Slavery, Path Dependence, and Development: Evidence from the Georgia Experiment

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ABSTRACT: From 1735 to 1751, the Board of Trustees of the Province of Georgia imposed the only ban on slavery among the North American colonies. Exploiting the historical boundary between the 88 counties of Trustee Georgia and the 71 counties that were appended to the colony after 1751, I analyze the effects of this initial institutional difference on subsequent differences in slave dependence, land inequality, income, and poverty. I find that counties that had been covered by the initial Trustee ban subsequently had lower slave population density, fewer farms holding more than 10 slaves, and have higher income and lower poverty rates today. I further find that while counties affected by the ban did not have significant differences in pre-Civil War land inequality, productivity, industrial development, or educational investment, their economic output was significantly more diversified and less reliant upon the production of cash crops. Finally, I demonstrate that controlling for pre-war output diversification significantly reduces the estimated relationship between Trusteeship and current income. Results therefore suggest that the effects of initial differences in labor institutions can persist even where those differences are not determined by geography, and that a primary channel of persistence is the path-dependence of early economic specialization.

Keywords: institutions, slavery, inequality, development, history

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1 Introduction

A large and growing academic literature, building on the work of Engerman and Sokoloff (1997, 2002, 2006), has demonstrated that historical instances of forced labor systems generated persistent, negative effects on contemporary economic outcomes (Nunn 2008; Dell 2010; Acemoglu, García-Jimeno, and Robinson 2012). In the original Engerman and Sokoloff hypothesis, coercive labor institutions were historically more likely to emerge where geographic conditions were particularly suited to production activities exhibiting economies of scale which could be most profitably conducted using large-scale forced labor, and these institutions in turn had negative effects on long-run development. Though Engerman and Sokoloff hypothesized that initial economic inequality was the primary mechanism by which slavery adversely affected long-run economic outcomes, subsequent research has emphasized political inequality, differences in land tenure systems, and the provision of public goods as important intermediating channels of institutional persistence (Acemoglu, Bautista, Querubín, and Robinson 2007; Dell 2010, Iyer 2010; Ager 2013).

In this paper I exploit institutional discontinuity within a single political entity to more precisely identify the potential channels through which slavery influenced long-run economic outcomes, and also to evaluate whether initial differences in coercive labor institutions persist even where those differences were not geographically determined. From 1735—three years after its founding—until 1751, the North American Province of Georgia, including 88 of the 159 counties constituting the modern state of Georgia, prohibited the selling, purchase, or owning of slaves. The ban was not the decision of the colonists themselves, but rather was exogenously imposed by a Board of Trustees in London. Concerned that slavery would give rise to an idle and decadent aristocratic elite, the Board maintained the ban until pressure from colonial lobbyists forced its repeal in 1751. In contrast, slavery was never prohibited during the colonial

period in the remaining 71 counties of the modern state of Georgia, which were formally added to the colony in 1763.

I therefore employ a regression discontinuity approach to estimate average differences in long-run economic outcomes in Georgian counties affected by the initial Trustee ban on slavery versus long-run outcomes in contiguous border counties that were unaffected by the ban, controlling for a comprehensive set of observable geographic characteristics. Whereas previous studies have included slave density—which is likely correlated with other, unobservable district characteristics which are in turn correlated with differential long-run economic outcomes—as an independent variable, in this paper I exploit county inclusion in Trustee Georgia as an exogenously determined "intention-to-treat" with subsequently lower slave intensity, with contiguously paired non-Trustee counties constituting the untreated control group.

I find that relative to contiguous non-Trustee counties, in 2010 median household income was 11.3% higher in former Trustee counties, and the poverty rate 2.091 percentage points lower. I also find that by 1860, the ratio of slaves to total county population was 10.5 percentage points lower in former Trustee counties, versus in contiguous non-Trustee counties, and that the percentage of farms holding more than 10 slaves was 6.2 percentage points lower in former Trustee counties, versus in contiguous non-Trustee counties. I further find that including slave density in 1860 as an explanatory variable attenuates the estimated relationship between Trusteeship and 2010 income and yields a large, negative estimated coefficient on slave density, which suggests that the positive effect of Trusteeship on long-run development can be accounted for by its large effect on subsequent slave intensity.

