

# Black Gold: The Effect of Wealth on Descendants of the Enslaved\*

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## Abstract

This paper examines how short-term wealth shocks affected the economic trajectories of descendants of the enslaved in the early twentieth-century United States. I exploit a natural experiment in which Creek Freedmen allottees—Black landholders in Oklahoma—received quasi-random windfalls when producing oil wells were drilled on their land allotments. By constructing and linking microdata from the Dawes Rolls, allotment maps, oil drilling records, and U.S. censuses from 1910 to 1940, I show that oil discoveries were as-good-as-random with respect to pre-treatment characteristics. The wealth shocks had modest direct effects on asset accumulation, but large and persistent impacts on human capital. Treated youths were less likely to work, more likely to remain in school, and ultimately attained higher levels of education. Over subsequent decades, they shifted toward white-collar occupations and urban residence, and—by 1940—had higher rates of homeownership. These findings provide the first causal evidence on the long-run effects of wealth shocks for descendants of the enslaved. They suggest that wealth enabled strategic investments in education and mobility, generating lasting socioeconomic gains despite ongoing racial barriers. *JEL* Codes: E21, N32, D31, I38, J15.

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# 1 Introduction

The gap in wealth held by Black and white Americans is one of the largest and most persistent racial disparities in the United States. Today, Black Americans own less than a sixth of the wealth held by white Americans, per capita. [Derenoncourt et al. \(2023\)](#) argue that, even though Black Americans have faced unambiguously worse access to capital, labor market opportunities, and financial markets than their white counterparts for over a century, the majority of this gap can still be traced back to the initial difference in wealth at the abolition of slavery in 1865. If so, holding a greater wealth in the first decades post-slavery may have enabled descendants of the enslaved to experience a virtuous cycle of generational wealth accumulation. Conversely, weak access to investment opportunities, poor financial education, and racial persecution may have caused initial wealth holdings by emancipated people and their children to dissipate within a generation.<sup>1</sup> Empirically evaluating the impact of greater wealth on the economic progress of the descendants of the enslaved is challenging, as emancipated people with greater wealth in the decades following slavery typically differed on other characteristics that may have independently influenced the socioeconomic success of their descendants.

Ex-ante, it is unclear whether the long-term impacts of a positive wealth shock to descendants of the enslaved would be positive, neutral, or even negative. Positive wealth shocks could lead to lasting improvements in socioeconomic status if the money were invested in productive ends, such as educating the direct recipients or their children, establishing a business, or funding migration to a location with stronger employment opportunities or civil rights protections. Such a dynamic could be understood as pushing a household out of a “poverty trap,” as discussed in the development economics literature ([Balboni et al., 2022](#)). The two main features of that model are that (a) a household’s starting wealth holdings and (b) the size of the positive wealth shock together determine whether the money “sticks,” with poorer households requiring larger shocks than wealthier families ones to begin a virtuous asset-accumulation trajectory.

However, much scholarly work is skeptical that transfers of land or wealth to emancipated people could have had any equalizing impact ([Engerman, 1982](#); [Foner, 1981](#); [Higgs, 2008](#); [Ransom, 2005](#); [Woodman, 1977, 2001](#)). These researchers contend that any material advantage offered by the land or money could not have been meaningfully invested, given the civil rights constraints faced by Black Americans at the time. Moreover, positive wealth shocks to Black Americans may have prompted anti-Black backlash that destroyed physical capital, restricted civil rights, or threatened the safety of the beneficiary communities.<sup>2</sup>

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<sup>1</sup> Researchers have estimated the enduring economic consequences of slavery for Black Americans. [Althoff and Reichardt \(2024\)](#) find that significant disparities in education, income, and wealth persist today between Black Americans whose ancestors were enslaved until the Civil War and those whose ancestors were free beforehand. They argue that this persistence stems largely from differential exposure to Jim Crow laws: descendants of the enslaved were more likely to remain in the South, where these policies were most aggressively enforced. Segregated schooling—mandated by laws that created separate and unequal educational systems for Black children—played a major role in reinforcing these long-term inequalities.

<sup>2</sup> [Chyn et al. \(2024\)](#) find a geographic relationship between Freedmen’s Bureau locations (and their resulting positive impact on

In this scenario, the Black Americans who received land or money would end up worse off than those who never received transfers.

In this project, I leverage a natural experiment, whereby hundreds of emancipated people and their children received large, quasi-random windfalls following oil discovery on their land. This unique historical event enables me to isolate the impact of greater wealth in the decades post-slavery on Black economic progress in the short and long term. Due to federal Native American policy, which I describe in greater detail in Section 2, thousands of formerly enslaved people and their descendants became landowners in present-day Oklahoma during the early 1900s. Over the following two decades, a small fraction of these landholders profited from the unexpected and unprecedented discovery of oil on their land. I construct a database of a subset of these landholders, Creek Freedmen, along with the exact locations of the more than one million acres of land they owned.<sup>3</sup> I combine this dataset with public records of the dates and exact locations of oil-producing activity in Oklahoma to identify which Creek Freedmen received a wealth shock and which did not. I link the majority of my sample to various historical datasets, in particular the decennial censuses, in order to establish pre-treatment balance over observable characteristics and to measure causal impacts of the windfall on socioeconomic variables. Freedmen who benefitted from oil discoveries, and those who did not are statistically indistinguishable on time-invariant characteristics and pre-treatment outcomes, supporting the validity of the identification strategy.

I find that oil wealth had a positive effect on human capital in the first two decades after its receipt: Young landholders who benefitted from oil discoveries remained in school longer than their peers who did not, with some even graduating from college. Oil allottees held higher status occupations. While recipients were more likely to live in urban areas in 1920, they were not initially more likely to own their homes. By 1940, however homeownership among the oil recipients had risen significantly. Thus, while the short-run effects on asset ownership are muted, the evidence suggests that treated families made deliberate choices to rent in urban areas, which provided better access to labor market and educational opportunities. Only in later decades do I find evidence that these investments paid off in homeownership and college completion.

This paper is the first to measure the *causal* impact of wealth on descendants of the enslaved. A few studies have *descriptively* examined the long-term outcomes of recently emancipated Black Americans

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Black economic status) and racial violence perpetrated by white Southerners. [Derenoncourt \(2022\)](#) finds that negative reactions by northern communities reduced social and economic gains of Black migrants from the South during the Great Migration (1940-1970). [Logan \(2023\)](#) finds a relationship between tax revenue and violence against Black politicians at the county level during Reconstruction.

<sup>3</sup>When capitalized, “Freedmen” refers to individuals once enslaved by a member of the Five Civilized Tribes and their descendants. In contrast, when not capitalized, “freedmen” is an adjective that means formerly enslaved, but not necessarily by individuals connected to the Five Tribes ([Oklahoma Historical Society, 2007](#)). Furthermore, I use “Creek Freedmen” as an adjective to refer to Dawes enrollment category or as a plural noun for the same, while “a Freedman” as a noun to refer to an individual. Similarly, “Creek Indian(s)” refers to Dawes enrollment category while Muscogee Native refers to Native citizens of the Muscogee (Creek) Nation, regardless of whether they were enrolled on the Dawes Rolls.

with differing levels of resources shortly following emancipation. [Miller \(2020\)](#) finds that, 35 years after emancipation, descendants of people who had been enslaved by Cherokee Natives, and thus received land following emancipation, had higher literacy rates and owned more capital than the descendants of similar people who had been enslaved by white Americans and who never received the infamously promised “forty acres and a mule.”<sup>4</sup> [Collins et al. \(2024\)](#) demonstrate that the adult sons of emancipated fathers who had owned land in 1880 had higher rates of literacy and homeownership in 1900, with more land being associated with more literacy/homeownership. In contrast, [Hornbeck and Keniston \(2024\)](#) find that descendants of emancipated people who were depositors in the Freedmen’s Bank and who suffered a large *negative* loss to their wealth upon the bank’s closure in 1874 are statistically indistinguishable on a number of outcomes from descendants of similar emancipated people who did not suffer such a loss.

In studies of non-formerly-enslaved populations, wealth shocks are found to have mixed impacts on the channels through which one might expect oil windfalls to operate, such as labor supply or human capital accumulation. The effect of a wealth shock on *labor supply* seems to depend on the population, with [Cesarini et al. \(2017\)](#) finding modest effects among Swedish lottery players but [Golosov et al. \(2021\)](#) find sizable negative impacts among American lottery players. Notably, both studies examine the labor supply of middle-class individuals in high-income, developed nations. Among poor populations in developing countries, [Banerjee et al. \(2017\)](#) find little evidence that cash transfer programs discourage work in a meta-analysis of seven different randomized controlled trials. Both [Cesarini et al. \(2016\)](#) and [Bleakley and Ferrie \(2016\)](#) find minimal impact on children’s education following parental lottery wins in contexts: contemporary Sweden and 1850 Georgia, respectively.

The early Oklahoma oil boom was characterized by many of the advantages shared by the above lottery, lottery-like, and randomized control trial (RCT) studies: the discovery of oil generated unexpected positive shocks to allottee wealth that were orthogonal to the recipients’ underlying characteristics. Windfalls could be large, and in regards to the Creek Freedmen population, their usage was largely unrestricted. However, this context offers several advantages over the lottery and RCT studies. First, when most Freedmen applied for an allotment and selected the land, they were unaware that their allotment might be associated with a bonus financial windfall. Unlike studies based on lottery participants, which must address concerns about external validity to non-lottery populations, this context offers an advantage: allottees did not anticipate either the risks or rewards associated with oil discovery. Second, I can follow the family of the treated allottees for fifty years, and up to a century for some, after the original positive shock was received, whereas contemporary studies focus only on short-term impact. However, the biggest distinction of this context over most lottery and RCT studies is the population examined: American descendants of the enslaved. Results

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<sup>4</sup>While similar in spirit to [Miller \(2020\)](#), my paper does not compare landholders to non-landholders, who may differ for reasons other than land ownership. Importantly, the individuals that I compare *all* own land, and in the aggregate, differ *only* on whether they received a positive wealth shock or not.

from this population are important to our understanding of continued racial disparities in the US today.

The remainder of the paper is organized as follows. Section 2 describes the historical events leading up to the natural experiment in this paper. Section 3 describes the construction of the novel datasets used in this study, provides summary statistics, and establishes balance over many pertinent characteristics. Section 4 lays out my causal identification strategy and presents my primary results. Section 5 presents intergenerational results. Section 6 concludes.

## 2 A Brief History of the Muscogee (Creek) Nation

### 2.1 The Muscogee (Creek) Nation Prior to Allotment

During the seventeenth and eighteenth centuries, several Indigenous villages in present-day Georgia and Alabama coalesced into the “Muscogee Confederacy” or the “Creeks.” While they mostly practiced communal agriculture at first, by the second half of the eighteenth century, some Muscogee farmers adopted slavery and engaged in plantation agriculture, as practiced by their white neighbors. Because of this move toward assimilation with Anglo-American norms, as well as for other practices, the Muscogee and four other Indigenous nations earned the dubious distinction as the “Five Civilized Tribes,” in contrast to the remainder of “...other so-called ‘wild’ Indians who continued to rely on hunting for survival” (Frank, 2007).

Unfortunately, the Muscogee’s efforts toward assimilation did not shield them from the Removal Act of 1830, federal law that forced all Native Americans living east of the Mississippi River to move to an “Indian Territory,” west of the Mississippi. The Muscogee people were forcefully moved west over the ensuing decade, bringing their enslaved people with them. In Indian Territory, in the decades leading up to the Civil War, usage of private land and the practice of plantation slavery intensified among the Muscogee. Following emancipation in 1865, the Muscogee (Creek) Nation recognized the freedom and citizenship of the formerly enslaved, comprising 13% of the population at that time, and allowed them land-use rights commensurate with those held by Muscogee Natives (Chang, 2010, p.33).

In an effort to weaken the political power of Native nations, and to open Native reservation land to white settlement, Congress passed the General Allotment Act of 1887, also known as the Dawes Act, which broke up communal Native land into privately owned parcels known as allotments. The Five Civilized Tribes, including the Muscogee (Creek) Nation, successfully resisted inclusion in the Dawes Act at that time, but eventually ceded under federal pressure, agreeing to undergo allotment under the Curtis Act of 1898 (Kidwell, 2007). The agreement between the United States government and the Muscogee stipulated that every Muscogee citizen was entitled to 160 acres of land, regardless of age, gender or former enslavement status.

## 2.2 The Muscogee (Creek) Nation under Allotment

In April 1899, the Dawes Commission began to enroll applicants onto the “Dawes Rolls,” formally designating them as members of the Muscogee (Creek) Nation.<sup>5</sup> Successful applicants had to demonstrate either Creek lineage, to be enrolled as “Creek Indians,” or that their ancestors were enslaved within the Muscogee (Creek) Nation prior to the Civil War, to be enrolled as “Creek Freedmen.” The Dawes Rolls closed for the first time in September 1904 but were reopened twice to enroll infants born after the original deadline, finally closing for good in March 1907. For more details, and excerpts of text from the agreements themselves, see Appendix Subsection F.2. Inclusion on the Dawes Rolls entitled individuals—or their parents or guardians—to choose an allotment of 160 acres of land from the Muscogee (Creek) Nation.<sup>6</sup> Allottees typically selected land on which they and their family already lived or farmed (Chang, 2010, p. 76).<sup>7</sup> The vast majority of eventual allottees had selected their allotments by September 1901 and deeds began to be issued in December 1901 (Chang, 2010, p. 62).

At the turn of the twentieth century, sitting near the northern boundary of the Muscogee (Creek) Nation, was the land that would become the city of Tulsa, Oklahoma, although the full extent of the Muscogee (Creek) Nation was much larger (see Appendix Figure H.2). While federal government’s intentions of privatization via allotment may have originally been to transform the Muscogee into yeoman farmers, within a few years, the landscape was transformed into one of landlords and tenants (Chang, 2010, p. 72). I describe one of the primary reasons for this in the next subsection.

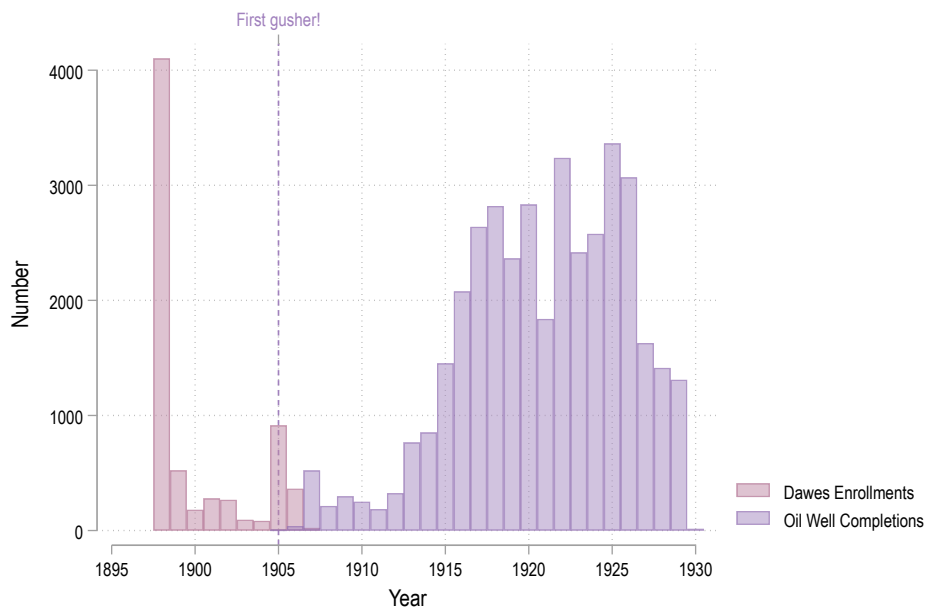
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<sup>5</sup>In fact, that one’s ancestors can be directly traced to the Dawes Rolls is required for citizenship in the Muscogee (Creek) Nation even today (The Muscogee Nation, 2023). Whether or not descendants of Freedmen should be included was recently decided in court in favor of the descendants of Freedmen (Press, 2023).

<sup>6</sup>Of the 160 acre allotment, 40 acres would be designated as their “homestead,” and would be “nontaxable and inalienable and free from any encumbrance whatever for twenty-one years.” The remaining 120 acres, known as the “surplus,” were only covered by these restrictions for the first five years. Federal treatment toward Creek Freedmen soon began to diverge from treatment toward Creek Natives and, in April 1904, Congress removed restrictions on surpluses held by adult Freedmen. In 1908, it removed restrictions on their homesteads too, as well as all restrictions on homesteads and surpluses of Freedmen minors. See Appendix Subsection F.1.

<sup>7</sup>Qualitatively, there is little evidence of land selection with respect to future oil earnings. I work to address this concern quantitatively in Section 3.2.

**Figure 1:** Freedmen Enrollment in the Muscogee (Creek) Nation



*Note:* This figure plots the year that each Freedmen allottee was enrolled as a citizen in the Muscogee (Creek) Nation by the Dawes Commission.

