
ECONtribute
Discussion Paper No. 195

**From Plantations to Prisons: The Race Gap in
Incarceration After the Abolition of Slavery in
the U.S.**

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August 2022

www.econtribute.de



From Plantations to Prisons: The Race Gap in Incarceration After the Abolition of Slavery in the U.S.

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Abstract

This paper documents the emergence of a race gap in incarceration after the abolition of slavery in the U.S. Counties that relied more on slave labor incarcerated more African Americans, with no comparable effects for whites. An increase of slave reliance by 10% increases black incarceration rates by 1.8-per-1,000. This effect is associated with an increased use of prison labor. Consistent with this, I show that arrests increase before cotton harvesting and incarceration declines after exogenous shocks that decrease the demand for labor. I find no evidence for supply-side mechanisms, according to which former slaves commit more crimes.

(JEL J15, J47, K31, N31, N91, N92)

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“Slaves went free; stood a brief moment in the sun; then moved back again toward slavery” (Du Bois & Lewis, 1999).

1 Introduction

Following the abolition of slavery in 1865 in the United States, African Americans were twice as likely as white Americans to be incarcerated. Now this ratio has tripled. While today’s racial disparity in the criminal justice system has been of increasing interest to economists, we know very little about the emergence of this race-based gap. This paper explores how the unfulfilled labor demand of the plantation economy after the end of slavery shaped the historically disproportionate representation of African Americans in the justice system.

After the abolition of slavery, most planters had difficulties satisfying their demand for labor.¹ Previously, enslaved people were an inexpensive workforce that made Southern agriculture lucrative (Wright, 2013; Fogel & Engerman, 1974). However, the Civil War marked the end of this slave-based labor system. Even though, agriculture faced various other difficulties, including the loss of livestock, fences, and barns, the largest concern to farmers was the lack of a system to ensure an adequate supply of labor. Evidence on how this labor demand was met remains anecdotal. Historian David Oshinsky, in his history of the Mississippi prisons, argues that white Southern elites were able to re-create the antebellum institutions by taking advantage of the 13th Amendment, which abolished slavery, *except as a punishment for a crime*. Thus, black men were convicted for minor offenses and sent to prison farms and chain gangs to secure labor (Oshinsky, 1997).

Thus, this is the first article that empirically asks whether the emerging race gap in incarceration can partly be attributed to the use of the justice system to satisfy labor demands in response to the loss of formerly enslaved workers. Specifically, I begin by documenting the relationship between the reliance on slave labor prior to the abolition and the incarceration rates for Blacks and Whites immediately after the abolition of slavery, and in each subsequent census year. When doing so, I control for a rich set of pre-existing differences in 1860 that might be related to the development of slavery. I find that counties that were more reliant on slave labor disproportionately incarcerated more African Americans. Going from the county at the mean (Richmond, Virginia), to the county one standard deviation above (Madison, Alabama) increases the black incarceration rate by 0.36 per 1,000 population. I find no evidence that the abolition of slavery increased the share of whites in prison.

The second part of the paper sheds light on the mechanisms underlying the race gap in incarceration. I distinguish demand-side mechanisms, including the use of prisoners as labor to replace slave reliance, from supply-side mechanisms, according to which former slaves commit more crimes due to poor economic conditions. I present empirical evidence in support of a demand-side

¹Some former slave owners, those "who had dealt honorably and humanely towards their slaves," were able to retain many of their former field hands (Alston & Ferrie, 2007).

story. Using manually transcribed and geocoded data on the types of prisons from the Department of Labor, I examine the relationship between former reliance on slave labor and the nature of the post-Civil War prison institutions. I document that places that relied more on slave labor, i.e., where there was a greater shock to labor supply, were significantly more likely to have post-Civil War convict camps. Moreover, these effects are even stronger for those types of prison institutions that provided the most intensive labor: chain gangs, lumber prison camps, and farm prison camps.

A causal interpretation of the demand-side mechanism comes from exploiting exogenous shocks to the demand for labor. In particular, I exploit three shocks to test whether counties that experienced an almost random decrease in their need for workers, exhibited a decrease in the number of people incarcerated. These shocks include: *i*) the establishment of agricultural stations in the South, which allowed the diffusion of advanced practices and promoted the introduction of labor-saving technologies (Kantor & Whalley, 2019); *ii*) the arrival of the Boll Weevil cotton pest, which adversely affected its production, lowering the demand for cotton pickers (Clay *et al.*, 2018); and *iii*) the Mississippi River flood. Hornbeck & Naidu (2014) show that flooded counties experienced mechanization in agricultural practices. I find that black incarceration rates were lower in counties where workers were replaced with labor-saving technologies. Again, I do not find evidence of an effect on white incarceration rates.²

These results are complemented by an event study in which I relate arrests to the seasonality of cotton harvesting in the State of Georgia. I present evidence that right before the cotton-picking months there is a significant increase only in the arrests of African Americans, and not white Americans, in counties with higher suitability for growing cotton. I take this set of findings as evidence for the use of black prisoners to provide labor.

However, securing cheap labor, not only came in the form of African Americans being sent to prison, but also in the use of the justice system as a threat for keeping African Americans under coercive working relationships such as sharecropping and tenant farming arrangements.³ Wilson (1933) documents how workers were legally bound to their landlords, and that the punishment for leaving their contracts consisted of serving time in prison. Accordingly, I show that counties that relied more on slavery (after conditioning on the number of black prisoners) had more sharecropping contracts and fewer farms owned by African Americans.

Next, I present a set of empirical exercises that allow me to partially rule out a supply-side mechanism in which the widespread poverty after the Civil War pushed African Americans

²The results are robust for possible migration patterns during the Great Migration.

³The percentage of lands rented is the largest in the Cotton Belt, where tenants' farms constituted 50% to 90% of the number of farms. Outside the Cotton Belt, in the Corn Belt, and the wheat areas of the western plains, tenant farmers contributed to less than 25% of the number of farmers. Furthermore, the nature of the rental contracts varied geographically. The Census of Agriculture shows that in the Mississippi Delta, 95% of the rented farms were owned by landlords who lived inside the same county. Whereas for counties that were not reliant on slavery the corresponding percentage was 65%. The proportion of the landlords who reported farming as their regular occupation varied as well. It was smaller in the Southern counties when compared to the North, which suggests a higher need for agriculture supervision in the South (Bureau of Agricultural Economics. Farm Ownership and Tenancy (1930).)

to disproportionately commit crimes (in the spirit of [Becker \(1968\)](#)).⁴ First, I document that African Americans were more likely to be charged for minor offenses against “good morals” such as loud talking and being out at night. Second, I show that even though the cotton pest worsened economic conditions, incarceration rates for African Americans did not increase. Finally, I show that the incarceration rates for free blacks before the abolition of slavery caught up with those of former slaves. This suggests that the economic advantage of free blacks was thwarted by the emerging institutions that sought to control the labor force. These sets of results are hard to reconcile with a mechanism in which African Americans were committing more crimes to secure their means of support.

A battery of tests confirms the robustness of the findings. First, I focus on counties that are likely to be similar in unobservable characteristics. To do that, I restrict the sample to the set of neighboring counties that border a county with differing proportions of slaves. This enables me to compare the effects of slavery across places that are geographically and arguably also politically, economically, and culturally similar. Furthermore, in a related exercise, I compare counties along the Mason-Dixon line that divides the slave-holding states from the North. Along this border, there is a discontinuous change in the prevalence of slavery, but otherwise, counties share similar characteristics. I find that even within fairly geographically concentrated areas, there are strong and statistically significant differences in black incarceration rates. Second, in a falsification test, I argue that if the main effects are genuinely attributable to the prevalence of slavery, then there should be no differences in incarceration outcomes between counties in the South that were largely non-slaveholding, and counties in the North, where slavery did not exist. The expectation is confirmed, suggesting that the local prevalence of slavery, rather than the institutional setting drives the results. Third, I use a cotton suitability index to capture exogenous variation in the reliance on slave labor in an instrumental variable approach. The intuition behind this instrument is that slave labor demand increased with the importance of cotton. Cotton plantations required specific climatic conditions that are arguably exogenous to the treatment of African Americans in the justice system, conditional on socio-economic and geographic county characteristics. Crucial for identification, I show that cotton suitability only affects prison rates in counties with a positive number of slaves, indicating that when there is no slavery, cotton suitability does not directly affect prison rates. Instrumenting slave-labor reliance with suitability for growing cotton produces results consistent to the OLS estimations.

This paper contributes to the literature on the emergence of the black and white incarceration gap in the U.S. Previous work with regard to the slave-labor experience and the racial disparities in the justice system is based on sporadic anecdotal evidence. We know, however, from an increasing number of studies the causes of the disproportionate representation of blacks in the justice system today. Work by [Rehavi & Starr \(2014\)](#) documents that black males tend to face longer prison terms than whites arrested for the same crimes, even after controlling by case and defendant characteristics. [Anwar *et al.* \(2012\)](#) find evidence that jury pools convict black defendants

⁴See for instance [Bignon *et al.* \(2017\)](#). They exploit the phylloxera crisis between 1863 and 1890 that destroyed about 40% of French vineyards to study the impact on property crime rates.

significantly more often than white defendants. But when the jury pool includes at least one black, conviction rates are almost identical. Nevertheless, the roots of this phenomenon have been relatively understudied. Thus, this paper aims to make progress on this agenda. To the best of my knowledge, this is the first systematic study of the racial disparities in incarceration since the first time African Americans faced the justice system. A recent exception includes [Eriksson \(2019\)](#), who shows that blacks that migrated to the north during the 1920s were more likely to end up in prison.

This paper also speaks to the well-established theoretical debate on the relationship between labor scarcity/abundance and coercion ([Acemoglu & Wolitzky, 2011](#)). [Domar \(1970\)](#)'s seminal paper argues that coercion is more likely when labor is scarce. While the "neo-Malthusian" theory of feudal decline claims that coercive labor relations started to decline when labor became scarce following the black death ([North, 1971](#); [Habakkuk, 1958](#)). My paper is part of a recent growing literature that analyzes empirically these theories. Using data from the British West Indies, [Dippel *et al.* \(2020\)](#) show that a lower plantation owners' power was associated with a decline in coercion (incarceration rates), and an increase in agricultural wages. Contrary to this, [Archibong & Obikili \(2021\)](#) find that positive economic shocks increased incarceration rates in British colonial Nigeria. However, my results are closely related to the work by [Naidu & Yuchtman \(2013\)](#). They demonstrate that labor scarcity led to higher criminal prosecutions for contract breaches in the XIX century in Britain. Here, I analyze empirically how the shortage in cheap labor that came with the abolition was fulfilled through the justice system.

In addition, my results contribute to understanding the rapid recovery of the White Southern households after one of the largest episodes of wealth compression in history: the nullification of slave wealth after the US Civil War. [Ager *et al.* \(2021\)](#) document that Southerners that owned more slaves in 1860 lost substantially more wealth by 1870, relative to Southerners that had been equally wealthy before the war. Yet, their sons almost entirely recovered from this wealth shock by 1900, and their grandsons completely recovered by 1940. Their explanation is related to how marriage networks and connections to other elite families may have aided them to catch up, whereas skills appear less relevant. This paper adds another explanation by proposing the continued access to cheap labor as a factor in the post-war recovery.

Finally, this paper relates to the literature on the legacy of slavery in the U.S. Several economists have documented the persistent impact of slavery on economic inequality. [Bertocchi & Dimico \(2014\)](#) show that the transmission channel from slavery to racial inequality is through human capital accumulation. [Mitchener & McLean \(2003\)](#) find that slavery had a strong and persistent effect on productivity levels, measured as income per worker across the U.S. in the 1880-1980 period. [Lagerlöf \(2009\)](#) documents a negative relationship between slavery and current

income at the county level for a sample of former slave states.⁵ However, this is the first study that relates slavery to the subsequent treatment of African Americans in the judicial system.

The remainder of the paper is organized as follows. Section 2 describes the historical institution of slavery and its abolition. Section 3 presents the data. Section 4 traces out the OLS estimated impact of slavery on the black-white incarceration gap. Section 5 provides extensive evidence regarding the robustness of the results to omitted variables, including an IV analysis. Section 6 turns to the mechanisms, using information on convict camps and reverse shocks to the demand for labor. Section 7 concludes.

2 Background

2.1 Slavery in the US

Slavery was introduced in the American colonies in the 17th century by the British, and served to recruit and regulate the unfree workforce forcibly imported from Africa. In 1619, the first enslaved Africans arrived at the Virginia Colony, and marked the beginning of a fundamental part of the U.S. history. With an ideal climate and available land, property owners in the southern colonies began establishing plantation farms. To meet the demand for labor they relied on slave workforce. [Fogel & Engerman \(1974\)](#) describe large plantations as “rigidly organized as in a factory” that made cotton growing so profitable that the number of slaves increased from 700,000 in 1790 to 4 million in 1860. This institution became crucial that historian Barbara Fields has written, that slavery was “the central organizing principle of society” ([Fields, 1982](#), p.143). Estimates suggest that if the Confederacy had been a separate nation, it would have been ranked as the fourth richest in the world at the start of the Civil War ([Fogel & Engerman, 1974](#)). In addition, slave wealth served as a collateral asset, and represented a significant share of Southern wealth. It facilitated planters’ mobility by maintaining credit relationships across distances, and the payment of debts because of their liquid character. [González *et al.* \(2017\)](#) documents the role of slave wealth in the formation of businesses. By the start of the war, the South was producing 75 % of the world’s cotton and creating more millionaires per capita in the Mississippi River Valley than anywhere in the nation ([Wright, 2013](#)).

2.1.1 Imprisonment during slavery

Imprisonment was not a suitable punishment for blacks in the antebellum South because it would have deprived the plantation owner of the labor of his slave ([Sellin, 1976](#)). Rather, the antebellum penitentiaries of slave states were meant to confine criminals from the master class. For instance, in 1850, in the Alabama penitentiary, there were 167 white males, 1 white female, and 4 free

⁵Other related evidence from outside the US studies the legacy of slavery. For instance, [Nunn \(2008\)](#) shows that those African countries that exported the most slaves are comparatively poorer today. [Nunn & Wantchekon \(2011\)](#) show a negative relationship between an individual’s reported trust and the number of slaves taken from the individual’s ethnic group during the slave trades. In Brazil, [Valencia *et al.* \(2022\)](#) and [Soares *et al.* \(2012\)](#) document a strong relationship between slavery and modern levels of inequality. In Peru, [Dell \(2010\)](#) shows how the Mita colonial system of forced mining in Peru and Bolivia continues to have negative impacts today. [Buonanno & Vargas \(2019\)](#) investigate the long-run effects of slavery on economic inequality and crime in Colombian municipalities.

colored persons. Local jails were a place for pre-trial slave detention, or to house runaway slaves until their owners could be located. Instead, slave-owners legitimized their domestic disciplinary violence and protected their property rights. Because slaves owned no property and had no ability to pay fines, corporal punishment (whipping) was the most common penalty (Sellin, 1976).

