World War II and Black Economic Progress

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During the 1940s, a substantial share of southern Black men moved from low-skilled to much better paying semiskilled jobs. Using newly digitized military data, I show that counties with higher World War II casualty rates among semiskilled White soldiers saw an increase in the share of semiskilled Black workers. These deaths opened new employment opportunities for Black southerners and, together with learning effects by employers, can explain 35% of the occupational upgrading at mid-century. I provide evidence that the casualty-induced labor shortages reduced racial barriers to entry, leading to a positive selection of Black workers into semiskilled employment.

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I. Introduction

The 1940s marked a major turning point in Black southerners' economic progress. A key driver of this development was the shift of Black workers from low-skilled into semiskilled occupations (Wolfbein 1947). In 1940, only 15% of southern Black men worked in semiskilled jobs, which paid significantly better than low-skilled jobs that the majority of Black men held at the time.[1] However, southern Black workers faced significant racial barriers to entry into these types of jobs prior to the 1940s (Myrdal 1944; Collins 2001).[2] In 1950, 26% of African American men worked in semiskilled jobs, with this share rising to more than 45% in 1970. This trend break in the occupational structure among Black men occurred both within and outside the South (see fig. 1), and related work has shown that occupational upgrading can explain much of the narrowing in Black-White economic outcomes over this period (Maloney 1994; Margo 1995; Collins 2000; Aizer et al. 2020).[3] Given the large wage difference between low-skilled and semiskilled jobs, this upgrading meant a substantial change in the economic position of Black workers and families. This raises the question of which factors can explain this occupational change at mid-century.

In this paper I seek to answer the question of how Black workers in the South were able to make such rapid and significant occupational advances during and after World War II (WWII) even while living under the repressive Jim Crow regime. My main hypothesis focuses on the permanent labor reductions brought by the differentially higher wartime mortality rates among semiskilled White soldiers. I show that their disappearance from the labor market opened new opportunities for Black workers to move into semiskilled jobs.[4] I construct a data set of newly digitized mortality records,

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[1] The average semiskilled job in 1940 paid more than one and a half times the wage of the average low-skilled job (see fig. A1; figs. A1–A12 are available online).

[2] For an example, see the study of the aircraft industry by Weaver (1945).

[3] Also, the Great Migration contributed to this change; however, Smith and Welch (1989) estimate that about 20% of the Black-White wage convergence at this time was due to migration.

[4] The bulk of upgrading occurred in jobs classified as operatives and to a lesser extent in jobs belonging to the craftsmen category, which is typically regarded as high skilled. For the purpose of this paper I consider operatives and craftsmen together. A common feature between the two employment groups is that neither require college training, although it takes significantly longer to train craftsmen than operatives.

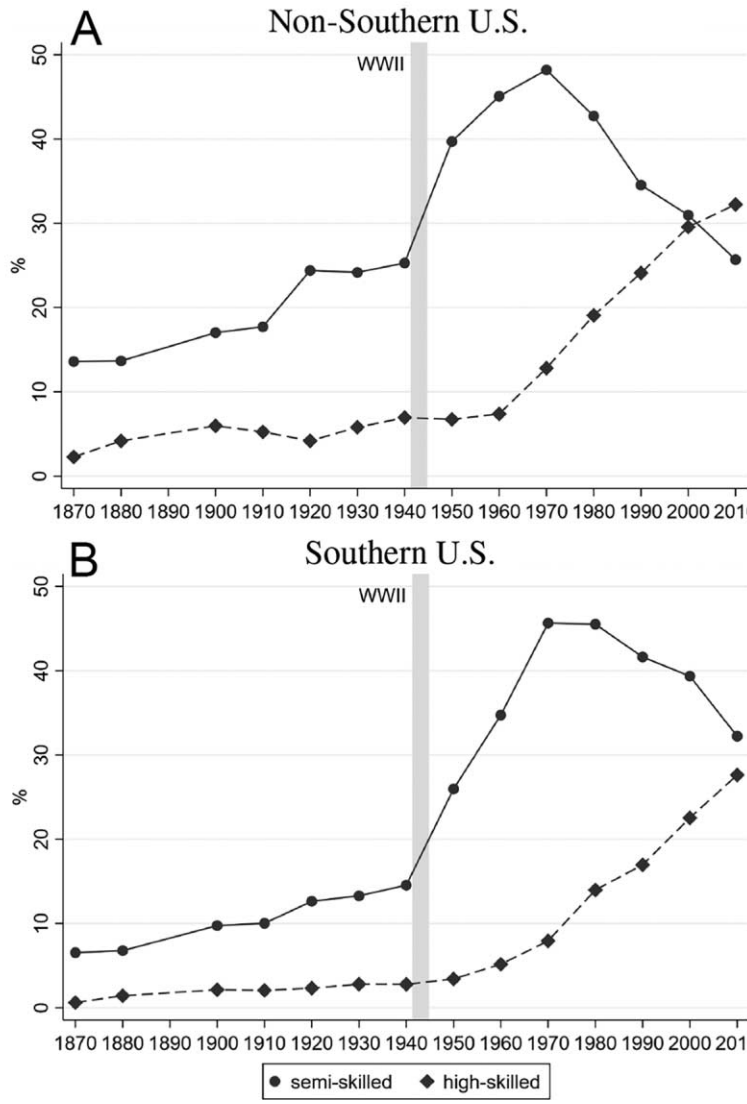

FIG. 1.—Share of semiskilled and high-skilled employment among Black men, 1870–2010. Graphs are based on the public use micro data files of the 1870–2010 decennial US censuses by Ruggles et al. (2018). The sample includes Black males aged 16–65 of the noninstitutionalized population who are not attending school at the enumeration date. Semiskilled jobs (circles) are operatives and craftsmen, and high-skilled jobs (diamonds) are clerks, professionals, and managers. One hundred minus the sum of the semiskilled and high-skilled shares yields the share of workers in low-skilled occupations. Occupations are defined according to the 1950 Census Bureau occupational classification scheme. The years of US involvement in WWII are marked with light gray shading. Data for the South include individuals living in the states of the former Confederacy as well as Delaware, the District of Columbia, Kentucky, Maryland, Oklahoma, and West Virginia.

which I combine with WWII army enlistment data for more than 8 million soldiers as well as with county-level employment information from 1920 to 1960 for the US South. Difference-in-differences results show that two African American men entered semiskilled employment for each fallen White soldier with a semiskilled prewar occupation. This is similar to the employment increase during World War I, when firms hired an additional Black worker for each Black worker they had already employed before the war, thus doubling their African American workforce (Whatley 1990). Given the significantly larger dimensions of WWII, one would expect not only one Black worker to replace a fallen semiskilled White soldier but at least one additional Black worker to follow into semiskilled work. This larger than proportional effect can be motivated with the declining discrimination on the part of employers at the time, which was an important driver of occupational upgrading among Black workers (Aizer et al. 2020), and race-based referral networks in hiring (Montgomery 1991; Royster 2003).

Since the 1940s were a period of significant socioeconomic changes, I rule out other explanations, including the industrialization of the South; the migration of Black workers within and out of the South; differences in education; skill-biased technological change in agriculture that released Black labor into the sectors with higher shares of semiskilled employment; selection on observables and unobservables; differences in historic anti-Black sentiment as measured by past lynchings, slave population, and land in cotton production (Cook 2014); federal spending related to the war; soldiers' characteristics; and legacies of New Deal spending. I also show that it is only deaths among semiskilled White workers that affect the Black occupational upgrading and not deaths in other race and skill groups. The Fair Employment Practice Committee is also less of a concern in the South, where it had little enforcement power (Collins 2001).

I then test whether the mechanism behind this occupational change was a reduction in racial barriers to entry or whether it was simply driven by improved economic opportunities that benefited everyone regardless of race. I analyze repeated cross-sectional data on individual workers from the US census between 1920 and 1960 in a triple-differences setting to compare the changes in the probability of occupational upgrading from low-skilled to semiskilled employment for Black and White workers from before to after the war in low- and high-casualty-rate commuting zones.[5] War casualties among semiskilled White workers did not improve the occupational prospects for low-skilled White men relative to the opportunities they already had before the war. Results show that the average WWII casualty rate among semiskilled White soldiers and the associated multiplier effects can

[5] Since the county of residence is not provided after 1940, I use commuting zones to assign the treatment, as these can be consistently constructed between 1920 and 1960.

explain 35% of the rise in semiskilled employment among southern Black men from 1940 to 1960.[6]

To better understand the selection of new semiskilled workers, I build and test a simple theoretical model in which Black and White workers choose between low-skilled and semiskilled jobs. The choice is based on their own ability in each type of job, the average wage paid in each job, and an entry cost that is higher for semiskilled work. This entry cost is also differentially higher for Black workers because of an added cost of discrimination. Once the discriminatory cost for Black workers is removed or lowered enough, the model predicts that more Black than White workers will upgrade from low-skilled to semiskilled work and that those Black workers will be positively selected compared with both other Black workers in low-skilled jobs as well as new White semiskilled workers. The model can motivate the observed empirical patterns in postwar characteristics of Black and White semiskilled workers.

This paper provides new empirical evidence for a causal link between wartime casualties and Black economic advancement at mid-century. I contribute to the literature on the labor market effects of the WWII draft, which has mainly focused on White women.[7] Work considering Black men has examined the effect of veteran status on manufacturing employment (Collins 2000) or on postwar education via the GI Bill, which, however, did not help African American men in the South (Turner and Bound 2003). Labor economists at the time also noted the large-scale occupational upgrading of Black workers during and after the war (Weaver 1945; Wolfbein 1947). Later studies by Maloney (1994) and Margo (1995) find that Black occupational upgrading had a sizable influence on the reduction in Black-White earnings differentials during the 1940s. Also, Collins (2000) shows how such upgrading improved economic mobility among Black workers in the North. A recent study by Aizer et al. (2020) shows that spending in the defense industry was an important factor in the occupational upgrading of Black workers during the war, which led to a significant decline in the Black-White wage gap. They also provide evidence for intergenerational spillovers that raised Black children's educational attainment. I complement this literature on wartime occupational upgrading and Black economic progress by exploring a particular channel of permanent labor shortages brought by skill- and race-specific wartime mortality rates. Black men faced lower draft rates

[6] Multiplier effects refer to follow-up employment after entrance of the first Black worker who replaced a fallen semiskilled White soldier. The argument is based on learning by employers about the type of Black workers (Whatley 1990), as well as the importance of employee-based referrals for new hires (Montgomery 1991) and the importance of race-based networks in hiring (Royster 2003).

[7] See Goldin (1991), Acemoglu, Autor, and Lyle (2004), Goldin and Olivetti (2013), Jaworski (2014), Shatnawi and Fishback (2018), and Bailey and Collins (2006) for Black women.

because of limited space in the barracks of a segregated military.[8] Racist attitudes also saw Black men as unfit for combat and therefore placed them in relatively safer support tasks in the military (see Lee 1965; Flynn 1993). Hence, more Black men were available during and after the war to fill jobs that remained open because of war-related deaths. Unlike most female workers, African American men maintained their wartime labor market gains (Wolfbein 1947; Collins 2000). Female workers of either race were displaced once draftees returned to their prewar jobs (Acemoglu, Autor, and Lyle 2004). Considering war casualties instead can potentially explain the persistent gains for southern Black men.