Exploring possible channels of persistence, I find that by 1860, the cash crop share of total crop output by value was 3.7 percentage points lower in Trustee counties than in contiguous non-Trustee border counties. Similarly, by 1860, the average Herfindahl index score of output

by category in Trustee counties was 0.021 points lower than in contiguous non-Trustee counties, indicating that Trustee county economies were significantly more diversified by the eve of the Civil War than non-Trustee counties. In particular, per capita production of orchard, market garden, homemade manufactures, and livestock was $105.14 higher in Trustee versus non-Trustee counties. Moreover, including Herfindahl score and cash crop share of total crop output in 1860 as explanatory variables attenuates the estimated relationship between Trusteeship and 2010 income and yields large, negative estimated coefficients on both variables.

I further find that land inequality was no greater by 1784 or 1860 in Trustee versus contiguous non-Trustee counties, and that by 1860 Trusteeship had exhibited no effect on the number of manufacturing establishments nor the volume of capital invested in manufacturing, no effect on differences in rail and water transport links, no effect on school enrollment or the number of educational institutions, no effect on per capita productivity, and a negative estimated effect on per capita wealth. The adult literacy rate, however, was 3.8 percentage points higher before the Civil War in Trustee counties versus contiguous non-Trustee counties, and in the aftermath of the Civil War, sharecropping was a significantly less prevalent form of farm tenancy in Trustee versus contiguous non-Trustee counties.

The results of this paper therefore lend additional support to the hypothesis that slavery had a persistent, negative effect on long-run economic development, and furthermore provide new evidence that greater dependence on cash crops and lower diversification of economic output were important channels through which slavery affected long-run outcomes. Results also indicate that initial economic inequality and the provision of public goods, particularly public schooling, were not channels through which slavery affected long-run outcomes, though literacy specifically and post-Civil War differences in land tenure were associated with differences in long-run economic outcomes. More broadly, the results presented in this paper

suggest that initial differences in coercive labor institutions can persist even where those differences were not shaped by geography, and that a primary mechanism of that persistence is simply the path dependence of economic specialization in commodity production.

The organization of the remainder of this paper is thus as follows. Section 2 provides historical background on the creation of the Province of Georgia and the period of Trustee rule. Section 3 details the data sources used for the analysis, while Section 4 describes the empirical approach. Section 5 presents results and Section 6 concludes.

2 Historical Background

The Province of Georgia was the last English colony founded in North America. Following a lengthy application process, in June 1732 King George II granted to James Oglethorpe, retired general and Member of Parliament, along with twenty other English trustees, a corporate charter to establish a new colony, vesting in them the powers to elect their own governing Board of Trustees, make land grants, and enact their own laws and taxes. Carved out of the unsettled and largely unexplored borderlands of the older royal Province of South Carolina, which had previously encompassed all of the territory of the present-day state of Georgia, the new colony was to include:

> "all those lands, countries and territories lying and being in that part of South Carolina, in America, which lies from the most northern part of a stream or river commonly called the Savannah, all along the sea coast to the southward, unto the most southern stream of a certain other great water or river called the Altamaha; and westerly from the heads of the said rivers respectively, in direct lines to the south seas, and all that shore, circuit and precinct of lands within the said boundaries" (Georgia Charter 1732)

As the trustees themselves possessed no firsthand knowledge of the new territories, their vision for the colony was largely based on second- and third-hand accounts of varying accuracy (Wood 2007). The northern boundary of the Savannah River was thus chosen for the simple reason that it had previously constituted the southern limit of English

settlement, following an agreement between South Carolina and the native Creek tribes at the end of the Yamasee War of 1715-17 (Paulett 2012). The choice of the Altamaha River as the province's southern boundary, meanwhile, owed primarily to the prior existence of a fort, Fort King George, at the river's coastal mouth, and to a strategic desire to leave an unoccupied neutral buffer zone between the new province's southern border and the northern border of Spanish Florida along the St. Marys River. These borders then remained unchanged until the end of the Seven Years' War, in 1763. Further territorial concessions by the Creeks at the 1763 Treaty of Augusta extended the province's southern border from the Altamaha to the St. Marys River, where the territory formerly nominally claimed by the Province of South Carolina bordered Florida, and its western to the Chattahoochee River, thereby incorporating all of the present-day state of Georgia (Miller 2011).