2.2 The Abolition of Slavery (1865)

The Civil War and the passage of the 13th Amendment marked the end of slavery in the U.S. Outside of the District of Columbia, southerners were not compensated for the forfeiture of their slave wealth.⁶ Thus, the emancipation proclamation stripped slave owners of their slaves, and the market value of these assets, leading to one of the largest ever destructions of wealth in the United States. As one Georgia planter bemoaned in 1866, “by our defeat, we have lost [...] millions in the emancipation of our slaves, we have virtually lost [everything]” (Bryant, 1996, p. 113). Although few southerners had their lands confiscated, land holdings also substantially declined in value, particularly in cotton-growing areas that had been dependent on slave agriculture. Ager *et al.* (2021) estimate that taken together, the wealth held by white southerners fell by 38% at the median and by 75% at the 95th percentile from 1860 to 1870. Much of this loss came from plantation farms (Wright, 2013).⁷

It is worth mentioning that slave prices increased steadily from 1850 to 1860, suggesting no anticipation of the abolition of slavery. In particular, Calomiris & Pritchett. (2016) argue that the decline in slave prices through early 1861 reflected concerns about wartime disruption and taxation, rather than fears about the expropriation of slave property; they rest their argument on the fact that they find no differential price decline for slave children, who would only have become profitable if owned for many years.

2.2.1 Agriculture arrangements and the penal system after slavery was abolished

With the ratification of the 13th Amendment in 1865, which abolished slavery throughout the nation, the penal laws of southern states became applicable to all offenders regardless of race. The 13th amendment explicitly authorized slavery or “involuntary servitude” as a punishment for crime. Historians suggest that, as a response, white elites established local laws and institutions for securing cheap labor — the so-called “Black Codes”. Former slave states enforced these codes, many of which were enacted shortly after abolition in 1866. They were designed to control the mobility of free black men and restrict their economic opportunities. One subset

⁶The cost of national emancipation through compensation, rather than through war, would have been very high; the estimated value of all slave wealth was \$2.7 billion in 1860, more than 50 percent of the annual GDP (Goldin & Lewis, 1975). However, in other parts of the Americas, the abolition of slavery compensated slave owners with cash or labor time. In other cases, the abolition was gradual, so slave owners did not face a dramatic shock to their wealth (Robinson & Acemoglu, 2008).

⁷Income per capita of the South fell to about 50% of the U.S GDP. Income per capita remained at half the average until the 1940s when it finally began slowly to converge (Wright, 1986, p.70). While the North developed large manufacturing sectors, the South remained primarily agricultural. The South had very low rates of urbanization (around 9% as opposed to 35% in the Northeast) and relatively little investment in infrastructure. For example, the density of railroads (miles of track divided by land area) was three times higher in Northern than Southern states (Wright, 1986).

of these laws criminalized vagrancy, which made it illegal to loiter or appear out of work without written evidence of it. The failure to have “lawful employment” was punishable by arrest and imprisonment. These codes also allowed prisons to lease out their inmates as low-cost laborers to local farms (Naidu, 2010). Furthermore, blacks were excluded from juries and endured extreme punishment for minor crimes. These sentences often included hefty sums that blacks could not pay (Acharya *et al.* , 2016). Anecdotal evidence describes how African Americans were randomly captured by rural whites, who falsely accused them of failing to pay their debts. Then they used the court system to extract labor under a system called peonage, or debt bondage, in which prisoners were “leased out” by the state to private farmers or companies, guaranteeing in this sense, the provision of black labor. It is this anecdotal evidence that I empirically test in the mechanism section.

The need to secure cheap labor from previously enslaved blacks was most dire for plantation owners living in areas that had high slave concentrations. This demand for cheap labor now had to be negotiated with freedmen. The Bureau of Agricultural Economics (*BAE*)⁸ reports that after the abolition of slavery, landowners lacked access to the banking system, and did not have liquid assets, making it difficult to set up a wage system. As a result, landowners established sharecropping and tenant farming arrangements. Under the sharecropping system, the landlord typically supplied the capital to buy the seed and equipment needed to sow, cultivate, and harvest a crop, while the sharecropper supplied the labor. Consistent with this, Steward *et al.* (1923) present the share of farmers in each tenure class from 1900 to 1930. The highest difference is for ownership. Most of the counties formerly reliant on slave labor adopted sharecropping labor arrangements. In particular, the percentage of lands rented is the largest in the Cotton Belt, where tenants’ farms constituted from 50% to 90% of the number of farms. Outside the Cotton Belt, in the corn belt, and the wheat areas of the western plains, tenant farmers contributed to less than 25% of the number of farmers. White tenants also existed, but they were more common in the Upperland of the Carolinas, Georgia, and Alabama. Furthermore, the nature of the rental contracts varied geographically. The 1920 Census of Agriculture shows that in the Mississippi Delta, 95% of the rented farms were owned by landlords who lived inside the same county. Whereas for counties that were not reliant on slavery the corresponding percentage was 65%. The proportion of the landlords who reported farming as their regular occupation varied as well. It was smaller in the Southern counties when compared to the North, which suggests a higher need for agriculture supervision in the South (Black & Allen, 1937). These sharecropping arrangements, however, were subject to liability problems, high-interest rates, unpredictable harvests, and unscrupulous landlords that kept black tenants severely indebted. Laws favoring landowners made it difficult, or even illegal, for sharecroppers to sell their crops to others besides their landlord, or prevented sharecroppers from moving because otherwise, they were subject to arrest (Wilson, 1933). In addition, most of the lynchings were directed toward African Americans looking to purchase land, which was seen by many at this time as being important for economic independence (Acharya *et al.* , 2016).

The US Commissioner of Labor (1885-1905) claims that prison labor was by far less expensive

⁸Report on Farm Ownership and Tenancy (1930).

than other sorts of labor. They estimate that the cost of prison labor was just 19% of the cost of free labor (Department of Labor, 1887, 1906, 1925). This is consistent with the theoretical framework of [Robinson & Acemoglu \(2008\)](#), who argue that the Southern land elites exercised de facto political power to compensate for the loss of their de jure political power, and therefore invested in alternative mechanisms to maintain control.⁹

Thus, the end of the Civil War saw an increase in correctional facilities and prison population. The southern penal system consisted of three types of institutions: state prison buildings, which resembled those in the North, the county chain gang, and the state prison farm. They were built within plantations, near coal mines and pine forests where turpentine was extracted, and close to railroads. In addition, punishment in the post-Civil War era also included a county system of hiring out vagrants and petty offenders to local farmers ([Wilson, 1933](#)).

Together with this, convict labor was introduced during the Reconstruction period (1865-1877) when the US government was trying to revive the economy of the former Confederate states. Convict labor also spread to the Northern states.¹⁰ By the end of the presidential term of Rutherford Hayes (1877-1881), this system was introduced in almost all states and was very profitable ([Wines, 1871](#)). The largest prison farms were located in Texas, Arkansas, Louisiana, and Mississippi. Nearly 250,000 acres of land in the United States were under cultivation by convicts. Texas alone had 83,407 acres farmed by prisoners, raising products that were valued in 1927 at \$1,362,958. Louisiana had an income from its prison system of \$1,557,715. This income from the forced labor of prisoners helped to keep down tax rates on the big plantations ([Wilson, 1933](#)). There was also a great deal of construction work done by convicts for government institutions ([Garret, 1929](#)).

2.2.2 Systems for employing prisoners

The most important systems were the "contract", the "state account", "state use", "public work", and "lease". The "contract" system was one of the oldest systems to be introduced. As early as 1867, prison contractors were flourishing in all prisons. Under this system, a private businessman or a firm contracted with the state for the use of a certain number of convicts. The private contractor then set up machinery in the prison and provided tools and materials. The state fed, sheltered, and guarded the prisoners for the contractor, who sold the products made by the convicts in the market. In the "state account" system, the state went into this practice on its own. There is anecdotal evidence of the state setting up dummy companies to market goods for them ([Wilson, 1933](#), p 39). Under the "state use" system, convict-made goods were not sold in open markets but consumed in the state's institutions. With regard to the "public work" system, convicts were used in construction or repair work, such as on roads. Finally, the "lease" was the most used convict system in the US. It worked by renting or hiring convicts out entirely to the

⁹Ager (2013) finds that the southern elite used the facto power (as proxied by pre-war relative wealth) to maintain their economic and political status after the Civil War.

¹⁰In prisons in southern states, working times were between 12 and 16 hours, whereas in northern states and in other parts of the country, the day's work was frequently eight or nine hours ([Wilson, 1933](#)).

custody of a private business or company.¹¹ The contractor had complete authority to guard, feed, discipline, and exploit convicts. This system grew after the Civil War. Prior to that time, convicts in the South were white workers. But after the abolition of slavery, the prison population rapidly became Black. African Americans were convicted for minor crimes and hired out to contractors. As a result, some historians claim that this system was a move by the ruling class to secure forced labor on a large scale as a partial substitute for chattel slavery (Wilson, 1933, p 40).

The chain gang, one of the penal institutions of the South, was the most brutal type of convict force labor in the United States. Historians argue that the chain gang was one of the devices developed by the former slaveholders to put the newly freed African Americans back into bondage. Consistent with this, one of the qualifications to get a job as a guard was to know how to handle former slaves (Wilson, 1933, p 72). In addition, the convict system provided monetary incentives to the police and judicial system (Sharkey & Patterson, 1933). There is anecdotal evidence that police would “round up idle blacks in times of labor scarcity” and that sheriffs were directly asked to arrest more people before the cotton harvest season (Oshinsky, 1997; Cohen, 1976).¹²

The majority of the convict population was black, about 85% to 90% Convict labor peaked around 1880, as it was used to supply labor to farming, railroads, mining, and the timber industry. By 1886, 70% of the prisoners were working as convict-laborers (45,277 of the nation’s 64,349).¹³

3 Data

3.1 Data Sources and Sample

The main analysis sample includes all counties that belonged to the 11 former Confederate States. I focus on the Southern states because slavery was not allowed in the Northern states by 1860. There are approximately 1,000 counties included; however, there is some variation in this number across censuses because some counties were divided over time.

To study the effect of slavery on black incarceration, I combine data from several sources. First, I use official decennial Census records from the *Integrated Public Use Microdata Series* (IPUMS)

¹¹A detailed list of companies and businesses that engaged in hiring convict labor can be found in the Convict Labor Records from the US Bureau of Labor Statistics.

¹²The sheriff and court officials in many states paid per arrest and conviction. For instance, in 1929, the sheriff of Bolivar county (Mississippi) – a cotton producer county, received \$24,350.70, while other sheriffs received \$20,000 a year (Wilson, 1933). The *The New York Times* for example, wrote on September 26, 1931:

LITTLE ROCK, ARK.—Police action to force unemployed men to help pick this year bounteous cotton crop today had extended from Helena, in Eastern Arkansas, to Bowie County, Texas, on the southwestern border. Helena and Phillips County officers already have started a drive to get cotton pickers to the fields by threats of vagrancy charges and Bowie officials today said a similar campaign would start the next Monday. Cotton planters in various sections of the State have complained that they were unable to obtain an adequate number of pickers, despite an unusually large number of unemployed persons. They attributed the situation to the prevailing low rate of 30 to 40 cents per hundred pounds being paid to cotton pickers, but said a higher price could not be paid because of the low price of cotton. Several truckloads of Negroes were captured and sent out to the cotton fields. The sheriff and other officers followed to see that none escaped.

¹³15,100 were engaged in prison duties, and 3,972 were sick or idle. Convict leasing persisted in various forms until it was abolished by Franklin Roosevelt in 1941.

spanning the period 1850-1940 to calculate the number of prisoners by race in each county.¹⁴

This information is complemented with historical prison archives on the location (state and county), the number of prisoners, the race of the prisoners, and the type of correctional facility (prison, jail, workhouse, or chain gang). These come from the *Department of Commerce* (Crime, Pauperism, and Benevolence) report for the years 1880, 1890, 1904, and 1910. Additional official data are taken from the *Department of Labor*. As competition between convict labor and free labor was a widely discussed topic at that time, the Bureau of Labor decided to inspect all penitentiary facilities to determine the level of competition between the goods produced under convict labor and the goods produced by free workers.¹⁵ The data include all prisons, houses of correction, and convict labor camps, as well as juvenile reformatories and industrial schools, and allow me to identify the presence of convict labor in a correctional facility. I use all of the available reports for the following years: 1886, 1895, 1905, and 1923. Then I matched all prisons and convict labor camps by name and location to their corresponding county in 1860. Thus, I can establish the relationship between slavery and the presence of these institutions. I do this by assigning GPS coordinates and then county FIPS codes for each of them.¹⁶ The coordinates' allocation was performed with Google APIs Maps. By using a Python program, Google Maps looks for every address and assigns coordinates at the county level; in 3% of the cases, Google found more than two results for a place, so coordinates were allocated manually based on whether the place was at some point a correctional facility. Overall, the dataset contains 460 different correctional facilities for every year for which data is available. Appendix Figures A3 and A4 include excerpts of these data sources. The next subsections describe in detail the construction of the main variables.

3.2 Construction of Variables

Imprisonment data. I use the full universe of prisoners from 1860 to the 1940 Census from the Integrated Public Use Microdata Series (IPUMS-USA) database. Following [Eriksson \(2019\)](#) and [Lochner & Moretti \(2004\)](#), prisoners are identified combining different variables. First, I use the group quarters type of residence in the Census, which indicates if the individual is in a correctional facility. Second, I only count individuals reporting a relationship to the household head as "Prisoner" or "Inmate". Third, people classified as Inmates in the occupation are also counted as prisoners. I rule out guards, watchmen, and doorkeepers.¹⁷ I create a dummy variable equal to 1 if the respondent is a prisoner in a correctional institution. I aggregate the data to the race and county level to construct the prison population in county c and census year t .¹⁸

¹⁴IPUMS collects, preserves and harmonizes U.S. census microdata. Data can be requested [here](#). The completed census forms for 1890 were lost in a fire thus data is unavailable for this census year.

¹⁵Data was collected by the Bureau of Labor employees who traveled directly to prisons and filled out the surveys according to the accounting books provided by prisons. Only the data for the 1895 report was obtained not in person but through mail: prison warders filled out the survey themselves.

¹⁶County FIPS codes are five-digit codes that uniquely identify counties in the United States.

