The Lingering Legacy of Slavery: Historical Injustices and Credit Scores in the United States

by:

CONOR FARRELL

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Members of the Examining Committee:

John Cruzatti Constantine

Matthias Rieger

The Hague, The Netherlands

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Disclaimer:

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Inquiries:

International Institute of Social Studies
P.O. Box 29776
2502 LT The Hague
The Netherlands

t: +31 70 426 0460
e: info@iss.nl
w: www.iss.nl
fb: http://www.facebook.com/iss.nl
twitter: @issnl

Location:

Korternaerkade 12
2518 AX The Hague
The Netherlands

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The Lingering Legacy of Slavery: Historical Injustices and Credit Scores in the United States

1. Abstract

Slavery and its immediate derivatives have created and contributed to institutionalized and persistent forms of inequalities in the United States. While policies have been introduced to address these historical inequalities, the lasting influences of slavery are still not fully quantified. One such system that was introduced to address racial discrimination in the credit market is the FICO credit scoring model. The model claims to be color-blind by not providing any explicit weight to an individual's race, orientation, ethnicity, or age, but the model's fundamental structure of scoring an individual's *historical* behavior without accounting for the multitude of contextual *historical* factors that continue to influence the very foundation of our financial health, means that the system will only continue to penalize Black Americans and perpetuate persistent racial inequalities.

Utilizing historical data from the 1860 census and data from 2014-2021 for a variety of contemporary control variables, this research finds strong and significant evidence of a lasting legacy of slavery on populations with subprime credit scores. Further, through an instrumental variable specification, we find further evidence of this relationship while continuing to account for contemporary controls and state and year fixed effects. In the most stringent model, we observe that a 10% increase in the relative 1860 county slave population will result in an average increase in 0.7913 percentage points of the county population with a subprime credit score when holding all else constant.

Relevance to Development Studies

In examining the relationship between the historical legacy of slavery and current day credit scores, this paper will investigate the persistent and complex effects of slavery on contemporary economic outcomes. Such research will seek to demonstrate how contemporary economic inequalities may be influenced by the lingering effects of historical factors emphasizing the complex interaction between race, inequality, historical factors and contemporary economic outcomes. While this research focuses on the United States context, it offers methodological and comparative perspectives that may resonate within other international contexts.

This research will further demonstrate that contemporary outcomes cannot be researched using only contemporary variables and that policy makers need to seriously understand and consider how historical injustices may continue to perpetuate and deepen societal inequalities. In addition, as the institution of slavery has extensive global impacts, this research seeks to add to the growing literature focused on economic history whereby economists can study the influence of historical events on present outcomes. Studying the effects of historical events on present day outcomes can be extrapolated to understand other historical structures and systems in different countries, providing valuable insights into their current economic challenges enabling a more holistic and comprehensive understanding of how current outcomes may be the result of a larger historical context.

Keywords

Slavery, credit scores, financial costs, historical impact, inequalities, United States, economic inequalities, persistence

2. Introduction

The institution of slavery, which existed in the United States for nearly 250 years, and its immediate derivatives have created and contributed to institutionalized and persistent forms of inequalities in the United States. The institution, coupled with subsequent decades of discriminatory policies, has had enduring effects on the African American community, contributing to the development of systemic barriers that have hindered wealth accumulation, social mobility, and overall economic stability.

One such systemic barrier that has been shown to be an inhibiting factor for Black Americans is the FICO credit score. Credit scores are often described as the gateway to obtaining affordable finance from lenders. Credit scores impact how much loans cost, the costs of a home, a car or a household appliance. Credit scores may impact where one can live or rent or inhibit one's ability to obtain employment opportunities. While the introduction of the FICO credit score model has been touted as a move to a "color-blind" scoring model, fundamental flaws in the model that do not consider the lingering legacies of slavery and subsequent forms of discriminatory practices that have contributed to a vicious cycle of poverty, marginalization, and racial economic inequalities (Henderson, et al., 2015). An abundance of research has demonstrated the significant gap in credit scores between White Americans and their Black counterparts with most literature pointing to an average 60-to-100-point difference between these two populations (Shift Processing, 2021). However, while much of this research explores the contemporary influences of human capital, income, and employment on credit score outcomes, few consider how such current day disparities may in fact be influenced by historical factors that contribute to existing racial inequalities. With credit scores potentially inhibiting or facilitating access to a variety of different assets or opportunities, this paper will contribute to a growing wealth of literature to understand how the lingering legacy of slavery and its subsequent institutionalized racial policies of sharecropping, redlining and discriminatory lending practices manifests itself in contemporary racial inequalities in the United States (see (Bertocchi & Dimico, 2014), (Buonanno & Vargas, 2016), (Egede, et al., 2023), (Gouda & Rigterink, 2017), (Lagerlöf, 2005), (Nunn, 2007), (Rawlinson, 2017))

Building from the foundational literature that explores slavery's continued influence on contemporary economic inequalities (**long run development** (Acemoglu, et al., 2012), (Lagerlöf, 2005) & (Nunn, 2007); **human capital generation** (Bertocchi & Dimico, 2014), **income inequalities** (Jardina, et al., 2023)), this paper will explore one specific manifestation of these enduring effects to investigate how slavery continues to contribute to persistent racial inequalities through credit scores in the United States. Affirming the lasting effects of the institution of slavery on existing inequalities, a variety of literature has explored the lasting ramifications of slavery on **crime rates** (Buonanno & Vargas, 2016), **economic development** (Nunn, 2008), education (Bertocchi & Dimico, 2014), **inequality** ((Summerhill, 2010), (Bertocchi & Dimico, 2012), (Jardina, et al., 2023)), and other socio-economic aspects.

While this strand of research contributes to a larger story of the continued influence of slavery on present-day socio-economic outcomes, no paper has sought to investigate how this a historical institution may influence such a structural and institutionalized concept like credit scores. With credit scores being almost universally used in the United States to facilitate or limit access financial support, housing, employment or asset growth, understanding how historical factors continue to influence this system is vital in order to consider ways by which the system can be adjusted to better limit the potentially negative effects.

In examining the relationship between the historical legacy of slavery and current day credit scores, this paper will investigate the persistent and complex effects of slavery on contemporary economic outcomes. Such research will seek to demonstrate how contemporary economic inequalities may be influenced by the lingering effects of historical factors emphasizing the complex interaction between race, inequality, historical factors and contemporary economic outcomes. While this research focuses on the United States context, it offers methodological and comparative perspectives that may resonate within other international contexts.

This research will further demonstrate that contemporary outcomes cannot be researched using only contemporary factors and that policy makers need to seriously understand and consider how historical injustices may continue to perpetuate and deepen societal inequalities. In addition, as the institution of slavery has extensive global impacts, this research seeks to add to the growing literature focused on economic history whereby economists can study the influence of historical events on present outcomes (**African development** (Nunn, 2008); **Colombia inequality** (Acemoglu, et al., 2012), **inequality and development in Brazil** (Summerhill, 2010)). Studying the effects of historical events on present day outcomes can be extrapolated to understand other historical structures and systems in different countries, providing valuable insights into their current economic challenges enabling a more holistic and comprehensive understanding of how current outcomes may be the result of a larger historical context.

Specifically, this paper will seek to research to what extent by which the historical prevalence of slavery influences the likelihood of having a subprime credit score in the United States. Based on similar economic historical research of the impact of slavery's legacy on contemporary economic outcomes, we hypothesize that counties with larger slave populations in 1860 will suffer from deep inequalities resulting from decades of discriminatory policies and practices, resulting in greater populations with subprime credit scores.

To investigate this hypothesis, we define the propensity of slavery as the proportion of the enslaved population in relation to the total county level population in 1860 using data provided by the 1860 United States Census. To measure credit scores, this paper uses data reported by the Federal Reserve Bank of New York and the Equifax Consumer Credit Panel which provide estimates of the percentage of a county level population with a credit score below 660 quarterly between April 2014 and January 2023. Using a multitude of other control variables, this paper will explore the relationship between the propensity of slave populations in 1860 and their impact on current credit scores at the county level in the United States using a data set of 2,172 counties across thirty-one states between 2014 and 2021.

This paper presents results from initial OLS specification models while controlling for the full set of contemporary control variables, state fixed effects and year fixed effects. We find the relative size of the slave populations in 1860 has a robust and positive relationship with subprime credit score populations. The results presented in section V find that a 10-percentage-point increase in the relative slave population of a county in 1860 results in an average increase of 1.462 percentage points in the percentage of the current population with a subprime credit score in 2021, holding all else constant. When accounting for a range of relevant socioeconomic covariates, the results remain highly significant while still finding an estimated average effect of 0.702 percentage point increase for every 10% increase in the relative 1860 slave population when holding all else constant.

Further, to address any endogeneity in the model, we instrument slave population data using cotton production reported at the county level using data from the 1860 agricultural census. The reasoning for this instrument is explained further in Section IV, but the results of the most stringent model demonstrate that greater slave populations in 1860 results in sizeable and significant increases in populations with subprime credit scores.

The results presented in this paper continue to contribute to a more nuanced understanding of how the legacy of slavery continues to persist presently and influence contemporary socioeconomic outcomes in the United States. The paper provides further evidence of the inequalities presented by previous authors like Bertocchi and Dimico (2010), Buonanno and Vargas (2016, and Nunn (2007) while demonstrating how these potential channels of persistence may in turn influence credit score outcomes.

To achieve this, this paper is structured to provide readers with a clear understanding of the historical and contemporary factors necessary to understand the framework of this research. To that end, this paper provides a background to the concepts and context of the analysis (Section 3), followed by a presentation of the data (Section 4). Section 5 details the empirical models implemented and the relevant results. These results are further analyzed and contextualized in Section 6. Section 7 further investigates these findings by testing several potential channels of influence and addressing the issue of persistence. Finally, Section 8 provides a summary conclusion of the findings of this paper.

3. Contextualization

3.1. Credit Scores and Race

Credit scores in the United States serve as one of the primary sources of one's financial identification. They can facilitate one's access to vital lines of credit or more attractive financing options. Conversely, they can also serve as an almost insurmountable barrier to finance, make everything from owning a house or a car substantially more expensive, and sustain racial, class and gender economic inequalities.

The FICO credit score model, formally introduced in 1989, is largely the main model that is in use today although there are other competing models in the market, most notably the Vantage scoring model (Stolba, 2021). In its simplest form, the model scores range from 300 to 850, with lower scores representing higher risk and higher scores the opposite by analyzing past borrowing behaviors of individuals to deter-mine their potential risk in the future. The score is largely made up of five components with associated weights although a variety of other factors also play into the scoring model (Pritchard, 2021):

- **Payment history (35%):** an analysis of timely payments on outstanding debts and the severity of late payments (i.e., 30 or 60+ days late).
- **Amounts owed (30%):** calculated as a percentage of total credit available and amount currently employed with a rule of thumb to keep this percentage lower than 10%.
- **Length of credit (15%):** calculated as the amount of time an individual has accessed credit.
- **New credit (10%):** how recently the individual opened a new account.
- **Type of credit (10%):** considers the different revolving and installment loans you have active.

Research from Experian notes that approximately half the population in the US has a credit score of 670 or below, a rate they categorize as "subprime" (Stolba, 2021). For those with a subprime credit score, costs of borrowing or making larger purchases can be-come almost four times more expensive (Gordon, 2022).

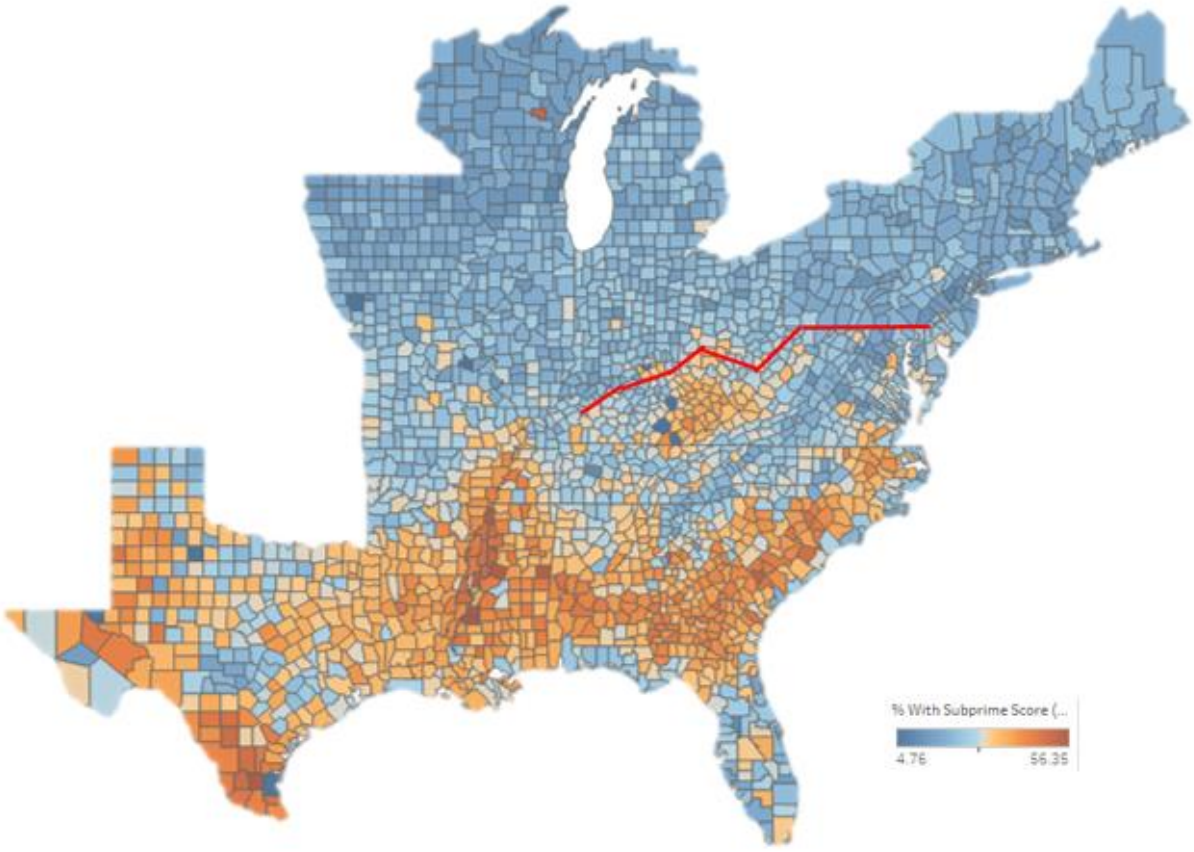
The adoption of the 1974 Equal Credit Opportunity Act and subsequent introduction of the FICO credit score model is highlighted as a change from a system that relied on a subjective, qualitative review of one's character to a more quantitative review of past financial behavior to determine the risk of lending to an individual (McClanahan, 2014, p. 33). Through such a model, race, sexuality, and other demographic factors should not play a factor as they are not explicit determinants in the outcome of the credit score. However, even at a cursory glance at the current statistics, there are clear divides between different ethnic groups, age groups, and geographic locations. So, if the model does not penalize individuals based on their race or geographic location, what might then explain these stark differences?

We start with the image presented in **Figure 1** which presents the percentage of a county population with a subprime credit score in 2020 across the thirty-one states in the dataset.[1] From such an image, we can clearly determine the geographic divides between those counties located south of the Mason

[1] For the purposes of this paper, a "subprime" score is defined as having a score equal to or below 660 on a scale between 350 and 850.

Dixon line divide (represented with the red line) and those to the north. These same states south of the line account for nearly 60% of the total Black population in the United States (Moslimani, et al., 2023) and are characterized by lower education levels, smaller income levels, and greater poverty rates (United States Census Bureau, 2021).

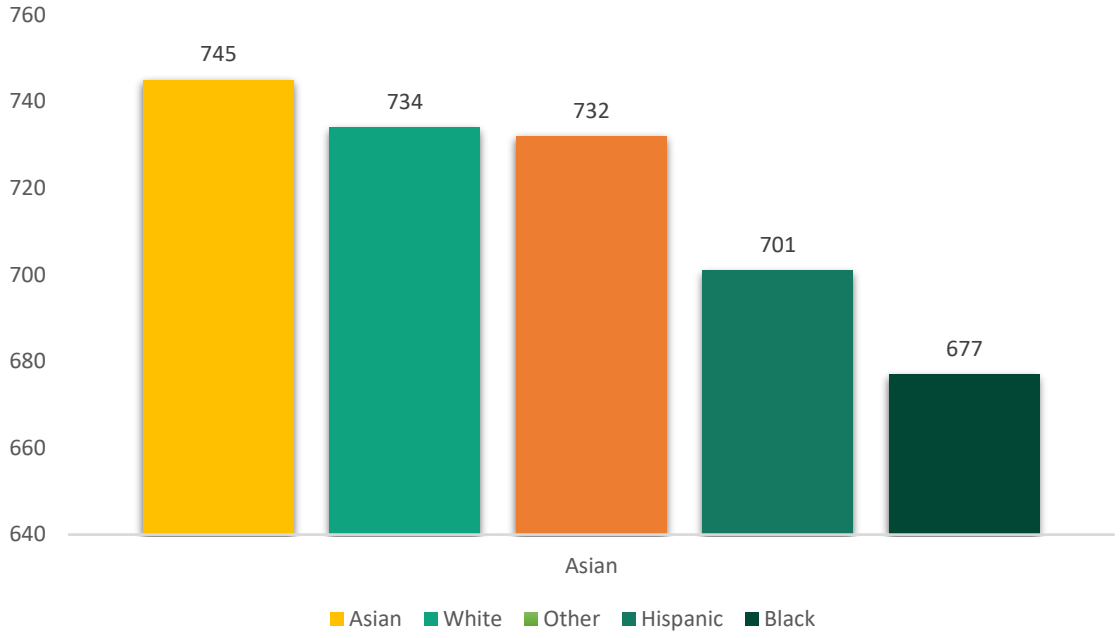
Figure 1: Percentage of County Populations with Subprime Credit Scores



Note: Thie figure reflects the percentage of a county population with subprime credit scores. Counties shaded in dark yellow have a larger share of their population with subprime credit scores while those in light and dark blue have smaller populations. The Mason-Dixon line and Ohio River extension, the traditional division between northern and southern states is reflected as the red line on the map. For the purposes of this paper, we use this geographic division to define states and counties in the South and North. This is further demonstrated through Figure 14.

