# The Origins of Racial Discrimination in U.S. Labor Markets: Evidence from 16 Million Vacancy Postings*

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**Abstract**

This paper studies the capacity of market forces to mitigate employer racial discrimination in labor markets, prior to the enactment of landmark anti-discrimination legislation and the Civil Rights Movement in the United States. Using a novel dataset of historical job advertisements from both nationwide, local, and historically Black newspapers from 1900 to 1970, we examine how changes in labor supply across racial groups influenced racial hiring preferences. Specifically, we examine the economic consequences of World War II-induced labor shortages—primarily through military casualties and enlistment—that disproportionally reduced the availability of White workers. We hypothesize that this alteration in labor market dynamics allows us to identify a period with increased economic cost for employers of maintaining discriminatory practices. Using an exposure research design that leverages variation in White soldiers casualties across local labor markets, our findings indicate that significant declines in the supply of white labor reduced explicit racial preferences for White workers in job postings.

Keywords: Labor Market Discrimination, Racial Inequality, World War II, Job Postings
JEL Classification: J71, J15, N32

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# 1 Introduction

To what extent can market forces mitigate overt racial preferences in labor demand? An important prediction put forth by Becker's (1957) model is that discrimination based on personal preference should be eradicated by firm competition, given that employers who do not engage in discriminatory practices can outcompete those who do. Rent or labor market power is necessary for businesses to maintain discrimination in the long-run. This paper investigates whether increased costs from maintaining taste-based discriminatory preferences—specifically, through a war-induced reduction of the relative labor supply of White workers—led to a change in discriminatory hiring practices against Black workers. We isolate the effect of market forces by focusing on periods preceding the enactment of federal and most local anti-discriminatory employment laws, using the prevalence of racially charged language in job listings as a measure of employers' taste-based discriminatory preferences. This approach allows us to assess the extent to which market forces alone can influence discriminatory labor practices in the absence of regulatory interventions.

The first part of the study documents the extent of stated racial preferences in hiring practices used by employers starting in 1900, before laws prohibiting such practices were passed. Recent research has documented the extent of non-discriminatory public accommodations in the pre-Civil-Rights-Era (Cook et al., 2022). Much less is known about employer-level labor market discrimination in the same period. While previous research provides ample anecdotal evidence of employers' explicit racial preferences in this period, it remains unclear how prevalent these preferences were prior to their prohibition through civil rights legislation. In addition, it is unknown to what extent these preferences contributed to the occupational sorting prevalent in U.S. labor markets (Hellerstein et al., 2008), the lack of workforce diversity (Hsieh et al., 2019), and racial wage gaps (Bayer and Charles, 2018; Blau and Beller, 1992; Charles and Guryan, 2008; Derenoncourt and Montialoux, 2020). This paper fills this void by using information from 16 million job ads from 13 major US newspapers between 1900 and 1970 to characterize the prevalence of racial preferences for African Americans versus workers of European descent in the labor market.

In the second part of the study, we use an event study design to exploit variation in casualties among White soldiers across local labor markets due to WWII. This setting constitutes a natural experiment for assessing the long-lasting effects of war-induced labor mobilization on

racial dynamics in labor markets. Specifically, we measure to what extent military casualties generate changes in the relative labor supply of White versus Black workers, which subsequently affects employers' stated racial preferences in job postings. Our findings indicate that White soldier casualties reduce White men's relative labor supply by 1950 and also led to statistically significant reductions in employers' racial preferences in job advertisements. Local labor markets that were affected by military casualties of White workers experienced a 2.8 percentage point decrease in the probability of job postings using explicit racial preferences.

Although it is illegal to discriminate on the basis of race in job postings today, historical records indicate that employers did so openly in the twentieth century (Darity and Mason, 1998; Kohl and Stephens, 1991; Kuhn and Shen, 2023; Walsh et al., 1975).[1] The literature indicates that one explanation is rooted in supply-side workforce attributes, which play a significant role in shaping employers' preferences. It has been well-documented that inequality in educational opportunities and resources, frequently attributable to historical discrimination through Jim Crow laws, has resulted in limited access to quality education among minority groups, leading to less competitive qualifications and skill sets when entering the labor market (Card and Krueger, 1992; Donohue et al., 2002; Wolpin, 1992). In addition, many of the causes of racial preferences in hiring stem from demand-side factors, such as information asymmetry in evaluating job candidates (Lang and Lehmann, 2012; Nunley et al., 2015); customer or consumer preferences (Giulietti et al., 2019; Laouénan, 2017); social networks and referrals (Miller and Schmutte, 2021; Beaman and Magruder, 2012); stereotypical evaluation of job applications (Bertrand and Mullainathan, 2004; Oreopoulos, 2011; Darolia et al., 2016; Rooth, 2010); and taste-based discriminatory practices (Bjørnshagen, 2022; Altonji, 2005; Ewens et al., 2014).

We introduce a novel dataset of racial prejudice among employers that covers the period of 1900 to 1970. We processed text features extracted from job postings published in nationwide newspapers that include the New York Times (1900-2009), The Washington Post (1900-2004), the Boston Globe (1900-1989), Chicago Tribune (1900-1997), the Los Angeles Times (1900-1996), eight additional local newspapers in the southern states, and historically black newspapers.[2] Our final dataset contains information 16.8 million job postings built using advanced

[1] Title VII of the Civil Rights Act expressly prohibits discrimination on the basis of race, color, religion, sex, or national origin by employers. This law applies to job postings, hiring procedures, and all other employment-related matters. In order to enforce this law, there has been significant follow-up litigation and grassroots activism. See for example Smith (2008) and (Donohue and Siegelman, 1991).

[2] Historically black newspapers are publications that were established primarily by and for African Americans. These newspapers played a crucial role in advocating for civil rights, documenting African American history and culture, and providing black communities with a forum for expression. The Chicago Defender, founded by

natural language processing tools that allow us to identify explicit racial references in published job descriptions. The evolution of racially explicit language and references in job postings indicate that employers' racial preferences for White workers were predominant and more common than preferences against (or for) Black workers throughout our period of analysis.

Starting in the interwar period between World War I and World War II, employers' racial preferences for Black and White workers begun to shift, at the same time as the occupational exclusion of African American workers from fields formerly dominated by White workers began to wane. Black workers were systematically excluded from applying to a large share of jobs; however, this restriction erode particularly sharply around World War II. This finding aligns with previous research that established the significance of labor shortages during the war for breaking down occupational barriers for Black workers (Maloney, 1994; Ferrara, 2022; Freeman et al., 1973). The share of job postings that specifically required that applicants be White ranged from 10 percent in 1920 to 20 percent in 1930 before falling back down to 10 percent during WWII. From 1920 to 1940, 5 percent of job openings indicated a preference for Black applicants; however, this percentage steadily decreased after WWII. After World War II, explicit racial preferences across occupations experienced, to different extents, a general decline no longer favoring White workers in low-skilled and semi-skilled occupations.

This study primarily contributes to the literature on labor market discrimination. Contemporary discriminatory practices among employers have been extensively studied, and the literature provides convincing evidence from audit studies at the job application stage, which primarily focus on measuring discrimination through experimental methods (see, for example, Bertrand and Mullainathan (2004); Nunley et al. (2015); Kline and Walters (2021); Neumark (2018)) or assessing the impact of policy changes affecting the employment probability of racial minorities. This paper provides complementary insights by analyzing the language and content of job postings, which reveals the extent to which employers signaled their preferences for certain racial groups in a systematic manner, potentially discouraging minority applicants and perpetuating occupational segregation. The paper also identifies which industries or job classifications tend to have these preferences more strongly. Despite legislative advancements promoting equal opportunity and combating discrimination, this analysis demonstrates how preferences may have become more subtle and pervasive over time by tracking the evolution of

Robert S. Abbott in 1905, is a prominent Black newspaper in the United States included in the dataset. It played a significant role in the Great Migration by encouraging African Americans to move north and providing information about employment and civil rights issues (Wolseley, 1986).

discriminatory language and measures used in job postings.

The second contribution is methodological and relates to the literature on the analysis of language in job postings using text as data (some examples include, Kuhn et al. (2020); Garg et al. (2018); Atalay et al. (2020)). We created a new data source that quantifies hiring preferences on the basis of race. Using text data from historical sources covering more than a century of published classified pages, we train a classification model to identify job advertisements and use Natural Language Processing (NLP) tools to analyze racial hiring preferences in the content of such advertisements. By sifting through vast quantities of textual data, this method can be used to analyze large datasets, thereby enhancing research capabilities and revealing new findings.

The organization of the paper is as follows. Section 2 contextualizes the historical factors that shape the evolution of preferences in hiring during the period of analysis. Section 3 explains the construction of the new dataset on racial preferences in job postings. Section 4 presents the characterization of how racial preferences in job advertisements have contributed to limited access for certain racial groups, hindering their representation in specific professions. Section 5 estimates the effects of war-induced labor market shortages on prejudice among employers, measured by the occurrence of racially discriminatory job advertisements displaying preferences for White Workers. Section 6 concludes.

## 2 Historical Context

### 2.1 Market Forces: War-Induced Labor Mobilization

World War II started the largest military mobilization in U.S. history, drawing 16 million Americans to serve in the armed forces (U.S. Department of Veterans Affairs, 2020; Defense Casualty Analysis System, 2020). This large demand for military personnel triggered substantial changes in U.S. labor markets, mobilizing approximately one third of the working population to participate in the war effort, including wartime industrial production and military roles (Harrison, 1988). The mobilization implied a reorganization of the workforce with well-documented consequences for women's labor participation (Bailey, 2006; Goldin, 1991; Goldin and Olivetti, 2013; Goldin, 1983; Rose, 2018), and more recently studied structural changes affecting the African American workforce (Bailey and Collins, 2006; Aizer et al., 2020; Ferrara, 2022; Schweitzer, 1980).

The War produced severe casualties, the highest in US history, with over 405,000 of those in service lost (U.S. Department of Veterans Affairs, 2020; Defense Casualty Analysis System, 2020). Recent empirical evidence has shown that these casualties, predominantly among White male soldiers, created labor market voids that facilitated the entry of African American workers into better-paid, semi-skilled jobs previously accessed by them (Ferrara, 2022).

Wartime mobilization created labor shortages that were specially pronounced in industries critical to war production, leading to an unprecedented opportunity that allowed fr increased participation of African Americans in a greater range of occupations and industries (Maloney, 1994). Around four million African Americans migrated from the South during the Second Great Migration which spanned from 1940–1970 (Boustan, 2016). During this era, the participation of Black workers in the defense industry increased, partially enabled by the passing of legislation that aimed to prevent discrimination in the defense industry, such as Executive Order 8802 (Delmont, 2022).

The historical records of the full-count Decennial Census of 1940 provide an empirical characterization of the extent of wartime labor mobilization across racial groups. Appendix Table B.1 displays the average share of men per county that were participating in labor and military activities according to military enlistment and casualties sources listed in Section 3. In Panel A, we observe the indicators calculated for workers of all racial groups. Columns 1 and 2 show that, across all age groups, labor force participation remained relatively high (above 70 percent), with prime age workers (18-65) showing a participation rate of 90 percent at the onset of of World War II. Young adults (21-35) exhibit particularly high engagement in the labor market, similarly to adults (36-45). The enlistment rates are notably higher among younger age groups, reflecting the demographic targeting of military recruitment during the war. This is consistent with the largely-documented *temporarily* decline in the youth labor force during the war that allowed for increased labor participation of women, other racial groups, and immigrants due war mobilization. The casualty rates, while low overall, provide a crucial variable for understanding *permanent* local labor market disruptions. Panel B and C reveal significant variations in employment and enlistment rates between White and Black workers, with White workers generally showing higher rates of enlistment and lower casualty rates across all age groups.

The labor mobilization of African Americans that started with World War II marked the beginning of significant changes in labor market dynamics that were subsequently sustained by the Civil Rights Act of 1964 and related anti-discrimination legislation. These legal frameworks

improved the economic status of African Americans in the 1960s, facilitating educational opportunities (Landry and Marsh, 2011; Freeman et al., 1973), equitable access to public facilities and schools (Cook et al., 2022; Hersch and Shinall, 2015), and their integration in the workplace (Stainback et al., 2005). While the impacts of these legislative and institutional measures are well documented, less attention has been placed on the role of market forces in reducing racial disparities in employment (Margo, 1995; Cunningham and Lopez, 2021; Ferrara, 2022; Aizer et al., 2020). Our subsequent analysis aims to bridge this gap, by focusing on how the distribution of prejudice against Black workers was affected by war-induced changes in the relative labor supply of White and Black workers.