II. Historic Background

A. Black Economic Progress at Mid-Century

The economic situation for African Americans improved little from the beginning of the twentieth century to WWII.[9] Since the early 1940s, however, the economic gaps between Black and White Americans began to shrink significantly (Smith and Welch 1989). Both Maloney (1994) and Margo (1995) document a substantial decrease in Black-White wage differentials from 1940 to 1950. Other advances include increased Black home ownership rates after 1940 (Boustan and Margo 2013) and higher economic mobility (Collins 2000).[10]

The majority of Black workers were employed in low-skilled jobs before 1940, many of which were in agriculture; [11] this changed with the onset of the war and the resulting labor shortages. Figure 1 shows the substantial occupational upgrading of Black men from low-skilled to semiskilled employment from 1940 onward. The figure also highlights not only that this upgrading occurred in the industrial areas of the North but also that Black southerners entered these higher-paying jobs at a much increased rate.[12]

[8] Some service branches would not even accept Black men at all. One example is the Marine Corps, which African Americans could join only in 1943 after an executive order by President Roosevelt.

[9] Myrdal (1944, 205) provides an account of the prewar conditions of Black Americans in the United States: "They own little property; even their household goods are mostly inadequate and dilapidated. Their incomes are not only low but irregular. They thus live from day to day and have a scant security for the future."

[10] For a review of postwar Black economic progress see Smith and Welch (1989).

[11] The 1940 census shows that 46% of Black workers were employed in agriculture.

[12] To make the meaning of "semiskilled" more tangible in this context, fig. A1 displays the semiskilled occupations with the largest inflows of Black workers from 1940 to 1950 as well as the wage ratio of each job relative to the average wage paid to Black men in low-skilled jobs in 1950. Most of the occupations listed are operatives jobs in the durable goods manufacturing sector (metal, stone/cement, wood, and textiles) and transport. Occupational definitions are those used by the US Census Bureau in 1950. Figure 1*B* shows that all of these jobs lie substantially above the average earnings received by Black workers in low-skilled jobs.

Overall, one million African Americans entered semiskilled employment during the war years (Wolfbein 1947). The share of semiskilled Black men rose by 8 percentage points between 1870 and 1940 but increased by 11.4 percentage points from 1940 to 1950 alone. Black men therefore made more occupational progress in this one decade than for most of the first half of the twentieth century.

With 16 million Americans serving in the military during WWII, labor shortages opened up job opportunities for groups that previously had received little consideration by employers. Wolfbein (1947) describes that for Black workers between 1940 and 1944, a "significant shift occurred from the farm to the factory as well as considerable upgrading of Negro workers, many of whom received their first opportunity to perform basic factory operations in a semiskilled or skilled capacity" (663).[13] The literature thus far has focused on the labor market effects of the WWII draft on women.[14] For Black men the unfilled labor demand also reduced barriers to entry to industries and jobs that were previously inaccessible to them. This particularly concerned employment in semiskilled jobs and in manufacturing, where racist attitudes against Black workers were high (Weaver 1945; Maloney 1994). Weaver (1945) describes how labor shortages in the aircraft industry opened job opportunities for Black workers beyond low-skilled work.[15] Government intervention via the Fair Employment Practice Committee further helped Black workers during the war years but was generally ineffective in the South (Collins 2001), where the postwar GI Bill benefits also had little effect on Black veterans in terms of college access (Turner and Bound 2003).

While the link between the war and women's labor market outcomes has been studied in previous work, its role in the occupational upgrading of Black men in the postwar period is less well understood. A recent paper by Aizer et al. (2020) has provided important evidence on the impact that wartime labor shortages and expenditures on war contracts in the private sector had on the Black occupational upgrading. They show not only that these gains persisted at least until 1970 but also that they led to increased educational attainment among Black children. Earlier work, such as Collins

[13] It should be noted though that not all farm labor was low skilled and many semiskilled occupations were not in classical factory settings. I thank an anonymous referee for pointing this out to me.

[14] See Goldin (1991), Acemoglu, Autor, and Lyle (2004), Goldin and Olivetti (2013), Jaworski (2014), Shatnawi and Fishback (2018), and Bailey and Collins (2006) for Black women.

[15] This development was not always welcome. Collins (2001) cites the example of the Philadelphia Transportation Company, where White workers went on strike in 1944 because they disliked working with Black Americans in the same jobs. The strike was eventually broken by the US Army's threat to reevaluate the striking workers' draft deferments.

(2000), documents large wage gains for Black men due to the occupational upgrading from low-skilled to semiskilled employment, especially in war-related industries. Maloney (1994) and Margo (1995) note the importance of the occupational upgrading of Black workers in explaining the overall wage gains at the time. Unlike most female workers who gained employment during the war, African American men managed to maintain their wartime labor market gains even after the draft ended. Hence, the draft alone cannot explain this pattern, as it ended with the war.

B. Racial Differences in Draft and War Mortality Rates

The United States mainly relied on the draft and the Selective Service Act to muster their military for WWII. Of the 16 million service personnel, more than 10 million were inducted via the draft. Given that the draft was enacted during peacetime,[16] it had to be significantly more just and equal than the prior drafts to pass the substantial resistance by politicians and the public. Going to college to evade the draft, for instance, was not possible, unlike in later drafts, such as the one for the Vietnam War. Volunteering was forbidden in 1942 because of the British experience, where overenthusiastic volunteering had negatively affected the labor supply in war production (Chambers 1987). The end of volunteering also meant that draftees did not choose their service branch, as this choice was mainly reserved for voluntarily enlisted soldiers. The broad acceptance of the draft is reflected in the fact that of the 40 million men assessed by local draft boards, only 11,896 registered as conscientious objectors (Flynn 1993). Of the 16 million soldiers, only some 50,000 deserted, compared with more than 200,000 desertions among the 2.2 million Union Army soldiers during the Civil War (Glass 2013).

Black men were drafted less frequently than White men. This was due to racism in the military, draft boards, and essentially at all institutional levels, and lower volunteer rates were due to the reluctance of Black men to serve a society that so heavily discriminated against them (see Qian and Tabellini 2020). In the first 6 months of the draft, not one Black man was called for service. In some service branches, such as the US Marine Corps, Black men were not allowed at all. Even in late 1943, only 5.6% (~375,000) of all soldiers were Black, compared with their population share of a little over 10% (Lee 1965). The Army General Classification Test often placed Black draftees in the bottom two out of five categories. This led to rejection or

[16] The United States had not entered the conflict yet when the draft was enacted on September 16, 1940. This first peacetime draft in US history inducted men aged 21–45 via a lottery. This was abandoned after the attack on Pearl Harbor, when the draft was substantially scaled up and the service age was changed to include men aged 18–44. See Flynn (1993) or Chambers (1987) for a historical treatment of the draft.

placement in service and support units, although such results mostly reflected the poor Jim Crow education received by Black Americans rather than innate reading aptitude (Lee 1965). Also, if advanced reading is not required for soldiers' postwar jobs, then this will be a noisier measure of ability across groups but will still correlate with some parts of ability that is used by employers to statistically discriminate (Aigner and Cain 1977). Another reason was segregation in the military. The US Army and other service branches could not build barracks fast enough to maintain segregation; hence, Black men were inducted at significantly lower rates (Flynn 1993). Roosevelt's aim of employing Black soldiers according to their share in the population, which was around 10%, was achieved only in the later stages of the war, when their share in the military rose to just above 9%.

Also, mortality rates were lower among Black soldiers. Because of the racist attitudes that saw Black men as unfit for combat, they typically served in support units that tended to be outside the line of fire (Lee 1965). At the end of 1942, the share of enlisted army soldiers serving in combat units was 40.2% for White soldiers but only 18.4% for Black soldiers;[17] 31.7% of Black soldiers but only 12.8% of White soldiers were employed in support and service units.[18] This uneven distribution of risk led to the racial gap in casualty rates that were higher among White soldiers. Figure A2 shows WWII mortality rates by race and occupational skill group. While high-skilled soldiers were safer in both racial groups, the mortality rate among Black soldiers was about half that of White soldiers in any skill group.

III. White War Casualties and the Black Occupational Upgrade

Can war casualties among semiskilled White soldiers explain the persistent occupational upgrading of Black workers from low-skilled to semiskilled employment during and after the war? To test this hypothesis, I compute county-specific casualty rates by race and occupational skill group by matching two data sources: the WWII Army Enlistment Records and the WWII Honor List of Dead and Missing for the Army and Army Air Force.[19] The army kept meticulous records of its drafted and enlisted soldiers during the war. On entry, an IBM punch card would store a soldier's name, unique army serial number, age, education, race, marital status, residence, date and place of entry, and prewar occupation codified in three-digit groups using the Dictionary of Occupational Titles of 1939. The National Archives and Records Administration digitized these enlistment records, which have been

[17] It should also be noted that Black and White units were segregated. Some Black fighting units, such as the Tuskegee Airmen or the 452nd Anti-Aircraft Artillery Battalion achieved remarkable successes. Yet the first Medal of Honor for service in WWII was awarded to a Black veteran only in 1997 by Bill Clinton.

[18] See fig. A3 for details.

[19] The Air Force became an independent service branch only after the war, in 1947.

used in studying the effect of the Rosenwald schools on Black education (Aaronson and Mazumder 2011), compulsory schooling and English-only instruction laws (Lleras-Muney and Shertzer 2015), and cash transfers and poverty (Aizer et al. 2016), among others.

The data do not contain soldiers in other service branches, such as the US Navy, Marine Corps, or Coast Guard. However, the 8.3 million individuals in the army data comprise the majority of the 10 million drafted men during WWII. Because of the high manpower demands by the armed forces, there was almost no scope for drafted soldiers to choose a service branch (Flynn 1993). Volunteering provided more choice regarding the branch of service but was forbidden in 1942 to give the military more control over who entered into service (Flynn 1993). The end of volunteering came before the largest battles and casualties were sustained but after the majority of the drafting was completed (see fig. A4). It therefore would have been difficult to form a prior as to which service branch was the least dangerous in order to enlist strategically.

I further digitized data on more than 310,000 fallen soldiers from the WWII Honor List of Dead and Missing for the Army and Army Air Force. The remaining 100,000 deaths were suffered by the US Navy, Marine Corps, and Coast Guard.[20] The data include the name, state and county of residence, cause of death, and army serial number. The unique serial number is what identifies soldiers across the two data sources.[21] More details on merging the enlistment and casualty records is provided in the data appendix (the data appendix and apps. A and B are available online).[22]

Using the information on residence, race, prewar occupation and casualty status, the casualty rate among semiskilled White soldiers in county *c* can be computed as

$$\text{Casualty rate}_c = \frac{\text{White semiskilled casualties}_c \times 100}{\text{White semiskilled soldiers}_c}, \tag{1}$$

which is the percentage of those who went to war and who needed a replacement at their prewar workplace but who did not return from the war. The denominator was chosen to be the number of serving semiskilled White soldiers rather than the total number of semiskilled White workers in a county. Using the latter is potentially problematic because workers in war-related

[20] I provide evidence that there is almost zero correlation between casualties in the US Navy, Marine Corps, and Coast Guard with those in the US Army and Air Force. See table A1 (tables A1–A9 are available online).

[21] Figure A5 shows examples of the enlistment and casualty records.

