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THE IMPACT OF AN ENVIRONMENTAL SHOCK ON BLACK-WHITE INEQUALITY: EVIDENCE FROM THE BOLL WEEVIL

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ABSTRACT

This paper estimates the causal effect of the boll weevil on home ownership, wages, and intergenerational mobility of Black and White sons born around the time of its arrival. The boll weevil resulted in a negative shock to cotton production and a positive shock to food-related agricultural products. Using a linked data set of fathers and sons, we find Black sons born after the weevil's arrival experienced large relative gains in outcomes. The paper discusses a number of mechanisms and provides evidence on two related mechanisms: relative improvements in Black fathers' income ranks and improvements in Black sons' early-life conditions.

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1 Introduction

One of the most important economic events in the U.S. South during the early twentieth century was the arrival of the boll weevil. The boll weevil was a cotton pest that destroyed cotton crops and spread slowly through the Southern United States between 1892 and 1922. By 1922 all cotton growing regions of the U.S. had been infested by the boll weevil. Within 5 years of the arrival of the boll weevil in a county, total cotton production fell 39-50% (Lange, Olmstead and Rhode, 2009; Ager, Brueckner and Herz, 2017). While there were many other large environmental shocks in the first half of the twentieth century, including the Mississippi River Floods of 1927 and the Dust Bowl (Hornbeck and Naidu, 2014; Hornbeck, 2012; Arthi, 2018), the boll weevil was unique in its scope. It affected approximately 22% of the U.S. population and 75% of the Black population. Although there is a substantial literature related to the boll weevil and its impact on agricultural production, considerably less attention has been paid to how it affected the economic outcomes of individuals, including children born around the time of its arrival.

Although typically described as a large *negative* shock, the boll weevil actually led to a negative shock to cotton production and a *positive* shock to the production of other agricultural products. There are reasons to believe that Black and White households may have been differentially impacted by these shocks. For example, Black and White households had different distributions of occupations and land ownership, overall and within agriculture. Prior to the arrival of the boll weevil, Black and White households differed in their ability to shift to other agricultural contracts, owners, or occupations, as a result of anti-enticement laws and other state and local policies (Naidu, 2010; Hornbeck and Naidu, 2014). This changed with arrival of the boll weevil, which ended many tenancy contracts. Black and White households could reoptimize to other agricultural contracts, owners, or occupations (Ager, Brueckner and Herz, 2017). In addition, Black households were in a more precarious nutritional position than White households prior to the boll weevil's arrival. Thus, they may have differentially benefited from the increased production of food-related agricultural products.

This paper estimates the causal effect of the boll weevil on home ownership, wages, and intergenerational mobility for Black and White children born around the time of its arrival. The analysis draws on a large newly linked data set of Black and White fathers and their sons and race-specific difference-in-differences and triple differences specifications. We begin by observing Black and White fathers who had a son aged 9 or younger in 1900 or 1910 in the census prior to the boll weevil's arrival in their county of residence. These fathers were then linked to the next decadal census (1910 or 1920) after the boll weevil had arrived in their initial county of residence. This allows us to observe fathers' characteristics and any changes, including changes in occupation, additional sons born, and whether they migrated to a new location. Sons of these fathers are observed in their father's household in 1900, 1910, or 1920 and are linked to the 1940 Census. This allows us to observe their adult outcomes such as home ownership, wage income, occupation, years of schooling, and whether they are living outside the South.[1]

Both race-specific difference-in-differences and triples differences empirical strategies are used to study the impact of the boll weevil. The race-specific difference-in-differences specifications leverage variation in fathers' initial county of residence and the timing of the boll weevil's arrival. The triple differences specifications pool Black and White sons and, therefore, additionally leverage variation in race. Event study graphs support the parallel trends assumptions.

In race-specific difference-in-differences, Black sons born immediately after the arrival of the boll weevil had home ownership rates that were 1.9 percentage points higher and wages that were 7.6 percent higher than Black sons born before its arrival. In contrast, White sons born after the boll weevil's arrival had home ownership rates and wages that were similar to White sons born before its arrival. In triple difference specifications, Black sons born after the arrival of the boll weevil saw a 2.6 percentage point increase in home ownership and a 7.4 percent increase in wages relative

[1]Fewer than 20% of Black and White sons in our sample are observed outside the South in 1940.

to White sons born after its arrival. The effects were larger in significant cotton producing counties and were not driven by migration of fathers or their sons out of the South. The results hold for alternative difference-in-differences estimators (Callaway and Sant'Anna, 2021), spatial standard errors, and temporal and spatial leads of the boll weevil. The effect of the boll weevil on the Black-White wage and home ownership gaps was large – 11% of the 1940 Black-White wage gap and 15% of the home ownership gap.

Why did Black sons experience relative improvements in outcomes? The paper discusses a number of possible mechanisms and provides evidence on two related mechanisms: relative improvements in Black fathers' income ranks and improvements in Black sons' early life conditions after the boll weevil. First, intergenerational mobility estimates suggest that some of the gains may have been due to small relative improvements in Black fathers' income ranks after the boll weevil's arrival as compared to White fathers. These improved ranks differentially benefited their sons born after the boll weevil. In contrast, White fathers' did not experience relative increases in income rank after the boll weevil's arrival and their income ranks did not differentially impact their sons born after the boll weevil's arrival.

Second, results on food production, pellagra, and heights suggest that early life conditions, especially nutrition, may have differentially improved for Black sons born after the arrival of the boll weevil. We begin by providing evidence that poor Black families had worse diets than poor White families, leaving open the possibility that Black families might be differentially impacted by improvements in nutrition. We then show that counties increased production of a range of food crops after the boll weevil's arrival, with larger increases in production occurring in heavily Black counties. In the aftermath of the boll weevil, pellagra, a disease caused by niacin deficiency and a marker for poor nutrition, fell and fell more in heavily Black counties. Finally, Black World War II recruits born in the South after the boll weevil's arrival experienced gains in height relative to Black recruits born before and White recruits born after the boll weevil. All three of these results point to improved nutrition for Black sons born after the boll weevil's arrival.

Our paper contributes to the literatures on Black-White differences in wages, home ownership, and intergenerational mobility. The literature on the wage gap is very large but has predominantly focused on the Great Migration or education and on the period after 1940 (Bayer and Charles, 2018; Collins, 2021; Carruthers and Wanamaker, 2017; Collins and Margo, 2006; Derenoncourt, 2022). A much smaller literature examines the Black-White home ownership gap (Collins and Margo, 2011; Boustan and Margo, 2013). A small but growing literature examines Black and White intergenerational mobility (Collins and Wanamaker, 2021; Saavedra and Twinam, 2020; Jácome, Kuziemko and Naidu, 2021). This paper shows that the boll weevil led to large relative improvements in home ownership, wages, and intergenerational mobility for Black sons born in the South after the arrival of the boll weevil.

The paper also contributes to the literature on early life conditions. Although there is a large literature on the effects of early life shocks on long run outcomes (Almond and Currie, 2011; Almond, Currie and Duque, 2018), a much smaller subliterature focuses on Black-White inequality (Almond, Currie and Herrmann, 2012; Bhalotra and Venkataramani, 2015; Almond, Currie and Duque, 2018). Because of data limitations, little is known about the early life conditions of individuals who were children in the late nineteenth and early twentieth centuries. This paper provides suggestive evidence that observed improvements may have been due to related improvements in Black fathers' income ranks and Black sons' early life conditions after the boll weevil.

Finally, the literature on the boll weevil is sizeable (Ager, Brueckner and Herz, 2017; Ager, Herz and Brueckner, 2020; Baker, 2015; Baker, Blanchette and Eriksson, 2020; Bloome, Feigenbaum and Muller, 2017; Feigenbaum, Mazumder and Smith, 2019; Ferrara, Ha and Walsh, 2022; Lange, Olmstead and Rhode, 2009), but there have been relatively few attempts to study the long-run impacts of the boll weevil on individuals. An important exception is Baker, Blanchette and Eriksson (2020), which uses a linked dataset to examine educational outcomes of individuals who were young (ages 4-9) and old (19-30) at the time of the boll weevil's arrival. This paper uses linked individual level data to examine the effects of the boll weevil on Black and White fathers and their children born around the time of its arrival.

2 Historical Background

The arrival of the boll weevil in the cotton belt during the late 1800s and early 1900s acted as an exogenous shock that disrupted cotton production and broadly impacted the Southern economy. The boll weevil, native to Mexico, first migrated to Texas in 1892. From there, it progressed north and east through the cotton belt over the next 30 years. By 1922, the entire cotton growing region of the United States had been invaded by the boll weevil. Figure 1 shows counties invaded by the boll weevil between 1892 and 1922.[2]

The focus of the boll weevil's invasion has typically been on the negative impact it had on cotton production. However, the boll weevil also led to an increase in the production of food crops. We describe these impacts below and provide further empirical evidence in Section 7.

2.1 Impact on Cotton

The U.S. Department of Agriculture (1951), Ransom and Sutch (2001), Lange, Olmstead and Rhode (2009), Ager, Brueckner and Herz (2017), and Ferrara, Ha and Walsh (2022) all find that the arrival of the boll weevil had large negative effects on cotton yields and production. Within 5 years of the arrival of the boll weevil in a county, total cotton production fell at least 39-50%.[3] This resulted in substantial disruptions to tenancy arrangements and had adverse affects on local labor markets including decreased farm wages and female labor force participation (Ager, Brueckner and Herz, 2017; Bloome, Feigenbaum and Muller, 2017). Lange, Olmstead and Rhode (2009), Ager, Brueckner and Herz (2017), and Ferrara, Ha and Walsh (2022) all show that the

[2] See Hunter and Coad (1923) or Lange, Olmstead and Rhode (2009) for a year-by-year map of the boll weevils' progression through the cotton belt.

[3] Ferrara, Ha and Walsh (2022) find even higher values using newspaper mentions as an IV for the arrival of the boll weevil.

boll weevil significantly reduced the value of land. These negative effects on tenancy, labor markets, and land values induced substantial migration (Lange, Olmstead and Rhode, 2009; Ager, Brueckner and Herz, 2017; Feigenbaum, Mazumder and Smith, 2019).

Black and White families may have been differentially impacted by this negative shock to cotton production for two reasons. The first reason is the difference between Black and White Southerners in occupations and land ownership. In our sample, prior to the arrival of the boll weevil about 75% of Black fathers and 65% of White fathers worked in agriculture.[4] However, Black and White fathers had substantially different statuses within agriculture: only 12% of Black fathers were farm owners, while 32% of White fathers were; 52% of Black fathers were tenant farmers or sharecroppers, while 30% of White fathers were; and 11% of Black fathers were farm laborers, while only 3% of White fathers were.[5] Thus, Black fathers may have been impacted differently, because they owned less land and were generally lower on the agricultural ladder than White fathers (Alston and Kauffman, 1998).

A second reason is that prior to the arrival of the boll weevil, Black and White households differed in their ability to shift to other agricultural contracts, owners, or occupations. Anti-enticement laws imposed fines on planters who made offers to laborers already under contract. These laws were likely to have been more binding on Black households.[6] More broadly, at the state and local level Black codes appear to have acted as constraints on Black households (Cohen, 1976; Roback, 1984). When the boll weevil voluntarily ended tenancy contracts, Black and White households were able to re-optimize to other agricultural contracts, owners, or occupations.

[4]Summary statistics are from Appendix Table B.1.

[5]We follow (Collins and Wanamaker, 2022) and define someone as being a farm owner if they report being a farmer as their occupation in the census own their home. This definition likely overstates the rate of farm ownership. A tenant farmer is an individual who reports being a farmer, but does not own their home. Note that we cannot distinguish between tenant farmers and sharecroppers.

[6]Naidu (2010) finds that these laws lowered mobility, wages, and the returns to experience for Black Southerners.

2.2 Impact on Other Agricultural Products

The boll weevil increased the production of food crops. Lange, Olmstead and Rhode (2009) note that the production of "Irish potatoes, peanuts, rice, and sweet potatoes; sugar cane, among other crops, showed statistically significant increases after the arrival of the weevil" (Lange, Olmstead and Rhode, 2009, p.710). Ager, Brueckner and Herz (2017) also find that corn acreage and the share of farmland devoted to corn increased after the boll weevil's arrival. Clay, Schmick and Troesken (2019) find that corn, peanut, and sweet potato acres per capita increased after the boll weevil's arrival.

Black and White families may have been differentially impacted by this shift from cotton to food crop production, due to underlying differences in diet and nutrition. Poor rural households in the South, which were predominantly Black, had low quality diets. Stiebeling and Munsell (1932) write that poor Southern households ate "a poorly balanced diet composed mainly of highly milled cereals, sweets, and lard or salt pork" (p.1-2). These staples tend to be low in nutritional value.[7] Low quality diets gave rise to pellagra, a disease caused by niacin deficiency that could lead to death.[8] Pellagra death rates were much higher among the poor and on farms, and so disproportionately impacted Black households (Brown, 1979). To further investigate differences in diets for Black and White households during this time period, we draw on data from the *1917-1919 Cost of Living Survey* conducted by the Bureau of Labor Statistics (U.S. Department of Labor, 1992). Interviews were conducted for 12,817

[7] The nutritional value of cornmeal depends on how it is milled. Cornmeal that retains the germ of the corn kernel during milling has higher nutritional value than cornmeal where the germ has been removed. Unfortunately, many Southerners consumed cornmeal imported from the Midwest, where the germ had been removed. For more details on Midwestern cornmeal and locally milled cornmeal, see Clay, Schmick and Troesken (2019).

[8] Households with more resources, which were predominantly White, already ate a more varied diet. Goldberger, Waring and Willets (1915) of the U.S. Public Health Service wrote (p. 3118): "From a study of the dietaries of certain institutions in which pellagra prevailed the impression has been gained that cereals and vegetables formed a much greater proportion in them than they did in the dietaries of well-to-do people; that is, people who as a class are practically exempt from pellagra. It was suggested, therefore, that it might be well to attempt to prevent the disease by reducing the cereals, vegetables, and canned foods and increasing the fresh animal foods, such as fresh meats, eggs, and milk; in other words, by providing those subject to pellagra with a diet such as that enjoyed by well-to-do people, who as a group are practically free from the disease."

families across 99 cities in the United States.[9] Although there are no data for farm families, the data provide insights into the diets of poor Southern households.

Table 1, Panel A, examines the diet of Southern households whose head was laborer and, therefore, were likely poorer households.[10] This table shows that poor Black households consumed lower quality diets than poor White households; they consumed significantly more cornmeal, grits, and salted pork per person, which all have low nutritional value. They also consumed significantly less milk, butter, and eggs, which are highly nutritious foods. The only highly nutritious food that Black households consumed more of was sweet potatoes. Some households in this sample lived in cities that had already been invaded by the boll weevil when the survey was conducted and, therefore, their diets might reflect changes from the boll weevil. Panel B restricts attention to households living in cities that had not been invaded by the boll weevil by 1917 when the survey was conducted and expands the sample to include all workers (not just laborers).[11] We find similar results - Black households had lower quality diets than White households.

The evidence suggests that Black households were in a more precarious nutritional position than White households prior to the boll weevil's arrival. This difference in baseline nutrition status means that Black families may have differentially benefited from the increase in food crop production. Improved nutrition in utero and during early childhood can lead to improved outcomes later in life, particularly improved wages (Almond and Currie, 2011; Almond, Currie and Duque, 2018). Indeed, we find evidence that both height (a marker of nutrition in utero and during early childhood) and wages differentially improved for Black individuals born after the boll weevil. We discuss other possible improvements in early life conditions, such as increases in father's relative earnings and decreases in family size, in Sections 6 and 7.

[9] The method of selecting families for this survey is not clear, but the codebook mentions "it is felt that the group of families chosen fairly represent the urban population of the nation at the time of the interviews" (U.S. Department of Labor, 1992).

[10] It is important to note that 43% of Black Southern households surveyed had a laborer head, while only 5% of White Southern households did.