### 2.2 Racial Discrimination in Labor Markets Through Classified Ads

Classified job advertisements have served as a primary channel for recruiting workers during the last century, with the number of job listings published in major newspapers considerably increasing since 1940, as shown in Appendix Figure B.1. Historically, these advertisements have reflected broader social norms and legislative frameworks with regards to worker characteristics such as race. Prior to landmark anti-discrimination legislation in employment, help wanted job listings openly used racial terms to require racial or ethnic characteristics for job eligibility. This practice institutionalized racial discrimination among employers.

The enactment of the Civil Rights Act of 1964 marked a legislative milestone that led to a large change in the structuring of job postings. According to Darity and Mason (1998), by January 1965, newspapers largely ceased to publish help-wanted ads that explicitly favored "white" or "colored" applicants. Despite these changes, covert forms of *indirect* discrimination persisted. Advertisements favoring candidates from certain European nationalities, without a direct mention of race, continued to appear. To understand both explicit prohibition of Black applicants and indirect racial preferences favoring White workers, we introduce a novel dataset of prejudiced racial preferences in labor demand throughout the twentieth century.

# 3 Data

## 3.1 Data Sources

**Historical Newspapers.** The raw text sources come from ProQuest's *Historical Newspapers* archive.[3] The original files available at ProQuest are unstructured text data derived from newspaper images digitized through an optical character recognition (OCR) software. We access the unstructured text data using by queries that for the selection of specific newspapers and time periods. For our study, we limit our query search to thirteen national newspapers editions covering the period from January 1, 1900, to December 31, 1970, detailed in Appendix Table B.2. The resulting text files encompass all published sections in a newspapers – including front pages, news, and Op-Eds – and are indexed at the page level, including include metadata fields such as publication date and record type (for instance, *classified ads*, *news*).

Our study focuses on job postings from the classified and advertisement sections of newspapers to assess employers' racial preferences in recruitment practices. The use of newspaper data offers substantial benefits, primarily the ability to construct a detailed, annually updated measure of racial prejudice in hiring across a broad spectrum of industries and employers. This approach constitutes a significant advance over prior studies, which typically narrow their analyses to a single industry or firm, thereby limiting the generalizability of their findings. By contrast, our dataset provides a comprehensive indicator of prejudice among employers who have historically relied on classified ads for recruitment during the 20th century.

The analysis faces three primary challenges in extracting job postings information from the original newspapers data. To address these challenges, we employ a hierarchical approach, leveraging natural language processing and computational linguistics techniques to extract, isolate, and analyze the content of job advertisements. These methods are detailed in Online Appendix A, with a procedural overview in Appendix Figure A.1. First, the text data retrieved is highly unstructured, and job postings are embedded withing continuous text streams on each page without clear delimiters. To address this, we first parse text across all newspaper pages to identify those belonging to the Classifieds section. Next, within the Classifieds, we use a heuristic topic modeling approach and train a classification model to distinguish job ads from other listings such as real estate, services, and vehicle sales (see Online Appendix A.1). Second, the content of job postings requires extensive cleaning and formatting to correct OCR errors and

[3]The digital archive contains more than 52 million digitized pages from more than 200 publications. Additional information is available at https://about.proquest.com/en/products-services/pq-hist-news/.

prepare it for feature extraction, including racial groups, locations and occupations. We utilize pre-processing techniques that compare words in job postings against extensive dictionaries that facilitate the correction of misrecognized words, as detailed in Online Appendix Sections A.1.2 to A.1.4. Third, the substantial volume of data (containing approximately 16.8 million job ads) demands considerable computational resources, as many processing steps involve detailed word-by-word analysis. We enhance computational efficiency throughout each processing step, ensuring speed, reproducibility, and accuracy in data handling.

**WWII Enlistment and Casualty Army Records.** We use the WWII Army Enlistment Dataset published by UC Berkeley's CenSoc Project. This is a harmonized version of the the National Archives and Records Administration's (NARA) Electronic Army Serial Number Merged File, spanning 1938-1946. It contains the enlistment records of over 9 million individuals who served in the Army, Army Air Corps, Women's Auxiliary Corps and Enlisted Reserve Corps, and who enlisted from 1938 through 1947. Casualty information is restricted to male personnel sourced from the *World War II Honor List of Dead and Missing Army and Army Air Forces Personnel* digitized by Ferrara (2022).[4] We linked these two sources of data using the army serial numbers of the military personnel. Our analysis uses an estimation sample that is restricted to records with a valid serial number, non-missing occupation codes, and complete county of residence information. Additionally, we focus on casualties recorded between between 1940 and 1945. Table 1 contains descriptive statistics of the estimation sample consisting of 6.8 million enlisted soldiers and 199,778 casualties.

**Full-count U.S. Decennial Censuses.** We use the information from the full-count U.S. decennial censuses spanning from 1900 to 1950 in various parts of our analysis. We use census data from 1900 to 1950 to examine the racial gaps in labor force participation across occupations, providing a comprehensive view of long-term trends. For our primary analysis, we use the 1940 and 1950 censuses, which contain detailed employment indicators. These data allows us to evaluate the causes of shifts in the distribution of racial preferences, particularly during and after wartime periods, offering insights into the underlying causes of market forces.

[4]The lists were compiled per state and show military personnel in alphabetical order, including each casualty soldier that was killed, died, or remained missing from May 27, 1941, to January 31, 1946 according to NARA.

### 3.2 Measuring Racially Charged Terms in Recruiting

Identifying racially charged terms poses a significant semantic challenge, as terms like "white" or "black" can ambiguously refer to colors for describing objects or to racial categories. To illustrate this, Table B.3 shows the classification of examples of true positive and false positive occurrences of these terms when they are used in job postings.

We address this in a systematic approach that that starts with a string search to detect potential racial terms in the job ads. The full list of terms looked up on this search is provided in Online Appendix Table A.1. We classify terms as "white" to indicate individuals of European and North American descent and "black" to refer to individuals of African descent. This initial term search accounts for variations in capitalization and non-alphabetic symbols introduced by OCR errors. To refine the classification and distinguish between racial and non-racial uses of these terms, we examine the content surrounding each occurrence. We define a local window of text that includes the terms immediately preceding and following the candidate racial term. These neighboring terms are then categorized based on their grammatical and semantic roles. For example, terms such as *mechanic, packers, porter* (occupations), *Canadian* (nationalities), or *young, experienced* (personal descriptors), are flagged as likely referring to racial categories. Focusing on these contextual terms ensures that candidate terms like "white" and "black" are accurately identified as racial descriptors, minimizing false positives.

### 3.3 Descriptive Statistics and Data Validation

Our job posting dataset contains 16.8 million listings of thirteen historical newspapers that include nationally circulating, sub-nationally circulating, and historically black newspapers. Appendix Table B.2 reports the summary statistics of the sample of job postings, where columns 3 to 5 show the percentage of postings, per newspaper, containing explicit racial terms and information on address and zip code.

Appendix Figure B.2 compares the the occupation shares in the job postings dataset with those in the employed population aged 14 to 65 years old, according to the Decennial Census from 1910 to 1960. We define the occupations at the two-digit SOC level and report these shares by decade. Consistent with prior research, Administrative Support and Sales positions are overrepresented in newspaper job postings, while Production, Transportation and Construction jobs are reported more often among workers according to census data. Overall, the breakdown by occupation is consistent with the decade-to-decade shift in the distribution of the workforce

across occupations. On average, the correlation between the occupational shares in job postings and census data is 63 percent per decade. Appendix Figure B.3 shows further validation using the four-digit SOC code.

For our analysis, we construct two samples with the job listings summarized in Columns 5 and 7 of Table B.2. The first is the full sample which includes all job postings that have a valid SOC code. We use this sample to characterize trends in the presence of prejudice in job recruitment, as discussed in Section 4. The second sample, our estimation sample, is restricted to job listings that provide both occupation and geographical zip code information. This allows us to identify the counties where the advertised jobs are located. We utilize this sample to conduct the analyses in Section 5 of our study.

## 4 Racial Preferences in Recruitment, 1900-1970

Figure 1 shows an annual time series of the shares of job postings that explicitly specify racial preferences. This series primarily reflect employers' preferences for certain racial groups although, in the case of Black workers, some postings may represent exclusion rather than preference. Consequently, we interpret these trends as indicative of employers' recruitment requirements in labor demand for for Black and White workers. Throughout the observed period, the explicit preference for White workers exceeds that for Black workers. This patterns suggest that employer's standards were less about outright barring black applicants, and more about discouraging their applications by explicitly stating a preference for White candidates.

The first two decades exhibit the highest preference levels for White workers, followed by notable declines in 1915, 1934, and at the end of World War II in 1945. After these periods, the prevalence of racial preference for White workers fell substantially and stabilized at lower levels. The share representing racial preferences for Black workers shows a sharp decline around 1916-1917, coinciding with the U.S.'s entry into World War I , and another significant drop at the end of World War II. [5]

Figure 2 shows the racial gap in job postings shares for the nine occupation groups at the two-digit level that have higher representation in the census (see the remaining occupations in Appendix Figure B.4). We observe that the main trend across all occupations is a declining

[5] We conducted a structural change analysis that detected significant breakpoints in 1909, 1919, 1934, 1945, and 1958 for the series pertaining racial preferences for Black workers. These breakpoints align with major historical events, such as pre- (1934) and post-World-War-II years (1945) and civil rights movements beginning around 1958.

racial gap in the demand for workers, particularly after the second world war. We accompany this section's examination of the job ads with an analysis of their counterpart in terms of labor force participation as observed in the Decennial Census (see Appendix Figure B.5).

The occupational sectors from which Black workers were systematically excluded experienced substantial changes prior to WWI and WII. Business and Financial Operations, Office and Administrative Support Occupations, Production, and Sales and Related Occupations were sectors steadily excluding Black workers during the first half of the 1900s. The disparity between White and Black applicants in Business and Financial was most pronounced in 1930 but narrowed to 4 percentage points in the 1940s and 3 percentage points in the 1960s. Office and Administrative Support and Production occupations also experienced a dramatic decline in hiring preferences, with the most drastic closing of the gap in job postings in Personal Care and Service Occupations. Moreover, our results suggest that the need for candidates of a specific race is most prevalent in job advertisements for jobs in the Food Preparation and Serving groups, where White workers are in greater demand relative to Black workers in the 1930s. During 1900–1920, there was a greater relative preference for Black workers in this occupational group, but this preference reverted to favoring White workers in the 1930s and 1940s.

Occupations that were related to war-time effort such as Production and Transportation and Material Movingshowed a declining trajectory of racial prejudice. Production was the sector that absorbed most of the Black civilian workforce during the war era, most likely due to in-migration into cities from farming jobs. Specially in Transportation and Material Moving, the White-Black labor force ratio declined sharply after the war (see Appendix Figure B.5), which is consistent with the decline in explicit racial prejudice communicated in recruiting. In Farming occupations, which experienced the largest decline in the Black civilian workforce during the war (Bureau of Labor Statistics, 1945), the racial gap in explicit references for race remained relatively stable at less than 5 percent after the war. Two sectors where the participation of Black working men improved substantially after the war – starting from a participation share of less than two percent in 1940 (Bureau of Labor Statistics, 1945) – were clerical and sales jobs. As shown in Appendix Figure B.5, there was a large decrease in the relative White-Black labor force participation in Office and Administrative Support occupations, consistent with the decline in racial references in recruiting after the war. A similar pattern is seen in Sales and Related occupations. The racial preferences in Personal Care Services remained relatively high even after the war, with the gap in racial preferences widening in favor of white workers – although during

the war period, employment among men and specially Black women increased considerable in this sector. Similarly, the racial gap in Food Preparation and Serving occupations remained open after the war and the relative labor force participation of White-Black workers did not drop as much as for Personal Services.

# 5 Effects of World War II Mobilization on Local Labor Markets

## 5.1 Identification

In Section 5.2, we examine the effects of war-induced labor mobilization on the relative labor supply of White men as the first stage of our analysis. This first stage analysis establishes the exogenous variation in labor supply due to wartime mobilization, allowing us to use this variation to isolate the causal effects of these shifts on changes in employers' prejudice in recruitment. Section 5.3 examines the causal effects of the decline in the relative labor supply of White versus Black workers on employers' prejudices in recruitment. Our unit of analysis is the local labor market, defined as an occupation-county pair.

In our first stage analysis, we hypothesize that military enlistment induced temporary changes in the labor supply of White and Black men during the period of WWII, and casualties induced a permanent labor market adjustment in labor supply. We measure the exposure of local labor markets to falling relative labor supply using military indicators derived from the WWII Casualty and Enlistment Records detailed in Section 3. First, we use the number of enlistments measured as the number of men from specific labor markets – that is, they reside in a county and held a particular civilian occupation before the war (Figure 3a). Second, we use the number of casualties among White men within these same markets before their military enlistment (Figure 3b). Both indicators use previously unutilized, refined historical information about soldiers' civilian occupations before the war, providing a measure of local labor market exposure to potential labor declines. Our empirical findings presented in Section 5.2 document a decline in the relative labor supply, associated primarily with White soldiers' military casualties and deployment as the changes in Black workers' labor supply are statistically insignificant.