## 2.3 Oil Discovery in the Muscogee (Creek) Nation

In late summer 1913, 11-year-old Sarah Rector was on track to become “the Richest Black Girl in America.” How the middle daughter of an Oklahoma farming family, descended from enslaved people, was reportedly bringing in \$300– nearly \$10,000 in 2025—a day was a matter of happenstance. As her grandparents were enslaved by Muscogee Natives, her parents Joe and Rose enrolled the family with the Dawes Commission, first themselves in 1899, then her older sister Rebecca in 1902, and lastly Sarah and her little brother Joe Jr. in 1905 as “Newborn Freedmen.” The enrollment entitled each family member to select an allotment of 160 acres of land in the Muscogee (Creek) Nation, and when Oklahoma became a state in 1907, the family was living on and farming Rose’s allotment in Muskogee County. However, it was Sarah’s allotment, over in Creek County, that would later change the direction of the family’s fortunes.<sup>8</sup>

The first discovery of oil in the Tulsa-area occurred in 1901 on an allotment belonging to a Creek Indian named Sue A. Bland. While the well itself produced minimal oil, this discovery is considered to have incited the Tulsa oil boom due to the attention that it brought to the area (Weaver, 2007). The first “gusher” oil well, nicknamed as such for its geyser-like appearance, was drilled in 1905 on the allotment of another Creek Indian, Ida Glenn, after which the lucrative “Glenn Pool” was named. Appendix **Figure H.1** gives a 1912 map of Glenn Pool. Soon, investors and speculators flooded the area and made exploratory contracts with many landholders for the right to drill for oil on their land.<sup>9</sup>

Two of those exploratory contracts were the ones that a “landman” named Frank Barnes made with Sarah Rector’s father in March 1912 for the exclusive right to drill on Sarah’s and Joe Jr.’s land. Just for signing each exploratory contract, the Rectors received \$80, or fifty cents an acre. Barnes soon sold the leases to a driller named B.B. Jones, who had the equipment and workers needed to drill holes, and the knowledge of and connections to sell crude oil, if the wells produced any, to a refinery. After some time, in August 1913, Jones finally drilled a well on Sarah’s land and discovered a gusher that output 2,500 barrels of oil a day.

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<sup>8</sup>Details about the Rectors are from **Bolden (2014)**.

<sup>9</sup>For more details on oil drilling contracts, including a sample notice of regulation changes at Appendix **Figure G.1**, see Appendix Section **G**.

Figure 2: Muskogee Times-Democrat, September 4, 1913

## Little Sarah Will Soon Be In The Plute Class

To have an income larger than that of the president of the United States, or of a life insurance or railroad president, and all out of one oil well, is the good fortune of Sarah Rector, a little ten year old negro girl, living just west of Muskogee near Crekola.

When Sarah's parents applied for an allotment for her, as a descendant of a Creek freedman, she was allotted her portion near what is now the town of Cushing. Lately oil derricks began to spring up about her land, and finally a lease was made on Sarah's allotment.

A well was drilled, and a few days ago, the famous Jones well, the largest ever tapped in the Mid-Continent oil field, was brought in on her land. The well is making 2,500 barrels of oil a day, and has been widely advertised as "the well that produces over \$2,500 a day, or over \$2 a minute."

Many miles from the property, however, little Sarah continues at her daily play, and plans what she is going to do with the \$300 a day which she gets as royalty. Her family is well-fixed, but in a short time little Sarah will be the richest of them all. As other wells are drilled, her income will multiply by leaps and bounds, so that ultimately not even John D. or Vincent Astor will have anything on Sarah in the matter of ready cash for ice cream and such delights of the very young.

## GAYNOR OFF FOR TRIP TO EUROPE

New York, Sept. 4.—Mayor Gaynor surprised friends and political enemies alike today by sailing for Europe. Astonishment that he should leave New York on the eve of his campaign for re-election was somewhat allayed by the announcement that his trip would last only twenty days.

Mayor Gaynor's plan previously announced, spoke of a vacation trip of two weeks to the Adirondacks.

The mayor changed his plans at the eleventh hour because he believed a sea trip would give him greater relief from the throat trouble that has recurred since he was shot more than three years ago. The bullet that lodged in his throat remains there and his voice never has served him for public speaking since then.

There was some doubt today about the composition of the ticket to run with Mayor Gaynor. It has not been announced whether the mayor would accept on his ticket the fusion nominees for comptrollers and president of the board of aldermen.

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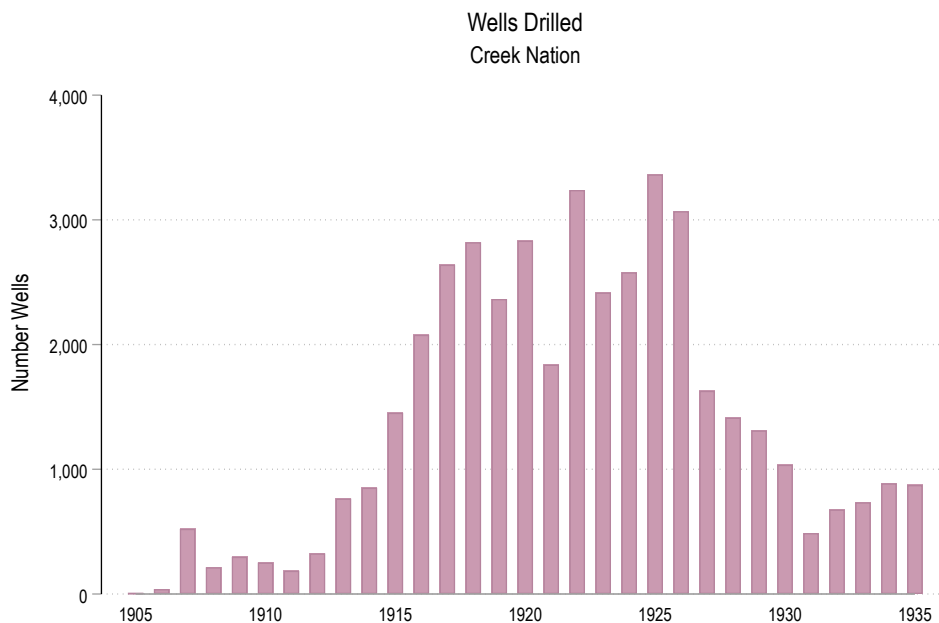
Which Tire does NOT RIM-CUT? U. S. UNIVERSAL DUNLOP. Sold by John Lumbard Tire Co. Adv.

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Note: This figure contains a news announcement from the week that the gusher was drilled onto Sarah Rector's allotment. "Plute" is short for plutocrat.

Over the next three decades, drillers found oil under many allotments owned by Muscogee Natives and Freedmen (see Appendix **Figure H.3**).<sup>10</sup> **Figure 3** is a histogram showing the distribution of the date that drilling was reported as complete on each unique well located in the Muscogee (Creek) Nation (oil-producing, dry, gas, or otherwise). Drilling ramped up precipitously between 1910 and 1920 and seems to have hit a peak in this area in the mid 1920s.

**Figure 3:** Distribution of Drilling Activity within the Muscogee (Creek) Nation



*Note:* This figure plots the date that each unique well was reported as completed within the Muscogee (Creek) Nation between 1907 and 1935. The Oklahoma Corporation Commission (OCC) was established in 1907 to regulate the Fuel, Oil and Gas, Public Utilities, and Transportation Industries in the new state of Oklahoma. I restrict the wells included in this figure to later than 1907 because some wells drilled prior to OCC oversight may be missing, or their dates of completion may be incorrectly set to 1901. This figure is intended to communicate the timing of oil industry activity in the Muscogee (Creek) Nation and thus includes all categories of wells that oil companies constructed, including oil-producing, dry, gas, injection, and others. For a histogram showing the distribution of “treatment arrival,” see **Figure 1**.

<sup>10</sup>One might wonder whether Freedmen differ from Muscogee Natives in likelihood of oil discovery. Such a disparity could occur in multiple plausible ways: if Natives and Freedmen faced different institutions, had different ownership rights and restrictions, or simply selected land of different quality due to Muscogee Nation or federal government discrimination. While any or all of these stories could be true, I show in **Table A.1** that I do not observe differential rates of oil discovery over Dawes enrollment category (Creek Freedmen versus Creek Indians).

The owners of the allotments on which a producing oil well was drilled received payments, sometimes substantial payments, via royalties from the oil company that drilled.<sup>11</sup> I estimate that the average allottee who held a lease with an oil company by 1909 to have earned \$257 that year. This represents a sizable windfall, considering that the typical American farm family is estimated to have only earned about \$402 in 1909 (Goldenweiser, 1916). The distribution of earnings from royalty accounts over the years 1908-1918 can be found at Appendix **Table C.10**.

Not much more is known about the later life of the most famous, but exceedingly private, Creek Freedmen allottee, Sarah Rector, and her family, following the oil strike on Sarah's land. It is said that the daughters spent time at the Tuskegee Institute in Alabama during their childhood, and eventually, the family moved to St. Louis, Missouri.<sup>12</sup>

### 3 Data

This study examines outcomes of descendants of the enslaved who received a wealth shock (oil) and those who did not. Toward this end, I compiled a dataset of individuals who were eligible for treatment and among them, who was treated by an oil shock. I try to find these people, their immediate family members, and their grandchildren in pre-shock and post-shock data sources in order to establish that treated individuals were comparable to untreated individuals and to analyze their later outcomes.

#### 3.1 Data Sources and Construction

I built a database of allottees for the entire Muscogee (Creek) Nation. My Creek allottee database contains some limited, time-invariant, microdata on all allottees, such as their age reported at date of enrollment, their gender, and the names of their mother and father and which Indigenous nations they were enrolled in, if any. I also observe a number of reported dates of death. This amounts to 18,850 allottees in total, but for this paper I subset this to only Freedmen allottees, or 6,836 individuals. More information and a full list of the variables can be found in Appendix Subsection **I.1**.

Half of the Freedmen allottees were women (**Table I.16**). In 1910, Freedmen were 25.3 years old on average and half were aged 22 or younger. However, the population spanned all ages, from very young to very old, as shown in **Figure 4**. The maximum possible number of allottees living at any point in time between

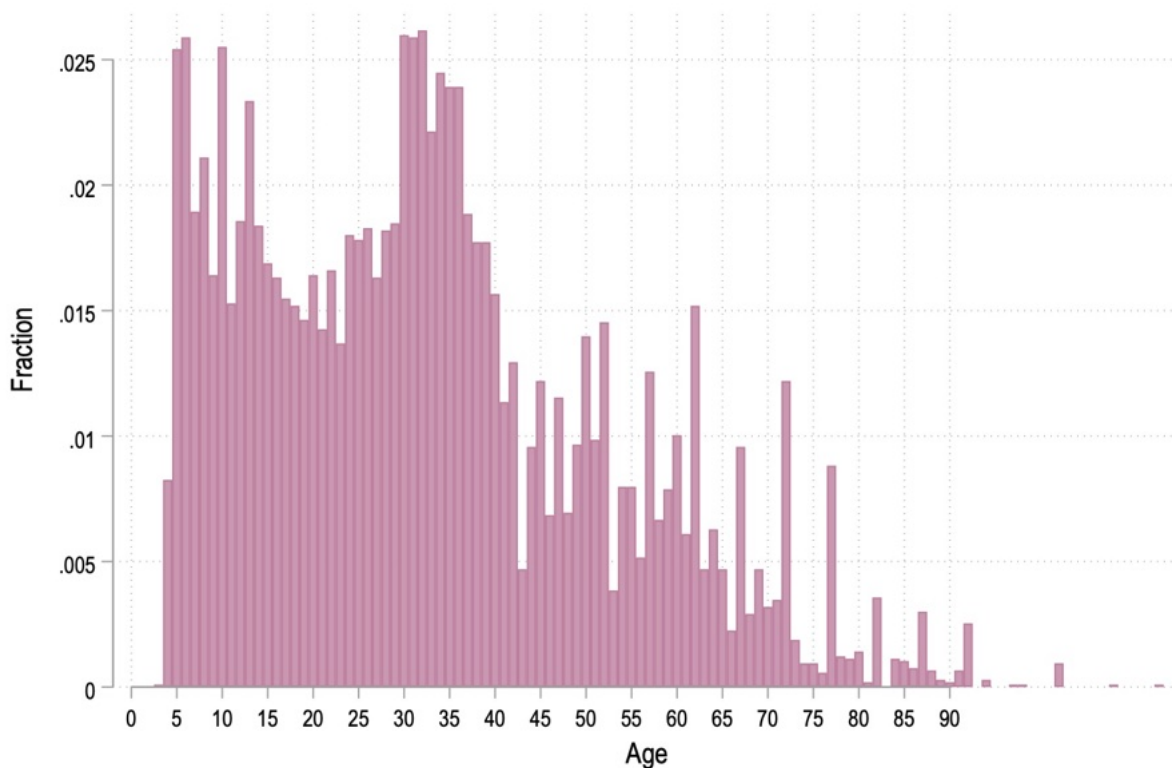
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<sup>11</sup>One might wonder whether the royalty, or "mineral rights owner's share," that oil companies paid Freedmen allottees, typically 1/8th (12.5%), is a lower rate than their white counterparts received at the time. However, this royalty was standard from 1900 through the 1980s (Oklahoma Mineral Rights and Royalty, nd). Given the degree of oversight that the Bureau of Indian affairs had over the business affairs of allottees at this time, it is not surprising that Indian and Freedmen received comparable or *better* agreements than their white counterparts.

<sup>12</sup>Interesting newspaper accounts of the pursuits of other individuals who grew up in households treated with oil can be found at Appendix Section **D**.

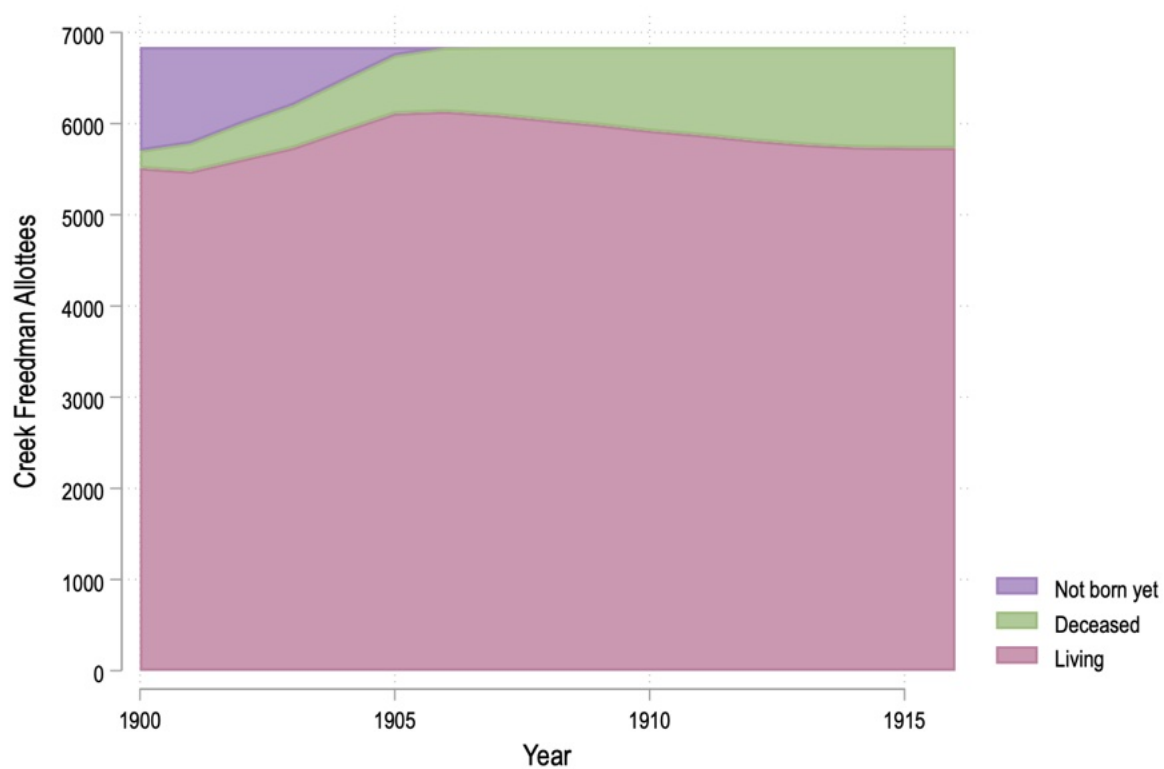
1900 and 1915 is represented by the blue area in **Figure 5**. While the full Creek Freedmen population may have been 6,836, a smaller number was alive at any point in time, as, for example, 1,583 people (23%) were born between 1900 and 1907, and 855 (12.5%) are indicated to have died by 1910.

**Figure 4:** Distribution of Creek Freedmen Allottee Ages in 1910



*Note:* Age is imputed based on “Dawes Census Card Number” and applicant “type.” For a discussion on bunching in reported age, see Appendix Subsection I.1. This figure includes all 6,836 Creek Freedmen allottees, regardless of whether they are indicated to have died by 1910. An age histogram set in 1900 would be closer to the time that the Dawes Commission drew up the original Census Rolls and would thus not include quite as many deceased people, but it would exclude the many “Minor” and “New Born” children born between 1900 and 1907.