[22] Summary statistics for the matched data for different sample splits comparing Black and White soldiers, enlisted and drafted, and northern and southern soldiers are reported in table A2. Black soldiers had a substantially lower probability of dying since there were few segregated Black fighting units, and hence African American soldiers were mainly employed in relatively safer support units (Lee 1965).

industries had a higher chance of receiving deferments. Without exact knowledge about the number of deferred men, it is not possible to compute an accurate measure of wartime demand for alternative labor, such as women of either race or Black men. In the regressions below I control for the draft rate. The draft rate captures how many White workers were gone during the war, whereas the casualty rate among semiskilled White soldiers captures the variation among those in this particular group who did not return.[23]

The spatial distribution of this casualty rate measure for counties in southern states is plotted in figure 2. The casualty rate measure can be constructed for the whole of the United States but the outcome variable of interest (i.e., the share of semiskilled Black workers) can be computed at the county level only for the mapped southern states. The county-level census data do not provide occupational counts by race for counties outside the South. Table A3 reports Moran's *I* statistic, and table A4 reports the Getis-Ord statistic for local spatial autocorrelation at different distance thresholds. While the casualty rate measure displays significant spatial correlation in both tests, once state fixed effects are included this vanishes entirely. I provide a further test for selectivity in the casualty rate measure by regressing it on prewar county characteristics measured in 1940.[24]

Last, I combine the casualty and draft rates with county-level data from the US decennial census from 1920 to 1960. The main outcome of interest is the percentage share of semiskilled Black male workers in county *c* and decade *t*. Following the US Census Bureau's occupational classification of 1950, semiskilled jobs are those classified in the craftsmen and operatives categories. Aggregate data on the number of employed workers by skill group at the county level are available for the US census files between 1920 and 1960. These data are not available in a digitized format and were collected specifically for this project. Figure A6 shows an example of the data. Only southern states tabulated occupational counts by race.[25] For the 16 states plus the District of Columbia, there is a total of 1,349 counties.

[23] For robustness checks, I later also use the casualty measure with the denominator being all semiskilled White workers in 1940 (see sec. A1.5 of app. A). The results are actually larger in this specification.

[24] Figure A7 plots the resulting coefficients. The WWII casualty rate does not show strong evidence of selection along the lines of wealth, education, income, government spending, agricultural and manufacturing industries, urbanization, or unemployment. This is consistent with evidence provided by Kriner and Shen (2010), who show that there was no significant difference in casualty rates across socioeconomic groups during WWII. Only from the Korean War onward such a gap emerged. Figure A8 shows that volunteering was not different comparing the South to the non-South (fig. A8*a*), and within the South there were no differences in volunteering between above- and below-median casualty rate counties (fig. A8*b*).

[25] These are Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, South Carolina, Oklahoma, Tennessee, Texas, Virginia, and West Virginia, and Washington, DC. Note that even

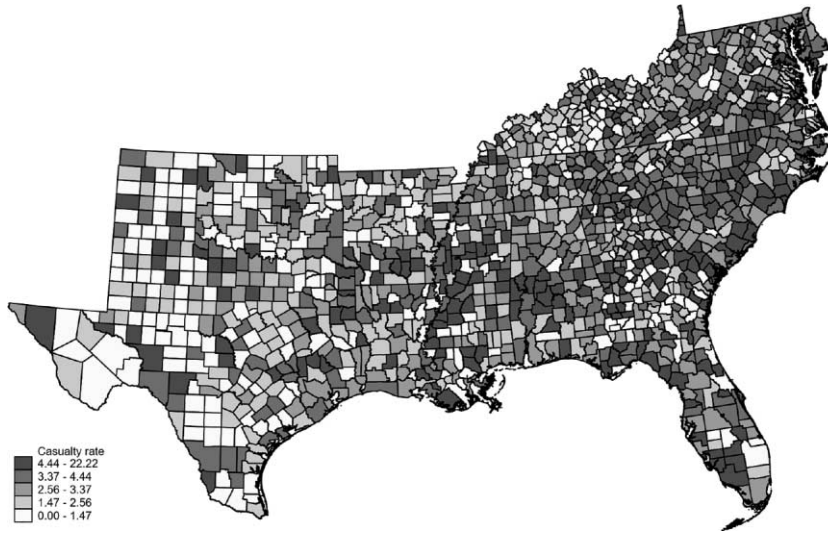

FIG. 2.—WWII casualty rates among semiskilled white soldiers in the US South. Shown is the spatial distribution of WWII casualty rates among semiskilled white soldiers at the county level in percent. Shaded polygons display the quintiles of the casualty rate distribution, with ranges shown in the legend on the side. Southern states included here are Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, South Carolina, Oklahoma, Tennessee, Texas, Virginia, and West Virginia. A color version of this figure is available online.

A. Evidence from Data on Southern Counties, 1920–60

The evolution of the share of semiskilled Black workers employed from 1920 to 1960 across casualty rate quartiles is plotted in figure 3*A*.[26] The figure shows how this variable followed the same trend across counties in all casualty rate quartiles before the war. After the war, the share of semiskilled Black workers rose, but it rose differentially faster in counties with the highest WWII casualty rates among semiskilled White soldiers. The graph also shows prewar differences between counties across casualty quartiles; however, notice that the top and bottom quartiles are less than a standard deviation away from the center of the distribution. Figure 3*B* provides the parallel trends plot after partialing out the share of manufacturing employment, Black population, and the urbanization rate. These factors are predictive of counties having a zero semiskilled White casualty rate; this is the case for

though I refer to mentioned states as "the South," this deviates from the typical definition of the South as the former Confederacy, unless stated otherwise.

[26] The raw correlation between casualty rates and the share of semiskilled Black men in the cross section of counties and across time is shown in fig. A9. Conditional scatterplots that partial out county characteristics in 1940 are shown in fig. A10.

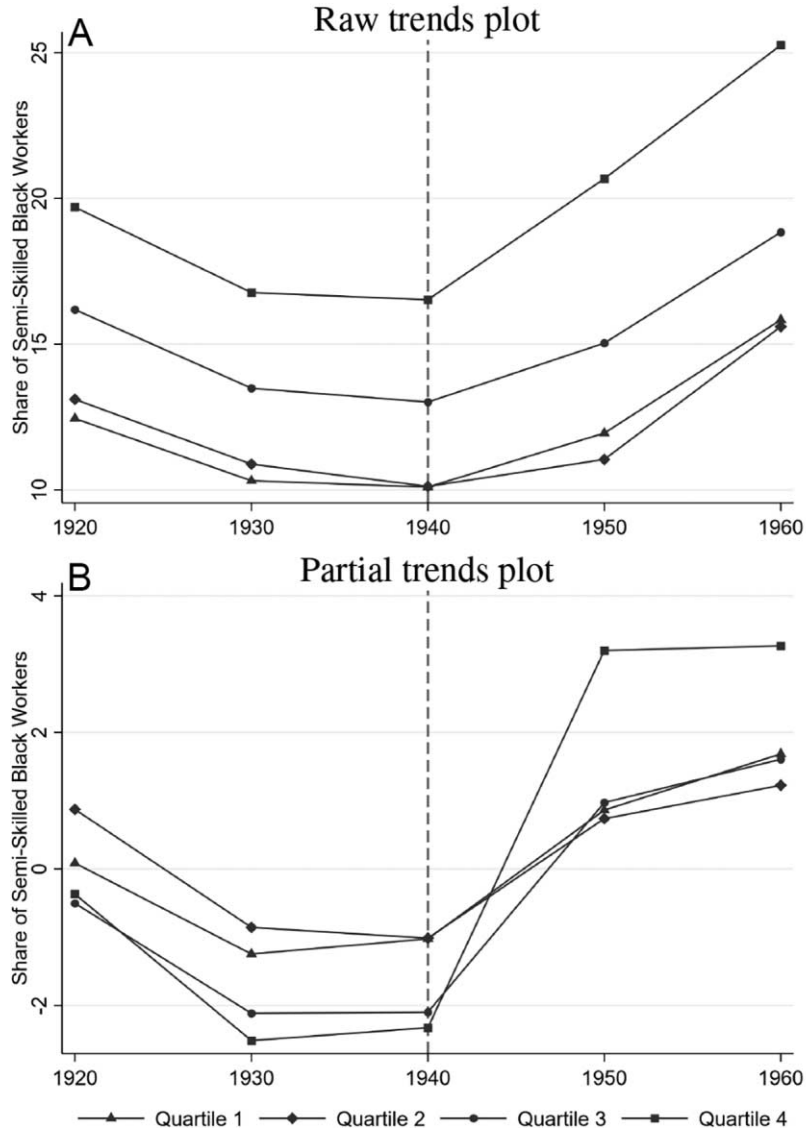

FIG. 3.—Share of semiskilled Black workers by casualty rate quartile. *A* plots the raw outcome data for the share of semiskilled Black workers for counties in southern states by quartiles of the WWII casualty rate among semiskilled White soldiers over time. *B* shows the same graph after partialing out the share of manufacturing employment, Black population, and the urbanization rate to explain the prewar differences in the share of semiskilled Black workers across quartiles of the WWII casualty rate distribution among semiskilled White soldiers. The dashed line marks the last prewar decade. A color version of this figure is available online.

161 counties, which drive the difference between the top and bottom quartiles. Once these factors are taken out, the initial difference shrinks from 13 percentage points to less than 1 percentage point.[27]

The prewar parallel trends in the share of semiskilled Black workers makes this a suitable setting for a difference-in-differences framework, which removes such differences and any other unobserved time-invariant county characteristics. The difference-in-differences regression to be estimated is

$$\begin{aligned}\%\ \text{semiskilled Black men}_{ct} = {} & \alpha_c + \lambda_t + \beta\,\text{Casualty rate}_c \\ & \times \text{Postwar}_t + X'_{ct}\phi + \eta_{ct},\end{aligned} \tag{2}$$

where % semiskilled Black men_{ct} is the outcome in county c in decade t and the WWII casualty rate among semiskilled White soldiers interacted with a postwar indicator is the main treatment of interest, which allows for variable treatment intensities. Under the usual parallel trends assumption and in the absence of time-varying confounding factors, the coefficient β captures the causal effect of a 1 percentage point increase in the WWII casualty rate among semiskilled White soldiers on the share of semiskilled Black workers after the war.[28]

Time-invariant observable and unobservable determinants of the share of semiskilled Black workers across counties, including any prewar differences, are absorbed by county fixed effects α_c. Time-varying shocks common to all counties are controlled for by time fixed effects λ_t. Alternative specifications include state-by-year fixed effects ρ_{st} or county-specific linear time trends $\alpha_c t$ to probe for robustness of the results with respect to treatment of the time dimension. This allows for partialing out state- or county-specific secular changes in the outcome that would have occurred in the absence of the casualty shock, such as state-specific legislation, for instance.

The vector X_{ct} contains controls that account for potential changes in observables that might determine the share of semiskilled Black workers but also correlate with the casualty rate among semiskilled White soldiers. The draft rate inversely accounts for the remaining workforce during the war in the county and controls directly for the share of the male population under threat of being killed in the war. To account for spillover effects, I include the

[27] Notice that the main requirement for the empirical strategy here is that the casualty rate is as good as randomly assigned conditional on time and county fixed effects, for which I provide visual evidence in fig. 4 as well as under different model specifications in fig. A11.

[28] With a continuous treatment, β will be a weighted average of the pairwise comparisons of the difference-in-differences estimates for each value of the treatment, which deviates from the standard approach of estimating such a model. Table A5 estimates the difference-in-differences model in a more traditional sense by using an indicator for a county being in the top quartile of the WWII casualty rate among semiskilled White soldiers interacted with a postwar dummy as main treatment variable.

average casualty rate in the adjacent counties of a given county *c*. Also included are the log of WWII-related spending per capita (Fishback and Cullen 2013; Aizer et al. 2020);[29] the share of rural population and the share of Black men from the county-level census; the Republican vote share from data by Clubb, Flanigan, and Zingale (2006); interactions of the postwar indicator with the number of lynchings between 1900 and 1930 per 1,000 Black population; the number of slaves in 1860; the number of Rosenwald schools per 1,000 Black population to capture determinants of Black education (Aaronson and Mazumder 2011); and the share of acres flooded by the Mississippi in 1928 (Hornbeck and Naidu 2014).

