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

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[PRELIMINARY DRAFT]

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Abstract

This study examines 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. Using digitized data on HBCU founding years and locations, along with full-count U.S. censuses, we employ a staggered difference-in-differences approach to compare counties that experienced their first HBCU openings to those that did not. HBCU establishments led to significant increases in youth enrollment rates among Black American males and shifted occupational composition from agriculture to higher-skilled non-manual jobs. HBCUs also reduced racial literacy gaps by 5.3–5.6 percentage points. The findings highlight HBCUs' critical role in advancing Black socioeconomic mobility during the postbellum era. (*JEL* I23, J15, J24, N31, N32)

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1 Introduction

Historically Black Colleges and Universities (HBCUs) continue to play a central role in higher education for Black Americans. In 2021, Black students comprised approximately around 75% of HBCU enrollment. While students at HBCUs represent only about 1.5% of total U.S. college enrollment, these institutions educate roughly 9% of all Black college students. HBCUs have a distinguished history of cultivating Black leaders across various professions, including W. E. B. Du Bois (Wilberforce), Spike Lee (Morehouse College), Martin Luther King, Jr. (Morehouse College), and Kamala Harris (Howard University). Nevertheless, less is known about the impact of HBCUs on Black Americans and their communities during earlier periods, particularly in the late nineteenth and early twentieth centuries.

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. The establishment of an HBCU in one's home county increases access to schooling; thus, following the approaches of Card (1999) and Currie and Moretti (2003), we exploit the uneven expansion of HBCUs to estimate the causal effect of increased educational opportunities on subsequent educational and economic performance.

Defined by the Higher Education Act of 1965, HBCUs are institutions established before 1964 with the principal mission of educating Black Americans. After the Civil War, support from philanthropies, churches, and the Freedmen's Bureau—a federal agency assisting newly freed Black Americans—spurred the initial wave of HBCU establishments, particularly during the Reconstruction era. The Morrill Act of 1890 further established several land-grant higher education institutions specifically for Black Americans. Approximately 80% of HBCUs came to fruition between 1865 and 1910. Leveraging the expansion of HBCUs during this period and the full-count U.S. census data, we exam-

ine how HBCU openings between 1870 and 1910 affected county-level educational and occupational outcomes for Black Americans from 1870 to 1940.

We first analyze the determinants of HBCU location. While prior studies have found that the establishment of land-grant institutions appears orthogonal to local economic characteristics (Moretti, 2004; Kantor and Whalley, 2014), we find that HBCUs were more likely to be established in populous counties with higher shares of urban and Black residents.

To assess the impact of HBCU expansion on Black Americans' outcomes, we exploit within-county variation in outcomes before and after an HBCU's establishment, as well as differences between counties that did and did not receive an HBCU, controlling for county and year fixed effects. To address concerns that a staggered event setting may bias estimates in a canonical two-way fixed effects regression, we implement the estimator proposed by Callaway and Sant'Anna (2021).

Our findings indicate that the establishment of HBCUs significantly improved educational outcomes for Black Americans. Increased access to HBCUs led to a 1.2 percentage point increase in the enrollment rate for Black males aged 16 to 25—a 48% rise relative to the 1870 mean. Although HBCUs' impact on Black Americans' literacy rate is statistically insignificant, HBCU openings significantly shrink the racial gap in literacy rates between Black Americans and the white population.

HBCU establishments also shifted the occupational composition of Black Americans toward higher-skilled jobs. The opening of HBCUs increased Black Americans' occupation scores by 21.96% relative to the 1870 mean. Moreover, HBCU establishment was associated with a decline in the county employment share in agriculture and an increase in the share of non-agricultural workers among Black males. Specifically, HBCU openings reduced the employment share of farmers and farm laborers by 5.8 percentage points, or

8.42% relative to the 1870 mean. The impact is economically significant, as the average share of Black Americans employed in agriculture ranged from 45% to 73% between 1870 and 1940. Our results further indicate that HBCU openings increased employment shares among non-manual workers, including clerical, service, and sales occupations.

To our knowledge, this is the first study to estimate the local educational and occupational outcomes for Black Americans exposed to HBCU establishments in the late nineteenth and early twentieth centuries—an era marked by pronounced labor market frictions 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, work in professional occupations, or have higher incomes.

Few studies, however, have examined the role of HBCUs. One notable exception is Fryer and Greenstone (2010), who document the decline in wage returns to attending HBCUs between the 1970s and 1990s. Price and Viceisza (2023) analyze differences in educational, economic, social mobility, and health outcomes among Black Americans attending HBCUs versus non-HBCUs in the contemporary context, exploring potential explanations for positive associations between HBCU attendance and later-life outcomes after accounting for college preparedness. Research in education and race has discussed the importance of historically Black institutions, but most studies focus on student selection into HBCUs (Freeman and Thomas, 2002), the economic returns of attending HBCUs (Albritton, 2012; Elu et al., 2019), and the current development of HBCUs (Bracey, 2017; Johnson et al., 2017).

2 Background: Establishment of Historically Black Colleges and Universities

Based on the full-count U.S. censuses, over four million enslaved Black Americans resided in Southern states, where education was prohibited from the Black population before the Civil War. Few secondary and post-secondary educational institutions were available for 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 conclusion of the Civil War expanded educational opportunities for free Black Americans. During the Postbellum era, the Freedmen's Bureau, religious organizations, and philanthropists established schools and higher education institutions for Black Americans in the South (Donohue et al., 2002). Various 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—played pivotal roles in founding Black colleges and universities (Rovaris, 2005). For example, Dillard University, Morehouse College, Spelman College, and Tougaloo College are religiously affiliated institutions (Redd, 1998; Rovaris, 2005). These institutions often began as seminaries emphasizing religious instruction before evolving into formal educational establishments offering agricultural and vocational training.

Approximately 70% of historically Black colleges and universities (HBCUs) were founded within three decades following the Civil War. Many prominent HBCUs, including Howard University, Morehouse College, Dillard University, and Florida A&M Uni-

[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, and later consolidated with Teachers College, Federal City College, and Washington Technical Institute in 1977.

versity, were established during this period. Alongside the growth of HBCUs, more than 200 private educational institutions emerged in the South to provide primary education, primarily literacy instruction, to freed Black Americans (Fryer and Greenstone, 2010). Such skills were especially vital for the Black population in the South, given that during the Antebellum era, Black Americans were enslaved and barred from formal education. According to the full-count 1870 Census, only 16.54% of Black Americans aged 16 to 55 in the South were literate, compared to approximately 56.60% literacy among the non-Southern Black population.

The Morrill Act of 1862 allocated federal land to state governments to establish educational institutions focused on agriculture and mechanical arts.[2] However, following the Reconstruction era, Black Americans in Southern states had limited access to these land-grant colleges. To address racial disparities in educational resources, Congress enacted the Second Morrill Act in 1890, mandating states to provide higher education opportunities for Black students.[3] Southern legislatures responded by funding separate institutions for Black students to maintain federal support for predominantly white institutions. 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).

Seventeen of the 131 historically Black colleges and universities ever established are land-grant institutions;[4] most were founded or merged with existing colleges between

[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).

[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.

1890 and 1900, including Florida A&M, Kentucky State, and North Carolina A&T universities. These HBCUs primarily offered vocational training. Unlike many white institutions that provided liberal arts education, many HBCUs, originally established as Normal schools, focused on training teachers for segregated public schools.[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 an interdependency between Black public schools and these institutions (Roebuck and Murty, 1993).

Despite the provisions of the Second Morrill Act, public HBCUs remained significantly underfunded after the 1890s, receiving state appropriations twenty-six times lower than those for white institutions. For example, Delaware State University received no state funding in the 1890s. While Alabama allocated approximately $65,000 annually to white land-grant institutions, 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 aimed to provide collegiate-level training in agriculture and mechanical arts, financial constraints limited the quality of education offered (Crosby, 1903; Klein, 1931; Jones, 1917).

Historically Black colleges and universities offered more than primary education and vocational training; they also fostered racial pride and self-esteem. These institutions served as centers of progressive political activism within the Black community (Mbajekwe, 2006). As more Black Americans attained formal higher education, these graduates became influential advocates in civil rights efforts against racial inequality and injustice.[6] HBCUs have cultivated numerous Black American scholars and civil rights leaders; for instance, Morehouse College is the alma mater of Martin Luther King Jr., and Andrew

[5] As Reconstruction 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 key role nationwide (Albritton, 2012).

Young Jr. graduated from Howard University. Table A1 lists selected Black American leaders who graduated from or matriculated at HBCUs.

3 Data

This paper analyzes the impact of historically Black colleges and universities (HBCUs) on the educational and occupational outcomes of Black Americans at the county level in the U.S. South from 1870 to 1940. To achieve this, we integrate digitized data on HBCUs with county-level characteristics derived from historical U.S. censuses. Additionally, we compile county-level information on agricultural outputs, transportation accessibility, religious institutions, Union Army influence, and political outcomes from various sources. To address concerns related to changes in county boundaries over time, all variables are mapped to the 1900 county boundaries using crosswalks provided by Ferrara et al. (2024).

Historically Black Colleges and Universities

Defined by the Higher Education Act of 1965, historically Black colleges and universities (HBCUs) are institutions of higher learning established before 1964 with the primary mission of promoting higher education for Black Americans. We digitize the list of HBCUs based on multiple reports from the National Center for Education Statistics (NCES) (Hill, 1985; Hoffman, 1996; Provasnik and Shafer, 2004) and prior studies (Bracey, 2017; Lovett, 2015). While NCES reports document operational statistics of HBCUs, they may omit institutions that have closed or merged. To comprehensively assess the potential impacts of HBCUs on local Black populations, we include all HBCUs documented in these sources and incorporate closure or merger information when available.

A total of 129 HBCUs were established between 1837 and 1965, with approximately 80% founded between 1860 and 1920. Our dataset includes each institution's name,

establishment location (state, county, city), and founding year. We cross-validate these details using official school websites to ensure consistency across sources. Furthermore, we document any location changes of HBCUs when data permits. Table 1 presents the number of HBCU establishments and the count of counties experiencing their first HBCU opening by decade.

U.S. Census

We utilize full-count Census data from 1870 to 1940 to capture county-level characteristics, including total population and shares of Black, urban, and foreign-born residents (Ruggles et al., 2024).[7] To evaluate the effects of HBCU openings on economic outcomes, we restrict our sample to Black males aged 16 to 55 residing in Southern counties during the study period.[8] We also construct enrollment shares for children aged 7 to 16 and youth aged 16 to 25 using the full-count census data.

Our analysis emphasizes Black Americans' literacy rates and occupational choices. Given the lack of wage and educational data in censuses prior to 1940, occupational status serves as a proxy for human capital and enables consistent comparisons across decades. Studies utilizing historical U.S. census data often employ the occupation score, a measure based on the median wage income for each occupation in 1950, to assess individuals' economic outcomes.[9]

[7]The 1890 Census records were lost due to fire; thus, 1890 county-level characteristics cannot be constructed.

[8]This study focuses on males due to relatively low female labor force participation and enrollment rates in the late nineteenth and early twentieth centuries. In addition, the U.S. South, 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, South Carolina, Oklahoma, Tennessee, Texas, Virginia, and West Virginia.

[9]The occupation score (OCCSCORE) assigns median 1950 wage income values to occupations harmonized with the 1950 Census occupational classification (OCC1950). While this measure facilitates comparisons over time by providing a consistent occupational status metric, it assumes fixed median wages across periods and locations and does not account for racial wage disparities, which is a significant limitation for analyses of this era.