**Figure 5:** Living sample size between 1900 and 1915



*Note.* Freedmen allottees in each group calculated from recorded birth and death dates. Dates are incomplete (see Appendix Section E).

Second, I built a database of the exact location of every allotment in the Muscogee (Creek) Nation.<sup>13</sup> A team of specially trained undergraduate research assistants manually converted each PDF allotment map in *Hastain's Township Plats of the Muscogee (Creek) Nation* to computer-readable Public Land Survey System (PLSS) data (Hastain, 1910). I describe this process further in Appendix Subsection I.3.

Lastly, I obtained a dataset of every “drilling action” taken in Oklahoma from the Oklahoma Corporation Commission (OCC). I subset this dataset to completion of oil-producing wells within the boundaries of the Muscogee (Creek) Nation and in the pertinent time span I describe this data further in Appendix Subsection I.4.

## Treatment Assignment

An allotment is considered to have been treated if any producing oil wells were built on top of the land within a specific window of time. As shown in **Figure I.8**, I assign treatment status by merging the three databases described above: I first link the allotment land with the oil well data by simply merging the PLSS codes of the well actions “many-to-one” to the PLSS codes of land allotments.<sup>14</sup> I then link each treated allotment with its allottee owner via the allottee’s unique roll number.

Then, for each Freedmen allottee, I can observe whether their own allotment was “assigned” treatment (got oil before 1918) or control (no oil before 1918).<sup>15</sup> For Freedmen defined as treated under this definition, the median first year of oil production is 1916. I plot allotments by the first year that oil was produced on them in **Figure 1**. This shows that the arrival of new oil-producing allotments peaks around 1920 and falls steadily afterward. Correspondingly, the progress of the treated and untreated sample sizes over five-year intervals can be seen in **Table 1**, with oil having been discovered under the allotments of 365 different people by 1920. Oil was discovered under the allotments of 293 different people by 1918, which I currently use as my conservative cutoff of treatment receipt. By this definition, the remaining 6,547 allottees make up the control group.

Lastly, because I observe familial relationships, I assign the positive treatment status of mothers and

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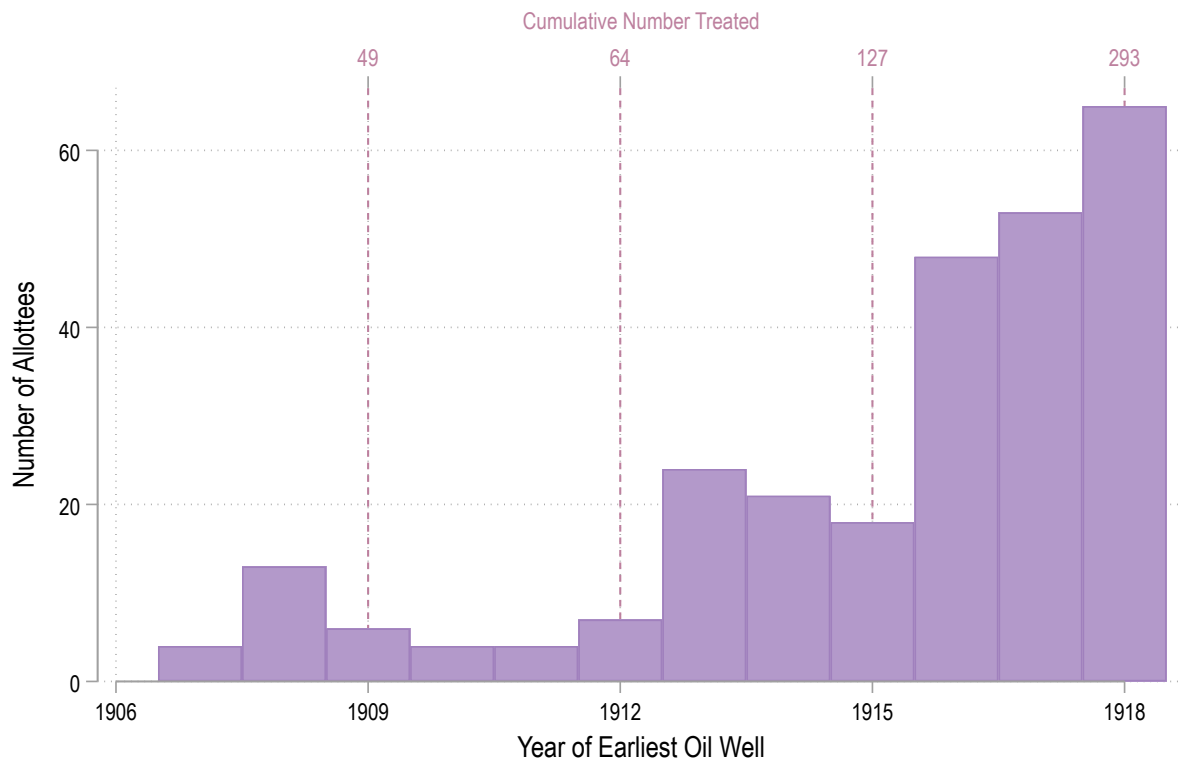
<sup>13</sup>I use the word “allotment” to refer to the entire 160-acre entitlement of one individual. In the case where an individual’s allotment is divided into multiple non-contiguous segments, I still refer to the sum of the land owned by that particular allottee as “allotment,” singular.

<sup>14</sup>By taking advantage of the PLSS, I avoid needing a geographic information system (GIS) software.

<sup>15</sup>At this time, I define ever/never treated as “oil before 1918” or “oil after 1918 or never at all.” Creek Freedmen originally were prohibited from selling the entirety of their allotment for twenty-one years after 1901, just the same as Creek Indians. However, those restrictions were lifted incrementally over the following three decades, with difficulty of land sale differing with respect to race, age and whether the land was designated as “homestead” or “surplus.” See Appendix Section F.1. The unconfirmed narrative is that many Creek Freedmen sold or otherwise lost their land relatively quickly. I am working to confirm the validity of this statement and, in the future, I should be able to verify allottee realization of oil royalties through 1918.

fathers to their allottee children.<sup>16</sup> At this time, I am conservative and only assign *parent treatment* to *children*, and only if the child was born in 1900 or later. This generation of allottees is likely to have been living at home during the entire treatment window (1900-1918).

**Figure 6:** Distribution of Year of First Oil Production Under Each Allotment



*Note:* This figure plots the subset of allotments, originally owned by Creek Freedmen, on which a producing oil well was drilled between 1901 and 1935. I plot the allotments by the year that they first received a producing oil well. The red dashed lines occur at five-year individuals and give the sum of the preceding blue bars.

<sup>16</sup>Future work will also extend treatment to spouses, parents siblings.

**Table 1:** Treatment arrival

	Oil discovered by year	
	No	Yes
year		
1905	6,810	26
1910	6,787	49
1915	6,726	110
1920	6,471	365

*Note:* This table indicates whether oil was yet produced on allotment land originally owned by allottee over five-year intervals. The first and second columns sum to 6,836, the total population of Creek Freedmen allottees, in all rows.

## Record Linking

While, as described above, the Creek Freedmen database includes a small number of variables for all allottees, in order to speak to any other pre-treatment observables, it is necessary to link individuals to external records, in particular to the 1910 census.<sup>17</sup> Then, in order to study outcomes, I need to link my sample to records collected in the post-treatment years. This paper presents estimates from the 1920, 1930, and 1940 censuses. Future work will incorporate the 1950 census.

The empirical strategy that I describe in Section 4 does not strictly require a panel in order to draw causal inference. Given the unique characteristics of my data, I design my own linking methodology, and first conduct each record linkage *separately* from every other record linkage. I supplement the sample that I personally linked with pre-made links, made by various census-linking projects, keeping their various strengths and weaknesses in mind and choosing the conservative options when appropriate (Abramitzky et al., 2021; Bailey et al., 2020; Buckles et al., 2023). This process is depicted in Figure E.3. To be clear, these projects link the decennial censuses *to each other* and my biggest challenge is linking an *external data source*—the Dawes Rolls—to any decennial census. See Appendix Section E for more details.

Table E.15 shows that there are differential linkage rates by observable characteristics, but they occur in predictable ways that we would not expect to be related to oil discovery.<sup>18</sup> The matched sample is younger and more male.

## 3.2 Summary Statistics and Balancing Tests

To confidently analyze later-life outcomes of oil discoverers as resulting from a natural experiment, I first establish that “treatment assignment” can be treated as random. That is, receiving a wealth shock was uncorrelated with pre-treatment observable characteristics.

As I describe in Subsection 3.1, I observe the age and gender of all units in the full Creek Freedmen allottee sample. This microdata can be considered “ground truth.” Table 2, Panel A, demonstrates that treatment and control units are statistically indistinguishable on these time-invariant characteristics: likelihood of receiving treatment does not vary by gender or age.<sup>19</sup> The average treatment and control allottee enrolled on the Dawes Rolls in late fall, 1899. Radically different enrollment dates among treatment and control allottees, in either direction, earlier or later, would be cause for concern: it would imply asymmetric oil distribution information between the treatment group and control group.

In addition, among those matched to the 1910 Census, treatment and control units were also similar on

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<sup>17</sup>While it would be ideal to observe this population in 1900, prior to the arrival of *any treatment whatsoever*, and though the Indian Territory was enumerated during the 1900 census, unfortunately the records have not been made available as computer-readable data.

<sup>18</sup>See differential link rates by oil discovery at Table E.14.

<sup>19</sup>Likelihood of treatment also does not vary between Creek Indians and Creek Freedmen, as shown in Appendix Table A.1.

time-invariant census observables, with the possible exception of mother's birthplace. This can be seen in Panel B.<sup>20</sup> It is unsurprising that matched individuals are not totally representative of the full population, whose true ages and genders we know from the Dawes Rolls. The people matched to the census may be slightly younger.

**Table 2:** Balance on characteristics in 1910

	No oil by 1918	Oil by 1918	p-value
<b>A. Time-Invariant (from Dawe's Rolls)</b>			
N	6,543 (95.7%)	293 (4.3%)	
Male	0.48 (0.50)	0.51 (0.50)	0.404
Age in 1910	25.38 (17.66)	25.28 (16.83)	0.924
Year of Dawes enrollment	1,899.95 (2.91)	1,899.87 (2.90)	0.615
<b>B. Time-Invariant (from 1910 Census)</b>			
N	2,746 (94.2%)	168 (5.8%)	
Male	0.52 (0.50)	0.51 (0.50)	0.817
Age	22.58 (16.98)	24.88 (15.32)	0.087
Born in Oklahoma	0.92 (0.27)	0.90 (0.30)	0.262
Mother born in OK	0.75 (0.43)	0.82 (0.38)	0.034
Father born in OK	0.67 (0.47)	0.70 (0.46)	0.510
Literacy (Age 20+ in 1910)	0.74 (0.44)	0.80 (0.40)	0.141

*Note:* Mean (Standard deviation). p-value from a pooled t-test. Allottees in this table grouped by whether oil produced under *own* allotment by 1918 or not. Summary statistics from Panel A include the entire Creek Freedmen population from the Dawes Rolls, including those indicated to have deceased by 1910. Adult occupation categories are mutually exclusive but for children, “in school” and “works” are not mutually exclusive. All allottees included in panels B, C, D and E have been linked to the 1910 Census, by construction.

<sup>20</sup>The treatment and control units that make it into the three post-treatment samples—those matched to the 1920, 1930, and/or 1940 censuses respectively—are also balanced on time-invariant characteristics, as demonstrated in **Table A.2**. The one exception is gender. Many more women in the treatment group were matched to the 1930 and 1940 censuses than women in the control group.

Lastly, **Table 2** demonstrates that in 1910, treatment and control units are also statistically indistinguishable over the variables that I will later analyze as outcomes during the post-treatment decades.<sup>21</sup>

## 4 Empirical Evidence: Human Capital and Wealth-Building

### 4.1 Effects on Individual Outcomes

The central challenge in estimating the effect of wealth on descendants of the enslaved is the endogeneity of wealth. Freedmen and their children who have greater wealth than others likely differ in other ways that make it difficult to interpret subsequent differences in other characteristics, such as educational attainment, as resulting directly from the wealth itself. In this paper, I overcome that challenge by demonstrating that the receipt of wealth shocks by some people but not for others is exogenous to other characteristics.

The treatment effect of finding oil to an individual can be calculated simply by comparing mean outcomes for finders to those of non-finders. This is equivalent to running a basic bivariate regression with an outcome on the left-hand side and a dummy variable for finding oil on the right-hand side. Random discovery of oil among allottees reduces the risk of omitted-variable bias. Therefore, I do not strictly need to introduce additional controls to recover the effect of treatment. However, most of my estimates do include controls for gender and age to improve the precision of my estimated treatment effect and to reduce residual variation. I estimate OLS regressions of the following form:

$$Y_{ij} = \gamma T_j + \delta_{ai} + \epsilon_{ij}, \quad (1)$$

where  $i$  is the individual,  $j$  indexes the allotment,  $T_j$  denotes treatment (oil discovery on allotment by 1918), which is a binary variable, and control variables are  $\delta_{ai}$  (dummies for gender, age and a quadratic term for age). When an allottee's own allotment is treated  $i = j$ . As children and grandchildren are considered,  $i$  and  $j$  vary. Standard errors are clustered at the allotment ( $j$ ) level.

In this section, I compare average outcomes for oil finders and non-finders. I rely on the reasonable assumption that oil distribution is orthogonal to underlying allottee characteristics in order to interpret cross-sectional differences as causal outcomes. Some of the effects are imprecisely estimated. However, taken together, the directions of the 1920-1940 metrics tell a consistent story: treated allottees— allottees with oil discovered under their own or their parents' allotment in or before 1918— seem to be doing better on a number of outcomes than those untreated. Immediate wealth effects— those in 1920— are muted. But by that year, young treated allottees have improved their human capital. This shows up in 1930 when they are more likely to be found in white-collar jobs and less likely to be farmers than their untreated counterparts, and by 1940, they own their homes more.

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<sup>21</sup>This is also largely true of variables that I will analyze as mechanisms as shown in Appendix **Table A.3**, though allottees who find oil are 5 percentage points more likely to be the head of their household.

If the path to greater Black wealth long term is through higher earnings, which [Derenoncourt et al. \(2023\)](#) would frame as a “flow value,” then investment into education would be prudent if it opens the door to professional, typically higher paying, jobs. In this section, I will consider the possibility that oil money allowed families to invest more in human capital—whether that investment was in the form of school fees and supplies or keeping teenagers in school rather than employing them on the family farm—and that human capital investment allowed allottees to enter higher-class, higher-paying occupations as adults.

**Table 3** shows that teenage allottees, together with allottees in their twenties—i.e. the generation of Creek Freedmen who were younger than age 18 before the arrival of treatment—are significantly more likely to be literate in 1920, with a boost of 2.1 percentage points on top of an already high literacy rate of 96 percent. Furthermore, there is suggestive evidence that treated people received higher levels of secondary and higher education, although there is not enough power to reject that these differences are greater than zero. In particular, to reject a difference of 6.7 percentage points in high school completion as at a ten percent level, given the sample standard deviations observed, I would need to observe the educational achievements of 1,392 control individuals and 232 treated individuals. Unfortunately, these numbers are larger than the starting populations, before normal attrition. Similarly, to reject a difference of 5.6 percentage points in college completion, I would need 875 control individuals and 145 treated individuals.<sup>22</sup> This analysis shows clear, modest gains in basic literacy among youths exposed to oil money and suggestive gains when the windfall hits in time to affect school-leaving decisions.

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<sup>22</sup>In comparison, nationwide in 1940, 12.3 and 1.6 percent of Black American adults held high school and college diplomas, respectively ([National Center for Education Statistics, 2017](#)).

**Table 3:** The Effect of Oil Money on Allottee Education

	Literate	High School	College
Coefficient	0.021*	0.067	0.056
Std. error	(0.011)	(0.056)	(0.034)
Mean	0.96	0.14	0.03
Observations	1,540	564	634

*Note:* This table presents a series of regression estimates of the differences in post-treatment educational achievements between treated and untreated Creek Freedmen allottees in three different age brackets. Literacy and completion of second grade are estimated for allottees who were younger than age 18 in 1910. Completion of high school is estimated for allottees who were younger than age 20 in 1910. Completion of college is estimated for allottees who were younger than 25 in 1910. All regressions control for age, age squared, and gender. Means are computed over the entire treated and untreated Creek Freedmen allottee population in the relevant age bracket. Treatment is defined as presence of a producing oil well on allotment by the year 1918. For more information on data and variable definitions, see Data Appendix I. Standard errors are robust to heteroskedasticity and are shown in parentheses. \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$

I next investigate whether finding oil affected the probability that a worker’s primary occupation could be characterized as white-collar, blue-collar or farming in the three decades post-treatment. In 1910, people who would be treated by 1918 had statistically similar employment characteristics as people who would “never” be treated (**Table 2**).