While the geographic divide is clear, when looking only at credit scores by race, we again find clear differences in average scores. Data reported by the Urban Institute using data reported by a major credit reporting agency (i.e., TransUnion, Experian or Equifax), notes that median credit scores in Black majority communities have an average score 100 points lower than majority White communities (The Urban Insitute, 2022). Similarly, using data reported by the Federal Reserve, a 2021 report finds a roughly 60-point gap between the average score of White Americans (734 points) and their Black counterparts (677) (Shift Processing, 2021), slightly higher than a 2022 report by the Federal Reserve which quotes a 40-point differential between Black and White Americans (Bhutta, et al., 2022, p. 2).

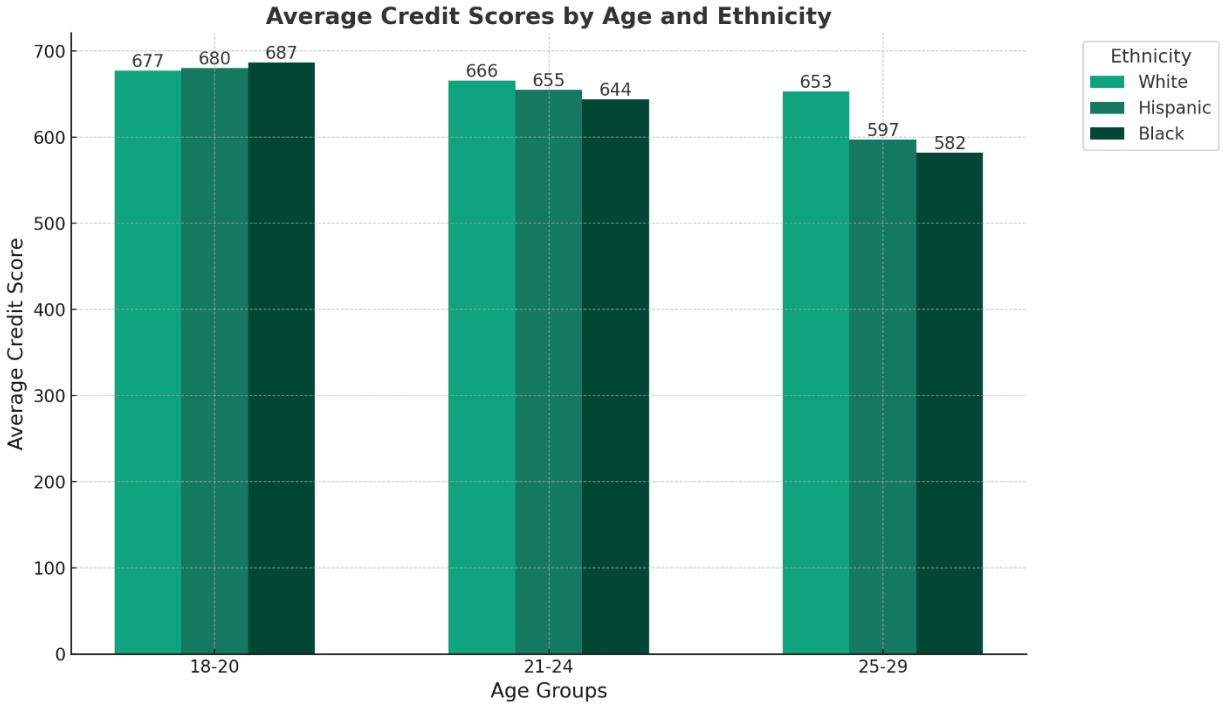
Figure 2: Average Credit Scores by Race (2021)



Source: (Shift Processing, 2021), author's illustration

Furthermore, while older generations have higher credits scores overall compared to younger Americans, data presented from the Urban Institutes in **Figure 3** shows divergent trends among younger populations by race. While the scores of their White counterparts aged 25 and 29 increase an average of ten points to 677, Black Americans find that their average credit scores decrease from 653 among 18–20-year-olds to 582 for those between 25 and 29 (Gordon, 2022). These young Black adults incur additional financial penalties that ultimately make it more difficult to save money, purchase a large asset like a home or a car, and remain resilient when facing unexpected emergencies. Stuck in a self-perpetuating cycle of debt, higher interest rates, and obstacles to fair financing, many of these individuals that enter this cycle find escape nearly impossible.

Figure 3: Average Credit Score by Majority Community (2022)



Source: (Gordon, 2022)

To put this gap into further context, **Figures 4 and 5** present the quantity of rates according to the Consumer Finance Protection Bureau that may be offered to the same individual based on their credit score in Mississippi – the state with the highest percentage of the population with subprime credit scores in the dataset. According to the information reported in **Figure 4,** an individual with a credit score between 740 and 760 can expect to find approximately twelve financial institutions ready to offer financing at an average interest rate of 6.85% but as low as 5.75%. Compared to the individual in **Figure 5** with a subprime rate (between 620 and 640 in this example), fewer options are available, and the average rate offered is 7.188%.

Figure 4: Interest Rates Offered (credit score between 740-760)

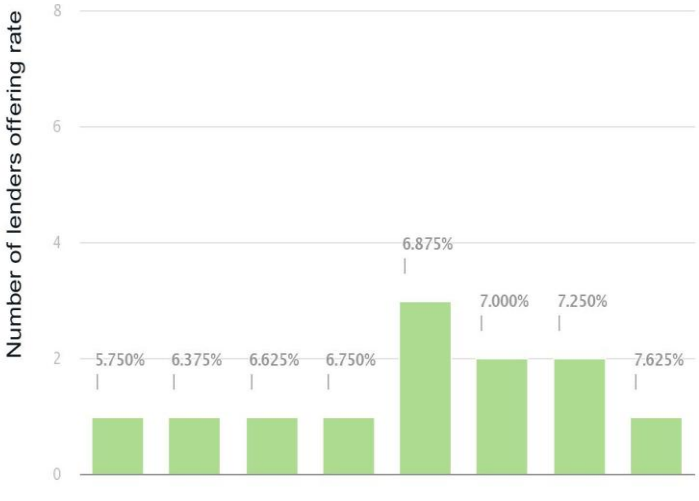
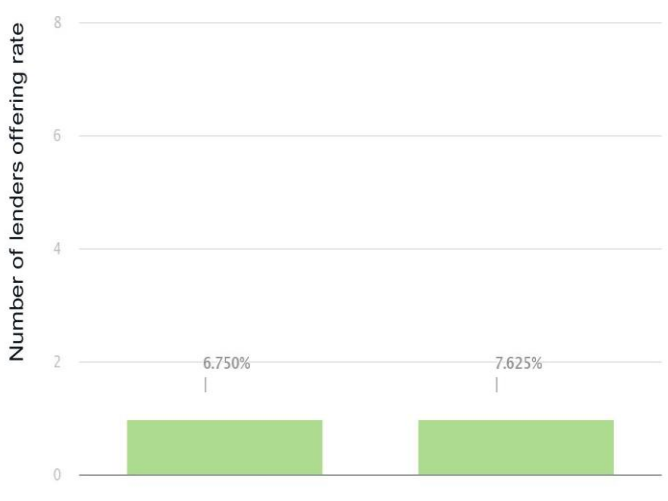


Figure 5: Interest Rates Offered (credit score between 620 - 640)



Source: (Consumer FInancial Protection Bureau (CFPB), 2023); In Figure 4, for an individual with a credit score between 740 and 760, twelve lenders are ready to offer financing at an average rate of 6.85%. Compared to an individual with a credit score between 620 and 640 (considered subprime) in Mississippi, only two lending providers are available, and the average rate offered is 7.188%

These figures demonstrate that individuals with a lower credit score can expect fewer financial institutions to lend to them but also that those that offer financing will do so at higher rates. Putting these differences into dollar terms, **Table 1** provides an overview of how these rates can drastically increase the cost of an average house in Mississippi based on one's credit score and subsequent interest rate obtained from a lender. Further empirical evidence shows that such differences in credit scores not only impacts the cost of home ownership and related systemic barriers but also impacts residential sorting behavior resulting in higher rates of minority populations in areas with lower desirability rates – i.e., poor educational institutions, higher poverty rates, greater crime rates, lower business ownership levels, etc. (Nelson, 2010, p. 43) (Blagg, et al., 2022, p. 12).

Table 1: Costs of Home Ownership based on Credit Scores

$200,000 house with 10% down ($180,000 loan) – average home cost in Miss.		
With rate of 5.75%	$52,775 over five years	$209,164/30 years
With rate of 7.625%	$70,682 over five years	$294,131/30 years

Source: (Consumer FInancial Protection Bureau (CFPB), 2023)

Finally, as we revisit **Figure 1,** there is a clear concentration of larger populations with subprime scores located in the deep southern states of Alabama, Arkansas, Georgia, Louisiana, Mississippi, South Carolina, and Texas; states with a historical legacy of large slave populations.

3.2. Slavery and Cotton Production In 1860

Beginning as early as the 15th century, the institution of slavery was a fundamental feature of the development of the United States (History.com, 2003). While initially concentrated in the mid-Atlantic regions, the practice eventually spread to new states of the union and began to coalesce in Southern states defined as those states below the Mason-Dixon line, particularly in the tobacco production regions of Maryland, Virgina, and North and South Carolina (History.com, 2003). Using data provided by the United States Census Bureau, by 1970, as depicted in **Figure 6**, slavery was present in many of the states of the early United States but largely concentrated around the tobacco producing states of Maryland, Virginia and North and South Carolina. However, by 1820, new territories were settled west of the Appalachian Mountains and along the Mississippi River valley. Combined with the invention of the cotton gin, this confluence of factors led to a massive increase in demand for cheap labor to clear, prepare and harvest the cotton crop (Beckert, 2014) – see **Figure 7**. Between 1790 and 1860, cotton fast became the primary cash crop in the American South, growing from nearly zero to over two billion pounds (Beckert, 2014). Accompanying this dramatic increase in production was the massed forced migration of slave populations to the Southern states of Georgia, Alabama, Mississippi, Louisiana, and Arkansas as well as a horrendous rise in the number of enslaved people brought into the United States. According to statistics, the number of enslaved people in the United Sates grew from approximately 700,000 in 1790 to over 4 million in 1860 with the vast majority found in the deep South in cotton producing regions (Rice University, 2020) (Dattel, 2006) – see **Figure 8.**

Figure 6: Slave Population (1790)

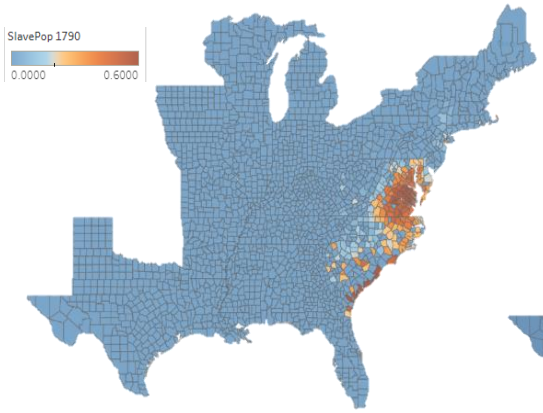


Figure 7: Slave Population (1820)

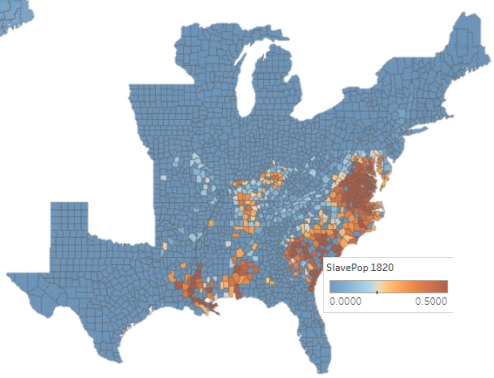
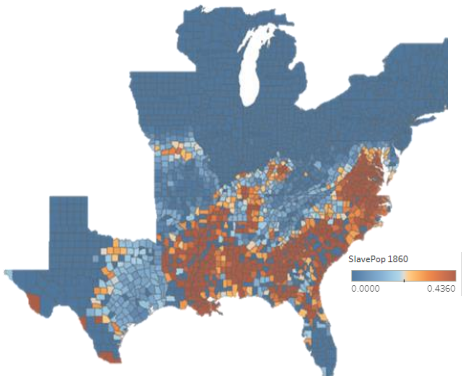


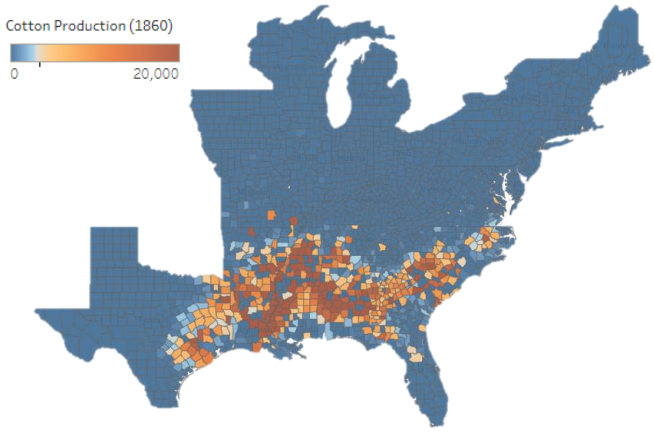
Figure 8: Slave Population (1860)



Note: Demonstrating the spread of slavery between 1790 and 1860, these maps use United States census data from the corresponding year. Counties with dark yellow shades have the largest slave population relative to the total county population while light blue are the counties with lower slave populations. Counties in dark blue are either unreported or have zero slave population according to the census. It is important to note that this data may not be fully reflective of the actual slave population but is the best official data that is available.

In the years immediately prior to the outbreak of the civil war, four states in the American South were producing 70% of the cotton produced in the United States and accounted for nearly 50 % of the total slave population (Beamish, et al., 2018). Through this system of forced, cheap labor, the American South operated a near global monopoly on cotton production, accounting for approximately two-thirds of the total cotton produced in the world. Cotton also became vital to the economy of the South and the United Sates during this period. Approximately three quarters of the cotton produced in the South was for exportation, accounting for $191.8 million in exports – nearly 60% of total export revenue in 1860 (Dattel, 2006). Through the following visualizations, we can readily see the relative correlation between overall slave populations the largest cotton producing counties in 1860.

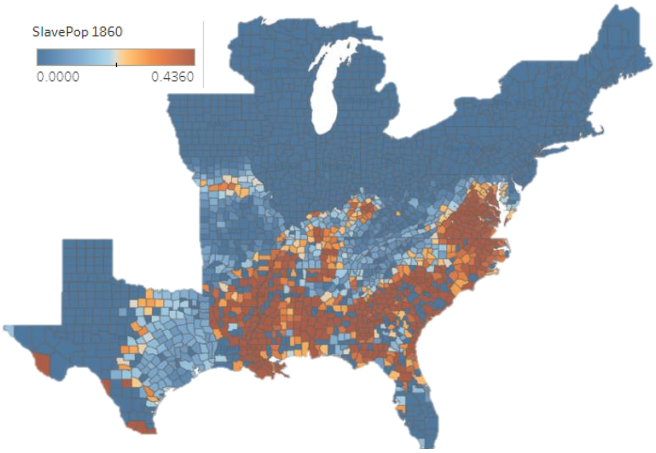
Figure 9: Cotton Production (1860)



Source: 1860 Agricultural Census; Authors illustration

**Note, in this image, the legend is adjusted to reflect the overall data set mean value for cotton production as the middle value while also adjusting the maxium value so that data can be presented accordingly.*

Figure 10: Slave Population (1860)



Source: 1860 Census; Authors illustration

**Note, in this image, the legend is adjusted to reflect the mean value for slave populations in the Southern states (0.436) as the maximum value so that data can be presented accordingly.*

Table 10 included in **Appendix B** further demonstrates the intrinsic correlation between cotton production and the overall increase and concretion of slave populations between 1820 and 1860 presenting statistics on cotton production between 1821 and 1860 across the eight largest slave states

and the absolute and relative slave population in 1820 and 1860. While each of the eight slave states experienced an increase in the absolute and relative slave populations, the biggest increases are present in the five largest cotton producing states. Between 1820 and 1860, these five states experienced massive increases in the absolute number of slaves as cotton production expanded and the migration of "northern" (e.g., Maryland, Delaware, Virigina) plantation owners moved south to produce the far more lucrative cotton crop. Among the largest percent increases in absolute slave populations, Georgia saw an influx of 388,395 new slaves between 1820 and 1860 (an increase of 844%), Mississippi an increase of over 400,000 (over 1,200% increase) and Louisiana an increase of over 262,000 (380% increase). Accompanying these increases, these three states also experienced significant increases in cotton production during the same period. Georgia nearly increased output by 1,862%, Mississippi by 4,710% and Louisiana by over 3,000%. Additionally, as Texas entered the Union in 1845, much of the land quickly became prepared for cotton production requiring additional slaves to prepare and plant the cotton crop, overtaking that of the other states and becoming the fifth largest producer of cotton by the time of the civil war (United States Census Bureau, 1864).

In the years prior to the American Civil War, as the tobacco crop became less lucrative and cotton production rose, almost all slave populations north of the Mason-Dixon line disappeared as slave populations were sold south. By 1850, almost 90% of all Blacks in the United States were slaves and nearly 95% of all Blacks lived in fourteen Southern slave states of the Union (United States Census Bureau, 1850). As of the 2020 census, while population shifts have resulted since the end of slavery in 1865, a comparison of counties with a high percentage of Blacks as proportion of the overall county population bears a striking resemblance to the counties with high proportions of slave populations in 1860 – see **Figures 11 and 12**. Among the thirty-one states included in the data set, nearly 60% of the Black population reside in Southern states with heavy concentrations in States in the deep South.