[11] These cities are: Atlanta, GA; Charleston, SC; Charlotte, NC; Jacksonville, FL; New Bern, NC; Savannah, GA; and Winston-Salem, NC.

3 Data

This section describes the data on the boll weevil, the construction of our linked sample of fathers and sons, our measures of home ownership and income, and summary statistics for the sample.

3.1 The Boll Weevil

Data on the year the boll weevil first arrived in a county were taken from Lange, Olmstead and Rhode (2009), which originally came from USDA boll weevil maps. In our linked sample, we require that fathers that were initially observed in 1900 or 1910 be living in a county that was invaded by the boll weevil in the next ten years. In Figure 1, counties shaded in dark gray were invaded by the boll weevil between 1901 and 1920.[12] They constitute the set of counties that we initially observe fathers residing in. Counties shaded in light gray were invaded by the boll weevil, but not during 1901-1920 and, therefore, fathers initially residing in these counties are not in our sample. Our sample includes over 80% of the total population that would eventually be invaded by the boll weevil.[13]

3.2 Linking

To study the impact of the boll weevil on children born after its arrival, we generated a linked sample of fathers and their sons. As already discussed, a linked sample of fathers and sons is important, because the boll weevil unleashed a wave of migration across the South, which could impact sons' long-run outcomes in a number of ways. By linking both fathers and sons, we are able to observe and control for migration and any changes in fathers' occupational status. Appendix Figure B.1 provides a graphical depiction of the linking process used to generate our sample of fathers and sons.

[12] Note that no counties were invaded by the boll weevil in 1900.

[13] The counties in our sample had a population of 10,566,549 in 1890 while the population of all counties that would be invaded by the boll weevil had a population of 12,970,288 in 1890.

In step 1 we locate fathers in the 1900 complete count census (Ruggles et al., 2021) who were living in a county that would be invaded by the boll weevil in the next ten year (i.e. invaded between 1901 and 1910).[14] These fathers are then linked to the 1910 census to observe whether they moved, changed occupations, etc. (step 2). Finally, we locate the sons of successfully linked fathers in either the 1900 or 1910 censuses (we use the 1910 census for sons born after 1900; step 3) and link them to the 1940 Census to obtain their adult outcomes (step 4). This process is repeated for fathers in the 1910 census that were living in a county that would invaded by the boll weevil between 1911 and 1920. Sons are assigned to being born before or after the boll weevil based on the year the boll weevil first arrived in their father's initial county of residence.[15]

The ABE linking algorithm was used to perform all of the linking (Abramitzky, Boustan and Eriksson, 2012, 2014, 2019). It uses first name (phonetically cleaned), surname (phonetically cleaned), birthplace, birth year, and race within a 5-year age-band. Robustness checks using alternative linking methods are provided in Section 5.4. The linking algorithm and match rates are discussed further in Appendix A and Appendix Table B.2.

The final sample of sons consists of sons who satisfy the following two conditions: (1) they were born within 10 years of the boll weevil's arrival in their father's initial county of residence (i.e. event-time ranges from -10 to 10) and (2) they were 9 years old or younger when they were initially observed in the census (i.e. possible birth years range from 1891 to 1920).[16] A total of 136,031 sons meet these two criteria and are in our final linked sample. Appendix Table B.3 compares the linked sons to all sons that we attempted to link. Although some differences are statistically significant, most are small in magnitude. Because White fathers and sons are linked at higher

[14] We define fathers as individuals that had at least one son age 9 or younger when we initially observe them.

[15] The initial county is the county their father lived in during 1900 (for 1900-1910 linked fathers) or 1910 (for 1910-1920 linked fathers).

[16] A son that we observe in the 1910 Census who was born in 1895 to a father whose initial county of residence was invaded by the boll weevil in 1903 would not meet these criteria because they would be 14 or 15 years old when we observe them.

rates than Black fathers and sons, we weight the linked sample in all specifications that use both Black and White sons.[17]

3.3 Home Ownership and Wage Worker Samples

We define two samples with our set of linked sons: a home owner sample and a wage worker sample. The 1940 census contains information on home ownership status for all individuals, so our home owner sample is simply our entire linked sample, which is 136,031 sons.

The 1940 census was the first census to ask about income, although it only asked about wage or salary income earned as an employee. Thus, it does not report self-employed income from farming or owning a business. Weekly wages are defined as an individual's yearly income in 1939 divided by the number of weeks they reported working in 1939.[18] We impose a number of restrictions on who is included in our sample of wage workers. They include dropping individuals that were unemployed, not in the labor force, on work relief, worked fewer than 30 weeks a year, or were self employed but reported some wage income.[19] The restrictions are discussed further in Appendix A and the number of observations dropped by various restrictions are outlined in Appendix Table B.4. Once these restrictions are made, the weekly wage distribution is calculated from the remaining sample. Because the sample is highly skewed, we trim the top 1% of wage earners.[20] The wage worker sample consists of 61,653 sons. The sensitivity of the results to a number of alternative wage worker restrictions is explored in Section 5.4.

To assign a measure of income to fathers and as an alternative measure for sons, we follow the method described in Collins and Wanamaker (2021). They construct

[17]The linkage rates of Black fathers is 23% and for Black sons it is 26%. The linkage rates for White fathers is 28%, while it is 36% for White sons. Thus, the probability that a White son appears in our sample is 0.1 ($0.28 * 0.36 = 0.1$), while the probability that a Black son appears in our sample is 0.06 ($0.23 * 0.26 = 0.06$). This implies a weight for Black sons of 1.667 (0.1/.06).

[18]The 1940 census had individuals report income and weeks worked for the previous year.

[19]Of individuals who report being self-employed but also report a wage, 68% are farmers.

[20]The CDF of weekly wages by race is reported in Appendix Figure B.2. The top 1% of weekly wage earners made over $76.92 per week, which is where the black line in Appendix Figure B.2 is drawn.

imputed incomes within a region, race, and occupation cell. They further break down farmers into farm owners versus tenants/sharecroppers. This method is particularly useful for assigning income to fathers and sons employed in agriculture, who constitute a large part of our sample.[21]

3.4 Summary Statistics

Panel A of Appendix Table B.1 provides summary statistics for fathers for both the home owner and wage worker samples. There are large cross sectional differences between Black and White fathers in home ownership and measures of income. A few additional things are worth noting. First, Black fathers' income ranks rose slightly on average between the two censuses, while White fathers' income ranks fell slightly. Second, more than half of Black and White fathers were living in a different county 10 years after they were first observed. However, most stayed in the same state and very few – 5% of the Black fathers and 8% of White fathers – moved out of the South.

Panel B provides summary statistics for sons. Here too there are large cross sectional differences in home ownership and measures of income.[22] It is worth noting that the migration patterns of Black and White sons are similar. Although small numbers remained in the county that their father was originally observed in, most remained in same state. Relatively few – 18% of the Black sons and 13% of White sons – moved out of the South.

4 Empirical Strategy

Our analysis takes two approaches to estimating the effects of the boll weevil on home ownership and weekly wage outcomes: a race-specific difference-in-differences model and a triple differences model. The difference-in-differences model takes advantage of variation across counties and birth years, while the triple differences model

[21]We are grateful to Collins and Wanamaker (2022) for providing us with their code to construct this measure of income.

[22]Both weekly wages and imputed income are in 1939 dollars. Imputed income is much larger than weekly wages, because it reflects annual income.

takes advantage of variation across counties, birth years, and racial groups. These approaches are described in the next two subsections. The third subsection discusses selection into wage work, the steps taken to address selection, and the direction of biases. It should be noted that this discussion only pertains to our wage-worker sample as our homeowner sample includes all individuals and, therefore, is not subject to selection. The final section describes the framework used to examine intergenerational mobility.

4.1 Race-specific Difference-in-Differences

Our race specific difference-in-differences specification takes the following form:

$$Outcome_{ict} = \beta * \mathbb{I}[Born\ post\ boll\ weevil = 1]_{ct} + \theta_c + \theta_t + \theta_c * time + \theta_b + \theta_e + \epsilon_{ict} \quad (1)$$

In the above specification, i indexes a son, c indexes the county that sons' fathers were initially residing in (in either 1900 or 1910), and t indexes sons' birth year. Thus, $Outcome_{ict}$ is the outcome, as observed in the 1940 census, of son i, whose father initially resided in county c, and who was born in year t.

$\mathbb{I}[Born\ post\ boll\ weevil = 1]_{ct}$ is a dummy variable that takes a value of one if sons born in year t were born after the arrival of the boll weevil in their father's initial county of residence c.[23] Sons born in the year the boll weevil first arrived are coded as not being treated (i.e. $\mathbb{I}[Born\ post\ boll\ weevil = 0]_{ct}$). We define the treatment variable this way, because the boll weevil usually did not become active and spread until the harvest season and infestation was often light during the first part of the year due to how the boll weevil multiplied.[24] This definition for treatment is, also,

[23]For sons whose fathers move, we do not observe the timing of the birth and the move relative to the arrival of the boll weevil. This is particularly true for fathers who move within their original state, because we only observe a son's state of birth, not the timing of their father's move to a new county.

[24]Each female weevil produced "100 to 300 eggs per generation for up to eight generations per year" meaning that late season crops were often more impacted than early seasons crops (Lange, Olmstead and Rhode (2009), p. 688).

supported empirically by the results of event studies, which we describe below.

Specification (1) includes fixed effects to control for fathers initial county (θ_c), birth year (θ_t), county specific time trends ($\theta_c * time$), birth order (θ_b), and census enumeration year (θ_e).[25] Estimating Specification (1) separately by race controls for potential omitted variables that arise in models not run separately (Feigenberg, Ost and Qureshi, 2021).

To account for spatial correlation we divide counties into 40 groups based on their longitude and cluster standard errors by these longitude bins. We use longitude because much of the movement of the boll weevil was west to east (see the map in Hunter and Coad (1923)) and selected 40 bins because this corresponds to roughly half a degree of longitude or about 27 miles.[26] Our results are robust to different methods of accounting for spatial correlation including spatial standard errors Conley (1999).

The event-study equivalent to Specification (1) is as follows:

$$Outcome_{ict} = \sum_{v=-5}^{5} \beta_v \cdot \mathbb{I}[t - g_c = v] + \theta_c + \theta_t + \theta_c * time + \theta_b + \theta_e + \epsilon_{ict} \quad (2)$$

In Specification (2), g_c is the calendar year in which the boll weevil first reached county c and t is sons' birth year. All other variables are defined analogously to Specification (1). Sons born -10 to -5 years before the boll weevil's arrival are included in the -5 category and sons born 5 to 9 years after the boll weevil's arrival are included in the 5 category. We omit the coefficient on the year -1, estimate the specification separately for Black and White sons, and cluster standard errors based on longitude bins.

[25]Birth order is determined by the age of sons who have the same father and are living in the same household in a given census. Birth order fixed effects do not take into account siblings who either moved out of the house or died before the census was taken. It also does not take into account sisters.

[26]In our sample of counties longitude runs from about the 80th meridian west to the 100th meridian west.

A number of assumptions are required for the estimates of β in Specification (1) to be interpreted as the causal impact of being born after the boll weevil's arrival. We perform checks to validate these assumptions.

First, the arrival of the boll weevil in a county must be exogenous. The prior literature has argued that the arrival of the boll weevil in a county was exogenous (Ransom and Sutch, 2001; Lange, Olmstead and Rhode, 2009; Ager, Brueckner and Herz, 2017; Feigenbaum, Mazumder and Smith, 2019; Ager, Herz and Brueckner, 2020; Ferrara, Ha and Walsh, 2022). While farmers tried to take steps to prevent the invasion of the boll weevil, in practice there was little that could be done to stop its spread.

Second, we must assume that treated and control sons would have parallel trends in outcomes in the absence of the boll weevil's arrival. To validate the parallel trends assumption, we use the event-study to show that treated and control sons were trending similarly prior to the boll weevil's arrival.

Third, the stable unit treatment value assumption (SUTVA) must hold. This assumption requires that the boll weevil's presence in one county does not affect the outcome of sons living in other counties. We use both spatial and temporal leads in some specifications to control for possible spillovers from earlier invaded counties.

Finally, treatment effects must be constant over time and across groups. To address potential bias that might result from non-constant treatment effects over time and across groups in a two-way fixed effects difference-in-differences set-up we use the estimator presented in Callaway and Sant'Anna (2021). Using the Callaway and Sant'Anna (2021) estimator requires collapsing our data to county-race-birth year cells and then estimating the treatment effect separately for Black and White cells using not-yet treated units as controls.[27]

[27]Note that when using the Callaway and Sant'Anna (2021) estimator we do not include any control variables, such as the average birth order in a county-race-birth year cell. Thus, we do not make use of their results for conditional parallel trends and, instead, assume unconditional parallel trends. This is not a large difference from our baseline specification, which only includes census enumeration year fixed effects, birth order fixed effects, and county-specific time trends as additional controls on top of two-way fixed effects. We display our baseline two-way fixed effects results without any additional controls when using the Callaway and Sant'Anna (2021) estimator.

4.2 Triple Differences: Comparing Black Sons and White Sons

Our second empirical approach involves triple differences and uses the following specification:

$$\begin{aligned} Outcome_{ict} = \gamma * \mathbb{I}[Born\ post\ boll\ weevil = 1]_{ct} * \mathbb{I}[Black = 1]_i \\ + \theta_c + \theta_c * \mathbb{I}[Black = 1]_i + \theta_t + \theta_t * \mathbb{I}[Black = 1]_i + \theta_c * \theta_t + \theta_b + \theta_e + \epsilon_{ict} \end{aligned} \quad (3)$$

The triple difference specification allows us to leverage all three dimensions of our data: birth years; fathers' initial county of residence; and race. The specification is similar to Specification (1), but interacts the post-boll-weevil treatment variable with a dummy variable indicating if individual i is Black ($\mathbb{I}[Black = 1]_i$). Specification (3) also includes interactions of birth year and father's initial county of residence fixed effects with the Black indicator ($\theta_c * \mathbb{I}[Black = 1]_i$ and $\theta_t + \theta_t * \mathbb{I}[Black = 1]_i$). Finally, it includes birth year and father's initial county of residence fixed effects interacted with each other ($\theta_c * \theta_t$). Standard errors are clustered based on longitude bins. In all of the triple difference regressions that use our linked sample we weight to account for the fact that we link Black fathers and sons at lower rates than White fathers and sons.

γ in Specification (3) estimates the effect of being born after the boll weevil for Black sons relative to White sons whose fathers initially resided in the same county. We also perform triple differences event-studies, where we plot the interaction between the event-time dummy variables and a dummy variable if an individual is Black.

4.3 Selection

Appendix Table B.4 shows that the number of observations falls by more than half when we move from the home owner sample to the wage worker sample. This raises questions about who engages in wage work. Figure 2 plots the percentage of sons in our sample who were wage workers by race and birth cohort. The share of all workers engaged in wage work trended up across birth cohorts. The Black and White shares of workers engaged in wage work were very similar across all birth cohorts used in our analysis.

We take a number of steps to address selection. First, we examine home ownership, which is reported for all sons and, therefore, is not subject to selection into wage work. Second, when we examine wages as our dependent variable we include a rich set of fixed effects. Specifically, the inclusion of birth year fixed effects, county fixed effects, and county specific time trends is likely to mitigate selection concerns.

To the extent that selection remains an issue after taking these steps, it is worth considering the direction of the bias. Appendix Figure B.3 shows that wage workers had more years of schooling than men of the same race who were not wage workers. Ignoring controls, if selection into wage work were positive, then the average quality of the wage workers would decline across birth cohorts. As shown in Figure 2), sons born later were more likely to become wage workers. This would bias down estimates of wage increases associated with the boll weevil in the race specific difference-in-differences specifications.

