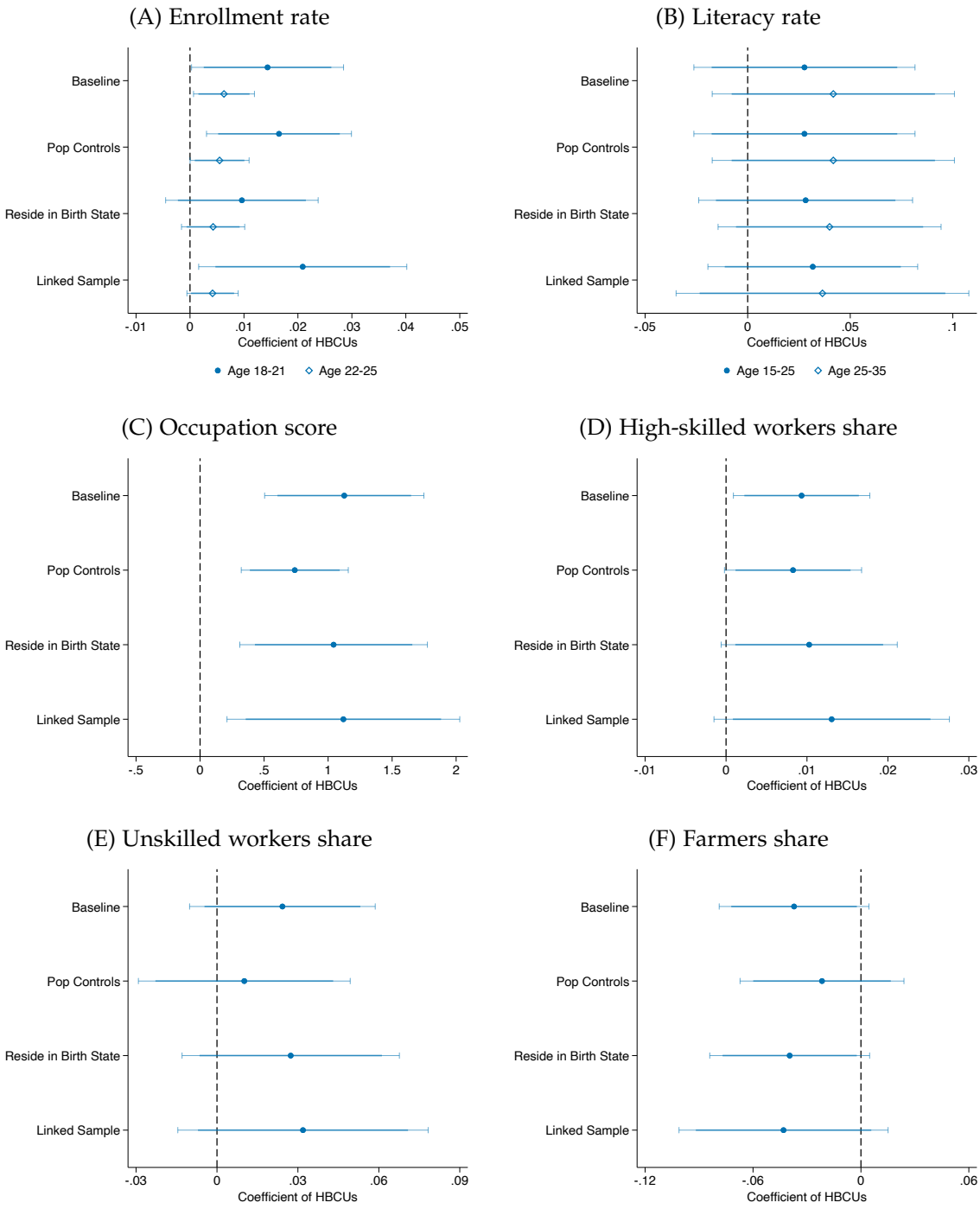


Figure 4: Population dynamics

Note: This figure displays average treatment effects of HBCU establishments on Black Americans' educational and occupational outcomes from 1870 to 1940. The baseline estimates replicate the findings in Tables 2 and 3. To account for population dynamics, we additionally control for log county population, the Black population share, and the urban population share. We also restrict the sample to individuals who remained in their birth state and to those who resided in the same county between two consecutive census waves, $t - 10$ and t, using the linking methodology of Price et al. (2023). Markers indicate average treatment effects, and solid lines report 90% and 95% confidence intervals for each specification.

We further mitigate the confounding influence of in-migrants using two alternative samples. The first sample restricts the analysis to Black American males who remained in their birth states, thereby excluding migrants from other states. The second relies on linked census data to identify individuals residing in the same county across consecutive census waves, using the linking methodology of Price et al. (2023), which matches census records between years t and $(t-10)$ from 1880 to 1940.[28] These restrictions are imperfect. The birth-state restriction cannot exclude within-state movers, and the linked sample may still include in-migrants who entered the county after the opening of an HBCU. Both specifications mitigate but do not fully eliminate bias arising from population mobility.

With these caveats in mind, the estimated effects of HBCUs on occupational scores and the share of high-skilled workers remain positive and statistically significant across these specifications (Figure 4). However, the effects on agricultural employment become noisier when focusing on same-county residents, and the impacts on school attendance among Black American youth are imprecisely estimated when restricting the sample to residents in their birth state. Taken together, these results suggest that selective in-migration is unlikely to be the primary driver of the observed effects.

Racial inequality

We next examine how the establishment of HBCUs affected racial disparities in educational and occupational outcomes. Specifically, we estimate the effects of HBCU establishments on white-Black differences in school attendance, literacy rates, and occupational scores. Panel A of Table 4 reports estimates using the matched sample, while panel B restricts the analysis to the linked sample to account for changes in population composition over time.

The results reveal that HBCU establishments reduce racial gaps in educational attainment. In the matched sample, the presence of an HBCU narrows the white–Black enrollment gap among 18–21 and 22–25 year-olds by approximately 10% and 35%, respectively, relative to control counties. Although the estimates are relatively noisy, the implied magnitudes are economically meaningful. In the linked sample, the racial enrollment gap among 22–25 year-olds declines by roughly 46% and is statistically significant among likely stayers.

HBCU establishments also generate substantial reductions in the white-Black literacy gap. In counties hosting HBCUs, literacy disparities narrow by 7.1-8.1 and 8.7-9.6 percentage points for 15-25 and 25-35 age groups, respectively. These effects represent about 28% to 33% reductions relative to the average racial difference in counties that never hosted an HBCU. Such reductions are sizable, particularly given the limited educational opportunities available to Black Americans in the Antebellum era. Despite substantial financial constraints, HBCUs made meaningful contributions to narrowing racial disparities in educational attainment.

[28] We construct the link between the 1880 and the 1900 censuses, given that the 1890 records are not available. We do not link the 1860 and 1870 censuses because the 1860 census includes only free Black Americans.

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 waves					
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 average treatment effects of HBCU establishments on white–Black gaps in enrollment rates for ages 18–21 and 22–25, literacy rates for ages 15-25 and 25-35, and occupational scores at the county level between 1870 and 1940. The estimates follow Equation (1). Panel A reports the results for the matched sample, while Panel B restricts the sample to linked individuals between consecutive census waves.

In addition, we find suggestive evidence that HBCU establishments modestly increased occupational scores for white males, though the estimates are imprecise. Combined with the findings of Table 3, these results suggest that occupational upgrading occurred at similar rates among Black and white male workers in counties with HBCUs. One possible mechanism is that as HBCUs expanded educational opportunities for Black workers, local labor markets adjusted: growing human capital among Black American workers may have pushed white workers toward higher-skilled occupations, generating modest spillover gains across racial groups.[29]

HBCUs and Black middle-class neighborhoods

We examine the relationship between the establishment of HBCUS and the subsequent development of Black middle-class neighborhoods and the spatial distribution of higher-skilled Black Americans, using data from the 1940 Census. Racial segregation, the emergence of ghettos, and the development of predominantly Black neighborhoods have long been central to explanations of racial disparities in economic outcomes in the United States (Massey,

[29]Our estimates also indicate that HBCUs increase whites' total wage income, hourly wages, and years of schooling, as reported in Table A1.