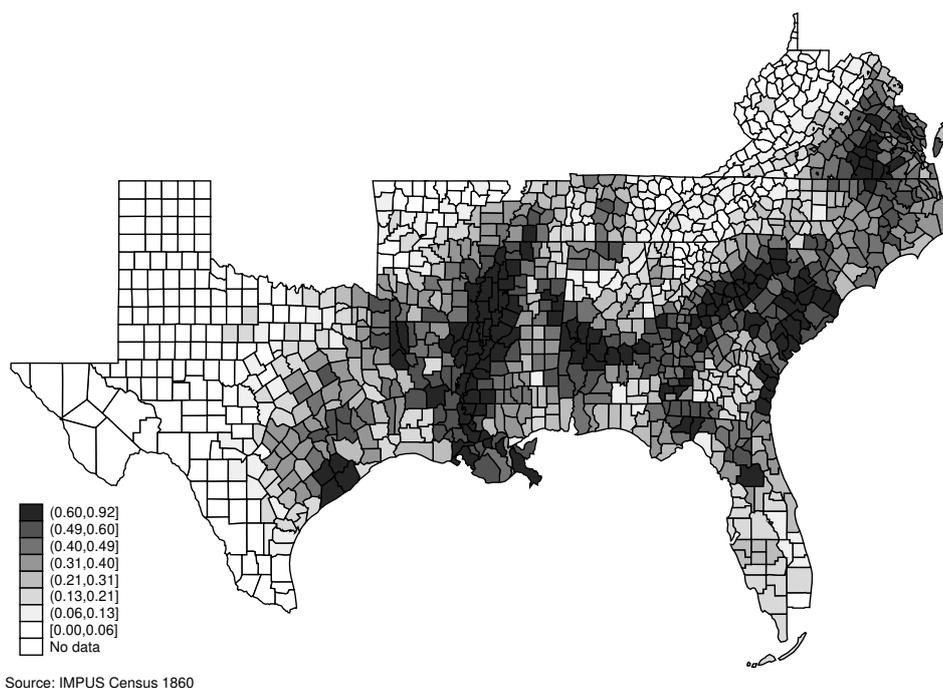
¹⁷The average prisoner-to-staff ratio was 11, with Arkansas and Louisiana having the highest ratios of 40 and 35, respectively.

¹⁸When constructing the incarceration rates, counties with less than 5 prisoners are removed from the sample because they make for incarceration rates of 500 or 1000 per 1,000 population. A robust check with other numbers of prisoners is performed as well.

Slavery. To measure slavery, I use the proportion of each county’s 1860 population that was enslaved, measured by the 1860 Census. This measure represents the last record before slavery was abolished in 1865. Figure 1 shows that there is considerable variation in the intensity of slavery. Darker shaded counties were more reliant on slave labor. Slavery spread from Virginia to Mississippi, in what scholars call the Black Belt, and alongside the Mississippi River. In the average Southern county, 29% of the population was enslaved in 1860, with a minimum value of 2%, and a maximum value of 92%. There was also substantial variation within states in the prevalence of slavery. For instance, in Benton County, in the northwest corner of Arkansas, 4.1% of the population was enslaved, whereas in Chicot County, in the southeast corner of Arkansas, 81.4 % of the population was enslaved. By the 1860 Census, there were approximately 4 million slaves. In particular, I use the number of slaves in the 1860 Census, and I divide it by the total population in that county:

$$ShareSlaves_c^{1860} = \frac{Number\ of\ Slaves_c^{1860}}{Total\ population_c^{1860}}$$

Figure 1: Geography of Slavery: slaves as share of population in 1860 counties



Note: This figure plots the explanatory variable - the intensity of slavery. It corresponds to the proportion of each county’s 1860 population that was enslaved, as measured by the 1860 US Census. Darker counties are counties with higher prevalence of slavery.

Controls.

Motivated by the possibility that slave-reliant counties were systematically different from other counties, I control for trends in pre-existing differences in 1860 that might be related to the development of slavery. The baseline set of covariates includes controls for county size (in acres), population, average farm value per acre of improved land, total acres of improved land, presence of railways, presence of waterways, the proportion of small farms, a measure for terrain ruggedness,

and land inequality.¹⁹ In addition, I control for variables that might proxy for the treatment of slaves before the abolition. These variables are the proportion of the county's free black population in the 1860 census, the percentage of votes for the democratic party in 1860, the mortality rates of slaves relative to whites in 1860, and the number of slaves per house. These variables were taken from the Historical, Demographic, Economic, and Social Data (ICPSR 2896). Finally, I take into account the monetary rewards offered to slave catchers for returning fugitive slaves as an indicator of the local law enforcement practices.²⁰

3.3 Descriptive Statistics

Table 1 gives an overview of the key variables. Panel A shows that 29% of the Southern population was enslaved by 1860, and 1.1% of the black population was free. For the entire studied period (1870-1940), African Americans were overrepresented in the prison population. They were 24% of the population in the US south but accounted for 39% of the total inmate population. In the average county, incarceration for African Americans was 4.16 per 1,000 population, while the same ratio for whites was 1.68. The average county reported 51 prisoners; the range was from 0 to 5857 (which I scale by population in the empirical analysis). Panel B shows that in about 4.23% of the counties, there was a prison; 60% had a jail; 23% had a chain gang, 30% a farm prison; and 6% a railroad prison. Panel C shows that in about 25% of counties, there was a railroad, and 34% were located next to a river.

Figure 2 demonstrates the evolution of the black and white incarceration rates from 1850 to 1940. The blue solid line represents the black incarceration rate, while the green dashed line represents the white incarceration rate. Before the abolition of slavery, if anything white Americans had higher incarceration rates compared to free blacks. However, after the abolition of slavery, the gap between African Americans and Whites started growing.

¹⁹There are also parallel trends on these variables for counties that highly relied on slavery compared to counties that did not.

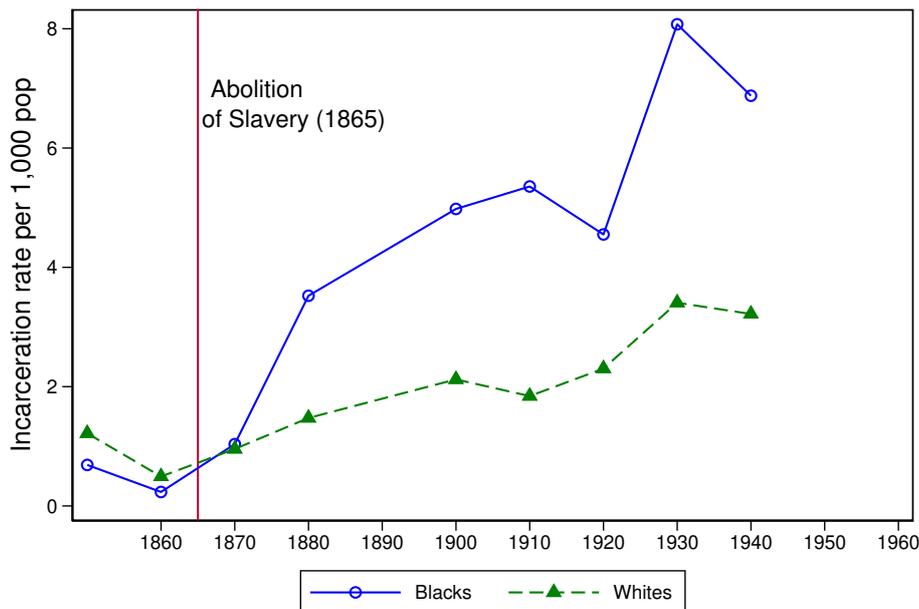
²⁰Data for the rewards was taken from [Dittmar & Naidu \(2012\)](#). In a complementary exercise, I use data on slave transactions from Louisiana for the period 1719-1820. I show that the characteristics of the slaves for high- versus low-reliant slave counties are not statistically different in terms of gender and price paid by slave owners. This might be an indication that incarceration rates, later on, are not driven by persistent characteristics in regions with a higher incidence of slavery.

Table 1: Descriptive Statistics

Panel A: Prison and pop. variables	(1)	(2)	(3)	(4)	Below slavery mean	Above slavery mean	t-test
	Mean	Std. dev.	Min	Max			
Proportion of slaves 1860	0.29	0.23	0	0.92			
Incarcerated pop.	51.55	234.88	0	5857	43.42	56.74	***
Incarcerated black pop.	22.44	106.6	0	2098	15.06	27.15	***
Incarcerated white pop.	29.06	153.71	0	3806	28.31	29.54	
Free black pop. 1860	0.01	0.025	0	0.26	0.008	0.013	***
Share of blacks in pop.	0.24	0.23	0	0.93	0.1	0.33	***
Share of whites in pop.	0.75	0.23	0.06	1	0.89	0.66	***
Share of prisoners who are black	0.39	0.37	0	1	0.23	0.49	***
Share of prisoners who are white	0.6	0.37	0	1	0.76	0.5	***
Black incarceration rate (per 1,000)	4.16	11.07	0	127.7	3.12	4.07	***
White incarceration rate (per 1,000)	1.68	5.32	0	58.69	1.3	1.9	***
Panel B: Type of correctional facility							
Prison (=1)	4,23%				1,42%	6,78%	***
Jail (=1)	59,57%				58,46%	60,58%	
Chain gang (=1)	22,79%				14,97%	19,88%	***
Lumber (=1)	3,81%				1,40%	4,83%	***
Farm (=1)	30%				19,43%	40,09%	***
Railroad (=1)	6,04%				5,35%	6,76%	
Reformatory (=1)	1,09%				0,70%	1,40%	
Panel C: County characteristics measured in 1860							
Land inequality 1860	0.47	0	0.78		0.47	0.48	***
Farm value 1860	187.65	0	1066.48		157.89	229.68	***
Slave mortality rate 1860	1671.57	0	10752.69		1583.21	1739.52	***
% Democratic vote	10.40	0	97		13.32	7.59	***
Rail presence (=1)	0.25	0.40			13.32	7.59	***
River presence (=1)	0.35	0.48			0.29	0.43	***

Note: This table shows the summary statistics at county level. Panel A presents the measures for slave labor reliance, incarcerated population by race, free blacks before the abolition of slavery, share of blacks in the population, shares of inmates by race, and incarceration rates for the period 1870-1940. All the variables are presented as the average across years for this period at county level. Panel B displays the type of correctional institutions for the same period. Panel C includes characteristics of counties measured in 1860. Source: IPUMS Census and Department of Labor.

Figure 2: Black-white incarceration rate 1850-1940 in the US South



Note Prisoners are counted as the number of males (non-wardens) living in group quarters corresponding to correctional institutions by the time of the decennial census. The incarceration rates are calculated by dividing the total inmate population for each race by their corresponding population at the county level for the Southern states. Before the abolition of slavery the incarceration rates for African Americans include only the free black population. Source: IPUMS.

Furthermore, Figure A1 shows that there was not only a racial gap at the extensive margin, but also at the intensive margin. Using an 1890 census component of "Crime and Pauperism", I show that African Americans received longer sentences for the same type of crimes compared to whites in the Southern States. Unfortunately, I do not have micro-data to see how this gap evolves over time, nor how it is related to the prevalence of slavery, as the data is only available at the state, and not the county level. Ignoring the intensive margin implies that the interpretation of the results presented in this paper may actually be a lower bound of the effect of slavery on the race gap in incarceration.

4 Slavery and Post-abolition Incarceration Gap

In this section, I first present the empirical strategy for tracing the impact of slavery on the black and white incarceration rates after slavery was abolished. I then discuss the main results, and show that the results are robust to alternative measures of black incarceration.

4.1 Empirical Strategy

I start by documenting the correlation between slavery measured in 1860 and black incarceration after the abolition of slavery. To do that, I estimate the following equation for every census year²¹:

$$Y_{cs} = \beta ShareSlaves_{cs}^{1860} + \mathbf{X}_{cs}^{1860} \gamma + \psi_s + \epsilon_{cs} \quad (1)$$

Y_{cs} represents the various measures for black incarceration in the U.S. at county level c and state s . $ShareSlaves_{cs}^{1860}$ denotes the share of slaves in a county c and state s in 1860 (5 years before the slavery abolition). I am using the intensity of slavery in 1860 in each county regardless of whether the county split into smaller counties afterward. As a robustness check, I estimate my results by using counties that did not split over time. $\mathbf{X}_{cs}^{1860} \gamma$ includes variables measured in 1860. In particular, I control for factors that may correlate with slave intensity in 1860. First, since wealthier and larger counties may have relied differently on slave labor, I control for economic indicators. These controls include county size (in acres), average farm value, the proportion of small farms, and a measure of land inequality. These variables proxy for the degree of workforce required for agriculture. In addition, I control for characteristics related to trade and commerce, including indicators for whether the county had access to rail and steamboat-navigable rivers or canals, and the ruggedness of the county terrain, which was crucial for agricultural markets, and therefore could have influenced the slave force used in different counties.

To account for the possibility that counties may have had different norms about race, I use different proxies for antebellum attitudes of whites towards slavery. Since comprehensive data on racial views are not available in the antebellum period, I instead look for measures that might be consequences of such attitudes. The first is the percentage of votes for the Democratic Party in 1860. At this time, the Democratic Party was the racially conservative party while the

²¹An alternative specification includes a difference in difference model that looks before and after the abolition of slavery, and that allows for the inclusion of county fixed effects. Results remain consistent.

Republican Party was the racially progressive party, which could have affected the subsequent treatment of African Americans in the justice system.²² Second, I include a measure for the relative mortality of slaves to whites. In particular, I use the natural log of the ratio of the slave mortality rate to the white mortality rate. Negative racial attitudes could have led white planters and farmers to increase the mortality of slaves, either directly through violence or indirectly through overwork, undernourishment, and poor medical care. Third, I use the average occupant size of slave quarters on farms as a proxy for slave treatment. Across the South, the average slave quarters housed around five individuals, though this number varied considerably. The idea is that planters with more extreme negative racial attitudes might provide less housing for their slaves, which would be measured as a higher occupancy in the average slave dwelling. I also control for the proportion of the free black population before slavery was abolished. Finally, I control for state fixed effects, which capture differences in the treatment of African Americans across states that can be attributed to different laws in the justice system.²³ Standard errors are clustered at the state level.²⁴

The main assumption in my identification strategy is that after including a series of control variables, I am able to take into account the possible unobserved variables that might be related both to the intensity of slavery and black incarceration rates and that could lead to biased estimators. However, it remains possible that low and high slavery areas differ in unobservable characteristics that affect both the prevalence of slavery and the treatment of African Americans in the justice system. I address this concern in Section 5 through a number of robustness checks that make the 'treated' and 'control' counties more comparable. In addition, I use an Instrumental Variable approach that exploits exogenous variation in slavery intensity driven by the county's suitability for growing cotton.

4.2 Baseline OLS Results

Figure 3 shows that after the abolition of slavery, there was an increased and persistent effect on black incarceration rates. The figure displays the OLS estimates of equation (1), where I estimate the effect of slavery separately for each census. Estimates are indistinguishable from zero for 1870, indicating that slavery's effects on black incarceration rates did not appear five years after the abolition of slavery. This is consistent with the Reconstruction period (1865-1877), in which attempts were made to redress the inequities of slavery and its political, social, and economic

²²Slavery was abolished under the first Republican President of the US - Abraham Lincoln. By around 1950, the Democratic party moved towards a civil rights platform (Acharya *et al.*, 2016).