I also control for manufacturing and agricultural variables, such as the number of manufacturing establishments per capita, the average employment per firm, log value added per worker, and the share of manufacturing employment. Agricultural controls include the share of land in agriculture, the share of acres in cotton, the share of cash tenants, and the average value of machinery per farm. The latter seeks to control for technological changes in the agricultural sector. In particular, the use and quality of tractors expanded at the time, especially in the South, and released labor from agriculture (see Olmstead and Rhode 2001).

Finally, to account for the major economic changes brought by the Great Depression in the decade just prior to the war, I include measures of New Deal spending per capita from Fishback, Horrace, and Kantor (2006). This includes government loans, money for public works, and funds from the Agricultural Adjustment Act (AAA) and the Federal Housing Administration (FHA), as well as the unemployment rate in 1937 interacted with decade fixed effects. Note that some of these variables are potentially endogenous to the casualty treatment, and thus I consider specifications where I use the prewar values of these variables in 1940 only and I also show that the controls do not change the results in any way. All monetary values are deflated to 2010 US dollars using the consumer price index provided by the Bureau of Labor Statistics.[30] Summary statistics are reported in table 1. All remaining variation in the outcome, which is not captured by the listed control variables, is absorbed in the error term η_{ct}. Standard errors are clustered at the county level to account for heteroscedasticity and autocorrelation.

B. Difference-in-Differences Results

The main results from the estimation of equation (2) are reported in table 2 under different model specifications. The baseline result from only including time and county fixed effects in column 1 estimates that a 1 percentage

[29] Data for WWII expenditure comes from the *County and City Data Book 1947*, published by the US Department of Commerce (2012)

[30] An overview of all data sources used to compile the final estimation sample is given in the data appendix.

Table 1
County Data Summary Statistics, 1920–60

	Obs	Mean	SD	Min	Max
Main outcome:					
% semiskilled Blacks	6,443	14.65	14.20	.00	87.55
% semiskilled Blacks, 1940	1,386	12.43	12.57	.00	67.62
Military:					
WWII casualty rate of semiskilled Whites	6,443	3.16	2.20	.00	22.22
Mean casualty rate, neighboring counties	6,430	1.15	1.69	.00	11.53
% men drafted	6,443	9.39	13.19	.00	61.59
Log WWII spending per capita	6,443	.45	1.36	.00	9.13
Demographics:					
% rural population	6,443	80.85	23.13	.00	100.00
% Republican vote share	5,938	12.02	20.54	.00	100.00
% Black population	6,443	23.56	21.18	.00	90.77
% Black men	6,443	23.29	20.93	.00	89.89
Lynchings per 1,000 Black population, 1900–1930	6,342	.43	8.66	.00	500.00
Rosenwald schools per 1,000 Black population	6,342	.67	1.29	.00	26.32
% acres flooded by the Mississippi, 1928	6,443	.54	5.69	.00	100.00
Number of slaves in 1,000s in 1860	6,443	1,458.60	2,163.57	.00	17,957.00
Agriculture:					
% of land in agriculture	6,440	63.99	22.97	.06	100.00
% of lang in cotton production	6,440	7.19	10.21	.00	74.41
% cash tenants	6,441	6.63	7.53	.00	78.28
Mean value of machines per farm	6,440	2.99	5.08	.00	219.46
Manufacturing:					
Manufacturing firms per capita	6,034	1.19	.94	.00	29.73
Mean manufacturing firm size	5,916	36.13	39.00	.00	629.00
Log value added per worker	5,406	12.46	.97	.00	14.79
% manufacturing employment	5,916	3.98	4.47	.00	100.00
New Deal controls:					
New Deal loans per capita, 1933–35	6,420	5.87	20.00	.00	573.87
Relief per capita, 1933–39	6,420	9.81	26.24	.00	949.11
Public works per capita, 1933–39	6,420	6.27	24.07	.00	844.37
AAA spending per capita, 1933–39	6,420	6.85	28.85	.00	852.11
FHA loans insured per capita, 1934–49	6,420	1.45	6.55	.00	195.79
Unemployment rate, 1937	6,438	10.90	5.71	.26	42.29

NOTE.—Shown are summary statistics for 1,388 counties in southern states between 1920 and 1960. Monetary values are deflated to 2010 dollars.

point increase in the WWII casualty rate among semiskilled White soldiers increased the share of semiskilled Black workers by 0.54 percentage points. Column 2 includes all control variables mentioned in the previous section.[31]

[31] Table A6 reports results from the estimation of eq. (2) also using median household income per capita as a control for the period from 1940 to 1960 to see whether occupational upgrading of Black workers occurred in significantly richer or poorer areas that may also relate with the local casualty rate. Since general wage income is only available in the census since 1940, it was omitted from the main specification. Results with the income control remain unchanged.

Table 2
County-Level Difference-in-Differences Results, 1920–60

	Outcome: % Semiskilled Black Workers (Prewar Mean = 12.433)					
	(1)	(2)	(3)	(4)	(5)	(6)
Casualty rate × Postwar	.539***	.543***	.717***	.555***	.718***	.443***
	(.130)	(.147)	(.156)	(.152)	(.228)	(.142)
Controls		Yes		Yes	Yes	Yes
1940 controls × decade			Yes			
State × decade fixed effects				Yes		
Linear county time trends					Yes	
LASSO selection						Yes
Observations	6,443	4,903	4,723	4,903	4,903	5,864
Counties	1,388	1,317	994	1,317	1,317	1,379
Adjusted R^2	.864	.885	.871	.891	.924	.866
Oster's δ	1.877	1.674	2.273	1.954	1.131	1.253

NOTE.—Shown are difference-in-differences regressions of the county-level share of semiskilled Black workers on the WWII county casualty rate among semiskilled White soldiers interacted with a postwar indicator. The estimation sample uses decennial US census data on counties in southern states from 1920 to 1960. Controls include county and decade fixed effects, the county draft rate, the average casualty rate in the neighboring counties, log WWII spending per capita, the share of Black men, the share of rural population, the number of manufacturing establishments per capita, the average manufacturing firm size, log manufacturing value added per worker, the share of employment in manufacturing, the share of land in agricultural production, the share of acres in cotton production, the share of cash tenants, the average value of machinery per farm, lynchings per 1,000 Black population between 1900 and 1930, the number Rosenwald schools per 1,000 Black population, the share of acres flooded by the Mississippi in 1928, the number of slaves in 1860, Republican vote share, New Deal spending per capita 1933–35 (loans, public works, AAA, FHA loans), and the unemployment rate in 1937. Time-invariant controls are interacted with decade fixed effects. Monetary values are deflated to 2010 US dollars. The doubly robust selection method implements the Belloni, Chernozhukov, and Hansen (2014) machine learning covariate selection algorithm for testing the stability of treatment effects with respect to the observables. The test for selection on unobservables by Oster (2019) is reported in the final row, computing the coefficient of proportionality δ for which the coefficient on the semiskilled casualty rate among White soldiers would equal zero. Standard errors are clustered at the county level.

*** $p < .01$.

To take into account the possibility that some of these time-varying measures could be outcomes of the semiskilled casualty rate themselves, column 3 includes all controls measured at their 1940 values and interacts them with the postwar indicator. While this reduces the risk of including potentially bad controls, it also takes out variation of these controls that might be useful, but results remain stable nevertheless. Columns 4 and 5 relax the parallel trends assumption by including state-by-year fixed effects and county-specific linear time trends, respectively. Finally, column 6 estimates equation (2) using the doubly robust selection algorithm by Belloni, Chernozhukov, and Hansen (2014). Their machine learning covariate selection algorithm tests for the stability of treatment effects and potentially improves inference on such parameters.[32] The casualty rate coefficient is statistically significant at

[32] Suppose that a large set of observed controls includes the most relevant covariates to explain the relation of interest but that these variables are unknown to the econometrician. First, the outcome is regressed on the controls, their squares, and all cross-term interactions, after which the most significant predictors are selected

the 1% level in all cases, with coefficients ranging between 0.44 and 0.72 percentage points. Results using a constant sample size are reported in table A7.

The magnitude of the effect implies that each fallen White semiskilled soldier was replaced by two Black workers.[33] Notice that this includes multiplier effects, such as those documented by Whatley (1990), who shows that firms employed another Black worker for each Black worker they already employed during World War I. If a fallen semiskilled White WWII soldier was replaced by one Black worker, we would expect at least one additional Black worker to join the firm. Since WWII was considerably larger and longer lasting, however, this multiplier effect might have been even stronger. An additional two Black workers who joined the Black replacement worker for a fallen soldier therefore is not an implausible magnitude. There are at least two potential contributing factors: first, the WWII period was characterized by steeper labor shortages than World War I; and second, it also significantly changed employers' views of Black workers, leading to updated beliefs among employers and hiring practices, as argued by Aizer et al. (2020). Whatley (1990) discusses the changing racial views of employers once they hire minorities for the first time, but internal referrals and networks have also been shown to lead to additional employment. Employers value referrals from their existing workforce because of their incentives for providing truthful information (Montgomery 1991); hence, Black workers who found jobs during the war might have provided such referrals. Additionally, Royster (2003) highlights the importance of race-based networks, which might be another channel for this larger than proportional effect.

Given the stability of the results in table 2, it seems unlikely that the estimated casualty rate effect is driven by selection on the observables or differential secular trends in the outcome. To probe for the sensitivity of the previous results with respect to the unobservable components, table 2 reports the coefficient sensitivity test by Oster (2019) for all specifications.[34]

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either via LASSO (least absolute shrinkage and selection operator) or a simple t-test from a multiple regression if the sample size permits. Here, a t-test sufficed. The same is repeated for the treatment, i.e., the casualty rate in this case. In a final step, eq. (2) is reestimated using the union of controls selected in either of the previous two steps. The idea is that the regression learns the most important predictors of outcome and treatment, which would be problematic omitted variables.

[33] Table A8 provides the corresponding regression result using the levels of the outcome in a first-differenced regression rather than working with shares, which yields the replacement of fallen soldiers in terms of the number of Black workers. When including interactions with variables capturing larger labor shortages, share of urban residents, and manufacturing centers, the coefficient is reduced to 1.5 workers who replace one fallen soldier.

[34] Her test considers a standard linear regression model of the form $Y = \beta X + W_1 + W_2 + \epsilon$, where $W_1 = \Psi w^o$ is a vector of observable controls and W_2 is an index of unobservables. The treatment variable X here is the casualty rate. She then defines the selection relationship as $\delta(\mathrm{Cov}(W_1, X)/\mathrm{Var}(W_1)) = (\mathrm{Cov}(W_2, X)/\mathrm{Var}(W_2))$ and solves for δ (the degree to which selection on

A value of $\delta = 1$ implies that selection on the unobservables would have to be equally important compared with selection on the observables in order to explain away the estimated treatment effect. The typical threshold for results to be considered reasonably robust is $\delta > 1$, which is the case in all specifications.