Figure 11: Counties by % of Black Population (2020)

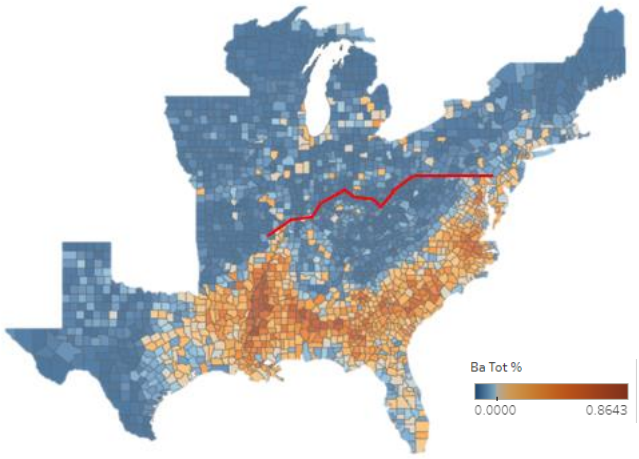
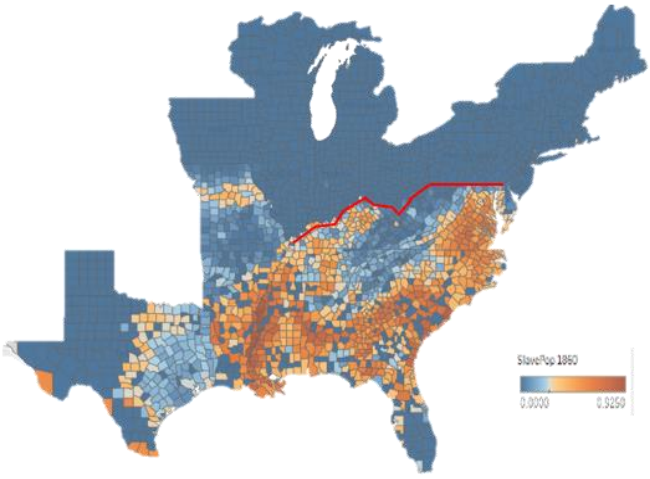


Figure 12: Slave Population (1860)



Note: Figure 11 presents the percent of a county population in 2020 that is Black. Counties shaded in dark yellow have higher relative Black populations while those in light blue have relatively small Black populations. We can readily see the concentration of highly Black counties in the south with a particular concentration within Alabama, Georgia, Mississippi, Louisiana, and Arkansas. Figure 12 is a replication of Figure 10 but adjusts the scale to better show the diversity of relative slave populations in 1860.

While subsequent migration of Black populations has resulted in some Black populations moving into northern states, these figures show a clear legacy of slavery and contemporary Black populations. While further justified in **Section 4** of this paper, as the effect of slave population have such an

established relationship with present day Black populations, this relationship creates issues with multicollinearity when controlling for both the effects of 1860 slave populations and contemporary Black population percentages.

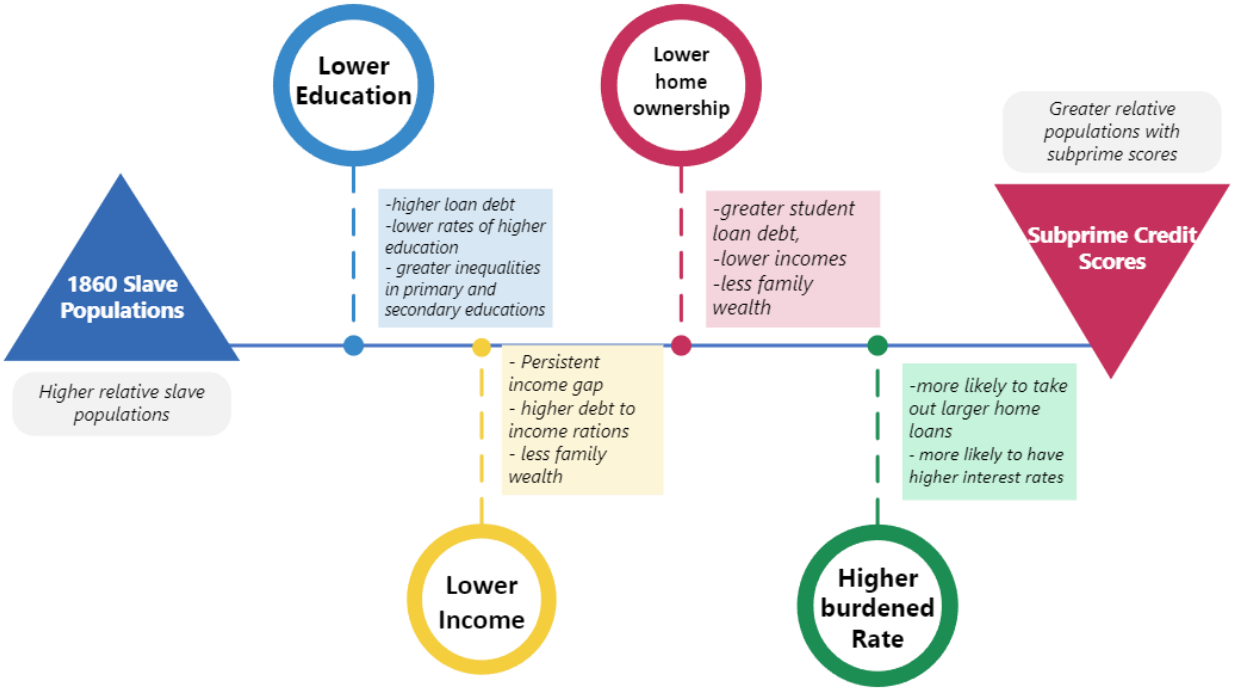
This visualization can then be compared to **Figure 1** which again presents the percent of a county population with a subprime credit score in 2021 according to data reported to the Federal Reserve Bank of New York by Equifax (one of three primary credit score aggregators). This comparison begins to structure the basis of this research. Using the Mason-Dixon line as the division between Northern and Southern states (shown as the red line in the Figures), states above the Mason-Dixon line are considered Northern States and the Southern States below this line. While there are some significant divisions clear at this divide, the concentration of counties with high populations with subprime credit scores are exceptionally present in southern states below the Mason-Dixon line that also have high Black populations.

3.3. Conceptual Framework

For Black Americans following the abolition of slavery, persistent forms of discrimination inhibited or outright prohibited their full socio-economic integration into society. Policies like "separate but equal" in the education system and redlining in the housing market, ensured that Black Americans were kept to the economic fringes of society for many of the decades that followed the abolition of slavery, particularly in the deep South.

The following figure builds from information provided by the Urban Institute to provide an understanding of the different barriers Black Americans face at various points in their young adult life with each stage presenting both new and interlinked financial strains that inhibit their ability to generate wealth, obtain equal return on human capital investments, and purchase homes. While Black Americans face barriers within each of these potential channels, the impact from slavery and its aftermath continue to retain influence in each of these variables.

Figure 13: Summary of Barriers of Black Americans



Through such a framework, we hypothesize that through decades of socio-economic exclusion starting with the institution of slavery, Black Americans have been unable to generate and retain intergenerational wealth beginning in an early education system that continues to underfund inner-city and low income segments to a higher education system that requires substantial student loan debt to access the same opportunities as their classmates (Scott-Clayton & Li, 2016). Even among peers of the same education level, Black Americans continue to experience a persistent wage gap (Jardina, et al., 2023), inhibiting their ability to generate wealth at the same rate as their counterparts while also potentially putting them in a riskier financial position as they face higher levels of student loan debt (Scott-Clayton & Li, 2016). With lower incomes and higher debt to income rations, Black Americans may face greater barriers to home ownership or search for homes in lower income segments of cities where they face fewer high income employment opportunities, lower quality public services, and institutional financial barriers (Blagg, et al., 2022). As such, many Black Americans continue to rent housing and often at high costs. For those Black Americans that are able to purchase a house, such a decision may come at a greater financial cost with higher interest rates and larger down payments, resulting in a higher burdened population within renters and owners.

3.4. Relevance to Literature

This paper seeks to understand the historical relevance and relationship between a historical event and present-day economic outcomes, a strand of literature referred to as economic history. Exploring the impacts of historical events or institutions can help to understand how systemic inequalities may in fact be lasting legacies of these patterns or events that continue to perpetuate or entrench inequalities. Further, through such an approach, this paper seeks to demonstrate how a system purported to be color blind and purely quantitative is unduly influenced by a confluence of historical factors rooted in the institution of slavery.

This paper will contribute to two primary aspects of literature – the study of economic history and that of contemporary racial inequalities.

Within economic history literature, there are two diverse strands of theory that explore the impact of geography and institutions on current economic outcomes. Under the "geography hypothesis", Gallup, Sachs, and Mellinger (1999) argue that natural obstacles, natural resource endowment, climate, etc. all may impede or facilitate a country's development (Gallup, et al., 1999, pp. 18-22). This paper will instead focus on research from Engerman and Sokolof (2002), Acemoglu, Johnson, and Robinson (2002), and Lagerlöf (2005) who argue that areas with "favorable" geographies experienced the establishment of extractive institutions such as slavery leading to a slower economic growth when compared to those areas with less favorable geographies. These authors promote the idea that the primary influence of geography's is through its influence on the quality of institutions, establishing the "institutional hypothesis". A seminal paper authored by Engerman and Sokolof (2002) in particular promotes the role of institutions in subsequent development outcomes. In their paper, the authors argue that while geography may have played an early role in the development of particular industries, the institutions that developed around these industries is the main historical influence on contemporary outcomes (Engerman, et al., 2002, pp. 45-46). Building from this strand of research, Lagerlöf (2005) demonstrates how the relative size of slave population in 1850 may explain subsequent growth rates and racial economic inequalities in former slave counties in the United States. Further, Lagerlöf explains that Whites in former slave counties are richer due to continuous intergenerational wealth transfers, greater foundational human capital levels, and institutional benefits (Lagerlöf, 2005, pp. 35-38). A similar approach from Nunn (2007) explores the findings of Engerman and Sokolof (2000) to demonstrate that slave use is negatively correlated with subsequent economic development at the state and county level in the United States. Nunn finds evidence that areas with larger populations of slaves continue to show marked disparities in economic development, with higher levels of inequality and diminished economic growth (Nunn, 2007).

These findings are further investigated through O'Connell (2012), Bertocchi and Dimico (2012), Berger (2016), and Rawlinson (2017) which explore diverse channels by which slavery influences racial inequality in the United States.

Given the fact that Black Americans have experienced generational discrimination in access to housing, finance, and employment, O'Connell (2012) finds that poverty inequality is greater in counties that had greater relative slave populations than those with smaller relative populations in the South. Further, O'Connell finds that these results only remain relevant for Black poverty rates demonstrating that "[t]he legacy of slavery is related to contemporary inequality in poverty rates through higher Black poverty rates" (O'Connell, 2012, p. 727). Similarly, in the Colombian context, Acemoglu, García-Jimeno, and Robinson (2012) find significant effects of slave population on contemporary poverty rates (Acemoglu, et al., 2012, p. 20) further demonstrating the historical legacy of such extractive institutions on modern poverty rates.

Bertocchi and Dimico (2014) assert that regions with a history of slavery show persistent educational disparities, which in turn serve to influence current levels of income inequality. The authors demonstrate slavery's effect on current income inequality is significantly impacted through human capital accumulation and due to historical and consistent barriers to educational opportunities, this channel continues to play a primary role in existing inequalities today. As proposed by the research, regions with higher slave populations had less incentive to invest in public goods like education and

through the "separate but equal" policies, leading to lower investment in public education and lower education levels among the Black population (Bertocchi & Dimico, 2014, p. 207). Such a stance is also postulated by Lagerlöf where he quotes findings from Restuccia and Urrutia (2004) noting the impact of education and the related (and growing) relationship with borrowing costs impacting intergenerational wealth growth and blunting increases in income.

Similarly, building from the findings of Lagerlöf (2005) and Nunn (2007), Berger (2016), in investigating impacts of slavery on long-run intergenerational mobility, looks into various channels to explain their main finding that areas with higher slave populations suffer from far lower rates of intergenerational economic mobility. Through such impactful research, Berger demonstrates how slavery has persisted through subsequent rates of economic development and inequality.

Inequality is further explored through differentials in business ownership and home ownership through Rawlinson (2017). In her doctoral thesis, Rawlinson finds that counties with higher relative slave populations in 1860 have, on average, lower Black business and home ownership rates which are influenced by slavery through lower Black wealth accumulation rates (Rawlinson, 2017, pp. 20-25). As posited by Rawlinson, it is through the institutional and continuous systems of discrimination beginning with slavery that have inhibited generational wealth accumulation and home ownership (Rawlinson, 2017, p. 15). Through such systemic inequalities, generations of Black Americans have faced a comparative disadvantage to the White colleagues that have benefitted from generational wealth accumulation, empowering greater opportunities to obtain higher education levels, training, and home ownership (Rawlinson, 2017, pp. 14-15).

Further, exploring contemporary differences in crime rates between northern and southern states, Gouda and Rigterink (2017) find significant and robust relationships between slave population and contemporary crime rates within US counties. Understanding the lasting legacy of slave and subsequent forms of racialized policing and systemic discrimination, Gouda and Rigterink find a strong and positive relationship between crime rates and relative slave populations with those counties with higher relative slave populations having a significantly higher crime rate for all census years between 1970 and 2000 (Gouda & Rigterink, 2017, p. 5). Buonanno and Vargas (2019) further explore this relationship in the Colombian context finding further evidence of the lasting legacy of slavery on land inequality and violent crime (Buonanno & Vargas, 2016, pp. 540-541).

Additional economic history literature has focused on the results of slavery across a diversity of contexts. As mentioned above, Acemoglu, García-Jimeno, and Robinson (2012) and Buonanno and Vargas (2016) have researched the impacts of slavery on contemporary socio-economic outcomes in the Colombian context. Nunn (2008) also sought to investigate the impacts of slave extraction on current economic development outcomes in Africa, finding a robust relationship between the two variables with larger slave extraction linked to lower rates of current economic development (Nunn, 2008, p. 141).

Each of these publications offer unique insights into how we can further understand how slavery continues to have persistent influence on modern economic outcomes. However, while valuable evidence of slavery's influence in present inequality outcomes have been studied, the concepts explored by these authors do not explore how slavery might continue to shape modern racial divisions through widespread institutional systems, such as the universally adopted FICO credit scoring model. To that end, this paper seeks to contribute to this valuable and growing strand of economic history

while also exploring the effect of slavery and subprime credit score outcomes to demonstrate how the ostensibly "color blind" algorithmic model in fact perpetuates economic inequality in the United States.

3.4.1. Methodological Approach

While considering the long-term effects of historical events and institutions this paper employs an instrumental variable similar to other seminal papers within this strand of literature to address endogeneity concerns that might arise from measurement error or omitted variable biases (see Nunn (2007), Bertocchi and Dimico (2014), Berger (2018), Buonanno and Vargas (2017)).

In this paper, the instrumental variable is the total bales of cotton produced in 1860 reflected in thousands of bales. Cotton was the primary source of revenue and early development in many of the Southern states and its rapid and extremely profitable growth between 1800 and 1860 was almost wholly dependent on the access to massive amounts of cheap labor in the form of slaves. While this relationship is further explored in section IV.C, this approach follows the same approach as other relevant literature which instruments slave populations with factor endowments that are best suited to cotton production (see Nunn (2007), Bertocchi and Dimico (2014), Berger (2018)). While the instrument employed by this paper is potentially weaker than that which instruments slave populations by factor endowments due to the exogeneous nature of factor endowments and potential continued endogeneity of cotton production data, the instrument is demonstrated to remain a strong and significant predictor of slave population figures.

Further, this paper builds upon existing persistence literature to provide a theoretical framework by which we can understand how the institution of slavery might continue to influence contemporary credit score outcomes. In doing so, this paper explores various channels of persistence building from that of Acemoglu et al (2012), Nunn (2007), and Lagerlof (2005) among others to highlight how historical institutions may continue to exert long term development outcomes.

4. Data Descriptions

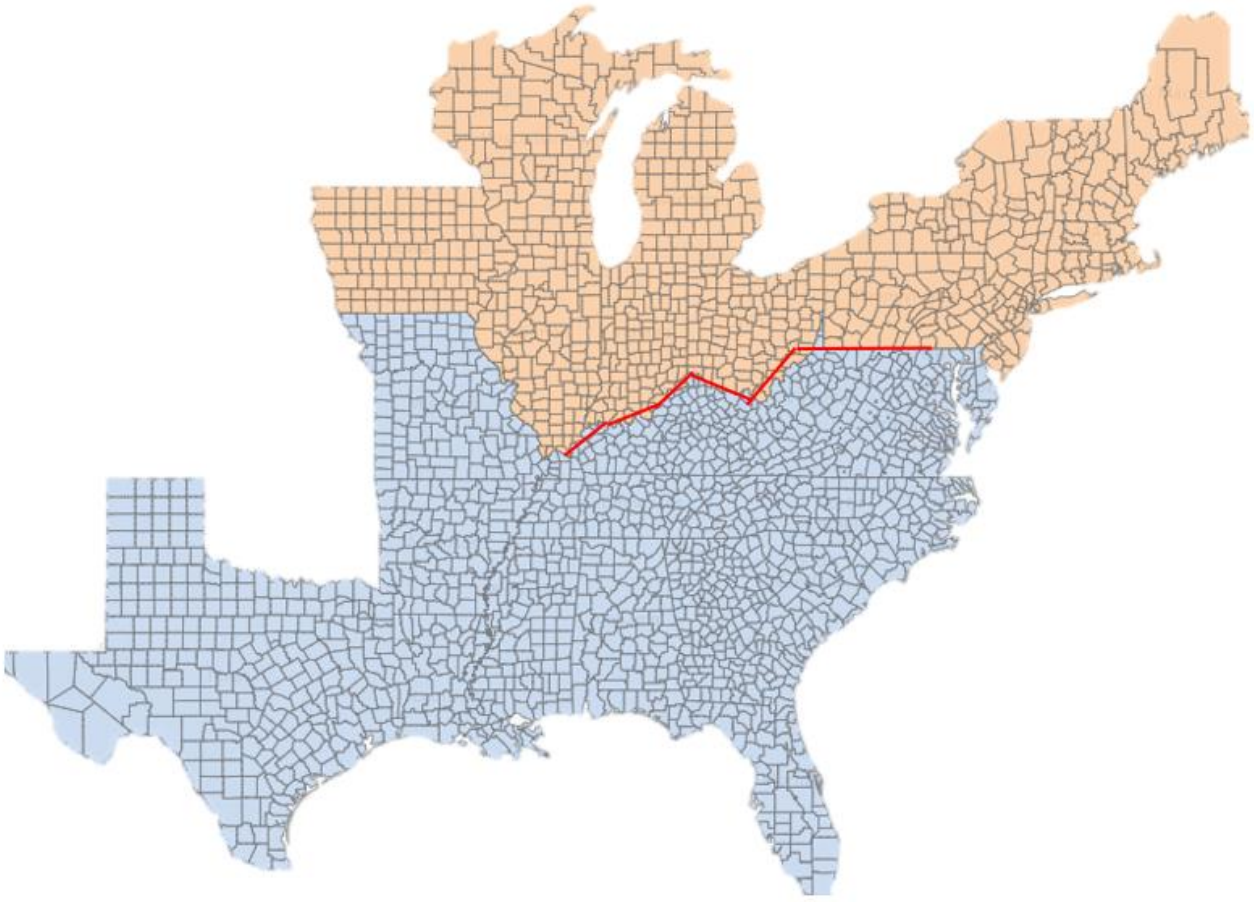
4.1. Historical Data

This paper draws from data reported by the United States Census Bureau from 1860 and the Agricultural Census of 1860. The demographic census records from this year provide insights into the number of "White", "non-White, free" and "slave" populations. While eighteen states report enslaved populations, two states (Indiana and Illinois) each have one county with reported slave populations. Within the remaining sixteen states, 1,084 counties report slave populations. This population as a percentage of the total population ranges from 1% to a high of 93% in Issaquena County, South Carolina.