In establishing the Province of Georgia, named in honor of George II, the trustees were motivated first and foremost by a desire to promote "a Christian, moral and industrious way of life," which they believed would create "a simple and stable society made up of contented citizens," living "by labour … a comfortable subsistence." With this aim in mind, they were determined to avoid the emergence of a planter aristocracy as existed in neighboring South Carolina, which they believed degraded white manners and morals. The trustees were by no means abolitionists, but rather opponents of the extreme inequalities of plantation economies which, in their view, encouraged "idleness" and "luxury" among aristocratic white society. Such idleness and luxury, they felt, was as morally corrupting as the "idleness and necessity" of grinding poverty, escape from which they hoped the new colony would offer the poor, "miserable wretches" of Great Britain (Wood 2007).

It was thus in an effort to prevent such extreme inequality that in 1734 the trustees drafted legislation to prohibit the institution of slavery within the province, receiving royal

assent in 1735. Though the ban subsequently received opposition from many of the province's colonists, particularly among lowland Scottish settlers near Savannah, it remained in place and enforced until proponents of legalization effectively lobbied Parliament directly for repeal (Coleman 2006; Wood 2007; Reese 2010). On 1 January, 1751, therefore, slavery became legal in the entire Province of Georgia, as it had remained legal since 1735 in those regions which would become part of the colony following the boundary changes at the end of the Seven Years' War. The following year, having failed to secure a new government subsidy upon expiration of its 20-year charter, Trustee rule in Georgia ended, and the province officially became a crown colony (Reese 2010).

3 Data

I examine the long-run impact of the Georgia Experiment on economic development by testing whether it affects living standards today. Counties assigned to Trustee Georgia are determined by the text of the Royal Charter of 1732, which granted the province all lands lying between the Savannah and Altamaha Rivers, up to their headwaters and extending westward "sea to sea."[1] The territories now comprising the remaining counties of the present-day state of Georgia, likewise formerly territories of the Province of South Carolina, were then incorporated into the colony in 1763. My analysis uses two distinct samples: a sample of all Georgian counties and a subset sample of contiguous border counties exploiting the original Province of Georgia border (see Figure 1). To control for potential non-randomness in the geographic characteristics of Trustee versus non-Trustee counties, I include latitude, longitude, land and water surface area, area-weighted soil type, mean elevation, and mean annual

[1] The headwaters of the Savannah were specified as where the Chattooga River, which becomes the Savannah below Lake Hartwell, crosses the 35th parallel. The headwaters of the Altamaha are where the Ocmulgee River meets Jackson Lake.

temperature and precipitation as independent variables. Latitude, longitude, and land and water surface area are from the U.S. Census Bureau. Area-weighted primary soil type is from the Web Soil Survey, which provides soil data produced by the National Cooperative Soil Survey and operated by the U.S. Department of Agriculture's Natural Resources Conservation Service. Mean elevation data is from The National Map, produced by the U.S. Geological Survey, and 1981-2010 mean annual temperature and precipitation is from the National Oceanic and Atmospheric Administration National Climatic Data Center.

Historical population data, including county-level slave population data, is from the U.S. decennial censuses from 1790 through 1860. Contemporary median household income and poverty rate data are from the 2010 U.S. census. The 1850 census additionally provides statistics for literacy by age group, school enrollment by age group, and the number of colleges, academies, and public schools. The 1860 census offers data on aggregate wealth (which I define as the sum of real estate, personal estate—including farming implements and machinery, and livestock—and capital invested in manufacturing), aggregate production by value, water and railroad transportation (binary variables equal to 1 if there were commercial water or rail transport routes in the county), and the number of manufacturing establishments. The 1860 census further subdivides production value by category, including 33 different crops, as well as orchard products, market garden products, manufactures, and animals slaughtered. From these production statistics I am able to construct a Herfindahl index of output diversity of the form $H = \sum_1^n s_i^2$, where s_i is the value share of crop i in overall county-level production, and $N = 37$, the number of census-designated production categories.

Data on the number of farms by farm size is also available from the 1860 census, though for county-level land Gini coefficients I use coefficients constructed by Nunn (2008).[2] In

[2] The Gini coefficient of land inequality is calculated using information about the size of each farm in the 1860 Census. The number of farms in each county is available for the following farm sizes: (1) 9

addition, for pre-census data on landholding, I use the Georgia Colonial and Headright Plat Index, a compilation of registered Georgian land grants through 1866. Though most colonial land grant records no longer exist, the first post-colonial survey, in 1784, is included in the index, listing the name of the person for whom the land was surveyed and the number of acres. The 1784 survey covers 36 counties, for which I am therefore able to construct land Gini coefficients. Unfortunately, as the sample includes only 32 Trustee counties and 4 non-Trustee counties, there are an insufficient number of contiguous border county pairs for subset analysis. The number of farmers by type of tenure (owned, cash-rented, or share-rented) in 1900 and 1940 are from the decennial censuses for those years.