To provide an estimate for the dynamics of this casualty rate effect and a test for the parallel trends assumption, I next interact the casualty rate treatment in equation (2) with census year indicators instead of the postwar indicator only. The omitted year is 1940, which makes this last pretreatment period the reference year for all other coefficients. Figure 4 plots the resulting coefficients.[35] The interaction of the casualty rate with the 1920 and 1930 indicators are essentially placebo treatments, since the war should not have had an effect on Black workers' occupational status before there were any casualties. These two coefficients are reassuringly almost zero and far from significant. The coefficients for 1950 and 1960 estimate stable coefficients close to 0.5, showing a persistent effect of the WWII casualty rate among semiskilled White soldiers on the postwar share of semiskilled Black workers. Miller (2017) assesses the affirmative action policies under President Johnson in 1965 and also finds that the effect of affirmative action policies remained even after their removal.[36]

Table 3 explores effect heterogeneity by including interactions of the casualty rate with indicators for above-median values for the draft rate, months of labor shortages,[37] out-migration before and during the war,[38] log military spending per capita, and the average machine value per farm. Counties with above-median months of labor shortages, draft rates, and military spending saw the largest increase in the occupational upgrading of Black workers in response to the casualty rate effect. This is consistent with Aizer et al. (2020), who find that these two factors were important drivers of the occupational

unobservables is less than or larger than selection on observables) that would be required to produce $\beta = 0$. This uses the coefficient and R^2 movement from the controlled and uncontrolled regression results in a bounding argument.

[35] The regression underlying the plot includes controls and state-by-year fixed effects. Figure A11 provides the same plot for all specifications presented in table 2 with and without controls, with the covariates fixed at their 1940 values and the doubly robust selection algorithm. The linear county-specific trends specification cannot be estimated in this setting.

[36] While this is certainly not to compare affirmative action policies to WWII, the idea is that an exogenous break in racial barriers to entry into certain occupations can have persistent effects.

[37] Months of labor shortages here are measured as those in which the number of drafted soldiers exceeds 10% of the prewar labor force.

[38] Out-migration between 1940 and 1950 is measured as the population difference between the two census years minus deaths plus births, which were taken from Bailey et al. (2018). The out-migration of Black workers from 1935 to 1940 comes from the backward-looking migration question of the full-count 1940 census.

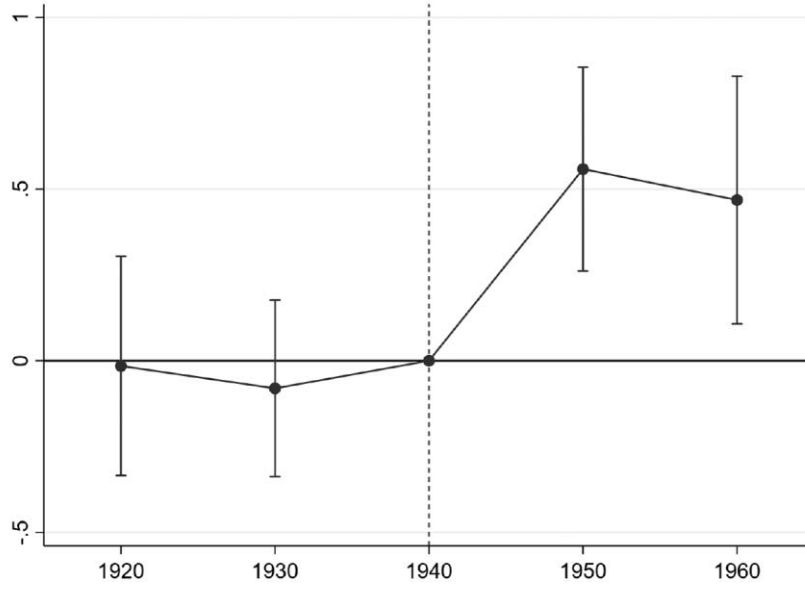

FIG. 4.—Difference-in-differences coefficient plot. Shown are difference-in-differences regressions of the county-level share of semiskilled Black workers on the WWII county casualty rate among semiskilled White soldiers interacted with decade fixed effects. The omitted baseline decade is 1940, which is marked by the dashed line. This is the last pretreatment period. The estimation sample contains counties in southern states from 1920 to 1960. Controls include county fixed effects and state-by-decade fixed effects, the county draft rate, the average casualty rate in the neighboring counties, log WWII spending per capita, the share of Black men, the share of rural population, the number of manufacturing establishments per capita, average manufacturing firm size, log manufacturing value added per worker, the share of employment in manufacturing, the share of land in agricultural production, the share of acres in cotton production, the share of cash tenants, average value of machinery per farm, lynchings per 1,000 Black population between 1900 and 1930, the number of Rosenwald schools per 1,000 Black population, the share of acres flooded by the Mississippi in 1928, the number of slaves in 1860, Republican vote share, New Deal spending per capita 1933–35 (loans, public works, AAA, FHA loans), and the unemployment rate in 1937. Time-invariant controls are interacted with decade fixed effects. Monetary values are deflated to 2010 US dollars. Standard errors are clustered at the county level. Error bars show 95% confidence intervals around each coefficient estimate. A color version of this figure is available online.

upgrading among Black workers, and it also suggests that much of the upgrading already occurred during the war. Out-migration during the war seems to have contributed equally much as migration before the war. Also, the average machine value per farm, as a proxy for how easily labor could be substituted with machines, amplified the treatment effect, albeit less so than the labor shortage and military spending measures.

Table 3
Treatment Heterogeneity

	Outcome: % Semiskilled Black Workers (Prewar Mean = 12.433)					
	(1)	(2)	(3)	(4)	(5)	(6)
Casualty rate × Postwar	.339*	.373*	.478**	.435**	.477**	.487**
	(.192)	(.204)	(.198)	(.200)	(.207)	(.215)
Interactions of Casualty rate × Postwar with above-median indicators for:						
Draft rate	.318					
	(.272)					
Months of labor shortages		.240				
		(.273)				
Out-migration 1940–50			.125			
			(.276)			
Out-migration 1935–40				.146		
				(.272)		
Log military spending per capita					.112	
					(.275)	
Mean machine value per farm						.071
						(.284)
Observations	4,903	4,903	4,903	4,903	4,903	4,903
Counties	1,317	1,317	1,317	1,317	1,317	1,317
Adjusted R^2	.886	.886	.886	.886	.886	.886
F-test	6.583	6.582	7.148	6.581	7.258	6.458
p-value	.001	.001	.001	.001	.001	.002

NOTE.—Shown are difference-in-differences regressions of the county-level share of semiskilled Black workers on the WWII county casualty rate among semiskilled White soldiers interacted with a postwar indicator. The casualty rate is further interacted with indicators for whether a given interaction variable was above its median value. The number of months of labor shortages was computed as the number of months during which the number of soldiers from a county was 10% or more of that county's male labor force in 1940. Out-migration from 1940 to 1950 was estimated as population growth from 1940 to 1950 minus deaths plus births using data from Bailey et al. (2018). Out-migration from 1935 to 1940 was measured using the backward-looking migration question for Black men residing outside the South in 1940. The estimation sample uses decennial US census data on counties in southern states from 1920 to 1960. Controls include county and decade fixed effects, the county draft rate, the average casualty rate in the neighboring counties, log WWII spending per capita, the share of Black men, the share of rural population, the number of manufacturing establishments per capita, the average manufacturing firm size, log manufacturing value added per worker, the share of employment in manufacturing, the share of land in agricultural production, the share of acres in cotton production, the share of cash tenants, the average value of machinery per farm, lynchings per 1,000 Black population between 1900 and 1930, the number of Rosenwald schools per 1,000 Black population, the share of acres flooded by the Mississippi in 1928, the number of slaves in 1860, Republican vote share, New Deal spending per capita 1933–35 (loans, public works, AAA, FHA loans), and the unemployment rate in 1937. Time-invariant controls are interacted with decade fixed effects. The regressions include the interaction of the main mediator with the postwar indicator. Monetary values are deflated to 2010 US dollars. Standard errors are clustered at the county level. The *F*-test reported tests whether the main and interaction effects are jointly different from zero.

* $p < .10$.

** $p < .05$.

A key falsification test is to consider the effect of casualty rates in other skill groups for both Black and White soldiers on the occupational upgrading of Black workers. If the claim is correct that it was the death of semiskilled White soldiers that led to the occupational upgrade of African American

men, then we should not see any effect coming from casualty rates in other skill-race groups. Results are reported in table 4, which includes casualty rates by race and skill group in the regression while controlling for the draft rates in each group. The estimated coefficients for the semiskilled White casualty rate are similar to those in the baseline specification. There is no detectable effect for the casualty rates in any other group. The exception is a weakly significant

Table 4
Difference-in-Differences Results by Race and Skill Group

	Outcome: % Semiskilled Black Workers (Prewar Mean = 12.433)					
	(1)	(2)	(3)	(4)	(5)	(6)
Low-skilled White	−.081	−.094	−.037	−.093	−.068	−.089
	(.144)	(.227)	(.183)	(.212)	(.307)	(.135)
Semiskilled White	.615***	.609***	.614***	.630***	.788***	.310**
	(.145)	(.168)	(.178)	(.172)	(.247)	(.147)
High-skilled White	−.227	−.091	−.075	−.164	−.275	−.066
	(.181)	(.199)	(.211)	(.205)	(.380)	(.165)
Low-skilled Black	−.091**	−.114*	−.078	−.092	−.041	−.140***
	(.041)	(.062)	(.048)	(.067)	(.092)	(.048)
Semiskilled Black	.084	.050	.075	.052	.082	.036
	(.065)	(.059)	(.060)	(.052)	(.098)	(.048)
Low-skilled Black	−.027	−.058	.045	−.049	.031	.042
	(.071)	(.068)	(.073)	(.071)	(.126)	(.079)
Controls		Yes		Yes	Yes	Yes
1940 controls × decade			Yes			
State × decade fixed effects				Yes		
Linear county time trends					Yes	
LASSO selection						Yes
Observations	6,443	4,903	4,723	4,903	4,903	5,296
Counties	1,388	1,317	994	1,317	1,317	1,340
Adjusted R^2	.865	.886	.881	.891	.924	.889
Oster's δ	1.764	1.533	1.523	1.827	.502	.749

NOTE.—Shown are difference-in-differences regressions of the county-level share of semiskilled Black workers on the WWII county casualty rate among semiskilled White soldiers interacted with a postwar indicator. The estimation sample uses decennial US census data on counties in southern states from 1920 to 1960. Controls include county and decade fixed effects, the county draft rate, the average casualty rate in the neighboring counties, log WWII spending per capita, the share of Black men, the share of rural population, the number of manufacturing establishments per capita, the average manufacturing firm size, log manufacturing value added per worker, the share of employment in manufacturing, the share of land in agricultural production, the share of acres in cotton production, the share of cash tenants, the average value of machinery per farm, lynchings per 1,000 Black population between 1900 and 1930, the number of Rosenwald schools per 1,000 Black population, the share of acres flooded by the Mississippi in 1928, the number of slaves in 1860, Republican vote share, New Deal spending per capita 1933–35 (loans, public works, AAA, FHA loans), and the unemployment rate in 1937. Time-invariant controls are interacted with decade fixed effects. Monetary values are deflated to 2010 US dollars. The doubly robust selection method implements the Belloni, Chernozhukov, and Hansen (2014) machine learning covariate selection algorithm for testing the stability of treatment effects with respect to the observables. The test for selection on unobservables by Oster (2019) is reported in the final row, computing the coefficient of proportionality δ for which the coefficient on the semiskilled casualty rate among White soldiers would equal zero. Standard errors are clustered at the county level.

* $p < .10$.
** $p < .05$.
*** $p < .01$.

negative effect coming from low-skilled Black soldiers, for whom a 1 percentage point increase in their casualty rate decreases the share of semiskilled Black workers by 0.04 to 0.14 percentage points. This result is intuitive given that these are the workers who, had they survived, would have replaced the deceased semiskilled White soldiers after the war.