From the Agricultural Census of 1860, we report the total bales of cotton produced at the county level where one bale of cotton is defined as equal to 400 pounds of ginned cotton. From this data source, we find 689 counties to have reported cotton production ranging from one bale to the highest amount of 141,193 reported in Tensas Parish, Louisiana and an average of 7,714.81 bales produced across the 689 counties. For ease of interpretation, this variable is presented in thousands of bales of cotton in the data set so that counties producing one bale of cotton in 1860 will be shown as having produced 1/1000 bales and maximum value of 141.19 bales.

For both historical sources, it is important to note that the dataset employed by this paper only includes counties which can be matched by name in current data records (i.e., the county in 1860 has the same name as the current county). Additionally, three counties in contemporary Texas were excluded due to lack of relevant data.[2] To that end, the dataset includes 2,172 counties from 31 states as visualized through **Figure 14** and further through **Table 9** in Apprendix A which provides the number of counties per state included in parenthesis.[3]

Figure 14: State and Couty Inclusion (by North/South Divide)



Note: the states shaded in blue are those that are considered as "southern" states in the data set while those states shared in gold are "northern". The red line included on the map shows the placement of the Mason-Dixon line and the Ohio river extension which historically separated slave states and non-slave states. While the Missouri Compromise of 1820 officially defined the geographic divide for the admission of new slave states to the United States, the Mason Dixon line divide reflects a more accurate division between slave and non-slave states.

[2] The counties eliminated are Loving County, King County, and Kenedy County. Each of these counties are extremely sparsely populated, have no reported financial institutions, do not have data for subprime populations or inequality rates among other indicators.
[3] The list of states and counties are also shown in table format through Table 9 included in the appendices.

4.2. Contemporary Data

The primary variable of interest is the percentage of a county population that is estimated to have a credit score below 660 which is considered "subprime". This data is accessed through the Federal Reserve Bank of New York and provided by Equifax. This data is provided quarterly from 2014 to 2021 and is then averaged annually at the county level for each of the 2,172 counties.

This paper employs data from a variety of sources to account for macroeconomic covariates between 2014 and 2021. The selection and inclusion of these variables are based on the empirical literature that have explored similar channels of the persistent effect of slavery on contemporary outcomes and based on literature that explores variables that influence differences in credit score outcomes.

Firstly, to define the geographic divide, states that fall below the Mason Dixon line and Ohio River have been coded as states in the "South" and coded as "1" for the variable named "South". Those above this line are considered "Northern" and coded as a "0". This divide can be visualized in **Figure 14** above as well as the Mason Dixon line that separates Maryland and Pennsylvania and the extension along the Ohio River.

The data set also then employs data provided by the Federal Reserve Bank to include annual averages for income inequality, burdened households, median ages, and median household income levels. Further, utilizing from the United States Census Bureau's American Community Survey (ACS), the data set incorporates annual information on county education levels, population data, poverty rates, and home ownership rates. Finally, utilizing data from the FDIC, we incorporate data on the total number of regulated financial institutions present in each county to determine the total number of financial institutions per 1,000 inhabitants.

4.2.1. Education[4]

The education level employed by this paper is determined as the percent of individuals 25 years or older with a bachelor's degree or higher as a percentage of the total population aged 25 or older according to the ACS. One's educational attainment can be assumed to have significant influence on their vulnerability to having a subprime credit score as those with higher levels of education can be assumed to have more exposure to financial education and literacy training, increased income earning opportunities, access to greater financial assets, higher rates of intergenerational wealth, and improved access to diverse financial products (Cole, et al., 2013, pp. 2-3). All the attributes help to improve one's ability to weather financial shocks, obtain affordable financing options and mitigate one's risk of default or bankruptcy.

Figure 19 shows the linear relationship between education and subprime populations with a clear steep, negative relationship shown meaning that the greater the average education attainment within a county, the smaller the population with subprime credit scores.

4.2.2. Income Factors

Income is assumed to have a strong influence on one's credit score with those with greater income being more capable of repaying loans or having longer positive credit histories. Slavery and its subsequent derivative institutions have influenced income generation opportunities, generated

[4] All contemporary socioeconomic covariates are plotted as binned scatterplots available in Annex C

persistent levels of income inequality and greater poverty levels (Nunn, 2007). This relationship is exposed through the findings of Engerman and Sokoloff (1997 & 2002), Nunn (2007), and Bertocchi and Dimico (2012) which find strong relationships between the 1860 slave population and current levels of income inequality. Further, in exploring the impact on intergenerational mobility, Buonanno and Vargas (2016) find a similar relationship between slave populations and income inequality in the context of Colombia (Buonanno & Vargas, 2016).

While research from the Federal Reserve of the United States notes only a modest correlation between income and credit scores (Beer, et al., 2018), change in income levels over time may demonstrate a different relationship. Further, intrinsically, higher income earners may have a better financial foundation to respond to emergencies and unexpected financial concerns. For low-income earners, these emergencies may require accessing higher amounts of unaffordable credit, liquidity concerns, or default. In this paper, income inequality is determined as the ratio of mean income for the highest quintile (top 20 percent) of earners divided by the mean income of the lowest quintile (bottom 20 percent) of earners. Median household income is the median point of income of the householder and all other people 15 years and older in the household including those households reporting no income. The model includes the natural log of this value per county as the variable *lnincome*. Consistent with literature, **Figure 15** shows that this relationship is expected to be relatively steep and negative meaning counties with higher median incomes are expected to have lower rates of subprime credit scores.

4.2.3. Poverty

While related to the lack of income generation opportunities, poverty provides a more detailed expression of financial wellbeing and potentially generational factors. Given the fact that Black Americans have experienced generational discrimination in access to housing, finance, and employment, O'Connell (2012) finds that poverty inequality is greater in counties that had greater relative slave populations that those with smaller relative populations in the South. Further, O'Connell finds that these results only remain relevant for Black poverty rates demonstrating that "[t[he legacy of slavery is related to contemporary inequality in poverty rates through higher Black poverty rates" (O'Connell, 2012, p. 727). Similarly, in the Colombian context, Acemoglu, García-Jimeno, and Robinson (2012) find significant effects of slave population on contemporary poverty rates (Acemoglu, et al., 2012, p. 20) further demonstrating the historical legacy of such extractive institutions on modern poverty rates.

As slavery and subsequent discriminatory practices have limited economic opportunities for Black American's and income generation, as presented in **Figure 16**, there is an expected positive relationship between the relative size of slave populations in 1860 and the current poverty rate of a county. Greater rates of poverty can be expected to have a large effect on subprime credit populations as those below or near the poverty line are more likely to access more predatory lending options, be less likely to repay loans, take out greater loans relative to their income, or be less likely to own larger financial assets. As such, **Figure 17** shows the fitted linear relationship between poverty rates and the associated subprime populations reflecting a steep and positive relationship between the two variables.

The poverty rate of a county is determined by calculating the total number of individuals below the poverty threshold divided by the total county population as reported by the United States Census

Bureau's American Community Survey (ACS) which provides annual data on various socio-economic and demographic data points.

4.2.4. Home Ownership and Burdened Rates

Home ownership has been explained as an important measure of wealth and economic prosperity and Black Americans have historically been denied the same opportunities as White Americans through institutionalized practices like red lining or more discrete forms of housing discrimination (Rawlinson, 2017, p. 19). Credit scores influence one's ability to obtain a mortgage and determine the associated mortgage interest rates meaning that even when someone with a lower credit score can obtain a mortgage, the associated costs of buying the same house as someone with a higher score may be substantially different. In a 2022 report by the Federal Reserve that explored potential discriminatory lending practices that would inhibit home ownership among minority populations, the report notes that "[r]ather than differential treatment, we find that group differences in risk characteristics drive most of the disparities in credit access" with an individual's credit score noted as the primary source for identifying those risk characteristics (Bhutta, et al., 2022, p. 2). So, while the Federal Reserve report does not find much evidence of differential treatment, they demonstrate the importance of one's credit scores in being able to access home ownership opportunities. Further, as posited by Rawlinson (2017), it is through the institutional and continuous systems of discrimination beginning with slavery that have inhibited generational wealth accumulation and home ownership (Rawlinson, 2017, p. 15). Through such systemic inequalities, generations of Black Americans have faced a comparative disadvantage to the White colleagues that have benefitted from generational wealth accumulation, empowering greater opportunities to obtain higher education levels, training, and home ownership (Rawlinson, 2017, pp. 14-15). Finally, through formal policies that have restricted home ownership for Black Americans like redlining have served as an extension of race based discriminatory lending practices that continued to perpetuate the legacy of slavery. Using data provided by the ACS, home ownership is defined as the percentage of total occupied housing units that are owner-occupied compared to those that are occupied by renters.

Further, while home ownership may be an important proxy to understand the economic prosperity of a county and any potential current or historical discriminatory practices, the paper also includes a variable to account for households who pay 30 percent or more of their household income on housing (such as rent or mortgage expenses). This variable can help to account for deeper historical and structural inequalities in housing affordability while it is also important to consider as populations with a higher burdened rate might be more financially strained, susceptible to foreclosure or eviction, and more vulnerable to large financial shocks which may result in late payments or default, all of which have significant impacts on one's credit score.

4.2.5. Unemployment

Counties with high unemployment may face wider economic challenges which may result in a greater financial strain on households and businesses. Similarly, those with high unemployment may imply a greater percentage of their population with increased financial delinquencies, reduced access to credit, and a downward pressure on credit scores. While ultimately contingent on a variety of contemporary influences, the impacts of slavery may still be present through discriminatory or biased hiring practices, concretion of Black populations in susceptible or low-skilled industries or inequalities in intergenerational wealth transfers that enable White populations to obtain higher paying and more

secure employment opportunities. **Figure 20** shows that the relationship between unemployment rates and populations with subprime credit scores is fairly steep and positive, meaning that counties with larger unemployment rates are expected to have a higher percentage of their population with subprime scores. This paper utilizes annual data reported by the Bureau of Labor Statistics' Local Area Unemployment Statistics (LAUS) program.

4.2.6. Median Age

Data from the Federal Reserve found that the majority of American's enter the credit market between 18 and 20 and that credit scores generally increase over time (Nathe, 2021). Further, Experian data shows that older generations consistently have higher credit scores than their younger counterparts with Baby Boomers averaging a credit score of 742 compared to an average score of 687 among Millennials (Horymski, 2023). However, research from the Urban Institute further finds a disparity of credit scores between Black and White Americans and a that this divergence begins early in life and tends to worsen as Black adults age. While the scores of their White counterparts increase, Black Americans find that their average credit scores decrease from 653 among 18–20-year-olds to 582 for those between 25 and 29 (Gordon, 2022). This is to say that on average, young Black adults have a subprime credit score, incurring the financial penalties that ultimately make it more difficult to save money, purchase a home or a car, and remain resilient when facing unexpected emergencies. Stuck in a self-perpetuating cycle of debt, higher interest rates, and obstacles to fair financing, many of these individuals that enter into this cycle find escape near impossible. In line with these statistics, as presented in **Figure 21**, counties with a higher median age are expected to have smaller populations with subprime credit scores on average. Within this paper, we utilize the median age of the county population annually using data reported by the ACS.

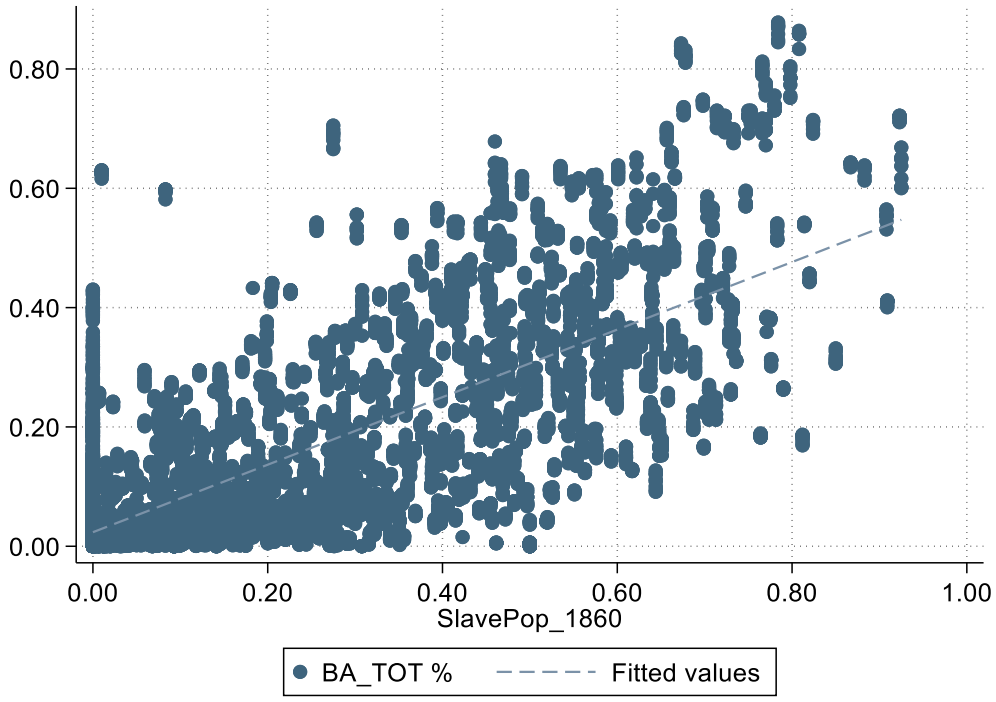
4.2.7. Access to Financial Institutions

Finally, a variable that seeks to define the banking density is determined by the total number of financial institutions present in a given county as reported by the Federal Deposit Insurance Corporation (FDIC) annually divided by the county population divided by 1,000 to obtain the number of financial institutions per 1,000 inhabitants. It is important to clarify that these statistics only refer to FDIC insured banking entities and do not include information about non-traditional banking institutions like payday lenders or other potentially predatory lenders. It can be assumed that having greater access to financial institutions may result in greater access to formal and affordable financing options which may help to mitigate the effects of accessing informal or unregulated lending institutions that often enact predatory lending techniques among poor populations and employ high interest rates which may cause greater financial stress and default or bankruptcy.

4.2.8. Black Population Data

From available literature and clearly visualized through the figures presented in section II, we know that areas of larger Black populations have lower average credit scores and higher percentages of subprime scores. We can also note that many of the counties with larger relative slave populations in 1860 also tend to have a greater relative Black share of their current population. **Figure 22** demonstrates the high degree of correlation between these two variables with a fairly steep and positive relationship between 1860 relative slave populations and current county-level relative Black populations.

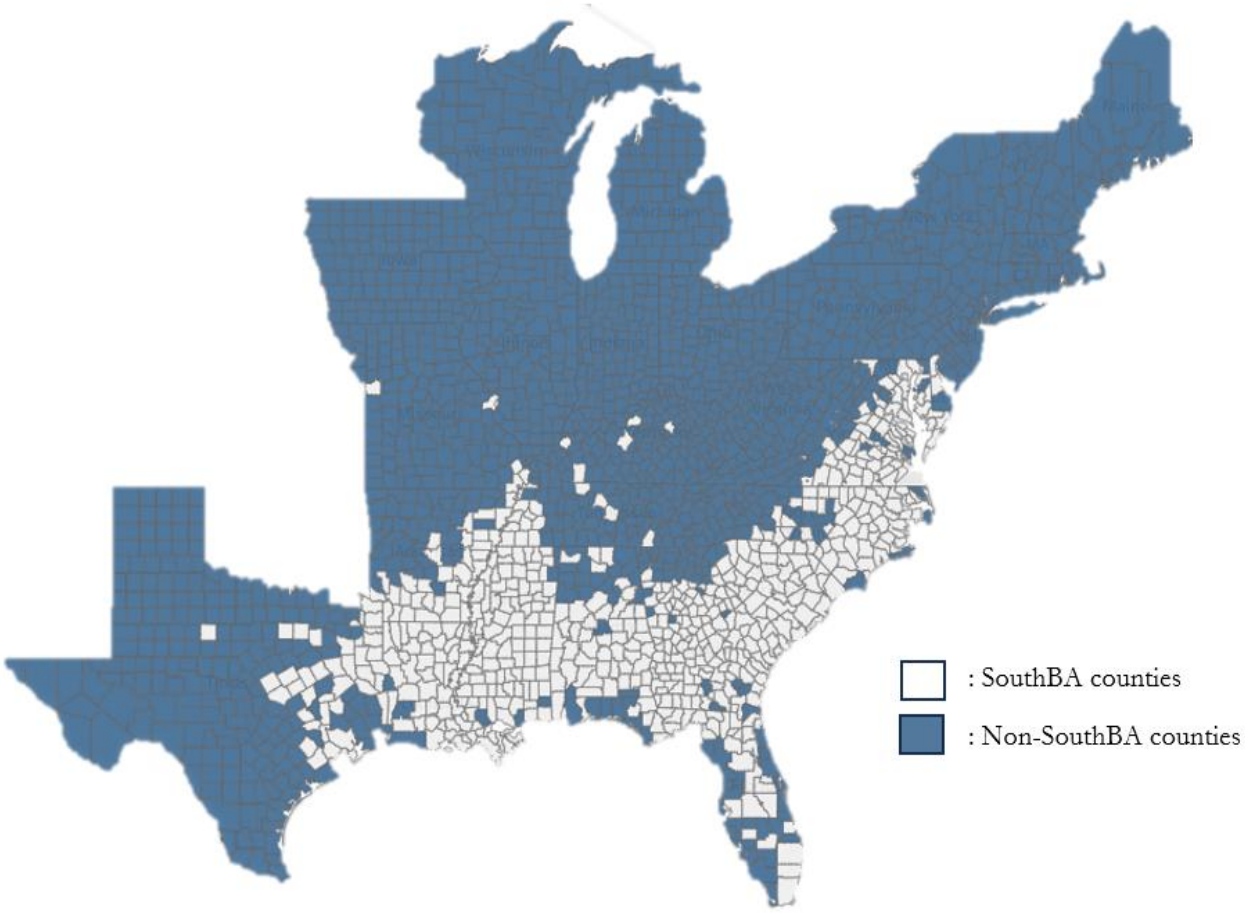
Figure 15: Present Black Populations and 1860 Slave Populations



Using the ACS population values, we determine the percentage of a county population that is African American (Black) as a percentage of the total population. Using this value, we define states with a Black population greater than or equal to 12.1% (the share of the national population) of the entire state population as "highly representative". For these counties, the variable "HighlyRepresentative" is coded as 1 and 0 if the percent is below the threshold. It is important to note that while there are some highly representative Black counties in the North, over 90% of the 5,397 counties coded as Highly Representative are located in the South.