1990). Extensive research finds that higher racial residential segregation is associated with poorer labor market outcomes and lower educational attainment among Black Americans, underscoring the potentially harmful role of highly segregated environments for average adult economic performance (Cutler and Glaeser, 1997; Card and Rothstein, 2007).

We define an enumeration district as middle class if its average years of schooling—computed across both white and Black residents—exceeds either the county median or the 75^{th} percentile. Table A2 presents differences in the shares of skilled Black Americans and middle-class Black neighborhoods across counties with and without HBCUs, and shows how these distributions vary by the proportion of Black residents. Skilled Black Americans are more concentrated in predominantly Black neighborhoods (those with over 80% Black residents) in counties that host an HBCU (Table A2, panel A). However, in predominantly Black areas, treated counties do not necessarily exhibit a higher prevalence of middle-class neighborhoods, partly because white middle-class neighborhoods are more prevalent in these counties (those with fewer than 20% Black residents).

On average, the shares of high-skilled Black Americans and Black high school graduates residing in majority-Black neighborhoods are 2.16 and 5.13 percentage points higher, respectively, in treated than in control counties. These patterns are robust when using the top quartile of the education distribution to define middle-class neighborhoods (panel B). Taken together, this evidence suggests a positive association between the presence of HBCUs and the emergence of Black middle-class neighborhoods. Concentrations of Black Americans with higher educational attainment and occupational status in these neighborhoods may have fostered peer effects and interactions conducive to upward economic mobility.

V. Robustness checks

Pre-existing educational infrastructures may have shaped both counties' educational and occupational trajectories. Since our matched sample does not explicitly control for such differences—and because these factors may themselves be endogenous—the establishment of an HBCU could correlate with local schooling capacity. For instance, counties with stronger educational institutions may have been more likely to attract an HBCU, while the presence of an HBCU could, in turn, influence subsequent educational outcomes.

To isolate the effect of HBCU establishment from other forms of local educational investment, such as the prevalence of Black primary and secondary schools, we implement three robustness strategies. First, we control for the 1870 share of Black American male children aged 7–16 enrolled in school—used as a proxy for county-level educational resources—and interact this measure with census-year indicators. Second, we incorporate the 1870 enrollment share among Black American children aged 7–16 as an additional covariate in constructing the matched sample. Third, we control for the number of Rosenwald high schools, which expanded rapidly after 1920, primarily in rural areas. Because HBCUs were concentrated in urban counties and largely predated the Rosenwald initiative, these schools are unlikely to

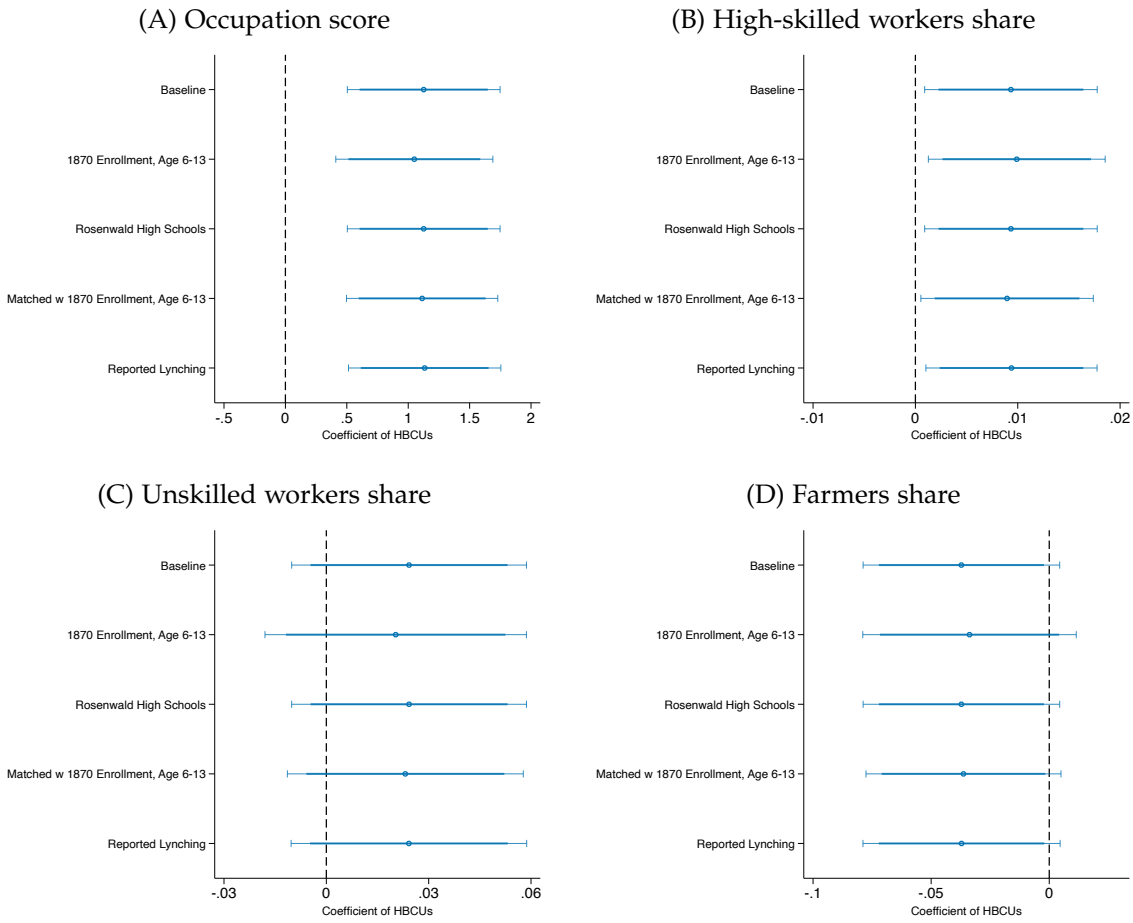


Figure 5: Robustness checks

Note: This figure presents the estimated average treatment effect of HBCU establishment, accounting for cross-county differences in educational resources and the intensity of anti-Black discrimination, proxied by the number of reported lynching cases. Specifically, the regressions (1) show baseline effects, (2) control for the 1870 enrollment rate of Black children aged 6–13 interacted with Census year indicators, (3) control for the time-varying number of Rosenwald high schools, (4) restrict the analysis to the matched sample based on the 1870 enrollment rate of Black children aged 6–13, and (5) include the time-varying number of reported lynching cases. Markers represent the estimated average treatment effects, and solid lines indicate the 90% and 95% confidence intervals.

bias our estimates for earlier periods.[30] Figure 5 compares baseline effects (the top coefficient in each panel) with those obtained after accounting for local educational inputs. Results are stable across specifications, suggesting that our main findings are unlikely to be confounded by differences in preexisting schooling provision.

The onset of the Jim Crow era, beginning soon after the end of Reconstruction in 1877, institutionalized racial segregation and systematic discrimination against Black Americans through laws and practices that restricted access to education, employment, political participation, and public services. Variation in the intensity of such discrimination across counties could thus

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

confound the relationship between HBCU establishment and long-run outcomes, as counties with more severe racial hostility may have been less likely to host HBCUs or support Black advancement. Although the matching procedure accounts for political preferences, it may not fully capture this dimension. To address this concern, we include the number of reported lynching cases as a proxy for county-level racial hostility. As shown at the bottom of Figure 5, our estimates remain stable when including this measure.