Further robustness checks are reported in appendix A. Section A1.1 shows the robustness of the event study regressions to different model specifications. Section A1.2 provides evidence for robustness toward selections on observables with potentially mismeasured controls (Pei, Pischke, and Schwandt 2019). Section A1.3 rules out that results are driven by selective migration of Black workers. Section A1.4 shows robustness to the potential selection of soldiers. Section A1.5 alters the treatment denominator in equation (1) from White semiskilled soldiers$_c$ to White semiskilled workers$_c$ and rules out denominator bias by fixing the outcome denominator at 1940 levels. Section A1.6 drops states one by one to show that no single state is driving the results. Section A1.7 corrects standard errors for spatial autocorrelation. Section A1.8 weights by population size.

IV. Racial Barriers and Selection into Semiskilled Work

In this section I first test whether the Black occupational upgrading was likely a result of a reduction in racial barriers to entry into semiskilled occupations due to the war-induced labor shortages or whether this was simply due to an overall improvement in economic conditions that benefited both Black and White workers. I use repeated cross-sectional data on individual workers from the census in a triple-differences setting to show that Black workers saw an increased probability of semiskilled employment in commuting zones with higher casualty rates among semiskilled White soldiers after the war. This same relationship does not exist for White workers. The casualty shock appears to have mainly acted to reduce racial entry barriers. I then build a simple theoretical model to better understand the selection of Black and White workers into semiskilled employment in response to such reduced racial barriers to entry. Using the same triple-differences setting, results show that new Black semiskilled workers are positively selected, while new White workers in such occupations are negatively selected.

There are additional advantages of using the individual-level data. It not only allows for a more direct comparison of Black and White workers to differentiate between the removal of racial barriers and overall economic conditions but it also lets me study the differential effects of White WWII casualties on Black and White occupational outcomes across industries as well as across the South and non-South.[39] I use the individual-level data of the 1920 to 1960 US census files by Ruggles et al. (2018). This includes the 1% micro

[39] The previous county-level data for Black and White employment are available only for the South.

census files from 1920 to 1950 and the 5% file of 1960. County of residence is not available in the later census years; however, commuting zones can be consistently constructed for the sample period. Overall, there are 722 commuting zones, which are clusters of counties that share a common labor market.[40] Figure A12 plots the WWII casualty rate among semiskilled White soldiers at the commuting zone level.

The estimation sample includes the noninstitutionalized Black and White male population who were of working age in 1940, participating in the labor force at the enumeration date, not enrolled in school, or classified as unpaid family workers. I consider those of working age at the start of the war because they were the most likely to benefit from war-related labor shortages as they were available to the labor market. The micro-level data provide the advantage of using White workers as an additional control group. If casualties resulted in a labor supply shock only, then one would expect occupational upgrading to occur for both Black and White workers. However, if semiskilled professions had higher barriers to entry for Black workers that were removed because of the labor shortages induced by the casualties, then only this group should see an effect on their probability to be employed in such jobs.

I compare the probability of semiskilled employment between Black and White workers, before and after the war, and across commuting zones with differing casualty rates using repeated cross-sectional data from the census in a triple-differences regression:

$$\begin{aligned}\Pr(\text{semiskilled} = 1)_{izt} = {} & \beta_1(\text{Casualty rate}_z \times \text{post-WWII}_t) \\ & + \beta_2(\text{Casualty rate}_z \times \text{Black}_{izt} \times \text{post-WWII}_t) \\ & + \beta_3(\text{Casualty rate}_z \times \text{Black}_{izt}) \\ & + \beta_4(\text{Black}_{izt} \times \text{post-WWII}_t) \\ & + \alpha_z + \lambda_t + \delta\text{Black}_{izt} + X'_{izt}\gamma + \epsilon_{izt},\end{aligned} \tag{3}$$

[40] The crosswalk used to construct the commuting zones for 1950 are available on David Dorn's website (http://www.ddorn.net/data.htm), and the crosswalk files for the other years come from König (2021). For years when county of residence is not available in the census, the crosswalks are merged to the state economic area identifier in 1950 and the mini-PUMA identifiers in 1960. To construct the commuting zone casualty rate (and associated commuting zone–level controls), the commuting zone and county identifiers were combined in a many-to-many merge, after which the data were collapsed to a weighted average at the commuting zone level. The weight was determined by the share of land of a county belonging to a given commuting zone. Following David Dorn's instructions, the person-specific weight variable from the census used in regressions was also multiplied with this area weight. It should be noticed that these are based on late twentieth-century commuting patterns, but they should still provide a reasonable approximation.

where i, z, and t index individuals, commuting zones, and census years, respectively. The outcome is an indicator for whether an individual is a semiskilled worker. The coefficients of interest are β_1 for White men and the triple-interaction coefficient β_2 for Black men. The overall effect on the employment probability for African American men is given by the sum of the two coefficients. Individual controls include age, marital status, year of birth, a self-employment indicator, farm status, and industry fixed effects, and α_z and λ_t are commuting zone and time fixed effects. Standard errors are clustered at the commuting zone level.

The triple-differences regression seeks to eliminate potentially confounding trends in the employment probability of Black workers in semiskilled jobs across commuting zones that are unrelated to the war casualties. It also accounts for changes in the employment probability of all workers in high-casualty commuting zones that might have happened as a result of other shocks that occurred at the same time, such as a general improvement in economic conditions that benefited all workers. If only β_1 increases, this would indicate that WWII deaths among semiskilled White soldiers simply implied a labor shortage in the sector that led to better opportunities for both low-skilled Black and White workers. If instead β_1 is zero while β_2 increases after the war, this would provide evidence for the casualty shock to have reduced racial barriers to entry into semiskilled jobs for Black men. This would be consistent with the historic account provided by Weaver (1945) for the aircraft industry.

To visualize this relationship, I interact the Casualty rate$_z$ and Casualty rate$_z$ $\times$ Black$_{izt}$ variables with census year fixed effects in equation (3), leaving out 1940 as baseline. The resulting coefficients for Black and White men are plotted in figure 5. There is no significant casualty rate effect before the war for either group and also remains insignificant for White workers in the postwar period. For Black workers there is a positive postwar effect, with a 5 percentage point rise in the semiskilled employment probability for every 1 percentage point increase in the commuting zone WWII casualty rate among semiskilled White soldiers (fig. 5*A*). The effect is not substantially different when considering the southern sample in figure 5*B*. The pattern resembles the county-level difference-in-differences results in figure 4. White workers have a slightly reduced probability of occupational upgrading into semiskilled work, pointing to the selection patterns that I explore in the next section.

Table 5 reports results from estimating equation (3) for different model specifications. The triple-differences coefficients for Black workers are positive and significant, and they range between 2.8 to 6.8 percentage points for the full sample and between 2 and 5.1 percentage points for workers in the South. There is a smaller negative effect for White workers, meaning that employers seem to have preferred upgrading low-skilled Black as opposed to White workers. I discuss a theoretical rationale for this in the next section.

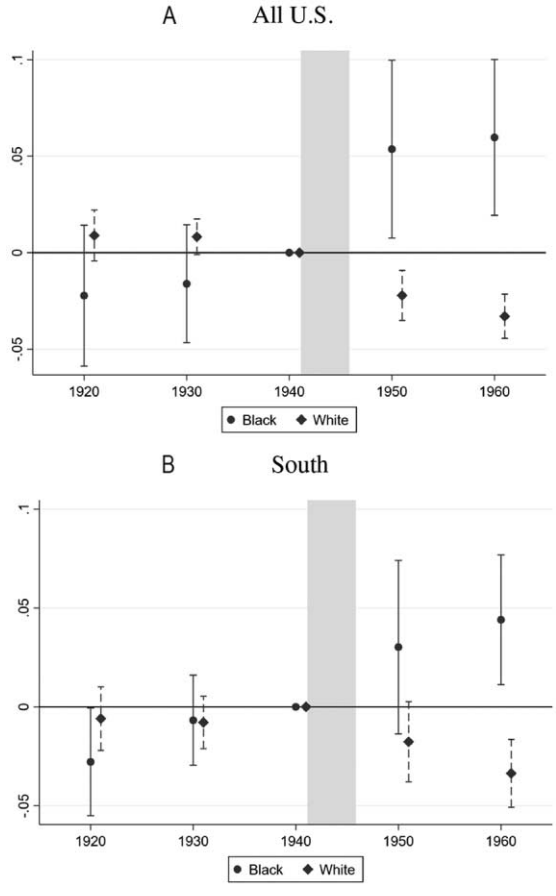

FIG. 5.—Triple-differences coefficients plot. *A* shows a coefficients plot from a difference-in-difference-in-differences regression of a semiskilled indicator on the commuting zone WWII casualty rate among semiskilled White soldiers interacted with decade dummies and with a Black indicator. In *B*, only the southern sample is used in the estimation. White workers' coefficients represent the interaction of the casualty rate with decade dummies; plotted Black workers' coefficients are for the casualty rate interacted with decade dummies and a Black indicator. The estimation sample contains repeated cross-sectional data on individuals from the decennial US micro census from 1920 to 1960 on noninstitutionalized, working Black and White males who were of working age in 1940. All regressions include commuting zone and census year fixed effects. Controls include dummies for age, marital status, and birthplace, as well as commuting zone, year, and race fixed effects. The shaded area marks the war years. Observations are weighted by their individual sample line weight times the spatial weight used to construct the commuting zone–level treatment variable. Standard errors are clustered at the commuting zone level. Error bars show 95% confidence intervals around each coefficient estimate.

Table 5
Micro Census Triple-Differences Results, 1920–60

	Outcome: Pr(Semiskilled$_{izt}$) = 1					
	(1)	(2)	(3)	(4)	(5)	(6)
	A. All United States					
Casualty rate × Black × Postwar	.068***	.060***	.035***	.042***	.030**	.029***
	(.014)	(.013)	(.013)	(.014)	(.013)	(.012)
Casualty rate × Postwar	−.036***	−.035***	−.013**	−.019***	−.011*	−.018***
	(.007)	(.007)	(.006)	(.005)	(.006)	(.007)
Individual controls		Yes	Yes	Yes	Yes	Yes
Commuting zone controls			Yes	Yes	Yes	Yes
Migration and education				Yes		
State time trends					Yes	
Commuting zone time trends						Yes
Observations	1,606,183	1,606,183	1,601,540	810,528	1,601,543	1,601,543
Adjusted R^2	.092	.114	.117	.097	.118	.120
	B. South					
Casualty rate × Black × Postwar	.052***	.040***	.030**	.021	.029**	.033**
	(.014)	(.014)	(.013)	(.015)	(.014)	(.013)
Casualty rate × Postwar	−.025**	−.025***	−.014	−.018**	−.013	−.024***
	(.010)	(.009)	(.009)	(.008)	(.009)	(.009)
Individual controls		Yes	Yes	Yes	Yes	Yes
Commuting zone controls			Yes	Yes	Yes	Yes
Migration and education				Yes		
State time trends					Yes	
Commuting zone time trends						Yes
Observations	482,993	482,993	481,966	245,274	481,966	481,966
Adjusted R^2	.131	.166	.169	.135	.171	.173

NOTE.—Shown is a difference-in-difference-in-differences regression of a semiskilled indicator on the commuting zone WWII casualty rate among semiskilled White soldiers interacted with a post-WWII dummy and with a Black indicator for individuals living in 722 commuting zones in the whole United States and 300 commuting zones in the South. The estimation sample contains repeated cross-sectional data from the decennial US micro census from 1920 to 1960 on noninstitutionalized, working Black and White males not currently attending school who were of working age in 1940. All regressions include commuting zone and census year fixed effects. Individual-level controls include age, marital status, and place of birth dummies. Column 4 adds cross-state migration and education controls interacted with race and time fixed effects. Commuting zone–level controls are the WWII draft rate, log WWII spending per capita, the share of Black men, the share of rural population, the number of manufacturing establishments per capita, average manufacturing firm size, log manufacturing value added per worker, the share of employment in manufacturing, the share of land in agricultural production, the share of acres in cotton production, the share of cash tenants, the average value of machinery per farm, lynchings per 1,000 Black population between 1900 and 1930, the number of Rosenwald schools per 1,000 Black population, the share of acres flooded by the Mississippi in 1928, the number of slaves in 1860, Republican vote share, New Deal spending per capita 1933–35 (loans, public works, AAA, FHA loans), and the unemployment rate in 1937. Time-invariant controls are interacted with decade fixed effects. Monetary values are deflated to 2010 US dollars. Observations are weighted by their individual sample line weight times the spatial weight used to construct the commuting zone–level treatment variable. Standard errors are clustered at the commuting zone level.