Using this data, the paper employs a variable named "SouthBA" which is a dummy variable that defines those counties that are located in the South (South=1) and include a highly representative Black population, defined above ("HighlyRepresentative" =1). **Figure 23** provides a visualization of the counties that are coded as SouthBA in the data set. A total of 4,931 observations are coded as SouthBA out of a total of 17,386 (approximately 28%). While this variable is not included in the model specification as justified below, it is an important reference in understanding the socio-economic differences between counties in the South with high relative Black and those that are either in the North or do not have high relative Black populations.

Figure 16: SouthBA Counties (2021)



Note: SouthBA counties, sharded in White, represent counties that are located in a "southern" state and with a Black population greater than 12.1% of the total population. All other counties in blue are considered "non-SouthBA" counties.

However, as we have previously demonstrated visually through **Figure 11 and 12** and graphically through **Figure 22**, including both the slave population data and contemporary Black population data may generate endogeneity concerns that result from the reciprocal influence between these two variables. Recognizing this, our model does not include the variable for contemporary Black population percentages in the regression on subprime credit scores. However, in Section 7, we explore this relationship further to understand the nature of this relationship on subprime credit score outcomes.

4.3. Summary Data Statistics

This section will seek to provide an overview of the dataset employed by this paper. **Table 2** provides an overview of the descriptives statistics of each of the variables considered in this paper. In **Annex D,** an additional breakdown of these statistics is included in a data table that presents the statistics for those counties in the south with a large Black population (i.e., SouthBA=1), those that are Northern and or counties with small Black populations (SouthBA=0), and a comparison to the mean statistics side by side as a comparison (**Table 11**).

Table 2: Overall Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Year	17368	2017.5	2.291	2014	2021
South	17368	.652	.476	0	1
LAND Mi COU	17368	610.22	410.766	22.656	6671.049
Population	17368	104407.46	267331.49	550	5265398
BA TOT	17368	16156.372	62341.755	0	1264466
Percent Black	17368	0.120	0.160	0	.878
Highly Representative	17368	0.311	0.463	0	1
Slave Population (1860)	14576	0.166	0.217	0	.925
Cotton Production (1860)	14448	2942.559	8712.279	0	141493
Median Age	17368	41.239	4.759	23.100	68.1
Median household income	17368	51.356	14.162	22.045	155.362
Poverty Rate	17367	0.165	0.065	0.010	.507
Income Inequality Rate	17355	13.829	4.346	6.056	142.994
Population Density	17368	296.316	2072.178	.306	73672.175
Financial Institutions	17368	30.25	68.067	0	1552
Banking Density	17368	83.339	675.435	0	30984.98
Home Ownership Rate	17368	0.723	.077	.19	.964
Burdened Households	17368	26.505	6.001	5.605	56.852
Bachelor's or higher	17368	0.203	.092	.032	.758
Unemployment Rate	17368	5.439	1.956	1.6	19.6
With Subprime Score	17368	30.21	8.639	5.621	61.641
SouthBA	17368	0.283	0.450	0	1
lnincome	17368	3.905	0.256	3.093	5.046
FIper1000	17368	.3875244	0.221	0	7.590841
Income Level	17368	1.854	0.462	1	3
No Years of Education	17368	.012	.008	0	.107
With 1-6 Years Education	17368	.016	.02	0	.316
With 7-12 Years Education	17368	0.477	0.098	0.099	0.764
With 13–16 Years Education	17368	0.420	0.074	0.178	0.634
With 16+ Years Education	17368	0.074	0.043	0	0.410
Avg Years of Education	17368	12.84	.701	9.607	16.053
No schooling completed	17368	951.427	3692.207	0	98333
Nursery school	17368	13.218	50.45	0	1307
Kindergarten	17368	13.707	54.227	0	1698
First	17368	35.532	177.744	0	4720
Second	17368	75.417	412.356	0	12003
Third	17368	163.102	821.209	0	23553
Fourth	17368	137.329	629.424	0	14626
Fifth	17368	206.025	958.394	0	22365
Sixth	17368	659.539	3717.051	0	99152
Seventh	17368	317.28	985.147	0	25793
Eighth	17368	927.198	2423.614	0	64615
Ninth	17368	1092.761	3354.496	0	84945
Tenth	17368	1366.33	3029.088	0	64609
Eleventh	17368	1488.013	3514.932	0	74824
Secondary (No Diploma)	17368	1219.67	3901.701	0	81156
High School	17368	17445.353	38876.476	63	752799
GED or alternative	17368	2999.715	6053.583	5	110972
Some college (<1 year)	17368	4322.807	9557.318	0	190593
Some college (> 1 year)	17368	9704.417	24397.778	47	501458
Associate degree	17368	5825.01	13583.429	1	246183
Bachelors degree	17368	13376.631	40162.702	8	869960
Masters degree	17368	6090.152	19313.097	0	439038
Professional school	17368	1435.801	5283.748	0	119333
Doctorate degree	17368	953.204	3230.221	0	62668

Table 11 provides a side-by-side comparison of sample means breaking out the counties. Across the 4,931 county observations that are coded as SouthBA over the eight-year panel period, we can observe some significant differences when compared to the non-SouthBA counties. Firstly, we can note that the average slave population in 1860 is 43.6 in SouthBA counties compared to only 3.9% in non-SouthBA counties and similarly, the current average relative Black population is 32.6% in SouthBA counties compared to only 3.8% in non-SouthBA counties. Similarly, given the relative slave populations between these groups, the difference in cotton production appears to further support our choice of instrument (explained in depth in Section 5). The summary statistics show that SouthBA counties on average produced 9,724 bales of cotton in 1860 compared to just 410 in non-SouthBA counties.

When comparing differences in means within the variable controls, we continue to note interesting differences between these groups. On average, SouthBA counties have a median income level 12% lower than that of non-SouthBA counties (equal to slightly above $6,500). Relatedly, SouthBA counties have an average poverty rate five-percentage-points higher than non-South counties (33% greater) and suffer from higher rates of income inequality (25% higher).

Supporting the statistics presented by Rawlinson (2017), we find that SouthBA counties have lower levels of home ownership and are 16% more likely to be spending 30% or more of their income on housing expenses. Further, the summary statistics support the claims of education inequality from Bertocchi and Dimico (2014), finding a nearly 10% difference between the populations with at least a bachelor's degree in SouthBA counties (19%) and non-SouthBA counties (20.8%). Additionally, given the hypothesis that slavery and its subsequent forms of discrimination have created fewer economic opportunities in counties with higher levels of slave population, the data shows that SouthBA counties have a 13% higher average unemployment rate than their counterpart counties.

Finally, given our variable of interest is the county population with a subprime credit score, the summary statistics show a dramatic difference between SouthBA counties and the non-SouthBA counties. 38.06% of a county population has a subprime credit score if they are in the South and with Black populations higher than 12.1% of the total county's population – 40% higher than counties not in this category.

5. Empirical Strategy

5.1. OLS Specification

To investigate the potential correlation between the propensity of slave populations in 1860 and percentage of a county population with subprime credit scores, we define the following equation whereby counties are denoted with subscript *i* and the eight-year periods of this study are identified by subscript *t*.

Equation 1: OLS Specification

$$S_{i,t} = \alpha + \beta P_{i,1860} + \mathrm{X}'_{i,t}\theta + \gamma_s + \lambda_t + \mu_{i,t}$$

S_{it} represents the percentage of the county *(i)* population with a subprime credit score in year *(t)*. P is the relative slave population of county *(i)* in 1860. X_{it} is the vector of convatiates for each county *(i)* in year *(t)* which include the natural log of median incomes, the income inequality rate, the financial institutions per 1,000 inhabitants, home ownership rate, the percentage of burden households, the education rate, the unemployment rate, and the median age of the county. We control for both state (γ_s), where (*s*) denotes States, and year (λ_t) fixed effects. To account for the fact that observations within the same county might not be independent, we cluster standard errors (μ_{it}) at the county level across all specifications.

5.2. Instrumental Variable (IV) Specification

However, consistent with similar research, there are two primary concerns apparent in this OLS model: omitted variable bias and measurement error. While the model employs a variety of control variables to account for potential channels of influence on credit scores, there may be other observed variables that may exert an influence on this outcome such as intergenerational wealth transfers, unobserved discriminatory practices, or cultural norms that might influence one's aversion or attraction to debt and credit resulting in an underestimation of the relationship (i.e., positive bias). Additionally, while the 1860 census provides relevant insights into the 1860 populations, there can be significant concerns related to the data that is report and its associated quality. To address these concerns, this paper this employs an instrumental variable approach using the following structural form two-stage least-squares (2SLS) model:

Equation 2: 2SLS Second Stage Model

$$S_{i,t} = \alpha + \beta \hat{P}_{i,1860} + \mathrm{X'}_{i,t}\theta + \gamma_s + \lambda_t + \mu_{i,t}$$

Where the values of *SlavePop_1860* are the predicted values of slave populations provided by instrumenting this variable using cotton production figures from 1860 in the following equation:

Equation 3: 2SLS First Stage Model

$$P_{i,t} = \varphi + \xi C_{i,1860} + \mathrm{X'}_{i,t}\theta + \gamma_s + \lambda_t + \mu_{i,t}$$

5.3. IV Justification

The relationship between the importance of slavery to cotton and its relevance to the rapid economic expansion of the United States in the 1800 can be briefly summarized by Karl Marx who said that "without slavery you have no cotton; without cotton you have no modern industry. It is slavery that gave the colonies their value; it is the colonies that created world trade" (Marx, 1847, pp. 49-50).

The historical relationship between cotton production and slave populations described by Marx is substantiated in **Section 3.2** where additional context related to the exponential expansion of cotton production in the United States and the significant increase in total slave populations is provided. As noted, between 1800 and 1860, slave populations in the United States increased from under one million to almost four million. During the same period, cotton production became the largest export of the United States and accounted for nearly 60% of all export revenue by 1860 (Dattel, 2006). As further visualized through **Figures 6-9**, the spread of slavery in the United States largely follows the expansion of the cotton crop through the deep south during this period, particularly following the fall of tobacco production in the mid-1800s (Rice University, 2020). It is through the expansion and

subsequent near global monopoly on the cotton crop that saw the rise of the United States as a global exporting county, large population shifts between the north and south, the geographic expansion of the United States westward, a belief in "King Cotton Diplomacy" that created the foundation for the ensuing civil war, and a growing dependency for cheap, accessible labor to sustain the record profits of the southern plantation owners (Rice University, 2020).

Following the end of the US Civil War and the subsequent abolition of slavery, cotton returned to its primacy in the South but was forced to find new ways of sourcing the necessary labor to meet the demand. In many states, this took the form in a system called sharecropping whereby former slaves continued to work the land but received a share of the profits in return for their labor (Beckert, 2014).

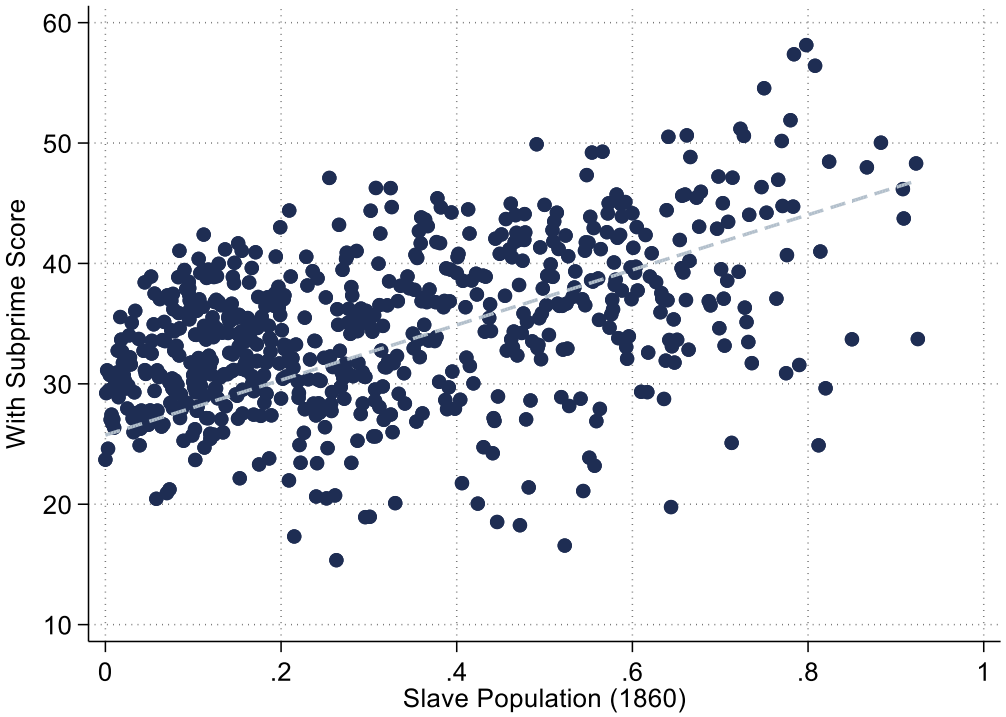
Cotton remained a strong industry in the South through the late 1920's, employing almost 18 million hectares of land and producing over 4 million tons of cotton in 1926 (O'Neill, 2022). However, with foreign producers offering greater quantities and lower prices, competition increased throughout this period. During the first World War, the United States only accounted for 40% of the total world cotton production (Phillips & Roberts, 2008)

With market prices falling throughout 1920 – 1930, farmers began to seek out alternative crops. One particular policy, the Agricultural Adjustment Act of 1933, was introduced to decrease global supply and increase prices. However, while successful in increasing global cotton prices, this ultimately caused cotton famers to reduce their acreage devoted to cotton production, ultimately meaning those populations working the land (former slave populations) were impacted disproportionally as a result (Beckert, 2014). Further macroeconomic shifts such as the Great Migration (Black Americans migrating north) and World War II resulted in larger labor shortages and a push to mechanize cotton production, increasing productivity but reducing land usage and human labor. Foreign competition, particularly from China and India also meant that the United States dominance was further reduced. Presently, the United States only accounts for just over 15% of the global cotton production but still accounts for 35% of the world's cotton exports (USDA, 2022). Further, while still an important global source, its share of the overall export revenue has dramatically fallen since its height prior to the civil war when it accounted for 57% of all US export revenue (Rice University, 2020). Currently, cotton exports only account for less than 1% of all export revenue (USDA, 2022).

Based on this justification and the specification provided above, the results presented in **Section 6.2** below will employ cotton production statistics from the 1860 agricultural census as an instrument to obtain predicted slave population sizes.

6. Results

Figure 17: Binned scatter plot - Slave Population and Subprime Scores



Graphic visualization between 1860 slave populations and percent of county populations with subprime credit scores

6.1. OLS Estimation

As shown in **Figure 24**, an initial graphical representation of the linear relationship between the relative size of slave populations in 1860 and percentage of a county population with subprime credit scores today appears to have a fairly large, positive relationship meaning that the counties with a larger slave population as a portion of their total population in 1860 is expected to have a greater share of their population today with a subprime credit score.

To investigate this, we first run an OLS regression using the model identified in **Equation 1** using only data from 2021 without controlling for any fixed effects (column 1). In the most basic model, as presented in **Table 3**, we find that a 10-percentage-point increase in the relative slave population of a county in 1860 results in an average increase of 1.462 percentage points in the percentage of the current population with a subprime credit score in 2021, holding all else constant.

Continuing to only include data from 2021, column 2 then includes State fixed effects in addition to the relevant socio-economic and demographic controls. While the effect of the slave population becomes more muted (0.574 percentage points), it remains highly significant as do almost all the other covariates included in the model.

Columns 3, 4 and 5 then provide full set of annual data regressions to account for variations in unobserved, time-varying characteristics that may affect the dependent variable. In Column 3, no fixed effects are included in the model, Column 4 adds in State fixed effects, while the results from the most stringent OLS model are presented in Column 5 which includes both State and Year fixed effects.

The results of the most stringent model (**Table 3** *column 5*) which employs the full set of covariates and State and Year fixed effects present a strong and significant relationship between the relative 1860 slave populations and current subprime credit score populations with an estimated average effect of 0.702 percentage point increase for every 10% increase in the relative 1860 slave population when holding all else constant. Almost all other variables remain highly significant in the model with only income inequality losing all significance employing State fixed effects and remaining so in the most stringent model specification.