Finally, we assess robustness using alternative staggered difference-in-differences estimators from Borusyak et al. (2024) and Sun and Abraham (2021). As displayed in Figure A3, results obtained from these alternative specifications closely align with those from the baseline Callaway and Sant'Anna (2021) estimator, reinforcing the consistency of our findings.

VI. Conclusion

This study provides new causal evidence on the profound role of Historically Black Colleges and Universities (HBCUs) in advancing the educational and occupational trajectories of Black Americans in the postbellum South. Using a newly assembled dataset on the timing and location of HBCU establishments and a staggered event-study framework, we find that counties that established an HBCU between 1870 and 1910 experienced marked and sustained gains in Black American educational attainment and occupational mobility from 1870 to 1940, relative to counties that never did. These long-run improvements reflect the enduring influence of early institutional investments in higher education for Black communities emerging from slavery.

Exposure to an HBCU increased enrollment among young Black American adults and substantially narrowed racial disparities in literacy, despite the broader constraints of segregation-era schooling. These educational advances translated into improved labor market outcomes, with local Black American workers shifting from agricultural employment toward professional, clerical, technical, and skilled trades. Importantly, these effects are not driven by selective migration: results remain robust when restricting to non-movers and accounting for population dynamics, suggesting that HBCUs generated local human-capital accumulation rather than merely attracting it.

Taken together, the findings underscore the critical role of HBCUs as engines of educational access and economic mobility during a period of pervasive racial exclusion. By transforming local opportunity structures, these institutions helped sustain long-term improvements in human capital and economic advancement for Black Americans across the American South.

Appendix



Figure A1: Locations of Historically Black Colleges and Universities

Note: The map plots the locations of 131 HBCUs using county boundaries as of 1900. Orange dots mark individual institutions, and shaded regions indicate the U.S. South. While most HBCUs were located in the South, though a few were established in the Northeast and Midwest. For clarity, Compton Community College (Los Angeles, CA) and the University of the Virgin Islands are omitted.

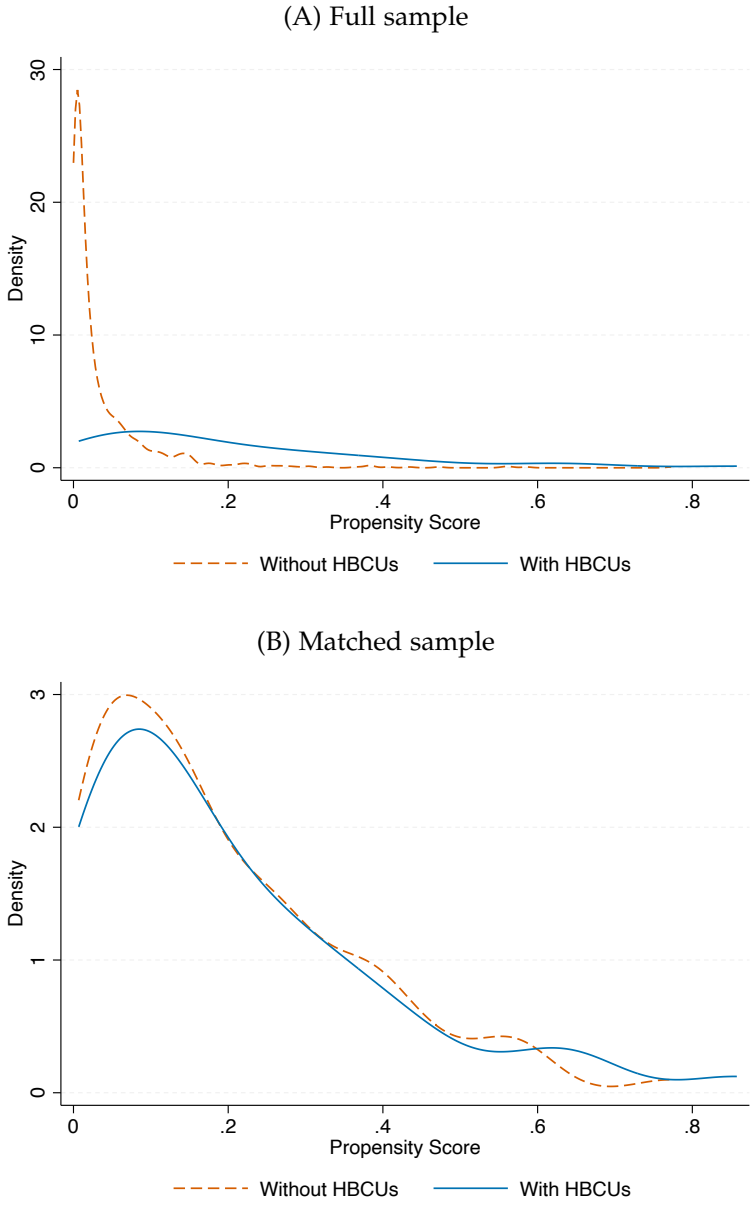


Figure A2: Propensity score for counties with and without HBCUs

Note: This figure plots the distribution of propensity scores for counties with and without HBCUs. Panel A shows the density for the full sample—49 counties that hosted at least one HBCU between 1870 and 1910, and 1,037 counties that never did. Panel B shows the density for treated counties and their five nearest neighbors in the matched sample. Propensity scores are estimated from a logit model of HBCU presence using 1870 county characteristics and state fixed effects. Each treated county is matched (with replacement) to its five nearest neighbors by propensity score.