To better capture socioeconomic status and human capital within occupations, accounting for variation by race, region, and time, we rank occupations by average human capital levels following Song et al. (2020) and Ward (2023).[10] In cross-sectional analyses, we also compute average wage income for Black workers at the county level using the 1940 census.

Transportation and Union Army Occupation

Transportation accessibility is measured using data from Atack (2015, 2016), identifying whether a county had operational railroads and the total railroad length within each county. We also measure distances to the nearest steamboat-navigable rivers and their lengths as of 1865.

Additionally, data from Downs and Nesbit (2015) enable construction of measures for each county's distance to the nearest Union Army occupation sites, duration of occupation, and median troop numbers at these sites between 1865 and 1872.

Religious Bodies

Churches and denominations played a significant role in establishing educational institutions for Black Americans after the Civil War. To examine the relationship between religious bodies and HBCU establishments, we use data from Haines (2010) documenting the number of churches and church members in selected denominations-including Baptist, Episcopal, Methodist, and Presbyterian-across Southern counties in 1870.

[10] Ward (2023) calculate a 1-100 index of average human capital for each occupation using full-count censuses from 1850 to 1940, supplemented with auxiliary samples from IPUMS, including the 1% samples for 1960 and 1970, 5% samples for 1980 and 1990, and the American Community Surveys from 2000, 2010, and 2017. This index reflects mean literacy rates within occupation-race-region-birth cohort cells. For cohorts observed after 1940, average human capital is based on mean years of education.

National Elections and Agriculture

We incorporate presidential election data from Clubb et al. (2006) to construct county-level political preference measures for 1870. To assess economic development at the county level, we use agricultural data from Haines et al. (2018) to calculate the shares of cotton, sugar, and tobacco production in Southern counties.

4 Empirical Strategy

We investigate the impacts of the HBCU establishment using an event study approach. Since the outcomes of interest are observable before and after the establishment, we are able to examine the validity of the assumption of parallel trends. However, local characteristics differ between counties with and without HBCUs. The location choices of HBCUs may be correlated with the growth potential of local economies and trends in educational outcomes. Counties with distinct characteristics prior to HBCU establishment may thus be on different trajectories with respect to economic and educational outcomes. In our preferred specification, we control for several county characteristics to account for potential dynamic differences between counties with and without HBCUs. Additionally, we employ a matching approach to estimate causal effects.

4.1 Event Study

To estimate the causal effects of HBCU establishment, we exploit within-county changes before and after HBCU openings, as well as variation between counties with and without HBCUs, by including county and year fixed effects. This approach allows us to filter out time-invariant, county-specific factors and common trends across all Southern counties in our sample.

Nonetheless, the staggered expansion of HBCUs may bias estimates in canonical two-way fixed effects regressions. Recent difference-in-differences literature highlights how variation in treatment timing across units and periods can threaten identification (Borusyak et al., 2024; de Chaisemartin and D'Haultfoeuille, 2020; Callaway and Sant'Anna, 2021; Sun and Abraham, 2021; Goodman-Bacon, 2021). In such cases, the canonical two-way fixed effects model compares treated and never-treated units as well as early- and late-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 this concern in the context of staggered events, we implement the estimator proposed by Callaway and Sant'Anna (2021), which is particularly suitable for our setting, as the determinants of HBCU location choices are unclear and the parallel trends assumption under the Callaway and Sant'Anna (2021)'s estimator is less restrictive.[11]

We examine the impacts of HBCUs from 1870 to 1940 while focusing on counties that received an HBCU between 1870 and 1910. Because the 1860 Census excludes most enslaved Black Americans, we omit the 1860 data to avoid potentially biased comparisons. Although several counties experienced multiple HBCU openings during our study period, we focus only on the first establishment in each ever-treated county.[12] To ensure sound comparisons, we exclude treated counties that received their first HBCU between 1910 and 1940, as only six counties experienced their first opening in these three

[11] As highlighted in Roth et al. (2023), the Borusyak et al. (2024) estimator constructs its baseline using average pre-treatment outcomes, requiring the parallel trends assumption to hold consistently across all periods prior to treatment. In contrast, Callaway and Sant'Anna (2021) adopt a more targeted approach: their estimator uses only the immediate pre-treatment period as the reference point, thereby necessitating parallel trends solely for that specific time window rather than the entire pre-intervention history.

[12] Among the 49 counties that experienced at least one HBCU opening, 20% had more than one establishment during the study period. Notably, Paul Quinn College was established in Austin, Texas, in 1872, moved to Waco, Texas, in 1877, and then relocated to Dallas, Texas, in 1900. We identify Waco, Texas, as the first county to experience the opening of Paul Quinn College. Since Paul Quinn is the first HBCU that Dallas, Texas, has ever had, Dallas is also considered a treated county in our analysis.

decades.[13]

Formally, we implement an event study design and estimate the dynamic effects of HBCU establishments with the following regression:

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

where Y_{ct} represents the outcomes of interest in county c at 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.

The identification relies on the parallel trends assumption: pre-establishment outcome trends must be parallel between treated and non-treated counties. The location choices of HBCUs are unlikely to be random. Based on the 1870 county characteristics, HBCUs tended to be in counties with more population and higher Black and urban population shares (Table 2). To account for the differences between counties with and without HBCUs before HBCU establishments, we construct a matched sample based on several 1870 county characteristics.

4.2 Matching Sample

Historical narratives suggest that the location choices of HBCUs may have been influenced by factors such as the sites of Union Army occupation, the presence of churches, and other local characteristics. Many of these factors reflect county conditions around the

[13]We include 49 counties in the treatment group, accounting for 89.09% of the counties that experienced an HBCU opening between 1870 and 1940 and 63.64% of those that received at least one HBCU before 1940. Note that 28.57% of ever-treated counties experienced their first establishment before 1870.

Civil War and prior to our study period. To improve the comparability between counties that ever received an HBCU and those that never did, we employ a matching approach based on these pre-existing characteristics.

Although we lack detailed evidence to fully rule out the possibility that counties with and without HBCUs were on different economic development trajectories, existing empirical research indicates that the location decisions for some institutions, particularly land-grant colleges-were often 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). Nevertheless, the historical record for HBCUs points to a significant role played by northern churches and philanthropies in supporting Black education, especially in the years immediately following the Civil War (Bracey, 2017; Lovett, 2015).

The degree of exposure to northern influences varied considerably across Southern counties. Rivers, ports, and railroads served as key conduits for the activities of northern churches and philanthropic organizations. Missionaries and denominational conferences were often concentrated in areas near major transportation hubs. Previous studies also indicate that missionaries frequently accompanied the Union Army and provided assistance to freedmen during the Civil War. Furthermore, during the Reconstruction Era, the intensity of local resistance could have influenced the likelihood of HBCU establishment.

To assess the potential impact of these factors on HBCU location, we compile data on transportation accessibility, exposure to the Union Army and churches, and political leanings in 1870, as presented in Table 2, Panel B. To further capture differences in educational resources and economic development across counties, we also document the number of existing predominantly white colleges and universities in 1870, as well as the

(log) volume of cotton production in each Southern county.

Table 2 shows that the likelihood of ever receiving HBCUs positively correlates with exposure to churches and the Union Army in 1870. Additionally, counties that eventually received HBCUs were more accessible to railroads and rivers, had a higher number of predominantly white colleges, and had lower vote shares for anti-abolitionist Democrats. The distinctions in the 1870 characteristics between counties that ever received and those that never received HBCUs are significant and cannot be attributed solely to variation across states. While ever-received counties had higher cotton production output, this difference is not statistically significant.

We construct a matched sample based on the propensity scores estimated using the 1870 county characteristics highlighted in the historical narrative. Panels A and B in Table 2 list the county characteristics included in the propensity score estimation, which is performed using a logit model.[14] In our preferred specification, we restrict the control group to the five nearest neighbors (with replacement) based on propensity scores for each county that ever received at least one HBCU.[15] The matched sample comprises 49 ever-received counties and 141 unique never-received counties. Figure 3 illustrates the locations of ever-received and never-received counties in both the full and matched samples.

[14]See Table A2 for the logit model estimation results.

[15]Figure 2 presents the distributions of the propensity scores for counties with and without HBCUs. As robustness checks, we also construct matched samples that include ten and one nearest neighbors. The results remain stable using alternative matched samples.

5 HBCUs' impacts on Black Americans in the South

We analyze the effects of HBCU establishments on educational and occupational outcomes for Black American males in Southern counties between 1870 and 1940. To estimate causal impacts, 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 using the staggered difference-in-differences estimator proposed by Callaway and Sant'Anna (2021). To address potential compositional differences across counties, we residualize individual-level outcomes by regressing them on age and nativity. The resulting residuals, aggregated to the county level, isolate variation attributable to HBCU establishment rather than demographic heterogeneity. Our preferred setting relies on a matched sample to ensure that counties with and without HBCUs share similar characteristics as of 1870.

We further extend the analysis to explore racial inequality and spatial decay. Specifically, we assess how HBCUs influenced white-Black disparities in education and occupation status. Additionally, we investigate whether the benefits of HBCUs diminish with geographic distance from campus locations, providing insights into their localized versus regional impacts.

5.1 Baseline results

HBCUs and Black Americans' educational outcomes

Due to limited data on educational attainment in censuses prior to 1940, we measure educational and economic performance using enrollment and literacy rates. For enrollment, we calculate the proportion of Black males aged 7–16 and 16–25 who were attending school. Literacy rates are constructed for Black males aged 16–55 at the county level.

Access to educational institutions is positively associated with Black Americans' enrollment rates for youth aged 16–25 and the literacy rates for those aged 16-55. Table 3 indicates that the estimated results are consistent across different samples and specifications. Black American youth aged 16–25 with greater geographic proximity to HBCUs exhibit significantly higher school attendance, with an average enrollment increase of 1.2 percentage points, equivalent to 48% of the 1870 baseline mean for Southern counties.

Unlike modern colleges, many early HBCUs served as primary education providers, addressing the systemic exclusion of Black Americans from schooling. In 1870, only 16.7% of adult Black males were literate. Our finding suggests a positive association between HBCU establishments and the county's average literacy rate, though this relationship is insignificant.[16]

HBCUs and Black Americans' occupational outcomes

The establishment of HBCUs also elevates Black Americans into occupations requiring higher levels of human capital. As shown in Table 4, HBCU openings raised the average occupational score for Southern Black males by 1.037 units, equivalent to 21.96% of the 1870 baseline mean. This positive effect persists throughout the study period (Panel A in Figure 4).[17]

In addition, Panels B to D in Figure 4 reveal that HBCU establishments induce changes in local occupational compositions. Two or three decades after the first HBCU opening, the share of workers in the agricultural sector declines significantly. Specifically, HBCU establishments reduce the share of farmers by 5.8 percentage points, an effect that is economically meaningful and represents approximately 8.42% of the 1870 share of em-

[16]Heterogeneous effects of HBCU openings by the timing of establishments are presented in Figure A2.
[17]Table 4 and Figure A1 show that the results remain robust across different specifications using the full sample. Consistent patterns emerge for educational attainment and wage income in the 1940 Census: Black Americans in HBCU counties had higher years of education, annual wages, and hourly earnings (Table A4).

ployment in agriculture. We also uncover that the HBCU establishments are positively associated with the employment shares in the non-agricultural sectors, particularly for non-manual workers such as clerical, service, and sales workers although the relationship is insignificant.[18]

Our findings regarding the decreasing employment share in the agricultural sector do not necessarily contradict the purpose and goals of land-grant Black institutions, which aimed to train students in agriculture and mechanical arts. However, our sample shows that only 12 of 49 first-opening HBCUs were land-grant institutions.[19] Two factors may explain the observed decline in the agricultural sector. First, impacts of non-land-grant institutions could dominate the potential positive associations between land-grant HBCUs and employment in the agricultural sector. Second, as mentioned in several narrative evidence, many A&M institutions faced financial constraints that limited their ability to provide collegial training in these fields (Crosby, 1903; Klein, 1931; Jones, 1917).