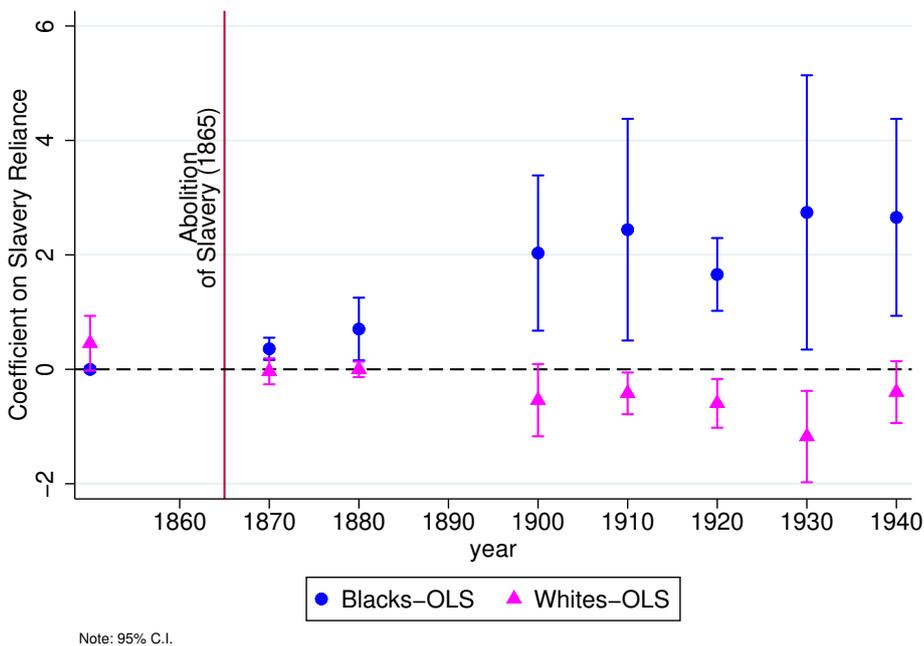
²³For instance, the Black Codes in the Southern States were restrictive laws designated to limit the freedom of African Americans. Some states required Blacks to sign yearly labor contracts; if they refused, they risked being arrested. Mississippi and South Carolina were the states to enact the first Black codes. Mississippi's law required Blacks to have written evidence of employment for the coming year each January. In South Carolina, a law prohibited Blacks from holding any occupation other than farmer or servant unless they paid an annual tax of \$10 to \$100. In both states, Blacks were given heavy penalties for vagrancy, including forced plantation labor in some cases (Du Bois & Lewis, 1999).

²⁴There are only 14 states in my analysis. For this reason, I also present bootstrapped standard errors in the next section.

legacy.²⁵ However, the effects of slavery on black incarceration rates emerge in 1880, with these effects being statistically significant and persistent until 1940.

The effect is quantitatively important. Overall, an increase of slave reliance by 10% significantly rises the black incarceration rates by 1.8 per 1,000 population (with a mean of 4.16). The point estimates imply that in 1880 the magnitude of the effect represents 0.86 more Blacks in prison, which increases to 3.3 more Blacks in prison by 1940. To account for the fact that there are only 14 states, and that this might be a concern for reliable inference, I follow [Cameron & Miller \(2015\)](#) to estimate the main specifications with bootstrapped standard errors.

Figure 3: The effect of slave labor reliance on black and white incarceration rates



Note: Dots represent the point estimates that relate incarceration rates by race against reliance on slave labor (the beta coefficient from equation 1). The regressions control for trends in county characteristics measured before the abolition of slavery. State fixed and year fixed effects are included. Standard errors are bootstrapped, and confidence intervals at 95 percent are presented. In an alternative specification, I have included the interaction of slavery reliance with year effects to allow for the inclusion of county fixed effects as well, and the results remain consistent.

Importantly, the estimates for Whites are indistinguishable from zero until 1910, then if anything they become negative. Furthermore, looking at the point estimates for blacks and whites at the same time provides a piece of evidence to understand the type of unobservable characteristics that might be related to slavery and incarceration rates. For instance, if general unobserved economic conditions were driving the results, we would expect to see similar effects for Blacks and Whites, and this is not the case.

Now, looking at these results more closely, Table 2 presents the estimates underlying Figure 3

²⁵For instance, The Freedmen’s Bureau was created in 1865 to provide aid to 4,000,000 newly freed African Americans in their transition from slavery to freedom.

for black and white incarceration rates for each census year in a different panel. Column 1 reports the estimates for Blacks without controls, while columns 2 and 3 include economic controls and proxies for attitudes towards Blacks, respectively. The coefficient of interest is stable across specifications even after additional covariates are included, suggesting a small amount of selection on observables. In addition, it alleviates the concern that slavery might simply be proxying to geographical, economic, or political factors that continue affecting black incarceration.²⁶ In particular, the effect of slavery does not disappear while controlling for measures proxying for white attitudes towards African Americans. Columns 4-6 of Table 2 show that slavery did not have an effect on white incarceration rates. This indicates that there was not a generalized increase in incarceration in counties that were more reliant on slavery, but that the increase occurred only for African Americans.

In addition, I address the potential issue of spatial autocorrelation in the residuals that is presented by Kelly (2019). The main concern here is that neighboring places tend to have similar values of residuals, and this raises the question of whether the explanatory power of some persistence regressions might be a consequence of fitting spatial noise that reflects deep structural characteristics of slavery. In other words, pro-slavery counties are likely to be surrounded by other pro-slavery counties, and when looking at the legacy of slavery on another variable, it is likely that again neighbors will resemble neighbors, leading to correlations. The Moran statistic for the main specification is $z = 1.23$; thus it is not possible to reject the null hypothesis that there is zero spatial correlation.²⁷

Finally, one natural concern regarding this historical period is migration. Does migration to the north confound these estimates? Migration of African Americans to the North started around 1915 prompted by the confluence of rising labor demand in northern factories during World War I and a temporary freeze on immigration from Europe, which encouraged northern employers to consider alternative sources of labor supply (Abramitzky & Boustan, 2017). Abramitzky & Boustan (2017) show that fathers employed in both low- and high-skill positions were more likely to have sons who migrated to the north, as compared with fathers in mid-skill occupations. Unskilled workers had the strongest incentive to leave the South, where pay for low-skilled work was low. High-skilled Black migrants may have been particularly motivated by the political and social freedoms available in the North. All of these together suggest that, if anything, the positive sample selection will attenuate the possibility that there was more crime because of economic conditions, and instead the results present a conservative estimation of the effect of slavery on incarceration rates. However, even if the Great Migration might be an issue for my analysis, it is worth emphasizing that the effects of slavery are seen in 1880 and persisted over the next 50 years – i.e. even before migration. Moreover, a robustness check that replicates the main results using an alternative dependent variable –the number of African Americans in prison relative to the size of the prison population– confirms these findings. Migration would affect these dependent

²⁶Section 5 presents a discussion on omitted variables by using the Altonji *et al.* (2005)'s and Oster (2019)'s approaches. In addition, I present a series of exercises in which I aim to make treated and controlled counties more comparable.

²⁷To calculate the Moran statistic I used 5 neighbors as in Kelly (2019).

Table 2: The effect of slave labor reliance on black and white incarceration rates

	Black incarceration rate			White incarceration rate		
Panel A: All Sample	Mean, dep. Var=4.16; N=6,719			Mean, dep. Var=1.68; N=6,719		
Proportion Slaves	1.598*** (0.243)	1.604*** (0.164)	1.586*** (0.205)	0.599* (0.332)	0.585** (0.287)	0.456* (0.243)
Panel B: Census 1870	Mean, dep. Var=1.03; N=845			Mean, dep. Var=0.95; N=845		
Proportion Slaves	0.379* (0.198)	0.399 (0.215)	0.358 (0.280)	-0.001 (0.198)	-0.078 (0.095)	-0.035 (0.159)
Panel C: Census 1880	Mean, dep. Var=3.54; N=907			Mean, dep. Var=1.54; N=907		
Proportion Slaves	0.834*** (0.304)	0.836** (0.335)	0.704*** (0.201)	-0.001 (0.000)	-0.001 (0.016)	-0.001 (0.070)
Panel D: Census 1900	Mean, dep. Var=5.11; N=942			Mean, dep. Var=2.27; N=942		
Proportion Slaves	2.085*** (0.624)	2.153*** (0.520)	2.032*** (0.522)	-0.648*** (0.155)	-0.539* (0.303)	-0.539** (0.248)
Panel E: Census 1910	Mean, dep. Var=5.68; N=965			Mean, dep. Var=1.88; N=965		
Proportion Slaves	2.036*** (0.400)	2.510*** (0.530)	2.440*** (0.639)	-0.385** (0.187)	-0.431** (0.177)	-0.421* (0.231)
Panel F: Census 1920	Mean, dep. Var=4.70; N=1,022			Mean, dep. Var=2.39; N=1,022		
Proportion Slaves	1.615*** (0.276)	1.727*** (0.268)	1.658*** (0.379)	-0.412** (0.164)	-0.480*** (0.134)	-0.595* (0.320)
Panel G: Census 1930	Mean, dep. Var=8.77; N=1,022			Mean, dep. Var=3.39; N=1,022		
Proportion Slaves	2.142** (1.044)	2.657*** (0.855)	2.742** (1.393)	-1.307*** (0.330)	-1.310*** (0.345)	-1.176** (0.533)
Panel H: Census 1940	Mean, dep. Var=7.28; N=1,022			Mean, dep. Var=3.21; N=1,022		
Proportion Slaves	1.729** (0.695)	1.913*** (0.735)	2.656** (1.062)	-0.440* (0.257)	-0.342 (0.294)	-0.398 (0.405)
Econ. controls	No	Yes	Yes	No	Yes	Yes
Inst. controls	No	No	Yes	No	No	Yes

Note: Panel A presents the point estimates from equation 1 (pooled) that related incarceration rates to slave labor. Therefore, year fixed effects are included. The regression also controls for trends in county characteristics measured before the abolition of slavery. Panel B-H corresponds to the point estimates of the reliance on slave labor on incarceration rates for the Census years 1870 to 1940. State-fixed and year-fixed effects are included. Standard errors are bootstrapped. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

variables in different ways. To the extent that the size of the prison population is determined by the demand for labor – a mechanism I return to later – the alternative dependent variable should be less sensitive to migration. The baseline, however, would be more sensitive in the later years to the extent that the denominator is getting smaller. Figure A2 plots estimates where the dependent variable is the share of Blacks and Whites in the prison population. A similar pattern is observed: there is an increase in the share of Blacks sent to prison relative to White prisoners, but the effect starts to decrease after the Great Migration in 1915. Therefore, migration could explain the increasing pattern in magnitudes in the post-migration periods. As a result, I am more confident about the estimates presented from 1880 to 1910 because during that period there was not an

important out-migration of African Americans from Southern states to Northern states.²⁸

5 Strategies to Deal with Potential Omitted Variable Bias

Even though I have included controls for economic characteristics and attitudes towards African Americans, it still remains possible that there are unobservable variables that are related both to the presence of slavery and incarceration rates that would bias the main results. For instance, counties that were more reliant on slavery could have had different institutions by which law enforcement affected differently incarceration rates. This subsection first provides evidence that the selection on unobservables is not a concern for the estimates presented in Section 4.2. Second, it presents an Instrumental Variable (IV) strategy, which instruments for 1860 slavery intensity with cotton suitability.

5.1 Counties that are Likely to be Similar on Unobservables

a. Comparing neighboring counties (in the South)

I restrict the sample to the set of neighboring counties that border a county in which the proportion of slaves differs by more than 10% to 40%. For instance, in column 1 of Table 3, I keep the sample of neighbors bordering counties with a 10% difference in the intensity of slavery. Column 2 of Table 3 keeps counties for which the neighbors differ by more than 20 percentage points, and so on. This allows me to compare the effects of slavery across counties that are geographically and perhaps also politically, economically, and culturally similar given their proximity to each other. Estimates from Table 3 show that the results are robust to restricting the analysis to only these neighboring counties, even though this removes more than half of the counties in the original sample. Thus, even within fairly geographically concentrated areas, there are strong and statistically significant differences between counties with higher and lower concentrations of slaves.

Table 3: The effect of slave labor reliance on black incarceration: restricting the sample to neighboring counties with different levels of slavery

	(1)	(2)	(3)	(4)
Dep. var.	Neighboring counties that differ by more than:			
<i>Black incarceration rate</i>	10%	20%	30%	40%
Proportion Slaves	0.257** (0.067)	0.649*** (0.145)	0.816*** (0.273)	1.196*** (0.561)
Mean dep. var.	4.77	4.28	3.38	2.51
Observations	5,848	3,584	1,604	664
Econ & Inst. Controls	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes

Note: The table shows the pooled results from the main estimation after restringing the sample for those counties that border a county in which the proportion of slaves differs from 10% to 40%. All regressions include state and year fixed effects. Standard errors are bootstrapped. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

²⁸There is however evidence of migration within the South. I have estimated the main regressions with individuals that at the moment of the census still live in the county in which they were born. In doing this I lose about 30% of the observations. Results are still statistically significant but standard errors increase.

b. Comparing neighboring counties along the North-South border

I next use an arguably exogenous variation in slavery driven by the discontinuity in the adoption of slavery along the “Mason-Dixon line” that divided slave and non-slave states. Slavery changed discretely at the boundary: on the northern side, Blacks were free while on the southern side, they were enslaved. The “Mason-Dixon” line was marked in 1767 by English surveyors to settle a dispute between The Penn and Calvert families for colonial property (Bill, 2008). This discontinuity can be used to evaluate the effects of slavery in a Regression Discontinuity style design (RD). This approach requires as identifying assumption that all relevant characteristics besides treatment (i.e. slavery) must vary smoothly at the Mason-Dixon boundary. Table A1 assesses the plausibility of this assumption by showing county characteristics measured just outside the Southern-Northern division. Panel A shows that most of the geographic characteristics are statistically identical across the boundary, as are farm values and crops. In contrast, the difference in democratic vote shares are statistically significant; hence it is important that they are controlled for. Furthermore, Table A1, Panel B presents county characteristics measured in 1790, the first year for which demographic characteristics at the county level are available, and slavery was allowed in northern states. Again, there were no discontinuities in observed characteristics along the border. Using the RD approach (i.e. restricting the sample to those counties on either side of the border), I estimate in Table 4 that along the "Mason-Dixon" border slavery increases the Black incarceration rates.

Table 4: The effect of slave labor reliance on black incarceration: Southern-Northern border counties (along the “Mason-Dixon” line)

Dep. var.	(1)	(2)
	Sample	
<i>Black Incarceration rate</i>	All counties	Border counties
Proportion Slavery	1.598*** (0.243)	1.896* (1.028)
Mean dep. var.	4.16	2.03
Observations	6,719	325
Econ & Inst. Controls	Yes	Yes
State & Year fixed effects	Yes	Yes

Note: The table shows the results from the main estimation after restricting the sample to those counties located on the southern-northern border. All regressions include state and year fixed effects. Standard errors are bootstrapped. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

c. Falsification Test: Low Slave Southern Counties versus Northern Counties

If the effects that are estimated in Table 2 can genuinely be attributed to the local prevalence of slave labor, then we should see no difference in the outcomes between areas in the South that were largely non-slaveholding and areas in other parts of the country that did not have slaves, such as counties in the North. In addition, if no such differences exist, then that would provide evidence against the story that it is the institutional legacy of slaveholding, rather than the local prevalence of slavery, that is driving the results. Making these comparisons with the North also enables the creation of a more appropriate counterfactual. I examine the differences

between Southern counties with very few slaves and non-Southern counties with no slaves. To do this, I restrict the data to counties in slave states where fewer than 1%, 5%, and 10% of the county population was enslaved. Table 5 shows that there are no differences between the Southern counties and non-Southern counties as coefficients are not statistically significant. This provides evidence that the local prevalence of slavery, rather than state laws permitting the ownership of slaves, drives the results.