I estimate a multinomial logit of the choice of occupational class as a function of treatment status. Thus, defining  $P_o$  as the probability of being employed in either a white collar occupation or the farming sector, I estimate

$$\log \left( \frac{P_o}{P_{o=0}} \right) = \beta T_j + \delta_{ai} + \epsilon_i \quad (2)$$

for  $o = 1$  to 2. I calculate robust standard errors, clustering at the individual level.

**Table 4** shows the predicted probabilities of occupational choice; the base category is blue-collar occupation. Finding oil increases the probability of white-collar occupation relative to the probability of blue-collar occupation in 1920, 1930 and 1940. Pooling all decades, we see that a switch from nontreatment status to treatment status leads to a .822 increase in the relative log odds of being in white-collar employment versus blue-collar employment. This corresponds to the relative risk ratio for a switch from nontreatment status to treatment status of 2.275 (i.e.  $e^{0.822}$ ), or more than twice as likely.

**Table 4:** The Effect of Oil Money on Occupational Status

	A. 1920		B. 1930		C. 1940		D. 1920-1940 Pooled	
	White_Collar	Farming	White_Collar	Farming	White_Collar	Farming	White_Collar	Farming
Oil	0.869 *	-0.018	0.798 **	-0.364	0.741 *	0.296	0.822 ***	-0.063
	(0.516)	(0.319)	(0.352)	(0.321)	(0.428)	(0.314)	(0.270)	(0.211)
Number of observations	1,091		874		673		2,638	

*Note:* This table presents a series of multinomial logit regression estimates of the 1920, 1930 and 1940 probabilities of employment type for treated and untreated Creek Freedmen allottees, relative to blue collar employment. All regressions control for age, age squared, and gender. Occupation categories are mutually exclusive. Treatment is defined as presence of a producing oil well on allotment by the year 1918. For more information on data and variable definitions, see Data Appendix I. Standard errors are robust to heteroskedasticity and are shown in parentheses. Pooled estimates are clustered at the individual-level. \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$

Household ownership is the main proxy for wealth during the censuses. **Table 5** shows that, while in 1920, treated and non-treated households have a similar propensity to own their homes, treated folks are much more likely to live in an urban area. By 1940, treated folks are more likely to own their home. House value was not collected in the 1920 census, and was only collected for non-farm homes in the 1930 census. Regressions of owner-occupied house value on treatment give large, positive, but imprecisely estimated effects to 1930, 1940, and pooled house value, and can be found at Appendix **Table B.4**.

A robust literature in the fields of urban and development explores the relationship between urbanicity and poverty, with respect to segregated Black Americans and people in developing nations respectively (**Kain, 1968; Lagakos et al., 2023**). While Creek Freedmen may have already owned farmland and homes in rural Oklahoma, perhaps movement to a city presented employment and education opportunities that were more lucrative in the long-term, despite the large upfront migration costs of travel, rent, higher consumer prices, and loss of community. For reference, Appendix **Table C.12** presents relevant summary statistics of all of the neighborhoods included in this study, split by urban and rural status. Urban neighborhoods have twice the rate of professional occupations among nonwhite people as rural neighborhoods, in all census decades. The children in urban neighborhoods were significantly more literate than the children in rural neighborhoods, perhaps as a result of higher quality schooling opportunities and fewer household responsibilities (i.e. farming). However, it seems that the availability of higher status jobs and greater educational opportunity in cities is accompanied with lower property ownership, descriptively. Taken together, **Table 5** and Appendix **Table C.12**, suggest that in the short term, upon receipt of oil, Freedmen chose to forego property owned in rural areas in order to make investments in migration to urban areas.

**Table 5:** The Effect of Oil Money on Homeownership

	A. 1920	B. 1930	C. 1940	D. 1920-1940 Pooled
Homeowner				
Coefficient	-0.001	0.070	0.095*	0.050
Std. error	(0.041)	(0.047)	(0.050)	(0.031)
Mean	0.64	0.45	0.37	0.52
Observations	2,001	1,228	997	4,226
Urban				
Coefficient	0.100***	0.017	-0.010	0.043
Std. error	(0.038)	(0.046)	(0.051)	(0.032)
Mean	0.22	0.35	0.44	0.31
Observations	2,001	1,228	997	4,226

*Note:* This table presents a series of regression estimates of the 1920, 1930, 1940 and pooled differences in homeownership between treated and untreated Creek Freedmen allottees. All regressions control for age, age squared, and gender and the pooled regression controls for year. Means are computed over the entire treated and untreated Creek Freedmen allottee population. Treatment is defined as presence of a producing oil well on own or parent allotment by the year 1918. For more information on data and variable definitions, see Data Appendix I. Standard errors are robust to heteroskedasticity and are shown in parentheses. \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$

## 4.2 Effects to Children

The canonical quantity-quality tradeoff theory of fertility proposes that families face a tradeoff between the number of children to have (quantity) and the investment to make in each child's upbringing (quality) (Becker and Lewis, 1973). The theory suggests that as families have more children, the resources available to devote to each child decrease, potentially leading to a lower “quality” of upbringing per child. On the other hand, if a family has fewer children, they can allocate more resources per child, providing a better “quality” of upbringing. This model can be extended to include potential income from child labor, particularly in the context of agrarian societies, where the immediate economic benefits of an extra hand on the farm can outweigh the long-term benefits of investing heavily in each child's education and health (Barro and Becker, 1989; Boserup, 2013; Rosenzweig and Wolpin, 1980; Schultz, 1988).

If child quantity-quality tradeoff dynamics are at play in this context, we might expect that as Creek Freedmen move out of farming and into professional employment, that they would bear fewer children but increase their investment into the human capital of the children that they do have. In fact, the number of children living in each household declines by nearly a quarter-child per household over all decades pooled. Most notably, 0.22 fewer teenagers live in treated households than in untreated households in 1920.

Oil income does sharply reduce the rate of teenagers who work by 8 percentage points on average, or by around one in three children, shown in **Table 7**. This estimate is the most stark in 1920, when the rate of teenagers working was highest generally. While working and school are not mutually exclusive activities for teenagers, we can also see that the negative relationship between treatment and working seems to correspond with a positive impact to schooling in all decades. We do not see an impact to the already nearly-universal literacy rate. Together, the results point to a strong income effect on child work and a negative response on family size or coresidence.

**Table 6:** Children in Allottee Households

	A. 1920	B. 1930	C. 1940	D. 1920-1940 Pooled
Total Children (#)				
Coefficient	-0.274	-0.228	-0.125	-0.243*
Std. error	(0.196)	(0.194)	(0.187)	(0.135)
Mean	2.76	1.87	1.45	2.19
Observations	1,960	1,206	973	4,139
Teenagers (#)				
Coefficient	-0.224***	0.029	-0.047	-0.105**
Std. error	(0.078)	(0.079)	(0.083)	(0.047)
Mean	1.06	0.49	0.49	0.76
Observations	1,960	1,206	973	4,139

*Note:* This table presents a series of regression estimates of the differences in post-treatment quantity of children in the households where treated and untreated Creek Freedmen lived. All regressions control for age, age squared, and gender of the allottee and the pooled regression controls for year. Means are computed over the entire treated and untreated Creek Freedmen allottee population. Treatment is defined as presence of a producing oil well on allotment by the year 1918. For more information on data and variable definitions, see Data Appendix I. Standard errors are robust to heteroskedasticity and are shown in parentheses. \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$

**Table 7: Quality of Upbringing in Allottee Households**

	A_1920	B_1930	C_1940	D. 1920-1940 Pooled
Teens Working (%)				
Coefficient	-0.101**	-0.071	-0.016	-0.076***
Std. error	(0.042)	(0.043)	(0.057)	(0.027)
Mean	0.28	0.17	0.15	0.22
Observations	850	445	428	1,723
Teens in School (%)				
Coefficient	0.084*	0.037	0.046	0.063**
Std. error	(0.046)	(0.056)	(0.062)	(0.031)
Mean	0.67	0.73	0.77	0.71
Observations	850	445	428	1,723
Teen Literacy (%)				
Coefficient	0.002	0.000	-0.011	-0.001
Std. error	(0.019)	(0.019)	(0.030)	(0.013)
Mean	0.97	0.98	0.98	0.97
Observations	850	445	379	1,674

*Note:* This table presents a series of regression estimates of the differences in post-treatment literacy and activities of children in the households where treated and untreated Creek Freedmen lived. For children, “in school” and “works” are not mutually exclusive activities. All regressions control for age, age squared, and gender of the child and the pooled regression controls for year. Means are computed over the entire treated and untreated Creek Freedmen offspring population. Treatment is defined as presence of a producing oil well on allotment by the year 1918. For more information on data and variable definitions, see Data Appendix I. Standard errors are robust to heteroskedasticity and are shown in parentheses. \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$

## 5 Productive Investments as a Mechanism for Economic Mobility

We might expect that the effects of oil money on socioeconomic status of the first-generation and intergenerationally might have a long-term impact if the money is invested into productive means, such as entrepreneurship, capital, education, or migration. I find evidence of allottee investment in education, but no investments into migration, in response to finding oil.

In **Table 8**, I consider where Freedmen lived in the decades following the oil shock. Of the people that I observe in the 1940 census, roughly 94 percent had moved to a new populated place and roughly 78 percent had moved to a different county. However, only around 43 percent and 31 percent, respectively, had left the Muscogee (Creek) Nation or moved out of Oklahoma entirely. I ran my main specification using these four measures as outcomes and found that finding oil led to no effect on changing populated places, which nearly everyone does, and no effect on leaving the Muscogee (Creek) Nation or Oklahoma. However, in 1920, treated individuals remained in their original county 10.4 percentage points more often than untreated individuals.

**Table 8:** The Effect of Oil Money on Migration

	Left OK Mean: 0.15	Left Cr Nation Mean: 0.26	Left county Mean: 0.53	Left PP Mean: 0.74
year=1920 X Oil by 1918	0.016 (0.025)	-0.037 (0.029)	-0.104*** (0.039)	-0.022 (0.041)
year=1930 X Oil by 1918	-0.020 (0.039)	-0.059 (0.044)	0.027 (0.049)	-0.011 (0.053)
year=1940 X Oil by 1918	-0.054 (0.042)	-0.053 (0.048)	0.012 (0.053)	-0.011 (0.048)
Controls (age, age <sup>2</sup> , gender)	Yes	Yes	Yes	Yes
Decade fixed-effects	Yes	Yes	Yes	Yes
Adjusted R-squared	0.04	0.05	0.05	0.06
Observations	4,404	4,402	4,394	4,123

*Note:* This table presents a series of regression estimates of the difference in likelihood of being observed out of Oklahoma, out of the Muscogee (Creek) Nation, out of “original county” or out of “original populated place,” respectively, between treated and untreated Creek Freedmen allottees in 1920, 1930 and 1940. I define original county as the Oklahoma county in which the allottee’s Dawes Enrollment took place, sometime between 1898 and 1907. I define original populated place as the populated place in which an allottee was living in 1910, if I observe them in the 1910 Census. All regressions control for age, age squared, and gender and include fixed effects for census decade. Means are computed over the entire treated and untreated Creek Freedmen allottee population allottee population in 1920. Treatment is defined as presence of a producing oil well on own or parent allotment by the year 1918. For more information on data and variable definitions, see Data Appendix I. Standard errors are clustered at the individual level and are shown in parentheses. \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$

There were few statistically robust or economically meaningful differences in the qualities of the places where people lived in 1940, save for possibly the rate of white neighbors which is 7.4 percentage points lower. Most notably, **Table 9** shows that, not only were the adults living near treated Creek Freedmen not more educated, but their children did not attend school at higher rates and the schools seem to be of the same quality, as proxied by teacher salary. No other statistically significant differences seem to exist between the places that treated and nontreated folks ended up, over the selected variables that I explored. **Table 10** shows that male Creek Freedmen treated with oil did not seem to live longer than those who were not treated, and were not statistically more likely to die in Oklahoma.

**Table 9:** Neighborhood Quality, 1940

	Estimate	Mean	Observations
<b>A. Education</b>			
Share graduated college	0.009 (0.030)	0.139	993
Share graduated high school	-0.002 (0.028)	0.278	993
School attendance	0.007 (0.010)	0.827	993
Teacher Salary	-24.754 (38.175)	936.422	925
<b>B. Labor Markets</b>			
Employment to population ratio	-0.006 (0.015)	0.809	993
Unemployment rate	-0.001 (0.012)	0.128	992
Racial earnings gap	-27.397 (41.141)	490.816	814
<b>C. Families</b>			
Share of families single-parent	0.009 (0.011)	0.174	991
Poverty rate	0.016 (0.021)	0.703	993
<b>D. Segregation</b>			
Proportion of neighbors white	-0.074** (0.035)	0.583	993
<b>E. Other</b>			
Urban	-0.010 (0.051)	0.443	997

*Note:* This table presents a series of regression estimates of selected neighborhood characteristics of the places where treated and untreated Creek Freedmen allottees lived in 1940. All regressions control for age, age squared, and gender. Means are computed over the entire treated and untreated Creek Freedmen allottee population. Treatment is defined as presence of a producing oil well on allotment by the year 1918. For more information on data and variable definitions, see Data Appendix I. Standard errors are robust to heteroskedasticity and are shown in parentheses.

\*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$

**Table 10: Death Outcomes**

	Died in OK Mean: 0.52	Age at Death Mean: 69.32
oil on own or parent allotment	0.119 (0.077)	0.247 (2.659)
Controls (age, age <sup>2</sup> , gender)	No	No
Adjusted R-squared	0.00	-0.00
Observations	381	412

*Note:* This table presents a series of regression estimates of the differences in death age and location between treated and untreated Creek Freedmen allottees who were born after 1898 but died after age 17. The regressions do not control for any covariates. Treatment is defined as presence of a producing oil well on own or parent allotment by the year 1918. Death information hand-collected as described in Online Appendix. \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$  Standard errors are robust to heteroskedasticity and are shown in parentheses.

## 6 Conclusion

The 1899 transfer of land to nearly seven thousand Black people in Oklahoma, and the subsequent discovery of lucrative oil deposits under a quasi-random subset of those pieces of land, provides a unique natural experiment. This episode gives me the opportunity to assess the role that post-emancipation stock of wealth played in the economic progress of Black Americans, providing insight into what types of post-emancipation policies may have been effective at reducing long-term racial inequalities, had they been successfully implemented in the decades following the abolition of slavery.

This is the first study to causally estimate the long-run effects of a wealth shock on the socioeconomic outcomes of descendants of the enslaved, addressing a major gap in our understanding of racial wealth disparities. I find that receiving a windfall in the decades following emancipation had positive economic effects that persisted over time and even across generations. In the short run, oil wealth led to urbanization: by 1920, treated Creek Freedmen were more likely to live in areas with greater educational and economic opportunity. Over time, treated individuals and their children attained higher levels of education and were more likely to enter professional occupations. These patterns suggest that human capital investments were a key channel through which wealth translated into lasting gains. By 1940, treated families also appear to have accumulated more physical wealth, as proxied by higher rates of homeownership.

While this study provides valuable causal evidence, further research is needed on longer-term and intergenerational effects, as well as potential policy implications. In ongoing work, I aim to provide evidence on the economic statuses of the children and grandchildren of Creek Freedmen at the end of their lives. I am also working to characterize the size, cadence and duration of the wealth shocks. Understanding what types of monetary shocks were most effective in reducing racial disparities in the past is key to designing future policy that is targeted to reduce inequality.

My research demonstrates that access to wealth can be transformative for disadvantaged groups, underscoring both the persistent impacts of historical injustices and the potential for targeted interventions to promote economic mobility.

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## A Additional Balance Tests

In this section, I present a series of supplementary tests that demonstrate further that the discovery of oil was not associated with many characteristics that we might consider important.

In **Table A.1**, I establish that oil-producing wells are built on the allotments of Creek Freedmen and Creek Indians at statistically identical rates.

**Table A.1:** Oil Discovery by Allottee Race

	Creek Indian N=[12,014]	Freedman N=[6,836]	p-value
Oil well 1900-1930	0.118 (0.323)	0.116 (0.320)	0.654

*Note:* Mean (Standard deviation), p-value from a pooled t-test.  
Allottees in this table grouped by whether they were enrolled on the Dawes Roll as “Indian” or “Freedmen.”

In **Table A.2**, I establish balance over time-invariant characteristics among treated and untreated allottees for the different samples used in this paper for outcome analysis.