5.2 Population dynamics

Population growth and compositional changes are important considerations for understanding the impacts of HBCUs in two key respects. First, HBCUs may be more likely to locate in counties with higher growth potential and, consequently, greater demand for education. Although our matched sample controls for differences between counties with and without HBCUs in 1870, the estimated effects may still partially reflect underlying disparities in population dynamics. Second, the establishment of HBCUs may attract in-

[18]Panel C in Figure 4 indicates an increasing share of non-manual workers after a county experiences its first HBCU opening. The magnitude is relatively large compared to the 1870 mean even though the impact is insignificant. Figure A3 illustrates the heterogeneous effects of HBCU on Black Americans' occupational outcomes for counties that experienced the openings in different decades.

[19]The land-grant institutions that are also the first opening in the located county include 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.

migrants, such as higher-skilled workers such as lecturers, professors, and other staff, to relocate to counties with these institutions. As a result, the observed positive association between HBCU establishment and occupational scores could be influenced by the influx of such in-migrants.

To address these issues, we first account for differences in population growth and compositional changes between counties with and without HBCUs by controlling for the log of county population, Black population share, and urban population share.[20] This allows us to compare counties with and without HBCUs that have experienced similar changes in population size and demographic composition. Our results remain robust under these controls (Table 5, Panel B), suggesting that the estimated effects are not driven by differential population growth or shifts in demographic structure.

To further mitigate the potential influence of in-migrants, we construct two alternative samples. The first restricts the analysis to Black American males who remained in their birth states, thereby excluding potential in-migrants from other states. The second approach uses linked census data to include only those individuals who resided in the same county over the preceding decade. Specifically, we link individuals in census years t and $(t-10)$ from 1880 to 1940, following the linking methodology of Price et al. (2023).[21]

The estimated results remain robust when using these alternative samples, as shown in Panels C and D of Table 5. HBCU establishments increase Black Americans' average occupation scores by 19.99% to 27.94% after accounting for population dynamics. The negative association between HBCUs and the share of agricultural workers ranges from 8.27% to 10.60%. Since these effects are statistically significant across different specifications, it is unlikely that in-migrants are the primary drivers of our findings. It is worth

[20] Specifically, we use the doubly robust estimator proposed by (Sant'Anna and Zhao, 2020)

[21] We link the 1900 census to the 1880 census due to the absence of the 1890 census. Additionally, since the 1860 census includes only free Black Americans, we do not link the 1860 and 1870 censuses.

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.

5.3 HBCUs and the racial inequality

We also investigate how the expansion of HBCUs affects racial inequalities in educational and occupational outcomes. Specifically, we estimate the impacts of HBCU establishments on literacy rates, enrollment rates for individuals aged 16 to 25, and occupational scores separately for Black American and white males, as presented in Table 6.

While HBCU establishments are positively associated with educational outcomes for Black Americans, the effect on the white enrollment rates is insignificant. Our results also indicate that HBCUs induce a decrease in the literacy rate among white males. However, the relationship becomes insignificant after restricting our comparison among counties with similar population growth and compositional changes.[22] These findings suggest that, conditional on similar population dynamics, fewer lower-educated white males selected into counties with HBCU establishments compared counties without.

The results further suggest that HBCU establishments increase occupation scores for white males. The result is significant when controlling for counties' population dynamics, which may imply a positively selected white in-migrants in occupational status. The opening of new schools could increase the demand for instructors or teachers, thereby attracting relatively higher-skilled white males to these areas. Additionally, HBCU establishments may induce compositional changes in local occupations that spill over to the white male population.

Our findings indicate that the expansion of HBCUs reduces racial disparities in liter-

[22]Table A6 presents the impacts of HBCU establishment on Black American and white males' educational outcomes measuring in both shares and levels. Though insignificant, HBCU establishments are positively associated with the inflows of literate white population.

acy, while the impacts on youth enrollment rates and occupational scores are statistically insignificant. We measure racial inequality as the difference in outcomes between white and Black individuals. Compared to counties that never received an HBCU, those with HBCUs experience a reduction in the literacy gap by 5.3 to 5.6 percentage points, equivalent to 8.60% to 9.09% of the mean racial difference in 1870. This effect is substantial, especially given the limited educational opportunities available to Black Americans during the Antebellum era.[23] Despite limited financial support, HBCUs made significant contributions to reducing racial disparities in educational outcomes.

5.4 Localized impacts

An opening of educational institutions in one's home county may reduce the cost of accessing educational resources and thereby enhance individuals' educational and economic outcomes. To assess how localized these effects are, we examine the spatial decay of HBCUs' impacts at the sub-county level.

We begin by geocoding the original addresses of each HBCU to the extent possible. Using data from the Census Place Project (Berkes et al., 2023), we geo-locate Southern Black Americans at the township level and calculate distances between each town and its nearest HBCUs. To isolate within-state effects, distances are computed only for HBCUs located in the same state as the township. For simplicity, we further restrict the sample to towns with only one HBCU opening within a thirty-mile radius during the study period. To quantify associations between proximity and outcomes, we conduct township-level regressions that model outcomes as a function of distance to the nearest HBCU, controlling for (log) town population, Black population share, and state fixed effects.

Figure 5 presents binscatter plots illustrating the relationship between outcome growth

[23] Figure A4 illustrates the event-study results for racial inequalities.

and distance to HBCUs for towns within twenty miles. As expected, the positive impacts of HBCUs on occupational scores diminish with distance, though this association is statistically insignificant. Proximity to HBCUs is significantly correlated with reduced agricultural employment shares, with towns closer to campuses experiencing sharper declines in farming occupations. However, distance to HBCUs shows no clear associations with employment shares in manual and non-manual sectors.[24]

These findings underscore the localized nature of HBCUs' economic impacts, particularly in reshaping agricultural labor markets, while highlighting the limited spatial reach of their influence on occupational upgrading. The localized effects are unsurprising given that traveling costs were significantly higher than today's.[25]

5.5 Robustness checks

Our primary analysis employs the staggered difference-in-differences estimator from Callaway and Sant'Anna (2021) to estimate the causal effects of HBCU establishments. To assess robustness, we conduct parallel analyses using alternative staggered DiD estimators proposed by Borusyak et al. (2024) and Sun and Abraham (2021). Figures A6 and A7 present a comparison of results across these estimators and shows that the estimated effects remain similar.

[24]These patterns persist in the fifteen-mile restricted sample (Figure A5). In the fifteen-mile sample, distance to HBCUs is significantly associated with changes in town-level occupation scores.

[25]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 10–15 cents per mile.

6 Conclusion

This paper presents novel evidence on the influence of Historically Black Colleges and Universities (HBCUs) on educational and occupational outcomes for Black Americans in Southern U.S. counties. By compiling and digitizing historical records of HBCU founding years and locations, we estimate their impacts using the staggered event-study estimator proposed by Callaway and Sant'Anna (2021). Our analysis compares outcomes from 1870 to 1940 between counties that experienced their first HBCU openings between 1870 and 1910 and those that never established an HBCU, thereby isolating the effects of uneven institutional expansion.

Exposure to HBCU openings is associated with notable improvements in educational outcomes for Black Americans. In counties with HBCUs, enrollment rates for Black males aged 16–25 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 populations. This finding is economically significant 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 empirical results demonstrate that HBCU expansion elevated occupational outcomes for Black Americans, facilitating a shift from agricultural work to higher-skilled sectors. Counties with HBCUs experienced declines in the share of Black farmers and concurrent increases in employment as craftsmen, clerical workers, and service-sector employees. These results align with HBCUs' mission to provide vocational training and broaden economic opportunities during an era of entrenched racial discrimination.

Critically, these positive economic effects are not attributable to the in-migration of higher-skilled individuals attracted by new institutions. Restricting the analysis to Black Americans who remained in their home states or had not migrated across counties in the

preceding decade yields robust results, confirming that observed improvements reflect local human capital development rather than compositional changes.

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Figures and Tables

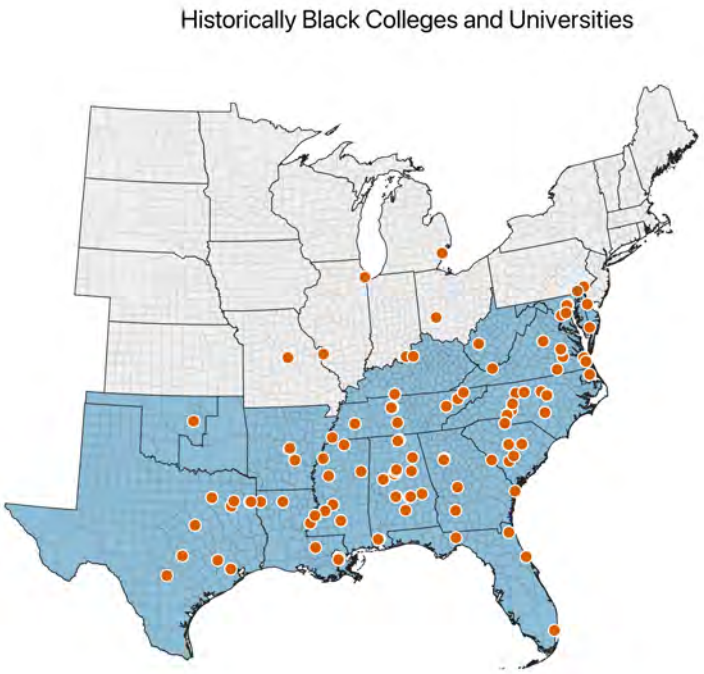

Figure 1: Locations of the Historically Black Colleges and Universities

Note: This figure presents the locations of HBCUs using 1900 county boundaries. Orange dots denote the 131 HBCUs, and the shaded areas represent the U.S. South. While most institutions are located in Southern counties, some early establishments were built in the Northeast and Midwest. For clarity, two institutions—Compton Community College in Los Angeles, CA, and the University of the Virgin Islands—are excluded from the map.