Building on these findings, Section 5.3 examines the causal effects of the decline in the relative labor supply of White versus Black workers on employer prejudice in recruitment. Our research design exploits the quasi-random variation in White soldier's casualties, which predominantly affected those more likely to hold combat positions during WWII (Frymer, 2004).

This contrasts with Black soldiers, who experienced differentially lower enlistment and casualty rates due to the existing segregation in the military and relegation to non-combat positions such as transportation (Delmont, 2022; Ferrara, 2022). This variation provides a unique natural experiment to identify how significant declines in the labor supply of White men, while keeping labor demand largely unaffected, causally affected the racial prejudice in recruitment practices. Figure 4 illustrates the geographic variation in White soldiers' casualties across labor markets during the war. Specifically, it reports the share of enlisted White men who died, averaged across occupations at the county level. The map exhibits higher casualty rates in the South (Mississippi, Alabama, Georgia), Central Midwest (Missouri and Arkansas), and Northeast (parts of Pennsylvanian and New York).

### 5.2 First-Stage: Labor Supply of White and Black Workers

This section introduces a reduced-form estimation to quantify the long-term effects of WWII mobilization of White men on the labor supply of White and Black men in 1950, five years following the war's end. We estimate the following specification in levels,

$$L_i = \beta_0 + \beta_1 Casualties_i + \beta_2 Enlistments_i + \delta_{occ} + \beta_3' X_i + \gamma_{state} + \epsilon_{i,t}, \tag{1}$$

where $L_i$ represents the working age population of White and Black men aged 15-65 in occupation-county $i$ during 1950 as a measure of labor supply. We also conduct an analysis using the number of employed White and Black men as the outcome variable. $Casualtiesi, t$ is the number of White soldier casualties in occupation-county cell $i$ during the war period, 1940-1945. $Enlistments_{i,t}$ indicates the number of White men who enlisted in military service from the same geographic location and time frame of 1940-1945. $X_i$ is a covariate vector that includes 1940 levels of the respective outcome and 1950 levels of the female labor force in cell $i$ measured in levels. $\delta_{occ}$ controls for occupation-specific fixed effects, capturing variation across different types of employment that might influence labor market outcomes, and $\gamma_{state}$ includes state-level fixed effects to adjust for broader geographic and policy influences that are consistent within states but vary across them. Lastly, $\epsilon_{i,t}$ is the error term, capturing unobserved factors at the occupation-county level.

By employing fixed effects for both occupation and state, we control for confounding factors that could otherwise bias our estimates. This method allows us to attribute observed changes in

labor force composition directly to the exogenous shocks of war casualties and the endogenous levels of military enlistments.

Table 3 reports the estimation of the specification outlined in Equation 1 on the white working-age population calculated for 1950. The first row reports the coefficient on casualties, $\beta_1$, which is consistently negative across all age groups. This effect suggests that higher rates of wartime casualties affecting local labor markets correlate with a significant decline in labor force participation rates lasting until the 1950s. This effect is most pronounced among young adults (aged 21-35), shown in Column 3, and senior men (ages 45-65), as shown in Column 5, where a one-unit increase in the number of casualties is associated with a 12.5 reduction of men in the labor force. This result is consistent with the hypothesis that high casualty levels had long-lasting impacts on the local workforce availability. In the second row, the enlistments coefficient, $\beta_2$, shows a less consistent pattern. For younger groups aged 21-35 and adult groups aged 36-45, shown in Columns 1 and 3, respectively, the effect of enlistments on the labor force is positive and statistically significant. However, Column 2 shows a negative association for the young group (18-20), suggesting that higher enlistment numbers temporarily depleted the labor force, which may not have fully recovered by the 1950s.

We observe that lagged labor force participation numbers from 1940, included as controls, are positively associated with the level of the labor force in the 1950s. The coefficients on female labor force participation rates from 1950 indicate varying impacts across age groups. In younger cohorts, increased female participation correlates with decreased male participation.

According to Table 4, casualties have a statistically significant detrimental effect on employment for White workers in the majority of age categories, with the most noticeable effects occurring in the senior cohort (ages 45–65). In particular, the casualty coefficient points to a drop in employment of roughly 11.3 men for this group. Similarly, an increase in casualties among young adults aged 21 to 35 is associated with a decline in the number of men employed in a particular local labor market. The effects of enlistments are more variable among age groups and are mostly linked to the rise in the number of white men in employment in 1950. We find a significant positive correlation between higher enlistment and lower employment for young adults (ages 21–35), which is probably due to prime-aged males returning to the workforce following military service.

In contrast, the analysis for Black workers shows a different pattern in Table 5. White soldier casualties do not significantly impact the working-age population of Black workers.

This indicates that the direct loss of White workers due to wartime casualties did not affect Black labor supply to the same extent as it did White labor supply, potentially due to the segregated nature of wartime military service and the labor market segregation that existed during that period. Enlistment numbers for Black workers also show no consistent significant effect across age groups, suggesting that the pull of enlistment from the civilian labor force did not distinctly alter labor market participation for this demographic, perhaps reflecting the limited labor market opportunities available to Black men at the time.

Table 6 shows that contrary to the significant negative effects observed among employed White cohorts, the estimates for Black workers suggest a largely non-significant relationship between White soldiers' casualties and levels of employment across all age groups. The effects of enlistments are uniformly non-significant, implying that the wartime mobilization of White workers did not translate into measurable disruptions in Black workers' civilian employment patterns during the 1950s.

## 5.3 Employer Prejudice in Recruitment

### 5.3.1 Research Design

Our empirical strategy allows us to measure the long-term effects of wartime casualties on prejudiced language in job postings, specifically focusing on postings that express a preference for White candidates. Using an event study approach, we estimate the dynamic effects of the shock of White soldier casualties during World War II on the share of job postings with White racial preferences across various occupation-county cells.

$$Y_{i,t} = \sum_{k=0,k\neq -1}^{41} \delta_k \cdot z_{i,t-k} + \delta_{-1} \cdot z_{i,t+1} + \alpha_g + \alpha_t + \epsilon_{i,t} \tag{2}$$

The outcome variable $Y_{i,t}$ represents the proportion of job postings stating racial preferences for White candidates in each occupation-county cell $i$ in year $t$. The treatment indicator $z_{i,t-k}$ is activated if the specified lag $k$ corresponds to the year since the initial impact of the casualties, with $\delta_k$ measuring the effect of casualties at each event time $k$. The estimates aim to capture how the racial preferences in job postings evolve over time, from several years before to several years after the casualty event.

### 5.3.2 Results

Figure 5 indicates a discernible declining effect in the share of job postings with White racial preferences over the event window. The pre-treatment period shows relatively stable levels of racial preference postings, with no significant deviations from zero, indicating no pre-existing trend. We formally reject the presence of pre-trends (Callaway and Sant'Anna, 2021). In the post-treatment period, there is a noticeable shift, with the treatment effect estimates consistently below zero across multiple post-treatment periods. This suggests a long-term decline in the propensity to state White racial preferences in job postings following the casualties. Particularly, local labor markets impacted by the casualties of White soldiers saw a reduction of 2.8 percentage points in the likelihood of job postings exhibiting explicit racial preferences.

The overall pattern underscores a potential change in societal norms or labor market dynamics influenced by wartime casualties, reflecting a broader assimilation or alteration in racial bias in the recruitment process. These findings highlight the nuanced ways in which historical events such as WWII casualties can have prolonged effects on labor market practices, potentially influencing employer behaviors and societal attitudes towards race. The robustness of these results, supported by controls for various fixed effects, emphasizes the importance of considering historical legacies when analyzing current labor market dynamics and employer preferences.

Figure 6 indicates that the treatment effects vary notably by cohort year of exposure to casualties. For earlier cohorts (1940-1942), the treatment effects are consistently negative and estimated precisely to conclude that the average treatment effects are led by the exposure to casualties belonging to the first part of the war. In subsequent years, particularly from 1944 onwards, the treatment effects become more pronounced but statistically indistinguishable from zero, reflecting a weaker or less detectable impact of the treatment over time.

The overall average effect on the treated (ATT) for the combined cohorts is relatively small, indicating that while individual cohorts, particularly those exposed later, exhibit more substantial effects, the average impact across all cohorts is muted. The statistical significance of these variations, as indicated by the p-value for the pre-test of parallel trends, confirms that the pre-treatment trends were stable, supporting the validity of our causal interpretation that the observed post-treatment effects are indeed attributable to the intervention.

# 6 Conclusions

We examine the dynamics of employer racial prejudice in U.S. labor markets from 1900 to 1970 by constructing a novel dataset of 16.8 million job postings from historical newspapers. Our analysis uses a research design that exploits the exogenous variation in the number of WWII military casualties among White soldiers across local labor markets to examine how market forces plausibly led to changes in discriminatory recruitment practices. We hypothesize that wartime declines in labor supply caused changes in racially discriminatory job advertisements. Our analysis first establishes the first stage relationship between military casualties significantly reducing the relative labor supply of White compared to Black workers, primarily due to the differentially higher numbers of war casualties and enlistment among white soldiers. Subsequently, we identify the causal effects of these casualties on the prevalence of racially discriminatory job listings using an event study design. Particularly, local labor markets impacted by the casualties of White soldiers saw a reduction of 2.8 percentage points in the likelihood of job postings exhibiting explicit racial preferences.

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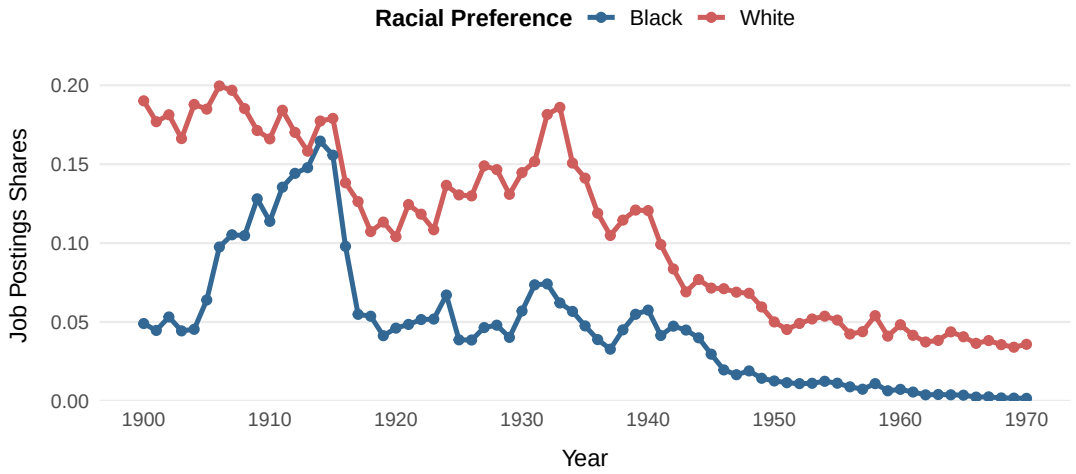
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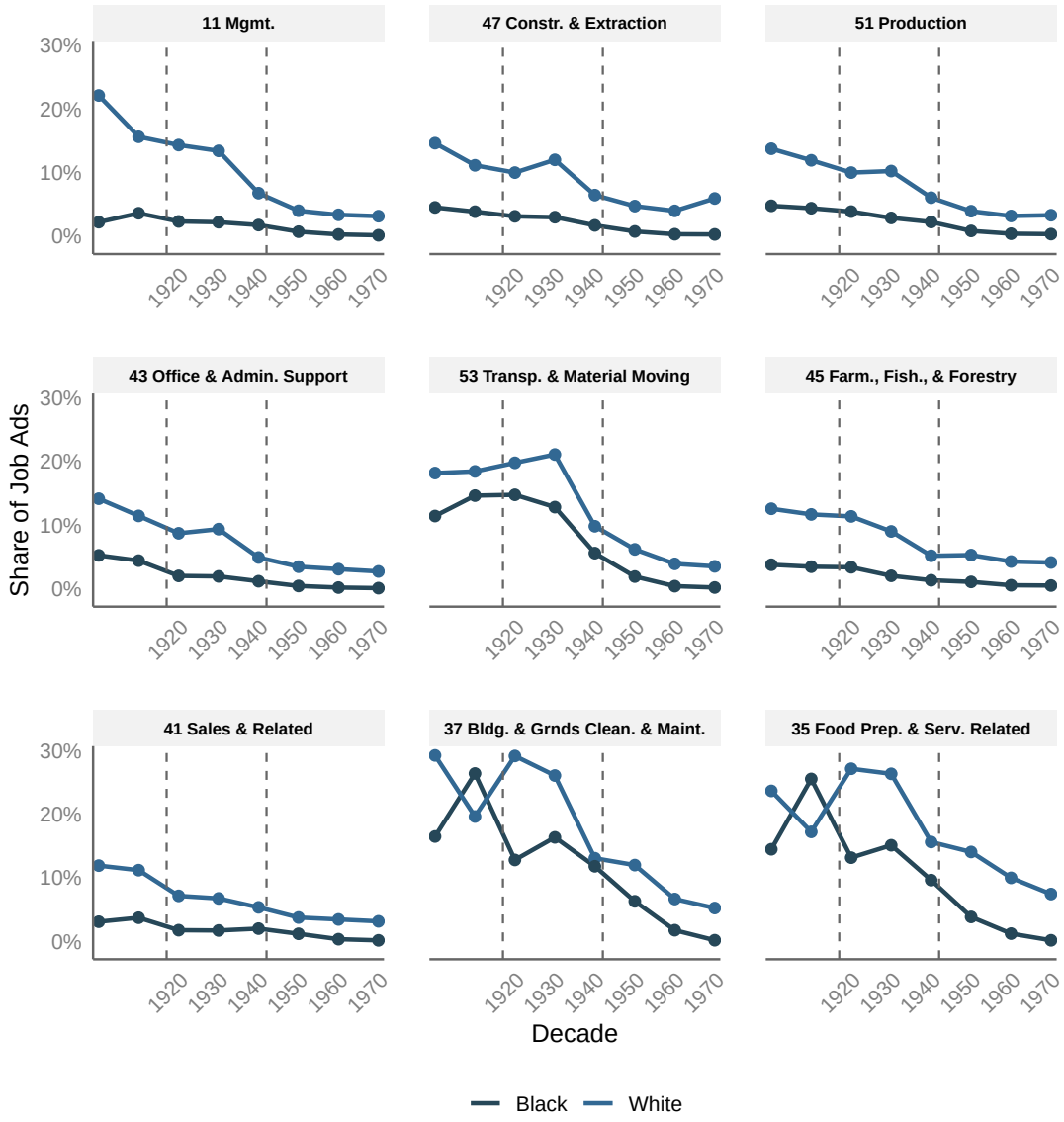
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Figure 1: Share of Job Postings With Racial Preferences by Occupation