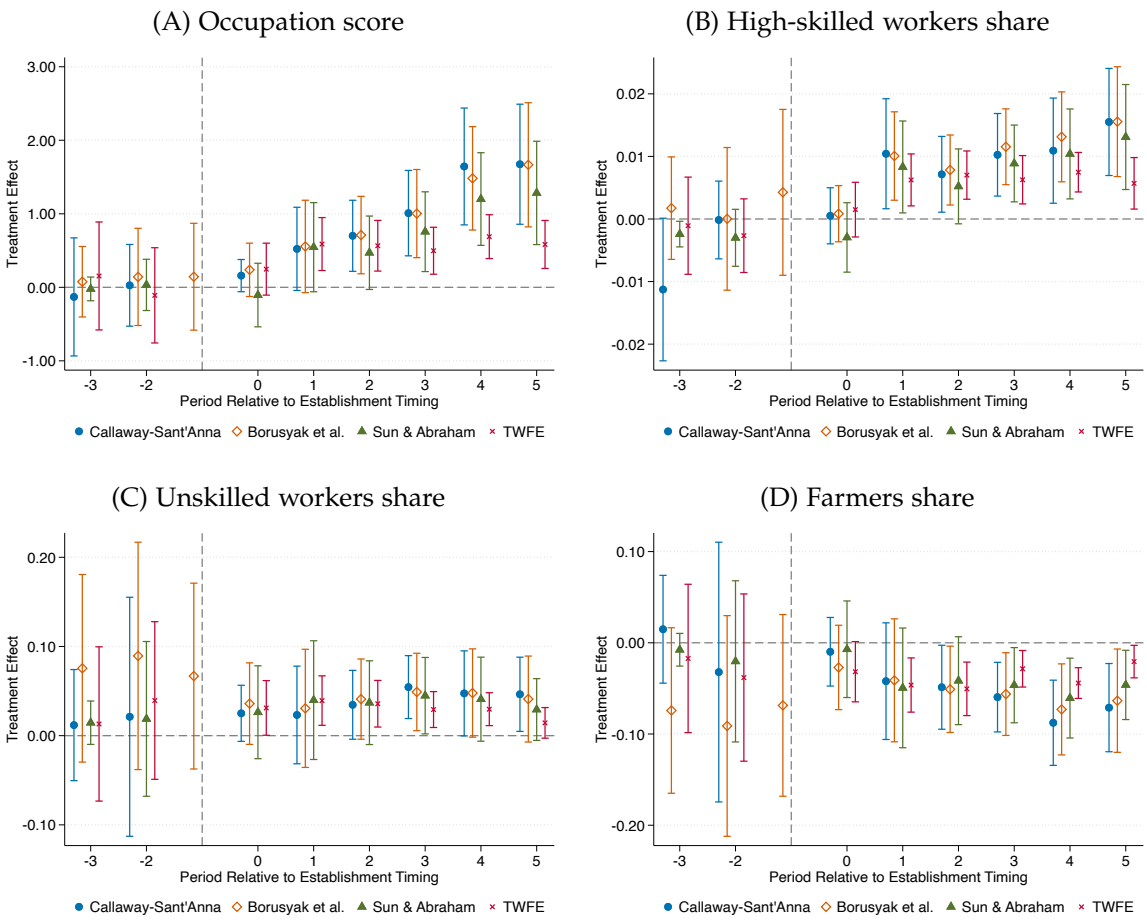


Figure A3: Alternative staggered difference-in-differences estimators

Note: This figure presents event-study estimates of occupational outcomes (as reported in Figure 3) based on alternative estimators for staggered treatment timing. Specifically, we report estimates using the approaches of Callaway and Sant'Anna (2021), Borusyak et al. (2024), and Sun and Abraham (2021), and include results from a conventional 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 waves						
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 1940 county-level outcomes for Black American males. Panel A includes individuals from each population group residing in treated and matched counties. Panel B further restricts the sample to individuals who remained in the same county across two consecutive census waves within matched counties. All specifications include state fixed effects. Standard errors are robust.

Table A2: Skilled Black Americans and Black middle-class neighborhoods

Treated-Control Difference	Black population share			
	$< 20\%$ (1)	20-50% (2)	50-80% (3)	80-100% (4)
Panel A: Middle-class (above-median years of schooling)				
High-skilled Black Americans (%)	0.01	0.56	-0.59	2.16
High school-graduate Black Americans (%)	-0.39	1.72	-0.95	5.13
Middle-class neighborhoods (%)	3.59	-2.16	-1.76	-0.13
Panel B: Middle-class (top 25^{th} percentile of years of schooling)				
High-skilled Black Americans (%)	-0.11	0.43	-0.16	0.64
High school-graduate Black Americans (%)	-0.30	0.25	-0.67	3.28
Middle-class neighborhoods (%)	1.14	-0.63	-0.19	0.20

Note: This table presents the shares of Black American high-skilled workers, Black adults with high school diplomas, and middle-class neighborhoods across counties with and without an HBCU. We report differences in these shares between treated (HBCU) and control (non-HBCU) counties by the neighborhood-level Black population share. A neighborhood is classified as middle-class if its enumeration-district average schooling years—calculated across both Black and white residents—exceeds the county median (Panel A) or the 75^{th} percentile (Panel B).

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Online Appendix

Localized impacts

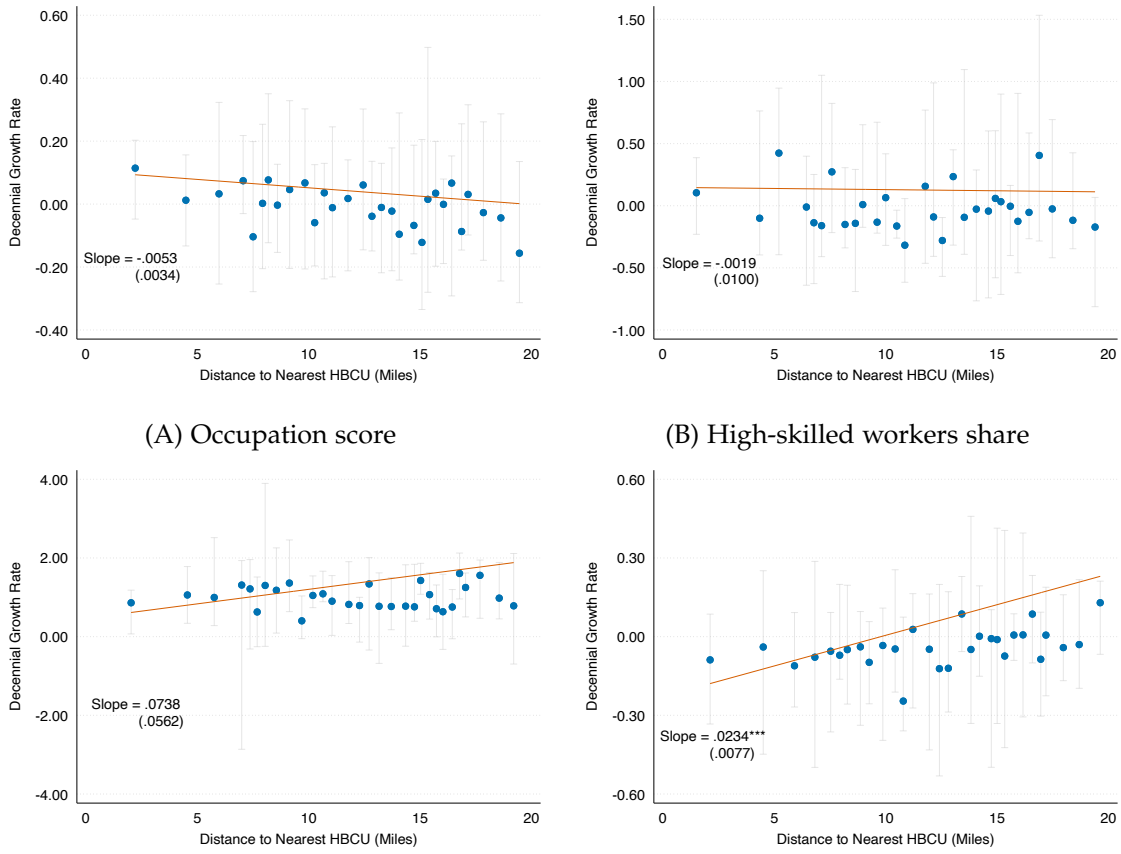
We assess the degree of spatial localization in the spillover effects of HBCUs by examining their attenuation at the sub-county level. To this end, we systematically geocoded, to the fullest extent possible, the original addresses of each HBCU. Using data from the Census Place Project (Berkes, Karger, and Nencka, 2023), we geolocated Southern Black Americans at the township level and computed the distances from each township to its nearest HBCU. To ensure that effects are confined within states, we calculated these distances only for towns located in the same state as the HBCU. For analytical clarity, we further restrict the sample to towns with only one HBCU opening within a thirty-mile radius during the study period. To quantify the association between geographic proximity and measured outcomes, we estimated township-level regressions that model outcomes as a function of distance to the nearest HBCU, controlling for the log of town population, the Black population share, and state fixed effects.

Figure B1 displays binscatter plots illustrating the relationship between outcome growth and proximity to HBCUs for towns within a twenty-mile radius. As expected, the positive impact of HBCUs on occupational scores attenuates with distance, although this relationship is not statistically significant. Proximity to HBCUs, however, is significantly associated with lower agricultural employment shares, with towns closer to HBCU campuses experiencing more pronounced declines in farming occupations. In contrast, the distance to HBCUs does not display clear associations with employment shares in manual and non-manual occupations.[1]

Overall, these results highlight the highly localized nature of HBCUs' economic impacts, particularly in transforming agricultural labor markets, while also emphasizing the limited spatial diffusion of their influence on occupational mobility. Such localized effects are perhaps unsurprising, given the substantially higher travel costs prevailing at the time.[2]

[1]These patterns persist among towns located within fifteen miles, as shown in Figure B2. In this restricted sample, proximity to HBCUs remains significantly correlated with changes in town-level occupational scores.

[2]Railroads became the dominant mode of long-distance travel in the US South starting in the 1880s, with fares typically around 2–3 cents per mile. Stagecoaches remained important for areas with limited railroad access, though fares were higher, generally ranging from 10 to 15 cents per mile.