**Table A.2:** Balance on time-invariant characteristics among samples matched to the 1920, 1930 or 1940 Census

	No oil by 1918	Oil by 1918	p-value
A. Sample Matched to 1920 Census			
N	1,895 (94.1%)	119 (5.9%)	
Male	0.58 (0.49)	0.54 (0.50)	0.424
Age from 1920 census	31.23 (16.09)	32.19 (15.60)	0.526
Born in Oklahoma	0.92 (0.28)	0.90 (0.30)	0.535
Mother born in OK	0.71 (0.46)	0.77 (0.42)	0.115
Father born in OK	0.64 (0.48)	0.67 (0.47)	0.492
Speaks English	0.94 (0.24)	0.97 (0.18)	0.222
Literacy (Age 20+ in 1910)	0.76 (0.43)	0.87 (0.34)	0.057
B. Sample Matched to 1930 Census			
N	1,148 (92.7%)	90 (7.3%)	
Male	0.67 (0.47)	0.52 (0.50)	0.004
Age from 1930 census	39.72 (14.01)	41.38 (14.61)	0.282
Born in Oklahoma	0.91 (0.28)	0.90 (0.30)	0.635
Mother born in OK	0.69 (0.46)	0.66 (0.48)	0.488
Father born in OK	0.62 (0.48)	0.63 (0.48)	0.843
Speaks English	1.00 (0.05)	1.00 (0.00)	0.627
Literacy (Age 20+ in 1910)	0.77 (0.42)	0.80 (0.40)	0.631
C. Sample Matched to 1940 Census			
N	935 (92.9%)	72 (7.1%)	
Male	0.72 (0.45)	0.54 (0.50)	0.001
Age from 1940 census	47.79 (12.64)	50.38 (11.84)	0.093
Born in Oklahoma	0.86 (0.34)	0.86 (0.35)	0.942
Mother born in OK	0.64 (0.48)	0.80 (0.45)	0.457
Father born in OK	0.49 (0.50)	0.67 (0.52)	0.420
Speaks English	. (.)	. (.)	
Completed 2nd grade (Adult in 1910)	0.81 (0.39)	0.92 (0.28)	0.114

*Note:* Mean (Standard deviation), p-value from a pooled t-test. Allottees in this table grouped by whether oil produced under *own* allotment by 1918 or not. In 1940, mother and father's birthplace were only asked of the 5 percent of the population selected as "sample-line respondents," which may be why the estimates are so large and imprecise for these years. Ability to speak English or literacy were not collected in 1940 but I proxy for the latter with whether the individual reports completing second grade or not.

**Table A.3:** Balance on individual-level and household-level pre-treatment characteristics

	No oil by 1918	Oil by 1918	p-value
A. Location, 1910			
N	2,746 (94.2%)	168 (5.8%)	
Urban	0.10 (0.30)	0.12 (0.33)	0.278
Living in Oklahoma	0.99 (0.09)	0.98 (0.13)	0.155
Farm	0.71 (0.45)	0.71 (0.45)	0.853
B. Family Status, 1910			
N	2,746 (94.2%)	168 (5.8%)	
Household head	0.18 (0.39)	0.25 (0.43)	0.034
Never married/single (Under age 25)	0.92 (0.27)	0.84 (0.37)	0.005
Separated or divorced if ever married	0.08 (0.27)	0.04 (0.19)	0.141
Duration of current marriage, years	14.38 (11.25)	11.24 (10.58)	0.027
Children ever born	5.83 (3.79)	5.67 (3.90)	0.779
Children still living	3.93 (2.65)	4.27 (3.05)	0.422
C. Household Characteristics, 1910			
N	2,731 (94.3%)	166 (5.7%)	
Household members	6.35 (2.65)	5.89 (2.55)	0.032
Household members under 18	3.64 (2.27)	3.20 (2.07)	0.015
Household members over 18	2.70 (1.25)	2.69 (1.19)	0.893
Child in school	0.85 (0.36)	0.91 (0.29)	0.216

*Note:* Mean (Standard deviation), p-value from a pooled t-test. Allottees in this table grouped by whether oil produced under own or parent allotment by 1918 or not.

## B Additional Outcomes

**Table B.4:** The Effect of Oil Money on Home Value

	A. 1930	B. 1940	C. 1930-1940 Pooled
House Value			
Coefficient	1607.434	567.448	954.557
Std. error	(1327.044)	(504.025)	(695.047)
Mean	1942.17	966.53	1315.36
Observations	192	345	537

*Note:* This table presents a series of regression estimates of the 1930, 1940 and pooled differences in home value between treated and untreated Creek Freedmen allottees. All regressions control for age, age squared, and gender and the pooled regression controls for year. Means are computed over the entire treated and untreated Creek Freedmen allottee population. Treatment is defined as presence of a producing oil well on own or parent allotment by the year 1918. For more information on data and variable definitions, see Data Appendix I. Standard errors are robust to heteroskedasticity and are shown in parentheses. \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$

**Table B.5:** Transitions into and out of Homeownership

	Homeowner to Non-homeowner Mean: 0.44	Non-homeowner to homeowner Mean: 0.42
year=1920 X Oil by 1918	0.042 (0.049)	0.127 (0.092)
year=1930 X Oil by 1918	-0.127* (0.072)	-0.110 (0.107)
year=1940 X Oil by 1918	-0.087 (0.074)	0.055 (0.145)
Controls (age, age <sup>2</sup> , gender)	Yes	Yes
Decade fixed-effects	Yes	Yes
Adjusted R-squared	0.10	0.02
Observations	2,844	835

*Note:* This table presents a series of regression estimates of the difference in likelihood of transitioning into or out of home ownership, respectively, between treated and untreated Creek Freedmen allottees in 1920, 1930 and 1940. I define original homeownership status as homeownership status in 1910, if I observe them in the 1910 census. All regressions control for age, age squared, and gender and include fixed effects for census decade. Means are computed over the entire treated and untreated Creek Freedmen allottee population allottee population in 1920. Treatment is defined as presence of a producing oil well on own or parent allotment by the year 1918. For more information on data and variable definitions, see Data Appendix I. Standard errors are clustered at the individual level and are shown in parentheses. \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$

## C Additional Descriptive Statistics

**Table C.6:** White-Collar Jobs in 1910

	Percent
Occupation, 1950 basis	
Clergymen	3.85
Nurses, professional	3.85
Teachers (n.e.c.)	15.38
Managers, officials, and proprietors (n.e.c.)	53.85
Collectors, bill and account	3.85
Mail carriers	3.85
Messengers and office boys	3.85
Real estate agents and brokers	3.85
Salesmen and sales clerks (n.e.c.)	7.69
Total	100.00

**Table C.7: White-Collar Jobs in 1920**

	Percent
Occupation, 1950 basis	
Clergymen	8.11
Lawyers and judges	8.11
Nurses, professional	2.70
Social and welfare workers, except group	2.70
Teachers (n.e.c.)	10.81
Managers, officials, and proprietors (n.e.c.)	18.92
Bookkeepers	5.41
Cashiers	2.70
Mail carriers	2.70
Shipping and receiving clerks	2.70
Telephone operators	2.70
Clerical and kindred workers (n.e.c.)	2.70
Demonstrators	2.70
Newsboys	2.70
Real estate agents and brokers	13.51
Salesmen and sales clerks (n.e.c.)	10.81
Total	100.00

**Table C.8: White-Collar Jobs in 1930**

	Percent
Occupation, 1950 basis	
Athletes	1.72
Clergymen	3.45
Lawyers and judges	1.72
Librarians	1.72
Pharmacists	1.72
Teachers (n.e.c.)	17.24
Postmasters	1.72
Managers, officials, and proprietors (n.e.c.)	32.76
Messengers and office boys	1.72
Shipping and receiving clerks	1.72
Stenographers, typists, and secretaries	5.17
Clerical and kindred workers (n.e.c.)	5.17
Advertising agents and salesmen	1.72
Insurance agents and brokers	1.72
Real estate agents and brokers	12.07
Salesmen and sales clerks (n.e.c.)	8.62
Total	100.00

**Table C.9: White-Collar Jobs in 1940**

	Percent
Occupation, 1950 basis	
Clergymen	4.26
Librarians	2.13
Musicians and music teachers	6.38
Nurses, professional	2.13
Pharmacists	4.26
Social and welfare workers, except group	2.13
Surveyors	2.13
Teachers (n.e.c.)	12.77
Therapists and healers (n.e.c.)	2.13
Inspectors, public administration	2.13
Managers, officials, and proprietors (n.e.c.)	21.28
Clerical and kindred workers (n.e.c.)	12.77
Insurance agents and brokers	2.13
Real estate agents and brokers	8.51
Salesmen and sales clerks (n.e.c.)	14.89
Total	100.00

**Table C.10:** Creek Indian and Freedmen Royalty Accounts

	Total Credits Received 1908-1918				
	# Accounts	Mean	Median	Minimum	Maximum
Number of Quarters Paid					
0	2	0	0	0	0
1	1,974	47.90655	24	.38	1981
2	2,487	121.1301	52	1.5	5864.83
3	1,878	229.3537	104	3	56546.07
4	1,348	435.1282	174	3.74	39840.6
5	953	639.0257	266.24	1.9	24063.24
6	810	1127.39	348	2.28	72124.1
7	546	1626.822	556.095	6.75	347497.7
8	432	3908.359	719.88	13	470667.3
9	320	8264.683	870.975	9	771851.1
10	282	14050.53	1048	15	1604416
11	179	18128.07	988	22	868537.2
12	162	12163.8	1068	22	360807.3
13	148	7946.048	1062.065	13	449181
14	101	4148.589	1728	14.14	57775.68
15	87	6824.173	1450.96	126.88	86824.3
16	62	4009.014	1183.08	19.2	47456.29
17	62	3547.767	2115	22	27986.78
18	38	3726.95	1768.135	27	32718.36
19	65	8770.296	580	42	235177.2
20	22	4686.077	1426.365	36.96999	36221.45
21	40	6201.217	1636.95	36	102185.3
22	21	12422.9	3440.94	27	65336.92
23	23	9614.618	2382	33	65613.92
24	26	9239.475	1255.36	144	68585.37
25	11	6616.052	6467.96	145.5	15258.04
26	18	6693.16	3784.52	392	53158.2
27	16	18848.94	3224.995	65.75	92671.73
28	10	37519.75	15453.56	336	241168
29	12	11134.49	2160.135	174	53151.16
30	54	1963.252	569.3	51	12536.6
Total	12,189	1877.621	144	0	1604416

**Table C.11: Freedmen with Royalty Accounts**

Number of Quarters Paid	Total Credits Received 1908-1918				
	# ALLOTTEES	Mean	Median	Minimum	Maximum
0	6,187	0	0	0	0
1	154	36.26903	12	1.5	1076.02
2	111	125.0732	52	6.65	3393.64
3	77	157.6096	104	8	608
4	58	549.246	138.5	11.07	20484.02
5	39	318.9474	200	10	1038.36
6	30	289.3713	200.55	33.44	1097.24
7	27	683.8044	274.14	42	6984.1
8	26	1033.137	494.185	36.4	12581.92
9	19	1457.378	496	51.08	11254.65
10	20	2112.78	819.5	120	11518.13
11	10	1368.145	480.52	144	6119.68
12	8	2948.536	1393.2	621	10549.58
13	12	984.2358	478	78	3488.35
14	3	893.8667	336	258.05	2087.55
15	6	15426.57	11107.6	183	37762.63
16	3	1275.953	1822	19.2	1986.66
17	2	2028.53	2028.53	1161.65	2895.41
19	11	491.8355	114	46.64001	3109
20	3	991.9601	1222	349.4001	1404.48
21	2	3111	3111	3076	3146
23	1	1908.28	1908.28	1908.28	1908.28
24	5	1770.318	288	177	7810.59
25	1	1582.39	1582.39	1582.39	1582.39
26	3	629.18	739.5399	392	756
27	1	1399.14	1399.14	1399.14	1399.14
28	2	2064.26	2064.26	1358	2770.52
30	18	474.5078	307	51	1789.4
Total	6,839	444.7794	46	0	37762.63

**Table C.12:** Characteristics of Rural and Urban Enumeration Districts

	Rural	Urban	p-value
A. 1920 Census			
N	343 (54.4%)	288 (45.6%)	
Nonwhite home ownership rate	0.40 (0.24)	0.25 (0.23)	<0.001
Nonwhite white-collar occupation rate	0.04 (0.08)	0.08 (0.06)	<0.001
Nonwhite child school attendance	0.61 (0.23)	0.75 (0.16)	<0.001
Literacy among nonwhite children/teenagers	0.91 (0.12)	0.98 (0.03)	<0.001
B. 1930 Census			
N	317 (53.0%)	281 (47.0%)	
Nonwhite home ownership rate	0.31 (0.20)	0.29 (0.23)	0.194
Nonwhite white-collar occupation rate	0.04 (0.07)	0.09 (0.08)	<0.001
Nonwhite child school attendance	0.72 (0.20)	0.79 (0.16)	<0.001
Literacy among nonwhite children/teenagers	0.92 (0.14)	0.98 (0.05)	<0.001
C. 1940 Census			
N	295 (46.2%)	344 (53.8%)	
Nonwhite home ownership rate	0.36 (0.23)	0.23 (0.20)	<0.001
Nonwhite white-collar occupation rate	0.05 (0.07)	0.11 (0.10)	<0.001
Nonwhite child school attendance	0.77 (0.22)	0.84 (0.16)	<0.001
Literacy among nonwhite children/teenagers	0.87 (0.25)	0.92 (0.22)	0.034

*Note:* The table presents descriptive statistics over the enumeration districts in which at least one allottee was found living in each Census year, split by whether the ED was classified as “urban” or “rural” (see Section I). Mean (Standard deviation): p-value from a pooled t-test. To be clear, these statistics consider *all* nonwhite households, not only Creek Freedmen households.

## D News Items



**Figure D.1**

### WESTERN UNIVERSITY.

Last Friday evening a mock trial was the program of the James A. Handy literary society.

Miss Eva Jones of Denver gave the fourth of the series of six recitals by the advance piano students under Prof. Robert Jackson. Miss Jones has made wonderful advancement, as interpreted by the many difficult high class numbers rendered with such ease and beauty on this occasion.

Miss Anna Rentie, a student of the Business department, returned Friday from a two weeks sight seeing visit to Denver, Colorado Springs and Salt Lake City, Utah, with her father, Mr. Ireland Rentie of Muskogee, Okla., and her sister, Miss Mattie Rentie. Mr. Rentie is a very wealthy negro land leasor, receiving a large income monthly from the Standard Oil company of New York. On this entire journey Mr. Rentie and his daughters occupied a private Pullman car specially chartered for this trip. He will return for our commencement.

Mr. Eugene Vaughan of last year's class in stenography, who was recently sent to fill a lucrative position in the office of superintendent of insurance at

Figure D.2

## E Census Linking

For each match decade, I first subset my Creek Freedmen database to people who are likely to have been living in the relevant year, although this information is by no means complete.<sup>23</sup> Importantly, there is considerable bunching within reported age for small children in particular. See **Figure I.5** and **Figure I.6**.

**Table E.13:** Method with which census-link made

	Census Decade			
	1910	1920	1930	1940
Matched by Hand	279	208	173	143
Semiautomated: Family	2,040	974		
Semiautomated: Unique name	326	364		
Census Tree (implied)	245	438	1,049	848
Confirmed deceased	894	1,114	1,121	1,130
Unmatched	3,055	3,741	4,496	4,718
Total	6,839	6,839	6,839	6,839

*Note:* Creek Freedmen allottees were linked to the various censuses in rounds using various methods. This table breaks down the method with which each link was made separately, as well as the deceased and unmatched people. In cases where the same link was made through multiple methods, they are grouped with the most reliable linking method. Observations of deaths are incomplete, particularly after 1920.

- **Cleaned Name.** I standardize names via the *abeclean* Stata command which converts nicknames into likely given names by gender, such that “Sam” would become “Samuel” for a man, and “Samantha” for a woman (Curtis and Eriksson, 2020). I also output NYSIS names.
- **Enumeration District, 1900 (census).** To assist in linking, I manually classified all post-office locations into 1900 Census enumeration districts (EDs).

I link Creek Freedmen allottees to the 1910-1920 Censuses separately and iteratively, using a combination of automated and manual methods.<sup>24</sup>

1. In Stage 1, I employ a novel household-linking strategy.<sup>25</sup> Taking the other members of the household into account allows me to approve, with near certainty, many candidates in whom I would not otherwise have felt confident.

(a) Using the Stata commands *matchit* and *relink2*, I search broadly for each individual by standard-

<sup>23</sup>My information on deaths is incomplete and in particular, would only include deaths by 1914 at the latest.

<sup>24</sup>Indian Territory was enumerated in the 1900 Census but is unavailable on IPUMs.

<sup>25</sup>My strategy differs from Helgertz et al. (2022).

**Table E.14:** Census-linkage rates, by treatment status

	No oil by 1918 [6,547]	Oil by 1918 [293]	p-value
Link result, 1910	0.583 (0.493)	0.709 (0.455)	<0.001
Link result, 1920	0.451 (0.498)	0.564 (0.497)	<0.001
Link result, 1930	0.258 (0.438)	0.408 (0.493)	<0.001
Link result, 1940	0.209 (0.406)	0.329 (0.471)	<0.001

*Note:* Mean (Standard deviation), p-value from a pooled t-test. Allottees in this table grouped by whether oil produced under own or parent allotment by 1918 or not. The Ns at the top of the columns represent the entire Creek Freedmen population but the denominators with which the linkage rates are calculated exclude individuals found to be deceased by the respective census year.

ized and unstandardized first and last name over all Black and Native American people living in Indian Territory within a cell defined only by sex. I keep those matches within a generous band around reported age such that each allottee has many candidates.