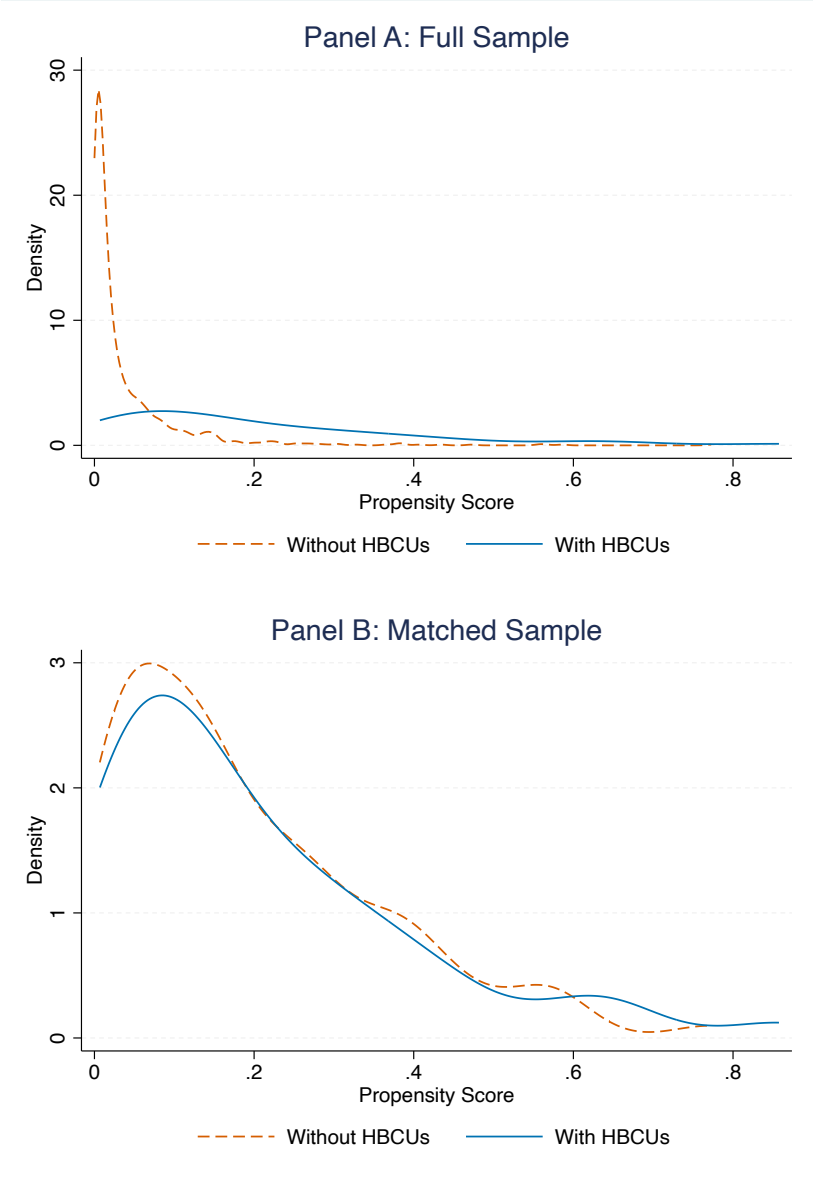

Figure 2: Propensity Score for Counties With and Without HBCUs

Note: This figure shows 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 received at least one HBCU between 1870 and 1910, and 1,037 counties that never experienced HBCU establishments. Panel B displays the density of scores for counties with HBCUs and their five nearest neighbors in the matched sample. We construc 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 to its five nearest neighbors by propensity score.

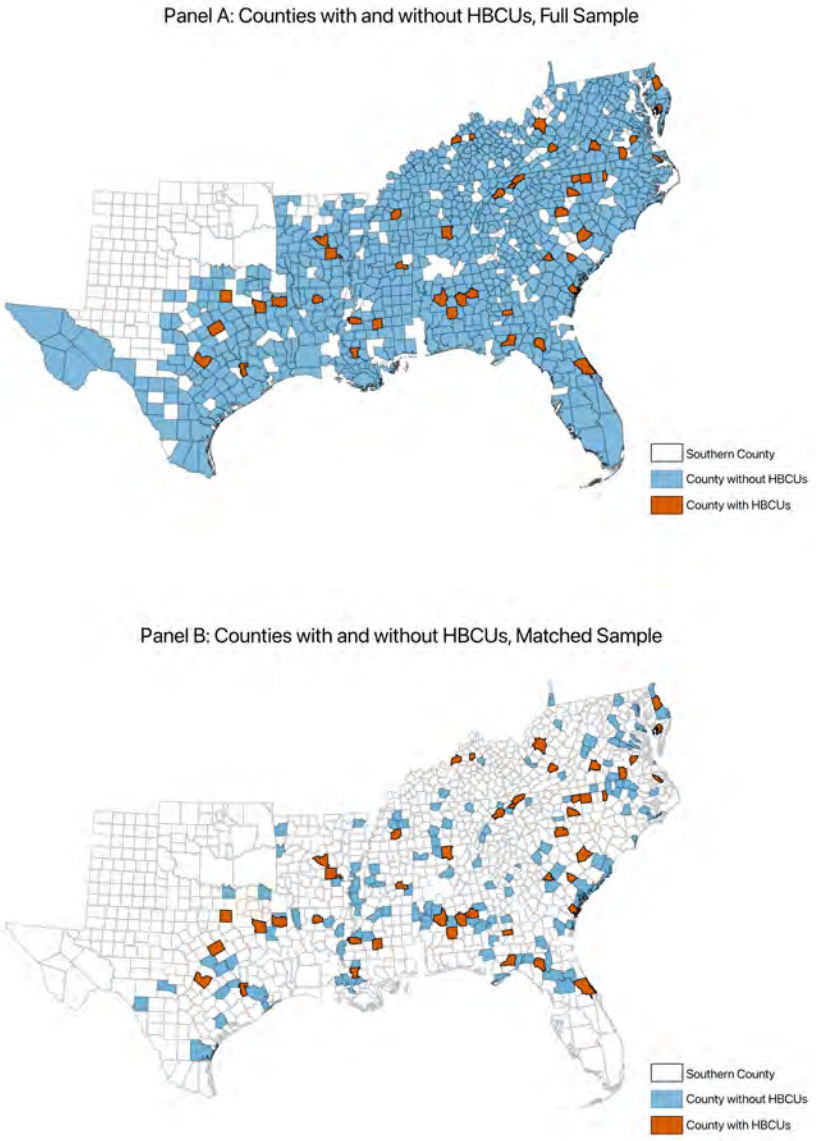

Figure 3: Counties With and Without HBCUs

Note: This figure presents maps of counties with and without HBCUs using 1900 county boundaries. Panel A shows treated and control counties in the full sample: 49 counties that ever received at least one HBCU between 1870 and 1910, and 1,037 counties that never experienced HBCU establishments. Panel B illustrates treated and control counties in the matched sample. The matched control group comprises 141 unique counties, selected as the five nearest neighbors (with replacement) by propensity score for each treated county.

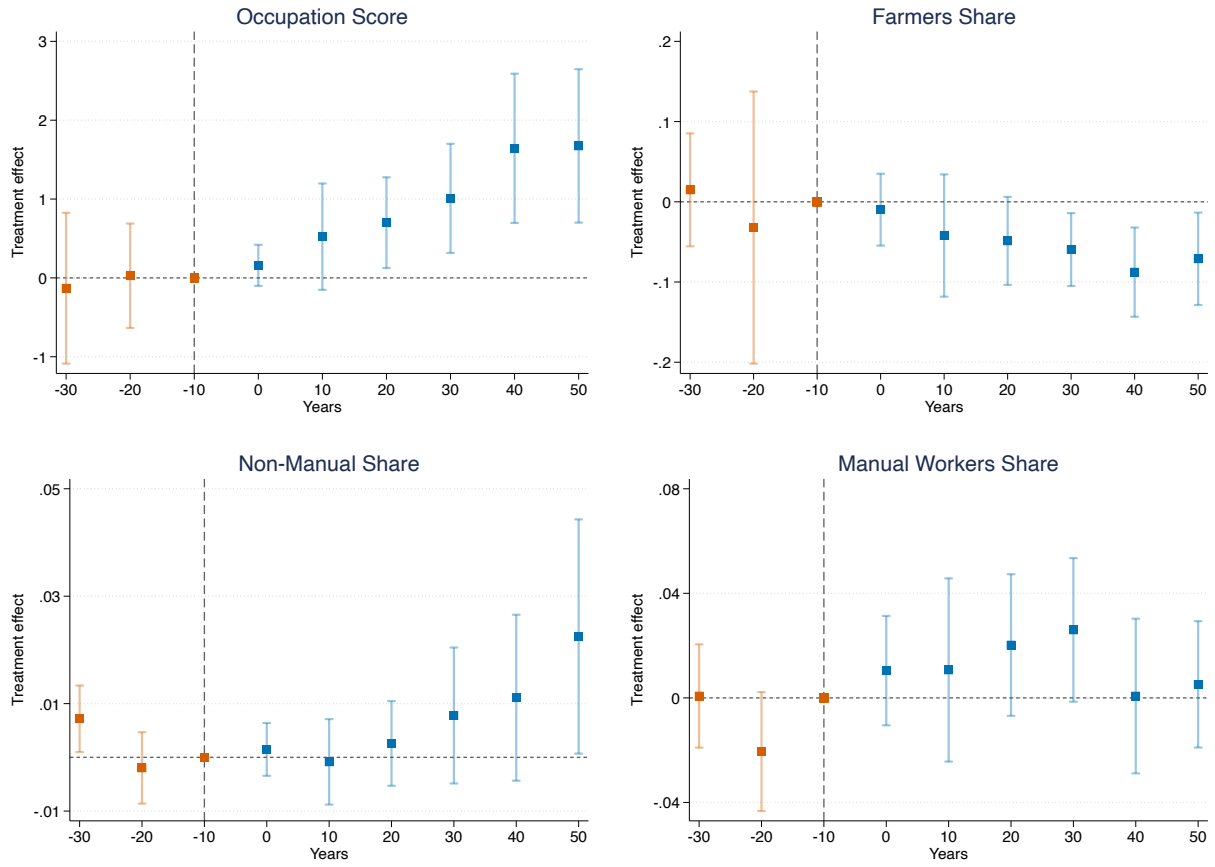

Figure 4: HBCUs on Occupational Outcomes

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 ever received at least one HBCU and their five nearest neighbors by propensity score. Squares represent estimated effects for each period, with bars indicating 95% confidence intervals. Effects are normalized to one census year before treatment; year 0 denotes the first census year after a county receives its first HBCU.