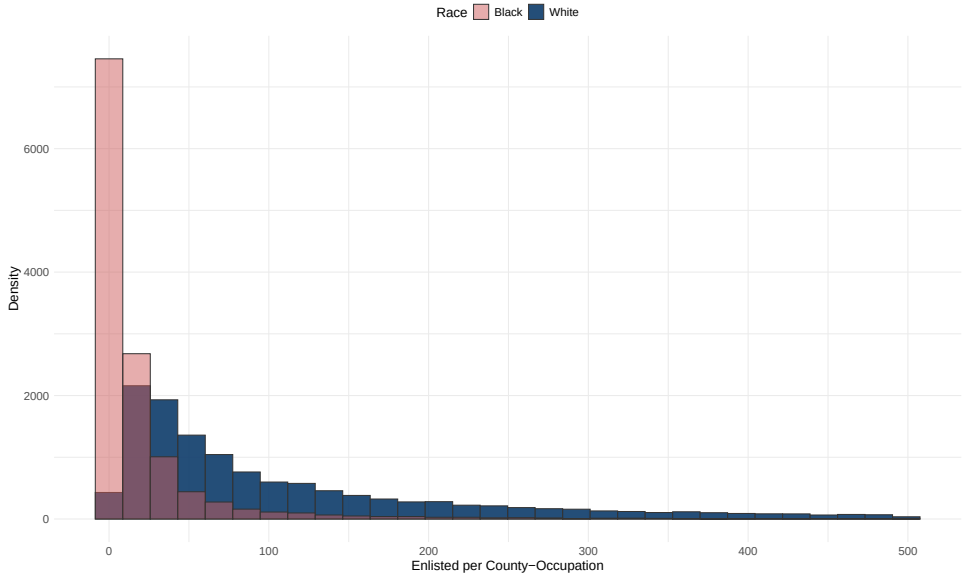

*Notes:* The graph depicts the proportion of job postings that include racial preference as a percentage of the total number of job postings per year. "African," "colored," "black," and "negro" are the terms used as racial identifiers for the category "black." "American," "Belgian," "British," "Canadian," "Caucasian," "Danish," "English," "European," "French," "German," "Irish," "Italian," "Polish," "Russian," "Scottish," "Spanish," and "Swedish" are the words used to identify racial preferences for the category "white." Using regex patterns that include lowercase singular and plural forms of the listed terms, these terms are recognized in the content of job advertisements.

Figure 2: Racial Gap in Job Postings with Racial Preferences by Occupation

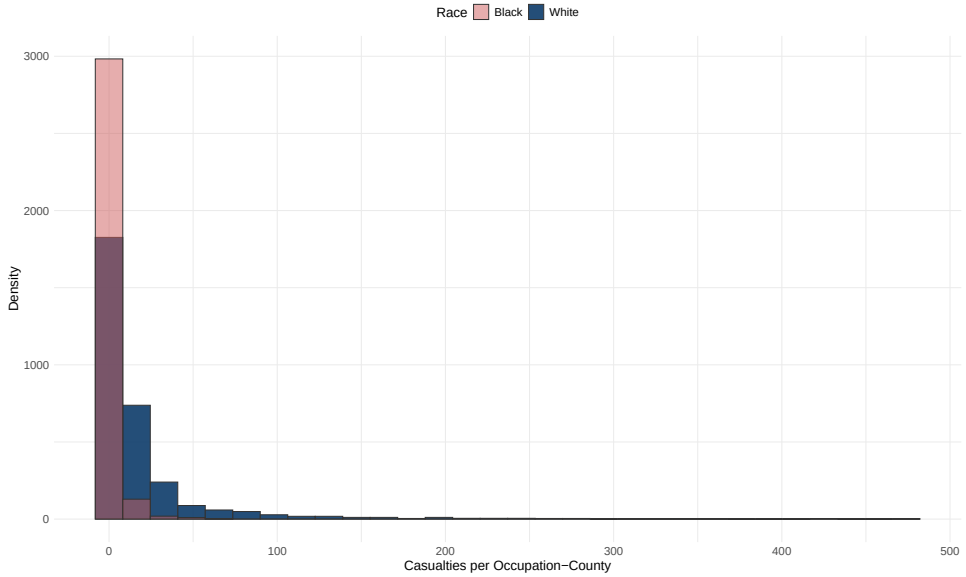



*Notes:* The graph displays the proportion of job postings within each occupational category (categorized by two-digit SOC codes) that specify a racial preference. The graphs are ordered by the occupations with the highest participation rates in job postings, with occupations appearing first if they have a greater share of total job postings. The remaining occupational groups are shown in Appendix Figure B.4.

Figure 3: Distribution of Casualties and Enlisted Soldiers across Local Labor Markets, 1940



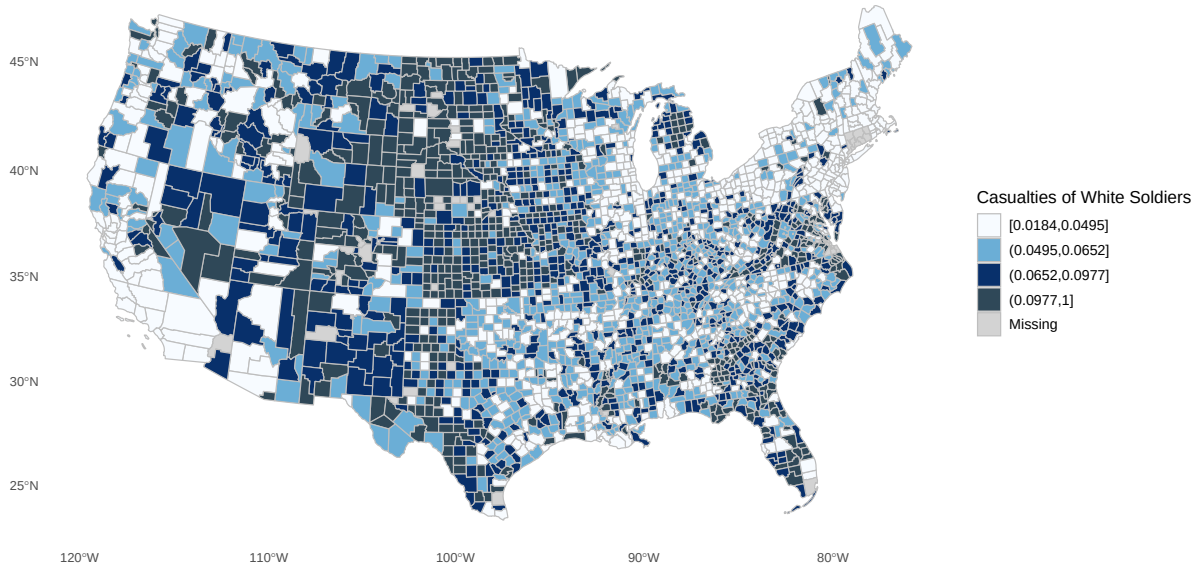

(a) Enlistments




(b) Casualties

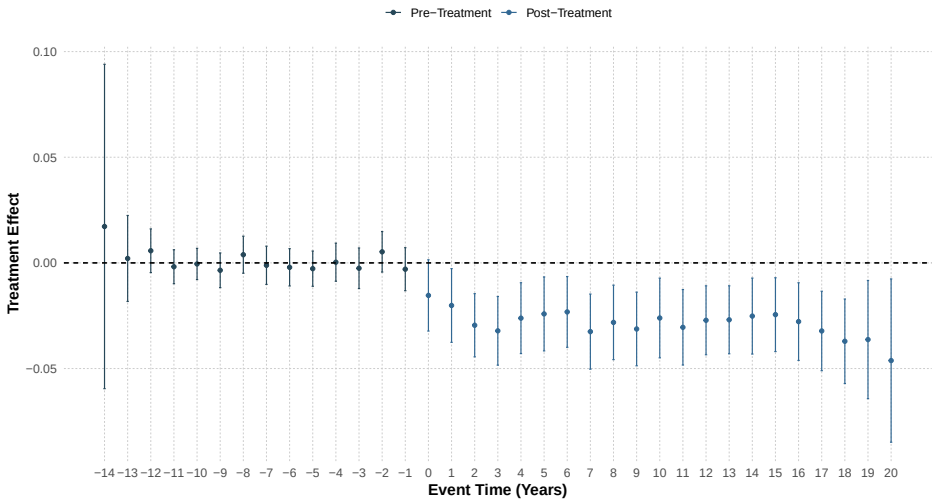
*Notes:* The figure shows the distribution of enlistments and casualties across local labor markets, stratified by racial group and calculated for 1940. Panel (a) shows the number of enlistments by county-occupation pair, while panel (b) shows the corresponding casualties.

Figure 4: Geographic Variation in WWII Casualty Rates Among White Soldiers



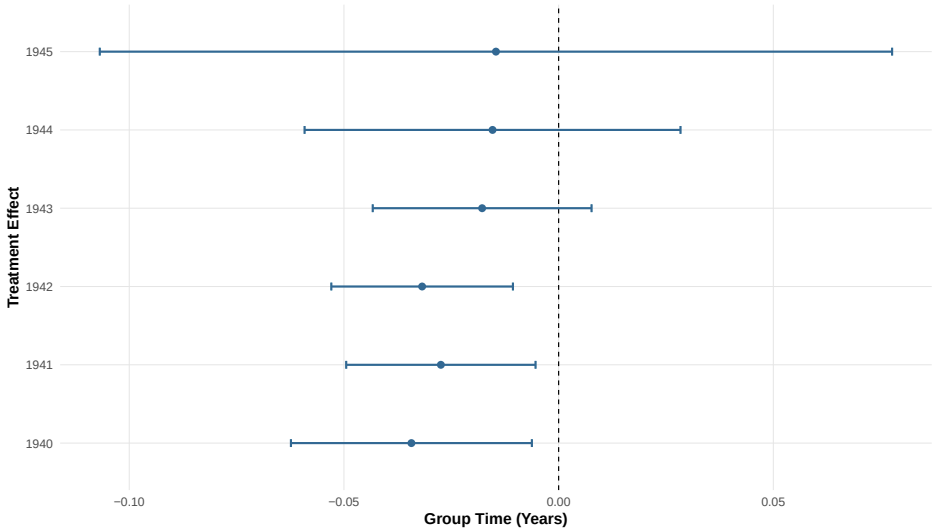

*Notes:* The map displays the average proportion of WWII casualties among White soldiers by occupational category within U.S. counties, calculated as $\sum_g C_{g,l}/|G(c)|$, where $g$ represents occupational groups, and $c$ represents counties. The term $G(c)$ denotes the number of occupational groups in a given country $c$. Data is missing for some areas, as indicated in gray. Analysis excludes soldiers of other racial groups and non-military casualties.