(A) Occupation score

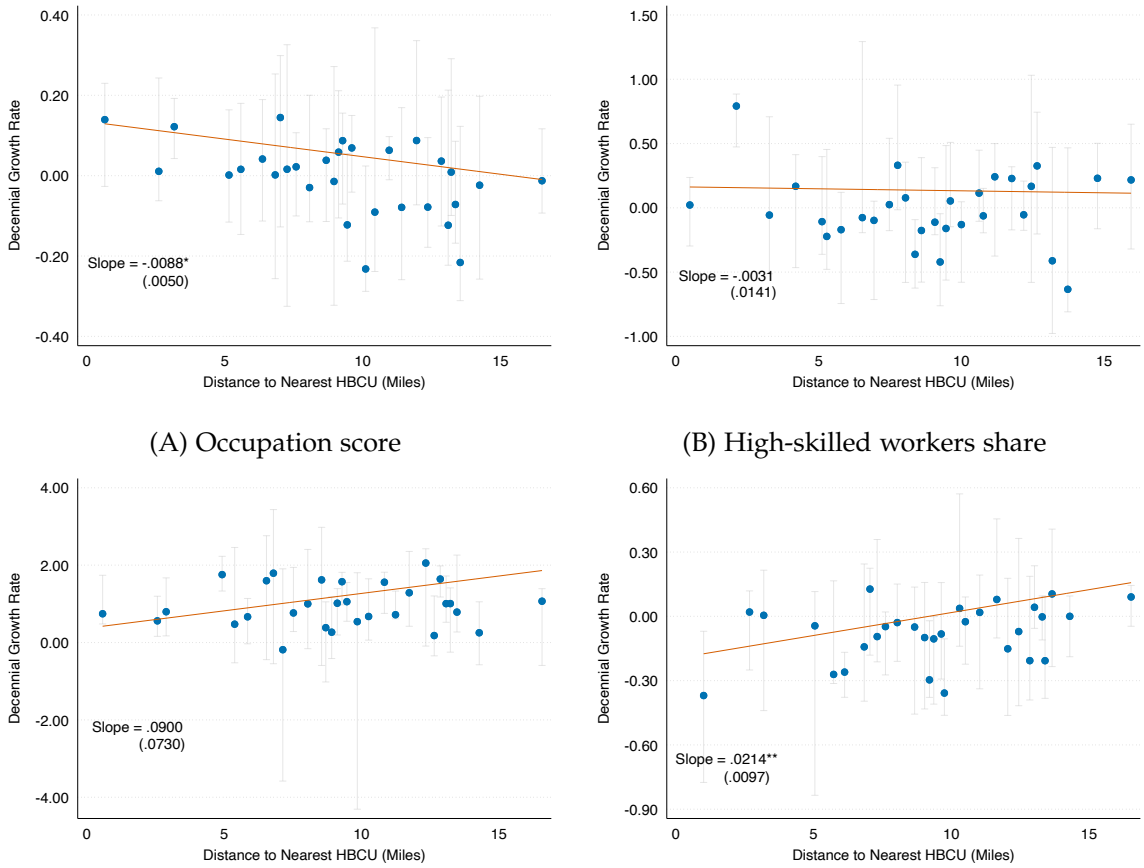
(B) High-skilled workers share

(C) Unskilled workers share

(D) Farmers share

Figure B1: Intensity of exposure to HBCUs by distance

Note: This figure displays binscatter plots relating the distance to the nearest HBCU to the decennial growth rate of each outcome. The orange line plots a linear fit. The light gray solid lines mark the interquartile range of the outcome distribution. The sample includes towns that have existed since 1870 and are located in states where only one HBCU was established during the study period. Distances are calculated from each town's centroid to the nearest in-state HBCU. Outcomes are residualized with respect to 1870 log town population, the Black population share, and state and year fixed effects. Town–year observations with growth rates in the top or bottom 1% of the distribution are treated as outliers and excluded.



(A) Occupation score

(B) High-skilled workers share

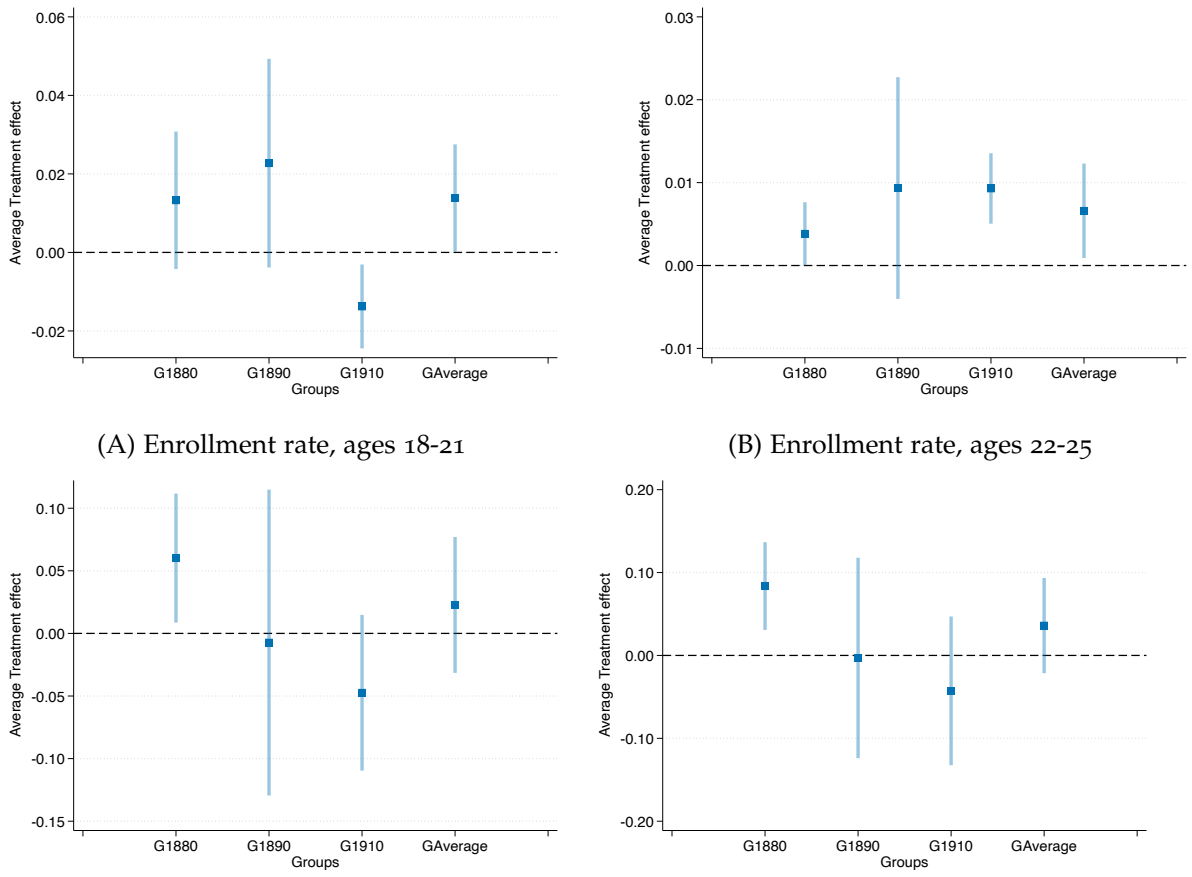
(C) Unskilled workers share

(D) Farmers share

Figure B2: Intensity of exposure to HBCUs by distance

Note: This figure replicates Figure B1, focusing on towns within a fifteen-mile radius of the nearest HBCU. The orange line plots a linear fit. The light gray solid lines mark the interquartile range of the outcome distribution. The sample includes towns that have existed since 1870 and are located in states where only one HBCU was established during the study period. Distances are calculated from each town's centroid to the nearest in-state HBCU. Outcomes are residualized with respect to 1870 log town population, the Black population share, and state and year fixed effects. Town–year observations with growth rates in the top or bottom 1% of the distribution are treated as outliers and excluded.