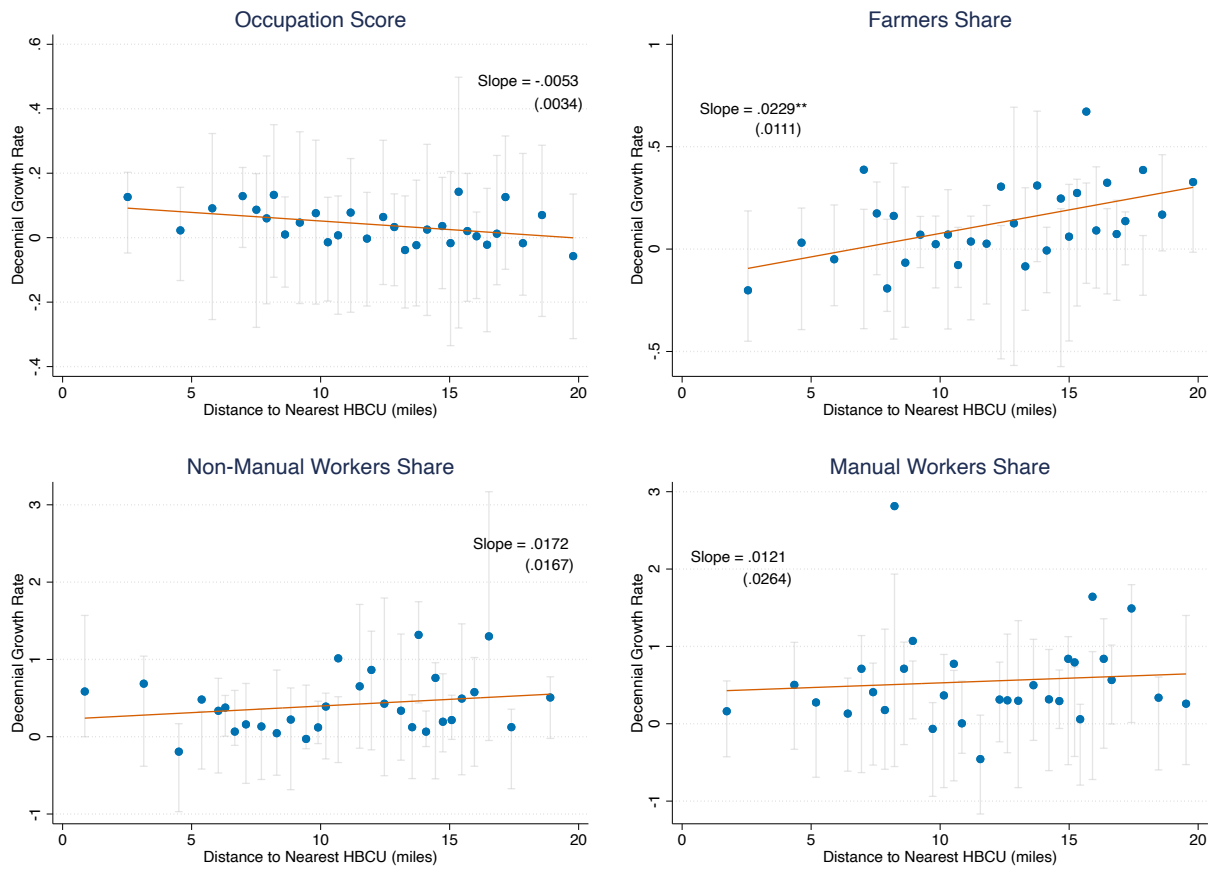

Figure 5: Intensity of Exposure to HBCUs by Distance

Note: This figure displays binscatter plots of the relationship between the distance to the nearest HBCU and the decennial growth rate of outcomes of interest. The curve reflects a quadratic fit. The light gray solid line denotes the interquartile range of outcomes. Only towns existing since 1870 are considered. Distances are measured from a town's centroid to the nearest HBCU within the same state, focusing on towns with only one HBCU opening during the study period. Outcomes are residualized after controlling for 1870 (log) town population, Black population share, and state and year fixed effects. Outliers are excluded if a town's growth rate is in the top or bottom 1% for that year.

Table 1: Expansion of HBCUs

Decades	# of HBCUs		# of Counties with HBCUs	
	All	US South	US South	Sample
Pre-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	-
Post-1940	17	16	-	-
Total	131	121	77	49

Note: This table documents the expansion of historically Black colleges and universities (HBCUs) by reporting the number of HBCUs and the number of counties that experienced their first HBCU establishment in each decade. 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 prior studies (Bracey, 2017; Lovett, 2015). Geographic boundaries are harmonized to 1900 counties to construct a balanced panel of Southern counties from 1870 to 1940. The sample excludes counties that received an HBCU before 1870 or after 1940 and comprises 1,037 counties that never experienced an HBCU establishment as control units.

Table 2: Summary Statistics, 1870 County Characteristics

	Treated Mean (1)	Control Mean (2)	Treated–Control Difference (3)	(4)	(5)
Panel A: Core Controls					
Log County Population	9.616	8.863	0.753***	0.678***	0.006
			(0.136)	(0.120)	(0.093)
Black Population Share	0.454	0.310	0.144***	0.130***	-0.031
			(0.033)	(0.027)	(0.024)
Urban Population Share	0.084	0.019	0.065***	0.071***	-0.018
			(0.014)	(0.014)	(0.026)
Panel B: Additional Characteristics					
Has Railroad $(= 1)$	0.653	0.428	0.225***	0.194***	-0.056
			(0.072)	(0.068)	(0.061)
Distance to River (miles)	24.922	32.808	-7.886	-8.648*	1.224
			(5.167)	(4.414)	(3.449)
Has Union Army $(= 1)$	0.857	0.460	0.397***	0.407***	0.003
			(0.072)	(0.067)	(0.041)
Exposure to Union Army (month)/Distance (miles)	7.407	2.660	4.747***	5.004***	-1.867
			(1.454)	(1.455)	(3.655)
Log of Cotton Production	2.974	2.443	0.531	0.313	-0.196
			(0.503)	(0.459)	(0.545)
Log of # Church	8.692	7.764	0.928***	0.822***	0.144
			(0.285)	(0.235)	(0.166)
# White Colleges	0.367	0.073	0.294***	0.283***	-0.010
			(0.047)	(0.047)	(0.094)
Democratic Vote Share (%)	32.341	39.985	-6.717**	-6.897**	0.109
			(3.340)	(2.663)	(2.214)
Panel C: Outcomes of Interest					
Occupation Score	4.528	4.307	0.221	0.224	0.043
			(0.180)	(0.175)	(0.157)
Farmers Share	0.665	0.708	-0.043	-0.049	-0.022
			(0.036)	(0.035)	(0.035)
Non-Manual Share	0.018	0.009	0.009***	0.010***	0.001
			(0.003)	(0.003)	(0.004)
Manual Share	0.076	0.056	0.019	0.022	0.010
			(0.014)	(0.014)	(0.010)
Literacy Rate	0.166	0.176	-0.010	-0.018	-0.002
			(0.028)	(0.028)	(0.022)
State Fixed Effect	-	-		✓	✓
Matched Sample	-	-			✓
Counties	49	1,037	1,086	1,086	294

Note: This table presents means and differences for 1870 county characteristics between counties that ever received HBCUs (Column 1) and those that never received an HBCU (Column 2). Column 3 reports the simple difference, Column 4 controls for state fixed effects, and Column 5 compares only treated counties and their five nearest neighbors by propensity score. Panel A lists core control variables; Panel B shows additional characteristics used in propensity score estimation. Exposure to the Union Army reflects the duration of occupation (in months), rescaled by distance (in miles) to the nearest occupation site. Statistical significance is denoted by: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table 3: HBCUs Establishment and Educational Outcomes

	Enrollment Rate		Literacy
	7-16	16-25	Rate
	(1)	(2)	(3)
Panel A: Matched Sample, Staggered DiD			
HBCUs	-0.010	0.012*	0.032
	(0.020)	(0.007)	(0.022)
1870 Mean	0.102	0.025	0.165
Observations	1,970	1,970	1,970
Panel B: Full Sample, Staggered DiD			
HBCUs	-0.021	0.014**	0.029
	(0.020)	(0.007)	(0.021)
1870 Mean	0.102	0.025	0.167
Observations	7,450	7,450	7,450
Panel C: Full Sample, TWFE			
HBCUs	-0.002	0.015**	0.012
	(0.014)	(0.007)	(0.018)
1870 Mean	0.102	0.025	0.167
Observations	7,450	7,450	7,450

Note: This table presents the average treatment effect of HBCU establishment on Black Americans' enrollment and literacy rates at the county level, 1870–1940. Enrollment rates are calculated separately for Black males aged 7–16 and 16–25; literacy rates focus on Black males aged 16–55. Outcomes are residualized after controlling for age and foreign-born status at the individual level. Using the estimator of Callaway and Sant'Anna (2021), Panels A and B show estimated effects for the matched and full samples, respectively. Panel C presents results from the two-way fixed effects model. Statistical significance is denoted by: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table 4: HBCUs Establishment and Occupational Outcomes

	Occupation Score (1)	Farmers Share (2)	Non-Manual Share (3)	Manual Share (4)
Panel A: Matched Sample, Staggered DiD				
HBCUs	1.037***	-0.058***	0.009	0.013
	(0.317)	(0.023)	(0.006)	(0.010)
1870 Mean	4.722	0.689	0.016	0.066
Observations	1,974	1,974	1,974	1,974
Panel B: Full Sample, Staggered DiD				
HBCUs	1.265***	-0.026	0.008	0.001
	(0.294)	(0.022)	(0.005)	(0.010)
1870 Mean	4.589	0.687	0.016	0.065
Observations	7,518	7,518	7,518	7,518
Panel C: Full Sample, TWFE				
HBCUs	1.271***	-0.026	0.007	0.007
	(0.323)	(0.027)	(0.005)	(0.013)
1870 Mean	4.589	0.687	0.016	0.065
Observations	7,518	7,518	7,518	7,518

Note: This table shows the average treatment effect of HBCU establishment on Black Americans' occupational outcomes at the county level, 1870–1940. The analysis focuses on Black males aged 16–55, using individual-level residuals after controlling for age and foreign-born status. Panels A and B use staggered difference-in-differences following Callaway and Sant'Anna (2021); Panel C presents results from a two-way fixed effects model. Panel A restricts the control counties to the five nearest neighbors (with replacement) in the matched sample. Statistical significance is denoted by: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table 5: Impacts of HBCUs and Population Dynamics

	Enrollment 7-16 (1)	Enrollment 16-25 (2)	Literacy Rate (3)	Occup. Score (4)	Farmers Share (5)	Non-Manual (6)	Manual Share (7)
Panel A: Matched Sample							
HBCUs	-0.010	0.012*	0.033	1.037***	-0.058**	0.009	0.013
	(0.020)	(0.007)	(0.022)	(0.317)	(0.023)	(0.006)	(0.010)
1870 Mean	0.102	0.002	0.165	4.722	0.689	0.016	0.066
Observations	1,970	1,974	1,974	1,974	1,974	1,974	1,974
Panel B: Matched Sample with Controls							
HBCUs	-0.010	0.012*	0.037*	0.944***	-0.057***	0.010**	0.013
	(0.019)	(0.007)	(0.022)	(0.222)	(0.022)	(0.005)	(0.010)
1870 Mean	0.102	0.002	0.165	4.722	0.689	0.016	0.066
Observations	1,970	1,974	1,974	1,974	1,974	1,974	1,974
Panel C: Matched Sample, Individuals in Birth State							
HBCUs	-0.015	0.010	0.033	1.010***	-0.058**	0.012**	0.019*
	(0.020)	(0.008)	(0.022)	(0.316)	(0.025)	(0.006)	(0.010)
1870 Mean	0.099	0.027	0.170	4.156	0.689	0.015	0.061
Observations	1,964	1,964	1,964	1,964	1,964	1,964	1,964
Panel D: Matched Sample, Individuals in Same County Between Two Census Years							
HBCUs		0.024***	0.023	1.392***	-0.073**	0.017**	0.012
		(0.008)	(0.021)	(0.444)	(0.029)	(0.008)	(0.015)
1870 Mean		0.025	0.165	4.722	0.689	0.016	0.066
Observations		1,912	1,912	1,912	1,912	1,912	1,912

Note: This table shows the average treatment effect of HBCU establishment on Black Americans' educational and occupational outcomes. Outcomes are county averages after partialling out age, nativity, and race at the individual level. Impacts are estimated using the staggered difference-in-differences estimator of Callaway and Sant'Anna (2021). Panel A replicates the results from Tables 4 and 3. Panels B to D address the population dynamics induced by HBCU establishments. Specifically, Panel B adds controls for (log) county population, Black population share, and urban population share. Panels C and D restrict to individuals who remained in their birth state or the same county between census years t and $t-10$, respectively, using the linking methodology of Berkes et al. (2023) to construct the linked sample and identify the stayers in the same counties across census years. Statistical significance is denoted by: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table 6: HBCUs and Racial Inequality