- (b) I identify *census households* for which multiple individuals from the same *household in the Creek Freedmen database* match.<sup>26</sup> I reshape the linked file to be at the household level, rather than the individual level.
  - (c) I review household-level candidates by hand using the Stata command *clrevmatch*.
  - (d) I subset the expansive data from **1a** to only those individual candidates from matched households identified in **1c**. I check the matched dataset for duplicates over *Roll\_Number + Type* and over *histid*.
2. In Stage 2, I take advantage of location data that was collected by the Dawes Commission: the nearest post office to where the application took place.
    - (a) I start with the expansive data from **1a** and drop all candidates identified by *Roll\_Number + Type* and *histid* for whom matches have already been identified.
    - (b) Using the Stata command *abematch*, I search for each individual by age and unedited first and last name among individuals in that ED.<sup>27</sup> See subsection ?? for how I defined EDs in this data.
    - (c) I return the remainder of matches to the common pool.
  3. I next search for each individual by age and standardized first and last name among individuals in that enumeration district. See Appendix Subsection ?? for how I standardized names in this data.

<sup>26</sup>I define a “household” in the Creek Freedmen database as individuals listed on the same Dawes Census Card, inclusive of parents listed on different cards than their children.

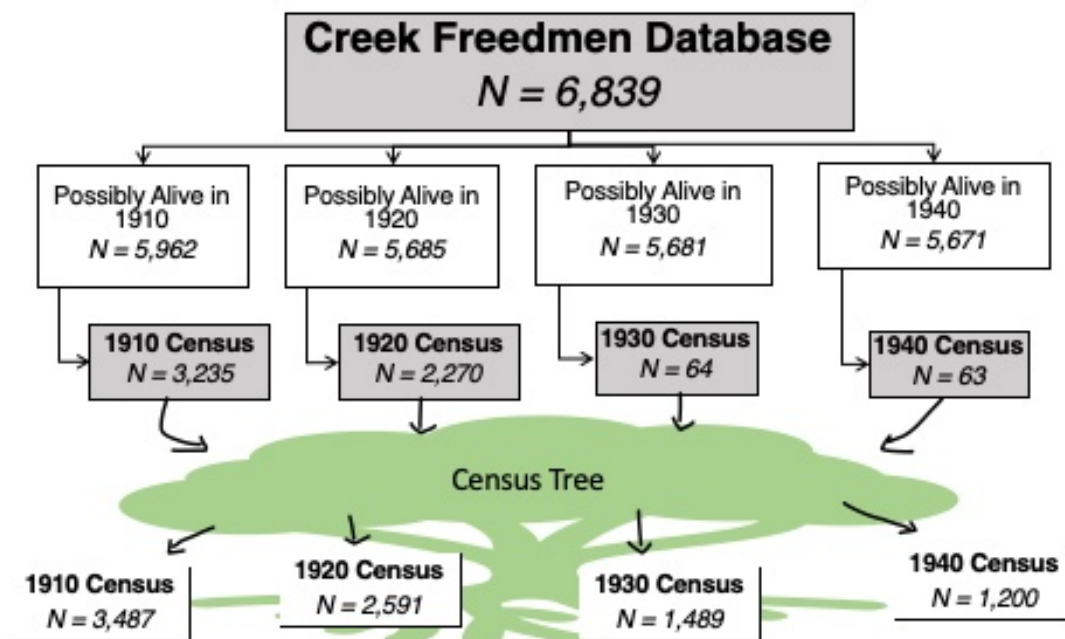
<sup>27</sup>Because *abematch* only identifies unique matches, there can be large sample size gains from matching within covariate groups defined as precisely as possible, as long as the groups are credible.

**Table E.15:** Census-linked sample characteristics

	Unlinked	Linked	p-value
1910 Census			
N	2,458 (41.2%)	3,505 (58.8%)	
Male	0.432 (0.495)	0.519 (0.500)	<0.001
Age in 1910	26.102 (17.346)	23.223 (16.216)	<0.001
1920 Census			
N	3,095 (54.4%)	2,591 (45.6%)	
Male	0.425 (0.494)	0.557 (0.497)	<0.001
Age in 1910	25.429 (17.230)	22.084 (15.012)	<0.001
1930 Census			
N	4,180 (73.6%)	1,502 (26.4%)	
Male	0.420 (0.494)	0.667 (0.471)	<0.001
Age in 1910	24.800 (17.186)	21.398 (13.427)	<0.001
1940 Census			
N	4,462 (78.7%)	1,210 (21.3%)	
Male	0.424 (0.494)	0.708 (0.455)	<0.001
Age in 1910	25.016 (17.169)	19.655 (11.797)	<0.001

*Note:* Mean (Standard deviation), p-value from a pooled t-test. Allottees in this table grouped by whether linked to each census or not. The linked and unlinked units in this table include both treated and untreated individuals who are not indicated to have deceased by each census year.

- (a) I append the near certain matches from Stage 1 to this.
- (b) I identify *census households* for which multiple individuals from the same *household in the Creek Freedmen database* match, now taking these as near-certain.
4. I generate a set of more ambiguous matches to be reviewed by hand by a group of research assistants and myself.
5. **Automated Links:** In the short term, I supplement my hand links with automated links. Using the Stata command *abematch*, I search for each individual by sex, age, race and NYSIIS-standardized first and last name among individuals born in Oklahoma. I allow for age to be up to five years incorrect on either end but matches with smaller errors will take priority over those with larger errors. In the standard version, which I utilize here, this command discards Freedmen that match to multiple individuals in the Census, thereby preserving only Freedmen who match to a single individual in the Census. I keep matches for which variable output “uniquefile1” is equal to 1, meaning that, IN EACH FILE, individuals are unique by NYSIIS name within a year above and below their reported age.



**Figure E.3:** Creek Freedmen Allottee Data Linking

## **F Laws of Descent and Distribution**

### **F.1 Restrictions on the Sale of Allotments**

#### **Original**

Sec. 7. “Lands allotted to citizens hereunder shall not in any manner whatsoever or at any time be incumbered taken or sold to secure or satisfy any debt or obligation contracted or incurred prior to the date of the deed to allottee therefor and such lands shall not be alienable by the allottee or his heirs at any time before the expiration of five years from the ratification of this agreement, except with the approval of the Secretary of the Interior.

Each citizen shall select from his allotment forty acres of land as a homestead which shall be nontaxable and inalienable and free from any incumbrance whatever for twenty-one years, for which he shall have a separate deed, conditioned as above: *Provided*, That selections for minors, prisoners, convicts, incompetents, aged and infirm persons who can not select for them may be made in the manner herein provided selection of their allotments; and if for any reason selection be not made for any citizen it shall be of said commission to make selection for him.

The homestead of each citizen shall remain, after the death of the allottee, for the use and support of children born to him after the ratification of this agreement but if he have no such issue then he may dispose of his homestead by will free from limitation herein imposed, and if this be not done, the land shall descend to his heirs according to the laws of descent and distribution of Muscogee (Creek) Nation, free from such limitation.”

Original Creek Agreement (31 Stat. L. 861) as given in [Kappler \(1904\)](#), page 730.

#### **First Removal of Restrictions**

“And all the restrictions upon the alienation of all land of allottees of either of the Five Civilized Tribes of Indians who are not of Indian blood, except minors, and except as to homesteads, hereby removed, and all restrictions upon the alienation of all other allottees of said tribes, except minors, and except as to homesteads, may, with the approval of the Secretary of the Interior, be removed under such rules and regulations as the Secretary of the Interior may prescribe, upon application to the United States Indian agent at the Union Agency in charge of the Five Civilized Tribes, if said agent is satisfied upon a full investigation of each individual case that such removal of restrictions is for the best interest of said allottee.”

Act of April 21, 1904 (33 Stat. 189.) as given in [Kappler \(1913\)](#), page 50.

## **Sale Upon Death of Allottee**

Sec. 2. “That the adult heirs of any deceased Indian of either of the Five Civilized Tribes... may sell and convey the lands inherited from such a decedent; and if there be both adult and minor heirs of such decedent, then such minors may join in a sale of such lands by a guardian...”

Act of April 26, 1906 (34 Stat. L. 137) as given in **Kappler (1913)**, page 178.

## **Second Removal of Restrictions**

“All lands, including homesteads, of said allottees enrolled as intermarried whites, as freedmen, and as mixed-blood Indians having less than half Indian blood including minors shall be free from all restrictions.”

Act of May 27, 1908 (35 Stat. 312.) as given in **Kappler (1913)**, page 351.

## **F.2 Birthdate of Inclusion on the Dawes Rolls**

### **“Citizen” Rolls**

Sec. 28. “No person, except as herein provided shall be added to the roles of citizenship of said tribe after the date of this agreement and no person whomsoever shall be added to said rolls after the ratification of this agreement.

All citizens who were living on the first day of April, eighteen hundred and ninety-nine, entitled to be enrolled under section twenty-one of the Act of Congress approved June twenty-eight, eighteen hundred and ninety-eight, entitled “An Act for the protection of the people of Indian Territory, and for other purposes,” shall be placed upon the rolls to be made by said commission under said Act of Congress, and if any such citizen has died since that time, or may hereafter die, before receiving his allotment of lands and distributive share of all the funds of the tribe, the lands and money to which he would be entitled, if living, shall descend to his heirs, according to the law of descent and distribution of the Muscogee (Creek) Nation, and be allotted and distributed to them accordingly.

All children born to citizens so entitled to enrollment, up to and including the first day of July, nineteen hundred, and then living, shall be placed on the rolls made by said commission; and if any such child die after said date, the lands and moneys to which it would be entitled, if living shall descend to its heirs according to the laws of descent and distribution of the Muscogee (Creek) Nation, and be allotted and distributed to them accordingly.”

Original Creek Agreement (31 Stat. L. 861) as given in **Kappler (1904)**, page 736.

## **New Born Rolls**

“That the commission to the Five Civilized Tribes is authorized for sixty days after the date of approval of this act to receive and consider applications for enrollment of children born subsequent to May twenty-five, nineteen hundred and one, and prior to March fourth, nineteen hundred and five, and living on said latter date, to citizens of the Creek Tribe of Indians whose enrollment has been approved by the Secretary of the Interior prior to the date of the approval of this act; and to enroll and make allotments to such children.”

Act of March 3, 1905 (33 Stat. L. 1048) as given in **Kappler (1913)**, page 148.

## **Minor Rolls**

Sec. 2. “That for ninety days after approval hereof applications shall be received for enrollment of children who were minors living March fourth, nineteen hundred and six, whose parents have been enrolled as members of the [Five Civilized Tribes], or have applications for enrollment pending at the approval hereof, and for the purposes of enrollment under this section illegitimate children shall take the status of the mother, and allotments shall be made to children so enrolled.”

Act of April 26, 1906 (34 Stat. L. 137) as given in **Kappler (1913)**, page 170.

## **Determination of Race and Age of Majority**

“That the rolls of citizenship and of freedmen of the Five Civilized Tribes approved by the Secretary of the Interior shall be conclusive evidence as to the quantum of Indian blood of any enrolled citizen or freedman of said tribes... and the enrollment record... hereafter be conclusive evidence as to the age of said citizen or freedman.”

Act of May 27, 1908 (35 Stat. 312.) as given in **Kappler (1913)**, page 352.

## **F.3 Heirship**

### **District Courts and Arkansas Law**

“That there shall be appointed... four additional judges of the United States court in the Indian Territory... And said judges shall have all the authority and exercise all the powers, perform like duties, and receive the same salary as other judges of said court...”

Sec. 2. All the laws of Arkansas heretofore put in force in the Indian Territory are hereby continued and extended in their operation, so as to embrace all persons and estates, whether Indian, freedman or otherwise, and full and complete jurisdiction is hereby conferred upon the district courts in said Territory in the settlements of all estates of decedents, the guardianships of minors and incompetents, whether Indians, freedmen or otherwise.”

Act of April 28, 1904 (33 Stat. 573.) as given in **Kappler (1913)**, page 109.

## **Wills**

Sec. 23. “Every person of lawful age and sound mind may by last will and testament devise and bequeath all of his estate, real and personal, and all interest therein.”

Act of April 26, 1906 (34 Stat. L. 137) as given in **Kappler (1913)**, page 178.

## **F.4 Taxes**

“That all the lands upon which restrictions are removed shall be subject to taxation, and the other lands shall be exempt from taxation as long as the title remains in the original allottee.”

Act of April 26, 1906 (34 Stat. L. 137) as given in **Kappler (1913)**, page 177.

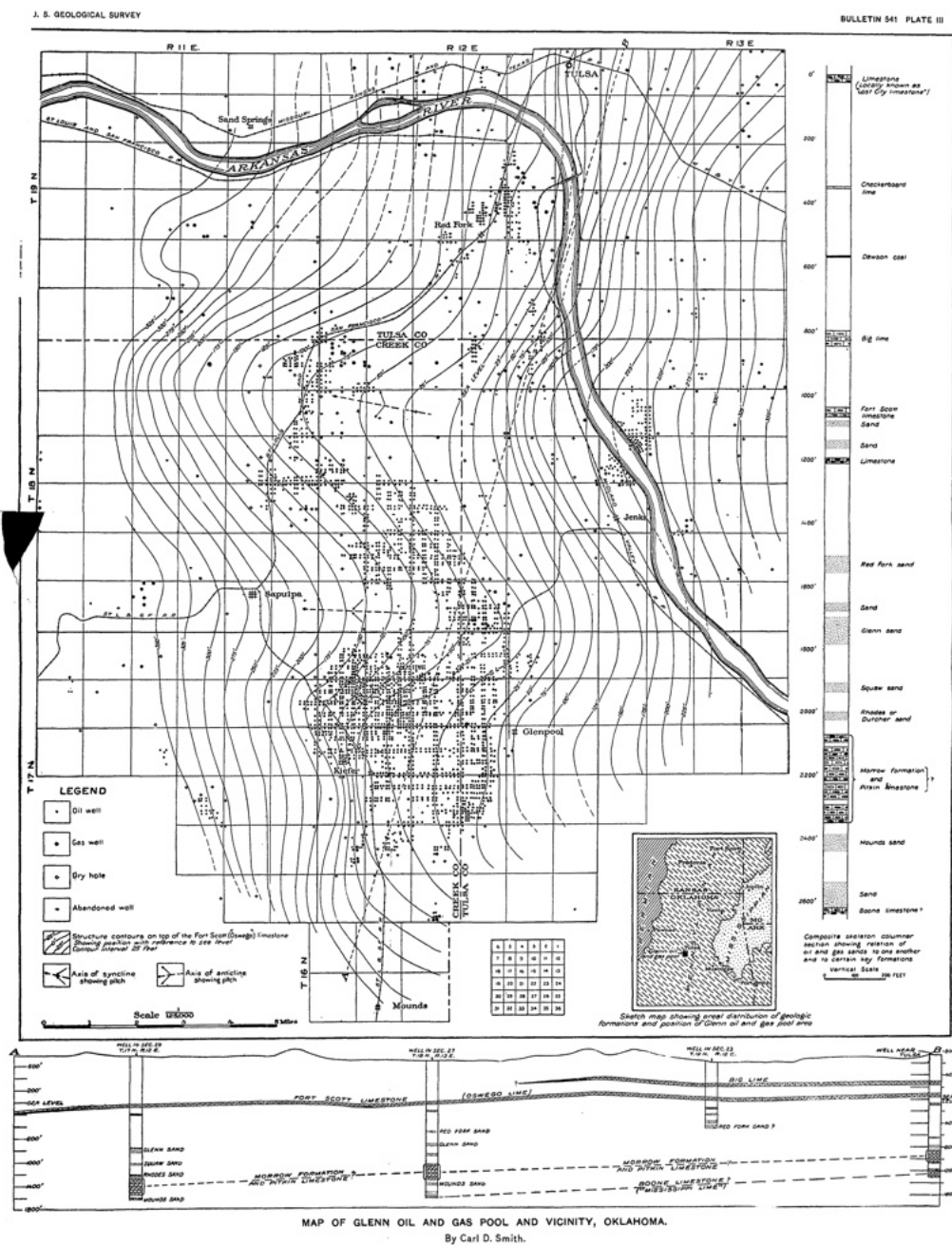
## G Oil Leases

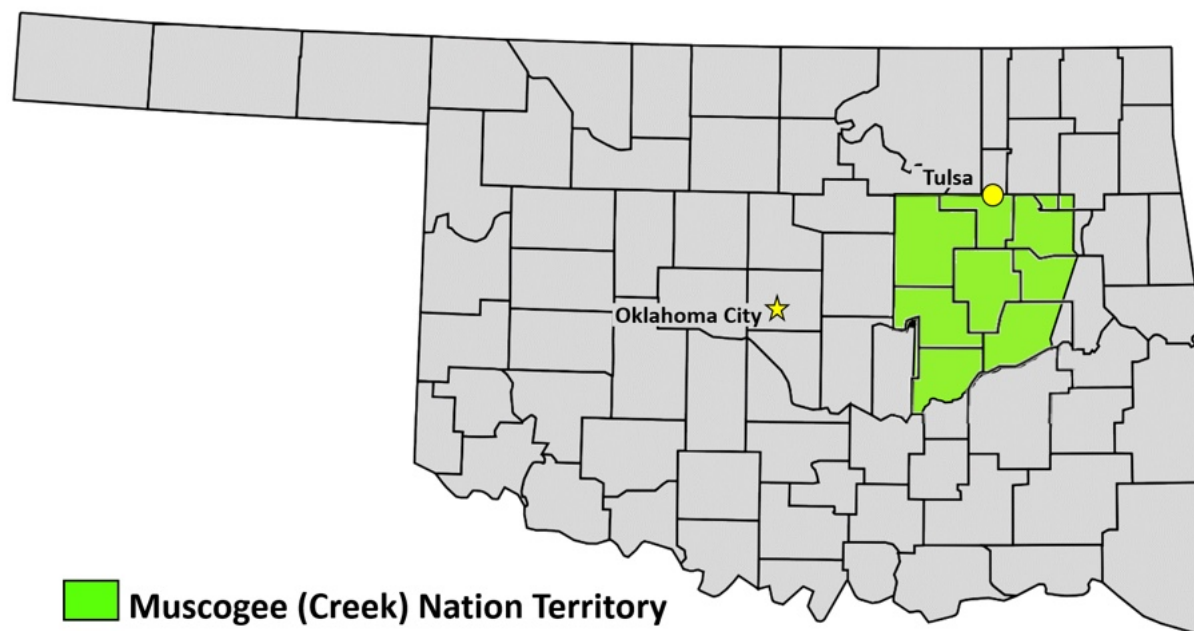
1. Oil companies hire “lease men” to make “advanced royalty” leases with small landholders for right to dig exploratory holes in their land
  - (a) Lease man identifies land that they might like to bet on.
  - (b) Lease man contacts the landholder and leases land for a signing bonus, plus \$24-48 annually (\$830-1600) regardless of the drilling status of the land.
2. If land is “restricted Indian” land, the lease man must follow terms of the Bureau of Indian Affairs (BIA) and must seek approval of the BIA before it goes into effect. While the exact regulations changed with time, they included stipulations like minimum royalty shares (i.e. 12.5%) and maximum lengths of time that the leaseholder was allowed to hold lease without drilling. A sample of a notice of oil lease regulation changes, made by the Acting Commissioner of the Indian Affairs at the Department of Interior, dated June 1907, can be found at **Figure G.1**.
3. Within next few months, driller drills hole(s)
4. If well “produces” oil, landholder gets stipulated royalty share of revenue.