Table 5: The effect of slave labor reliance on black incarceration: Northern vs. Southern counties with low levels of slavery

	(1)	(2)	(3)
Dep. var.	Slavery intensity Southern & Northern counties		
<i>Black incarceration rate</i>	<1%	<5%	<10%
Proportion Slaves	-0.233 (0.298)	-0.886 (0.345)	0.285 (0.235)
Observations	10,553	10,898	11,452
Econ. & Inst. Controls	Yes	Yes	Yes
State & Year fixed effects	Yes	Yes	Yes

Note: The table shows the results from the main estimation after restricting the sample to those counties in the South that have low levels of slavery, and counties in the north. Columns present the estimation when the slave population was less than different percentages. All regressions include state and year fixed effects. Standard errors are bootstrapped. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

d. Discussion about selection into observable variables

Table 2 showed that the results are barely affected when including control variables, and the main message is unchanged: slavery had an impact on the subsequent incarceration gap between Blacks and Whites. The stability in the coefficients across specifications suggests a relatively small amount of selection on observables. However, it is not impossible that a small amount of selection on unobservables could explain the whole effect. I explore this possibility following [Altonji *et al.* \(2005\)](#)'s omitted variable approach. Roughly speaking, the smaller the difference between the coefficients with and without controls, the less the estimate is affected by selection on observables, and so the larger the selection on unobservables needs to be in order to explain away the entire effect of the variables of interest. This approach uses the degree of selection on observables as a guide to the degree of selection on the unobservables. The value of the ratio indicates that selection on unobservables would need to be 9 times stronger than the selection on observables for the entire analysis period, which seems highly unlikely.²⁹

5.2 Instrumental Variable Approach: Cotton Suitability

The previous sections demonstrated a close association between the prevalence of slavery and the subsequent Black incarceration rates. Whether or not this relationship should be interpreted as causal depends on whether there are unobserved characteristics of southern counties that affect both the prevalence of slavery and the treatment of African Americans in the justice system.³⁰

²⁹More formally, the shift in the distribution of unobservables would have to be 9 times as large as the shift in observables to explain away the entire effect of slavery.

³⁰Simultaneity is not a concern here because slavery is measured in 1860, and incarceration rates started to be measured in 1870.

Section 5.1 provided a series of tests that demonstrate that such selection on unobservables is unlikely to be driving the results. This section takes an instrumental variable approach to address the same concern.

5.2.1 IV Estimation Strategy

I instrument for the prevalence of slavery in each county in 1860 with the suitability for growing cotton. Historical sources provide evidence that the evolution of slavery grew with the importance of cotton. For instance, slaves arrived first in Virginia, but were rapidly moved to more suitable climates for cotton production. Similarly, one of the reasons to acquire the Louisiana territory in 1803 was to get access to fertile land for growing cotton. Therefore, I measure soil suitability for cotton with the Food and Agriculture Organization (FAO)'s potential yield for this crop.³¹ The first stage equation is as follows:

$$ShareSlaves_{cs}^{1860} = \alpha CottonSuitability_{cs} + \mathbf{X}_{cs}^{1860} \gamma + \psi_s + \epsilon_{cs} \quad (2)$$

where $CottonSuitability_{cs}$ is an index from 0 to 1 that indicates how good a county is for growing cotton, where 1 corresponds to counties that are very suitable for cotton production.

5.2.2 IV Assumptions

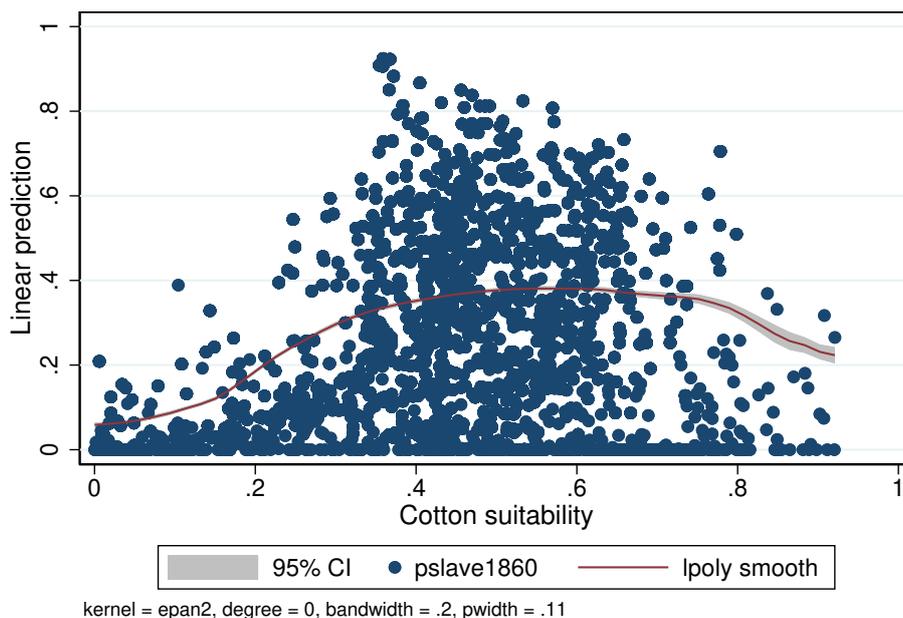
In this subsection, I discuss the identifying assumptions of the instrumental variable design, which uses cross-county variation in the suitability for growing cotton.

a. Instrument relevance: First stage

I start by documenting the relationship between the suitability for growing cotton and slavery prevalence. Figure 4 is a flexible analog to the first stage in equation (2), plotting estimates from a local linear regression with a 95 percent confidence interval. Counties that were more suitable for cotton cultivation had higher levels of slavery, in particular, the prediction of the intensity of slavery is monotonically increasing in the suitability for growing cotton.

³¹The estimates are based on climate averages from 1961 to 1990. I omit suitability for other crops, such as tobacco, because they have no relationship with slavery conditional on cotton suitability. While these measures use data from the contemporary period, most of the changes to the suitability between 1860 and 1960 were either uniform shifts across the entire region due to worldwide climate change or were unrelated to attitudes towards African Americans. Technological change in the production of cotton is not a worry as what changed was the yield per hectare and not the suitability for growing cotton.

Figure 4: First stage: slavery on cotton suitability (local linear regression)



Note: This figure plots the prediction in the intensity of slavery (Y-axis) against the suitability for growing cotton at the county level (X-axis) from a local linear regression. 95% confidence intervals.

Table 6 confirms that the relationship between cotton suitability and the prevalence of slavery is strong. Each panel of the table corresponds to a different census, and has a slightly different number of observations due to the number of counties changing over time. The estimates are, however, similar. The fact that the results are robust to the inclusion of controls indicates the high quality of the instrument. First, it suggests that the first stage is not explained by other variables different than the instrument, which would bias the IV estimates towards the OLS estimates. Second, the inclusion of controls could pick up a small amount of the endogenous variation in slavery (as R^2 goes to 1), making the exclusion restriction invalid. Third, the instrument is not correlated with the controls, which would invalidate the conditional independence assumption.

In all cases, the coefficients have the expected sign and are significant. The coefficient in the second column, after including controls, indicates that counties that are more suitable for cotton production had a higher enslaved population. In particular, one standard deviation above the mean of the cotton suitability increases the share of slaves by 0.14, over a mean of 0.31. Robust (Montiel-Plueger) F-statistics, accounting for clustered residuals at the state level, are above the conventional threshold for weak instruments.³²

b. Instrument validity

Although the exclusion restriction is not testable, I discuss its plausibility. This condition is violated if there are unobservable factors correlated with cotton suitability and the main outcome.

³²The standard Stock-Yogo critical values for weak instruments are only valid under *i.i.d* assumptions on the residuals (Montiel-Olea & Pflueger (2013); Kleibergen & Paap (2006)).

Table 6: First stage: cotton suitability and slave labor reliance

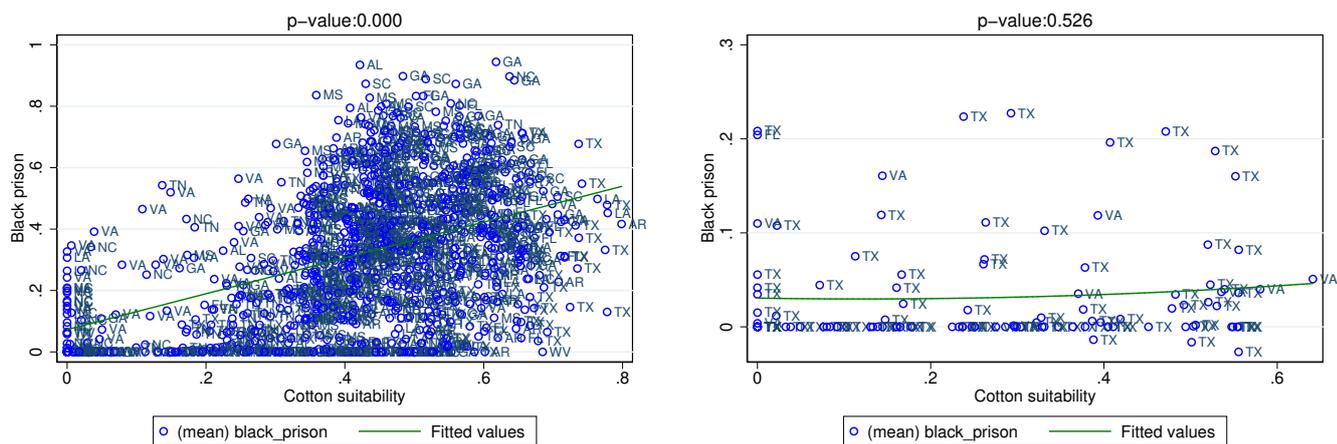
Dependent variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Proportion of slaves</i>	All censuses		Census 1870		Census 1880		Census 1900	
Cotton suitability	0.6511*** (0.0328)	0.5969*** (0.0334)	0.6646*** (0.0363)	0.5014*** (0.0363)	0.6492*** (0.0352)	0.6072*** (0.0370)	0.6610*** (0.0341)	0.6303*** (0.0357)
Constant	0.1294*** (0.0287)	0.0703 (0.0488)	0.1226*** (0.0289)	0.0758*** (0.0291)	0.1275*** (0.0295)	0.0629 (0.0479)	0.1382*** (0.0297)	0.0817** (0.0319)
F-test	139	58.8	123.5	51.89	121.2	51.7	128.5	51.9
Observations	6,719	6,719	822	822	872	872	941	941
R-squared	0.4315	0.4767	0.4321	0.5710	0.4356	0.4729	0.4389	0.4813
Controls	No	Yes	No	Yes	No	Yes	No	Yes

Dependent variable	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
<i>Proportion of slaves</i>	Census 1910		Census 1920		Census 1930		Census 1940	
Cotton suitability	0.6380*** (0.0343)	0.5960*** (0.0362)	0.6414*** (0.0338)	0.5881*** (0.0352)	0.6166*** (0.0345)	0.5651*** (0.0360)	0.6272*** (0.0347)	0.5819*** (0.0362)
Constant	0.1370*** (0.0294)	0.0569* (0.0307)	0.1455*** (0.0296)	0.0911*** (0.0314)	0.1542*** (0.0305)	0.0819** (0.0324)	0.1590*** (0.0310)	0.0934*** (0.0329)
F-test	115	47.69	124.3	46.44	114.9	51.27	112.2	54.46
Observations	978	978	1032	1032	1032	1032	1042	1042
R-squared	0.4237	0.4620	0.4378	0.4759	0.4314	0.4680	0.4294	0.4617
Econ & Inst. Controls	No	Yes	No	Yes	No	Yes	No	Yes

Note 1: The table shows the first stage for the whole sample and separately by censuses. All regressions include state fixed effects. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

An example might be that counties that are more suitable for growing cotton have different labor markets and this could directly affect incarceration rates. I start by performing a placebo test to provide evidence for the exclusion restriction. This test aims to show that the only reason for which cotton suitability affected incarceration rates was the intensity of slavery. Therefore, I separate counties with a positive intensity of slavery and counties with no slavery and I estimate a reduced form of the effect of cotton suitability on black incarceration rates for all censuses. The idea behind this test is that there should not be a correlation between cotton suitability and black incarceration rates for counties that did not have slavery. Such correlation would invalidate the exclusion restriction. Figure 5 plots cotton suitability (horizontal index) against the average of the black incarceration rate filtered by a set of observed characteristics as in equation (1) and state and time effects (vertical axis). The left panel shows counties characterized by a positive share of slaves in the population, while the right panel displays counties where none of the population was enslaved. The relationship is positive and highly significant across counties that experienced slavery, but is insignificant across those with zero slavery. Though not a formal test for the exclusion restriction, this falsification analysis suggests that suitability for cotton production has an effect on black incarceration only through the channel of slavery.

Figure 5: Placebo test for exclusion restriction of the instrument



Note: The figures show the average black incarceration filtered by a set of state and time effects. The left figure presents the counties that have a positive intensity of slavery. The figure on the right displays counties without slavery. There is only a positive relationship between the instrument-cotton suitability index- and the conditional measure of black incarceration, suggesting that the only way in which the instrument affects incarceration rates is through the levels of slavery.

c. Monotonicity

In this setting, the monotonicity assumption requires that counties with low suitability for growing cotton that had slavery, would also have slave-holdings if they had high suitability for growing cotton, and vice versa for non-slave counties. This assumption ensures that the 2SLS identifies the local average treatment effect (LATE), i.e. the average causal effect among the subgroup of counties that could have had a different slavery intensity if the need for slave-labor would have been different because of their conditions for growing cotton.³³

One testable implication of this assumption is that the first stage estimates should be non-negative for any subsample. Table A2 shows that the first stage estimates are positive and significant for a wide range of subsamples, characterized by: geographic features, slave mortality rates, political preferences, and railroad presence. This is consistent with the monotonicity assumption.