4 Empirical Framework

The empirical approach is based on estimating average differences in long-run economic outcomes in Georgian counties covered by the initial Trustee ban on slavery, versus long-run outcomes in counties that were unaffected by the ban. The baseline cross-sectional estimating equation is therefore:

$$Y_c = \alpha + \beta\, Trust + X_c'\boldsymbol{\delta} + \varepsilon_c \tag{1}$$

where Y_c is the outcome variable of interest for county c; $Trust$ is an indicator variable equal to 1 if county c was part of Trustee Georgia and equal to 0 otherwise; X_c is a vector of county-

acres or less, (2) 10 to 19 acres, (3) 20 to 49 acres, (4) 50 to 99 acres, (5) 100 to 499 acres, (6) 500 to 999 acres, and (7) 1,000 acres or more. Because for each category I do not know the mean farm size, I use the median size of the category. For the category 1,000 acres or more, I use 1,000 acres. The Gini coefficients are calculated using the Stata program *ineqdec0* written by Stephen P. Jenkins.

The formula for calculating the Gini coefficient is:

$$1 + (1/n) - \frac{2\sum_{i=1}^{n}(n-i+1)a_i}{n\sum_{i=1}^{n}a_i}$$

where n is the number of farms, a_i is farm size, and i denotes the rank, where farms are ranked in ascending order of a_i.

level covariates that includes geographic center latitude and longitude, primary area-weighted soil classification, county land and water surface area, mean annual temperature and precipitation, and mean elevation; and ε_c is an error term encompassing all other omitted factors, with $E(Trust, \varepsilon_c) = 0$ for all c.

Because it is possible that there were other, unobservable county characteristics that were correlated both with initial Trusteeship and subsequent differences in observed outcomes, I also employ a regression discontinuity approach to estimate average differences in long-run economic outcomes in Georgian counties covered by the initial Trustee ban on slavery versus long-run outcomes in contiguous border counties that were unaffected by the ban. Exploiting this sharp spatial discontinuity at each county border, I therefore estimate a modified version of equation (1) of the form

$$Y_{cb} = \alpha + \beta Trust + X_c'\boldsymbol{\delta} + \phi_b + \varepsilon_{cb} \tag{2}$$

where Y_{cb} is the outcome variable of interest for county c along contiguous border county pair b; $Trust$ is again an indicator variable equal to 1 if county c was part of Trustee Georgia and equal to 0 otherwise; X_c is a vector of county-level covariates that includes geographic center latitude and longitude, primary area-weighted soil classification, county land and water surface area, mean annual temperature and precipitation, and mean elevation; ϕ_b is a set of contiguous county pair-specific time fixed effects, and ε_{cb} is an error term.[3] Because they generally share similar geographic, cultural, and economic covariates, contiguous border counties offer a plausible control group. The identifying assumption is thus that $E(Trust, \varepsilon_{cb}) = 0$, that is, that assignment to Trustee Georgia within each contiguously adjacent county pair is uncorrelated with differences in outcome residuals in either county.

[3] Note that Y_{cb} and ε_{cb} indicate that counties may be repeated for multiple contiguous county pairs.

The advantage of including the variable for Trusteeship in lieu of slave density—as previous studies have done—as an independent variable is that it serves as a plausibly exogenous intention-to-treat instrument. The acquisition of slaves constituted a substantial fixed capital investment, such that plantation production relying on slave labor exhibited declining unit costs and increasing returns to scale, which can generate path dependence as early volume leaders retain a cost advantage (Anderson and Gallman 1977).[4] On the other side of the discontinuity threshold, meanwhile, initial cost uncompetitiveness relative to slave-intensive plantation agriculture in neighboring South Carolina and non-Trustee Georgia would have created cost-push incentives to invest in alternative, non-slave-intensive economic activities—for instance livestock and animal husbandry, orchards and timber, or manufacturing—which would similarly have required substantial upfront fixed capital investments generating declining unit costs and path dependencies.