	Enrollment 16-25		Literacy Rate		Occupation Score		White-Black Diff		
	Black (1)	White (2)	Black (3)	White (4)	Black (5)	White (6)	Enroll (7)	Literacy (8)	OccScore (9)
Panel A: Matched Sample									
HBCUs	0.012*	0.009	0.032	-0.023*	1.037***	2.169	-0.003	-0.056**	1.132
	(0.007)	(0.008)	(0.022)	(0.014)	(0.317)	(1.689)	(0.009)	(0.026)	(0.912)
Panel B: Matched Sample with Controls									
HBCUs	0.012*	0.011	0.036	-0.018	0.944***	2.067**	-0.001	-0.053**	1.123
	(0.007)	(0.007)	(0.022)	(0.014)	(0.222)	(0.918)	(0.008)	(0.026)	(0.887)
1870 Mean	0.025	0.125	0.165	0.781	4.722	28.261	0.101	0.616	23.539
Observations	1,970	1,970	1,970	1,970	1,974	1,974	1,970	1,970	1,974

Note: This table shows the average treatment effect of HBCU establishment on occupation score and literacy rate for Black and white populations, as well as the racial gaps at the county level between 1870 and 1940. Similarly, outcomes are the county averages after partialling out age, foreign-born status, and race at the individual level. Impacts are estimated using the staggered difference-in-differences estimator of Callaway and Sant'Anna (2021). Panels Panels A and B show effects with and without controls for (log) county population, Black population share, and urban population share. Statistical significance is denoted by: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Online Appendix

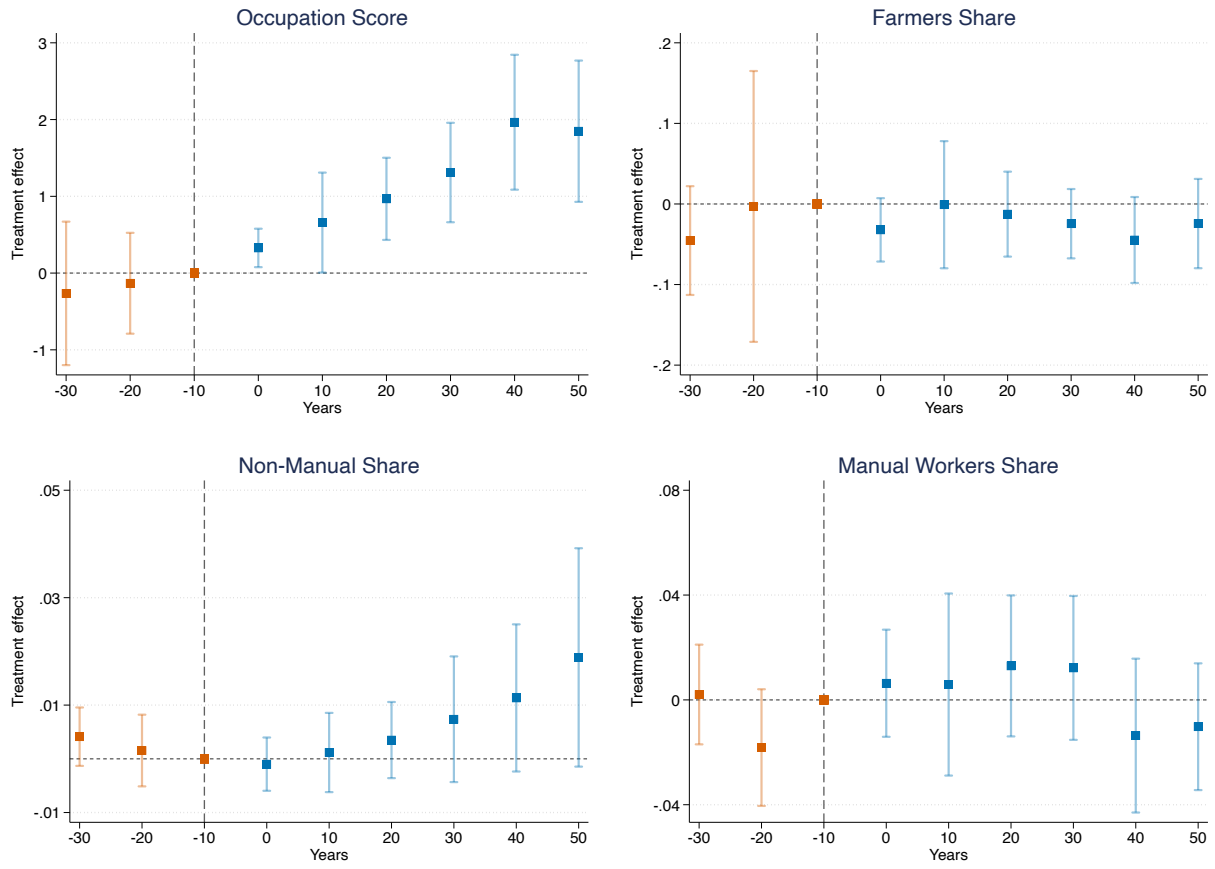

Figure A1: HBCUs on Occupational Outcomes, Full Sample

Note: This figure replicates Figure 4, showing how HBCU establishment affects average Black Americans' occupational outcomes at the county level using the full sample. Estimates follow Callaway and Sant'Anna (2021). The solid line displays the estimated effect in each period; the dotted line shows their 95% confidence intervals. The estimated effects are relative to the last period before the first HBCU opening. Period 0 represents the first decade after a county receives its first HBCU. Other periods show the treatment effect averaged across counties treated in different years before and after the first HBCU establishment.

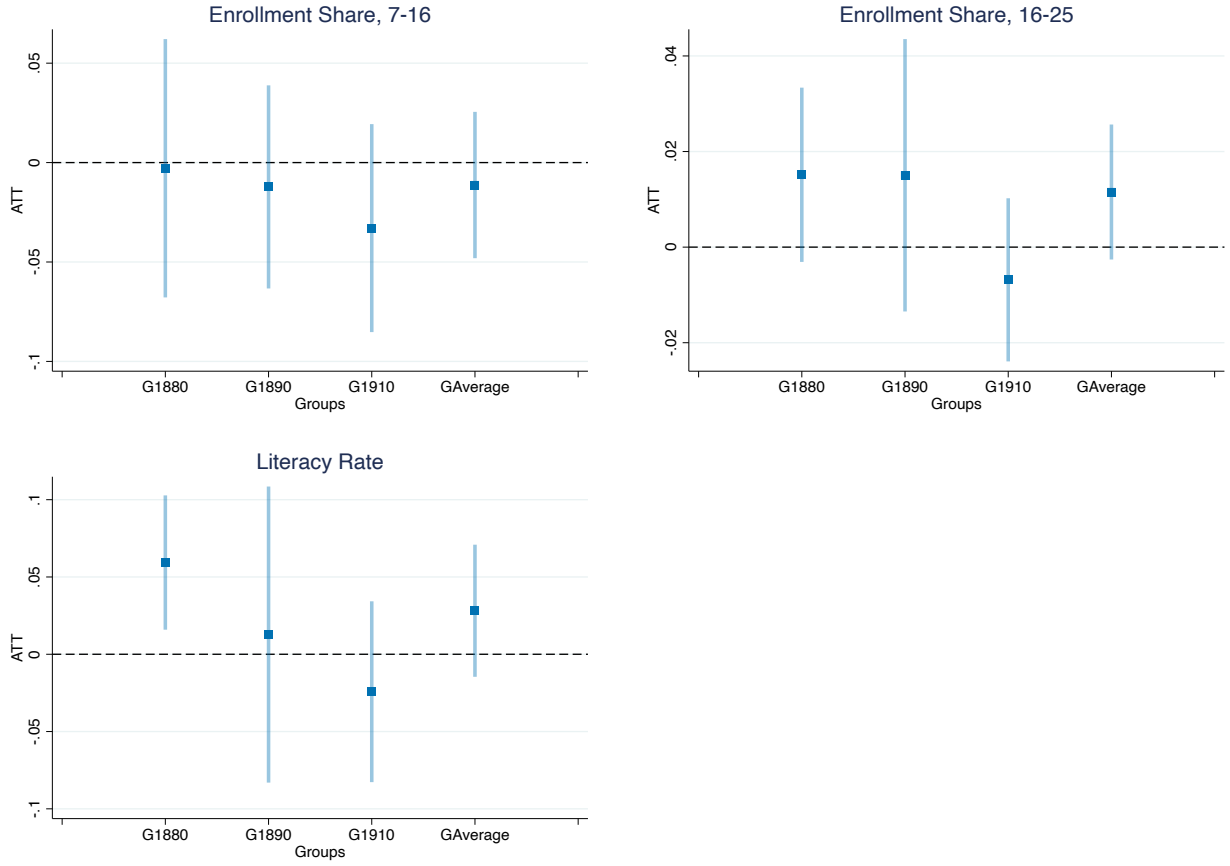

Figure A2: Heterogeneous Effects on Educational Outcomes by Opening Timing

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 first HBCU opening in 1900 are excluded due to the missing 1890 Census. The dots denote the point estimates of the average treatment effects for each treatment group; the spikes indicate their 95% confidence intervals.