Figure 5: Event Study on Share of Postings with White Racial Preferences




*Notes.* The graph shows the group-time average effect on the treated (ATT) by length of exposure, $\delta_k$ on the occurrence of job postings with racial preference for White workers. The outcome variable is the percentage of job postings in a year with a racial preference for White workers. The group-time ATT estimates were calculated using the methods for allowing multiple time periods, proposed by Callaway and Sant'Anna (2021). The p-value for pre-test of parallel trends assumption is 0.13756. The overall ATT is -0.028 with a SE of 0.047.

Figure 6: Treatment Effects per Adoption Cohort




*Notes.* The graph shows the adoption-cohort average effect (ATT) on the occurrence of job postings with racial preference for White workers. The outcome variable is the percentage of job postings in a year with a racial preference for White workers. The group-time ATT estimates were calculated using the methods for allowing multiple time periods, proposed by Callaway and Sant'Anna (2021). The p-value for pre-test of parallel trends assumption is 0.13756. The overall ATT is -0.028 with a SE of 0.047.

Table 1: Descriptive Statistics for the Sample of WWII Enlistment Records, 1938–1947

| | All Enlisted | | Casualties | |
|---|---|---|---|---|
| | Mean (1) | Std. Dev. (2) | Mean (3) | Std. Dev. (4) |
| *A. Demographics* | | | | |
| Men | 0.98 | 0.13 | 1.00 | 0.03 |
| Women | 0.02 | 0.13 | 0.00 | 0.03 |
| White | 0.89 | 0.32 | 0.92 | 0.28 |
| Black | 0.09 | 0.28 | 0.06 | 0.24 |
| ANHPI | 0.01 | 0.08 | 0.01 | 0.09 |
| Latino | 0.01 | 0.07 | 0.00 | 0.02 |
| Missing Race | 0.01 | 0.10 | 0.01 | 0.08 |
| *B. Education* | | | | |
| Some High School or Less | 0.59 | 0.49 | 0.63 | 0.48 |
| High School Graduate | 0.27 | 0.44 | 0.27 | 0.45 |
| Some College | 0.10 | 0.30 | 0.07 | 0.26 |
| College Graduate | 0.04 | 0.20 | 0.02 | 0.13 |
| *C. Enlistment Year* | | | | |
| 1940 | 0.04 | 0.19 | 0.05 | 0.22 |
| 1941 | 0.14 | 0.35 | 0.17 | 0.38 |
| 1942 | 0.44 | 0.50 | 0.42 | 0.49 |
| 1943 | 0.21 | 0.41 | 0.24 | 0.43 |
| 1944 | 0.09 | 0.29 | 0.10 | 0.29 |
| 1945 | 0.08 | 0.27 | 0.02 | 0.13 |
| *D. Occupations* | | | | |
| Production | 0.24 | 0.42 | 0.25 | 0.43 |
| Farming, Fishing, Forestry | 0.14 | 0.34 | 0.17 | 0.38 |
| Transportation and Material Moving | 0.13 | 0.34 | 0.14 | 0.35 |
| Office and Admin Support | 0.10 | 0.31 | 0.09 | 0.29 |
| Construction and Extraction | 0.10 | 0.30 | 0.11 | 0.31 |
| Sales | 0.06 | 0.23 | 0.05 | 0.22 |
| Installation and Repair | 0.05 | 0.22 | 0.05 | 0.21 |
| Food Preparation and Serving | 0.03 | 0.17 | 0.03 | 0.17 |
| Arts, Design, Media | 0.03 | 0.16 | 0.03 | 0.16 |
| Management | 0.03 | 0.16 | 0.02 | 0.13 |
| Observations | 6,858,598 | | 199,778 | |

*Notes:* This table shows summary statistics of the estimation sample of enlisted World War II soldiers and casualties from 1940-1945. Occupations accounting for less than two percent of soldiers' occupational share are not reported in the table.

Table 2: County Average Labor, Employment, and Military Service Participation Among Men by Demographic Group, 1940

| | Labor Force (1) | Employment (2) | Enlistment (3) | Casualty (4) |
|---|---|---|---|---|
| A. Everyone | | | | |
| Everyone 18-65 | 0.90 | 0.84 | 0.14 | 0.00 |
| | [0.04] | [0.06] | [0.26] | [0.01] |
| Young 18-20 | 0.72 | 0.61 | 0.36 | 0.01 |
| | [0.08] | [0.11] | [0.44] | [0.02] |
| Young adult 21-35 | 0.93 | 0.87 | 0.24 | 0.01 |
| | [0.05] | [0.06] | [0.49] | [0.01] |
| Adult 36-45 | 0.94 | 0.90 | 0.04 | 0.00 |
| | [0.05] | [0.06] | [0.09] | [0.00] |
| Senior 46-65 | 0.89 | 0.84 | 0.00 | 0.00 |
| | [0.05] | [0.06] | [0.00] | [0.00] |
| B. White | | | | |
| Everyone 18-65 | 0.81 | 0.75 | 0.12 | 0.00 |
| | [0.16] | [0.14] | [0.20] | [0.01] |
| Young 18-20 | 0.63 | 0.53 | 0.32 | 0.01 |
| | [0.15] | [0.13] | [0.36] | [0.02] |
| Young adult 21-35 | 0.83 | 0.77 | 0.21 | 0.01 |
| | [0.17] | [0.15] | [0.38] | [0.01] |
| Adult 36-45 | 0.85 | 0.81 | 0.04 | 0.00 |
| | [0.16] | [0.15] | [0.07] | [0.00] |
| Senior 46-65 | 0.80 | 0.76 | 0.00 | 0.00 |
| | [0.15] | [0.14] | [0.00] | [0.00] |
| C. Black | | | | |
| Everyone 18-65 | 0.09 | 0.09 | 0.01 | 0.00 |
| | [0.15] | [0.15] | [0.06] | [0.00] |
| Young 18-20 | 0.09 | 0.08 | 0.03 | 0.00 |
| | [0.15] | [0.14] | [0.12] | [0.00] |
| Young adult 21-35 | 0.09 | 0.09 | 0.02 | 0.00 |
| | [0.16] | [0.16] | [0.12] | [0.00] |
| Adult 36-45 | 0.09 | 0.09 | 0.00 | 0.00 |
| | [0.15] | [0.15] | [0.02] | [0.00] |
| Senior 46-65 | 0.08 | 0.08 | 0.00 | 0.00 |
| | [0.14] | [0.14] | [0.00] | [0.00] |

*Notes:* This table reports the average proportions of men residing in a county in 1940 that were part of any of the groups indicated in the column headers in the table. The proportions reported were calculated as an average across all counties using the full-count Decennial Census from 1940. Standard deviations of these shares are presented in brackets.

Table 3: Effects of Casualties and Enlistment on the Working Age White Population

| | Everyone 18-65 (1) | Young 18-20 (2) | Young adult 21-35 (3) | Adult 36-45 (4) | Senior 45-65 (5) |
|---|---|---|---|---|---|
| Casualties | -30.897* | 0.715 | -10.707* | -4.79 | -12.554** |
| | (16.361) | (0.677) | (6.337) | (4.024) | (6.194) |
| Enlisted | 0.906* | -0.004 | 0.466** | 0.19* | 0.279 |
| | (0.51) | (0.025) | (0.206) | (0.106) | (0.202) |
| Lagged outcome, 1940 | 0.941*** | 0.657*** | 0.828*** | 0.907*** | 1.048*** |
| | (0.052) | (0.037) | (0.05) | (0.048) | (0.052) |
| Female Labor Force, 1950 | 0.013 | 0.008*** | -0.021 | 0.005 | 0.043*** |
| | (0.048) | (0.002) | (0.022) | (0.01) | (0.012) |
| Constant | -110.183* | 2.846 | 11.884 | 25.575 | -203.602*** |
| | (61.074) | (3.018) | (24.271) | (15.869) | (28.594) |
| Mean Outcome | 1101.928 | 51.522 | 420.99 | 270.048 | 359.368 |
| Ad. R-Squared | 0.954 | 0.93 | 0.935 | 0.949 | 0.959 |
| Observations | 24,421 | 24,421 | 24,421 | 24,421 | 24,421 |

*Notes:* This table estimates the effects of military casualties and enlistment rates of White male soldiers on the labor force participation of White workers in a local labor market (county-occupation), segmented by age group. The regression models control for the lagged labor force share from 1940, the proportion of women in the labor force in 1950, and fixed effects for occupation and state. Robust standard errors are in parentheses, with significance indicated by $*$ p $<$ 0.1, $**$ p$<$ 0.05, and $***$ p $<$ 0.01.

Table 4: Effects of Casualties and Enlistment on the Employed White Population

| | Everyone 18-65 (1) | Young 18-20 (2) | Young adult 21-35 (3) | Adult 36-45 (4) | Senior 45-65 (5) |
|---|---|---|---|---|---|
| Casualties | -29.006** | 0.854 | -10.734* | -4.844 | -11.305** |
| | (13.619) | (0.529) | (5.616) | (3.701) | (4.845) |
| Enlisted | 0.899** | -0.011 | 0.455*** | 0.207** | 0.282* |
| | (0.396) | (0.019) | (0.173) | (0.1) | (0.153) |
| Lagged outcome, 1940 | 1.011*** | 0.712*** | 0.894*** | 0.95*** | 1.136*** |
| | (0.045) | (0.035) | (0.044) | (0.049) | (0.046) |
| Female Labor Force, 1950 | -0.027 | 0.005*** | -0.036* | 0.000 | 0.027*** |
| | (0.041) | (0.001) | (0.02) | (0.008) | (0.009) |
| Constant | -228.502*** | 2.896 | -15.73 | 4.625 | -274.256*** |
| | (58.412) | (2.334) | (22.222) | (15.419) | (27.088) |
| Mean Outcome | 1040.062 | 44.901 | 397.718 | 258.711 | 338.732 |
| Ad. R-Squared | 0.954 | 0.93 | 0.935 | 0.949 | 0.959 |
| Observations | 24,421 | 24,421 | 24,421 | 24,421 | 24,421 |

*Notes:* This table estimates the effects of military casualties and enlistment rates of White male soldiers on the number of employed White workers in a local labor market (county-occupation), segmented by age group. The regression models control for the lagged labor force share from 1940, the proportion of women in the labor force in 1950, and fixed effects for occupation and state. Robust standard errors are in parentheses, with significance indicated by $*$ p $<$ 0.1, $**$ p$<$ 0.05, and $***$ p $<$ 0.01.

Table 5: Effects of Casualties and Enlistment on the Working Age Black Population

| | Everyone 18-65 (1) | Young 18-20 (2) | Young adult 21-35 (3) | Adult 36-45 (4) | Senior 45-65 (5) |
|---|---|---|---|---|---|
| Casualties | 2.918 | 0.179 | 2.559 | -0.061 | 0.163 |
| | (4.907) | (0.166) | (2.515) | (1.263) | (1.149) |
| Enlisted | 0.052 | 0.001 | -0.003 | 0.038 | 0.026 |
| | (0.148) | (0.005) | (0.075) | (0.039) | (0.034) |
| Lagged outcome, 1940 | 0.928*** | 0.727*** | 0.872*** | 0.866*** | 1.049*** |
| | (0.038) | (0.034) | (0.047) | (0.046) | (0.042) |
| Female Labor Force, 1950 | 0.023*** | 0.001*** | 0.012*** | 0.004* | 0.005*** |
| | (0.008) | (0) | (0.004) | (0.002) | (0.002) |
| | -63.388*** | 1.434 | -34.367*** | 0.03 | -30.126*** |
| Constant | (15.834) | (0.875) | (7.708) | (4.163) | (6.424) |
| Mean Outcome | 103.306 | 6.165 | 41.671 | 26.504 | 28.967 |
| Ad. R-Squared | 0.879 | 0.804 | 0.83 | 0.882 | 0.89 |
| Observations | 24,421 | 24,421 | 24,421 | 24,421 | 24,421 |

*Notes:* This table estimates the effects of military casualties and enlistment rates of White male soldiers on the labor force participation of Black workers in a local labor market (county-occupation), segmented by age group. The regression models control for the lagged labor force share from 1940, the proportion of women in the labor force in 1950, and fixed effects for occupation and state. Robust standard errors are in parentheses, with significance indicated by $*$ p $<$ 0.1, $**$ p$<$ 0.05, and $***$ p $<$ 0.01.