Exogenous assignment to Trustee Georgia, with its initial ban on slavery, therefore offers a valid intention-to-treat with the treatment of lower subsequent slave intensity. Nonetheless, to examine whether this is the case, I also estimate modifications of Eqs. (1) and (2) for current income and poverty rate, including slave population density in 1860, of the form:

$$Y_c = \alpha + \beta\, Trust + \gamma S_c/L_c + X_c'\boldsymbol{\delta} + \varepsilon_c \tag{3}$$

and

$$Y_{cb} = \alpha + \beta\, Trust + \gamma S_c/L_c + X_c'\boldsymbol{\delta} + \phi_b + \varepsilon_{cb} \tag{4}$$

where S_c/L_c is the proportion of slaves in the total population in county c. If assignment to Trustee Georgia affects long-run outcomes only through its effect on subsequent slave intensity,

[4] An additional reason for assignment to Trustee Georgia to exert a persistent effect on subsequent slave intensity is that after reaching eighteenth-century lows in the 1740s, the price of slaves in the deep South rose sharply after the 1750s, placing new entrants into labor-intensive agriculture at a distinct cost disadvantage to existing slaveholders (Mancall, Rosenbloom, and Weisss 2001).

then controlling for slave density should significantly reduce any estimated relationship between Trusteeship and income.

The primary potential threat to identification is that county assignment to Trustee Georgia is in fact correlated with other, unobservable variables that are in turn correlated with differential long-run economic outcomes. This might be the case if 1) additional, unobservable county-level geographic characteristics are both correlated with differential outcomes and vary systematically across the discontinuity threshold; 2) unobservable settler characteristics, including culture, vary systematically across the discontinuity threshold and are correlated with differential outcomes; or 3) the Trustee boundary coincides with additional policy discontinuities that are also correlated with differential long-run outcomes.

Though including the listed geographic control variables and restricting the analysis to border counties and exploiting contiguously paired counties as a control group should attenuate all three potential sources of omitted variable bias, there are additional historical reasons why omitted variable bias should not pose a threat to identification. First, the provincial boundary was exogenously imposed on the colony by Parliament and the Trustees in England, none of whom had visited the region nor possessed accurate knowledge of its geographic characteristics. To bound the new political entity, the drafters of the 1732 charter thus simply relied on the known locations of two regional rivers, the Savannah and the Altamaha.

Second, discontinuity in settler characteristics would require both that those who settled in the Province of Georgia between 1732 and 1752 differed systematically from those who settled contemporaneously in those counties which were not part of Georgia province between 1732 and 1752, and that these differences at the discontinuity threshold could persist through subsequent waves of immigration and population growth. There is no historical evidence that this was the case. Moreover, far from possessing any moral or cultural hostility toward the

institution of slavery that may have differed from views held by settlers on the other side of the discontinuity threshold, the settlers of Trustee Georgia aggressively and repeatedly lobbied the Board of Trustees for repeal of the ban almost from the province's inception. The initial ban was not a choice of the settlers themselves, but was rather imposed upon them by the Trustees in London (Wood, 2007).

Third, both Trustee and non-Trustee Georgia were formerly unsettled and un-administered territory of the Province of South Carolina, inhabited by the same Native American tribes—principally the Creek, Yamacraw, and Cherokee tribes—whose territorial concessions constituted both the original province as well as those non-Trustee regions that were incorporated into the colony in 1763. From 1763, both the former Trustee and non-Trustee counties were part of the same colony of Georgia and subsequently state of Georgia. Therefore, there should be no additional policy discontinuities that coincide with the Trustee boundary and correlate with differential long-run outcomes.

5 Results

5.1 Long-run effects of initial Trustee status

Results of estimating Eqs. (1) and (2) for average differences in patterns of slave-holding and long-run income and poverty, for both the main sample (panel A) and border county sub-sample (panel B) are reported in Table 1. The estimated coefficient reported in column 1, panel A indicates that by 1860, the ratio of slaves to total county population was 9.8 percentage points lower in former Trustee counties, where slavery was initially banned, than in non-Trustee counties. Restricting the analysis to the border county sub-sample, the estimated coefficient reported in column 1, panel B indicates that by 1860, the ratio of slaves to total county population was 10.5 percentage points lower in former Trustee counties, versus non-

Trustee counties. Figure 2 plots estimated coefficients (β's from Eq. (1)) for average differences in slave population density in Trustee vs. non-Trustee counties for each decennial census year from 1790 to 1860. For every census year before the Civil War, slave population density was lower in counties that had been affected by the Trustee ban on slavery, compared to counties that were unaffected by the ban.