Heterogeneous effects by treatment timing



(A) Enrollment rate, ages 18-21

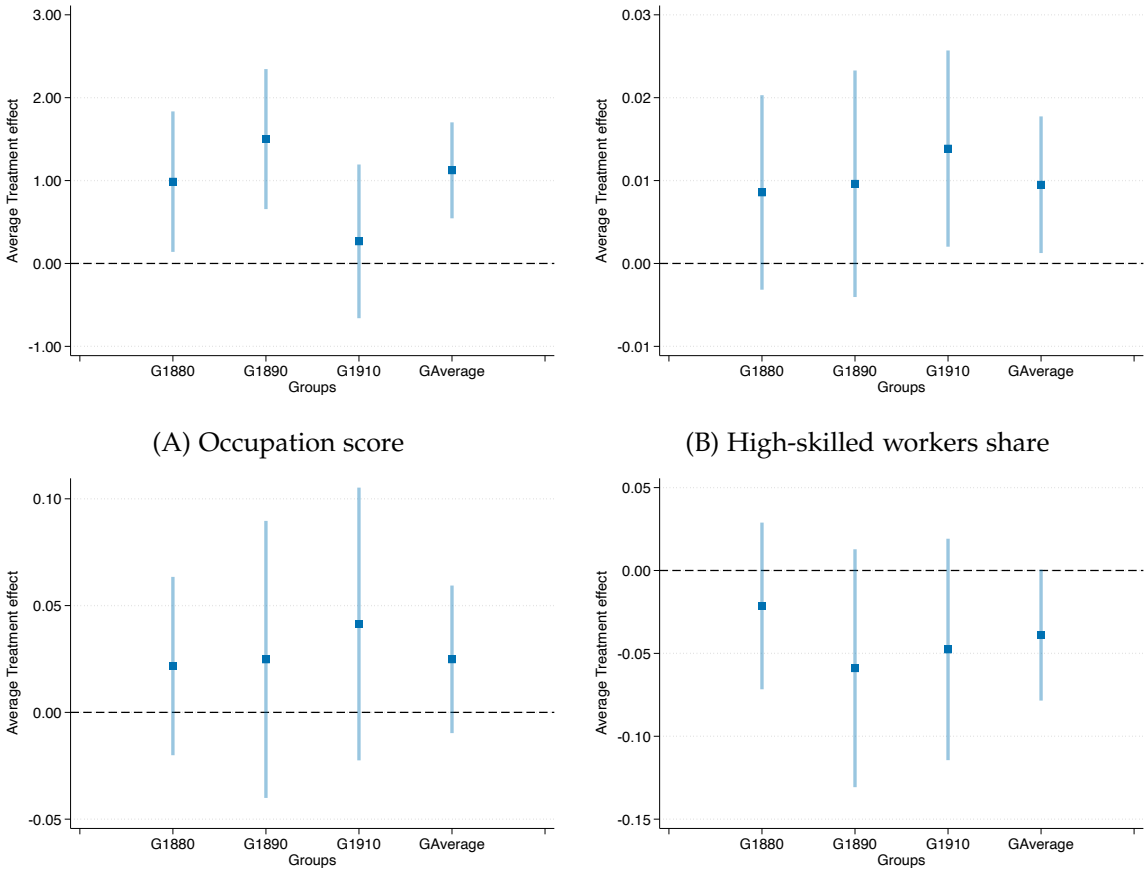
(B) Enrollment rate, ages 22-25

(C) Literacy rate, ages 15-25

(D) Literacy rate, ages 25-35

Figure B3: Heterogeneous effect on educational outcomes by opening timing

Note: This figure presents the heterogeneous effects of HBCU establishments on Black Americans' educational outcomes for counties that experienced openings in 1880, 1890, and 1910. Counties with the first HBCU opening in 1900 are excluded because the 1890 Census is missing. The dots denote the point estimates of the average treatment effects for each treatment group; the spikes indicate their 95% confidence intervals.



(A) Occupation score

(B) High-skilled workers share

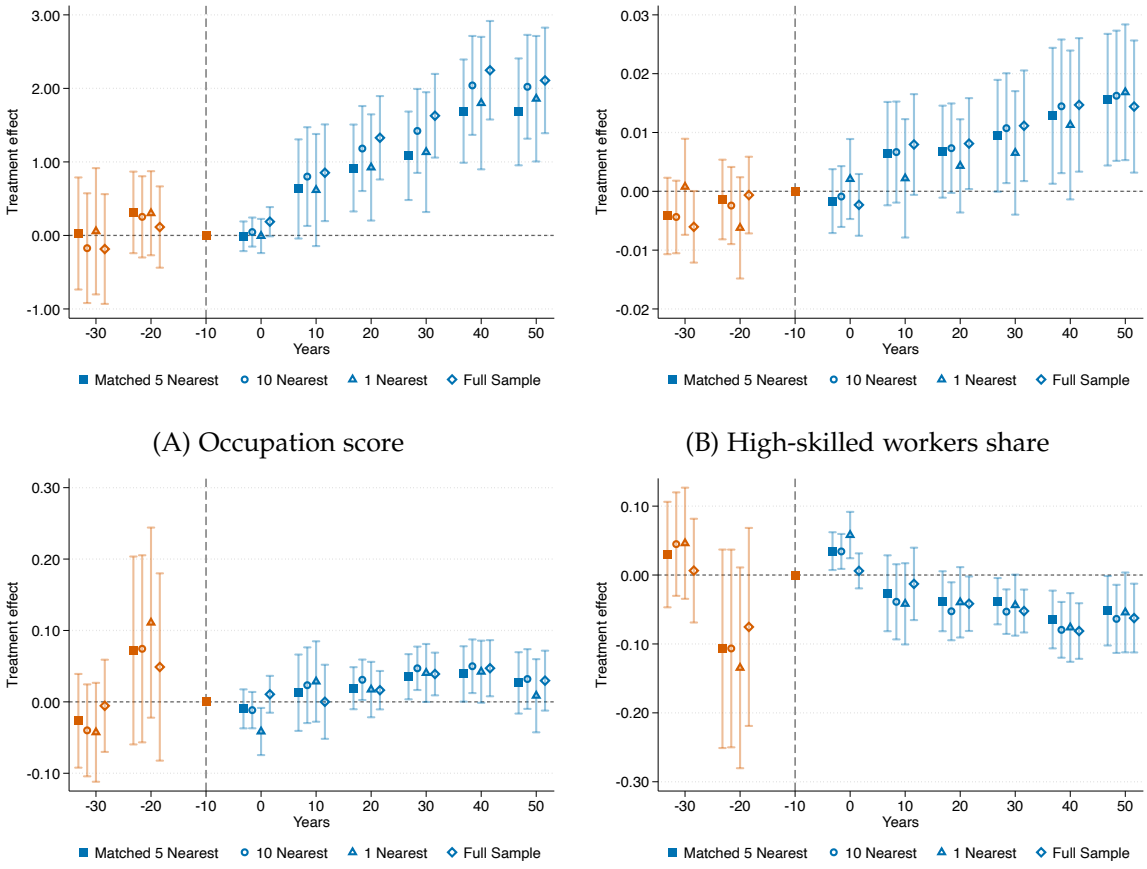
(C) Unskilled workers share

(D) Farmers share

Figure B4: Heterogeneous effect on occupational outcomes by opening timing

Note: This figure presents the heterogeneous effects of HBCU establishments on Black Americans' occupational outcomes for counties that experienced openings in 1880, 1890, and 1910. Counties with the first HBCU opening in 1900 are excluded because the 1890 Census is missing. The dots denote the point estimates of the average treatment effects for each treatment group; the spikes indicate their 95% confidence intervals.