The situation becomes more complicated in the triple difference setting, because it depends on relative selection for Black and White sons. Ignoring controls, triple difference estimates will be biased downward if Black sons were relatively more positively selected into wage work than White sons. Conversely, the triple difference estimates would be biased upward if Black sons were relatively less positively selected.

4.4 Intergenerational Mobility

We explore intergenerational mobility using the following specification:

$$
\begin{aligned}
Son\ Outcome_{ict} = \alpha + \xi * Father\ Outcome_{ict} + \sigma * \mathbb{I}[Son\ born\ post\ boll\ weevil = 1]_{ct} \\
+ \psi * Father\ Outcome_{ict} * \mathbb{I}[Son\ born\ post\ boll\ weevil = 1]_{ct} \\
+ \theta_c + \theta_t + \theta_e + \epsilon_{ict} \quad (4)
\end{aligned}
$$

In this specification we regress sons' outcome on their fathers' outcome. We use two outcomes for fathers and their sons: percentile rank in the national income distribution and home ownership status (presented in the appendix). In line with the literature, our main focus is on the correlation between fathers' income rank and sons' income rank; the "rank-rank" correlation. Sons outcomes are measured in 1940, when their average age was 32, while the outcomes of their fathers are measured in both the first census they are observed in (i.e. either in 1900 or 1910), when their average age was 34, and the second census they are observed in (i.e. either in 1910 or 1920), when their average age was 44. α is the intergenerational mobility intercept, which captures a son's outcome if their father's outcome is zero). ξ is the slope of intergenerational mobility, which captures how much a son's outcomes improves with an increase in their father's outcome. Conditioning on their fathers' outcomes, we examine whether the boll weevil changed the intergenerational mobility intercept, slope, or both. We include father's initial county of residence, son's birth year, and census enumeration year fixed effects. Standard errors are, again, clustered based on longitude.

5 Results

This section begins with our main results for home ownership and wages. It then discusses differences by agricultural and migration status. Finally, it examines the robustness of our results to alternative difference-in-differences estimators, spatial standard errors, stricter linking criteria and not linking fathers, and a range of alternative samples.

5.1 Main results

The event studies in Figure 3 highlight the improvement in outcomes for Black sons after the arrival of the boll weevil and the lack of pre-trends in outcomes. In Panels (a) and (b), there are positive effects of the boll weevil on Black sons' home ownership and weekly wages but no effect for White sons. For home ownership, the positive effect of being born after the boll weevil for Black sons appears in the year it arrives (year 0). For wages, the positive effect of being born after the boll weevil for Black sons begins the year after the boll weevil arrived in a county. White sons see no effect of being born after the boll weevil on either outcome. Panel (c) plots the triple difference event study when home ownership is the outcome and Panel (d) does the same for wages. Black sons born after the boll weevil experienced increases in home ownership rates and wages relative to White sons born after the boll weevil. In all four plots, the outcomes do not show any discernible pre-trends.

Table 2 presents our main results. Panels A and B report coefficients from the difference-in-differences specifications for Black and White sons. Panel C reports coefficients from triple difference specifications using both Black and White sons. Columns 1-3 use home ownership status as the dependent variable and use the home owner sample. Columns 4-6 use the log of weekly wages as the dependent variable and the weekly wage sample. We begin with the simplest specification and add additional controls. Column 1 includes only county and birth year fixed effects. Column 2 adds birth order and census enumeration year fixed effects. Column 3 adds county time trends in Panels A and B and county-by-race, birth year-by-race, and county-by-birth year fixed effects in Panels C. Columns 3 and 6 are our preferred empirical specifications.

In the difference-in-differences specifications in Panel A, Black sons born after the boll weevil had higher rates of home ownership and higher wages compared to Black sons born before the boll weevil. In column 3, Black sons born after the boll weevil had rates of home ownership that were 1.9 percentage points higher. In column 6, Black sons born after the boll weevil had wages that were 7.6 percent higher. In Panel B, White sons born after the boll weevil saw no change in home ownership or wages compared to White sons born before the boll weevil.

In the triple difference specifications in Panel C, Black sons born after the boll weevil had higher rates of home ownership and higher wages relative to White sons born after its arrival. In column 3, Black sons born after the boll weevil had rates of home ownership that were 2.6 percentage points higher. In columns 6, Black sons born after the boll weevil had wages that were 7.4 percent higher.

Differential Black-White gains of 2.6 percentage points in home ownership and 7.4 percent in wages are large. In 1940, the Black-White home ownership gap in our sample was about 17 percentage points and the Black-White weekly wage gap was about 0.66 log points.[28] The differential gains, therefore, account for 15% (0.026/0.17) of the Black-White home ownership gap and 11% (0.074/0.66) of the Black-White wage gap.

5.2 Heterogeneous Effects

To further explore the results presented in the previous section, we examine the heterogeneity of the effects across historically important dimensions. We begin with the intensity of county cotton production and the county share of the Black population. We then examine the effects for fathers and sons who did not migrate out of the South after the arrival of the boll weevil.

Table 3 examines the effects of the boll weevil based on the intensity of county cotton production and the share of county population that was Black. Significant cotton producing counties are defined as counties above the 25th percentile in farm acre shares devoted to cotton in 1900. We expect that individuals in significant-cotton counties were more impacted by the boll weevil, since it damages cotton crops.

[28]To get these numbers, we ran a regression of our sample from Table 2 on county and birth year fixed effects and a dummy variable indicating if an individual was Black.

High Black-share is defined as counties above the median Black share in 1900.[29] We also expect that the boll weevil had a greater effect in high Black-share counties if it improved nutrition in its wake.

In Table 3, the effects of being born after the boll weevil are concentrated among sons whose fathers initially resided in significant-cotton and high Black-share counties. The point estimates in the triple difference specification in panel C for these counties are larger than, although not statistically significantly different from, our main estimates. For home ownership, the effects are 3.0 (significant-cotton) and 3.4 (high Black-share) percentage points vs. 2.6 percentage points in our main specification. For wages the effects are 7.9 (significant-cotton) and 8.6 (high Black-share) percent vs. 7.4 percent in our main specification. The effects are small and not significant in all three panels for low cotton counties. For Black sons in low Black-share counties, the effects are statistically significant in panel A, but not in panel C.

Table 4 shows our results are similar if we restrict attention to sons of fathers who remained in the South or who themselves remained in the South.[30] The point estimates in the triple difference specification in panel C for these counties are slightly smaller than, although not statistically significantly different from, our main estimates. For home ownership, the effects were 2.2 vs. 2.6 percentage points in our main specification. For wages the effects were 7.1 percent vs. 7.4 percent in our main specification. In last two columns in Table 4, being born after the arrival of the boll weevil had little effect on the probability of migration of the South. Only one of the six coefficients is statistically significant and the magnitudes are small. These results suggest that home ownership and wage gains experienced by Black sons born after the boll weevil were not driven by migration out of the South.

[29] If we define high Black-share as being above the 25th percentile, so it is analogous to our significant-cotton measure, then almost all Black fathers in our sample were initially observed in a "high Black-share" county. Defining Black-share this way results in 30,854 out of 32,030 Black sons having fathers who were initially residing in a high Black-share county in the home owners sample. In the wage worker sample, 13,530 out of 13,985 Black sons have fathers who were initially observed in a high Black-share county.

[30] A father moved out of the South if they were not in the South census region in the second census we observe them in (i.e. either in 1910 or 1920). A son moved out of the South if they were not living in the South in the 1940 census.

The previous results do not imply that those who migrated out of the South experienced similar or worse outcomes to those that did not migrate. In Appendix Table B.5, which decomposes the returns to migration, we find large returns to moving out of the South. In columns 1 and 2, there are indeed large and significant returns to migrating out of the South. It is important to note, however, that the stand-alone post-boll-weevil term in Panel A and the post-boll-weevil interacted with Black term in Panel C are positive, significant, and of a similar magnitude as our baseline results presented in Table 2. Columns 3 and 4 control for years of schooling, while columns 5 and 6 control for years of schooling and drop sons whose father moved out of the South, but are themselves observed in the South in 1940.[31] We include these columns because column (2) shows a very large return of being born after the boll weevil for Black sons whose father moved out of the South (a 0.5 log point return in Panel A and a 0.44 log point return in Panel C). This return decreases by about two-thirds by simply controlling for years of schooling and dropping sons whose father moved out of the South, but are themselves living in the South in 1940. However, the coefficient estimate on being born after the boll weevil remains unchanged.

To summarize, we find positive and significant effects in significant-cotton counties and no effect in low cotton counties, which is consistent with our effects coming through the boll weevil. We also find positive and significant effects in high Black-share counties, which is consistent with the boll weevil improving outcomes for Black sons whose fathers were originally observed in these counties. Finally, the gains for Black sons born after the boll weevil's arrival are not driven by migration out of the South by either sons or their fathers. We find positive home ownership and wage gains for the large share of sons who remained in the South.

[31]There are at least two reasons why this might have occurred. First, the son might not have moved out of the South with the father. Second, the son might have moved with the father, but migrated back to the South by 1940.

5.3 Selection into Wage Work

We next examine selection into our wage worker sample. The results are displayed in Appendix Table B.6. In Panel A, Black sons born after the boll weevil were about 3.1-4.2 percentage points less likely to be in our wage worker sample. There is no effect for White sons in Panel B. In Panel C, Black sons born after the boll weevil were 3.4 percentage points less likely to be in our wage worker sample than White sons born after the boll weevil. The effect is smaller, however, for sons whose fathers were initially observed in significant-cotton or high Black-share counties.

Appendix Table B.7 shows the occupations sons who are born after the boll weevil and are not wage workers are moving into and out of. Black sons who are not wage workers and were born after the boll weevil are moving out of farming and into semi-skilled blue collar work.[32] They also have significantly higher imputed incomes, which were constructed from Collins and Wanamaker (2022). Thus, even among non-wage workers, Black sons born after the boll weevil appear to be experiencing relative gains. White sons experience these same effects, but the magnitude is smaller.

What do the results presented in this section mean for our baseline weekly wage estimates? If wage workers were positively selected, then the movement out of wage work for Black sons in cohorts born after the boll weevil implies that the average quality of Black non-wage workers should increase and the average quality of Black wage workers should decrease. The results in Appendix Table B.7 are consistent with this, since Black non-wage workers born after the boll weevil are less likely to be farmers and more likely to be in semi-skilled occupations. In addition, this implies that we are underestimating the effect of the boll weevil on weekly wages, since we are comparing cohorts born prior to its arrival, where wage workers had a higher average quality, with cohorts born after its arrival, where wage workers had a lower average quality. Finally, we note again here that our results for home ownership are not subject to the same concerns about selection.

[32]Semi-skilled blue collar work is defined as being an operative or a service worker. Operatives include occupations such as conductors, miners, milliners, motormen, etc.

5.4 Robustness

Appendix Table B.8 shows our main results hold for a number of other measures of income. Column 1 uses sons' rank in the 1940 national income distribution as the dependent variable. Black sons born after the arrival of the boll weevil had income ranks that were about two points higher. Columns 2 shows that annual income significantly increased for Black sons born after the boll weevil, while column 3 shows no change in the number of weeks worked. Accordingly, the results we find in Table 2 are due to increases in income as opposed to changes in the number of weeks worked. We also find positive, and sometimes significant estimates on imputed incomes constructed from Collins and Wanamaker (2021). Appendix Table B.9 shows our main results when we control for fixed effects for the number of years of schooling a son completed. The results remain unchanged when controlling for schooling.

Appendix Table B.10 shows that our results hold if we use alternative difference-in-differences estimators or spatial standard errors.[33] Accordingly, columns 1 and 6 present our baseline two-way fixed effects difference-in-differences estimates without control variables. This is the specification shown in Table 2, columns 1 and 4. Columns 2 and 7 use the estimator proposed in Callaway and Sant'Anna (2021).[34] Columns 3 and 8 code sons whose fathers lived in a low-cotton producing county as always being untreated, since we do not have any untreated individuals in our sample. Finally, columns 4, 5, 9, and 10 assume that the error term of sons whose fathers initially resided in county c is correlated with the error term of sons whose fathers resided within a 100 or 200 kilometer radius of county c's centroid and adjust the standard errors using the method proposed by Conley (1999). The estimates in all columns of Appendix Table B.10 are similar in magnitude to our baseline two-way

[33]This table focuses on two-way fixed effects difference-in-differences estimates for a number of reasons. First, these are the estimates that are subject to bias due to heterogeneous treatment effects over time. The estimators designed to deal with this bias have only been shown to work in difference-in-differences set-ups not triple difference set-ups. In addition, the spatial standard errors are computationally intensive when using a triple differences set-up due to the large number of fixed effects.

[34]To use this estimator we collapse our individual-level data into county-race-birth year cells and weight these by the number of observations used to generate the cell average.

fixed effects estimates.

Counties not yet invaded by boll weevil could be impacted by its arrival in other, nearby counties, violating SUTVA. Accordingly, Appendix Table B.11 shows the robustness of our results to controlling for both spatial and temporal leads. Columns 1 and 4 show our baseline results. Columns 2 and 5 control for a dummy variable if an individual was born -4 to 0 years prior to the boll weevil's arrival in their fathers' initial county of residence. Controlling for this time lead results in similar or larger coefficient estimates. Columns 3 and 6 control for dummy variables for spatial leads. In particular, we control for the first year the boll weevil arrived at a county within 100-200 miles and 0-100 miles of the county an individual's father initially resided in. The coefficient estimates are similar in magnitude or large than our baseline estimates.

Appendix Table B.12 shows that stricter linking criteria – criteria that result in fewer false positive matches – yield similar home ownership and wage results. When we require that individuals' names be unique within a five-year age band in columns 2 and 6, the coefficients are very similar to our baseline estimates. Columns 3 and 7 use only those individuals who match exactly on first name (not phonetically cleaned), last name (not phonetically cleaned), birthplace, birth year, and race, and columns 4 and 8 use individuals that match both exactly and are unique within a five-year age band. In columns 3, 4, 7 and 8, stricter linking criteria results in sample sizes that are less than 40% of our original samples. The estimates are less precise but remain similar in magnitude to our main estimates.

One question that arises is whether linking fathers to sons, which allows us to control for the fathers' initial counties of residence, adds information. To examine this, we linked all sons under the age of 9 directly from the 1900, 1910, and 1920 censuses to the 1940 census without linking their fathers.[35] We then assigned boll

[35]We performed this linking using exact name and age. We then made restrictions on this sample to make it comparable to our main linked sample. We required that sons be 9 or younger at the time of the first census (i.e. the 1900, 1910, or 1920 census), be living in a county invaded by the boll weevil between 1901 and 1920, be living in a county that would be invaded by the boll weevil in the next 10 years, and be living in the state they were born in during the initial census.

weevil status based on county of residence during the first census. When we control for sons' county of residence instead of the fathers' initial county of residence in Appendix Table B.13, the effect of the boll weevil is attenuated. This is consistent with having introduced noise regarding the timing of sons' exposures to the boll weevil. In column 1, the effect on home ownership for Black sons is no longer significant in Panels A and C. In column 2, we dropped individuals that were unemployed, not in the labor force, on work relief, worked fewer than 30 weeks, were self employed but reported income, or were in the top 1% of the income distribution to make it comparable to our wage worker sample. Although the wage effects are positive and significant in Panel C, the magnitude is less than half as large as our baseline estimate. These results suggest that fathers' initial county of residence, prior to the boll weevil's arrival, contributes important information about treatment status.

Appendix Table B.14 shows that our results are robust to alternative restrictions on the wage worker sample. The results across different wage restrictions and samples are very similar to the wage results in Table 2. Column 7 of Appendix Table B.14 examines the results for a sample that only includes brothers and controls for father fixed effects. We define individuals as being brothers if they lived in the same household during the same census and reported having the same father. The point estimates in column 7, Panel C, are considerably larger than – but not statistically significantly different from – our baseline result in column 6 of Table 2.