Trusteeship was also associated with a lower fraction of farms holding more than 10 slaves. Estimated coefficients reported in column 2, panel A of Table 1 reveal that the percentage of farms holding more than 10 slaves was 8.1 percentage points lower in former Trustee counties, relative to in non-Trustee counties. Analyzing the border county sub-sample, the estimated coefficient reported in column 2, panel B indicates that by 1860, the percentage of farms holding more than 10 slaves was a non-statistically significant 6.2 percentage points lower in former Trustee counties, versus non-Trustee counties.

Estimated coefficients reported in columns 3 and 4 of Table 1 also reveal that Trusteeship was strongly associated with long-run differences in median household income and poverty rates. Relative to non-Trustee counties, by 2010 median household income was 14.1% higher in former Trustee counties, and the poverty rate 4.091 percentage points lower. Restricting the analysis to the border-county sample, estimated coefficients reported in columns 3 and 4, panel B indicate that by 2010 median household income was 11.3% higher in former Trustee counties, versus non-Trustee counties, and the poverty rate 2.783 percentage points lower.

Results of estimating Eqs. (3) and (4) for average differences in 2010 income and poverty, with slave population density (S_c/L_c) included as an independent variable, for both the main sample (panel A) and border county sub-sample (panel B) are reported in Table 2. Estimated coefficients reported in column 1 indicate that including slave density as an independent variable significantly reduces estimated coefficients for Trustee status. The estimated effect of

Trustee status on current income declines from a statistically significant 14.1% to a non-statistically significant 4.9%, in the main sample, and from 11.3% to a non-statistically significant 4.4% in the border county sub-sample. Estimated coefficients reported in column 2 also reveal that the estimated effect of Trustee status on current poverty rates declines in magnitude from -4.091 percentage points to -3.106 percentage points, in the main sample, and from -2.783 percentage points to a non-statistically significant -2.025 percentage points in the border county sub-sample. Meanwhile, the estimated effect of a 1-percentage point increase in slave density (S_c/L_c), is 25.8% lower median household income in 2010 (30.6% lower in the border county sub-sample), and a 5.432-percentage point higher poverty rate (10.316 percentage points in the border county sub-sample). Results presented in Table 2 therefore strongly suggest that the estimated relationship between Trusteeship and long-run economic development can be accounted for by the relationship between Trusteeship and subsequent slave intensity.

Results reported in Table 3, however, suggest that while by 1900 Trustee counties were on average wealthier than non-Trustee counties—by an estimated $6,202.80 per person—by the eve of the Civil War, in 1860, Trustee counties were no more or less developed than non-Trustee counties. Analyzing the main sample of all Georgian counties reveals, as reported in column 1, that wealth per capita was no higher in Trustee versus non-Trustee counties, and, in fact, restricting the analysis to the border county sub-sample reveals that wealth per capita was lower in Trustee versus non-Trustee counties, by $274.36 per person. Output per capita in 1860 was also no higher or lower in Trustee versus non-Trustee counties, as reported in column 2. Likewise, estimated coefficients reported in columns 3 and 4 of Table 3 indicate that Trustee counties were by 1860 no more or less likely to have water or rail transport links. Estimated coefficients reported in columns 5 and 6 also indicate that Trustee counties did not

have more manufacturing establishments, nor a larger volume of capital invested in manufacturing, than non-Trustee counties.

Results presented in Tables 1, 2, and 3 therefore strongly indicate that belonging to Trustee Georgia had a significant, positive effect on income and negative effect on poverty rates over the very long run, and that these relationships are largely accounted for by the effect of Trusteeship on subsequent slave density. Results further suggest that significant divergence in development between Trustee and non-Trustee counties did not occur before the Civil War.

5.2 Potential channels of persistence

In this section, I use historical census data to test potential channels of persistence. Though there are many potential channels through which belonging to Trustee Georgia affected long-run economic development, I focus on four that speak to the extant literature on the question of slavery and development, and of which available historical data permits analysis. These are inequality in land ownership, land tenure, provision of public goods, specifically education, and economic diversification. Results suggest that Trusteeship did not have a significant long-run effect on land inequality, nor on the provision of formal schooling. Results do, however, indicate that Trusteeship had a strong, positive long-run effect on non-slave adult literacy and diversification of economic output, and a strong, negative long-run effect on cash crop dependence.