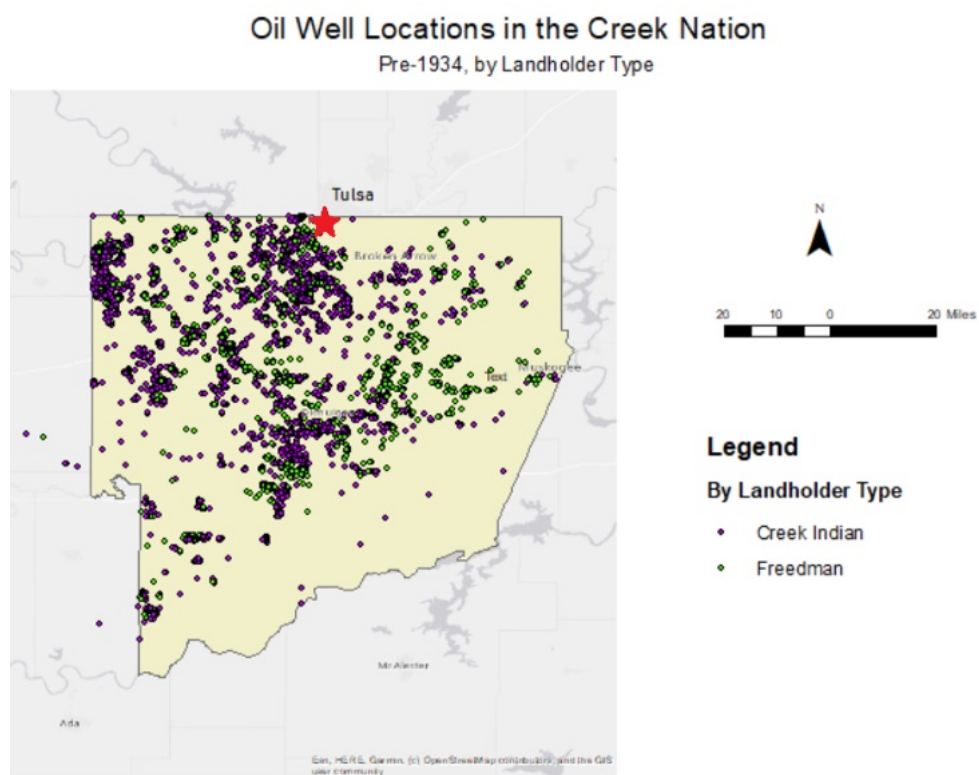
## **H Maps**

Figure H.1: The Glenn Oil and Gas Pool and Vicinity, Oklahoma, Contributions to Economic Geology, 1912, Part II





**Figure H.2:** Muscogee (Creek) Nation Territory within an Oklahoma county map



**Figure H.3:** Oil Well Locations in the Muscogee (Creek) Nation

*Note.* This figure displays a map of the Muscogee (Creek) Nation with producing oil wells plotted by the race of the landholder.



# I Data Appendix

## I.1 Allottees: Dawes Census Cards

I digitized *Campbell's Abstract of Creek Freedman Census Cards and Index*, a typed and published volume of every Creek Freedman Dawes Census Card (Campbell, 1915). I am fortunate that this typed and published volume exists, as the Dawes Rolls for some nations still only exist as handwritten cards. These cards provide a small number of variables:

- **Post Office.** Allottees usually applied for Creek enrollment with the traveling Bureau of Indian Affairs (BIA). The post office nearest to where the enrollment took place is generally listed as the location.
- **Dawes Roll Number.** Each allottee was assigned a persistent “Dawes roll number” or just “roll number,” unique within his or her enrollment category: Creek Indian, Freedmen, Minor, or New Born. Minor and New Born are additionally split into Creek Indian or Freedman, for a total of six enrollment categories within the Muscogee (Creek) Nation.
- **Name.**
- **Age.** I assume that the age listed on the Dawes Census Cards is the age reported at the date of enrollment and not, for example, age at the date of application.<sup>28</sup> There was considerable bunching within reported age, particularly for infants (Figure I.5 and Figure I.6). If we assume that the census links are correct, then it seems that many of the parents reported their children to have been born earlier to the Dawes Commission than they did to the census enumerators. This behavior may have been strategic, in response to the three successive enrollment birthdate cutoffs.
- **Sex.**

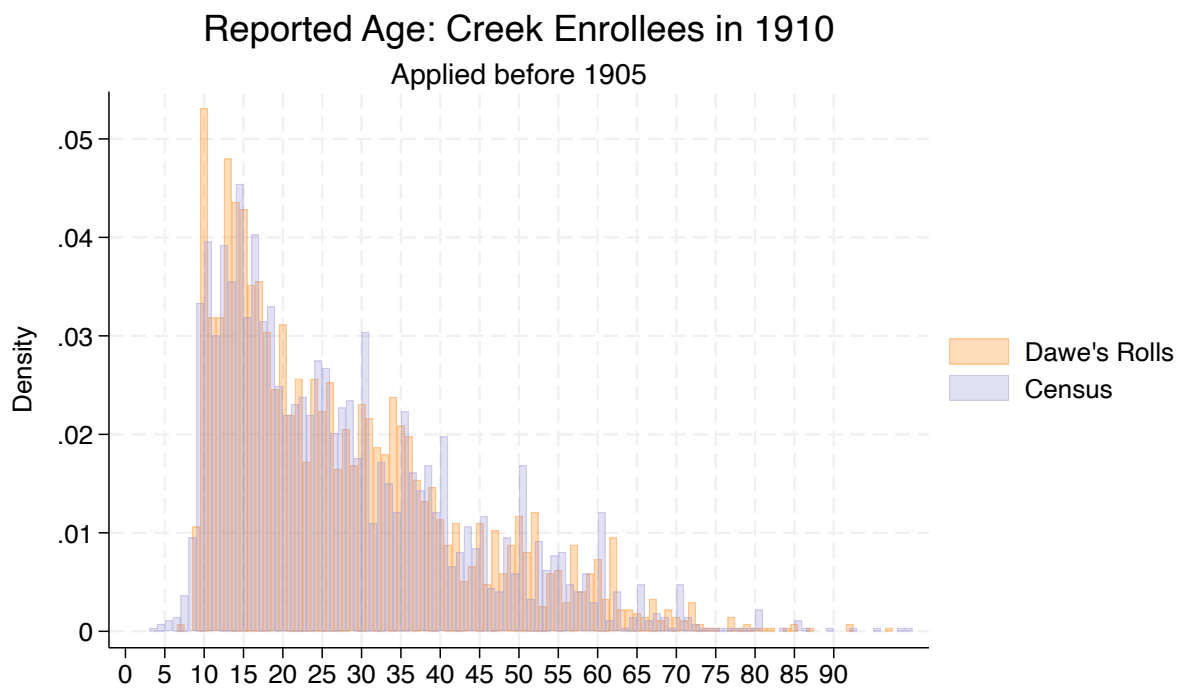
**Table I.16:** Creek Allottee Summary Statistics

	Enrollment Category			
	Indian		Freedman	
	12,014	63.7%	6,836	36.3%
Age in 1910	26.8	(17.8)	25.3	(17.5)
Male	0.5	(0.5)	0.5	(0.5)

*Note:* Table provides counts (percents) and means (standard deviations) for variables from the Dawes Rolls (?).

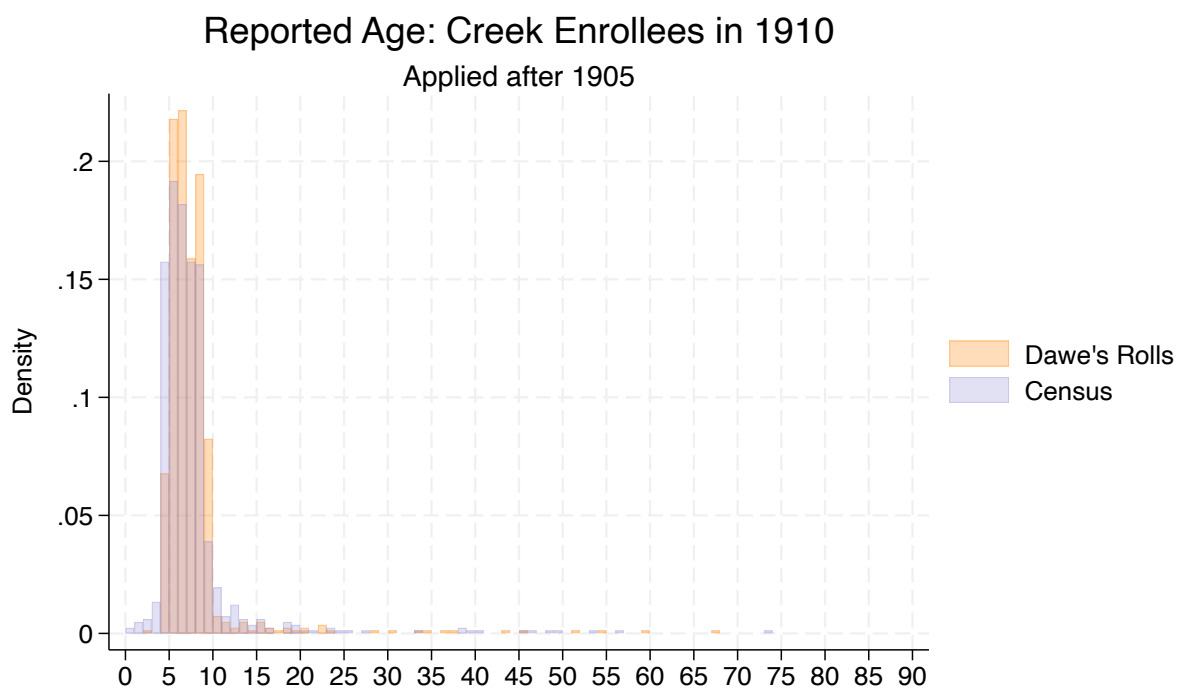
<sup>28</sup>Unfortunately, even contemporary experts were not entirely confident in this interpretation. On page 4, ? writes that “many believe that the date of enrollment is the date from which you calculate to determine the age of the allottee. In a great many instances this is true, but in many cases this is not true. The law says, that the enrollment record shall govern as to age. The enrollment record may include the testimony taken at the time of enrollment, affidavits, birth certificates, etc. Everyone ought before purchasing, or leasing lands, to secure from the Commissioner a certified copy of the enrollment testimony, if there be any question as to age.”

**Figure I.5:** Bunching in Creek Freedmen database versus 1910 Census.



*Note:* Laws regarding dates of birth and death to qualify for enrollment as a Creek Freedman are detailed in Subsection [F.2](#).

**Figure I.6:** Bunching in Creek Freedmen database (Minors and Newborns) versus 1910 Census



*Note:* Laws regarding dates of birth and death to qualify for enrollment as a Creek Freedman Minor or Newborn are detailed in Subsection [F.2](#).

## I.2 Intergenerational Sample

I begin with the intersection of enrolled Creek Freedmen and the 1910 Census ( $N = x, xxx$ ).<sup>29</sup> I subset this linked dataset to census households where one or both is true:

1. A male Creek Freedman is listed as the “head” (101) (“relate” in IPUMS extract).
2. A female Creek Freedman is listed as the “head” (101) or the “spouse” (201).

I return to the full 1910 Census and, within each of the above households, I extract all children born between 1900 and 1920 and labeled as “child” (301), “adopted child” (302) or “stepchild” (303). I repeat the above process with the intersection of enrolled Creek Freedmen and the 1920 Census ( $N = y, yyy$ ).

I link these three sets of children to the 1940 Census with a combination of pre-made Census Tree links and my own handlinks. Children that appeared in both 1910 and 1920 are linked to the same 1940 Census histid and thus appear only once in the final intergenerational sample, following deduplication over histid. In 1940, this group will be between ages 20 and 40.

## I.3 Allotments: Plat Maps

Edward Hastain was a member of the Dawes Commission. He drew up and published maps of the full allotted Muscogee (Creek) Nation in [Hastain \(1910\)](#). There is one map per “township,” or six-mile by six-mile area of land, for a total of 149 maps. I hired and trained undergraduate research assistants to convert all maps, such as the one in [Figure I.7](#), into PLSS data. Each allotment can be coded into a unique polygon within the United States. Each plot of land on each map is labeled with the owner’s name and his or her unique Dawes roll number. Thus, this dataset contains the variables:

- **Dawes Roll Number.** Described in Subsection [I.1](#)
- **Name.**
- **Public Land Survey System (PLSS) Code.**

## I.4 Oil Well Data

By 1905, as the Oklahoma oil boom exploded, in their fervor to discover oil first and to stake claim, independent drillers and nascent oil companies drilled in an uncontrolled manner. There was a growing sense that regulation and oversight was needed to temper the “external damage caused by the uncontrolled production of crude oil overflowing into fields and streams and certain apparent waste of natural gas” ([Clark, 1977](#), p.376). And thus in 1907, during the first year of Oklahoma’s statehood, the Oklahoma Corporation Commission (OCC) was established to regulate public utilities. My primary source of oil well data is the “W27 Well Completion List” from the OCC, which has an entry for all well actions taken since 1907, what the action was, the date and the location in both Public Land Survey System (PLSS) format and

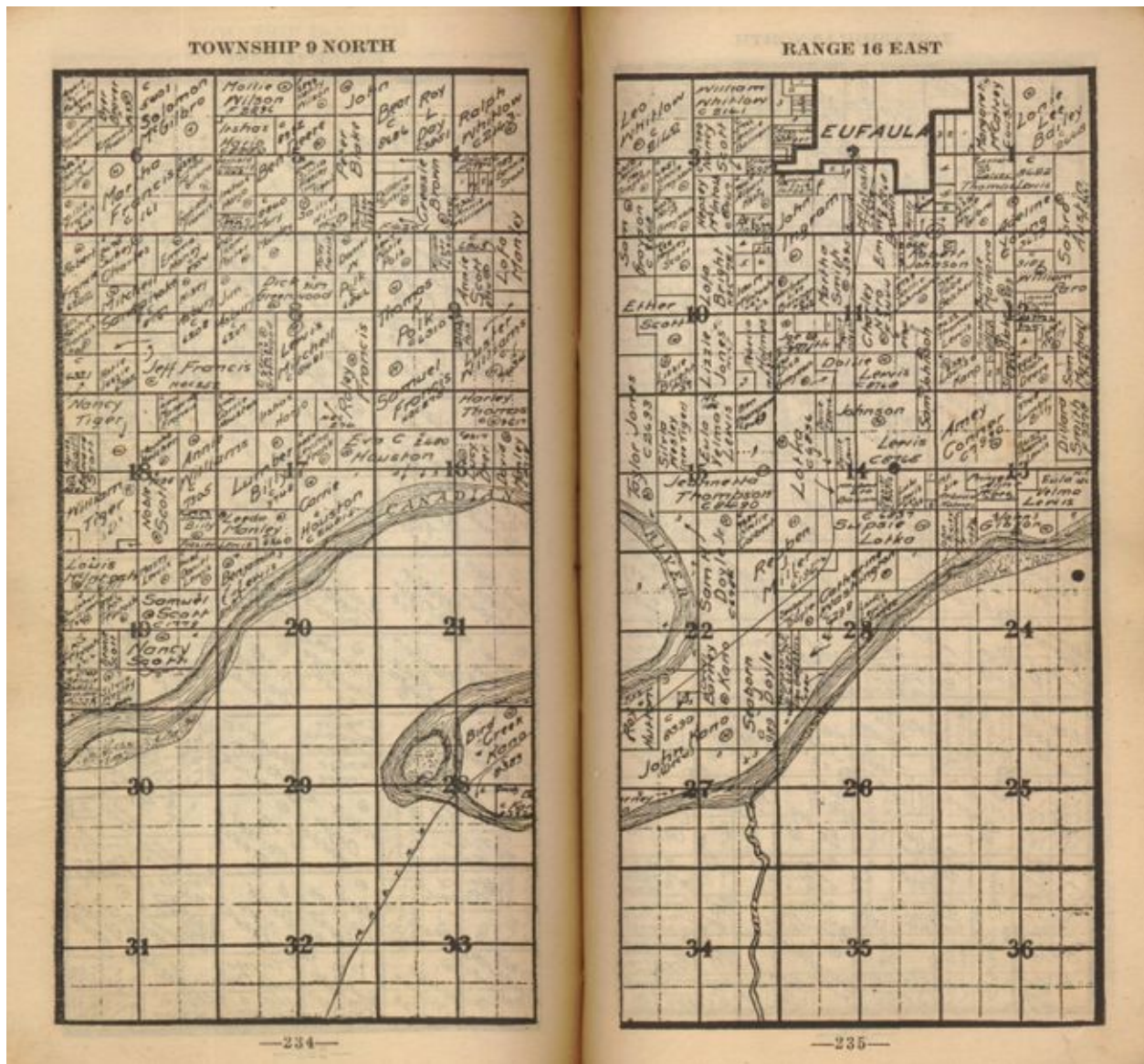
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<sup>29</sup>75% of individuals in this intersection are either heads, spouses or children. A further 2% are adopted children or stepchildren.