6 Mechanism: Intergenerational Mobility

In this section we explore the effect of the boll weevil on intergenerational mobility. Our analysis of intergenerational mobility differs from conventional analysis in a number ways. First, the sample is limited to fathers observed in counties in the South, prior to the arrival of the boll weevil, who had a son under the age of 9. Intergenerational mobility in the early twentieth century was much lower in the South than in other regions (Connor and Storper, 2020). Second, Black and White intergenerational mobility are examined separately by race.[36] Third, to align with the home ownership and wage analysis, county fixed effects are included.[37] Fourth, fathers are observed twice.[38] Fifth, some father-son linkages are between 1900 and 1910 and 1940 and some are between 1910 and 1920 and 1940. This reflects our focus on the boll weevil. Finally, fathers' rank in the national distribution in 1900, 1910, or 1920 is based on imputed income scores. However, sons' rank in the national distribution in 1940 is based on the actual annual income of wage workers. Many of these differences are likely to weaken the relationship between fathers' and sons' outcomes.

We begin by presenting descriptive regressions that show small improvements for Black fathers in imputed income ranks after the boll weevil. The change in fathers' imputed income rank between the first and second census is regressed on a dummy variable indicating if the father was Black, as well as initial county of residence fixed effects, father's age at initial census, and initial census enumeration year fixed effects. The results from this descriptive exercise are shown in Table 5. Black fathers experienced small increases in their income ranks relative to White fathers after the boll weevil arrived. These effects are concentrated in significant-cotton and high Black-share counties.

In Table 6, we examine how Black fathers' income rank affected their sons' income rank.[39] Comparing columns 1 and 2, there is a higher positive correlation between fathers' rank and sons' rank using fathers' final income rank (in the second census) compared to fathers' initial income rank (in the first census) for both Black and White sons. For Black sons, in both columns there is an independent positive and significant effect of being born after the boll weevil. For White sons, the independent effect is negative, small, and not significant. In column 3, which uses the fathers' rank before the boll weevil and allows being born after the boll weevil to affect the coefficient on

[36] Collins and Wanamaker (2021), Saavedra and Twinam (2020), and Jácome, Kuziemko and Naidu (2021) are the closest to our analysis in that they also analyze intergenerational mobility separately by race in some specifications. Ward (2021) includes Black and White fathers and sons but does not run Black-only specifications.

[37] Appendix Table B.15 presents the same analysis without county fixed effects.

[38] Ward (2020) and Ward (2021) also observe fathers twice or even three times.

[39] Appendix Table B.16 has similar results for home ownership.

fathers' rank, the pattern is similar to what we observed in columns 1 and 2.

The magnitudes of the coefficients on the born post-boll-weevil variable for Black sons in columns 1-3 are substantial. Jácome, Kuziemko and Naidu (2021) find that the rank coefficient on Black parental income to adult child income increased by 7 percentiles between the 1910s-1920s birth cohorts and the 1940s-1950s birth cohorts.[40] Given these differences, increases in rank due to the boll weevil of 1.3-2.1 percentiles are substantial.

Column 4 uses the fathers' rank after the boll weevil and allows being born after the boll weevil to affect the coefficient on fathers' rank. Strikingly, the independent positive effect of the boll weevil on Black sons goes away, and there is an increase in the correlation between Black fathers' and sons' outcomes for sons born after the boll weevil. In other words, if Black fathers did well after the boll weevil so did their sons. Conversely, if Black fathers did worse their sons did worse. There is also an increase in the correlation between White fathers' and sons' outcomes for sons born after the boll weevil, but the increase is relatively small.

This analysis highlighted that gains to Black fathers appear to have benefited Black sons and differentially benefited Black sons born after the boll weevil. Thus, one explanation for the observed home ownership and wage gains for Black sons born after the boll weevil is that some fathers did better and were able to pass this advantage on to their sons.

7 Mechanism: Nutrition and Early-life Conditions

In this section, we present evidence that early life conditions and particularly nutrition may have improved after the boll weevil's arrival, and differentially improved for Black sons. We also present evidence on other dimensions of early life conditions including the number of siblings born after the boll weevil and schooling.

Table 7 shows that after the arrival of the boll weevil, cotton production fell and

[40] It is worth noting that our birth cohorts are earlier, 1891-1920.

the production of food-related crops rose in significant-cotton and high Black-share counties.[41] Column 1 shows that following the arrival of the boll weevil, cotton production per capita fell in all counties and fell more in counties that were significant cotton producers or had a high share of the population that was Black. Columns 2-7 examine corn, sweet potatoes, milk, butter, eggs, and peanut production per capita. Significant-cotton counties saw statistically significant, differential increases in the production of sweet potatoes, milk, and peanuts. High Black-share counties saw statistically significant, differential increases in the production of corn, sweet potatoes, milk, and peanuts. Thus, the local production of food-related crops increased in significant-cotton and high Black-share counties after the arrival of the boll weevil. These results are related to Lange, Olmstead and Rhode (2009) and Ager, Brueckner and Herz (2017), which examine the effects of the boll weevil on corn production. Our results complement their analysis by focusing on crop production per capita, differential effects in significant cotton and high Black-share counties, and a wider range of crops.

Table 8 presents evidence that pellagra mortality fell after the arrival of the boll weevil and fell more in counties with high Black-shares of the population.[42] Column 1 reproduces the main regression from Clay, Schmick and Troesken (2019). Using county data from North and South Carolina and a difference-in-differences estimation strategy, the paper found that pellagra mortality rates fell after the arrival of the boll weevil.[43] Column 2 extends their analysis by interacting the post-boll-weevil variable with a dummy variable indicating if a county was a significant-cotton county. Column 3 interacts the post-boll-weevil variable with a dummy variable indicating if a county was a high Black-share county. High Black-share counties saw statistically

[41] Data are from the Censuses of Agriculture (Haines, Fishback and Rhode, 2018). Estimates in Table 7 are obtained using PPML due to some dependent variables (such as peanuts) having a large number of zeroes. We have also used OLS with the dependent variable transformed as $log(Y+1)$ and obtain similar results.

[42] Pellagra is a disease caused by insufficient niacin consumption and is an indicator of poor nutrition.

[43] North and South Carolina are the only states that reported pellagra deaths at the county level both before and after the boll weevil invasion. Ferrara, Ha and Walsh (2022) use newspaper reports as an instrumental variable for boll weevil arrival and show that the effect of the boll weevil on pellagra deaths is even larger.

significant differential declines in the pellagra death rate after the arrival of the boll weevil, suggesting that nutrition improved.

Table 9 examines the heights of Black and White men born around the time of the arrival of the boll weevil using *U.S. World War II Army Enlistment Records, 1938-1946*.[44] The records include information on the state and county of residence at the time of enlistment as well as the individual's height (in inches). The sample is restricted to men who lived in the same state they were born in, were drafted, were born between 1915 and 1924, had a valid height and weight, and were living in a county that was invaded by the boll weevil after 1914.[45] It includes 173,786 men. Because the records do not include county of birth, we assume that men were living in their county of birth when they enlisted. This likely introduces measurement error, which would bias our coefficient estimates toward zero.

Table 9 indicates that Black men born after the boll weevil were taller than Black men born before the boll weevil and White men born after the boll weevil. In column 1, Black enlistees born after the boll weevil were 0.09 inches taller than Black enlistees born before the boll weevil; White enlistees born after the boll weevil were the same height as White enlistees born before the boll weevil; and Black enlistees born after the boll weevil experienced height gains of 0.11 inches relative to White enlistees born after its arrival. Column 2 restricts the sample to enlistees who were living in a significant cotton county and column 3 restrict to enlistees living in a high Black-share county. The coefficient estimates are less precise but are generally similar in magnitude to the coefficients in column 1.

Table 10 documents that the number of male children born after the boll weevil to Black fathers was statistically significantly lower than for White fathers, but the magnitude was small. The effects in columns 1 and 4 were 0.016 and 0.022 for the home-

[44] The use of nineteenth century heights has been actively debated by economic historians because of selection issues. Less has been said about twentieth century heights, but similar issues are likely to apply in this context. See Bodenhorn, Guinnane and Mroz (2017, 2019) and Komlos and A'Hearn (2019).

[45] Men born after 1924 could still have been growing when they enlisted. To serve in WWII an individual had to be between 5 and 6.5 feet tall and weigh over 105 pounds. Thus, a valid height is between 60 and 78 inches and a valid weight is 105 pounds and above.

owner and wage samples, as compared to means of 0.21 and 0.20. These findings are consistent with Ager, Herz and Brueckner (2020). Using repeated cross sectional data and focusing on children under 5, they find that fertility of Black mothers was lower than White mothers after the arrival of the boll weevil, but the difference was small and not statistically significant. Black female labor force participation also decreased after the arrival of the boll weevil, which may have reduced stress on pregnant and nursing mothers (Ager, Brueckner and Herz, 2017) and allowed Black families to invest more in their children.

Table 11 shows that the boll weevil did not affect average years of schooling for Black or White sons.[46] Across the six specifications and the three panels, the coefficients are uniformly statistically insignificant and small in magnitude. Notably, the boll weevil did not have differential schooling impacts by race. Our findings regarding schooling relate most closely to Baker, Blanchette and Eriksson (2020). While the estimation approaches differ, they also find that the boll weevil did not have differential schooling impacts by race. Baker, Blanchette and Eriksson (2020) do, however, find that children who were young (4 to 9) when the boll weevil arrived experienced increases in schooling relative to young adults (19 to 30 year olds). One potential explanation for our difference in results is that we are comparing young children born just before the boll weevil's arrival to other young children born just after.

The boll weevil appears to have improved early life conditions of Black sons, who then saw improved outcomes as adults. Tables 7, 8, and 9 suggest that Black men experienced improved nutrition. There may also have been other improvements in early life conditions.

[46]On average there is no effect on years of schooling. However, there might be an effect for sons whose father moved out of the South as columns 2, 4, and 6 of Appendix Table B.5 imply. Recall that only 5% of fathers moved out of the South.

8 Conclusion

This paper estimated the causal effect of the boll weevil on home ownership, wages, and intergenerational mobility of Black and White men born around the time of the its arrival. The boll weevil resulted in a *negative* shock to cotton production and a *positive* shock to other food-related agricultural products.

Using a linked data set of fathers and their sons, we found substantial wage and home ownership gains for Black sons born after the arrival of the boll weevil. These gains occurred both relative to Black sons born before the boll weevil and to White sons born after. In addition, the gains were larger for sons whose father lived in a significant cotton or high Black-share county and remained if we restricted the sample to sons whose fathers remained in the South or who themselves remained in the South. The observed gains were large relative to the Black-White wage and home ownership gaps in 1940.

We provide evidence on two related mechanisms that may explain these gains: intergenerational mobility and early life conditions. Our findings on intergenerational mobility indicate that some of the gains may have been due to small relative improvements in Black fathers' income ranks after the boll weevil's arrival as compared to White fathers. Our findings on crop production, pellagra, and height provide evidence suggesting that that early life nutrition differentially improved for Black sons born after the arrival of the boll weevil. We also discuss other possible improvements in early life conditions.

Our work has implications for our understanding of the economic status of Black men and of similar shocks in other contexts. Improvements driven by the boll weevil may have played an important and underappreciated role in the improvement of the economic status of Black men by 1940. We speculate that the effects of the boll weevil continued to be important in subsequent decades as sons in our sample, who were on average 32 years old in 1940, aged and as more cohorts were born after the boll weevil. In our setting, a negative shock to one crop and the associated positive shock to other crops led to long term benefits for Black sons born after the boll weevil.

Our findings suggest that similar types of shocks in other contexts may also generate benefits for some parts of the population.

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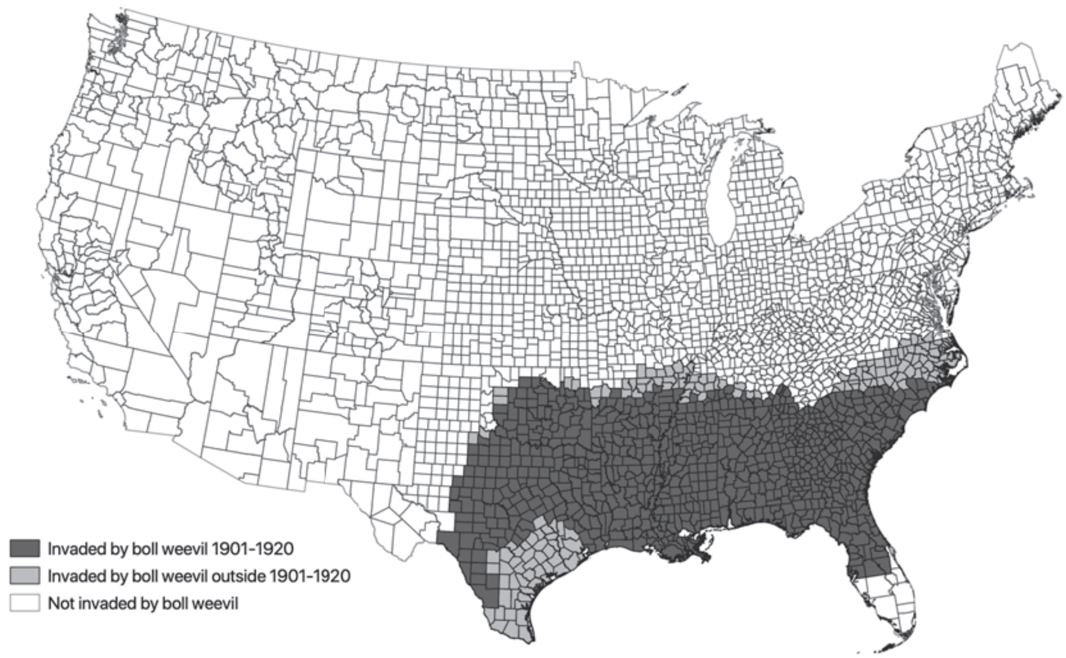
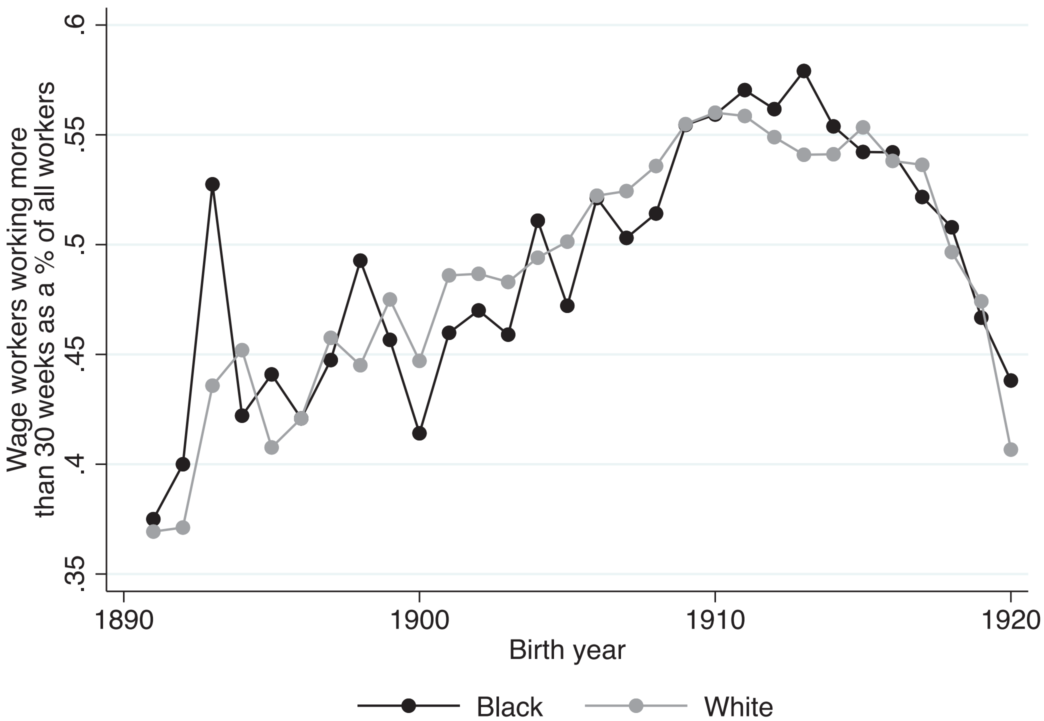
Figures and Tables

Figure 1: Counties invaded by boll weevil



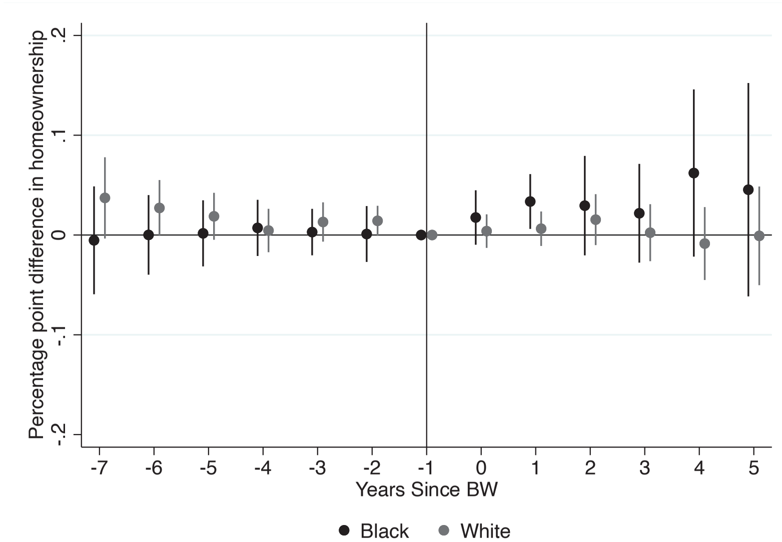
Notes: This map displays counties that were invaded by the boll weevil. Counties in dark gray were invaded by the boll weevil sometime between 1901 and 1920. Counties in light gray were invaded by the boll weevil, but not within the 1901-1920 time frame.