Table 4 reports estimated coefficients for the effects of Trusteeship on non-slave adult literacy, non-slave school enrollment rate (as a fraction of non-slave county population under the age of 21), and the number of colleges, public schools, and academies in 1850, the only pre-Civil War decennial census for which such statistics are available. Results reveal that Trusteeship had no effect on the number of colleges, public schools, or academies, and no effect

on school enrollment rate. The estimated coefficient reported in column 1, panel A, however, reveals that relative to non-Trustee counties, the rate of adult illiteracy in Trustee counties was 8.8 percentage points lower in 1850. Restricting the analysis to the border county sub-sample (panel B), the estimated coefficient indicates that adult illiteracy was 3.8 percentage points lower in Trustee versus non-Trustee counties. Thus, though the provision of formal schooling before the Civil War did not vary systematically across the discontinuity threshold, adults were more literate in counties that had been affected by the initial Trustee ban on slavery than in unaffected counties.

In the Engerman and Sokoloff hypothesis, slavery was causally related to long-run economic development through its strong, positive effect on initial economic inequality, specifically land inequality. However, results presented in Table 5 suggest that Trusteeship was not negatively correlated with land inequality. Estimated coefficients reported in column 1, panel A reveal that by 1784, the first year for which landholding data is available, the average Gini coefficient was in fact 0.057 points higher in Trustee versus non-Trustee counties. By 1860, the average Gini coefficient was still higher by 0.032 points in Trustee versus non-Trustee counties, in the main sample, and by a non-statistically significant 0.025 points in the border county sub-sample (panel B). Results therefore suggest that the distribution of land pre Civil War was more unequal in counties in which slavery was initially banned, versus in counties where it was not.

However, estimated coefficients reported in column 2 of Table 5 suggest that while overall inequality in landholding was greater in former Trustee counties than in non-Trustee counties, the frequency of very large landholdings was initially lower. By 1784, the fraction of all landholdings over 500 acres was 5.3 percentage points lower in Trustee versus non-Trustee

counties, though by 1860 the estimated difference had declined to a non-statistically significant 1.7 percentage points (2.3 percentage points in the border county sub-sample).

Estimated coefficients reported in column 3 of Table 5 indicate that Trusteeship had a significant long-term effect on patterns of land tenure. By 1900, the fraction of farmholdings operated by sharecropping tenants was 9.8 percentage points lower in Trustee versus non-Trustee counties, in the main sample of all counties, and 7.8 percentage points lower in the border county sub-sample. As late as 1940, the fraction of farmholdings operated by sharecropping tenants was still 4.1 percentage points lower in Trustee versus non-Trustee counties (6.6 percentage points lower in the border county sub-sample).

Columns 4 through 6 of Table 5 report the effects of Trusteeship on diversification of economic output. Estimated coefficients reported in column 4 indicate that Trusteeship was persistently negatively correlated with Herfindahl index scores of economic output, implying that economic output was less concentrated in a few product categories in Trustee counties versus in non-Trustee counties. By 1860, the average Herfindahl index score in Trustee counties was 0.019 points lower than in non-Trustee counties (0.021 points lower in the border county sub-sample), and by 1940 was 0.073 points lower (0.136 points lower in the border county sub-sample).[5] Reliance on the principal cash crops of cotton, tobacco, indigo, cane sugar, and rice was also lower before the Civil War in Trustee versus non-Trustee counties. In 1860, the cash crop share of total crop output by value was 8.5 percentage points lower in Trustee counties versus in non-Trustee counties (3.7 percentage points lower in the border county sub-sample). In the very long run, however, cash crop dependence does not appear to have varied systematically between Trustee and non-Trustee counties; by 1940, the cash crop share of total crop output by value was a non-statistically significant 3.3 percentage points

[5] Unfortunately since the 1900 census reports production in incommensurable physical units, it is not possible to construct Herfindahl index scores of output by value.

lower in Trustee counties versus in non-Trustee counties (2.2 percentage points in the border county sub-sample). Contrary to less reliance on cash crops, on the eve of the Civil War, per capita output of orchard, market garden, homemade manufactures, and slaughtered livestock was significantly higher in Trustee versus non-Trustee counties. By 1860, per capita output of these products was $86.13 higher in Trustee counties than in non-Trustee counties. Restricting the analysis to the border county sub-sample, per capita output of these products in 1860 was $135.14 higher in Trustee counties.[6]

To further test whether greater economic diversification was an intermediating channel through which the initial Trustee ban on slavery affected long-run development, I estimate modifications of Eqs. (1) and (2) by including Herfindahl index score and cash crop share of total crop output by value in 1860 as explanatory variables:

$$Y_c = \alpha + \beta Trust + \gamma H_c + \lambda Cash_c + X_c'\boldsymbol{\delta} + \varepsilon_c \tag{5}$$

and

$$Y_{cb} = \alpha + \beta Trust + \gamma H_c + \lambda Cash_c + + X_c'\boldsymbol{\delta} + \phi_b + \varepsilon_{cb} \tag{6}$$

where H_c is the 1860 Herfindahl index score of 37 census-designated production categories in county c and $Cash_c$ is the cash crop share of total crop output by value. Results for the main sample of all Georgian counties are reported in Table 6.