For further investigation, **Table 12**[5] further disaggregates the model by adding in each separate variable while continuing to control for State and Year fixed effects. The 1860 slave population variable remains consistently significant and relatively stable in magnitude across specifications 6-16 as each additional control is added. Upon including the education level variable, which presents a strong and significant effect on the subprime outcome, income inequality becomes exceedingly small in magnitude and non-significant at each subsequent stage of the specification. Finally, while income also loses significance after including the variable on education attainment, it regains its size and significance in the final specification after including the variable for median age suggesting that median age may be a confounding variable in the relationship between income and subprime credit scores. All other variables reflect the expected sign relationship as anticipated and presented in **Section 4.2.**

[5] Included in Annex E

Table 3: OLS Results - Adding in FE, Panel

	OLS RESULTS				
	1	**2**	**3**	**4**	**5**
With Subprime Score	**Coef.** **(St. Errs)**	**Coef.** **(St. Errs)**	**Coef.** **(St. Errs)**	**Coef.** **(St. Errs)**	**Coef.** **(St. Errs)**
SlavePop_1860	**14.619***** (0.494)	**5.735***** (0.671)	**13.841***** (0.476)	**7.293***** (0.629)	**7.022***** (0.621)
lnincome	**-7.123***** (0.881)	**-4.486***** (0.851)	**-8.166***** (0.698)	**-7.379***** (0.627)	**-2.929***** (0.789)
Poverty Rate	**12.079***** (2.868)	**2.329** (2.651)	**12.071***** (2.620)	**3.782*** (2.300)	**8.196***** (2.299)
Income Inequality Rate	**0.051** (0.050)	**-0.019** (0.031)	**-0.080***** (0.025)	**-0.011** (0.026)	**-0.025** (0.022)
Financial Inst. Per 1,000	**-2.969***** (0.902)	**-1.944***** (0.442)	**-4.391***** (0.797)	**-2.819***** (0.567)	**-3.012***** (0.635)
Home Ownership Rate	**-5.860***** (2.216)	**-10.070***** (2.017)	**-1.535** (1.894)	**-4.929***** (1.748)	**-10.260***** (1.958)
Burdened Households	**0.052*** (0.028)	**0.066**** (0.027)	**0.122***** (0.018)	**0.194***** (0.019)	**0.109***** (0.021)
Bachelor's Degree	**-26.203***** (1.980)	**-27.858***** (1.635)	**-26.726***** (1.885)	**-26.128***** (1.622)	**-29.809***** (1.610)
Unemployment Rate	**0.637***** (0.079)	**0.997***** (0.094)	**0.303***** (0.043)	**0.345***** (0.036)	**0.619***** (0.065)
Median Age	**-0.433***** (0.032)	**-0.346***** (0.031)	**-0.505***** (0.032)	**-0.411***** (0.032)	**-0.360***** (0.033)
Constant	**74.112***** (3.903)	**64.066***** (3.714)	**80.480***** (3.384)	**76.791***** (3.006)	**61.537***** (3.394)
Observations	1,820	1,820	14,569	14,569	14,569
Clusters	1,820	1,820	1,822	1,822	1,822
State Fixed Effects	**No**	**Yes**	**No**	**Yes**	**Yes**
Year Fixed Effects	**No**	**No**	**No**	**No**	**Yes**
Panel	**No**	**No**	**Yes**	**Yes**	**Yes**
Contemporary Controls	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
R-squared	**0.7810**	**0.8696**	**0.7705**	**0.8465**	**0.8631**

*Note: Table 3 reports OLS estimates resulting from Equation 1. The primary variable of interest (SlavePop_1860) represents the relative slave population as a percentage of the total county population in 1860 while the dependent variable (With Subprime Credit Score) represents the percentage of a county population with a subprime credit score. Columns 1 and 2 reflect a cross sectional analysis of the model utilizing data only from 2021. Columns 3, 4, and 5 then add in the remaining panel data while progressively adding in State fixed effect controls in column 4 and then both State and Year fixed effect controls in column 5. ***p<0.01, **p<0.05, *p<0.1*

6.2. Instrumental Variable Estimation

As noted previously, as there are concerns regarding omitted variable bias and measurement error when using OLS, we seek to further address these concerns by employing an instrumental variable model with the models defined in **Equations 2 and 3**.

To demonstrate the validity of this instrument, the following two figures present binned scatterplots showing cotton production and associated subprime scire score populations in counties with one or more slaves in 1860 (**Figure 25**) and where no slaves were present in 1860 (**Figure 26**). As these figures demonstrate, there is a steep and positive relationship between cotton production and subprime credit score populations in counties where slaves were present in 1860 but an almost zero relationship in counties where slaves were not present. This instrument's validity is further supported through the IV results included in **Table 5**, Panel B which present the first stage results of the instrument finding that the instrument remains highly significant across all specifications.

Figure 18: Cotton Production and Subprime Scores (with slaves)

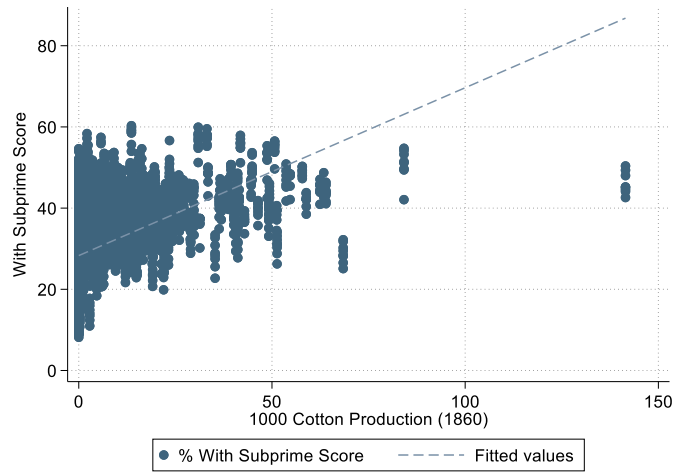


Figure 25 presents a scatterplot to reflect the potential linear relationship between slave populations and subprime credit scores. As one can see, there is an expected positive and fairly steep relationship between the two variables.

Figure 19: Cotton Production and Subprime Scores (no slaves)

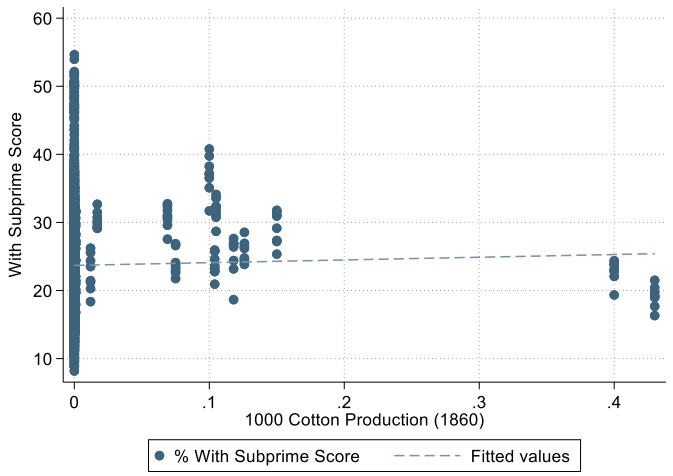


Figure 26 presents a binned scatterplot to reflect the potential linear relationship between cotton production and subprime credit scores. As one can see, there is an almost zero relationship between the two variables.

Similar to the OLS approach, **Table 4** presents different IV specifications first without any covariates, panel data or fixed effects in the model (column 1), then adding the contemporary controls (column 2), while then additionally accounting for State and Year fixed effects (3). Columns 4-6 then employ the full data set. Column 4 includes no control variables and no fixed effects, while column 5 introduces the full set of contemporary controls. While column 6 and 7 add in State and then State and Year fixed effects. Column 7 is the most complete specification, accounting for the full set of controls, panel data, and fixed effects. For ease of interpretation, these tables only provide the results for the slave population variable (β) and the coefficient for the instrument coefficient (ξ) even when all other control variables are employed in the models (columns 2, 3, 5, and 6).

The results presented in **Table 4** demonstrate a strong link between cotton production and slave populations in 1860 as evident in panel B which presents the first stage regression coefficient of the

instrument. The instrument coefficient remains positive and highly significant in each model through the table.

From these results, we again find a positive and significant impact of the propensity of the 1860 slave population on the percent of a contemporary population with a subprime credit score. Additionally, as evident in Table 13[6], the coefficients of the main variable of interest in the IV regression are larger than that of the OLS model supporting the downward biasedness that is expected from the omitted variable and measurement error bias.

Columns 1-3 of **Table 4** present the results of the two-stage least squares estimation using a cross-section of only 2021 data. Column 1 presents the model without accounting for any contemporary covariates or fixed effects. Column 2 then adds the full set of contemporary variables while Column 3 then introduces the full set of fixed effects to the model. We can note that at each stage of the model, the slave population variable retains its significance and positive value indicating that a rise in the relative slave population in 1860 is expected to result in a higher percentage population with subprime scores.

Columns 4-7 then replicate this approach using the full data set for all years between 2014 and 2021 for the set of covariates. Column 4 is the empty model presenting the relation between the slave population variable and subprime credit scores without any contemporary covariates included. Column 5 introduces the full set of contemporary variables while Columns 6 and 7 then include State and then State and Year fixed effects respectively.

In the most stringent model (**Table 4**, column 7), we observe that a 10% increase in the relative 1860 county slave population will result in an average increase in 0.7913 percentage points of the county population with a subprime credit score when holding all else constant.

From the results in **Table 4** we can identify a positive and significant relationship between 1860 slave populations and county populations with subprime credit scores and one that remains significant even when controlling for a wide variety of contemporary variables, multiple fixed effects, and endogeneity concerns through an instrumented variable. While there are a variety of qualitative research angles that might suggest how a purported "color blinded" scoring system continue to be influenced by a lasting legacy of slavery, the next section will investigate a theoretical hypothesis to explore channels of persistence.

[6] Included in Appendix F

Table 4: IV Results – Evolving Specification

	1	2	3	4	5	6	7
WithSubprimeScore	**Coef.** **(St. Errs)**	**Coef.** **(St. Errs)**	**Coef.** **(St. Errs)**	**Coef.** **(St. Errs)**	**Coef.** **(St. Errs)**	**Coef.** **(St. Errs)**	**Coef.** **(St. Errs)**
Panel A: Second Stage							
SlavePop_1860	**28.886***** (1.123)	**15.892***** (1.038)	**7.650**** (1.927)	**29.392***** (1.184)	**14.857***** (1.005)	**8.016***** (1.408)	**7.913***** (1.451)
Panel B: First Stage							
CottonProduction1860	**0.014***** (0.001)	**0.013***** (0.001)	**0.008***** (0.001)	**0.014***** (0.001)	**0.012***** (0.001)	**0.007***** (0.001)	**0.007***** (0.001)
Observations	1,812	1,812	1,810	14,440	14,433	14,433	14,433
Clusters	1,812	1,812	1,810	1,812	1,812	1,812	1,812
State Fixed Effects	**No**	**No**	**Yes**	**No**	**No**	**Yes**	**Yes**
Year Fixed Effects	**No**	**No**	**Yes**	**No**	**No**	**No**	**Yes**
Panel	**No**	**No**	**No**	**Yes**	**Yes**	**Yes**	**Yes**
Contemporary Controls	**No**	**Yes**	**Yes**	**No**	**Yes**	**Yes**	**Yes**
R-squared	**0.3315**	**0.7812**	**0.6701**	**0.3219**	**0.7689**	**0.6404**	**0.6308**

For ease of reference, only the results for ξ are presented in the table (Panel B) although all other control variables within the control vector are included in each specification.

****p<0.01, **p<0.05, *p<0.1*

7. Channels of Persistence

A 2016 report from Pew Research Center found significant insights into wealth generation divides between Black and White Americans. Their research found that over a thirty-year period, Black net worth – defined as the difference between assets and liabilities - decreased by $1,000 while White Americans saw their household wealth increase by $45,000, a shocking statistic that persists even when controlling for educational attainment (Pew Research Center, 2016, p. 24). Further, the same research found that Black Americans are thirty percentage points less likely to own a home than their White counterparts although the gap decreases upon accounting for education and income (Pew Research Center, 2016, p. 25). These statistics point to evidence of less access to large assets while increasing their debt burden or taking our larger loans to access home ownership. Coupled with higher rates of poverty, lower levels of education with far greater student loan balances, and a persistent income gap, Black Americans are on average far more susceptible to riskier credit behavior, face increased systemic barriers to building intergenerational wealth, and start their lives in a far more precarious financial position than their White counterparts – all leading to a far greater likelihood that they will have a subprime credit score.

While the contemporary effects of these variables on subprime credit score outcomes may be clear and well documented, understanding that slavery has largely influenced contemporary outcomes, this section aims to further investigate the channels by which we can explain slavery's lasting legacy. Specifically, we have demonstrated how slavery has influenced the demographic separation within the United States with larger Black populations still concentrated in and around counties with historically large slave populations. Replicating the summary means from **Table 11**, the following table again reminds us of the clear divides present in the SouthBA counties. As evident in **Table 5**, we know that counties with larger Black populations in the South where there is a larger legacy of slavery, are often poorer, less educated, have lower home ownership rates, and higher burdened rates on average than their counterpart counties.

Table 5: Comparison of Channel Summary Means

Variable	Mean (SouthBA=1)	Mean (Full Sample)	Mean (SouthBA=0)
Percent Black	.326	.12	.038
Bachelors Degree	.19	.203	.208
Median Household Income	46.695	51.355	53.20325
Income Level (1-3)	1.6857	1.8535	1.9207
Home Ownership Rate	.69	.723	.736
Burdened Rate	29.275	26.505	25.413

To further investigate the potential channels of persistence, we continue to instrument slave population data using 1860 cotton production data while employing a variety of contemporary control variables across each model. As such, the model specification employed is defined as follows:

Equation 4: 2SLS Channels Second Stage Model

$$Ch_{it} = \alpha + \beta \hat{P}_{i,1860} + \mathrm{X}_{it}\theta + \gamma_s + \lambda_t + \mu_{it}$$

Where the values of *SlavePop_1860* are the predicted values of slave populations provided by instrumenting this variable using cotton production figures from 1860 in the following equation:

Equation 5: 2SLS Channels First Stage Model

$$P_{it} = \varphi + \xi C_{i,1860} + \mathrm{X}_{it}\theta + \gamma_s + \lambda_t + \mu_{it}$$

Ch_{it} represents the channel of influence in county *(i)* in year *(t)* based on the different dependent variables previously identified. P is the relative slave population of county *(i)* in 1860. X_{it} is the vector of control variables for each county *(i)* in year *(t)* which include the poverty rate, the income inequality rate, the financial institutions per 1,000 inhabitants, the unemployment rate, and the median age of the county. We control for both state (γ_s) and year (λ_t) fixed effects. To account for the fact that observations within the same county might not be independent, we cluster standard errors (μ_{it}) at the county level across all specifications. The results of this specification across the four potential channels are presented in **Table 6.**

Table 6: Effect of Slave Populations on Potential Channels

	(1)	(2)	(3)	(4)	(5)
Dep. Variables	**PercentBA**	**Bachelors Degree**	**Income**	**Home Ownership**	**Burden Rate**
Slave Population	**0.697***** (0.053)	**0.091***** (0.032)	**0.129***** (0.041)	**-0.069***** (0.025)	**6.603***** (1.748)
Constant	**0.261***** (0.088)	**-0.515***** (0.032)	**4.738***** (0.037)	**0.477***** (0.024)	**31.133***** (1.462)
Contemporary Controls	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
State Fixed Effects	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
Year Fixed Effects	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
Mean Value of Dependent Variable (std. dev.)	**0.120** (0.160)	**0.203** (0.092)	**3.905** (0.256)	**0.723** (0.077)	**26.505** (6.000)
R Squared	**0.4275**	**0.5801**	**0.7066**	**0.5438**	**0.3034**
Observations	**14,433**	**14,433**	**14,433**	**14,433**	**14,443**

For ease of reference, only the results for ξ are presented in the table (Panel B) although all other control variables within the control vector are included in each specification.

7.1. Slavery's Effect on Contemporary Black Populations

To begin this analysis, we return to the visualizations presented in **Figures 11 and 12** which show the geographic divisions of large relative Black populations and the relative size of slave populations in 1860. While subsequent migration has resulted in some movement away from the deep south, our data set shows that nearly 60% of the Black population continues to reside in this region, a finding reflected in the entire fifty states as reported by the 2020 census (United States Census Bureau, 2021). We have further demonstrated that within these sixteen southern states, larger concentrations of Black populations continue to reside in counties with historically large slave populations, strongly influenced by the spread of cotton production in the middle 1800s. There is no surprise then that the results of Column 1 of **Table 6** points to a highly significant and sizeable relationship between slave population and contemporary Black populations suggesting that a one percent increase in relative salve

populations results in a 0.697 percentage point increase in the contemporary relative Black population in a county while holding all else constant.

7.2. Education Level

Data presented by Neal (2006) shows the shrinking educational attainment gap between Black and White Americans throughout the twentieth century helping to substantially decrease the gap established during slavery (Neal, 2005, p. 4). While Neal ultimately notes that this trend stops in the 1990s, the educational attainment gap has decreased once more in recent years. However, the gap persists; according to 2020 United States Census data, 24.9% of Black Americans have a bachelor's degree or higher, compared to 38.3% of White Americans (United States Census Bureau, 2021). The trend in recent years and that noted by Neal may help to explain the findings presented in **Table 6** which presents a positive and significant relationship between slave populations and populations with a university degree or higher.

However, not captured in this table is the fact that while the attainment gap may have decreased in recent years, research shows that Black Americans borrow almost double the amounts to attend universities than their White counterparts and that this gap only increases in the years following graduation (Scott-Clayton & Li, 2016). Further, a recent report from the National Bureau of Economic Research continues to confirm a muted return on human capital investment in labor segregation with Black workers more likely to be working lower wage and less desirable jobs even at the same education level (Jardina, et al., 2023, pp. 29-30). In all, while there are positive notions that there is a smaller educational attainment divide between Black and White Americans, Black Americans are forced to take on greater debt to obtain the same educational credentials and have a far more muted return on this investment.

Such borrowing behavior to obtain the same education credentials for a lower return may also influence further borrowing behaviors and wealth generation. A report by the Urban Institute notes that this confluence of greater borrowing behavior and lower earnings make Black Americans appear to be higher lending risks, strains their ability to keep up with loan repayments and their overall financial health, and limit their ability to purchase larger assets such as homes (Blagg, et al., 2022, pp. 17-18).

Further, as we break out the effect of slave population on individual levels of education, we find a more nuanced story.

7.2.1. Slave Populations and Education Levels

From an early age through university, Black Americans suffer from a systemic disadvantage in obtaining the same education level as their White counterparts. To explore this phenomenon further, we run an additional model of slave population on individual levels of education attainment. The variables represent the total number of individuals that attained "X" grade of education as their highest level of education (i.e., if "Fifth grade", this is the number of individuals that stopped their education after completing the 7^{th} grade). In addition to the covariates identified previously, this model also accounts for county population so that the relationship can account for differences in county level populations which can widely vary across the nation.

Table 7 explores the relationship between relative slave populations and populations who have the associated level of education as their highest level of attainment across five different levels of education. We used this set of variables as these are usually the last grade before advancing to another tier of education (e.g., after fifth grade students enter middle school; eighth into high school; and college after their high school diploma). Using this set of variables, we find that slave populations have a consistently negative and significant relationship with individuals throughout the primary and secondary education attainments. While the relationship does become positive in later stages of education, it is insignificant among those attaining a doctorate degree.