Figure 2: Wage workers by birth cohort and race as a % of workers

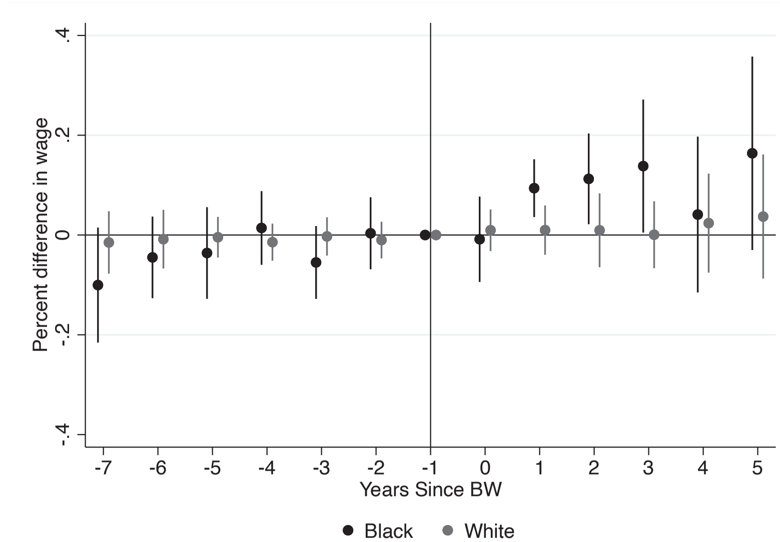


Notes: This figure shows the percentage of individuals in our sample that were wages workers as a percentage of all workers. More precisely, the numerator is the number of wage workers that worked more than 30 weeks in the previous year, were not on work relief, were employed, were in the labor force in each birth year, and were not in the top 1% of weekly wage earners (our "wage worker sample"). The denominator is the number of workers that were employed and not on work relief.

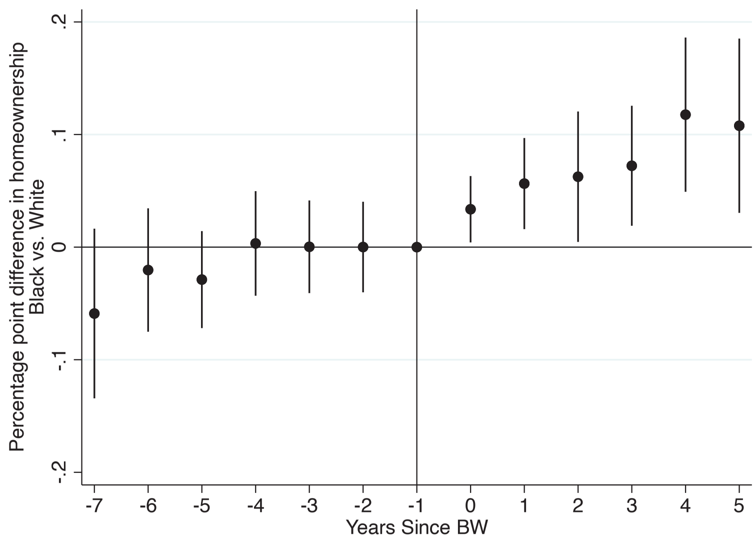
Figure 3: Event studies



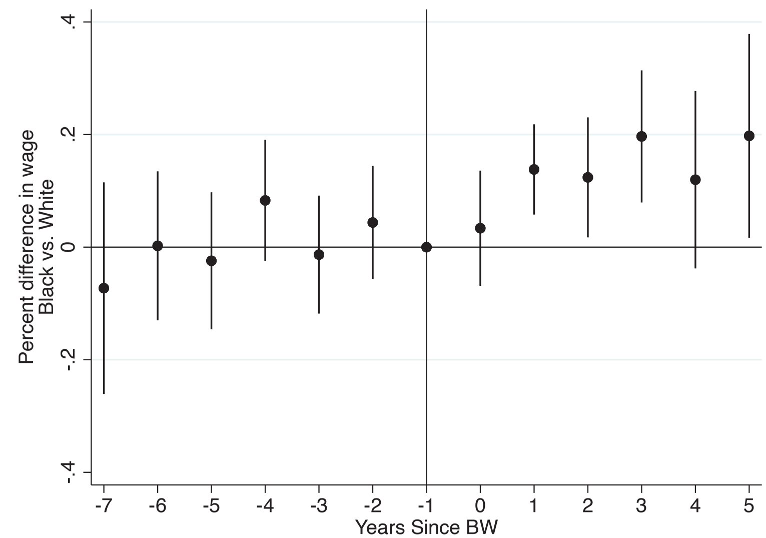
(a) DiD: Home ownership



(b) DiD: Wages



(c) DDD: Home ownership



(d) DDD: Wages

Notes: Panels (a) and (b) show estimates of Specification (2) in the text. Panels (c) and (d) shows event-study estimate of Specification (3). The coefficient -7 contains individuals born 7 to 10 years prior to the boll weevil's arrival in their father's original county of residence. The coefficient 5 contains individuals born 5 to 9 years after the boll weevil's arrival in their father's original county. The coefficient for individuals born 1 year prior to the boll weevil's arrival is omitted, so all other coefficients are interpreted relative to being born 1 year prior to the boll weevil. 95% confidence intervals are shown.

Table 1: Southern diets

	Cornmeal	Grits	Salted pork	Corn	Sweet potatoes	Milk	Butter	Eggs
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Southern laborer households								
Black household	11.376**	4.468***	8.839***	-0.525	29.949***	-15.254**	-2.755***	-2.567
	(5.312)	(1.211)	(1.775)	(0.623)	(7.992)	(6.678)	(0.681)	(1.705)
Observations	392	392	392	392	392	392	392	392
Mean of dep. var.	48.162	9.928	24.731	1.48	54.787	18.254	8.327	8.666
Panel B: Southern households not yet impacted by boll weevil								
Black household	10.723***	4.535	8.507***	0.464	28.598***	-19.018***	-3.796***	-4.633***
	(1.809)	(2.363)	(1.541)	(0.275)	(4.871)	(3.734)	(0.824)	(1.206)
Observations	805	805	805	805	805	805	805	805
Mean of dep. var.	36.985	16.576	21.452	1.774	55.219	20.477	12.618	11.084

Notes: The unit of observation is households. All dependent variables are quantities per person in the household measured as pounds per person except corn (dozens per person), milk (quarts per person), and eggs (dozens per person). The data used in this table comes from U.S. Department of Labor (1992). All columns control for city fixed effects. Standard errors are clustered at the city level. *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level.

Table 2: Home ownership and weekly wages

	Pr(Home owner = 1)			Log(weekly wage)		
	(1)	(2)	(3)	(4)	(5)	(6)
	Panel A: DiD for Black sons					
Born post BW	0.018**	0.017**	0.019**	0.050**	0.051**	0.076***
	(0.007)	(0.007)	(0.009)	(0.020)	(0.020)	(0.026)
Observations	32031	32030	32030	13987	13985	13985
Mean of dep. var.	.187	.187	.187	2.279	2.279	2.279
	Panel B: DiD for White sons					
Born post BW	0.006	0.007	0.010	-0.006	-0.006	-0.003
	(0.005)	(0.006)	(0.006)	(0.013)	(0.013)	(0.012)
Observations	104000	104000	104000	47666	47666	47666
Mean of dep. var.	.365	.365	.365	2.948	2.948	2.948
	Panel C: Black and White sons					
Born post BW * Black	0.034***	0.034***	0.026**	0.046**	0.047**	0.074**
	(0.009)	(0.009)	(0.011)	(0.019)	(0.019)	(0.028)
Observations	136031	136031	136031	61653	61653	61653
Mean of dep. var.	.323	.323	.323	2.796	2.796	2.796
County and birth year FE	X	X	X	X	X	X
Birth order and census year FE		X	X		X	X
County TT/DDD interactions			X			X

Notes: The unit of observation is sons. Panels A and B of this table display estimates for Specification (1) in the text. Panel C provides estimates for Specification (3). Columns 3 and 6 of Panels A and B control for county specific time trends using the county that we first observe the father in (i.e. the county they resided in when the 1900 or 1910 census was taken). Columns 3 and 6 of Panel C control for the triple difference interactions: county-by-race, birth year-by-race, and county-by-birth year fixed effects where “county” is the father’s initial county of residence. Birth order is determined by the age of the sons who have the same father in the censuses. Thus, it does not take into account older sons who either moved out of the house or died before the censuses were taken. It also does not take into account daughters. Standard errors are clustered based on 40 bins of longitude. *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level.

Table 3: Home ownership and weekly wages in significant-cotton and high Black-share counties

	Pr(Home owner = 1)				Log(weekly wage)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: DiD for Black sons								
Born post BW	0.007	0.020*	0.046**	0.012	-0.014	0.074**	0.110***	0.064**
	(0.039)	(0.010)	(0.018)	(0.010)	(0.106)	(0.029)	(0.040)	(0.031)
Observations	2912	29114	6862	24971	1429	12554	3025	10898
Mean of dep. var.	.237	.182	.227	.176	2.331	2.273	2.3	2.273
Panel B: DiD for White sons								
Born post BW	0.012	0.010	0.017*	-0.003	0.002	-0.007	-0.005	0.003
	(0.014)	(0.007)	(0.008)	(0.010)	(0.031)	(0.014)	(0.016)	(0.028)
Observations	19167	84833	66121	34076	8982	38683	29255	16687
Mean of dep. var.	.395	.358	.367	.362	2.945	2.948	2.945	2.946
Panel C: Triple differences								
Born post BW * Black	0.001	0.030**	0.024	0.034**	-0.046	0.079**	0.074	0.086**
	(0.037)	(0.012)	(0.015)	(0.014)	(0.095)	(0.029)	(0.056)	(0.034)
Observations	22080	113949	72984	59047	10411	51239	32281	27586
Mean of dep. var.	.374	.313	.353	.283	2.861	2.783	2.884	2.68
Sample	Low cotton	Sig. cotton	Low Black Share	High Black Share	Low cotton	Sig. cotton	Low Black Share	High Black Share

Notes: The unit of observation is sons. Panels A and B of this table display estimates for Specification (1) in the text. Panel C provides estimates for Specification (3). All columns control for: father's initial county fixed effects, birth year fixed effects, birth order fixed effects, and census enumeration year fixed effects. Panels A and B control for county specific time trends using the county that we first observe the father in (i.e. the county they resided in when the 1900 or 1910 census was taken). Panel C controls for the triple difference interactions: county-by-race, birth year-by-race, and county-by-birth year fixed effects where "county" is the father's initial county of residence. Birth order is defined as in Table 2. High Black-share counties are counties with 38.55% or more of their population that are Black in 1900, which corresponds to the median of the 655 counties in our sample. Significant-cotton counties are counties with 3.2% or more of their farm acres devoted to cotton production in 1900, which corresponds to the 25th percentile of the 655 counties in our sample. Standard errors are clustered based on 40 bins of longitude. *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level.

Table 4: Home ownership and weekly wages by migration status

	Pr(Home owner = 1)		Log(weekly wage)		Pr(Son not in South = 1)	
	(1)	(2)	(3)	(4)	(5)	(6)
	Panel A: DiD for Black sons					
Born post BW	0.016*	0.022*	0.070**	0.059**	0.017*	0.025
	(0.009)	(0.011)	(0.026)	(0.029)	(0.010)	(0.017)
Observations	30621	26374	13325	11399	32030	13985
Mean of dep. var.	.188	.199	2.271	2.145	.176	.184
	Panel B: DiD for White sons					
Born post BW	0.010	0.014*	-0.001	0.004	0.006	0.002
	(0.007)	(0.008)	(0.012)	(0.017)	(0.004)	(0.008)
Observations	95894	90797	43826	40431	104000	47666
Mean of dep. var.	.362	.374	2.928	2.901	.127	.152
	Panel C: Triple differences					
Born post BW * Black	0.022*	0.022*	0.071**	0.071**	0.010	0.014
	(0.011)	(0.011)	(0.032)	(0.032)	(0.013)	(0.020)
Observations	126456	117062	57012	51466	136031	61653
Mean of dep. var.	.32	.334	2.775	2.735	.139	.159
Sample	Father remained in South	Son remained in South	Father remained in South	Son remained in South	Home-owner sample	Wage sample

Notes: The unit of observation is sons. Panels A and B of this table display estimates for Specification (1) in the text. Panel C provides estimates for Specification (3). All columns control for: father's initial county fixed effects, birth year fixed effects, birth order fixed effects, and census enumeration year fixed effects. Panels A and B control for county specific time trends using the county that we first observe the father in (i.e. the county they resided in when the 1900 or 1910 census was taken). Panel C controls for the triple difference interactions: county-by-race, birth year-by-race, and county-by-birth year fixed effects where "county" is the father's initial county of residence. Birth order is defined as in Table 2. Standard errors are clustered based on 40 bins of longitude. *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level.

Table 5: Fathers' change in income rank after the boll weevil

	Fathers' change in income rank		
	(1)	(2)	(3)
Black	0.443	-2.835***	-0.109
	(0.475)	(0.835)	(0.736)
Black * Sig. Cotton		3.699***	
		(0.898)	
Black * High Black			0.817
			(0.567)
Observations	88098	88098	85640
Mean of dep. var.	-.229	-.229	-.142

Notes: The unit of observation is fathers. The table presents results from estimating a regression where the dependent variable is the change in fathers' income rank in the national income distribution between the first census we observe the father in and the second census. All columns control for initial county of residence fixed effects, father's age at initial census, and initial census enumeration year fixed effects. Standard errors are clustered based on 40 bins of longitude. *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level.