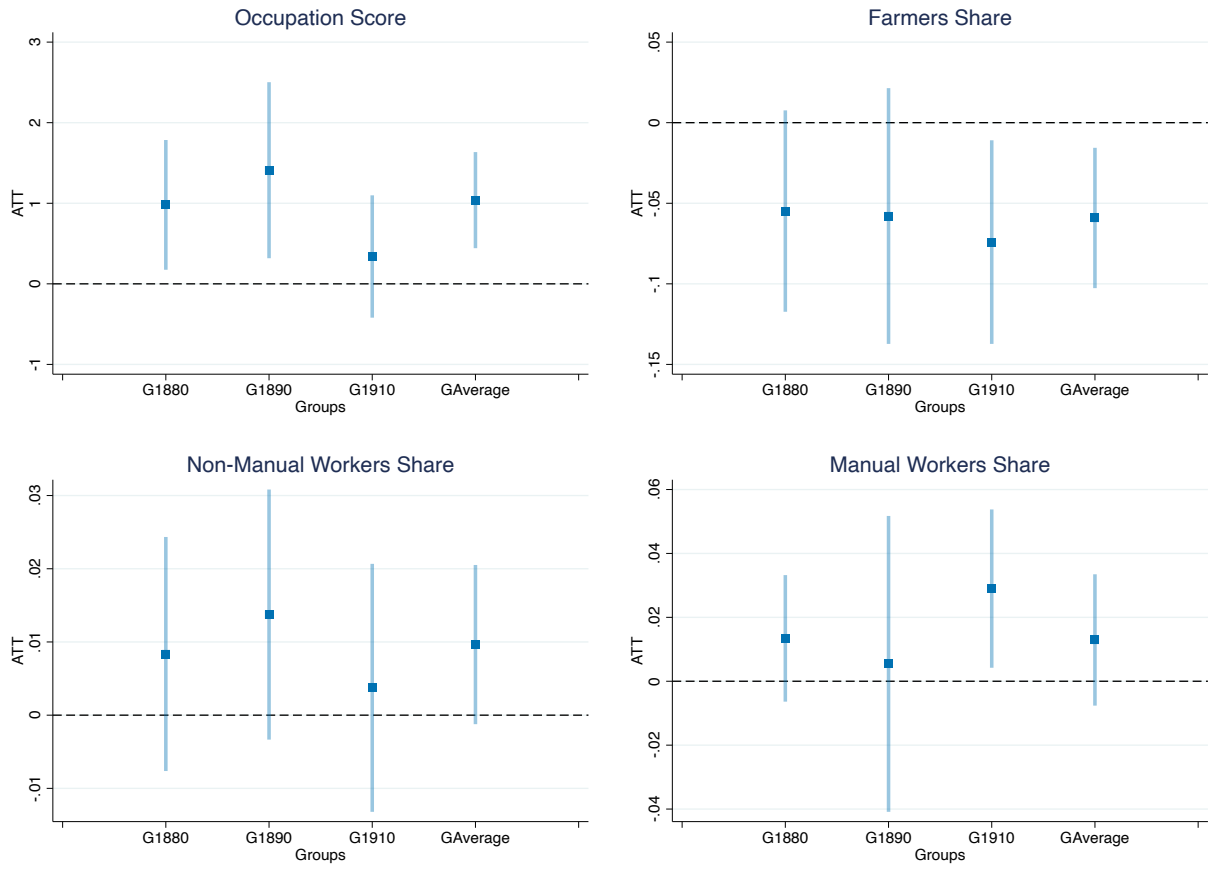

Figure A3: Heterogeneous Effects on Occupational Outcomes by Opening Timing

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

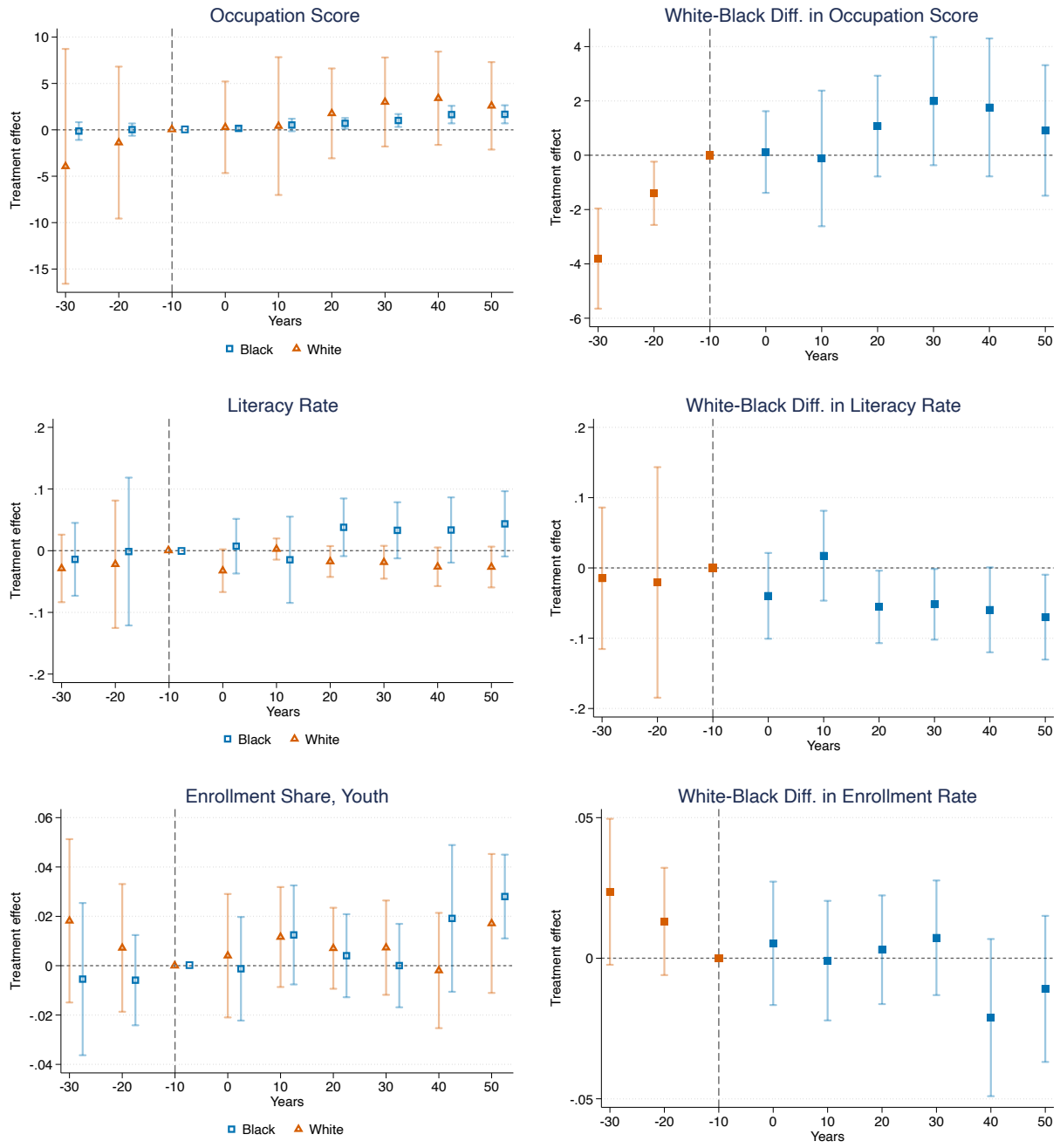

Figure A4: HBCUs on Racial Inequality

Note: This figure displays event-study results of how HBCU establishments affect racial differences in occupation score, literacy rate, and youth aged 16 to 25's enrollment rate. The left panel shows event-study results for Black and white populations separately; the right panel presents racial differences in the outcomes. Squares and triangles represent estimated coefficients for Black and white populations, respectively. Bars reflect 95% confidence intervals.

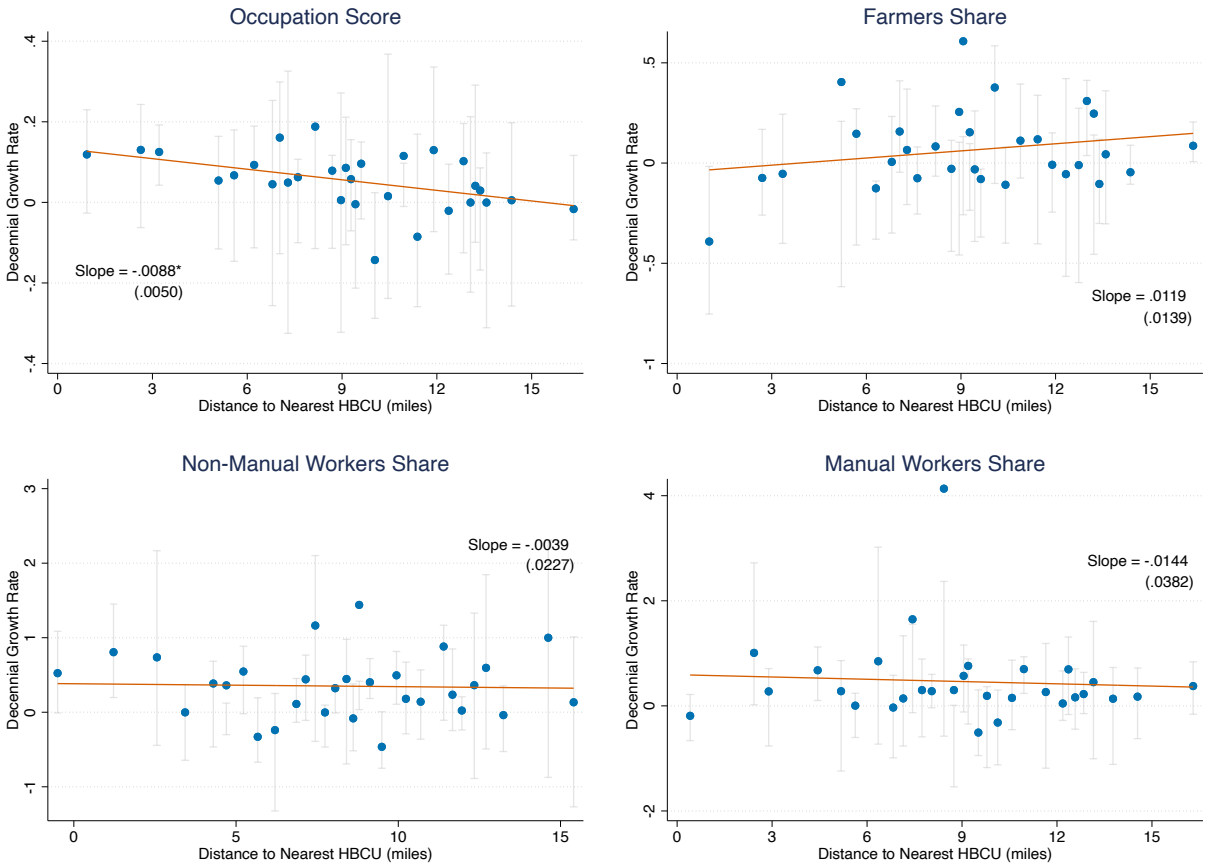

Figure A5: Intensity of Exposure to HBCUs by Distance

Note: This figure replicates Figure 5 focusing on towns within a fifteen-mile radius of the nearest HBCU. The line reflects the linear fit. The light gray solid line denotes the interquartile range of outcomes. Distances are measured from a town's centroid to the nearest HBCU within the same state, restricting the sample to towns with only one opening during the study period. We control for 1870 (log) town population, Black population share, and state and year fixed effects. Towns with growth rates in the top or bottom 1% are excluded.

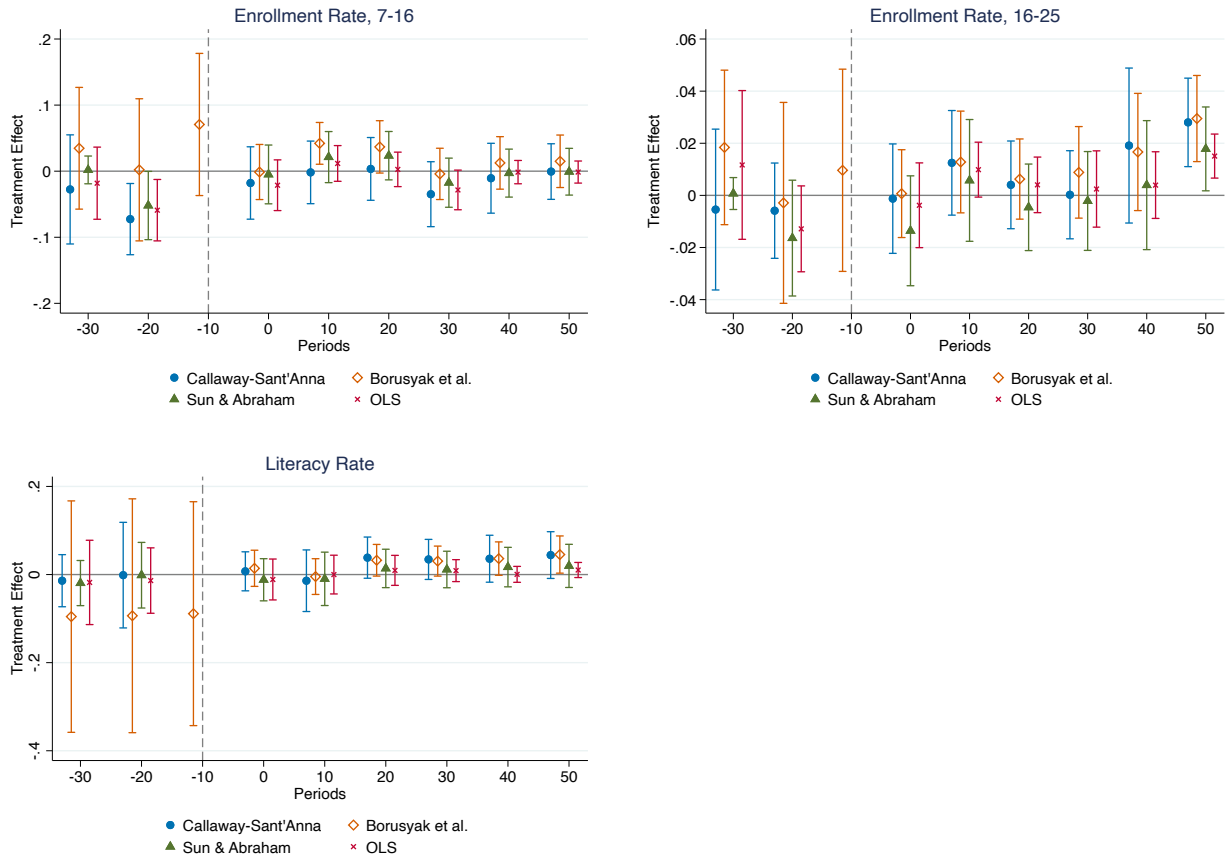

Figure A6: Alternative Staggered DiD Estimators, Educational Outcomes

Note: This figure presents event-study estimates of educational outcomes (as reported in Table 3) using alternative estimators for staggered treatment timing. Results estimated by 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.