Table 6: Effects of Casualties and Enlistment on the Employed Black Population

| | Everyone 18-65 (1) | Young 18-20 (2) | Young adult 21-35 (3) | Adult 36-45 (4) | Senior 45-65 (5) |
|---|---|---|---|---|---|
| Casualties | 2.918 | 0.179 | 2.559 | -0.061 | 0.163 |
| | (4.907) | (0.166) | (2.515) | (1.263) | (1.149) |
| Enlisted | 0.052 | 0.001 | -0.003 | 0.038 | 0.026 |
| | (0.148) | (0.005) | (0.075) | (0.039) | (0.034) |
| Lagged outcome, 1940 | 0.928*** | 0.727*** | 0.872*** | 0.866*** | 1.049*** |
| | (0.038) | (0.034) | (0.047) | (0.046) | (0.042) |
| Female Labor Force, 1950 | 0.023*** | 0.001*** | 0.012*** | 0.004* | 0.005*** |
| | (0.008) | (0) | (0.004) | (0.002) | (0.002) |
| | -63.388*** | 1.434 | -34.367*** | 0.03 | -30.126*** |
| Constant | (15.834) | (0.875) | (7.708) | (4.163) | (6.424) |
| Mean Outcome | 103.306 | 6.165 | 41.671 | 26.504 | 28.967 |
| Ad. R-Squared | 0.879 | 0.804 | 0.83 | 0.882 | 0.89 |
| Observations | 24,421 | 24,421 | 24,421 | 24,421 | 24,421 |

*Notes:* This table estimates the effects of military casualties and enlistment rates of White male soldiers on the number of employed Black workers in a local labor market (county-occupation), segmented by age group. The regression models control for the lagged labor force share from 1940, the proportion of women in the labor force in 1950, and fixed effects for occupation and state. Robust standard errors are in parentheses, with significance indicated by $*$ p $<$ 0.1, $**$ p$<$ 0.05, and $***$ p $<$ 0.01.

# Online Appendix

# A Data Appendix

## A.1 Processing Unstructured Newspaper Pages into Delimited Job Postings

We begin by processing the raw text data from newspapers for detecting which text corresponds to classifieds pages. We preprocess the raw textual data at the level of the newspaper-page, using regular expressions that recognize deterministically the following fields: page title, publication date, publication title, publisher city and publication identifiers. We filter the pages that according to the metadata of ProQuest are of the types "*Display Ad*" or "*Classified Ad*" as any type of advertisement and job posting only appears in these two types of pages.[6]

In the classifieds page, numerous listings are unrelated to job postings. To isolate the relevant content, we apply a topic filtering routine to each page, targeting contents that are job-related. The objective is to discard all text that cover non-job-related topics, such as sales, services, and other types of classified advertisements.

**Structuring into Classified Ad.** We recognize individual job posting by delimiting the start and end of a posting, using recognized job titles and common closure phrases cited in Atalay et al. (2020). This process involves detecting capitalization patterns and terms that typically conclude advertisements, such as addresses noted by zip codes and address markers such as *ave*, *blvd*, *hgwy*, *street*, *road* o *drive*. [7] The result is a candidate job posting text sequence, which contains a newspaper name, page type, publication date, page number, ad title, and the text content, in addition to the metadata on the page number, identifiers and newspaper title.

**Topic Modeling for Filtering Classifieds that are Job Postings.** We use topic modeling to identify the classified ads in a content page, that correspond to job postings. Our task of filtering job-related ads from non-job-related ads is formalized as an unsupervised machine learning problem, involving the discovery of latent topics and the subsequent classification of job ads to these *topics* based on their contents. Intuitively, a topic can be understood as a set of words that collectively suggest a shared theme.

To identity job related content in the job postings, we implement two alternative methods for topic detection. First, we use Latent Dirichlet allocation (LDA) for discovering $K$ topics, where each topic aligning with the contents of the words in the text is modeled as a probability, $t_k$, over contents. The number of topics, $K$, is treated as a hyper parameter and selected based on log-perplexity, which serves as a measure of goodness of fit for topic coherence.[8] Once the hyper parameter, $K$ is identified for each classified page, we estimate the probability that each classified page is job-related by examining the distribution, $t_{K^*}$.

[6] Using the textual data from these pages, we perform a word-by-word pre-processing in the remaining pages by separating punctuation, removing non-grammatical characters, and correcting words based on their frequency occurrence across all pages.

[7] Common end phrases include *in confidence* , *submit resume*, *equal opportunity*, *for further information contact*, and *affirmative employer*.

[8] For choosing $K$, we also inspect the highest-scored words by topic to examine the topics discovered across the classified pages containing multiple types of job ads. We choose the number of topics that is the minimum after which the log perplexity does not improve substantially. Alternatively, Atalay et al. (2020) selects $K$ by identifying the point where increasing $K$ splits a single job-related topic into multiple, overly specific job-related topics. This approach aims to recover the minimum job-ad-related topics ads that are grouped cohesively.

The preparatory steps for implementing the LDA strategy are summarized as follows:

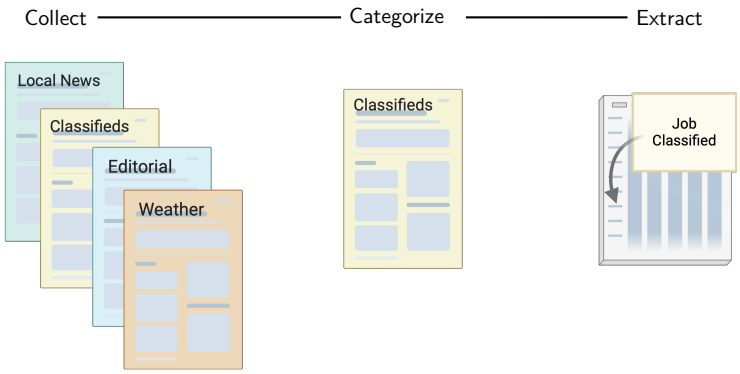
1. Cleaning: text is converted to lowercase, punctuation is removed, and words not commonly found in standard English dictionaries are excluded.

2. NLP Pre-processing: tokenization, stop-word filtering, and stemming are applied.

3. Vectorization: text is converted a bag-of-words representation using Python's *gensim* *doc2bow* functionality.

After pre-processing, we use *gensim*'s LDA to generate models with 2 to 18 topics. We evaluate each model using log-perplexity and topic coherence from a held-out set, selecting the optimal number of topics, $K^*$, as the point after the log-perplexity improvements stabilize. Using the topic distribution probability mass, $t_k$, we apply three heuristics to identify candidate job postings: (1) we retain job ads with a non-zero probability mass on the identified job-related topics; (2) retain the job ads with probability mass greater or equal than the mean (across all topics); and (3) retain job ads with the greatest probability mass on job topics. For analysis, we adopt the first heuristic and structure the data by decade.

Figure A.1: NLP Transformation of Newspaper Content into Structured Job Advertisements




*Notes.* This schematic representation summarizes the text preprocessing, classification of newspaper pages, and job classifieds extraction using computational linguistics and language natural processing techniques. We parse page titles and other metadata with high reliability, focusing exclusively on 'Display Ad' and 'Classified Ad' pages to filter relevant content efficiently.

### A.1.1 Job Titles: Standard Occupational Classification (SOC)

We assign standard occupational classification (SOC) titles and codes to job titles found in job postings. We use a deterministic string-matching search approach to compare the words in job titles against the SOC list published by O*NET in 2010.[9] Additionally, we calculated the cosine-similarity between all terms included in the job title header and the full list of SOC occupations. Prior to this similarity procedure, we pre processed, cleaned the job titles using a stop-word removal, stemming, and vectorization for semantic comparison. The word vectorization that is necessary for calculating the distance measure of cosine similarity (CS) is performed using the

[9]The SOC classification used is available at https://www.onetcenter.org/dictionary/22.1/excel/.

package Word2Vec.[10] The highest similarity scores direct the assignment of SOC titles to job titles.

### A.1.2 Racial Preferences

The terms employed in the string search to detect references to racial preferences for white or black workers in advertisements are listed below.

Table A.1: Classification of Terms by Racial Categories

| ***Race Category*** | **Terms** |
|---|---|
| White | american, belgian, british, canadian, caucasian, danish, english, european, french, german, irish, italian, polish, russian, scottish, spanish, swedish, white |
| Black | african, afro, afric, africk, black, black, blk, colored, colour, negro, negroes |

*Notes:* The table lists the terms used to classify the occurrence of racial categories in job postings. The string search based on these terms account for variation in spelling, common OCR misrecognitions of characters (for instance, "i" read as "1"), singular and plural forms, as well as differences in capitalization.

### A.1.3 County Names: Geolocation Extraction and Validation

We identify and validate the job locations advertised in job postings using a two-step procedure. Initially, we use string-matching techniques on the raw text to compile a list of potential addresses. This process iterates over all words in the content of the job posting—excluding the header, which usually contains job titles— searching for terms associated with address markers such as "road", "street", or "avenue". If the search is successful and an address marker is found, the surrounding text is examined using a probabilistic model that assesses the likelihood of inclusion in an address. This is based on the typical sequence of address components: Unit Number, Street, City, State, and Zip Code.

With the potential addresses identified, we clean and refine these candidates using various heuristics. This procedure results in a list of all candidate addresses associated with each job posting. We then use a geolocalization verification service application programming interface (API) to verify these addresses against a comprehensive dataset of U.S. locations.[11] The service returns a list of fully structured addresses, ranked based on their reliability of the mapping between the provided candidate address and the output address. Each successfully verified address is included in the job posting dataset with geographical information that includes the postal code and county name, which are later used in our analysis.

[10] Word2Vec models learn high-dimensional vector representations of words to map similarly used words to approximate vectors. In our routine, we clean the job ad titles, combine the titles with the ad content, and train a continuous continuous-bag-of-words Word2Vec model on text from all newspapers to learn the word embeddings for our ads.

[11] Geoapify's geocoding API service is available at https://www.geoapify.com.

### A.1.4 Job Skills

We generate binary variables that indicate the presence of specific skills: non-routine analytical, non-routine interactive, routine cognitive, routine manual, and non-routine manual. These classifications are based on a task-based framework as proposed by Spitz-Oener (2006). We conduct a mapping procedure between the job titles of the job postings and a list of terms included in Appendix Table A.2 using a cosine similarity and string matching techniques.

Table A.2: Classification of Skills by Cognitive and Manual Routines

| *Category* | **Terms** |
|---|---|
| Non-routine Analytics | research, analyz, evalu, plan, design, sketch, devising rul, interpreting rul, budget, letter, styliz, implement, evalu, develop, plan, analys, architectur, instal, determin, freehand, sketcher, compil, deign, rsrch, devis, administ, research, modifi, mechan, desi, assess, correl, synthes, implement, valid, render, defin, sketchbook, conceptu, creat, valid, synthes, analys, render, resolv, monitor, review, design, interpret, rule, fetter, summar, research, recommend, monitor, collect, configur, analyz, identifi, identifi, compil, develop, assess, formul, layout, construct, investig, architect, prepar, formul, evalu, interpret, render, document, defin, mock, gather, recommend, evalu, pylon, summar, illustr, artist, determin, coordin, dylan, gather, airbrush, analyz, design, analysi, illustr, sketch, deploy, examin, design, resign |
| Non-routine Interactive | tise, legisl, assist, manag, lobbyist, educ, azov, articul, direct, propos, seil, develop, guy, vertislng, advertlslag, iobbi, structur, sale, facilit, execut, support, advtsg, administ, negoti, advt, lobbv, execut, explain, odv, inform, advtg, lobbyist, advertlsln, adv, brief, coordin, lobb, congression, advert, delight, seli, present, intergovernment, review, advis, communic, soil, advert, arrang, overse, public, grassroot, legisl, academ, leach, media, market, advertis, irrever, priorit, teeth, negoti, initi, supervis, nightlif, consult, prepar, present, inform, lobbi, coordin, organ, teach, sell, buy, advis, entertain, present, manag, negoti, lobbi, coordin, organ, sell, purchas, advis, advertis, entertain, present, present |
| Routine Cognitive | gaug, modif, measur, bkkpo, bkkp, isol, bookkpg, micromet, correct, payrol, measur, ajp, calcul, calip, correct, calcul, bkkpg, correct, blu, revis, dkkpg, bookkeep, adjust, reconcil, calcul, calcul, stenographi, bkkpng, bkkping, comput, resolv, cleric, bill, fix, calcul, measur, rectifi, beekeep, gaug, calcul, bookkeep, correct, measur, calcul, correct, measur |
| Routine Manual | quip, eqp, troll, instrument, minim, eouip, eaulp, equlp, ntrol, eguip, quid, equlo, eoulp, equtp, gulp, machin, apparatus, uip, equipag, eqpmt, control, steril, eauio, eqpt, engulf, equip, conhol, devic, ulp, control, eq, equlpt, instrument, equ, equio, oper, equlpmt, oper, machineri, epuip, oper, control, equip, oper, control, equip, equip |
| Non-routine Manual | accommod, inspect, calibr, accomod, overhaul, rebuild, serv, instal, restor, serv, instal, diagnos, reassembl, mechan, repair, overhaul, accommod, repair, renov, restor, accommod, repair, renov, restor, servic, accommod, accommod |

*Notes:* The table lists the terms from Spitz-Oener (2006) used to categorize job tasks derived from job titles, according to the classification found in O*NET or SOC.