Table 6: Intergenerational mobility - Father's income rank

	Panel A: Rank in income distribution for Black sons			
	(1)	(2)	(3)	(4)
Born post BW	1.526**	1.309*	2.078***	-0.118
	(0.598)	(0.714)	(0.669)	(0.940)
Father income rank (initial)	0.086***		0.096***	
	(0.021)		(0.023)	
Father income rank (final)		0.127***		0.105***
		(0.018)		(0.022)
Father income rank (initial) * Born post BW			-0.062	
			(0.056)	
Father income rank (final) * Born post BW				0.163**
				(0.071)
Observations	12991	12701	12991	12701
Mean of dep. var.	36.881	36.628	36.881	36.628
	Panel B: Rank in income distribution for White sons			
	(1)	(2)	(3)	(4)
Born post BW	-0.386	-0.144	0.504	-1.583
	(0.457)	(0.457)	(0.791)	(0.984)
Father income rank (initial)	0.121***		0.124***	
	(0.008)		(0.008)	
Father income rank (final)		0.132***		0.127***
		(0.006)		(0.006)
Father income rank (initial) * Born post BW			-0.018	
			(0.014)	
Father income rank (final) * Born post BW				0.029*
				(0.017)
Observations	43220	41535	43220	41535
Mean of dep. var.	60.308	60.127	60.308	60.127

Notes: The unit of observation is sons. This table display estimates for Specification (4) in the text. All columns control for: father's initial county fixed effects, birth year fixed effects, and census enumeration year fixed effects. Standard errors are clustered based on 40 bins of longitude. *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level.

Table 7: Agricultural output per capita

	Cotton (bales)	Corn (bushels)	Sweet potato (bushels)	Milk (gallons)	Butter (pounds)	Eggs (dozens)	Peanut (bushels)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: Significant Cotton							
Post BW	-0.162	-0.053	-0.016	-0.072*	-0.054	-0.056	-0.407
	(0.143)	(0.108)	(0.082)	(0.038)	(0.039)	(0.051)	(0.320)
Post BW * Sig. Cotton	-0.542***	0.000	0.118**	0.048*	0.023	-0.089**	1.662***
	(0.179)	(0.065)	(0.054)	(0.027)	(0.036)	(0.037)	(0.311)
Observations	3832	3850	3850	3850	3850	3850	3779
Mean of dep. var.	.582	19.262	2.492	46.813	11.633	12.804	.869
Panel B: High Black							
Post BW	-0.168*	-0.147	-0.071	-0.084**	-0.046	-0.069	0.048
	(0.089)	(0.104)	(0.091)	(0.035)	(0.036)	(0.047)	(0.320)
Post BW * High Black Share	-0.683***	0.224***	0.206***	0.102***	0.013	-0.076**	0.507*
	(0.131)	(0.065)	(0.055)	(0.024)	(0.038)	(0.034)	(0.268)
Observations	3832	3850	3850	3850	3850	3850	3779
Mean of dep. var.	.582	19.262	2.492	46.813	11.633	12.804	.869

Notes: The unit of observation is counties. All columns control for county fixed effects and year fixed effects. Estimates are obtained using PPML due to some dependent variables (such as peanuts) having a large number of zeroes. The data used in this table comes from the 1890, 1900, 1910, 1920, 1925, and 1930 Censuses of Agriculture (Haines, Fishback and Rhode, 2018). The production quantities used as the dependent variables are reported for the year prior to the Census (e.g. the 1890 census reports production in 1889) and are all per capita in the county. Only counties that were invaded by the boll weevil between 1901 and 1920 are included in the sample. Standard errors are clustered based on 40 bins of longitude. *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level.

Table 8: Pellagra death rates

	Log(pellagra death rate)		
	(1)	(2)	(3)
Post BW	-0.233***	-0.230***	-0.155***
	(0.047)	(0.052)	(0.058)
Post BW * Sig. Cotton		-0.010	
		(0.063)	
Post BW * High Black Share			-0.129**
			(0.061)
Observations	1273	1273	1273
Mean of dep. var.	.763	.763	.763

Notes: The unit of observation is counties in North and South Carolina. Pellagra death rates are not available in other states prior to the arrival of the boll weevil. This table displays estimates for a regression of the pellagra death rate on a post-boll-weevil dummy variable for counties in North Carolina for the year 1915-1925 and for counties in South Carolina for the years 1916-1925. The share of a county's population that was Black was taken from the 1910 census and standardized to have a mean of zero and a standard deviation of one. All columns control for county and year fixed effects. *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level.

Table 9: Height of WWII enlistees

	Height (inches)		
	(1)	(2)	(3)
	Panel A: DiD for Black sons		
Born post BW	0.088*	-0.015	0.070
	(0.050)	(0.084)	(0.061)
Observations	52825	21215	35447
Mean of dep. var	68.229	68.44	68.196
	Panel B: DiD for White sons		
Born post BW	0.022	-0.009	0.006
	(0.030)	(0.043)	(0.044)
Observations	121747	36788	44600
Mean of dep. var	68.768	68.896	68.681
	Panel C: Black and White sons		
Born post BW * Black	0.113**	0.063	0.092
	(0.049)	(0.070)	(0.074)
Observations	174572	58003	80047
Mean of dep. var	68.605	68.729	68.465
Sample:	Full	Sig. cotton	High Black share

Notes: The unit of observation is a World War II enlistee. The data used in this table comes from *U.S. World War II Army Enlistment Records, 1938-1946* from the National Archives and Records Administration. Panels A and B of this table display estimates for Specification (1) in the text. Panel C provides estimates for Specification (3). All columns control for: county of residence at time of enlistment fixed effects, birth year fixed effects, and year of enlistment fixed effects. Panels A and B control for county specific time trends. Panel C controls for the triple difference interactions: county-by-race, birth year-by-race, and county-by-birth year fixed effects. *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level.

Table 10: Number of siblings born after the boll weevil

	Number of male children born after boll weevil					
	Home owner sample			Wage sample		
	(1)	(2)	(3)	(4)	(5)	(6)
Black	-0.016***	-0.000	-0.015***	-0.022***	-0.014	-0.027***
	(0.003)	(0.009)	(0.005)	(0.004)	(0.011)	(0.008)
Black * Sig. Cotton		-0.017*			-0.010	
		(0.009)			(0.012)	
Black * High Black			-0.001			0.006
			(0.007)			(0.010)
Observations	107485	107485	104266	54880	54880	53265
Mean of dep. var.	.21	.21	.212	.201	.201	.203

Notes: The unit of observation is fathers. The table presents results from estimating a regression where the dependent variable is the number of male children born to a father after the boll weevil. All columns control for initial county of residence fixed effects, father's age at initial census, and initial census enumeration year fixed effects. *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level.

Table 11: Schooling

	Years of Schooling					
	Home owner sample			Wage sample		
	(1)	(2)	(3)	(4)	(5)	(6)
	Panel A: DiD for Black sons					
Born post BW	0.064	0.104	0.123	0.034	0.073	0.131
	(0.098)	(0.099)	(0.110)	(0.179)	(0.182)	(0.201)
Observations	32030	29114	24971	13985	12554	10898
Mean of dep. var.	5.46	5.425	5.354	5.76	5.73	5.638
	Panel B: DiD for White sons					
Born post BW	0.034	0.048	0.043	0.031	0.033	0.077
	(0.056)	(0.063)	(0.088)	(0.085)	(0.100)	(0.111)
Observations	104000	84833	34076	47666	38683	16687
Mean of dep. var.	8.70	8.679	8.848	9.403	9.416	9.518
	Panel C: Triple differences					
Born post BW * Black	0.048	0.089	0.077	-0.017	0.067	0.026
	(0.129)	(0.137)	(0.150)	(0.169)	(0.186)	(0.217)
Observations	136031	113949	59047	61653	51239	27586
Mean of dep. var.	7.937	7.847	7.37	8.576	8.513	7.985
Sample:	Full	Sig. cotton	High Black Share	Full	Sig. cotton	High Black Share

Notes: The unit of observation is sons. Panels A and B of this table display estimates for Specification (1) in the text. Panel C provides estimates for Specification (3). All columns control for: father's initial county fixed effects, birth year fixed effects, birth order fixed effects, and census enumeration year fixed effects. Panels A and B control for county specific time trends using the county that we first observe the father in (i.e. the county they resided in when the 1900 or 1910 census was taken). Panel C controls for the triple difference interactions: county-by-race, birth year-by-race, and county-by-birth year fixed effects where "county" is the father's initial county of residence. Birth order is defined as in Table 2. Standard errors are clustered based on 40 bins of longitude. *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level.

A Data Appendix

A.1 Linking

To perform all of the linking we use the ABE algorithm, which is commonly used in economics and was developed by Abramitzky, Boustan, and Eriksson (Abramitzky, Boustan and Eriksson, 2012, 2014, 2019). This algorithm is similar to the algorithm used in Ferrie (1996) and Long and Ferrie (2013). We begin by adjusting first names for common nicknames and then standardize each first and surname using the NYSIIS algorithm, which transforms a name into a phonetic code. We then restrict our sample to individuals who are unique by NYSIIS first name, NYSIIS surname, birthplace, birth year, and race. Using these variables we search for the individual in the census we want to link them to. If we find a unique match we declare this observation to be a match. If we find multiple matches the observation is discarded. If we do not find a unique match we continue to search for individuals who match exactly on NYSIIS first name, NYSIIS surname, birthplace, and race, but we now allow birth year to differ by up to one year (e.g. if an individual in the 1910 Census is reported as being born in 1902 we will search for individuals in the 1940 Census with a birth year of 1901 and 1903). If still no unique match is found we continue to search for individuals who match exactly on NYSIIS first name, NYSIIS surname, birthplace, and race but we now allow birth year to differ by up to two years. The ABE algorithm is one of many algorithms currently used to link individuals across censuses. Other approaches include the Expectation-Maximization (EM) algorithm (Abramitzky, Mill and Pérez, 2020), machine learning approaches (Feigenbaum, 2016), and combinations of hand matched samples and computer programming (Bailey et al., 2020). Despite the variety of approaches, Abramitzky et al. (2019) show that automated approaches, including the ABE algorithm used in this paper, result in low false positive rates and similar coefficient estimates to a hand linked sample.

The results from this linking procedure are displayed in Appendix Table B.2. We begin with 403,744 Black fathers and 750,286 White fathers with sons under the age of

9 who were observed in either the 1900 or 1910 Censuses living in a county that would be invaded by the boll weevil in the next ten years. We were able to successfully link 22-24% of Black fathers and 28-29% of White fathers to the next census. We then located sons of successfully linked fathers that were 9 years of age or younger and born within 10 years of the boll weevil's arrival in their fathers' initial county. We linked these sons to the 1940 Census. We were able to successfully link 26% of Black sons and 35-36% of White sons to the 1940 Census. As show in Table B.2, the overall link rate for Black sons was 26% (32,031 out of 122,716), while it was 36% for White sons (104,000 out of 290,578). Our overall link rates are slightly higher than some papers in this literature because we do not link both forward (from the 1900, 1910 and 1920 censuses to the 1940 census) and backward (from the 1940 census to the 1900, 1910, and 1920 censuses) and then take the intersection of the two linked sets.[47] This, results in mechanically higher link rates and, likely, more false positives, which will bias our estimates towards zero if the false positives are uncorrelated with both the arrival of the boll weevil and sons' outcomes.

A.2 Sample Restrictions

We make several restrictions on who is included in our baseline sample our wage worker sample. Appendix Table B.4 shows how our sample is reduced from the home owner sample to the wage worker sample.

First, we exclude any individual that did not report wage or salary income. This could include individuals that were not employed or individuals that were self-employed. Census enumerators in 1940 were only supposed to record the wage and salary income earned as an employee.[48] This restriction reduces the sample by 33%.

Second, we exclude individuals that worked for public work relief programs, such

[47] Linking both forward and backward and taking the intersection is most applicable when one is not trying to link specific individuals. In our case, we have a specific set of sons that we are attempting to link.

[48] The instructions to census enumerators say to record wage or salary income "for work done as an employee, including public emergency project work, in 1939. Do not include the earning of businessmen, farmers, or professional persons derived from business profits, sale of corps, or fees" (Ruggles et al., 2021).

as the CCC or the WPA, were unemployed or not in the labor force. Individuals on work relief did receive a wage, but these wages were set by strict formulas and 75-80% of workers received the lowest wage on the scale (Bremer, 1975). [49] This restriction reduces the sample by 42% relative to the home owner sample.

Third, we exclude workers that worked less than 30 weeks in a year or reported being self-employed but also reported a wage or salary income. Individuals that worked less than 30 weeks in a year likely did not have a steady job. As just explained, census enumerators were not supposed to report income for self-employed individuals. Income might have been reported for self-employed individuals because they had a second job that paid them a wage or salary as an employee. Alternatively, some census enumerators might have mistakenly recorded income for individuals that they were not supposed to. Of individuals who report being self-employed but also report a wage, 68% are farmers. It is difficult to know how to interpret income for self-employed individuals so we exclude them from our analysis. This restriction reduces the sample by 54% relative to the home owner sample.

Finally, we exclude individuals that were in the top 1% of the weekly wage distribution. Census enumerators were supposed to top-code any individual with an annual income over $5,000 a year as having an income of $5,000. This practice was not universally followed as there are several individuals for whom income is over $5,000. We address these outliers by excluding individuals in the top 1% of the weekly wage distribution.[50] Appendix Figure B.2 displays a CDF of our weekly wage variable for our baseline sample, but it also includes the top 1 percentile of the weekly wage distribution. The vertical line is drawn at $76.92, which represents the 99th percentile weekly wages. Observations above this are excluded in our final wage worker sample. This restriction reduces the sample by 55% relative to the home owner sample.

Other papers that examine weekly wages from the censuses use similar approaches to determine who is included in the sample and how to address outliers. For example,

[49]We show the robustness of our results to the inclusion of both individuals that were on work relief and those that were unemployed or not in the labor force in Appendix Table B.14.

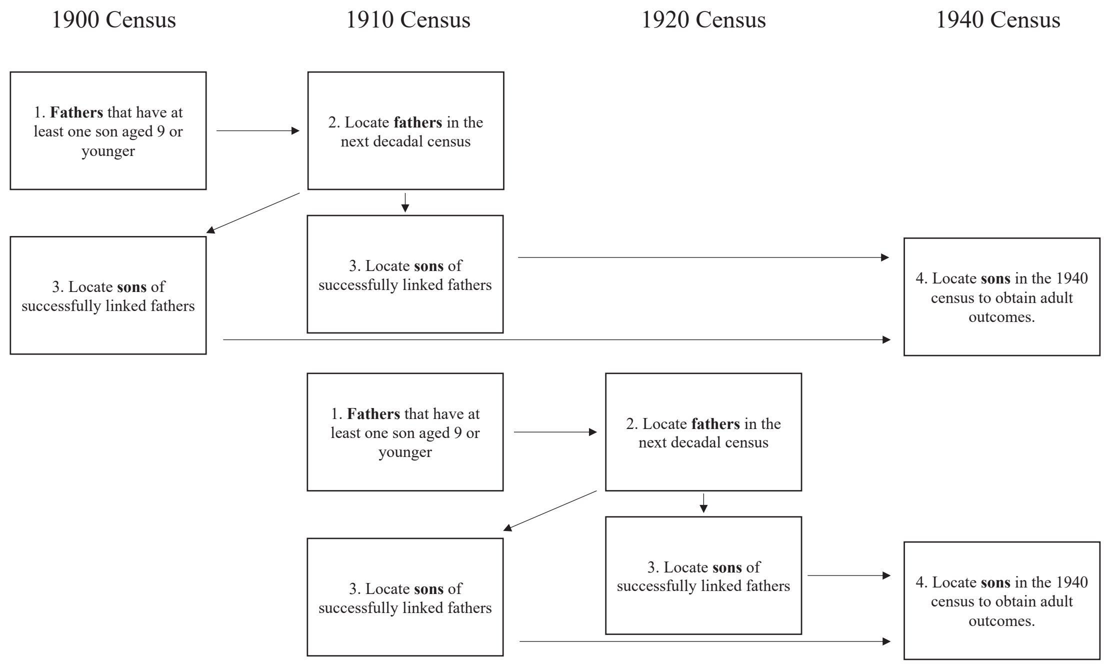
[50]For our sample, the 99th percentile of weekly wages is $76.92, so individuals with wages above this level are dropped from our analysis. Our results are not sensitive to this restriction.