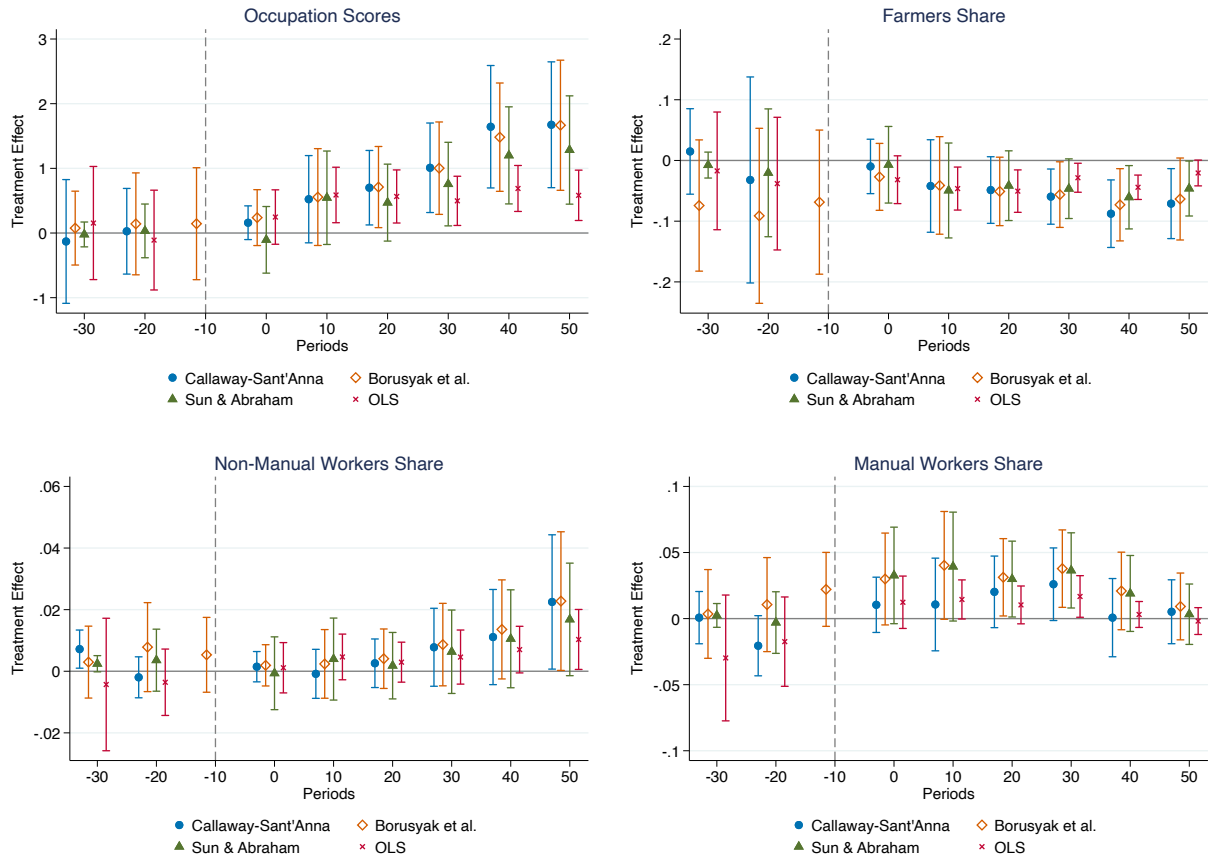

Figure A7: Alternative Staggered DiD Estimators, Occupational Outcomes

Note: This figure replicates Figure 4 and presents event-study estimates using the matched sample and alternative estimators for staggered treatment timing. We illustrate results estimated by the estimators proposed 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: Black leaders matriculated at HBCUs

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

Table A2: HBCUs Establishments and 1870 County Characteristics

	Ever Had at Least One HBCU			
	(1)	(2)	(3)	(4)
Log of 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 Nearest River (miles)		0.001	0.001	0.001
		(0.007)	(0.007)	(0.007)
Has Union Army $(= 1)$		1.972***	2.013***	2.054***
		(0.575)	(0.576)	(0.585)
Exposure to Union Army (month)/Distance (miles)		0.018*	0.018*	0.018*
		(0.011)	(0.011)	(0.011)
Log of Cotton Production			-0.005	-0.015
			(0.047)	(0.048)
Log of # Church			0.237	0.247
			(0.235)	(0.231)
# of White College				0.716**
				(0.343)
Democratic Vote Share (%)				-0.029**
				(0.012)
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 between 1880 and 1910 and 1,037 counties that never experienced an HBCU establishment. Statistical significance is denoted by: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table A3: HBCUs and Occupational Outcomes, Alternative Samples

	Full Sample	Matched Sample, Nearest Ten	Five	One
	(1)	(2)	(3)	(4)
Panel A: Occupation Score				
HBCUs	1.265***	1.221***	1.037***	1.395***
	(0.294)	(0.299)	(0.317)	(0.348)
1870 Mean	4.589	4.700	4.722	4.740
Observations	7,518	3,535	1,974	595
Panel B: Farmers Share				
HBCUs	-0.026	-0.054**	-0.058**	-0.055**
	(0.022)	(0.022)	(0.023)	(0.026)
1870 Mean	0.687	0.689	0.689	0.689
Observations	7,518	3,535	1,974	595
Panel C: Non-Manual Workers Share				
HBCUs	0.008	0.010*	0.009	0.016**
	(0.005)	(0.005)	(0.006)	(0.007)
1870 Mean	0.016	0.016	0.016	0.016
Observations	7,518	3,535	1,974	595
Panel D: Manual Workers Share				
HBCUs	0.001	0.011	0.013	0.004
	(0.010)	(0.010)	(0.010)	(0.012)
1870 Mean	0.065	0.066	0.066	0.066
Observations	7,518	3,535	1,974	595

Note: This table replicates Table 4 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 show the results focusing only on matched samples with the nearest ten, five, and one neighbors of the counties with HBCUs. Statistical significance is denoted by: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table A4: HBCUs and the 1940 County-Level Outcomes

	Education	Annual Wage	Hourly Wage	LFP	Employed
	(1)	(2)	(3)	(4)	(5)
Panel A: Matched sample, 5 Nearest Neighbors					
HBCUs	0.475***	0.148***	0.174***	-0.003	-0.019***
	(0.091)	(0.040)	(0.043)	(0.014)	(0.007)
Mean	5.215	5.643	1.982	0.871	0.919
Observations	294	294	294	294	294
Panel B: Matched sample, 10 Nearest Neighbors					
HBCUs	0.514***	0.171***	0.201***	-0.011	-0.016**
	(0.084)	(0.037)	(0.039)	(0.013)	(0.007)
Mean	5.215	5.643	1.982	0.871	0.919
Observations	514	514	514	514	514
Panel C: Matched sample, 1 Nearest Neighbors					
HBCUs	0.429***	0.102**	0.123***	-0.020**	-0.011
	(0.132)	(0.048)	(0.055)	(0.009)	(0.008)
Mean	5.211	5.645	1.984	0.872	0.919
Observations	96	96	96	96	96
Panel D: Full sample					
HBCUs	0.633***	0.186***	0.206***	-0.009	-0.017**
	(0.089)	(0.036)	(0.038)	(0.014)	(0.007)
Mean	5.219	5.642	1.981	0.871	0.919
Observations	1,074	1,074	1,074	1,074	1,074

Note: This table presents associations between HBCU establishment and Black male Americans' education and occupational outcomes at the county level. Outcomes are residualized at the individual level after controlling for age and foreign-born status. The comparison is between counties that experienced at least one HBCU opening between 1870 and 1910 and those that never had an HBCU during our study period. As in our main analyses, we exclude counties that received HBCUs before 1870 or after 1910. Our specification includes 1870 (log) county population, 1870 Black population share, 1870 urban population share, and state fixed effects. Statistical significance is denoted by: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table A5: HBCUs and Racial Differences in 1940 Outcomes

	Education	Annual Wage	Hourly Wage	LFP	Employed
	(1)	(2)	(3)	(4)	(5)
Panel A: Black Male					
HBCUs	0.475***	0.148***	0.174***	-0.003	-0.019**
	(0.091)	(0.040)	(0.043)	(0.014)	(0.007)
Mean	5.215	5.643	1.982	0.871	0.919
Observations	294	294	294	294	294
Panel B: White Male					
HBCUs	0.477***	0.205***	0.215***	-0.014	-0.007**
	(0.130)	(0.042)	(0.042)	(0.008)	(0.004)
Mean	8.522	6.324	2.711	0.868	0.927
Observations	294	294	294	294	294
Panel C: White-Black Difference					
HBCUs	0.002	0.057***	0.041	-0.011	0.011**
	(0.117)	(0.029)	(0.031)	(0.009)	(0.005)
Mean	3.307	0.682	0.729	-0.003	0.008
Observations	294	294	294	294	294

Note: This table replicates Table A4 and reports how HBCU establishments affects the 1940 education and labor market outcomes for both Black and white males' using the matched sample. Similarly, we control 1870 (log) county population, 1870 Black population share, 1870 urban population share, and state fixed effects. Statistical significance is denoted by: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table A6: HBCUs and Educational Outcomes, Measured in Shares and Levels

	Shares			Numbers		
	Enrollment		Literacy	Enrollment		Literacy
	7-16	16-25		7-16	16-25	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Black Male						
HBCUs	-0.010	0.012*	0.032	23.896	21.426**	241.237**
	(0.020)	(0.007)	(0.022)	(42.010)	(10.843)	(114.136)
Mean	0.102	0.025	0.165	116.567	24.010	390.931
Observations	1,970	1,970	1,970	1,970	1,970	1,970
Panel B: White Male						
HBCUs	-0.019	0.009	-0.023*	33.286	25.409	102.776
	(0.021)	(0.008)	(0.014)	(61.768)	(31.964)	(66.027)
Mean	0.388	0.125	0.781	460.628	134.951	2,064.45
Observations	1,970	1,970	1,970	1,970	1,970	1,970

Note: This table replicates Table 6 but include educational outcomes measured in levels, for males of Black and white males. Statistical significance is denoted by: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.