Table 7: Slave Populations and Various Education Levels

	(1)	(2)	(3)	(4)	(5)
Dep. Variables	**No Education**	**Fifth Grade**	**Eighth Grade**	**High School Diploma**	**Doctorate Degree**
Slave Population	**-842.333***** (319.943)	**-315.248***** (117.111)	**-926.492***** (247.316)	**-4503.63**** (1935.96)	**613.424** (376.188)
Dept. Var. Mean	**951.427**	**206.025**	**927.198**	**17445.35**	**953.204**
Contemporary Controls	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
State Fixed Effects	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
Year Fixed Effects	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
R Squared	0.8602	0.7385	0.8477	0.9547	0.7246
Observations	14,433	14,433	14,433	14,433	14,433
Clusters	1,812	1,812	1,812	1,812	1,812

In the decades following the abolition of slavery Black Americans were largely barred from education facilities and then suffered from policies of segregation, discrimination and underfunding of school systems in the decades that followed. While the 1954 decision in the *Brown vs. the Board of Education* enshrined equal access to education as a fundamental right regardless of race, it failed to account for the systemic inequalities already present within the education system by that time. A report from Columbia University demonstrates that the inequality present at the time of 1954 decision has persisted since due to the continued underfunding of schools and educational programs (White & Cordova-Cobo, 2022, p. 5). This supports the findings of Bertocchi and Dimico (2012) which show that the contemporary racial education divides are significantly influenced by historical gaps, and that slave states had much larger initial differences resulting in a persistent gap (Bertocchi & Dimico, 2014, p. 204). Their finding is further supported in their other 2012 paper to suggest that such an initial gap has been able to persist due to explicitly discriminatory processes during the Jim Crow era of "separate but equal" schooling practices, and intentional underfunding of inner-city school systems (Bertocchi & Dimico, 2012a). With the public school system partially financed through the county property tax contributions, poorer counties tend to have far lower public education budgets, fewer after school programs, and less resources that might enable parents to find alternative childcare solutions so that they can obtain employment, Black Americans suffered from decades of neglect and underfunding in the education system. Bertocchi and Dimico (2012) further note slavery's effect on current income inequality is significantly impacted through human capital accumulation and due to historical and consistent barriers to educational opportunities, this channel continues to play a primary role in existing inequalities today. The authors argue that regions with higher slave populations had less incentive to invest in public goods like education and through the "separate but equal" policies, leading

to lower investment in public education and lower education levels among the Black population (Bertocchi & Dimico, 2014, p. 207).

7.3. Income Earning

Table 8: Channel Results - Income by Income Level

	(1)	(2)	(3)
Dep. Variables	**LnIncome (Low Income)**	**LnIncome (Middle Income)**	**LnIncome (High Income)**
Slave Population	**-0.089***** (0.027)	**-0.028** (0.040)	**0.075** (0.084)
Constant	**3.961***** (0.039)	**4.274***** (0.033)	**4.487***** (0.067)
Contemporary Controls	**Yes**	**Yes**	**Yes**
State Fixed Effects	**Yes**	**Yes**	**Yes**
Year Fixed Effects	**Yes**	**Yes**	**Yes**
R Squared	0.5064	0.4214	0.5580
Observations	2,505	8,685	3,241
Clusters	598	1,540	730

While the overall result for income appears to insinuate that a larger slave population in 1860 is correlated with increased median income rates, when we breakout the income by economic class, we find that the magnitude of the effect is largely driven by high income segments of the population while the other two segments would experience. In this case, low income is defined as a median income under $40,000, middle income is between $40,000 and $60,000 while high income is above $60,000. As expected, **Table 8** shows that larger slave populations are correlated with lower income levels for low-income counties, a result that is statistically significant at the 0.01 level. While it is also negative for the middle-income segment, it is not statistically significant. Finally, while again not significant, the magnitude and sign for the high-income segment is as expected. Such a finding suggests that while higher income segments may have actually experienced improved earning potential in the years following slavery, the lower income segments have seen decreased earning.

Following slavery, many Black Americans were discriminated from many productive and high income professions, particularly in the South where many continued to participate in agriculture through sharecropping whereby they continued to farm the land of White landowners and earning a small percentage of the total profit (Beckert, 2014). Jim Crow laws and segregation continued to bar Black Americans from many professions throughout the 1900s with discriminatory hiring practices and artificial barriers in place based on race and ethnicity. Even as higher education opened up new opportunities to Black Americans following the ruling on *Brown vs. The Board of Education*, the literature previously mentioned in Section VI.B. shows that Black Americans experience a muted return on this investment in terms of their earnings and employment prospects (Jardina, et al., 2023). Furthermore, with Black Americans having to take on more debt to obtain the same education level and less able to rely on family wealth to offset these early inequalities, Black American's are less able to save at the same rate as their White counterparts, limiting their ability to purchase larger assets that are key in generating intergenerational wealth while also making them more dependent on credit and more susceptible to emergencies.

7.4. Home Ownership

While educational attainment is generally associated with greater income earning and home ownership rates, even Black university graduates are 12.8 percentage points less likely to be homeowners than White individuals with only a high school education (Blagg, et al., 2022, p. 5).

In the decades that followed the abolition of slavery in the United States, explicit practices of redlining and other discriminatory housing practices ensured that Black Americans were frequently kept out of certain neighborhoods or limited to urban areas that often lacked public services or suffered from an array of harmful environmental conditions. Redlining restricted Black American's access to financing and credit, forcing them to live in poor and decrepit areas of inner cities (within the risky areas within red lines) and with little potential to generate wealth through their homes. Research has found that the legacy of these practices is still very much present in many U.S. cities (see (Mitchell & Franco, 2018) and (Ray, et al., 2021)), revealing what Mitchell and Franco (2018) state to be a "persistent pattern of both economic and racial residential exclusion". With home ownership still out of reach for many Black Americans (46.5% compared to a rate of 75.8% for White Americans), access to a fundamental asset with the same wealth generation potential as their counterparts remains a real challenge for Black Americans.

As home ownership is consistently seen to be a foundational asset to enables families to generate intragenerational wealth and financial leverage, the barriers that Black families face as a byproduct of slavery has rippling impacts to their education, financial health, intergenerational wealth, and credit behaviors (Egede, et al., 2023, p. 1536). Further, as suggested by the findings of Bertocchi and Dimico (2010 & 2012) which show that the contemporary racial education divides are significantly influenced by historical gaps, it is precisely the result of historic redlining and other discriminatory housing practices that initially marginalized Black populations following slavery, restricted them to areas with segregated and underfunded public education systems, limited income and wealth generation, and continues to contribute to persistent racial inequality in the United States (Bertocchi & Dimico, 2014).

While the home ownership gap may be smaller than preceding generations, based on the statistics from Pew Research Center we know that Black Americans are now holding greater debt as a percentage of their total wealth while still thirty percentage points less likely to own a home. From Table 6, we can observe that SouthBA counties are four percentage points more likely to have households who pay 30 percent or more of their household income on housing. In Column 5 of Table 6 we can see that there is a significant and sizable relationship between slave populations and the household burdened rate which supports the notion that populations in counties with historically larger slave populations have a greater portion of the population that is burdened by home ownership. While Black homeownership rates have fallen in recent years, literature also notes that Black indebtedness has continued to rise. With more families taking out larger loans to access higher education for diminished returns in comparison to their White colleagues and home ownership continuing to be an essential step to economic growth and financial health, more Black families may be willing to take on more expensive mortgages.

8. Conclusion

Persistent inequalities since the abolition of slavery continue to limit the full socio-economic integration of Black Americans and continue to inhibit their full economic potential. While the FICO

credit scoring model claims to be color-blind by not providing any explicit score to an individual's race, orientation, ethnicity or age, the model's fundamental feature of scoring an individual's *historical* behavior without accounting for the multitude of contextual *historical* factors that continue to influence the very foundation of our financial health means that the system will only continue to punish Black Americans and perpetuate racial inequalities.

Through this paper, we have demonstrated that the historical legacy of slavery still very much persists in influencing subprime credit score outcomes in the United States. We find that the relative slave populations in 1860 result in a robust and sizable impact on the relative size of a county population with a subprime credit score. Utilizing an instrumental variable regression to address an endogeneity within the model and continuing to control for a variety of contemporary socio-economic variables, the slave population variable remains sizable and significant across all models.

Furthermore, to begin to explore the possible channels of persistence to extrapolate how this historical institution might continue to influence this modern system, we evaluate four potential channels of persistence that build from existing research and statistics. Specifically, we show how slave populations continue to influence credit score outcomes through its impact on education attainment, income generation, and home ownership. Beginning from an education system that consistently underfunded and marginalized Black children in poor neighborhoods to a current system that requires significant borrowing costs to access while providing uneven benefits, and discriminatory housing practices like redlining that kept Black people in poor and decrepit areas of cities helped to limit their ability to generate and pass down wealth to future generations, the current credit score system in the United States helps to ensure unequal access to the economic system and reinforce the socio-economic inequalities in society.

Alternative models to the existing credit scoring model must be considered so that the historical inequalities present in the economic system in the United States since its inception do not continue to keep future generations at a disadvantage. While the current model may claim to be color-blind in its analysis, its simplistic model does not fully consider how the institution of slavery may continue to influence persistent inequalities across housing, education, income and intergenerational wealth generation creating an uneven field in which Black Americans are already at a significant disadvantage. In order to obtain the same socio-economic integration as their White colleagues, Black Americans are taking out larger student loans to obtain the same education level but experiencing diminishing returns on this outsized investment (Bertocchi & Dimico, 2014, pp. 204-205) . When entering the job market with these equal education credentials, Black Americans are still experiencing a significant income gap and persistent occupational segregation that keeps them in lower paying, less desirable jobs (Jardina, et al., 2023, p. 4) meaning that upon graduation with greater levels of debt, fewer desirable jobs are available and even then, Black Americans face a persistent wage gap with their White colleagues (Jardina, et al., 2023, p. 20). Experiencing greater levels of debt, limited returns on human capital investment, fewer decent employment opportunities and a housing system that has historically marginalized them to less desirable and underfunded areas, Black American continue to face barriers in building and passing on wealth to subsequent generations. Chiefly, the home ownership rate of Black Americans continues to significantly lag behind White Americans. Even when Black Americans obtain a bachelor's degree, their home ownership rate is still lower than White Americans with only a

high school diploma further demonstrating that other socio-economic variables continue to prevent equal access to this vital asset. (Blagg, et al., 2022, p. 5).

This paper contributes to a growing strand of literature that explores how historical events and institutions continue to influence contemporary outcomes. Specifically, in exploring how the abhorrent practice of slavery continues to impact credit score outcomes in the United States, this paper provides evidence to advocate for a change in how credit scores are calculated and how subsequent models can better account for historical inequalities that have persistent through time and continue to marginalize communities of color.

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Appendices

Appendix A: States and counties included in the data set.

Table 9: States and Counties included

Northern States		Southern States	
Connecticut	(8)	Alabama	(67)
Illinois	(102)	Arkansas	(75)
Indiana	(92)	Delaware	(3)
Iowa	(99)	Florida	(67)
Maine	(16)	Georgia	(159)
Massachusetts	(14)	Kentucky	(120)
Michigan	(83)	Louisiana	(64)
New Hampshire	(10)	Maryland	(24)
New Jersey	(21)	Mississippi	(82)
New York	(62)	Missouri	(115)
Ohio	(88)	North Carolina	(100)
Pennsylvania	(67)	South Carolina	(46)
Rhode Island	(5)	Tennessee	(95)
Vermont	(14)	Texas	(254)
Wisconsin	(72)	Virginia	(95)
		West Virgina	(55)

States are included in the left column and the corresponding number of counties are included in parathesis in the right column, i.e., Alabama has 67 counties included in the data set.

Appendix B: Cotton Production and Slave Populations: 1820 - 1860

Table 10: Cotton Production and Slave Populations (1820 - 1860)

State	Cotton Production (millions of lbs.)				Slave Population 1820~ (as % of total pop)	Slave Population 1860~ (as % of total pop)
	1821*	1839*	1850+	1860+		
South Carolina	50.0	61.7	120.0	141.0	258,475 (51.4%)	402,406 (57.2%)
Georgia	45.0	163.4	199.6	280.7	149,654 (43.8%)	462,198 (43.7%)
Alabama	20.0	117.1	225.7	392.4	46,085 (31.9%)	435,080 (45.3%)
Mississippi	10.0	193.2	193.7	481.0	32,814 (43.4%)	436,631 (55.2%)
Louisiana	10.0	153.9	71.5	311.0	69,064 (45.2%)	331,726 (46.9%)
Texas	N/A	N/A	23.2	172.6	N/A	182,566 (30.2%)
Tennessee	N/A	N/A	77.8	118.6	80,097 (18.9%)	275,719 (24.8%)
North Carolina	N/A	N/A	20.2	58.2	204,917 (32.1%)	331,059 (33.4%)