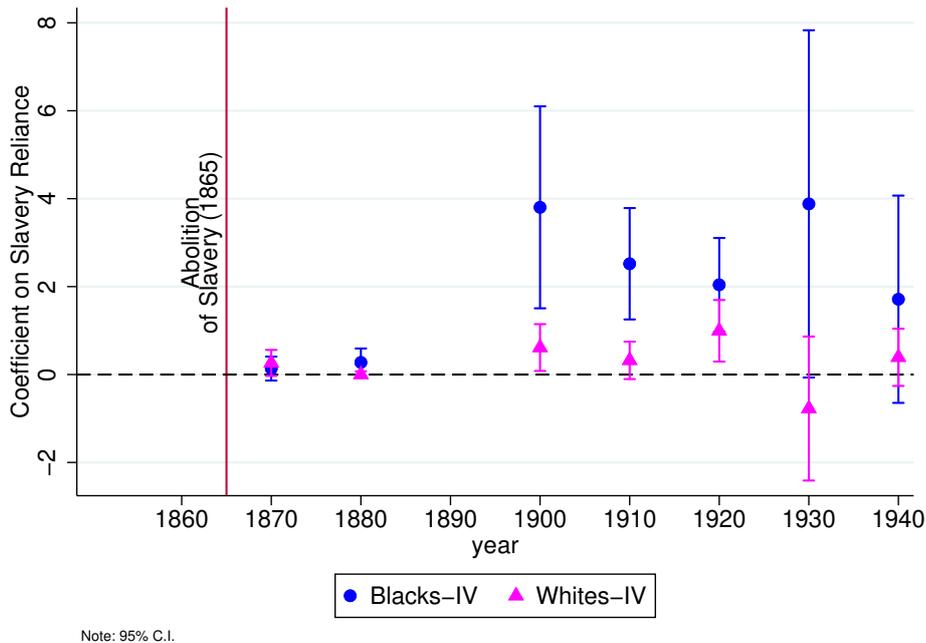
5.2.3 2SLS Results

Figure 6 presents the IV estimates for Blacks and Whites for the entire period. The point estimates for African Americans are statistically significant after 1880, and they continue to grow until 1940. Again, one does not see an effect of slavery on white incarceration rates. Figure 6 shows the analogous impacts of slavery on incarceration for Blacks from a 2SLS specification as well as the OLS estimates. Coefficients follow a similar pattern as those in Figure 3, and are approximately the same size, providing evidence that the main effect on incarceration rates comes from counties more reliant on slavery.

³³Following [Imbens & Angrist \(1994\)](#), this assumption is also known as the "no defiers" assumption, and it assumes that the instrument affects the treatment in the same direction for the entire sample.

2SLS coefficients are larger than OLS. One possible explanation for this pattern is that OLS is downward biased because counties that relied more on slavery tried to maintain control over the newly freed African American population. Anecdotal evidence indicates that the abolition of slavery and the subsequent disenfranchisement of Blacks threatened whites who controlled local politics. As a result, this created incentives in former slaveholding counties to promote an environment of violence and intimidation against the new freedmen.

Figure 6: IV Results: slavery and incarceration rates by race (Instrument: cotton suitability)



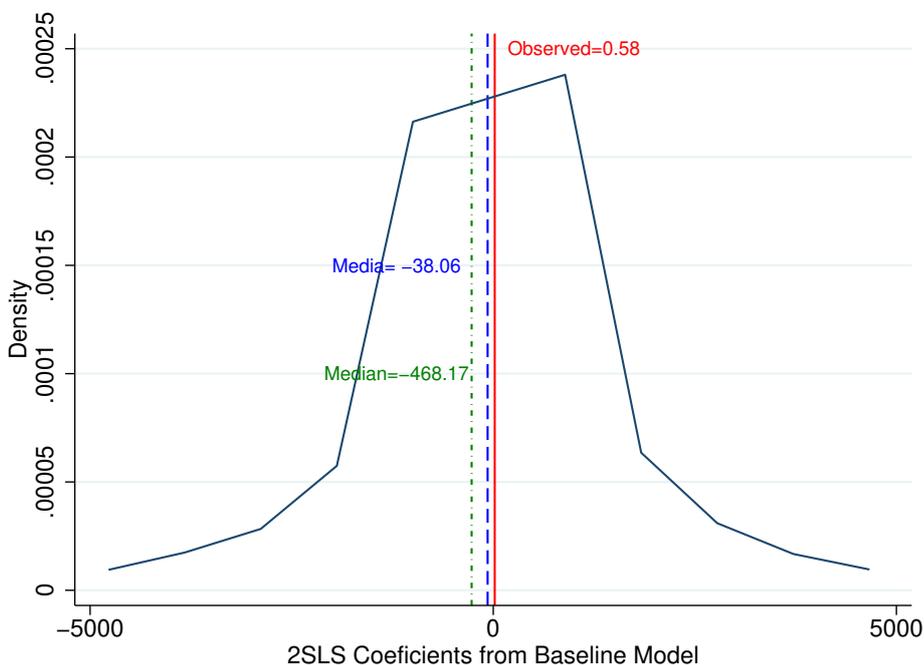
Note: The figure shows the coefficient on slavery (shares of slaves in the total population) estimated for each census year. Slavery is instrumented with the suitability for growing cotton. Dots represent the effect for African Americans, while triangles are for whites. 95% confidence intervals are plotted as well. Slavery is instrumented with the suitability for growing cotton. All regressions include state and year fixed effects. Standard errors are bootstrapped. In an alternative specification, I have included the interaction of slavery reliance with year effects to allow for the inclusion of county fixed effects as well, and the results remain consistent.

a. A robustness test on the estimated 2SLS coefficient

I perform an additional placebo test in the form of randomization inference following [Barrett & Paul \(2017\)](#). This test rests on the principle that introducing randomness into the endogenous explanatory variable of interest (slavery prevalence) while holding constant the instrument, should eliminate, or at least, substantially attenuate, the estimated causal relationship if indeed an exogenous variation in the endogenous explanatory variable (slavery) drives the main outcome (incarceration rates). Therefore, I randomly assign (without replacement) the share of slaves in the population among counties in the sample. This "new dataset" preserves the source of endogeneity that [Barrett & Paul \(2017\)](#) worry about -selection into the treatment- but sweeps out the source of variation by randomizing slavery among counties. This way, incarceration rates can remain spuriously related to the instrument because neither the incarceration rates nor the instrument are altered, but the causal mechanism has been rendered non-operational by randomization.

If it is true that the causal relationship between slavery and black incarceration rates is positive and the identification is unaffected by selection bias, the distribution of coefficients would shift to the left relative to the original point estimate, and if the share of counties in which slavery causes incarceration rates is small relative to a large enough sample, would center around zero. This is because the randomization of slavery would attenuate the estimated relationship between slavery and incarceration. Figure 7 plots the results of this exercise. The distribution of parameter estimates shifts to the left of the IV coefficient estimate. I obtain a non-statistically significant mean coefficient of -38 from this randomization process. This implies that there is not a direct correlation between cotton suitability and black incarceration rates, which would invalidate the exclusion restriction.

Figure 7: Distribution of 2SLS Coefficient Estimates Using Randomized Slavery Allocations



Note: The density plot depicts the distribution of 2SLS coefficient estimates using the set of baseline controls with 10,000 draws of randomized allocation of slavery among counties. This figure shows that cotton suitability does not affect incarceration rates in a different way than slavery.

6 Mechanisms

My results show that slavery had a persistent effect on black incarceration. In this section, I turn to two competing mechanisms underlying the relationship between slavery and black incarceration. The first is a demand-side mechanism, in which convict labor was used to replace slave labor. The second is a supply-side mechanism, in which poor economic conditions after the abolition of slavery pushed Blacks to commit more crimes.

6.1 Demand-side mechanisms: prison labor to replace slave labor

Historians have argued that the end of slavery affected the Southern economic landscape not only by the wealth shock that it represented to whites but also by affecting the labor market. Cotton

production was a labor-intensive process, but with the abolition of slavery, land was abundant and labor supply was the limiting factor (Ransom & Sutch, 2001). The southern stagnation after the Civil War made it difficult for planters to pay wages to the recently freed black population (Higgs, 2008). Furthermore, emancipation brought Blacks some freedom over the amount of labor they supplied, and many ex-slaves chose to work for themselves rather than for white planters (Ransom & Sutch, 2001). This both reduced the labor supply and increased labor costs sharply, threatening the Southern plantation economy (Alston & Ferrie, 2007; Ransom & Sutch, 2001). As a result, whites could have had incentives to establish new forms of labor coercion that would replace slavery. Taken together with the fact that slavery was abolished except as a punishment for crimes, this might explain why African Americans were more likely to end up in prison.

6.2 Adverse Shocks to the Demand of Black Labor

A clear implication of the shortage of labor after the abolition of slavery is that once the demand for black labor drops due to exogenous shocks, the incentives for whites to interfere in the labor market should lessen, and thus the effect of slavery on black incarceration should also diminish. This implication is testable given that much of the Southern economy was agricultural, and its main cash crop – cotton – was heavily labor-intensive until about the 1930s when Southern agriculture started to mechanize and tractors began to replace labor. To test this, I exploit three exogenous reverse shocks to the demand for black labor by using a difference in difference approach.

6.2.1 Proximity to Agricultural Stations Established in 1887

The establishment of federal agricultural experiment stations in the late nineteenth century serves as a source of exogenous variation in the location of agricultural knowledge production. These stations positively affected land productivity 20 years after they were opened, and allowed the diffusion of advanced farming practices (Kantor & Whalley, 2019). These stations were opened at preexisting land-grant colleges in response to nationwide concerns about agriculture. They created a positive shock to research independent of local economic conditions (Kantor & Whalley, 2019). As a result, one could expect that a more mechanized production reduced the demand for labor. I calculate the linear distance in kilometers between the counties' most central points and the closest agricultural stations.

Table 7 presents a triple difference in difference estimation of the effect of slavery in counties that were further away from agricultural stations after they were implemented in 1880 for black and white incarceration rates on columns 1 and 2. The estimates indicate that the effects of slavery on black incarceration are stronger for counties that were further from the agricultural stations. On the other hand, white incarceration rates did not change with the proximity to the agricultural stations. An interpretation of this result is that counties closer to agricultural stations quickly replaced manual labor in agriculture, and therefore, there was lower demand for the labor force provided by African Americans.

Table 7: Proximity to Agricultural Stations Established in 1880 (DDD)

Dep. var.	(1)	(2)
<i>Incarceration rates</i>	<i>Black rate</i>	<i>White rate</i>
Proportion Slaves 1860	-13.405 (11.892)	2.522 (5.706)
T=1 (≥ 1 1887 After the introduction of Agri. Stations)	32.816*** (5.663)	3.699 (2.709)
Distance Agri. Stations	0.149 (1.062)	-0.407 (0.509)
Proportion Slaves * Distance Agri. Stations *T \geq 1880	4.466** (2.176)	0.947 (1.043)
Mean dep. var.	4.16	1.68
Observations	6,719	6,719
R-squared	0.065	0.022
Econ & Controls	Yes	Yes
Year fixed effects	Yes	Yes

Note: The table presents a difference-in-difference-in-difference (DDD) of the effect of the distance to agricultural stations for counties that were more reliant on slave labor. Interactions between all three terms of the DDD are included as well. All regressions include state fixed effects. Standard errors are bootstrapped. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

6.2.2 Exposure to Boll Weevil Cotton Pest

The Boll Weevil was an agricultural plague that adversely affected cotton production in the American South. The boll weevil feeds almost exclusively on cotton, and its arrival caused large declines in cotton yields. During 1909-1935 the average reduction in cotton production was 11%, ranging from 0.8% in Missouri to 17.8% in Louisiana (Ager *et al.*, 2015). Importantly, the spread of the Boll Weevil was determined by climatic and geographic conditions, in particular, temperature and wind directions (Hunter & Bert, 1923; Lange *et al.*, 2009a). Farmers and local authorities could do little to prevent it, implying that its arrival was largely exogenous to counties' economic conditions (Lange *et al.*, 2009b). As a result, this pest could have shifted the demand for labor in cotton plantations.

Table 8 shows the effect of slavery on black and white incarceration rates for counties that were affected by the cotton pest in a difference-difference setting. Results show that counties that were affected by the cotton pest experienced lower black incarceration rates, whereas white incarceration rates remain unaffected. One possible interpretation of this result is that black labor was not demanded in counties where cotton crops were destroyed. In addition, this supports the story that the abolition of slavery affected black incarceration through the labor market mechanism, and not through lower economic conditions that decreased the opportunity cost of committing crime. One could imagine that if it is true that African Americans were involved in more criminal activities, then counties that were also more adversely affected by the pest should have seen an increase in black incarceration since cotton production was central to the Southern

economy. This is not the case.³⁴

Table 8: Exposure to Boll Weevil Cotton Pest

Dep. var.	(2)	(4)
<i>Incarceration rates by race</i>	<i>Black rate</i>	<i>White rate</i>
Proportion Slaves	1.366*** (0.135)	-0.256*** (0.079)
Pest (=1)	0.029 (0.031)	0.183* (0.066)
Proportion Slaves * Pest (=1)	-0.539*** (0.167)	-0.382* (0.208)
R-squared	0.065	0.092
Mean dep. var.	4.16	1.68
Observations	6,719	6,719
Econ & Inst. Controls	Yes	Yes

Note: The cotton pest occurred during the period 1909-1935. In this exercise, I record with a dummy variable equal to one if a county has been affected by the cotton pest. The table shows the differential effect of slavery depending on whether counties were affected by the cotton pest. All regressions include state fixed effects. Standard errors are bootstrapped. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

6.2.3 Exposure to Mississippi River Floods

Hornbeck & Naidu (2014) show that flooded counties in the Great Mississippi Flood of 1927 experienced an immediate and persistent out-migration of the black population. As a result, over time, landowners modernized agricultural production and increased capital intensity relative to landowners in nearby similar non-flooded counties. Therefore, I interact the proportion of slaves in 1860 with the proportion of land destroyed after this natural event in a triple difference in difference specification.³⁵ As Table 9 shows, the effect of slavery is weaker for counties where the Mississippi flooded.³⁶

³⁴A caveat from this exercise is that I only have information on whether a county has been affected by the cotton pest during the entire period of analysis. More detailed data on the exact year in which the pest arrived at the county would allow me to identify better the effect of slavery. This information is available but it needs to be digitalized from the USDA archives.

³⁵Data come from Hornbeck & Naidu (2014).

³⁶In this exercise it is important to mention that after the Mississippi River floods there was a decrease in the black population, and this, in turn, could have mechanically reduced black incarceration rates. However, the triple difference in difference specification allows me to compare counties that were flooded but that had a different intensity of slavery. Therefore, I can learn what happens whenever there is a shortage of labor in terms of incarceration rates. The effect that I find in the Mississippi River floods can be comparable to the effect that I find in counties exposed to the Cotton Pest. In both cases, there was a reduction in black incarceration rates.