Goldin and Margo (1992) and Margo (1995) compare wages across the 1940 and 1950 censuses. For the 1940 census, they include only wage or salary workers that worked more than 40 weeks in a year in their sample and impute incomes for those whose income was top-coded with 1.4 times the top code, which was $5,000 in 1940.[51] They also truncate the bottom of their distribution by omitting individuals whose weekly wage was less than $6. It is important to note that we compare wages within the 1940 census and, therefore, do not have to worry about wages being comparable across censuses.

[51] Acemoglu and Angrist (2000) take a similar approach when using the 1960-1980 censuses. They censor weekly wages at the 98th percentile and replace wages above this with 1.5 times the 98th percentile wage. Censoring takes outliers in the weekly wage distribution, which are largely White sons, and makes them even larger outliers. Nevertheless we show the robustness of our results to censoring in Appendix Table B.14.

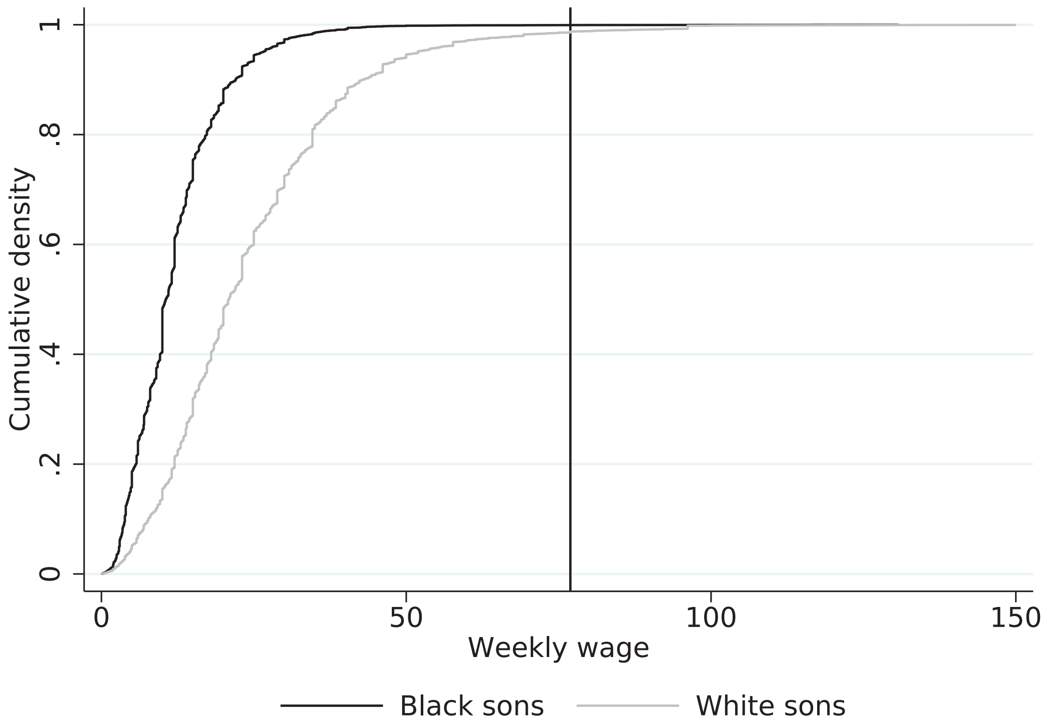
B Figure and Table Appendix

Figure B.1: Multi-step linking procedure



Notes: This figure displays our multi-step linking procedure.

Figure B.2: CDF of weekly wages by race



Notes: The graph shows a CDF of our weekly wage variable using our sample from Table 2, but without truncating the top three percentiles of the distribution. The vertical Black line in the figure is drawn at $76.92, which represents the 99th percentile of the weekly wage distribution and the point at which we truncate our data in the baseline sample.

Figure B.3: Years of schooling by birth cohort by race

Notes: This figure compares years of schooling for Black wage workers (Table 2, Panel A, columns 4-6) versus Black non-wage workers. It also compares years of schooling for White wage workers versus White non-wage workers.

Table B.1: Summary statistics

Sample:	Black		White	
	Home owner	Wage worker	Home owner	Wage worker
	(1)	(2)	(3)	(4)
	Panel A: Fathers			
Homeowner in first census	0.202	0.199	0.467	0.453
Homeowner in second census	0.264	0.258	0.556	0.541
Works in ag. in first census	0.746	0.725	0.656	0.609
Works in ag. in second census	0.668	0.651	0.610	0.557
Farm owner in first census	0.120	0.110	0.318	0.290
Farm owner in second census	0.148	0.137	0.352	0.317
Tenant farmer in first census	0.515	0.499	0.297	0.279
Tenant farmer in second census	0.434	0.426	0.220	0.205
Works in manufac. in first census	0.040	0.040	0.051	0.061
Works in manufac. in second census	0.067	0.069	0.053	0.064
Imputed income in first census	348.179	352.630	954.474	971.477
Imputed income in second census	379.625	384.010	1008.793	1028.962
Income rank in first census	9.033	9.336	48.344	49.052
Income rank in second census	9.668	9.823	47.785	48.690
Percent urban (1900) in first census	0.122	0.128	0.124	0.142
Percent urban (1900) in second census	0.180	0.188	0.157	0.176
Age in first census	33.730	33.796	34.335	34.244
Moved out of South	0.047	0.050	0.080	0.084
Moved out of state	0.235	0.238	0.289	0.289
Moved out of county	0.622	0.632	0.582	0.586
Literate in first census	0.634	0.642	0.908	0.918
Observations	26415	11594	81076	37360
	Panel B: Sons			
Homeowner	0.187	0.181	0.365	0.331
Works in ag.	0.341	0.193	0.275	0.087
Works in manufac.	0.170	0.267	0.176	0.291
Weekly wage	12.129	12.023	22.309	23.285
Income rank	31.524	36.918	51.760	60.675
Imputed income	461.940	502.120	1032.433	1101.927
Living in urban area	0.476	0.584	0.392	0.538
Age in 1940	31.158	30.969	31.507	31.332
Moved out of father's initial region (South)	0.176	0.184	0.127	0.152
Moved out of father's initial state	0.374	0.412	0.342	0.395
Moved out of father's initial county	0.827	0.864	0.771	0.825
Years of schooling	5.460	5.760	8.700	9.403
Observations	32031	13987	104000	47666

Notes: Weekly wages and imputed income are in 1939 dollars. Imputed incomes come from Collins and Wanamaker (2022).

Table B.2: Linking results by race

	1900-1910 Black (1)	1900-1910 White (2)	1910-1920 Black (3)	1910-1920 White (4)
Fathers with at least one son 9 or under	139,443	283,289	264,301	466,997
Linked fathers	33,437	80,755	59,373	128,555
(Match rate)	24%	29%	22%	28%
Sons of linked fathers born within 10 years of weevil's arrival in father's initial county	41,180	112,943	81,536	177,635
Linked sons of linked fathers	10,801	41,105	21,230	62,895
(Match Rate)	26%	36%	26%	35%

Notes: In this table we report the number of fathers that we attempted to link and the number of fathers that we actually linked. We then found all sons that were living in the households of successfully linked fathers and were under the age of 9 and attempted to link them.

Table B.3: Comparison of linked sons to sons attempted to link

	Black sons		White sons	
	Linked	Attempted to Link	Linked	Attempted to Link
Age at first census	4.094	3.901	4.288	4.044
In owner occupied housing†	0.244	0.231	0.529	0.505
In urban area	0.115	0.107	0.145	0.136
Father moved states	0.228	0.238	0.286	0.303
Father moved region	0.044	0.046	0.078	0.083
Father initially farmer	0.751	0.755	0.664	0.669
Observations	32031	122716	104000	290578

†: Owner occupied housing status is available for fewer observations than is reported in the table. There are 32,022 linked Black sons and 122,664 Black sons that we attempted to link that have owner occupied housing status. There are 103,908 linked White sons and 290,313 White sons that we attempted to link that have owner occupied housing status.

Table B.4: Sample sizes for home owner and wage worker samples

	Black sons (1)	White sons (2)	Total (3)
Born within 10 years of boll weevil, aged 0-9 in first census (Home owner sample)	32,031	104,000	136,031
Minus individuals with no reported wage	21,764	69,572	91,336
Minus individuals on work relief, unemployed, or not in labor force	18,129	60,134	78,263
Minus worked less than 30 weeks or self employed but reported income	14,002	48,372	62,374
Minus top 1% of wage distribution (Wage worker sample)	13,987	47,666	61,653

Notes: This table shows how we moved from our home owner sample, used in Table 2 columns 1-3, to our wage worker sample used in Table 2 columns 4-6.

Table B.5: The returns to migrating out of the South

	Log (weekly wage)					
†: Who moved?	Son	Father	Son	Father	Son	Father
	(1)	(2)	(3)	(4)	(5)	(6)
	Panel A: DiD for Black sons					
Born post BW	0.060**	0.068**	0.063***	0.067***	0.065***	0.074***
	(0.025)	(0.026)	(0.022)	(0.023)	(0.023)	(0.023)
Moved out of South†	0.697***	0.079*	0.573***	0.042	0.563***	0.164***
	(0.016)	(0.042)	(0.013)	(0.041)	(0.013)	(0.042)
Born post BW * Moved out of South†	-0.008	0.497***	-0.020	0.305***	-0.009	0.175*
	(0.033)	(0.102)	(0.031)	(0.097)	(0.031)	(0.097)
Observations	13985	13985	13985	13985	13194	13194
Mean of dep. var.	2.279	2.279	2.279	2.279	2.285	2.285
	Panel B: DiD for White sons					
Born post BW	-0.000	-0.007	-0.005	-0.009	-0.007	-0.008
	(0.014)	(0.012)	(0.012)	(0.010)	(0.012)	(0.010)
Moved out of South†	0.260***	0.107***	0.220***	0.079***	0.214***	0.117***
	(0.022)	(0.017)	(0.017)	(0.012)	(0.016)	(0.016)
Born post BW * Moved out of South†	-0.021	0.067***	-0.015	0.037*	-0.008	0.001
	(0.022)	(0.024)	(0.019)	(0.020)	(0.019)	(0.019)
Observations	47666	47666	47666	47666	44434	44434
Mean of dep. var.	2.948	2.948	2.948	2.948	2.94	2.94
	Panel C: Triple differences					
Moved out of South†	0.259***	0.105***	0.224***	0.077***	0.220***	0.109***
	(0.023)	(0.017)	(0.019)	(0.012)	(0.018)	(0.017)
Born post BW * Moved out of South†	-0.013	0.067**	-0.011	0.028	-0.006	-0.002
	(0.026)	(0.026)	(0.022)	(0.023)	(0.022)	(0.022)
Born post BW * Black	0.057*	0.069**	0.065**	0.067**	0.069**	0.076***
	(0.031)	(0.029)	(0.027)	(0.025)	(0.030)	(0.028)
Moved out of South† * Black	0.435***	-0.034	0.310***	-0.051	0.300***	0.019
	(0.027)	(0.050)	(0.024)	(0.046)	(0.025)	(0.049)
Born post BW * Moved out of South† * Black	0.006	0.403***	-0.037	0.232***	-0.029	0.162*
	(0.038)	(0.091)	(0.035)	(0.079)	(0.037)	(0.084)
Observations	61653	61653	61653	61653	57495	57495
Mean of dep. var.	2.796	2.796	2.796	2.796	2.79	2.79
Control for years of education			X	X	X	X
Drop sons whose fathers migrated but are observed in South in 1940					X	X

Notes: See notes for Table 2. Columns 1, 3, and 5 include interactions with a variable for migration of sons out of the South. Column 2, 4, and 6 include interactions with a variable for migration of fathers out of the South. *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level.

Table B.6: Selection into wage work

	Pr(Wage worker = 1)		
	(1)	(2)	(3)
	Panel A: DiD for Black sons		
Born post BW	-0.041***	-0.042**	-0.031**
	(0.013)	(0.015)	(0.015)
Observations	32030	29114	24971
Mean of dep. var.	.437	.431	.436
	Panel B: DiD for White sons		
Born post BW	0.001	-0.003	-0.003
	(0.006)	(0.007)	(0.014)
Observations	104000	84833	34076
Mean of dep. var.	.458	.456	.49
	Panel C: Triple differences		
Born post BW * Black	-0.034**	-0.029*	-0.018
	(0.015)	(0.017)	(0.016)
Observations	136031	113949	59047
Mean of dep. var.	.453	.45	.467
Sample	Full	Sig. cotton	High Black share

Notes: The unit of observation is sons. Panels A and B of this table display estimates for Specification (1) in the text. Panel C provides estimates for Specification (3). All columns control for: father's initial county fixed effects, birth year fixed effects, birth order fixed effects, and census enumeration year fixed effects. Panels A and B control for county specific time trends using the county that we first observe the father in (i.e. the county they resided in when the 1900 or 1910 census was taken). Panel C controls for the triple difference interactions: county-by-race, birth year-by-race, and county-by-birth year fixed effects where "county" is the father's initial county of residence. Birth order is defined as in Table 2. Standard errors are clustered based on 40 bins of longitude. *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level.

Table B.7: Occupational categories for non-wage workers

	Agri-culture	White collar	Skilled Blue collar	Semi-skilled Blue collar	Laborer	Log (imputed income)
	(1)	(2)	(3)	(4)	(5)	(6)
			Panel A: DiD for Black sons			
Born post BW	-0.039**	0.006	-0.002	0.028*	0.012	0.032**
	(0.018)	(0.005)	(0.007)	(0.015)	(0.017)	(0.013)
Observations	16076	16076	16076	16076	16076	15902
Mean of dep. var.	.509	.037	.037	.139	.247	5.981
			Panel B: DiD for White sons			
Born post BW	-0.009	-0.003	0.008**	0.013**	-0.008	0.022*
	(0.009)	(0.007)	(0.004)	(0.006)	(0.007)	(0.012)
Observations	51751	51751	51751	51751	51751	51269
Mean of dep. var.	.47	.185	.093	.119	.112	6.719
			Panel C: Triple differences			
Born post BW * Black	-0.028	0.005	-0.006	0.013	0.026	0.010
	(0.020)	(0.012)	(0.009)	(0.020)	(0.021)	(0.022)
Observations	67299	67299	67299	67299	67299	66635
Mean of dep. var.	.479	.15	.079	.123	.144	6.544

Notes: The unit of observation is sons. Only sons that are in our home owner sample, but not our wage worker sample are included in the table. Panels A and B of this table display estimates for Specification (1) in the text. Panel C provides estimates for Specification (3). The dependent variables in columns (1)-(5) are dummy variables that take a value of one if an individual falls into a certain occupational category as coded in the variable OCC1950 from IPUMS Ruggles et al. (2021). "White collar" includes professional, managerial, clerical, and sales occupations. "Skilled Blue collar" includes craftsman and a few service occupations (e.g. barbers and policemen). "Semi-skilled Blue collar" includes operatives and most service occupations. Panels A and B control for county specific time trends using the county that we first observe the father in (i.e. the county they resided in when the 1900 or 1910 census was taken). Panel C controls for the triple difference interactions: county-by-race, birth year-by-race, and county-by-birth year fixed effects where "county" is the father's initial county of residence. Birth order is defined as in Table 2. Standard errors are clustered based on 40 bins of longitude. *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level.