* $p < .10$.
** $p < .05$.
*** $p < .01$.

For the South, the average casualty rate of 3.17% and associated multiplier effects can explain 35% of the occupational upgrading of Black workers in the postwar period.[41]

The results show that the employment gains for Black workers not only occurred in the North and West but also that Black southerners gained significantly in terms of the occupational upgrading. Another advantage of the micro data is that I can further deal with potential migration responses. I therefore interact an indicator for whether an individual lives outside his or her state of birth with time fixed effects and the Black indicator in column 4. The same interactions are applied to the education variable. The results are unchanged by this inclusion and thus do not appear to be driven by differential migration or education between Black and White workers. It should be noted that migration and education are potential outcomes of the treatment; hence, results from this specification are to be taken with caution. Yet it potentially sheds light on whether the occupational upgrading effect can be explained away by differential migration or educational attainment across Black and White workers over time.

Next, I analyze whether the occupational upgrading of Black workers was concentrated in particular sectors. Table 6 estimates the probability of semiskilled employment in a given sector for Black and White workers. I consider the manufacturing sector as a whole, the durable and nondurable manufacturing subsectors, and telecommunications, retail, and mining and construction. Unlike the manufacturing sector, jobs in telecommunications and retail often involved direct customer contact, and therefore employers sought to avoid employment of Black workers in such positions (Anderson 1982). The results provide evidence that Black occupational upgrading was particularly pronounced in manufacturing, with a 2.5–2.8 percentage point increase in the probability of semiskilled employment for Black workers for a 1 percentage point increase in the WWII casualty rate among semiskilled White soldiers. This effect is mainly driven by nondurable manufacturing. Effects are negative in telecommunications and retail, as expected. Aside from manufacturing, construction and mining in the full sample also saw significantly increased occupational upgrading among Black workers in response to the casualty shock.

A. Selection into Semiskilled Work and Economic Outcomes

Having established that, unlike low-skilled Black workers, low-skilled White men did not see an increase in their opportunities to obtain semiskilled employment in response to the WWII casualty shock, one remaining question is which workers entered these semiskilled jobs and what were

[41] The share of semiskilled Black men in 1940 in the sample was 18.8%, which rose to 36.7% in 1960. Given the coefficient estimate in col. 4, the overall increase that can be explained by the average commuting zone casualty rate and associated multiplier effects is $(0.02 \times 3.17)/(0.367 - 0.188) = 0.354$.

Table 6
Triple Differences by Sector

	Outcome: Pr(Semiskilled$_{izt}$) = 1					
	Manufacturing All (1)	Manufacturing Durable (2)	Manufacturing Nondurable (3)	Telecommunications (4)	Retail (5)	Mining and Construction (6)
	A. All United States					
Casualty rate × Black × Postwar	.029***	.004	.024***	−.001*	.001	.016**
	(.010)	(.007)	(.008)	(.001)	(.003)	(.006)
Casualty rate × Postwar	−.003	−.004	.001	.001	−.002*	.001
	(.005)	(.004)	(.005)	(.000)	(.001)	(.005)
Observations	1,601,540	1,601,540	1,601,540	1,601,540	1,601,540	1,601,540
Adjusted R^2	.120	.058	.111	.002	.007	.093
	B. South					
Casualty rate × Black × Postwar	.027**	.005	.021**	−.002**	−.006**	.011
	(.011)	(.008)	(.009)	(.001)	(.003)	(.007)
Casualty rate × Postwar	−.002	.001	−.003	.002***	.002	.003
	(.007)	(.005)	(.005)	(.001)	(.001)	(.006)
Observations	481,966	481,966	481,966	481,966	481,966	481,966
Adjusted R^2	.116	.109	.063	.003	.011	.142

NOTE.—Shown is a difference-in-differenece-in-differences regression of a semiskilled indicator on the commuting zone WWII casualty rate among semiskilled White soldiers interacted with a post-WWII dummy and with a Black indicator. The estimation sample contains data from the decennial US micro census from 1920 to 1960 on noninstitutionalized, working Black and White males who were of working age in 1940. Regression results are shown for semiskilled (cols. 1–3) and high-skilled (cols. 4–6) intensive sectors. All regressions include commuting zone and census year fixed effects. Individual-level controls include age, marital status, and place of birth dummies. Commuting zone–level controls are the WWII draft rate, log WWII spending per capita, the share of Black men, the share of rural population, the number of manufacturing establishments per capita, the average manufacturing firm size, log manufacturing value added per worker, the share of employment in manufacturing, the share of land in agricultural production, the share of acres in cotton production, the share of cash tenants, the average value of machinery per farm, lynchings per 1,000 Black population between 1900 and 1930, the number of Rosenwald schools per 1,000 Black population, the share of acres flooded by the Mississippi in 1928, the number of slaves in 1860, Republican vote share, New Deal spending per capita 1933–35 (loans, public works, AAA, FHA loans), and the unemployment rate in 1937. Time-invariant controls are interacted with decade fixed effects. Monetary values are deflated to 2010 US dollars. Observations are weighted by their individual sample line weight times the spatial weight used to construct the commuting zone–level treatment variable. Standard errors are clustered at the commuting zone level.

* $p < .10$.
** $p < .05$.
*** $p < .01$.

their characteristics. First, to add some structure to this question consider the following model based on Heckman and Sedlacek (1985) and Borjas (1987). Assume that there are two types of jobs, low-skilled $\mathcal{L}$ and semiskilled $\mathcal{S}$. Both types of jobs have roughly similar labor demands. There are two groups of workers g, which are Black (b) and White (w). Further assume that workers select into jobs based on maximizing income y[42] and that income in each job is determined by

$$y_{\mathcal{L}} = \mu_{\mathcal{L}} + \epsilon_{\mathcal{L}} \quad \text{and} \quad y_{\mathcal{S}} = \mu_{\mathcal{S}} + \epsilon_{\mathcal{S}}, \tag{4}$$

where μ_j is the average income received from working in job j and ϵ_j is a worker's innate productivity in occupation j,[43] which are normally distributed with mean zero, variances $\sigma^2_{\mathcal{L}}$ and $\sigma^2_{\mathcal{S}}$, and covariance $\sigma_{\mathcal{LS}}$. The errors can be interpreted as the demeaned ability premium to a worker's income. Workers have full knowledge of their own μ and ϵ, and the cost c of entering into semiskilled work is common knowledge. The prewar probability of choosing a job $\mathcal{S}$ over $\mathcal{L}$ for a White worker can be expressed as

$$\begin{aligned}
\Pr(\text{semiskilled})_{\text{w}} &= \Pr(y_{\mathcal{S}} - c > y_{\mathcal{L}}) \\
&= \Pr(\epsilon_{\mathcal{S}} - \epsilon_{\mathcal{L}} > \mu_{\mathcal{L}} - \mu_{\mathcal{S}} + c) \\
&= \Pr\left(\frac{\nu}{\sigma_\nu} > \frac{\mu_{\mathcal{L}} - \mu_{\mathcal{S}} + c}{\sigma_\nu}\right) \\
&= \Pr\left(\frac{\nu}{\sigma_\nu} > z_{\text{w}}\right) \\
&= 1 - \Phi(z_{\text{w}}),
\end{aligned} \tag{5}$$

where $\nu = \epsilon_{\mathcal{L}} - \epsilon_{\mathcal{S}}$, $z_{\text{w}} = (\mu_{\mathcal{L}} - \mu_{\mathcal{L}} + c)/\sigma_\nu$, and $\Phi(\cdot)$ is the cumulative density function of the standard normal distribution. A worker chooses semiskilled over low-skilled work if the expected individual wage in the semiskilled job is higher than that in the low-skilled job after paying the entry cost. Once a worker chooses a job, he or she can make the same choice again at later point in time, for instance, if the entry cost in the semiskilled job is lowered. Black workers follow a similar entry process in the prewar period, with the only difference being that Black workers face increased entry costs due to discrimination d,[44] such that

$$\Pr(\text{semiskilled})_{\text{b}} = \Pr(y_{\mathcal{S}} - c - d > y_{\mathcal{L}}) = 1 - \Phi(z_{\text{b}}) \tag{6}$$

[42] Income is supposed to be higher in semiskilled jobs, which is motivated by the data. Income is also given exogenously and not affected by labor supply and demand for tractability, which is based on the same assumptions as in Heckman and Sedlacek (1985).

[43] I omit individual subscripts for clarity.

[44] This can be discrimination by employers or other factors affecting their productivity, such as the quantity and quality of schooling received.

and $z_b = (\mu_{\mathcal{L}} - \mu_{\mathcal{L}} + c + d)/\sigma_\nu$. Since $z_b > z_w$, we would expect relatively fewer Black than White workers in $\mathcal{S}$ before the war. To provide a visual form of comparative statics, consider the distribution of ν among Black and White workers. This distribution in the difference of job-specific innate abilities can be plotted as shown in figure 6, since the difference of two normal random variables is itself normal with $\nu \sim N(0, \sigma^2_{\mathcal{L}} + \sigma^2_{\mathcal{S}} - 2\sigma_{\mathcal{LS}})$.[45] In the absence of the race-specific entry cost d faced by Black workers, we would expect $z_b = z_w$ if the ability distributions in $\mathcal{L}$ and $\mathcal{S}$ are the same for both groups. In this case, the mass between zero and z_b^{pre} in figure 6*B* represents all Black workers who could have productively filled a semiskilled job but could not choose it over a low-skilled job because of the additional race-specific entry cost d.

Next, assume that the WWII casualty related labor shortages reduced both c and d. Using the comparative statics provided in figure 6, there are two results. First, a reduction in both types of switching costs should lead to a relatively larger inflow of Black than White workers into $\mathcal{S}$. Second, new entries into $\mathcal{S}$ will be positively selected in terms of their relative semiskilled ability if they are Black workers and negatively selected if they are White workers. Positive selection here means that a worker has a higher innate ability in semiskilled work than in low-skilled work with $\nu > 0$.[46] The first result is due to the fact that d is only relevant for Black individuals. According to the data, the share of semiskilled employment among Black men rose by 16 percentage points between 1940 and 1950, while that of White men rose by 10 percentage points.

The second result, given the data, is because White workers in the postwar period have $\nu < 0$; that is, they would have been relatively more productive in low-skilled than in semiskilled work but decided to move to semiskilled work anyway because of higher income, which became attractive after the reduction in switching costs. Likewise, the mass of Black workers entering $\mathcal{S}$ after the war, which is the mass between z_b^{pre} and z_b^{post} in figure 6*B*, have $\nu > 0$. This also implies that even before the war Black workers had to be particularly more able in order to gain access to semiskilled jobs relative to White workers.

B. Testing the Model Predictions Empirically

The simple theoretical model predicted that more Black than White workers should upgrade from low-skilled to semiskilled work in response to the WWII casualty shock among semiskilled White soldiers and that Black workers should be positively selected whereas White workers should be negatively selected.