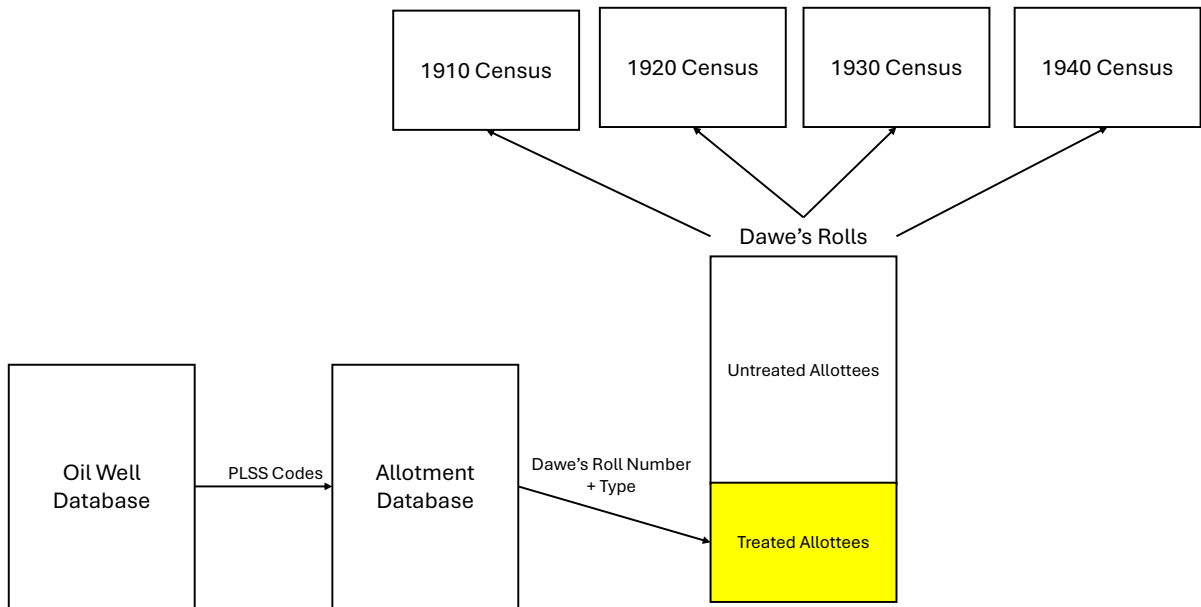
latitude/longitude. Most of the well actions are not construction of a producing oil well and most take place after my time period of study, into the present day. For this project, I subset the well actions to construction of producing oil wells that were completed before the early 1930s.

- **Public Land Survey System (PLSS) Code.**

- 



**Figure I.7:** Township 9 North, Range 16 East



**Figure I.8:** Treatment Assignment

## I.5 Treatment

### Primary Treatment

Only enrolled Creek Freedmen have a value for this variable.

- **Treated, 1910-1940 (census).** Variable has a value of 1 if a producing oil well was built on top of individual's Dawes allotment before the year 1918 and a value of 0 if one was built later or never built.

### Parent Treatment

Children, as defined in Subsection I.2, can have values for these variables. Children may be enrolled or unenrolled.<sup>30</sup>

- **Father Treated, 1940 (census).** Individual has a value (0/1) for this variable if he or she was labeled as "child" (301), "adopted child" (302) or "stepchild" (303) in a census household where a male Creek Freedman is listed as the "head" (101) in the 1910 or 1920 census ("relate" in IPUMS extract).
- **Mother Treated, 1940 (census).** Individual has a value (0/1) for this variable if he or she was labeled as "child" (301), "adopted child" (302) or "stepchild" (303) in a census household where a female Creek Freedman is listed as the "head" (101) or the "spouse" (201) in the 1910 or 1920 census ("relate" in IPUMS extract).

Children are given the maximum treatment status of their parents that occurs during the first 18 years of their life, when they may have been living at home.

## I.6 Individual-Level Outcome Variables

Most of my individual-level outcome variables are derived from cleaned and harmonized census records provided by IPUMS (Ruggles et al., 2024a,b).

### Occupational Status

Using "occ1950" in IPUMs extracts, I define occupational classes consistent with the codes delineated in Durlauf et al. (2024), Table B.1.

- **White-Collar, 1910-1940 (census).** Professionals, Semi-professionals, Proprietors, Managers, Officials, Clerical and Sales.
- **Blue-Collar, 1910-1940 (census).** Craftmen, Government Services, Semi-Skilled and Unskilled.
- **Farming, 1910-1940 (census).** Farmers: Owners, Tenants and Managers. I follow Durlauf et al. (2024) and classify Farm Laborers as Unskilled or Semiskilled and therefore Blue-Collar.

---

<sup>30</sup>Some of the children from the 1920 Census, and most of the children from the 1910 Census were born prior to March 4, 1906. They were enrolled in the Muscogee (Creek) Nation by their parents and thus received an allotment of their own. Subsection 2.2 describes the enrollment process and Subsection F.2 gives the full text of the laws.

- **Unemployed in labor force, 1940 (census)**
- **Employment wages/salary, 1939 (1940 census).** respondent's total pre-tax wage and salary income - that is, money received as an employee - in 1939 ("incwage" in IPUMS extract).

## Wealth and Assets

- **House Value, 1930-1940 (census).** Value of home in contemporary dollars, conditional on household home ownership. In 1930, house value was collected only for *non-farm* owner-occupied units and includes the value of the land. In contrast, in 1940, house value was collected for *all* owner-occupied units, including single-family farmhouses, but excludes the value of the land.
- **Has Live-In Domestic Servant, 1910-1940 (census).** Definition adapted from [Kalsi and Ward \(2025\)](#). Unless the household head is a clergyman ("occ1950" equal to 9) or the operator of a boarding house (752), members of a main family connected to a household head get a 1 for this variable if the household contains an individual fitting one of the following criteria:
  - Listed as one of the following relations to household head ("relate" ): housekeeper (1212), maid (1213), cook (1214), nurse (1215), or other probable domestic employee (1216).
  - Listed as a servant ("relate" equal to 1211) or domestic employee (1251) AND give their occupation as teacher ("occ1950" equal to 93), private dressmaker (633), taxi cab driver/chauffeur (682), private household service worker (700-720), attendant (731), charwomen and cleaner (753), cook (754), practical nurse (781) waiter/waitress (784) or gardener (930).
  - Listed as a servant ("relate" equal to 1211) or domestic employee (1251) AND give their industry as private household ("ind1950" equal to 826).
- **Has Live-In Non-Domestic Employee, 1910-1940 (census).** Members of a main family connected to a household head get a 1 for this variable if the household contains an individual fitting one of the following criteria:
  - Listed as other employee to household head ("relate" equal to 1217).
  - Listed as a servant ("relate" equal to 1211) or non-domestic employee (1252) AND give their occupation as farmer ("occ1950" equal to 100, 123), boarding and lodging housekeeper (764), elevator operator (761), porter (780), farm laborer (810-840), or laborer (970).
  - Listed as a servant ("relate" equal to 1211) or non-domestic employee (1252) AND give their industry as agriculture ("ind1950" equal to 105), hotels and lodging places ("ind1950" equal to 836).

## Education

- **Literacy, 1910-1940 (census).** Individual 10 years or older can read and write in any language ("lit" in IPUMS extract). This question was not asked during the 1940 Census and thus I define all individuals

who report having completed second grade or above as literate (“educd” in IPUMS extract).

- **“Young” literacy, 1910-1940 (census).** Literacy as defined above, but restricted only to individuals whose literacy was not asked during the last census enumeration (i.e. individuals between the ages of 10 and 20).
- **School attendance, 1910-1940 (census)** Individual between the ages of 5 and 17 who attended school or college any time between March 1, 1940 and the time of enumeration (“school” in IPUMS extract).
- **Children working, 1910-1940 (census)** Individual between the ages of 14 and 18 that works for pay (not missing “occ1950” in IPUMS extract).
- **Years of education, 1940 (census).** Calculated from highest year of school or degree completed (“educd” in IPUMS extract)
- **High-school, 1940 (census).** Individual reports completing 12 or more years of education (“educd”).
- **College, 1940 (census).** Individual reports completing 16 or more years of education (“educd”).

## Migration

- **Urban, 1910-1940 (census).** Whether household was located in an urban or rural enumeration district (“Urban” in IPUMS extract). In these census decades, the Census defined as urban “cities and places with more than 2,500 inhabitants... Also includes townships and other political subdivisions (not incorporated municipalities) with a total population of 10,000 or more and a population density of 1,000 or more per square mile.”
- **Moved states.** This variable is equal to 1 if there is evidence that this individual moved outside of Oklahoma by 1942 or earlier. I code this outcome variable according to the following sequence:
  1. If the individual was observed in the 1940 census, then this variable is equal to 1 if they lived outside of Oklahoma, and 0 if they lived inside Oklahoma (“stateicp” is equal to 53 in IPUMS data).
  2. If a registration card for this individual for the World War II draft is observed, then this variable is recoded as 1 if the registration took place outside of Oklahoma. This variable is recoded as 0 if the registration took place in Oklahoma only if the individual was not observed in the 1940 census.
  3. If a post-1940 death record is observed, then this variable is recoded as 1 if the death took place outside of Oklahoma. This variable is recoded as 0 if the death took place in Oklahoma only if the individual was not observed in the 1940 census or World War II draft.
  4. If the individual was not observed in the 1940 census, the WWII draft or a death record, but they were observed in the 1930 census, this variable is recoded as 1 if they lived outside of Oklahoma (“stateicp” is not equal to 53 in IPUMS data). I do not recode this variable as 0 based on 1930 census location because I do not know if the individual moved after 1930.

- **Moved counties.** This variable is equal to 1 if there is evidence that this individual moved out of the county in which their Dawes enrollment took place. To generate this variable, I first placed all historic Muscogee (Creek) Nation post office locations into one of the eight counties inside the Muscogee (Creek) Nation: Creek, Tulsa, Wagoner, Muskogee, Okmulgee, McIntosh, Okfuskee and Hughes.<sup>31</sup> I treat county of enrollment post office as a sort of “home county,” where this individual was likely to be living at the time of their own enrollment (1898-1906). I then code this outcome variable in a fashion analogous to the “moved states” variable.
- **Moved populated places, 1940 (census).** Enumeration districts, the geographical units over which US censuses of population were taken from 1880 through 1940 (“enumdist” in IPUMS extract), were generally not consistent between decades. As such, in order to quantify movements within counties, I created a geographically consistent crosswalk of “populated places” within the Muscogee (Creek) Nation boundaries (PPs).
  1. I began with the set of roughly 114 different populated places, as defined by Ancestry.com, into which all of the 1940 enumeration districts within the Muscogee (Creek) Nation can be classified.
  2. I worked backward, and collapsed all of the 1930, 1920 and 1910 enumeration districts into the 1940 PPs. I was guided by the populated places delineated by Ancestry.com for those decades.
 With these smaller units, I am able to quantify migrations smaller than cross-county, like moving from a rural area of Tulsa county, to Tulsa city proper, for example. This outcome variable is equal to 1 if an individual’s PP in 1940 differs from the PP they lived in, in 1910. Less than six percent of people lived outside of the Muscogee (Creek) Nation by 1910 and I do not attempt to generate PPs outside of the Muscogee (Creek) Nation. As such, this variable is also equal to 1 if, in 1940, the individual lives outside of the Muscogee (Creek) Nation boundaries, as this person has left their 1910 PP by construction.

## Fertility & Household Size

- **Number of household members, 1910-1940 (census).** Number of people recorded living in household (defined by “serial” in IPUMS extract). Households labeled as group quarters (“gq” in IPUMS extract) are excluded, but other non-family living situations, such as boarding-houses, are included.
- **Number children ever born, 1910 and 1940 (census).** Number of children ever born to each woman (“chborn” in IPUMS extract). In 1910, the question was asked of every woman over age 15 who has ever been married. In 1940, this question was asked of sample-line respondents.
- **Number children surviving, 1910 (census).** Number of children surviving to each woman over age 15 who has ever been married (“chsurv” in IPUMS extract)

<sup>31</sup> Rogers, Mayes and Seminole counties are also partially in the Muscogee (Creek) Nation and I treat their post offices accordingly.

## I.7 Neighborhood-Level Outcome Variables

For the following variables, I only consider individuals living in households; I exclude individuals living in group quarters (“gq” not equal to 1 in IPUMS extract).

### Education

- **High-school graduation rate, 1940 (census).** The share of the population, over age 24, who report having completed 12 or more years of education (“educd”).
- **College graduation rate, 1940 (census).** The share of the population, over age 24, who report having completed 16 or more years of education (“educd”).
- **School attendance, 1940 (census).** Proportion of children between the ages of 5 and 17 who attended school or college any time between March 1, 1940 and the time of enumeration (“school” in IPUMS extract).
- **Teacher education, 1940 (census).** Calculated from highest year of school or degree completed (“educd” in IPUMS extract) for teachers (individuals aged 17– 65, “occ1950” equal to 93 in IPUMS extract) living in enumdist.
- **Teacher relative salary income, 1939 (1940 census).** County-average of earnings (“incwage”) for all individuals aged 17–65 with occ1950 value 93, divided by the county average of earnings for all individuals aged 17 -65 with positive earnings.

### Labor Markets

- **Employment-to-population ratio, 1940 (census).** Share of men ages 25 to 64 who are employed (“sex” equal to 1, “age” between 25 and 64, and “empstat” equal to 1 in IPUMS extract).
- **Unemployment rate, 1940 (census).**
- **Racial wage gap, 1940 (census).** Mean earnings of Black adult men subtracted from mean earnings of white adult men (“incwage” in IPUMS extract).

### Families

- **Rate of single-parent households, 1940 (census).** The share of families (“serial” + “famunit”) with children that are single-headed.
- **Poverty rate, 1940 (census)** Following [Barrington \(1997\)](#), each member of a family is assigned an earnings poverty threshold according to gender of household head, number of members, number of children, and whether household is a farm or not.<sup>32</sup> All members of the same family receive the same

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<sup>32</sup>I define members of a family using the combination of “serial” and “famunit” in IPUMS, recoding children under 15 “living alone” to be primary family in the household.

threshold but different families have different thresholds based on the stated characteristics. This rate represents the share of people whose total family earnings (“fwage1”) was below their designated poverty threshold. I exclude families with more than nine members as no poverty threshold was defined for these people.

### **Segregation and Racial Animus**

- **Proportion of neighbors white, 1940 (census).** The percent of people living in enumdist with race equal to white (“race” equal to 100 in IPUMS extract).
- **Segregation, 1940 (census).** Will use formula from Logan paper.
- **Jim Crow** County-level Jim Crow database from Althoff paper.
- **Sundown Towns** County-level Jim Crow database from Althoff paper.

### **Other**

- **Local Amenities** County-level amenities from Derenoncourt paper.