Table B.8: Other long-run outcomes

	Percentile in national income distribution	Log (annual income)	Weeks worked	Log (imputed income)
	(1)	(2)	(3)	(4)
	Panel A: DiD for Black sons			
Born post BW	2.154***	0.087***	0.446	0.037*
	(0.681)	(0.027)	(0.300)	(0.020)
Observations	13985	13985	13985	13985
Mean of dep. var.	36.921	6.128	47.485	6.144
	Panel B: DiD for White sons			
Born post BW	-0.257	-0.006	-0.157	0.003
	(0.354)	(0.012)	(0.122)	(0.012)
Observations	47665	47666	47666	47666
Mean of dep. var.	60.675	6.823	48.664	6.887
	Panel C: Triple differences			
Born post BW * Black	1.870**	0.079**	0.243	0.029
	(0.896)	(0.031)	(0.282)	(0.025)
Observations	61652	61653	61653	61653
Mean of dep. var.	55.285	6.666	48.397	6.719

Notes: The unit of observation is sons. Panels A and B of this table display estimates for Specification (1) in the text. Panel C provides estimates for Specification (3). All columns control for: father's initial county fixed effects, birth year fixed effects, birth order fixed effects, and census enumeration year fixed effects. Panels A and B control for county specific time trends using the county that we first observe the father in (i.e. the county they resided in when the 1900 or 1910 census was taken). Panel C controls for the triple difference interactions: county-by-race, birth year-by-race, and county-by-birth year fixed effects where "county" is the father's initial county of residence. Birth order is defined as in Table 2. *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level.

Table B.9: Home ownership and wages controlling for schooling

	Pr(Home-owner = 1) (1)	Log (weekly wage) (2)
	Panel A: DiD for Black sons	
Born post BW	0.019**	0.072***
	(0.009)	(0.023)
Observations	32030	13985
Mean of dep. var.	.187	2.279
	Panel B: DiD for White sons	
Born post BW	0.010	-0.006
	(0.006)	(0.011)
Observations	104000	47666
Mean of dep. var.	.365	2.948
	Panel C: Triple differences	
Born post BW * Black	0.025**	0.070***
	(0.011)	(0.025)
Observations	136031	61653
Mean of dep. var.	.323	2.796

Notes: The unit of observation is sons. Panels A and B of this table display estimates for Specification (1) in the text. Panel C provides estimates for Specification (3). All columns control for: years of schooling fixed effects, father's initial county fixed effects, birth year fixed effects, birth order fixed effects, and census enumeration year fixed effects. Panels A and B control for county specific time trends using the county that we first observe the father in (i.e. the county they resided in when the 1900 or 1910 census was taken). Panel C controls for the triple difference interactions: county-by-race, birth year-by-race, and county-by-birth year fixed effects where "county" is the father's initial county of residence. Birth order is defined as in Table 2. Standard errors are clustered based on 40 bins of longitude. *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level.

Table B.10: Robustness of TWFE estimates to alternative estimators and spatial standard errors

	Pr(Home owner = 1)					Log(weekly wage)				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A: DiD for Black sons										
Born post BW	0.018**	0.036***	0.010	0.018*	0.018	0.050**	0.032	0.039*	0.050***	0.050***
	(0.007)	(0.014)	(0.007)	(0.010)	(0.012)	(0.020)	(0.049)	(0.021)	(0.018)	(0.011)
Observations	32031	6435	32031	32031	32031	13987	4594	13987	13987	13987
Panel B: DiD for White sons										
Born post BW	0.007	0.016	-0.001	0.007	0.007	-0.006	-0.001	-0.009	-0.006	-0.006
	(0.006)	(0.011)	(0.006)	(0.006)	(0.005)	(0.013)	(0.020)	(0.013)	(0.012)	(0.013)
Observations	104000	8727	104000	104000	104000	47666	7468	47666	47666	47666
Method	TWFE	Callaway and Sant'Anna (2022)	Low cotton untreated	Spatial HAC: 100 km band-width	Spatial HAC: 200 km band-width	TWFE	Callaway and Sant'Anna (2022)	Low cotton untreated	Spatial HAC: 100 km band-width	Spatial HAC: 200 km band-width

Notes: The unit of observation is sons. Panels A and B of this table display estimates for Specification (1) in the text. All columns in this table, except for columns 2 and 7, use two-way fixed effects regression specifications without any additional control variables. Columns 2 and 7 use the estimator proposed by Callaway and Sant'Anna (2021) without any control variables. Columns 3 and 8 treated low cotton producing counties as being untreated by the boll weevil. Columns 4, 5, 9, and 10 use compute standard errors corrected for spatial autocorrelation (Conley, 1999). Standard errors are clustered based on 40 bins of longitude. *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level.

Table B.11: Robustness to spatial and temporal leads

	Pr(Home owner = 1)			Log(weekly wage)		
	(1)	(2)	(3)	(4)	(5)	(6)
	Panel A: DiD for Black sons					
Born post BW	0.019**	0.019	0.015	0.076***	0.099**	0.097**
	(0.009)	(0.016)	(0.009)	(0.026)	(0.042)	(0.037)
Observations	32030	32030	32030	13985	13985	13985
	Panel B: DiD for White sons					
Born post BW	0.010	-0.002	0.008	-0.003	-0.015	0.001
	(0.006)	(0.010)	(0.007)	(0.012)	(0.021)	(0.015)
Observations	104000	104000	104000	47666	47666	47666
	Panel C: Triple differences					
Born post BW * Black	0.026**	0.040*	0.017	0.074**	0.142***	0.073*
	(0.011)	(0.021)	(0.010)	(0.028)	(0.051)	(0.043)
Observations	136031	136031	136031	61653	61653	61653
	Baseline	Time leads	Spatial leads	Baseline	Time leads	Spatial leads

Notes: The unit of observation is sons. Panels A and B of this table display estimates for Specification (1) in the text Panel C provides estimates for Specification (3). All columns control for: father's initial county fixed effects, birth year fixed effects, birth order fixed effects, and census enumeration year fixed effects. Panels A and B control for county specific time trends using the county that we first observe the father in (i.e. the county they resided in when the 1900 or 1910 census was taken). Panel C controls for the triple difference interactions: county-by-race, birth year-by-race, and county-by-birth year fixed effects where "county" is the father's initial county of residence. Birth order is defined as in Table 2. Columns 1 and 4 show our baseline results. Columns 2 and 5 control for a dummy variable if an individual was born -4 to 0 years prior to the boll weevil's arrival in their fathers' initial county of residence. Columns 3 and 6 control for dummy variables for spatial leads. We control for the first year the boll weevil arrived at a county within 100-200 miles and 0-100 miles of the county an individual's father initially resided in. Standard errors are clustered based on 40 bins of longitude. *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level.

Table B.12: Alternative linking criteria

	Pr(Home owner = 1)				Log(weekly wage)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				Panel A: DiD for Black sons				
Born post BW	0.019**	0.015	0.008	0.015	0.076***	0.084**	0.091	0.123
	(0.009)	(0.011)	(0.020)	(0.025)	(0.026)	(0.040)	(0.055)	(0.081)
Observations	32030	20904	9484	5503	13985	8939	4012	2174
Mean of dep. var.	.187	.195	.193	.203	2.279	2.258	2.302	2.285
				Panel B: DiD for White sons				
Born post BW	0.010	0.013**	0.010	0.012	-0.003	-0.004	-0.000	0.002
	(0.006)	(0.006)	(0.013)	(0.013)	(0.012)	(0.014)	(0.023)	(0.025)
Observations	104000	83067	42722	33662	47666	37515	20032	15584
Mean of dep. var.	.365	.369	.373	.379	2.948	2.943	2.988	2.988
				Panel C: Triple differences				
Born post BW * Black	0.026**	0.033**	0.027	0.044	0.074**	0.099**	0.044	0.117
	(0.011)	(0.015)	(0.028)	(0.034)	(0.028)	(0.038)	(0.085)	(0.102)
Observations	136031	103762	51177	37570	61653	45829	22066	15348
Mean of dep. var.	.323	.334	.34	.355	2.796	2.812	2.884	2.92
Sample	Baseline	Unique name and age matches	Exact name and age matches	Exact and unique and and age matches	Baseline	Unique name and age matches	Exact name and age matches	Exact and unique and and age matches

Notes: The unit of observation is sons. Panels A and B of this table display estimates for Specification (1) in the text Panel C provides estimates for Specification (3). All columns control for: father's initial county fixed effects, birth year fixed effects, birth order fixed effects, and census enumeration year fixed effects. Panels A and B control for county specific time trends using the county that we first observe the father in (i.e. the county they resided in when the 1900 or 1910 census was taken). Panel C controls for the triple difference interactions: county-by-race, birth year-by-race, and county-by-birth year fixed effects where "county" is the father's initial county of residence. Birth order is defined as in Table 2. Standard errors are clustered based on 40 bins of longitude. *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level.

Table B.13: Outcomes not conditional on linking fathers

	Pr(Home-owner = 1)	Log(weekly wage)
	(1)	(2)
	Panel A: DiD for Black sons	
Born post BW	0.003	0.011
	(0.006)	(0.014)
Observations	96278	42413
Mean of dep. var.	.189	2.225
	Panel B: DiD for White sons	
Born post BW	0.001	-0.004
	(0.003)	(0.007)
Observations	368793	170875
Mean of dep. var.	.365	2.925
	Panel C: Triple differences	
Born post BW * Black	0.003	0.028*
	(0.007)	(0.015)
Observations	465071	213288
Mean of dep. var.	.329	2.785

Notes: The unit of observation is an individual. Panels A and B of this table display estimates for Specification (1) in the text Panel C provides estimates for Specification (3). The sample used in this table is from linking all individuals under the age of 9 directly from the 1900, 1910, and 1920 censuses to the 1940 census. We then made the sample comparable to our baseline sample. See the text for more details. All columns control for: county fixed effects, birth year fixed effects, and census enumeration year fixed effects. *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level.

Table B.14: Alternative weekly wage samples

	Log(weekly wage)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Panel A: DiD for Black sons						
Born post BW	0.076***	0.069**	0.064**	0.053*	0.073***	0.075***	0.048
	(0.026)	(0.026)	(0.024)	(0.030)	(0.024)	(0.026)	(0.132)
Observations	13985	14997	14900	11907	13985	14000	2419
Mean of dep. var.	2.279	2.279	2.281	2.276	2.32	2.281	2.245
	Panel B: DiD for White sons						
Born post BW	-0.003	-0.004	-0.002	0.009	-0.003	-0.000	0.061*
	(0.012)	(0.012)	(0.012)	(0.013)	(0.012)	(0.013)	(0.031)
Observations	47666	50580	49811	42374	47666	48372	10570
Mean of dep. var.	2.948	2.91	2.935	2.969	2.964	2.97	2.932
	Panel C: Triple differences						
Born post BW * Black	0.074**	0.070**	0.060**	0.054	0.067**	0.070**	0.262*
	(0.028)	(0.030)	(0.027)	(0.034)	(0.027)	(0.029)	(0.140)
Observations	61653	65579	64712	54283	61653	62374	7669
Mean of dep. var.					2.818		2.831
Restrictions	Baseline	Include work relief	Include unemployed and not in labor force	Work 40 or more weeks	Adjust farm laborer wages for perquisites	Wages censored at $100	Brothers

(Table B.14 continued)

*Notes:*The unit of observation is sons. Panels A and B of this table display estimates for Specification (1) in the text Panel C provides estimates for Specification (3). Column 1 uses our baseline sample, which includes wage workers that were in the labor force, not on work relief, not unemployed, and worked more than 30 weeks in the year. We truncate our baseline sample of wage workers at the 97th percentile of weekly wages. Column 2 includes workers on work relief. Column 3 includes workers that were unemployed or not in the labor force, but reported a wage for the previous year. Column 4 restricts the baseline sample to individuals that worked more than 40 weeks in the year. Goldin and Margo (1992) use this restriction as well as replacing incomes above $5,000 with 1.4 times $5,000, or $7,000. We chose not to do this winsorizing because we are comparing Black and White incomes and almost no Black incomes are above $5,000. Column 5 uses information from Collins and Wanamaker (2021) to adjust the wages of farm laborers for perquisites that they received in the form of room and board. In particular, we scale farm laborers weekly wages up by 26%, which is the amount of perquisites for farm laborers in 1940. Column 6 censors weekly wages at $100 and replaces wages about $100 per week with $100. We selected $100, because a worker who worked 50 weeks in a year earning $100 a week, would have an annual income of $5,000 a year, which is the top coded annual income in the 1940 census. Column 7 uses a sample of brothers and father fixed effects. We define brothers as male individuals who report having the same father in the census. The coefficient estimates in column 7 are identified by sets of brothers where at least one brother was born prior to the arrival of the boll weevil in their father's initial county and at least one brother was born after. All columns control for: father's initial county fixed effects, birth year fixed effects, birth order fixed effects, and census enumeration year fixed effects. Panels A and B control for county specific time trends using the county that we first observe the father in (i.e. the county they resided in when the 1900 or 1910 census was taken). Panel C controls for the triple difference interactions: county-by-race, birth year-by-race, and county-by-birth year fixed effects where "county" is the father's initial county of residence. Birth order is defined as in Table 2. Standard errors are clustered based on 40 bins of longitude. *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level.

Table B.15: Intergenerational mobility - Income rank; no county fixed effects

	(1)	(2)	(3)	(4)
	Panel A: Rank in income distribution for Black sons			
Born post BW	0.835	0.648	1.386*	-0.483
	(0.561)	(0.634)	(0.756)	(0.786)
Father income rank (initial)	0.128***		0.137***	
	(0.023)		(0.027)	
Father income rank (final)		0.147***		0.130***
		(0.019)		(0.022)
Father income rank (initial) * Born post BW			-0.063	
			(0.057)	
Father income rank (final) * Born post BW				0.128**
				(0.062)
Observations	13001	12706	13001	12706
Mean of dep. var.	36.89	36.626	36.89	36.626
	Panel B: Rank in income distribution for White sons			
	(1)	(2)	(3)	(4)
Born post BW	-0.948**	-0.603	0.134	-2.072**
	(0.385)	(0.402)	(0.775)	(0.888)
Father income rank (initial)	0.145***		0.150***	
	(0.010)		(0.011)	
Father income rank (final)		0.151***		0.145***
		(0.007)		(0.008)
Father income rank (initial) * Born post BW			-0.022	
			(0.015)	
Father income rank (final) * Born post BW				0.030*
				(0.018)
Observations	43221	41538	43221	41538
Mean of dep. var.	60.309	60.128	60.309	60.128

Notes: The unit of observation is sons. This table display estimates for Specification (4) in the text. All columns control for: birth year fixed effects and census enumeration year fixed effects. Standard errors are clustered based on 40 bins of longitude. *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level.

Table B.16: Intergenerational mobility - Home ownership

	Panel A: Pr(Home owner = 1) for Black sons			
	(1)	(2)	(3)	(4)
Born post BW	0.017**	0.016**	0.019**	-0.006
	(0.007)	(0.007)	(0.008)	(0.008)
Father homeowner (initial)	0.052***		0.053***	
	(0.005)		(0.006)	
Father homeowner (final)		0.094***		0.078***
		(0.007)		(0.008)
Father homeowner (initial) * Born post BW			-0.006	
			(0.012)	
Father homeowner (final) * Born post BW				0.080***
				(0.017)
Observations	32031	32031	32031	32031
Mean of dep. var.	.187	.187	.187	.187
	Panel B: Pr(Home owner = 1) for White sons			
	(1)	(2)	(3)	(4)
Born post BW	0.007	0.008	0.004	-0.023***
	(0.006)	(0.006)	(0.005)	(0.007)
Father homeowner (initial)	0.074***		0.072***	
	(0.005)		(0.005)	
Father homeowner (final)		0.095***		0.082***
		(0.007)		(0.007)
Father homeowner (initial) * Born post BW			0.007	
			(0.007)	
Father homeowner (final) * Born post BW				0.056***
				(0.012)
Observations	104000	104000	104000	104000
Mean of dep. var.	.365	.365	.365	.365

Notes: The unit of observation is sons. This table display estimates for Specification (4) in the text. All columns control for: father's initial county fixed effects, birth year fixed effects, and census enumeration year fixed effects. Standard errors are clustered based on 40 bins of longitude. *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level.