** (Boody, 2014) +1860 Agricultural census ~1860 Population Census*

Appendix C: Descriptive Data Scatterplots

Figure 20: Scatterplot – Median Income and Credit Scores

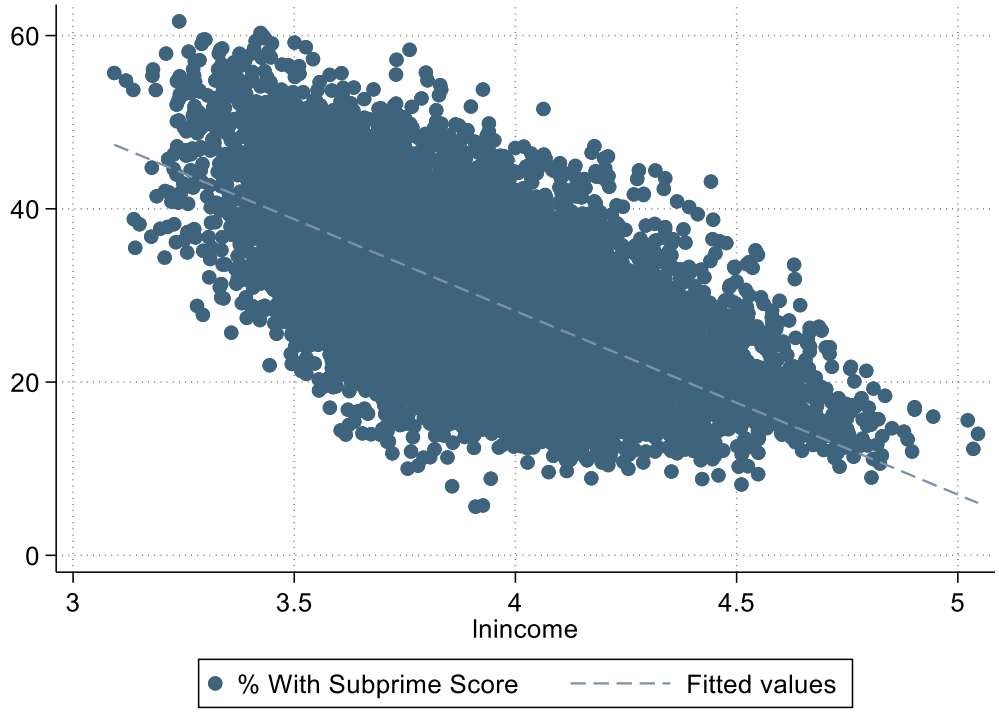


Figure 21: Scatterplot - Poverty Rate and Slave Populations

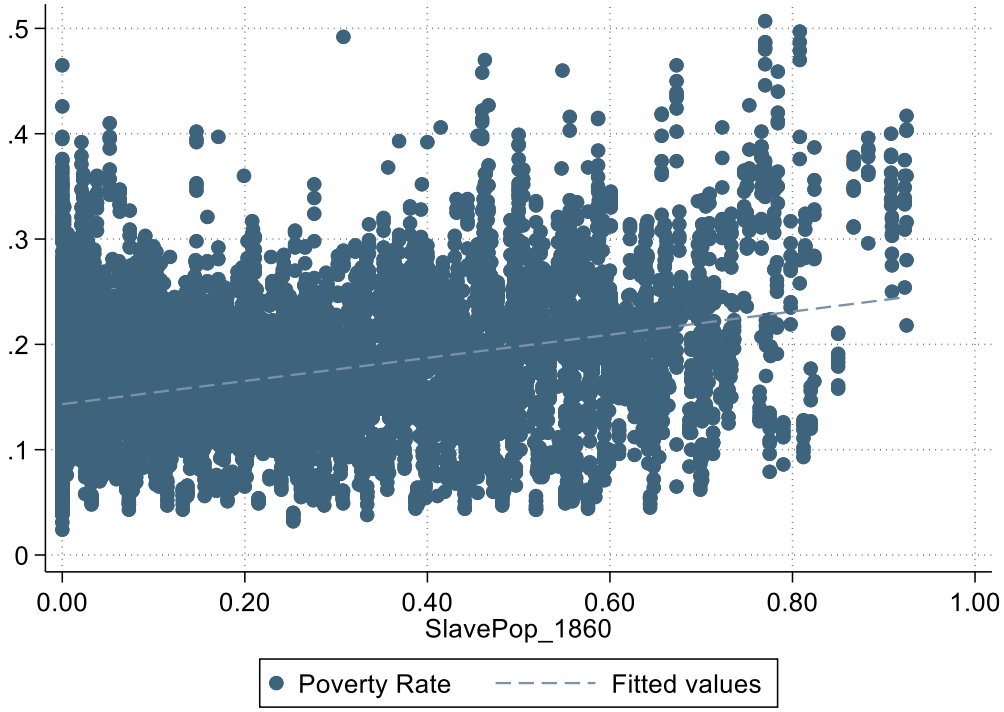


Figure 22: Scatterplot - Poverty Rate and Subprime Credit Scores

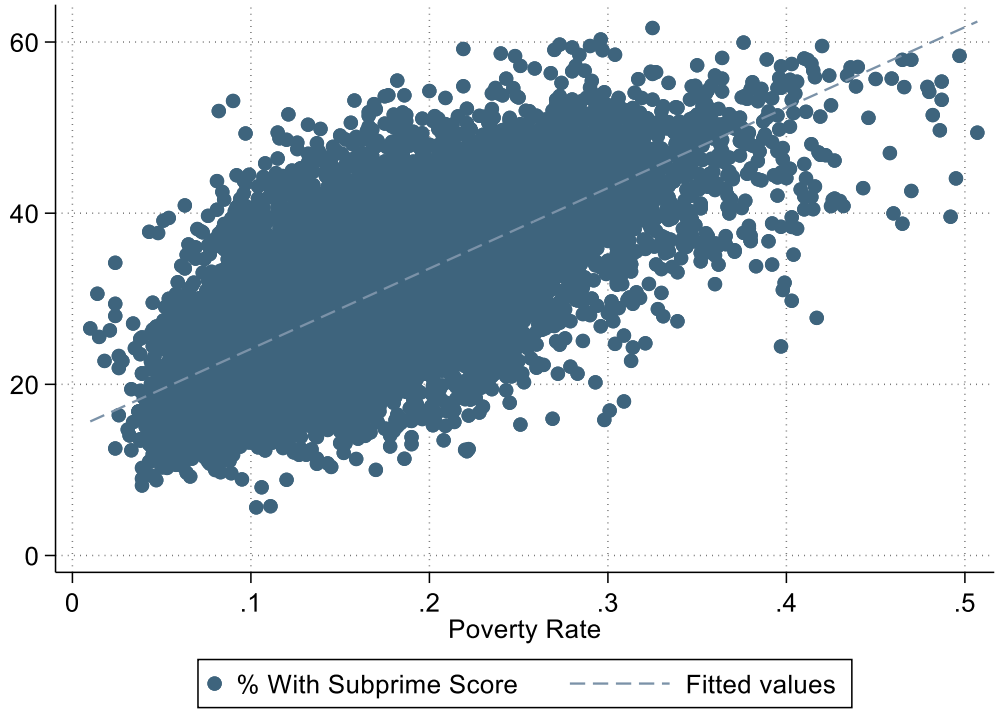


Figure 23: Scatterplot – Home Ownership and Subprime Credit Scores

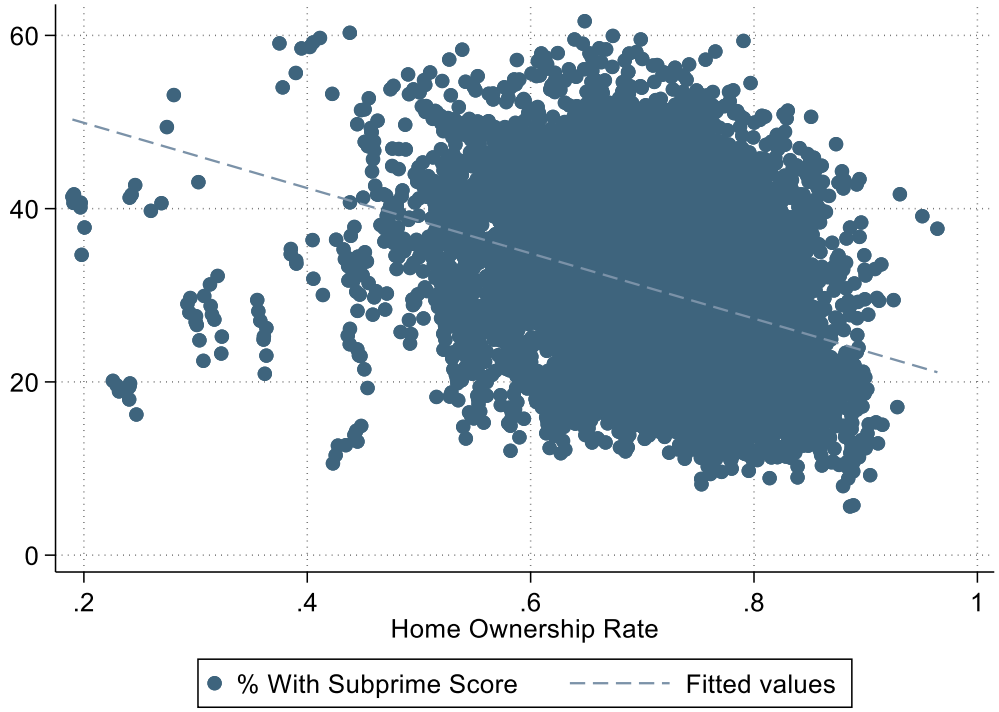


Figure 24: Education Level and Subprime Credit Scores

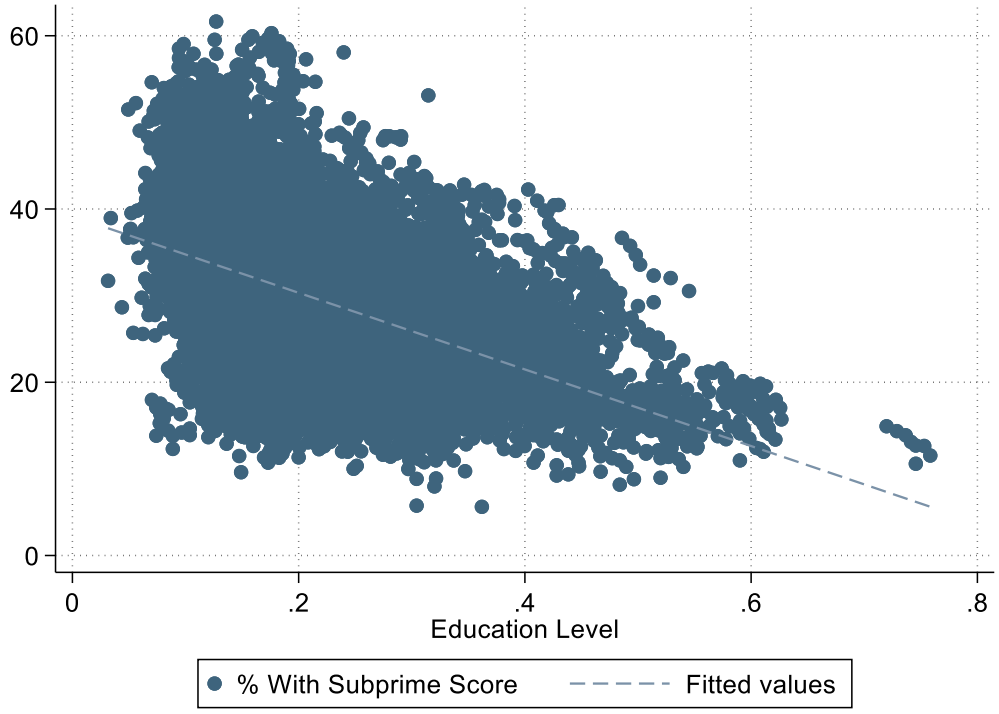


Figure 25: Unemployment and Subprime Credit Score

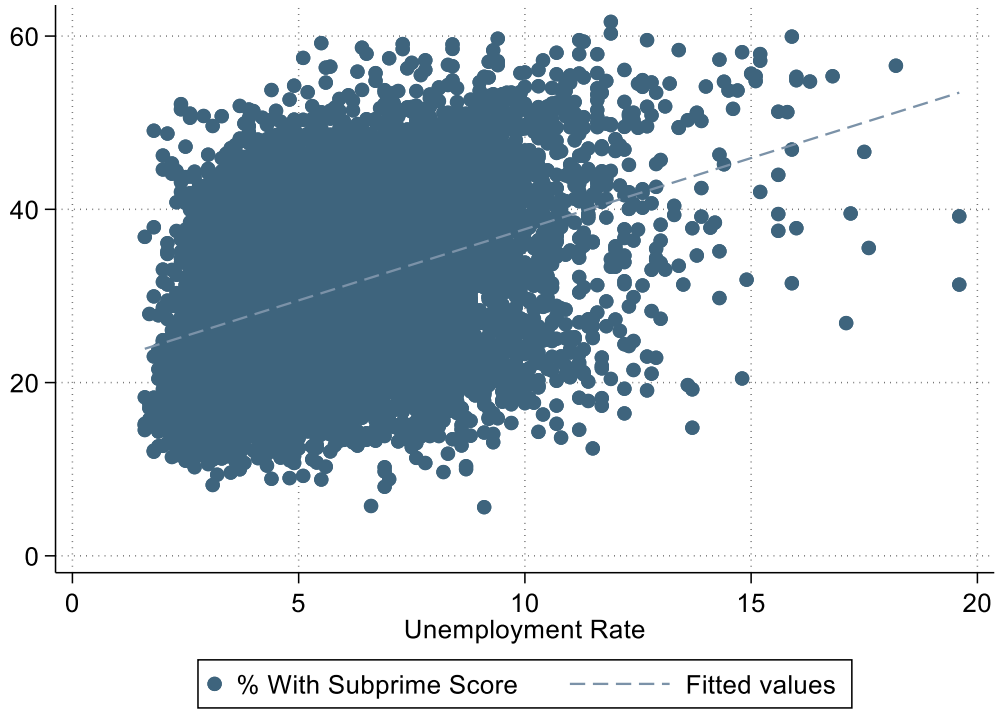
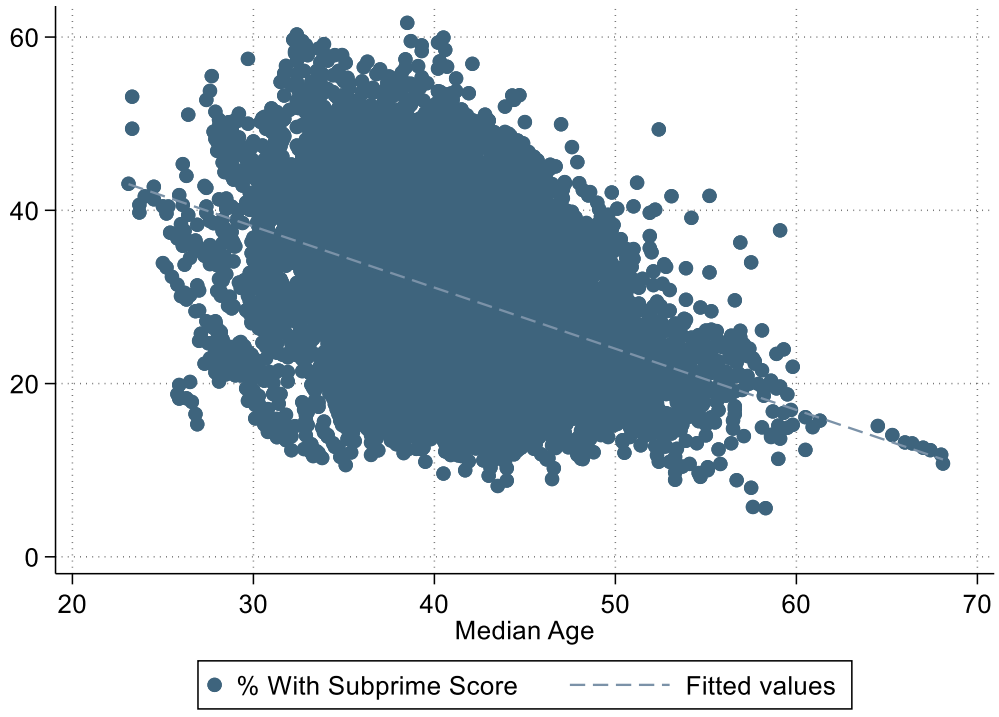


Figure 26: Scatterplot Median Age and Credit Scores



Appendix D: Comparison of Means (SouthBA)

Table 11: Comparison of Means (SouthBA)

Variable	Mean (Full sample)	Mean (SouthBA=1)	Mean (SouthBA=0)	Notable Differences
Observations	**17,368**	**4,931**	**12,458**	
LAND Mi COU	610.220	574.920	624.132	
Population	104,407.460	116,411.160	99,676.511	
BA TOT	16,156.372	32,022.339	9,903.210	
Percent Black	0.120	0.326	0.038	
Highly Representative	0.311	1	0.039	
Slave Population (1860)	0.166	0.436	0.065	Much greater relative slave populations in SouthBA
Cotton Production (1860)	2942.559	9724.12	410.432	Almost all cotton was produced in SouthBA counties
Median Age	41.239	39.645	41.86694	Average two years younger
Median household income	51.356	46.629	53.218	Almost $6,000 lower median income
Poverty Rate	0.165	0.202	0.150	Five percentage points more population living in poverty
Income Inequality Rate	13.829	16.032	12.960	Four percentage points greater income inequality
Population Density	296.316	219.844	326.455	
Financial Institutions	30.250	29.903	30.387	
Home Ownership Rate	0.723	0.690	0.736	Four percentage points lower home ownership rates
Burdened Households	26.505	29.275	25.413	Four percentage points higher burdened rates
Bachelor's or higher	0.203	0.190	0.208	5% lower rates of having at least a bachelors degree
Unemployment Rate	5.439	5.956	5.235	14% higher rates of unemployment
With Subprime Score	30.210	38.061	27.116	10 percentage points more population with subprime scores
SouthBA	0.283	1	0	
lnincome	3.905	3.806	3.944	
FIper1000	0.388	0.316	0.416	
Income Level	1.854	1.686	1.920	Greater portion of the population in lower income
No Years of Education	.012	.014	.011	27% higher population with no years of education
With 1-6 Years Education	.016	.019	.015	26% higher population with 1-6 years of education
With 7-12 Years Education	0.477	0.489	0.472	Higher population with 7-12 years of education
With 13–16 Years Education	0.420	0.408	0.425	Smaller population with 13-16 years of education
With 16+ Years Education	0.074	0.070	0.076	Smaller population with 16+ years of education
Avg Years of Education	12.84	12.693	12.898	
No schooling completed	951.427	1153.751	871.21	
Nursery school	13.218	16.61	11.873	
Kindergarten	13.707	15.704	12.916	
First	35.532	47.167	30.919	
Second	75.417	99.96	65.686	
Third	163.102	217.513	141.53	

Fourth	137.329	167.121	125.517	
Fifth	206.025	259.004	185.02	
Sixth	659.539	910.494	560.041	
Seventh	317.28	436.261	270.107	
Eighth	927.198	946.261	919.641	
Ninth	1092.761	1432.149	958.201	
Tenth	1366.33	1661.42	1249.333	
Eleventh	1488.013	1837.555	1349.427	
Secondary (No Diploma)	1219.67	1425.47	1138.075	
High School	17445.353	17996.154	17226.972	
GED or alternative	2999.715	3336.858	2866.045	
Some college (<1 year)	4322.807	4582.7	4219.765	
Some college (> 1 year)	9704.417	11618.098	8945.683	
Associates degree	5825.01	6230.535	5664.229	
Bachelors degree	13376.631	14631.646	12879.044	
Masters degree	6090.152	6281.757	6014.185	
Professional school	1435.801	1575.672	1380.344	
Doctorate degree	953.204	1051.644	914.175	

Appendix E: OLS Stepwise Results

Table 12: OLS Stepwise Results

	6	7	8	9	10	11	12	13	14	15
With Subprime Score	**Coef. (St. Errs)**	**Coef. (St. Errs)**	**Coef. (St. Errs)**	**Coef. (St. Errs)**	**Coef. (St. Errs)**	**Coef. (St. Errs)**	**Coef. (St. Errs)**	**Coef. (St. Errs)**	**Coef. (St. Errs)**	**Coef. (St. Errs)**
Slave Population (1860)	**10.578***** (1.151)	**11.006***** (0.885)	**9.564***** (0.869)	**9.587***** (0.871)	**9.560***** (0.826)	**8.910***** (0.794)	**8.845***** (0.807)	**7.625***** (0.721)	**7.005***** (0.696)	**7.022***** (0.621)
lnincome	-	**-14.101***** (0.475)	**-7.376***** (0.702)	**-6.889***** (0.685)	**-8.819***** (0.734)	**-10.021***** (0.704)	**-10.118***** (0.694)	**-0.335** (0.794)	**0.873** (0.835)	**-2.929***** (0.789)
Poverty Rate	-	-	**33.887***** (2.861)	**38.076***** (2.974)	**31.911***** (3.005)	**23.748***** (2.942)	**23.233***** (2.945)	**22.823***** (2.570)	**18.460***** (2.417)	**8.196***** (2.299)
Income Inequality Rate	-	-	-	**-0.072**** (0.034)	**-0.053** (0.032)	**-0.108**** (0.050)	**-0.110**** (0.051)	**-0.001** (0.025)	**-0.002** (0.028)	**-0.025** (0.022)
Financial Inst. Per 1,000	-	-	-	-	**-5.647***** (1.013)	**-5.347***** (0.967)	**-5.314***** (0.970)	**-4.703***** (0.890)	**-4.430***** (0.856)	**-3.012***** (0.635)
Home Ownership Rate	-	-	-	-	-	**-13.097***** (1.611)	**-12.757***** (1.041)	**-21.887***** (1.661)	**-23.667***** (1.721)	**-10.260***** (1.958)
Burdened Households	-	-	-	-	-	-	**0.017** (0.027)	**0.092***** (0.025)	**0.073***** (0.024)	**0.109***** (0.021)
Bachelor's Degree	-	-	-	-	-	-	-	**-30.708***** (3.343)	**-30.473***** (1.668)	**-29.809***** (1.610)
Unemployment Rate	-	-	-	-	-	-	-	-	**0.561***** (0.072)	**0.619***** (0.065)
Median Age	-	-	-	-	-	-	-	-	-	**-0.360***** (0.033)
Constant	**27.778***** (0.211)	**82.986***** (1.882)	**51.391***** (3.110)	**49.787***** (3.003)	**60.261***** (3.413)	**76.509***** (3.479)	**76.154***** (1.666)	**47.432***** (3.343)	**42.090***** (3.448)	**61.537***** (3.394)
Observations (Clusters)	14,576 (1,822)	14,576 (1,822)	14,575 (1,822)	14,569 (1,822)	14,569 (1,822)	14,569 (1,822)	14,569 (1,822)	14,569 (1,822)	14,569 (1,822)	14,569 (1,822)
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	**0.6515**	**0.7666**	**0.7833**	**0.7847**	**0.8000**	**0.8098**	**0.8099**	**0.8415**	**0.8474**	**0.8631**

Note: Table 4 reflects the OLS estimations of a stepwise variable inclusion whereby additional socio-economic variables are added to the model.
****p<0.01, **p<0.05, *p<0.1*

Appendix F: Summary results table (OLS and IV)

Table 13: Summary Results - OLS and IV

	Cross-sectional (2021)		Panel (no Fixed Effects)		Full Specification	
	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	IV	OLS	IV	OLS	IV
WithSubprimeScore	**Coef. (St. Errs)**	**Coef. (St. Errs)**	**Coef. (St. Errs)**	**Coef. (St. Errs)**	**Coef. (St. Errs)**	**Coef. (St. Errs)**
SlavePop_1860	**14.619***** (0.494)	**15.892***** (1.038)	**13.841***** (0.476)	**14.857***** (1.005)	**7.022***** (0.621)	**7.913***** (1.451)
Constant	**74.112***** (3.903)	**72.825***** (3.959)	**80.480***** (3.384)	**80.857***** (1.005)	**61.537***** (3.394)	**66.652***** (3.391)
State Fixed Effects	**No**	**No**	**No**	**No**	**Yes**	**Yes**
Year Fixed Effects	**No**	**No**	**No**	**No**	**Yes**	**Yes**
Panel	**No**	**No**	**Yes**	**Yes**	**Yes**	**Yes**
Contemporary Controls	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
R-squared	**0.7810**	**0.7812**	**0.7705**	**0.7689**	**0.8631**	**0.6308**
Observations	**14,569**	**14,433**	**14,569**	**14,433**	**14,569**	**14,433**

****p<0.01, **p<0.05, *p<0.1*