Robustness: alternative matching samples



(A) Occupation score

(B) High-skilled workers share

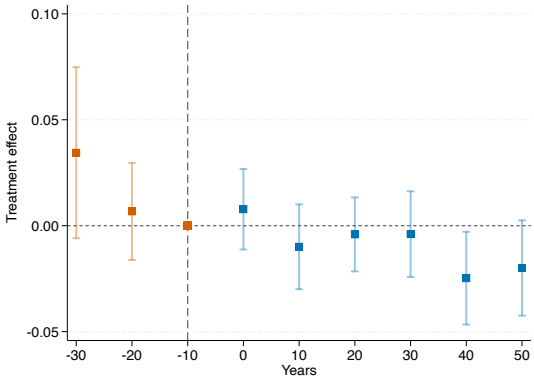
(C) Unskilled workers share

(D) Farmers share

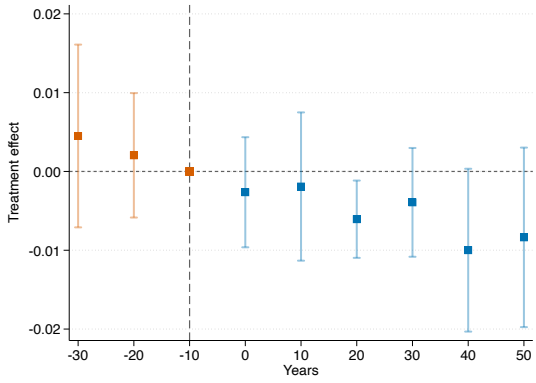
Figure B5: HBCUs on occupational outcomes, alternative matching samples

Note: This figure replicates Figure 3 and illustrates how the establishment of an HBCU influences average occupational outcomes among Black Americans at the county level. Results are presented for the full sample and for alternative matched samples, using the estimation strategy described in Equation (1). Markers denote the estimated effect for each period, and the solid lines indicate the corresponding 95% confidence intervals. All effects are measured relative to the final period before the county's first HBCU opening. Period 0 corresponds to the first decade following an HBCU's establishment, and subsequent (or preceding) periods represent the average treatment effects for counties that received an HBCU in different years.

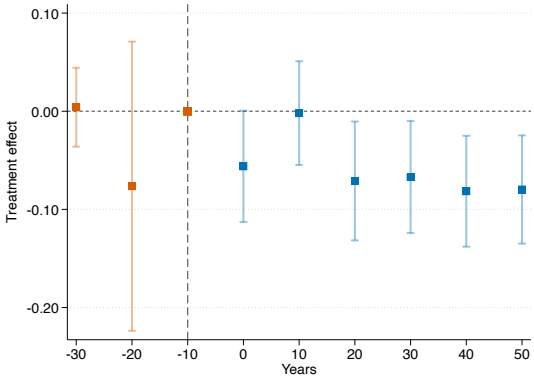
Dynamics effects on racial inequality



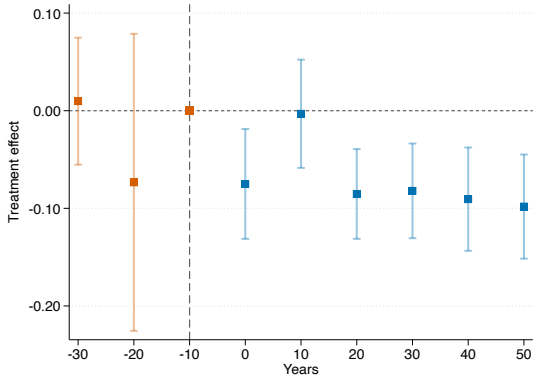
(A) Enrollment rate, ages 18-21



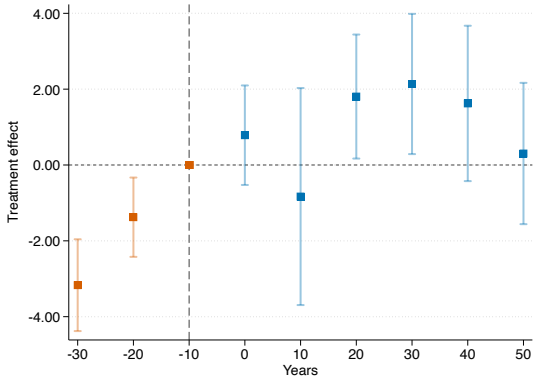
(B) Enrollment rate, ages 22-25



(C) Literacy rate, ages 15-25



(D) Literacy rate, ages 25-35



(E) Occupation score

Figure B6: HBCUs on racial inequality

Note: This figure replicates Table 4 and displays event-study results of how HBCU establishments affect racial differences in the enrollment share for the 18-21 and 22-25 age groups, literacy rate for the 15-25 and 25-35 age groups, and occupation scores. Bars reflect 90% confidence intervals.

Background: HBCU prominent leaders

Table B1: Black leaders matriculated at HBCUs

Names	Alma Mater	Known for
Ralph Abernathy	Alabama State University	Civil rights activist
Ella Josephine Baker	Shaw University	Civil rights activist
Claude Black	Morehouse College	Minister, political figure
Julian Bond	Morehouse College	Politician
Benjamin Chavis	St. Augustine's University	Author, journalist
	Howard University	
Medgar Evers	Alcorn State University	Civil rights activist
James L. Farmer	Wiley College	Civil rights activist
Kamala Devi Harris	Howard University	Vice President of the U.S.
Zora Neal Hurston	Morgan State University	Writer, anthropologist
	Howard University	
Jesse Jackson	North Carolina A&T State	Politician, civil rights activist
Martin Luther King, Jr.	Morehouse College	Civil rights activist
John Lewis	American Baptist College	Politician
	Fisk University	
Joseph Lowery	Knoxville College	Civil rights activist
	Alabama A&M University	
Thurgood Marshall	Lincoln University	Associate justice, Supreme Court
Diane Nash	Howard University	Civil rights activist
	Fisk University	
Rosa Parks	Alabama State University	Civil rights activist
A. Philip Randolph	Bethune-Cookman University	Civil rights activist
Bayard Rustin	Wilberforce University	Political activist
Kwame Ture	Howard University	Civil rights activist
Andrew Young	Dillard University	Politician, diplomat
	Howard University	
Whitney Young	Kentucky State University	Civil rights activist

Note: This table shows several Black American leaders who graduated from or matriculated at historically Black colleges and universities. Source: Bracey (2017)

Summary statistics between treated and control counties

Table B2: Summary statistics, 1870 county characteristics

	Treated mean	Control mean	Treated–control difference	
	(1)	(2)	(3)	(4)
County population	9.616	8.863	0.678	0.006
			(0.120)	(0.093)
Black population share	0.454	0.310	0.130	-0.031
			(0.027)	(0.024)
Urban population share	0.084	0.019	0.071	-0.018
			(0.014)	(0.026)
Has railroad $(= 1)$	0.653	0.428	0.194	-0.056
			(0.068)	(0.061)
Distance to rivers	0.249	0.328	-0.087	0.012
			(0.044)	(0.034)
Has Union Army $(= 1)$	0.857	0.460	0.407	0.003
			(0.067)	(0.041)
Union Army exposure	0.617	0.222	0.417	-0.156
			(0.121)	(0.305)
Cotton production	2.974	2.443	0.313	-0.196
			(0.459)	(0.545)
# Churches	8.692	7.764	0.822	0.144
			(0.235)	(0.166)
# White colleges	0.367	0.073	0.283	-0.010
			(0.047)	(0.094)
Democratic vote share (%)	0.323	0.400	-0.067	0.001
			(0.027)	(0.022)
Literacy, ages 15-25	0.757	0.693	0.071	0.006
			(0.027)	(0.030)
Literacy, ages 25-35	0.814	0.775	0.049	0.011
			(0.028)	(0.031)
Enrollment share, ages 18-21	0.037	0.031	0.006	0.009
			(0.010)	(0.006)
Enrollment share, ages 22-25	0.009	0.011	-0.001	0.000
			(0.004)	(0.003)
Occupation scores	4.941	4.738	0.201	0.080
			(0.184)	(0.173)
High-skilled share	0.048	0.031	0.018	0.006
			(0.006)	(0.004)
Unskilled share	0.212	0.170	0.045	0.008
			(0.029)	(0.031)
Farmers share	0.665	0.709	-0.049	-0.022
			(0.035)	(0.036)
Number of counties	49	1,037	1,086	294

Note: This table displays the mean values and differences for 1870 county characteristics between counties that ever hosted HBCUs and those that never hosted an HBCU. Column 3 reports the raw differences, and column 4 compares only treated counties and their five nearest neighbors, matched using propensity scores. Both specifications include the state fixed effect. County-level populations and cotton production volumes are in log form. Distance to the nearest navigable river is measured in 100 miles. Union Army exposure reflects the duration of occupation (in years), rescaled by distance (in 100 miles) to the nearest occupation site.