Table 9: Exposure to Mississippi River Floods (DDD)

Dependent variable	(1)	(2)
Incarceration rates by race	<i>Black rate</i>	<i>White rate</i>
Proportion Slaves	0.038 (0.027)	0.050 (0.081)
T=1 (\geq 1927 Mississippi River Floods)	0.031 (0.149)	0.659*** (0.094)
Flood (=1)	-0.040 (0.107)	1.068*** (0.362)
Proportion Slaves * Flood (=1) *T \geq 1927	-2.882* (1.638)	0.698 (0.836)
Observations	6,719	6,719
R-squared	0.052	0.031
Econ & Year Controls	Yes	Yes

Note: Mississippi River floods occurred in 1927. The dummy variable *Flood* takes the value of one if a county experienced floods. The table presents a difference-in-difference-in-difference (DDD) of the effect of the Mississippi River floods for counties that were more reliant on slave labor. Interactions between all three terms of the DDD are included as well. All regressions include state fixed effects. Standard errors are bootstrapped * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

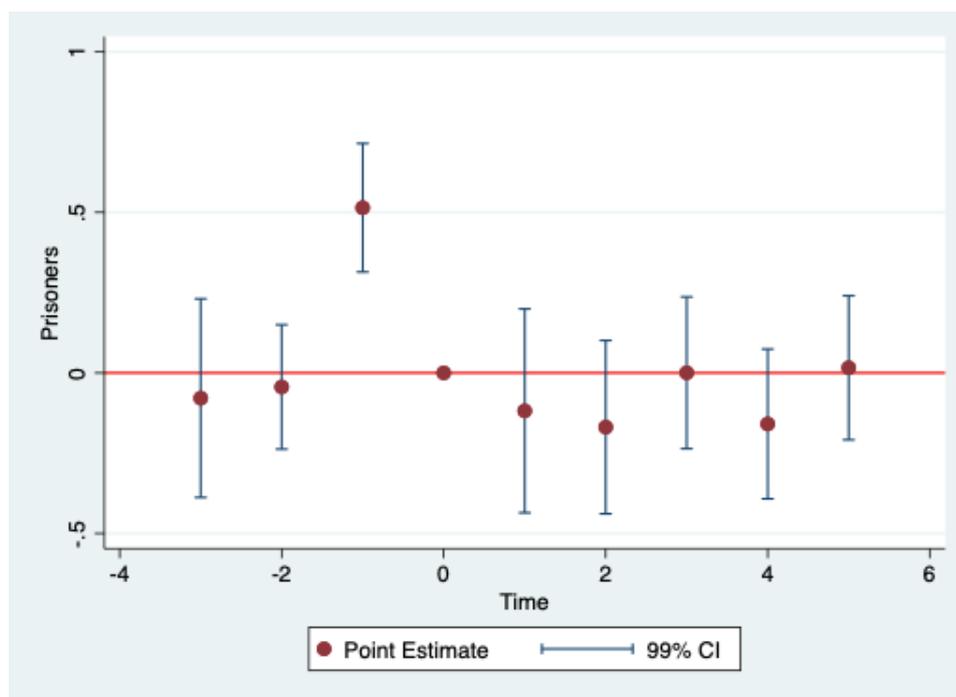
6.3 Event study: Arrests and the Seasonality of Cotton Harvesting

Using an event study approach I study the effects of cotton harvests on the arrests of African Americans. Exploring the timing of the arrests might bring support to the results of the labor mechanism hypothesis. To do that, I analyze the leads and lags relative to the months of May to September when the cotton needs to be picked. In particular, the specification takes the form

$$Arrests_{c,m,t} = \sum_{k=1}^K \beta_k + \sum_{l=1}^L \beta_l + \alpha_c + \phi_m + \gamma_t + X_{c,t} + e_{c,m,t} \quad (3)$$

where γ_t are coefficients on year fixed effects, $X_{c,t}$ represents a vector of control variables, including the prevalence of slavery at the county-year level, β_k and β_l are coefficients on leads and lags indicators for the time relative to the cotton-harvesting. $Arrests_{c,m,t}$ are the number of African Americans captured in a county, during a given month, and year. The results are plotted in Figure 8. Time zero corresponds to the harvesting month, and right before there is a statistically significant increase in the number of African Americans arrested. This is not the case, however, for white Americans.

Figure 8: Event study: Arrests vs. cotton harvesting months



Note: Zero corresponds to cotton harvesting time.

6.4 Types of Correctional Institutions that Emerged Post-slavery

The correctional institutions were introduced during the Reconstruction period (1865-1877) when the government of the US was trying to revive the economy of the former Confederate states. Historical accounts document that it was intended to replace the labor force once slaves had been freed (Wilson, 1933; Alston & Ferrie, 2007; Ransom & Sutch, 2001). On average, the profit made from convicts was four times higher than the cost of the prison administration. The main labor systems were convict leasing and chain gangs. The former included monetary incentives to the police and judicial system.³⁷ Blacks were charged with vagrancy and minor crimes, and then leased on first-bid auctions (Cohen, 1976).³⁸ Anecdotal evidence suggests that sheriffs were directly asked to arrest more people before the cotton harvest season (Blackmon, 2008; Oshinsky, 1997).

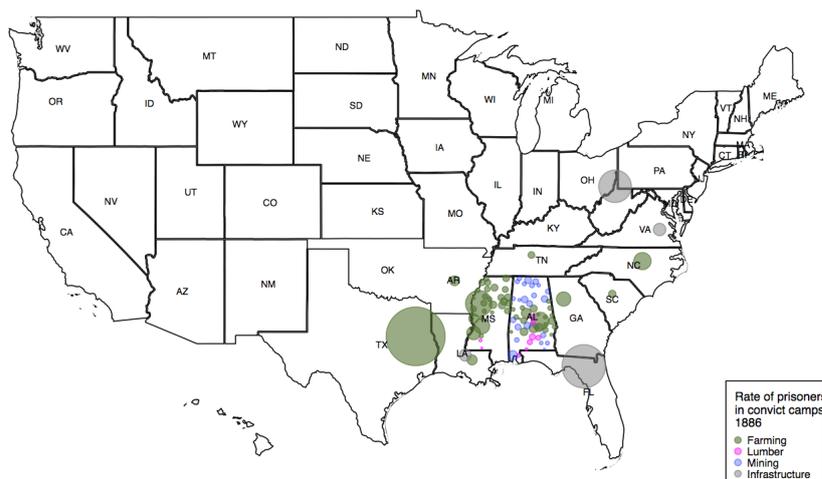
I start testing this conjecture by collecting and digitalizing records from the Department of Labor on convict labor camps. Overall, the dataset contains 464 correctional facilities in southern counties. Figure 9 maps the number of prisoners employed in forced labor after controlling for population; most of the prison camps were concentrated in what is known as the Black Belt in the South.³⁹ The records from the Department of Labor also document in detail the name of the company that employed prisoners, as well as the cost of maintaining inmates and the profits from goods produced by them.

³⁷Department of Labor. Laws relating to prison labor, 1933.

³⁸While a high share of the auction money went to the state, some portion of that price was paid to the sheriff and judge who was involved in the criminal case (Cohen, 1976).

³⁹The year 1886 corresponds to the first time in which convict camps were legally created in the U.S.

Figure 9: Prisoners employed in convict camps



Note: The map shows the distribution of labor convict camps in 1886 after controlling by population and disaggregated by industry. Bigger circles represent more prisoners employed in these camps. Source: Department of Labor Archival Records.

After the Civil War, different types of correctional institutions emerged, including jails, prisons, and convict camps. This can be seen in Table 10, which presents the results of regressing dummy variables indicating which types of prison institutions existed in a given county and year on the pre-Civil War intensity of slavery for all counties in the South for the entire period of analysis. All specifications control for state and year fixed effects. Specifically, the results show that the introduction of convict camps was more likely to occur in counties with high concentrations of slaves. The point estimates indicate that a county with a 10 percentage point higher prevalence of slavery is associated with a 2.4 percentage point higher probability of having at least one chain gang. The same is true for penitentiaries, lumber prison camps, and farm prison camps. But the effects are largest for those institutions that provide the most labor: chain gangs, lumber camps, and farm camps, and no statistical effect is found for institutions such as jails, which existed in 64% of the counties. The same is true for reformatory and military institutions.

Table 10: Relationship between slavery and type of correctional institutions

Dependent variable $\mathbb{P}(=1)$	(1) <i>Chain gang</i>	(2) <i>Penitentiary</i>	(3) <i>Lumber</i>	(4) <i>Farm</i>	(5) <i>Jail</i>	(6) <i>Reformatory</i>	(7) <i>Military</i>
Proportion Slaves	0.242*** (0.021)	0.151*** (0.055)	0.707* (0.390)	0.310*** (0.075)	0.169 (0.158)	0.193 (0.171)	0.110 (0.644)
Observations	6125	6125	6125	6125	6125	6125	6125
R-squared	0.022	0.004	0.008	0.058	0.060	0.004	0.001
Econ & Inst. Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The table presents the results of regressing dummy variables indicating the type of prison institutions that existed in a given county and year on the pre-Civil war intensity of slavery. Results are presented for observations pooled for all years. All regressions include state and year fixed effects. Standard errors are bootstrapped $*p < 0.1$; $**p < 0.05$; $***p < 0.01$.

6.5 Supply-Side Mechanisms: Were African Americans Committing More Crimes in Response to Poor Economic Conditions?

A second possible mechanism is a supply-side mechanism in which the widespread poverty and low education of African Americans immediately after the Civil War pushed them to disproportionately commit more crimes (as in Becker (1968)). To test for this possibility I collected and digitized data from two different sources: the *Alabama, U.S. Convict Records, 1886-1952*; and the *Georgia, U.S. Central Register of Convicts, 1817-1976*. These records contain information about the prisoners that spent time in these two prisons. Thus, I can construct crime rates according to the type of crimes committed by race. The crimes are classified as *i*) serious crimes (rape, murder, killing); *ii*) Property crimes (stealing, larceny, burglary); and *iii*) minor crimes (vagrancy, illegal voting, disturbing peace, and violations of social customs). Table 11 compares the crime rates by race for counties with low and high reliance on slavery. In particular, African Americans were not disproportionately committing more crimes related to property, which would be an indication of the Becker (1968) hypothesis; instead, they seem to be charged with minor crimes.

Table 11: Probability of being charged for different crimes - Georgia and Alabama

Dep. var.	(1)	(2)	(3)
Type of crime	$\mathbb{P}(\text{Serious crime})=1$	$\mathbb{P}(\text{Property crime})=1$	$\mathbb{P}(\text{Minor crime})=1$
African American (=1)	-0.013 (0.010)	-0.002 (0.007)	0.184*** (0.057)
Observations	1993	1993	1993
R-squared	0.001	0	0.005
County and Year fixed effects	Yes	Yes	Yes
Individual controls	Yes	Yes	Yes
Econ & Inst. controls	Yes	Yes	Yes

Note: Level of observation is the individual. Individual controls include: age and a dummy variable for whether the inmate used to be a farmer. Clustered standard errors at the county level. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

6.5.1 Free Blacks before and after the abolition of slavery

Consistent with this idea, I have merged by name, surname, age, and birthplace African Americans after the abolition of slavery to the Census records before the Civil War. Any African American who was found in the Census before the Civil War was a free Black. Slaves were recorded without names and under their master's property. Comparing free Blacks before and after abolition sheds light on whether the effects are driven by racist attitudes towards African Americans, or the new institutional setting after the abolition of slavery. Intuitively, if incarceration rates for free Blacks are the same before and after the abolition of slavery, one would conclude that it was merely the effect of being enslaved that explains the results. On the opposite, if free African Americans are incarcerated at higher rates than before, one could imagine a change in Institutions to recreate the Old South. In Table 12, I find that incarceration rates for free Blacks before the abolition of slavery caught up with those of former slaves. This suggests that the economic advantage of free Blacks was thwarted by the emerging institutions that sought to control the labor force. These sets

of results are hard to reconcile with a mechanism in which African Americans were committing more crimes to secure their means of support.

Table 12: Probability of being incarcerated for children of former slaves

Dep. var.	$\mathbb{P}(\text{incarcerated})=1$
Sample	Only blacks
Free black parents in 1880 (=1)	0.012 (0.09)
Observations	1,665
Mean dep. var.	0.01
Controls	Yes

Note: Level of observation is the individual. This table includes all African Americans that were matched to their parents in 1860. They are recorded as having free parents in 1860. The African Americans that were not able to be matched to their parents in 1860, are assumed to have parents in slavery. Controls include age, literacy, and occupation. State and county fixed effects are included. $*p < 0.1$; $**p < 0.05$; $***p < 0.01$.

6.6 Discussion

Table 13 relates the reliance on slave labor on sharecropping arrangements. Columns 1 and 2 show that sharecropping arrangements were more common in counties with higher levels of slavery. In particular, one additional standard deviation in the reliance on slavery increases the number of tenant farms by 381, which corresponds to more than one-third of the mean in the tenant farms in the Southern states (or, an increase of 15% in the mean of the tenant farms per capita). Columns 2 and 3 show that this relationship is mainly driven by farms with more African American sharecroppers. Columns 4 and 5 present evidence of lower farm ownership by African Americans, while slavery reliance is positively correlated to the number of white farm owners per capita. Thus, counties with slavery as the pillar of their economy, not only sent more African Americans to prison, but also had a higher prevalence of coercive working contracts such as sharecropping. Consistent with this, Table A3 shows that going from zero to one on the reliance on slave labor increases the share of unrelated members in the household by 5,6%.

Table 13: Slavery and sharecropping

Dep. Var.	(1) <i>N. of tenant farms</i>	(2) <i>N. of tenant farms p.c.</i>	(3) <i>Farms with black sharecrop.</i>	(4) <i>Farms with white sharecrop.</i>	(5) <i>Black farm owners p.c.</i>	(6) <i>White farm owners p.c.</i>
Proportion Slaves	1,656.39*** (26.995)	0.109*** (0.014)	1,013.53*** (18.562)	-613.31*** (28.297)	-0.151*** (0.230)	2.16*** (0.060)
R-squared	0.217	0.041	0.337	0.219	0.021	0.278
Observations	6,719	6,719	6,719	6,719	6,719	6,719
Mean dep. var.	1147.23	0.16	213.59	651.33	0.072	0.062
Econ. & Inst. Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes

Note: The data come from the Census of Agriculture for the period 1870-1940. The level of observation is the county. All regressions include state fixed effects. In an alternative specification, I have included the interaction of slavery reliance with year effects to allow for the inclusion of county fixed effects as well, and the results remain consistent. Standard errors are bootstrapped $*p < 0.1$; $**p < 0.05$; $***p < 0.01$.

This brings another point to the discussion on the legacy of slavery in the U.S: the role of the prison system to secure other forms of labor. When looking at the Census records, the inmate population was a relatively small share of the working population. For instance, according to the individual census counts, by 1880, there were 36'761.607 workers, and 60,140 inmates, which corresponds to 0,1% of the working population, which makes it hard for the emerging institutional setting to replace the slave labor merely with inmates. But it might have helped to maintain agricultural arrangements that guaranteed the provision of labor. Therefore, another way to interpret the results presented in this paper is that the prison system was used as a threat to keep African Americans under coercive working relationships.