# B Additional Tables and Figures

## B.1 Tables

Table B.1: County Average Male Proportions of Labor, Employment and Military Service Participation By Demographic Groups, 1940

| | Labor Force (1) | Employment (2) | Enlistment (3) | Casualty (4) |
|---|---|---|---|---|
| A. Everyone | | | | |
| Everyone 18-65 | 0.90 | 0.84 | 0.14 | 0.00 |
| | [0.04] | [0.06] | [0.26] | [0.01] |
| Young 18-20 | 0.72 | 0.61 | 0.36 | 0.01 |
| | [0.08] | [0.11] | [0.44] | [0.02] |
| Young adult 21-35 | 0.93 | 0.87 | 0.24 | 0.01 |
| | [0.05] | [0.06] | [0.49] | [0.01] |
| Adult 36-45 | 0.94 | 0.90 | 0.04 | 0.00 |
| | [0.05] | [0.06] | [0.09] | [0.00] |
| Senior 46-65 | 0.89 | 0.84 | 0.00 | 0.00 |
| | [0.05] | [0.06] | [0.00] | [0.00] |
| B. White | | | | |
| Everyone 18-65 | 0.81 | 0.75 | 0.12 | 0.00 |
| | [0.16] | [0.14] | [0.20] | [0.01] |
| Young 18-20 | 0.63 | 0.53 | 0.32 | 0.01 |
| | [0.15] | [0.13] | [0.36] | [0.02] |
| Young adult 21-35 | 0.83 | 0.77 | 0.21 | 0.01 |
| | [0.17] | [0.15] | [0.38] | [0.01] |
| Adult 36-45 | 0.85 | 0.81 | 0.04 | 0.00 |
| | [0.16] | [0.15] | [0.07] | [0.00] |
| Senior 46-65 | 0.80 | 0.76 | 0.00 | 0.00 |
| | [0.15] | [0.14] | [0.00] | [0.00] |
| C. Black | | | | |
| Everyone 18-65 | 0.09 | 0.09 | 0.01 | 0.00 |
| | [0.15] | [0.15] | [0.06] | [0.00] |
| Young 18-20 | 0.09 | 0.08 | 0.03 | 0.00 |
| | [0.15] | [0.14] | [0.12] | [0.00] |
| Young adult 21-35 | 0.09 | 0.09 | 0.02 | 0.00 |
| | [0.16] | [0.16] | [0.12] | [0.00] |
| Adult 36-45 | 0.09 | 0.09 | 0.00 | 0.00 |
| | [0.15] | [0.15] | [0.02] | [0.00] |
| Senior 46-65 | 0.08 | 0.08 | 0.00 | 0.00 |
| | [0.14] | [0.14] | [0.00] | [0.00] |

*Notes:* This table reports the average proportions of individuals residing in a county in 1940 that were part of any of the groups indicated at the column headers of the table. The proportions reported were calculated as an average across all counties using the full-count Decennial Census from 1940. Standard deviations of these shares are presented in brackets.

Table B.2: Newspaper Job Postings Sample

| | Sample period | | Variables | | | Job Postings Sample | |
|---|---|---|---|---|---|---|---|
| | Start (1) | End (2) | Explicit Racial Terms (3) | Address (4) | Zip Code (5) | Percent (6) | Number (7) |
| *A. National circulation newspapers* | | | | | | | |
| Los Angeles Times | 1900 | 1970 | 0.04 | 0.24 | 0.12 | 0.21 | 3,501,259 |
| Chicago Tribune | 1900 | 1970 | 0.06 | 0.24 | 0.17 | 0.21 | 3,484,354 |
| The Washington Post | 1900 | 1970 | 0.18 | 0.39 | 0.26 | 0.04 | 749,429 |
| The New York Times | 1900 | 1970 | 0.07 | 0.37 | 0.17 | 0.28 | 4,681,172 |
| The Boston Globe | 1900 | 1970 | 0.07 | 0.37 | 0.28 | 0.03 | 478,051 |
| *B. Non national newspapers* | | | | | | | |
| Austin American-Statesman | 1900 | 1970 | 0.14 | 0.16 | 0.10 | 0.01 | 173,443 |
| The Baltimore Sun | 1900 | 1970 | 0.12 | 0.35 | 0.22 | 0.12 | 2,093,305 |
| Hartford Courant | 1900 | 1970 | 0.05 | 0.36 | 0.30 | 0.03 | 519,306 |
| The Atlanta Constitution | 1900 | 1970 | 0.07 | 0.30 | 0.16 | 0.02 | 355,639 |
| New-York Tribune | 1900 | 1962 | 0.18 | 0.38 | 0.21 | 0.05 | 781,752 |
| *C. Historically Black newspapers* | | | | | | | |
| Los Angeles Sentinel | 1932 | 1970 | 0.09 | 0.29 | 0.20 | 0.00 | 14,395 |
| Norfolk Journal and Guide | 1916 | 1970 | 0.10 | 0.47 | 0.34 | 0.00 | 1,989 |
| Atlanta Daily World | 1932 | 1970 | 0.06 | 0.40 | 0.23 | 0.00 | 6,935 |
| Total | 1900 | 1970 | 0.08 | 0.31 | 0.18 | | 16,841,029 |

*Notes:* This table provides descriptive statistics of job advertisements published in 13 newspapers from January 1900 to December 1970. The periods of available job postings are presented in columns 1 and 2. Columns 3 to 5 indicate the share of job postings containing geographical and explicit racial terms calculated over the number of ads on each newspaper. Columns 6 reports the share of job postings from each individual newspaper over the total sample. Column 7 indicates the overall number of job postings in the sample, which consists of advertisements that have been parsed, cleaned, and assigned occupation codes.

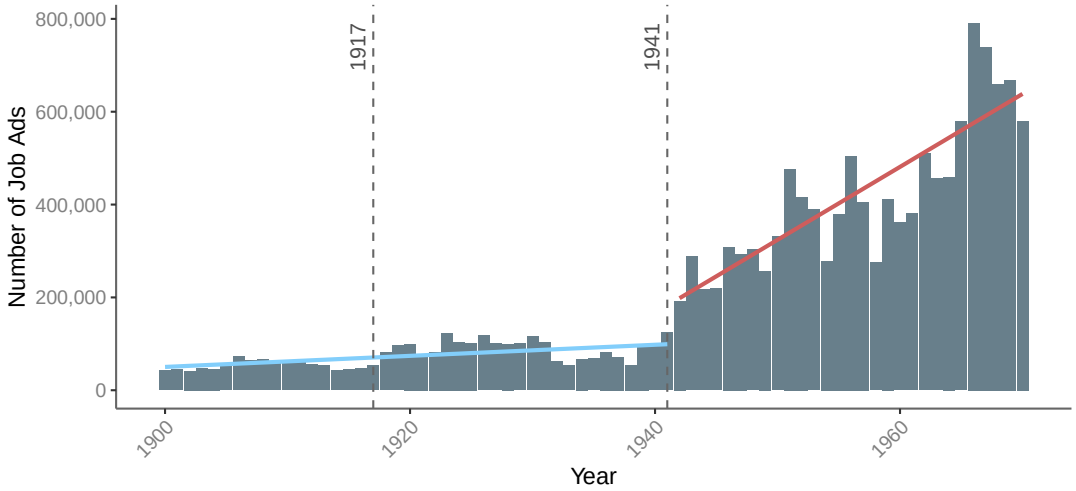
Table B.3: Examples of Job Postings With Racial References From the Boston Globe, 1920-1940

| Publishing year | Content |
|---|---|
| A. Job ads with explicit racial references | |
| 1925 | "**Colored porter** temporary must clean and well mention age weight height references and wages expected globe office wanted" |
| 1925 | "Wanted female young **colored girl** desires position general plain **cook** references tel unirersity t w accommodators at once for laundry or housework agcy tel i sudt dtr aplcoimoi atos agency Arlington" |
| 1925 | "...desires work honest aod reliable **man-colored** needs as **butler** write or call Jones htard st Cambridge Massachussets to best connect or day window ru etc i ft lire rk or kindtin boston fa mn s globe office" |
| 1930 | "**Wanted maid** for general housework canadian or **colored preferred** no laundry Aspinwall" |
| 1930 | "**bookkeeper** hubbrd fsutw sl **colored** girl wants parttime work kenmore day work wanted by an experienced woman arlinton" |
| B. Job ads without explicit racial references (no identifying terms) | |
| 1925 | "requires experienced **packers** department store training preferred apply at temporary employment office washington street d floor" |
| 1925 | "wanted-sewing machine **mechanic** wate at once experi enced on and inger mnchineu giood position for riislt man apply powdrell alexanlder causeway st" |
| 1930 | "mother s helper wanted **housework** and care of children call alter Milton..." |
| C. Job ads without explicit racial references (with identifying terms) | |
| 1941 | Production Man **white sailor caps**. Thoroughly experienced factory man with complete knowledge factory systems and deigning excellent opportunity write particulars ... |

*Notes:* The table presents job postings from the Boston Globe newspapers published between 1920 and 1940. It highlights occurrences of the racial terms "black" and "white" alongside the referenced occupations.