Matching: logit estimation

Table B3: Logit estimation of HBCUs on 1870 county characteristics

	Ever had at least one HBCU			
	(1)	(2)	(3)	(4)
County population	1.424	1.206	0.962	0.882
	(0.349)	(0.360)	(0.427)	(0.433)
Black population share	1.965	1.499	1.490	0.887
	(0.942)	(1.063)	(1.074)	(1.131)
Urban population share	1.924	1.704	1.869	1.192
	(1.083)	(1.168)	(1.179)	(1.273)
Has railroad $(= 1)$		-0.365	-0.348	-0.405
		(0.400)	(0.401)	(0.413)
Distance to rivers		0.139	0.089	0.077
		(0.704)	(0.712)	(0.731)
Has Union Army $(= 1)$		1.972	2.013	2.054
		(0.575)	(0.576)	(0.585)
Union Army exposure		0.216	0.212	0.217
		(0.129)	(0.128)	(0.127)
Cotton Production			-0.005	-0.015
			(0.047)	(0.048)
# Churches			0.237	0.247
			(0.235)	(0.231)
# White colleges				0.716
				(0.343)
Democratic vote share (%)				-2.903
				(1.196)
Observations	1,086	1,086	1,086	1,086
Pseudo R^2	0.177	0.230	0.233	0.260

Note: This table presents the relationship between whether a county received an HBCU and 1870 county characteristics under the logit model with state fixed effects. The sample includes only Southern counties, harmonized to 1900 boundaries, excluding those that received HBCUs before 1870 or after 1910. There are 49 counties that received at least one HBCU from 1880 to 1910, and 1,037 counties that never experienced an HBCU establishment.

HBCUs and educational outcomes across age groups

Table B4: HBCUs and educational outcomes by age groups

	Enrollment rate					Literacy			
Age groups	6-9	10-13	14-17	18-21	22-25	15-25	25-35	35-45	45-55
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A: Black males									
HBCUs	-0.004	-0.030	-0.003	0.014	0.006	0.028	0.042	0.037	0.023
	(0.020)	(0.028)	(0.019)	(0.007)	(0.003)	(0.028)	(0.030)	(0.029)	(0.032)
Control mean	0.440	0.602	0.404	0.084	0.015	0.628	0.617	0.587	0.514
Observations	1,968	1,968	1,968	1,968	1,968	1,968	1,968	1,968	1,968
Panel B: White males									
HBCUs	0.008	-0.036	0.009	0.012	0.001	-0.010	-0.014	-0.012	-0.009
	(0.016)	(0.062)	(0.037)	(0.012)	(0.004)	(0.026)	(0.015)	(0.012)	(0.013)
Control mean	0.620	0.805	0.601	0.176	0.029	0.909	0.919	0.913	0.894
Observations	1,968	1,968	1,968	1,968	1,968	1,968	1,968	1,968	1,968

Note: 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 the age groups 6-9, 10-13, 14-17, 18-21, and 22-25 who attended school at the time the Census was enumerated. We measure literacy rates for males in four age groups: 15-25, 25-35, 35-45, and 45-55. The results are estimated following our baseline specification and using the matched sample, in which each treated unit is compared to its five nearest control neighbors (with replacement).

Occupational outcomes using alternative samples

Table B5: HBCUs and occupational outcomes by alternative samples

	Full sample	Matched sample, nearest		
		Ten	Five	One
	(1)	(2)	(3)	(4)
Panel A: Occupation score				
HBCUs	1.556	1.413	1.126	1.205
	(0.301)	(0.305)	(0.317)	(0.406)
Control mean	5.802	5.776	5.774	5.727
Observations	7,514	3,535	1,974	595
Panel B: High-skilled workers share				
HBCUs	0.010	0.010	0.009	0.009
	(0.004)	(0.004)	(0.004)	(0.004)
Control mean	0.056	0.056	0.056	0.055
Observations	7,514	3,535	1,974	595
Panel C: Unskilled workers share				
HBCUs	0.029	0.032	0.024	0.016
	(0.017)	(0.017)	(0.018)	(0.022)
Control mean	0.356	0.351	0.351	0.347
Observations	7,514	3,535	1,974	595
Panel D: Farmers share				
HBCUs	-0.049	-0.049	-0.037	-0.038
	(0.020)	(0.021)	(0.021)	(0.026)
Control mean	0.498	0.505	0.506	0.511
Observations	7,514	3,535	1,974	595

Note: This table replicates Table 3 and presents the average treatment effect of HBCU establishment on Black Americans' occupational outcomes for alternative samples. Column 1 presents results for the full sample, while columns 2 to 4 focus only on matched samples with the nearest ten, five, and one neighbors of counties with HBCUs.

Heterogeneous effects by sizes of student bodies in HBCUs

Table B6: Heterogeneous effects by size of HBCUs

	Enrollment rate		Literacy		Occupation	High-skilled	Unskilled	Farmers
	18-21	22-25	15-25	25-35	score	share	share	share
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Enrollment above- vs. below-25th percentile								
HBCUs	0.005	0.009	0.001	0.023	0.964	0.013	0.015	0.002
	(0.011)	(0.003)	(0.037)	(0.046)	(0.738)	(0.009)	(0.017)	(0.019)
HBCUs$\times$1(Enroll $>$ 25pct)	0.023	0.003	0.005	-0.021	0.317	-0.004	0.046	-0.095
	(0.023)	(0.007)	(0.062)	(0.065)	(0.861)	(0.009)	(0.038)	(0.043)
Control mean	0.024	0.009	0.628	0.617	5.774	0.056	0.351	0.506
Observations	1,863	1,863	1,863	1,863	1,869	1,869	1,869	1,869
Panel B: Enrollment above- vs. below-median								
HBCUs	0.011	0.011	0.020	0.037	1.250	0.012	0.022	-0.024
	(0.016)	(0.004)	(0.034)	(0.036)	(0.567)	(0.006)	(0.022)	(0.025)
HBCUs$\times$1(Enroll $>$ 50pct)	0.021	-0.001	-0.060	-0.094	-0.473	-0.006	0.057	-0.079
	(0.019)	(0.009)	(0.078)	(0.073)	(0.794)	(0.008)	(0.046)	(0.063)
Control mean	0.024	0.009	0.628	0.617	5.774	0.056	0.351	0.506
Observations	1,863	1,863	1,863	1,863	1,869	1,869	1,869	1,869

Note: This table presents the heterogeneous effects of HBCU establishments on Black Americans' educational and occupational outcomes following the specification used in Tables 2 and 3. We recover enrollment information for only the first 10 years of establishment for 56 of 131 institutions, as systematic statistics on HBCUs' enrollment in the early years are unavailable. We exclude institutions without enrollment information from the analyses. The mean and standard deviation of early-year enrollment are 143.205 (210.107) and 202.679 (229.246), respectively, for institutions with enrollment above the 25th (50th) percentile.

References

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