7 Conclusion

This paper studies the race gap in incarceration from the first time African Americans are seen in the prison system: after the abolition of slavery. In particular, I document a substantial increase in black incarceration immediately after the abolition of slavery, with no comparable effects on whites, and that this black-white incarceration gap continues to grow. Importantly, these results are not driven by omitted variables. Furthermore, I use novel historical data from the Department of Labor to provide evidence of the use of prison labor after abolishing slavery, which suggests that the scarcity of labor supply could have driven the effects. This mechanism is supported when looking at different exogenous shocks that reduced the demand for labor. This, of course, does not rule out that other mechanisms, such as increased criminality due to poor living conditions, for instance, were also important. However, when using data from two prisons in the U.S. regarding the type of crimes committed, it indicates that African Americans were not disproportionately involved in more property crimes. At the same time, there was an increase in coercive working relationships in the U.S. South.

Putting together the results this paper suggests that the prison system in the U.S. was used to control the labor market after the abolition of slavery, and it was possibly responsible for shaping the emergence of the Black and White gap in incarceration. One limitation of my work to date is that it stops in 1940 because of data availability and possible confounding events of the XX century that might have played a role in shaping the race gap in incarceration today, e.g. the Great Migration, the Civil Right Movements, and Drug Policies. Therefore, further analyses are needed to understand their potential impacts, and how they compare in size to the role played by the need to control labor after the abolition of slavery.

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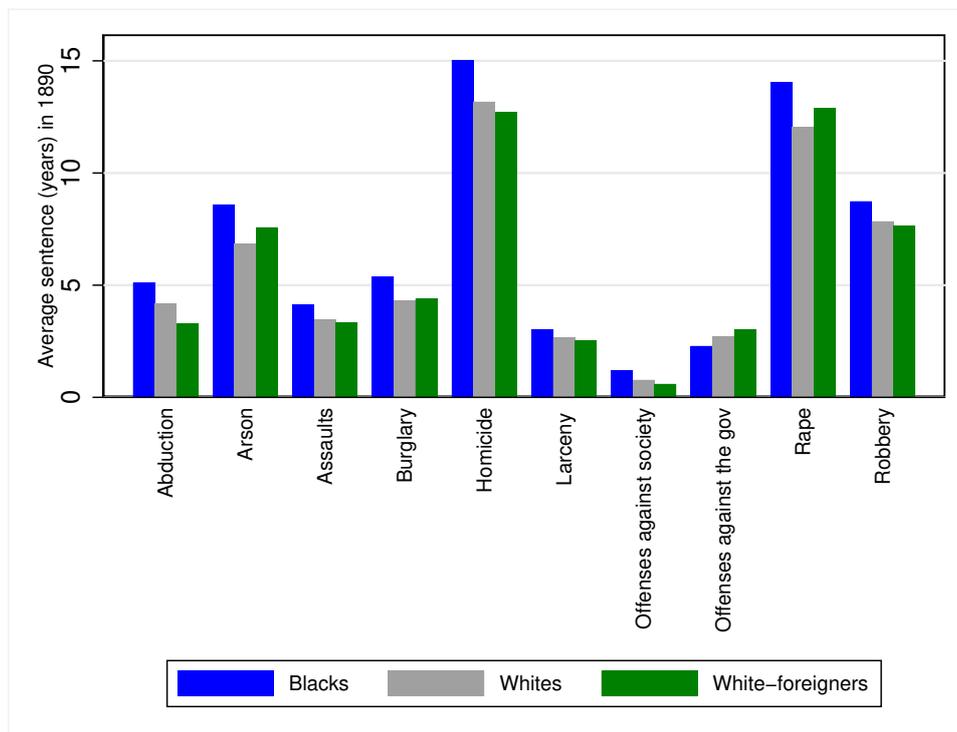
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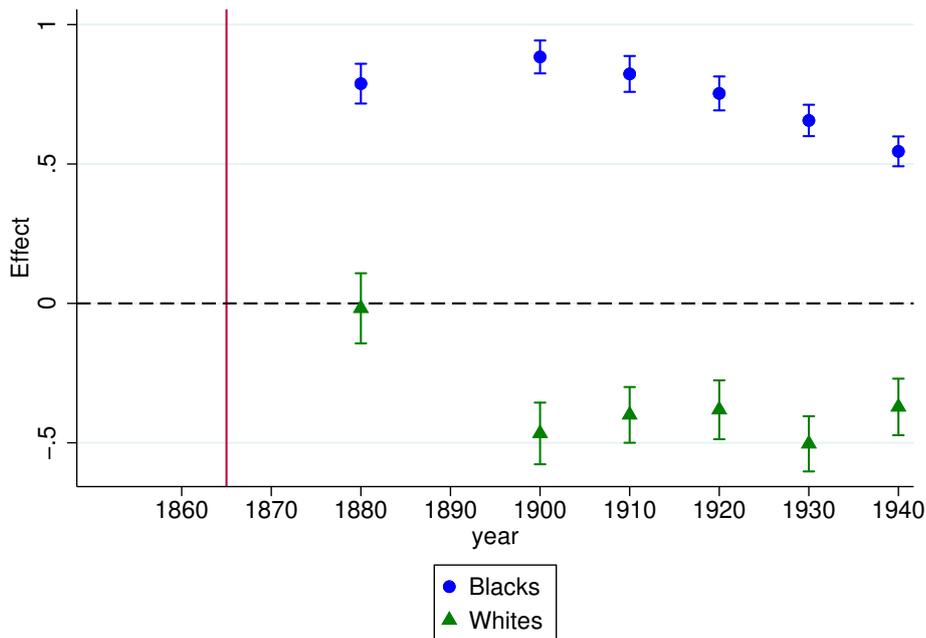
For Online Publication - Appendix

Figure A1: Average length of sentences by race (1890-1910)



Note: The figure shows the average length of sentences for prisoners disaggregated by race for the period 1890-1910. Black prisoners were charged with longer sentences for the same crimes compared to other prisoners. Source: "Crime and Pauperism, Census records." Tables 105-131. Average sentences by crime and race, males. Pg 89.

Figure A2: Results on alternative dependent variable: share of blacks and whites in the prison population



Note: Dots represent the point estimates that relate the share of prisoners by race against reliance on slave labor. The regressions control for trends in county characteristics measured before the abolition of slavery. State fixed and year fixed effects are included. Standard errors are bootstrapped, and confidence intervals at 95 percent are presented. In an alternative specification, I have included the interaction of slavery reliance with year effects to allow for the inclusion of county fixed effects as well, and the results remain consistent.

Table A1: Characteristics of Southern-Northern border counties before the abolition of slavery

Sample	Northern counties (N=59)	Southern counties (N=53)	t-stat
<i>Panel A: County characteristics 1860</i>			
Land inequality	0.441	0.449	-1.35
Value of farms	233.24	227.94	0.6
% Democratic vote	35.9	6.7	18.12
River access =1	0.4	0.36	1.45
Rail =1	0.39	0.33	1.54
Rugged terrain	73.43	44.2	5.02
<i>Panel B: County characteristics 1790</i>			
Total population	37906.35	34654.41	1.56
White population	15943.02	14843.87	1.39

Note: The table shows the mean for county characteristics for counties located in the southern and northern border. Column 3 displays the t-statistics.

Table A2: Testing monotonicity assumption

Dependent variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Slavery	Low rugged	High rugged	Low slave mortality	High slave mortality	Low dem vote	High democratic vote	No river	River	No rail	Rail
Cotton suitability	0.396*** (0.013)	0.448*** (0.020)	0.573*** (0.013)	0.666*** (0.030)	0.588*** (0.012)	0.768*** (0.063)	0.728*** (0.016)	0.304*** (0.032)	0.668*** (0.017)	0.584*** (0.032)
Constant	0.138*** (0.011)	0.295*** (0.016)	0.146*** (0.012)	0.209*** (0.023)	0.175*** (0.011)	0.044 (0.036)	0.016 (0.014)	0.377*** (0.020)	0.075*** (0.014)	0.261*** (0.020)
Observations	2,476	4,738	5,739	1,475	6,842	372	3,699	1,972	4,260	1,530
R-squared	0.519	0.353	0.507	0.450	0.510	0.404	0.507	0.435	0.459	0.363

Note: The table shows the results from the first stage of an instrumental variable regression for the different subsamples. Standard error in parenthesis (robust clustered at the state level). The dependent variables is the intensity of slaverly. Controls include: county size (in acres), average farm value, the proportion of small farms, and a measure of land inequality. These variables proxy for the degree of workforce required for agriculture. In addition, I control for characteristics related to trade and commerce, including indicators for whether the county had access to rail and steamboat-navigable rivers or canals, and the ruggedness of the county terrain, which were crucial for agricultural markets. Finally I include proxies for racist attitudes as the percentage of votes for the democratic party in 1860, the relative mortality of slaves to whites, and the average occupant size of slave quarters in farms as a proxy for slave treatment. All regressions include county and year fixed effects. $*p < 0.1$; $**p < 0.05$; $***p < 0.01$.

Figure A3: Example of Prison Records from the Department of Commerce

INSTITUTION AND STATE.	In institutions January 1, 1910.						Committed in 1910.							
	Total.			White.			Colored.	Total.			White.			Colored.
	Total.	Male.	Female.	Total. ¹	Native.	Foreign born.		Total.	Male.	Female.	Total. ¹	Native.	Foreign born.	
GEORGIA—Continued.														
County jails, workhouses, and chain gangs—Contd.														
Brooks County Chain Gang, Quitman.....	18	18		1	1		17	26	25	1	1	1		25
Bryan County Chain Gang, Ellabell.....	13	11	2				13	13	13		2	2		11
Bulloch County Jail and Chain Gang, Statesboro. ²														
Burke County Chain Gang, Waynesboro.....	41	41					41	73	72	1	2	2		71
Camden County Chain Gang, Kingsland.....	6	6					6	10	10					10
Calhoun County Jail or Chain Gang, Morgan....	12	12					12	2	2					2
Carroll County Jail, Carrollton ²														
Charlton County Jail, Folkston.....	15	15		3	3		12	37	37		20	20		17
Chatham County Chain Gang and Farm, Savannah.	248	200	39	14	14		234	974	807	167	58	57	1	916
Chatham County Jail, Savannah.....	51	43	8	15	14	1	36	449	339	110	276	235	41	173
Cherokee County Convict Camp, Canton.....	5	5					5	8	8		5	5		3
Clarke County Chain Gang, Athens ²														
Clay County Chain Gang, Fort Gaines.....	10	10		1	1		9	9	9					9
Clayton County Chain Gang, Jonesboro.....	24	23	1	4			20	36	36		16	16		20
Clinch County Convict Camp, Homerville.....	23	23		3	3		20	32	32		1			31
Clinch County Jail, Homerville.....								1	1		1	1		
Cobb County Chain Gang, Marietta.....	44	42	1				44	95	90	5	9	9		92

Note: The table corresponds to the year 1910. These records provide information on all correctional facilities in the US, including the number of inmates divided by race.

Figure A4: Convict Camps Records from the Department of Labor

8 REPORT OF THE COMMISSIONER OF LA BOR.

TABLE I.—CONVICTS BY STATES AND TERRITORIES.

Institution.	Location.	Official control.	System of work.	Industry.	Contractors or lessees.
ALABAMA.					
1 State Penitentiary	Wetumpka ...	State	Lease	All industries	5
				Farming	
				Mining, coal	
				Stone, broken	
2 Autauga Co. Jail ..	Prattville	County ...	Lease	Lumber	1
3 Baldwin Co. Jail ..	Daphne	County ...	Lease	All industries	2
				Lumber	
				Mining, coal	
4 Barbour Co. Jail ..	Clayton	County ...	Lease	All industries	2
				Farming	
				Mining, coal	
5 Bibb Co. Jail	Centreville ...	County ...	Lease	Farming	1
6 Blount Co. Jail ...	Blountsville ..	County ...	Lease	Mining, coal	1
7 Bullock Co. Jail ..	Union Springs	County ...	Lease	All industries	2
				Farming	
				Mining, coal	
8 Butler Co. Jail	Greenville	County ...	Lease	Lumber	1
9 Calhoun Co. Jail ..	Jacksonville ..	County ...	Lease	Mining, coal	1
10 Chambers Co. Jail	La Fayette ..	County ...	Lease	Farming	1
11 Cherokee Co. Jail	Centre	County ...	Lease	Mining, coal	1
12 Chilton Co. Jail ...	Clanton	County ...	Lease	Lumber	1
13 Choctaw Co. Jail	Butler	County ...	Lease	All industries	2
				Farming	
				Mining, coal	
14 Clarke Co. Jail	Grove Hill	County ...	Lease	Mining, coal	1
15 Cleburne Co. Jail	Edwardsville .	County ...	Lease	All industries	2
				Farming	

Note: The table corresponds to the year 1886. These records provide information on all convict camps in the US.

Figure A5: Death penalty

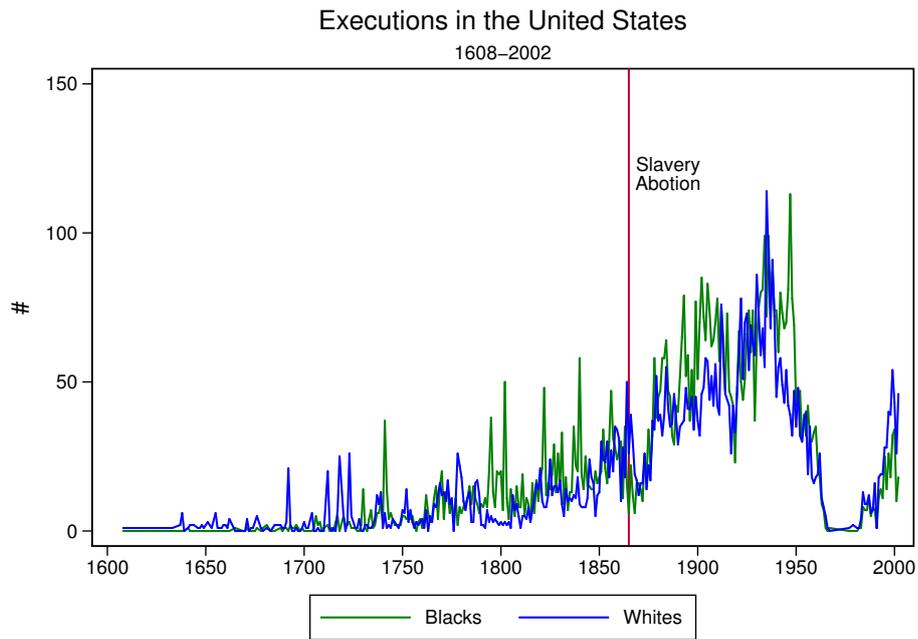


Table A3: The effect of slave labor reliance on the share of hh. members that are African Americans, but not related to the head of the household

	(1)
Dep. var.	<i>Share of members in the hh. that are African Americans & who are not related to the head of hh.</i>
Proportion Slaves	0.056*** (0.005)
Observations	6,719
Mean dep. var.	0.38
Econ. & Inst. Controls	Yes
State & Year fixed effects	Yes

Note: The dependent variable counts the number of African Americans that are not related to the head of the household and divides them by the members of the household. All regressions include state and year fixed effects. Standard errors are bootstrapped. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.