[45] The threshold points, z_g^{pre} and z_g^{post}, are motivated by the data. In 1940, when considering only the low-skilled and semiskilled population of southern male workers, 50% of White men were in a semiskilled as opposed to a low-skilled job. Likewise, only 14% of Black men were in semiskilled employment at that time. These employment shares rose to 30% and 60% in 1950 for Black and White workers, respectively.

[46] From fig. 6 it is clear that this is the case for new Black semiskilled workers but not for new White semiskilled workers.

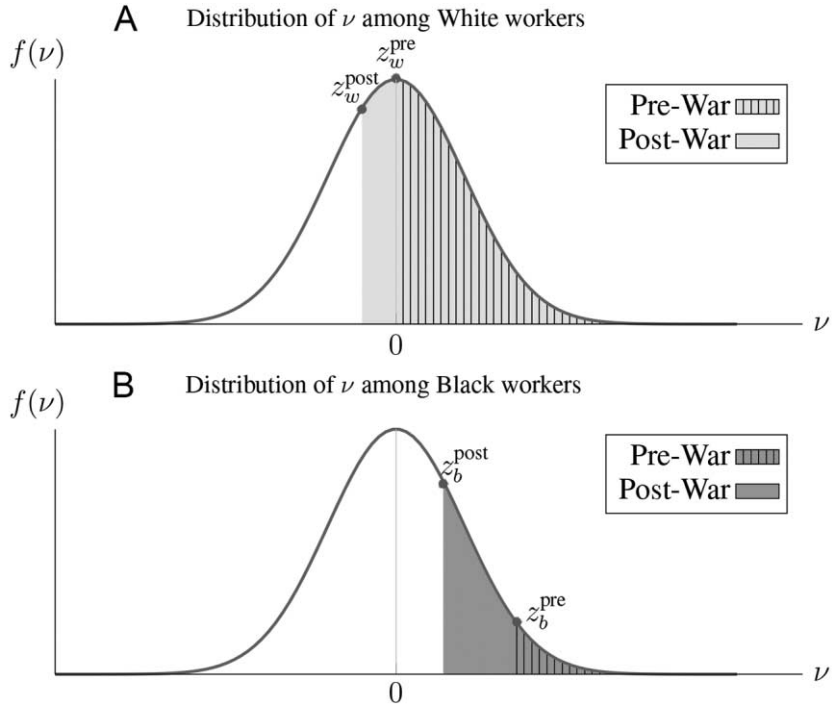

FIG. 6.—Distributions of relative talent in semiskilled work among White and Black workers. Shown are distributions of the differences in talent for semiskilled and low-skilled work ν among White and Black workers before and after WWII. The vertical lines show the prewar distribution, and the shaded area shows the postwar distribution. The threshold at which migration costs from agriculture to manufacturing become larger than the gains is the border of the lined and shaded areas before the war and the border between the shaded and blank areas in the postwar period. A color version of this figure is available online.

The first prediction was already confirmed by estimating the triple-differences regression in equation (3). To test the second prediction of the model, I compare the postwar economic outcomes of Black and White men in semiskilled jobs in the same repeated cross-section triple-differences setting as before. In particular, I reestimate equation (3) by exchanging the semiskilled employment outcome with different economic outcomes. These include the natural log of a worker's annual wage, his or her years of education, and binary outcomes for internal migrant status (which equals 1 if the worker does not currently live in his or her state of birth), for whether a person lives in a metropolitan area, and for home ownership, as well as the natural logarithm of house values.[47]

[47] In sec. B1 of app. B, I show the same analysis for women.

Note that the resulting coefficients will capture a mix of selection of workers into better-paying jobs as well as the economic gain resulting from the occupational upgrade.[48] This is not a direct test of how ν changes (the relative individual ability in semiskilled versus low-skilled work) because this cannot be observed in practice. Instead, the empirical results seek to establish a relationship between the shock that led to the occupational upgrading of workers to their postwar characteristics in a correlational exercise.

Results for the full sample and for the southern subsample of semiskilled Black and White workers are reported in panels A and B of table 7, respectively. As predicted by the model, semiskilled Black men who live in commuting zones with higher WWII casualty rates among semiskilled White soldiers after the war have higher wages, levels of education, and home ownership rates, whereas for White workers the opposite tends to be the case. However, these effects are not always statistically significant. In the whole sample, Black workers saw an increase in wages of approximately 1.3%, while White workers' wages increased by only 0.2%. In the South the difference is more pronounced, with an approximate 3.8% increase in Black workers' wages and a decline of 0.9% for White workers. None of these coefficients are statistically significant, but the direction of the coefficients, especially for the southern sample, are in line with the selection patterns predicted by the model. This is a pattern also found for the other outcomes such as education, which captures two effects. The first is the positive and negative selection of new Black and White manufacturing workers, respectively, as predicted by the model. The second is that Black men might have increased their investment in educational attainment because of the increased labor market opportunities and the therefore-raised returns to education (see Aizer et al. 2020).

The probability of migrating to outside their state of birth declined significantly for semiskilled Black workers, which is intuitive given the job opportunities in their home state. It also declined for White workers, especially in the South. The probability of urban status is negative for both groups, which implies that rural and suburban areas might have attracted semiskilled workers, who were harder to replace in these locations than the cities. As a last piece of evidence for the positive selection of Black semiskilled workers, notice that their probability of home ownership increased significantly by around 2 percentage points. For White workers, there is either a negative or no effect. Despite the noise in the estimates, taken together the evidence points toward Black workers being positively selected into postwar semiskilled employment, a pattern that is the opposite for White workers, and

[48] In sec. B2 of app. B, I replace the casualty rate with an indicator for semiskilled employment as treatment to provide a more direct estimate of the benefits associated with the upgrading from low-skilled to semiskilled jobs. However, in the absence of a good measure of ability that can partial out the selection effect it is not possible to fully disentangle the two, and for the purpose of the exercise here the casualty rate is arguably more exogenous and provides a direct reduced-form link to the war.

Table 7
WWII Casualties and Economic Characteristics of Semiskilled Workers

	Outcome					
	ln(Wage) (1)	Education (2)	Migrant (3)	Urban (4)	Owns Home (5)	ln(House Value) (6)
	A. All United States					
Casualty rate × Black × Postwar	.014	.114	−.067*	−.075***	.019*	−.004
	(.051)	(.136)	(.035)	(.018)	(.011)	(.060)
Casualty rate × Postwar	.004	.053	.029***	−.052*	−.011*	−.043
	(.019)	(.033)	(.006)	(.027)	(.006)	(.027)
Observations	551,367	493,634	1,049,871	1,049,871	1,023,650	288,467
Adjusted R^2	.647	.160	.324	.773	.255	.400
	B. South					
Casualty rate × Black × Postwar	.041	.044	−.004	−.039**	.017*	.003
	(.057)	(.153)	(.018)	(.018)	(.010)	(.061)
Casualty rate × Postwar	−.013	.020	.007	−.121***	−.002	−.021
	(.029)	(.045)	(.007)	(.042)	(.009)	(.037)
Observations	156,635	139,198	285,100	285,100	277,532	82,779
Adjusted R^2	.657	.173	.432	.735	.248	.391

NOTE.—Shown is a difference-in-differenece-in-differences regression of economic outcomes on the commuting zone WWII casualty rate among semiskilled White soldiers interacted with a post-WWII dummy and with a Black indicator for individuals in semiskilled employment living in 722 commuting zones in the whole United States (panel A) and the US South (panel B). The estimation sample contains data from the decennial US micro census from 1920 to 1960 on noninstitutionalized, working Black and White males not currently attending school who were of working age in 1940. All regressions include commuting zone and census year fixed effects. Urban is an indicator for whether an individual resided in a metropolitan area. Owns home is a binary outcome for whether an individual owns his or her home. The log house value, log wages, and education variables are available only from 1940 onward. Log house value is also missing for 1950. Individual-level controls include age, marital status, and place of birth dummies. Commuting zone–level controls are the WWII draft rate, log WWII spending per capita, the share of Black men, the share of rural population, the number of manufacturing establishments per capita, average manufacturing firm size, log manufacturing value added per worker, the share of employment in manufacturing, the share of land in agricultural production, the share of acres in cotton production, the share of cash tenants, the average value of machinery per farm, lynchings per 1,000 Black population between 1900 and 1930, the number of Rosenwald schools per 1,000 Black population, the share of acres flooded by the Mississippi in 1928, the number of slaves in 1860, Republican vote share, New Deal spending per capita 1933–35 (loans, public works, AAA, FHA loans), and the unemployment rate in 1937. Time-invariant controls are interacted with decade fixed effects. Monetary values are deflated to 2010 US dollars. Observations are weighted by their individual sample line weight times the spatial weight used to construct the commuting zone–level treatment variable. Standard errors are clustered at the commuting zone level.

* $p < .10$.
** $p < .05$.
*** $p < .01$.

indicates that this development was linked to the war casualties that brought down racial barriers to entry, as predicted by the theoretical model.[49]

[49] In comparison, Black women also gained more than White women; however, their labor market successes were temporary and essentially disappear again by 1960, which is consistent with the results of Acemoglu, Autor, and Lyle (2004; see sec. B1 of app. B).

V. Conclusion

The 1940s marked a turning point in the economic progress of Black Americans. In this paper I provide a new explanation for the large economic gains made by Black southerners by relating this development to WWII. Prior to the war, more than 80% of Black men worked in low-skilled jobs. These paid significantly less than semiskilled jobs, from which Black workers were barred because of racial barriers to entry. During the war, Black men saw both lower draft and lower mortality rates. This meant that more Black men were available to work both during and after the war. This raises the question of how much of the Black occupational upgrading at the time can be explained by the higher casualty rates among semiskilled White soldiers.

Having digitized and compiled a novel data set on WWII casualty rates by race, occupation, and location, I provide evidence in a county-level difference-in-differences setting from 1920 to 1960 that counties with higher mortality rates among semiskilled White soldiers saw larger increases in the share of semiskilled Black workers after the war. The importance of this occupational upgrading and its significance for Black southerners is hard to overstate. The average semiskilled job paid twice the salary of the average low-skilled job, implying a substantial increase in disposable income for Black workers who secured such employment during the war years. With incomes determining individual's standards of living, health, political power, and the fortunes of their children, this was an important step forward for Black workers in the South. This finding is robust, and I can rule out alternative explanations, including differential migration or education of Black and White workers, the industrialization of the South at the time, the selection of soldiers, WWII-related spending, historic anti-Black sentiment proxied by the share of cotton production and lynchings, the legacy of New Deal spending, selection on observables and unobservables, and different model specifications and time trends.

Using repeated cross-sectional census data at the individual level in a triple-differences setting, I also provide evidence that the semiskilled White casualty rate was not only a shock to the supply of labor of young White men but that it reduced racial barriers to entry for Black workers into semiskilled employment. The removal of such barriers in the aircraft industry during the war were described by Weaver (1945). This reduction in racial barriers to entry is consistent both with the historical account (see Weaver 1945; Anderson 1982) and with a simple model that describes the entry of Black and White workers into low-skilled and semiskilled employment based on ability in each job as well as differential racial entry costs.

The overall contribution of this paper is to provide a new explanation for Black economic progress in the South at mid-century and to highlight the importance of group-specific barriers to entry into certain occupations that can significantly hamper the economic progress of this group. Avenues for

future work include the further exploration of how this occupational upgrading of Black southerners and the implied increase in disposable income of Black households impacted their ability to lobby for more political rights, how it affected Black-White social relations, and whether this increase in income made Black Americans more attractive customers for White store owners, who would not have commonly served them out of fear of losing their White customers.

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