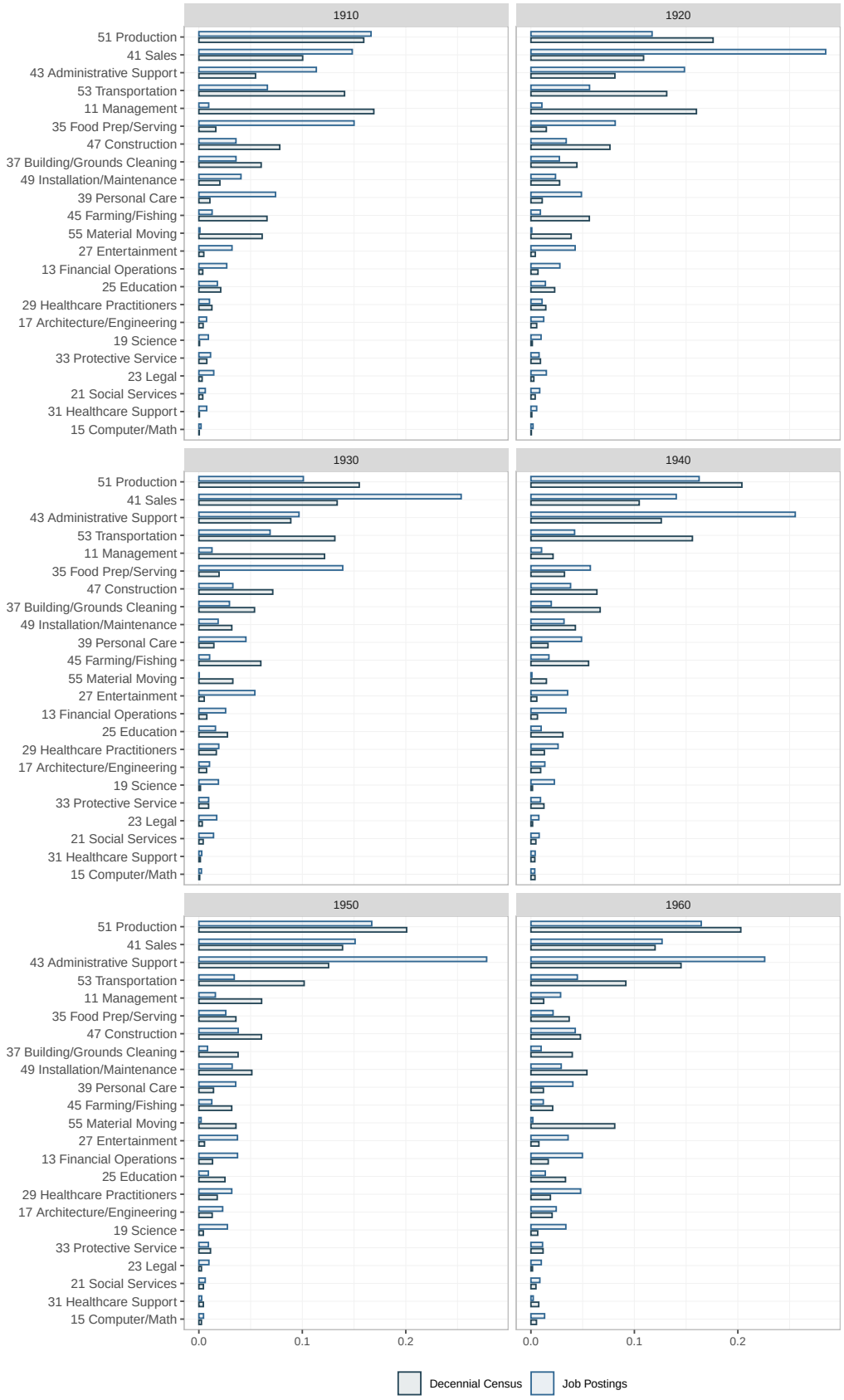
## B.2 Figures

Figure B.1: Number of Job Postings



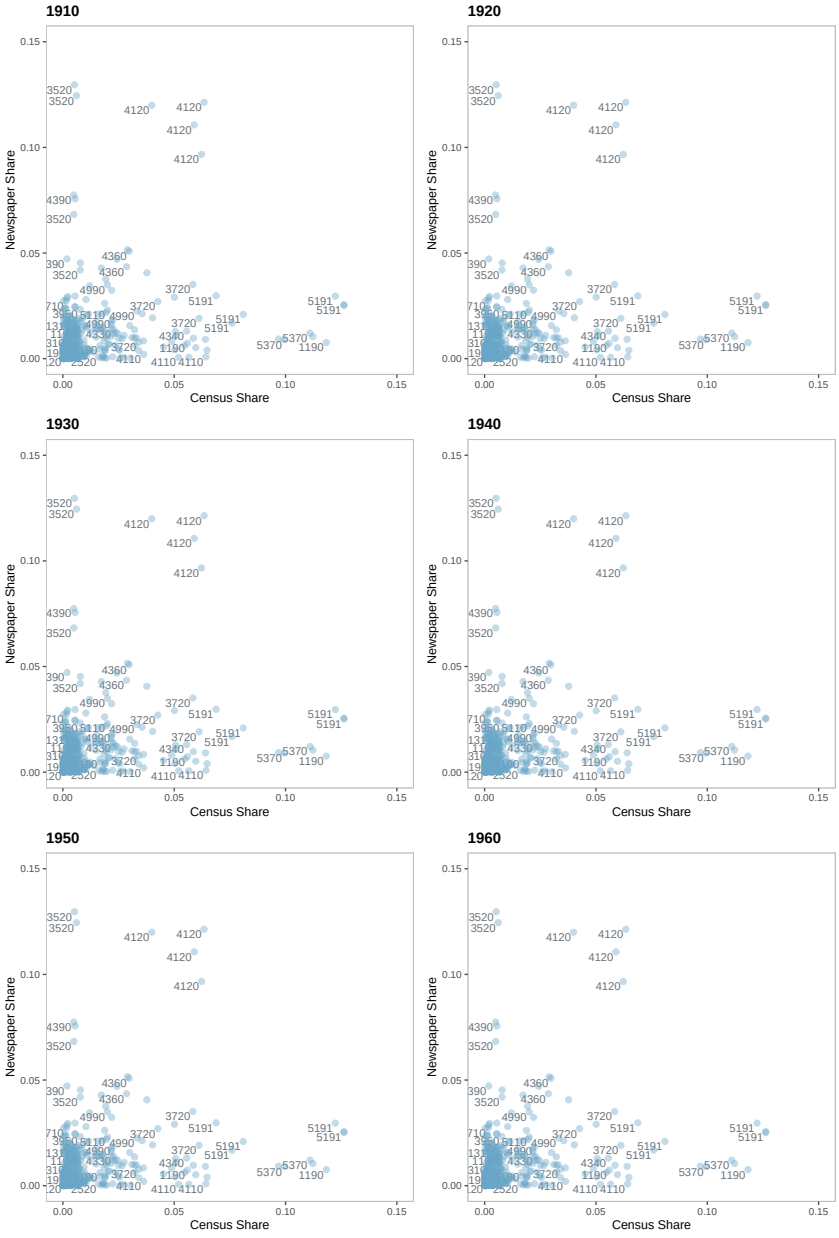

*Notes:* This graph displays the annual number of job postings from 1900 to 1970, as compiled from out dataset of nationwide, local and historically Black newspapers. The market increases around 1917 and 1941 correspond to the US entry into World War I and World War II, respectively.

Figure B.2: Occupation Shares of Job Postings and Decennial Census, 1910–1960



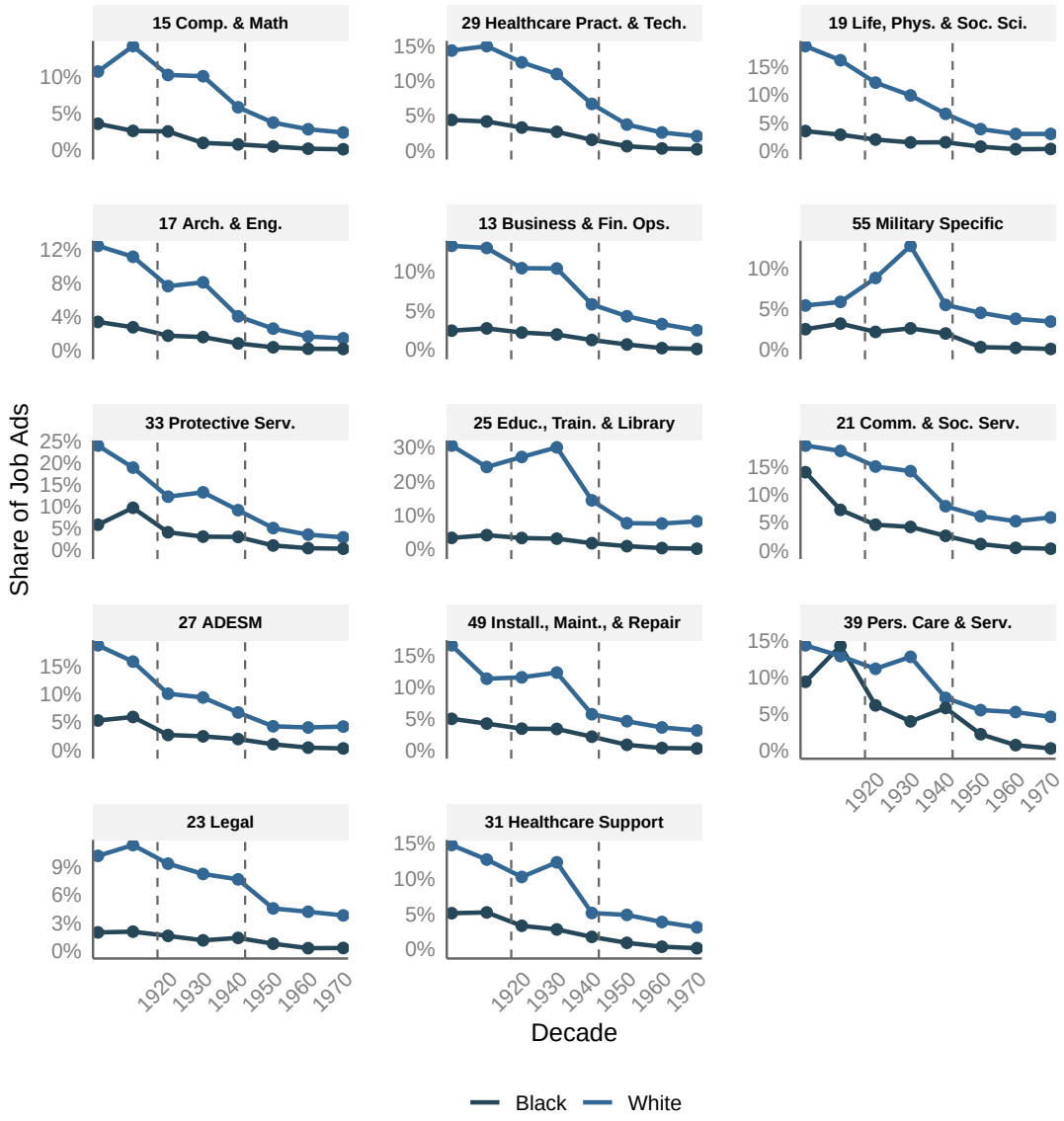

*Notes:* This graph illustrates the occupation shares for individuals aged 14 to 65 in the labor force according to the Decennial Census and the newspaper dataset constructed in Section 3. The occupational categories used for this comparison are 2010 Standard Occupation Codes (SOC) with two digits.

Figure B.3: Occupational Shares from Job Postings and Decennial Census: Analysis of 4-Digit SOC Codes, 1910–1960



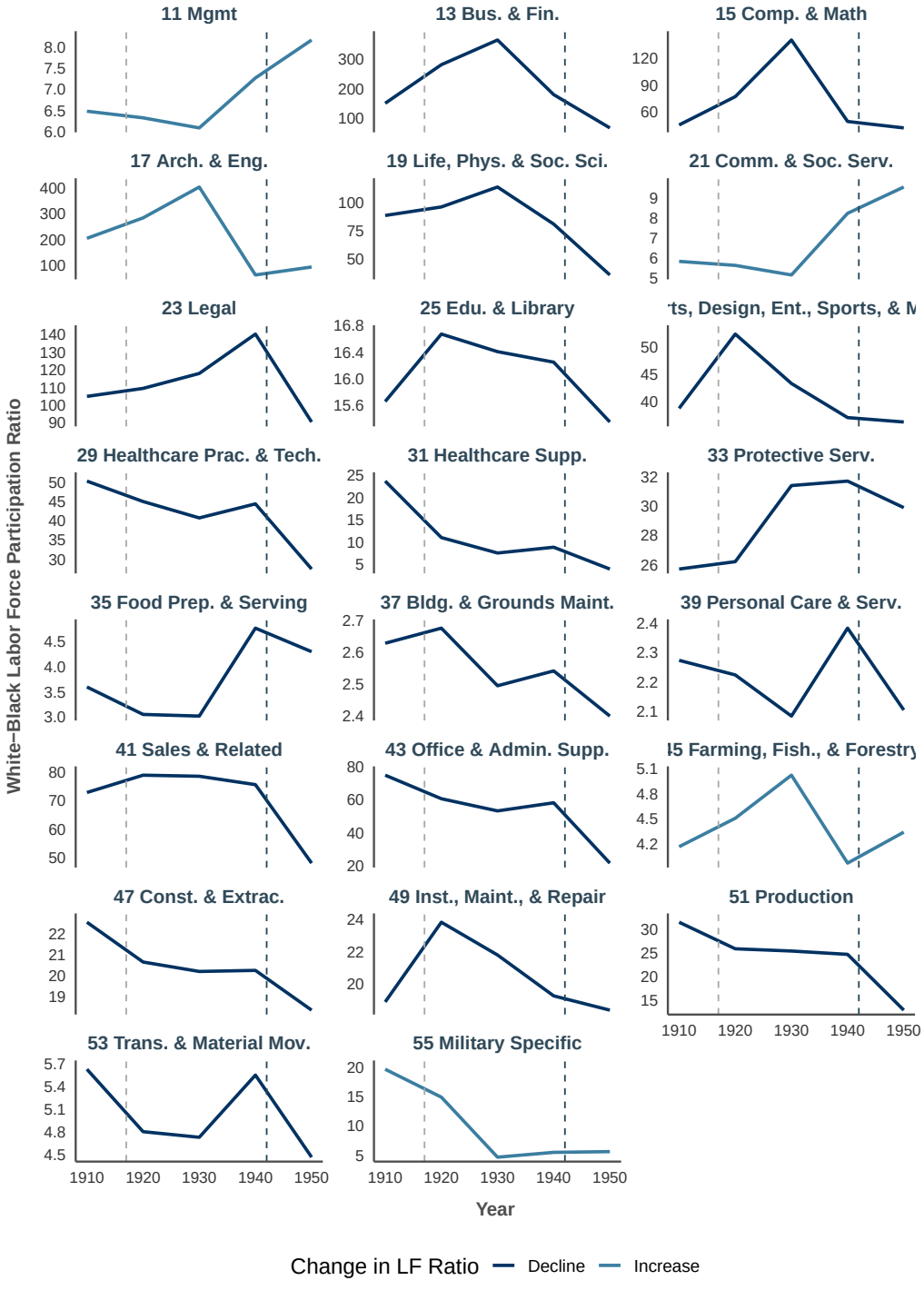

*Notes:* This graph illustrates the occupation shares for individuals aged 14 to 65 in the labor force according to the Decennial Census and the newspaper dataset constructed in Section 3. The occupational categories used for this comparison are 2010 Standard Occupation Codes (SOC) with four digits.

Figure B.4: Share of Job Postings With Race Preferences by Occupation




*Notes:* The graph displays the proportion of job postings within each occupation category (categorized by two-digit SOC codes) that specify a racial preference. The graphs are ordered by the occupations with the highest participation rates in job postings, with occupations appearing first if they have a greater share of total job postings.

Figure B.5: Labor Force Participation Ratio Evolution by Occupational Category, 1920–1950




*Notes:* The figure shows the evolution of labor force participation ratios across occupational categories between 1910 and 1950. Each panel represents a distinct occupational group. Light blue lines indicate an increase in the white-black labor force participation ratio, while dark blue line denote declines. The data are derived from the full-count Decennial Census 1910–1950. The dashed gray vertical lines represent the years 1917 and 1942.