Results reported in column 1 of Table 6 indicate that when we include the cash crop share of total crop output by value in 1860 as an explanatory variable, the estimated coefficient on Trusteeship declines from a statistically significant 0.141 to a non-statistically significant 0.013, while the estimated coefficient on cash crop share is a statistically significant -0.317. This suggests that greater reliance on the production of cash crops was one channel through which the Trustee ban on slavery affected long-run development. Similarly, results reported in column

[6] Unfortunately, subsequent censuses to not provide commensurate statistics on orchard, market garden, home manufactures, and slaughtered livestock.

2 of Table 6 indicate that when we include Herfindahl index score in 1860 as an explanatory variable, the estimated coefficient on Trusteeship again declines, to a non-statistically significant 0.031, while the estimated coefficient on Herfindahl score is a statistically significant -1.890, meaning a 1-point increase in a county's Herfindahl index score was associated with 1.890% lower median household income in 2010.

However, results reported in column 3 of Table 6 reveal that when both Herfindahl index score and cash crop share of total crop output are included as explanatory variables, the estimated coefficient for cash crop share of crop output drops by almost half, and is no longer statistically significant, while the estimated coefficient for Herfindahl score remains a statistically significant -1.452 and the estimated coefficient for Trustee a non-statistically significant 0.023. This suggests that greater reliance upon cash crops did not independently affect long-run development, but rather was negatively correlated with greater overall economic diversification, which was positively correlated with long-run development.

6 Conclusion

In this paper, I exploit a historic institutional discontinuity—namely, the exogenously imposed prohibition of slavery in 88 of 159 Georgian counties from 1735 to 1751—as an "intention-to-treat" with subsequently lower slave intensity, in order to analyze the effects of slavery on long-run economic development. By comparing average outcomes in counties affected by the initial ban to average outcomes in contiguous border counties not affected by the ban, and including a rich set of geographic covariates, I am furthermore able to control for unobservable county characteristics that may have been correlated both with treatment and subsequent differences in observed outcomes.

I find that belonging to Trustee Georgia during the period of the ban had a significant, positive effect on income and negative effect on poverty rates over the very long run, and that these relationships are largely accounted for by the effect of Trusteeship on subsequent slave density. Results further suggest that significant divergence in development between Trustee and non-Trustee counties did not occur before the Civil War.

Exploring possible channels of persistence, I find that by 1860, average cash crop share of total crop output and Herfindahl index score of output by category were significantly lower in Trustee counties than in contiguous non-Trustee counties unaffected by the initial slave ban, indicating that Trustee county economies were significantly more diversified by the eve of the Civil War than non-Trustee counties. In particular, per capita production of orchard, market garden, homemade manufactures, and livestock was $105.14 higher in Trustee versus non-Trustee counties. Moreover, including Herfindahl score and cash crop share of total crop output in 1860 as explanatory variables attenuates the estimated relationship between Trusteeship and 2010 income and yields large, negative estimated coefficients on both variables, which suggests that less economic diversification was a significant channel through which slavery impacted long-run development. In contrast, I also find that counties affected by the initial slave ban did not have significant differences in pre-Civil War levels of land inequality, educational investment, or rail and water transport links, suggesting economic inequality and differential provision of public goods were not significant channels through which slavery affected long-run economic development.

The results of this paper therefore lend additional support to the hypothesis that slavery had a persistent, negative effect on long-run economic development, and furthermore provide new evidence that greater dependence on cash crops and lower diversification of economic output were important channels through which slavery affected long-run outcomes, particularly

after 1860. Further research is needed, however, to clarify the mechanisms by which greater reliance on the cash crops of cane sugar, cotton, indigo, rice, and tobacco, and lower output diversification overall in formerly slave-intensive counties affected long-run divergence in economic outcomes, and why this divergence did not occur until the latter half of the nineteenth century.

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Figure 1: Province of Georgia Border Counties

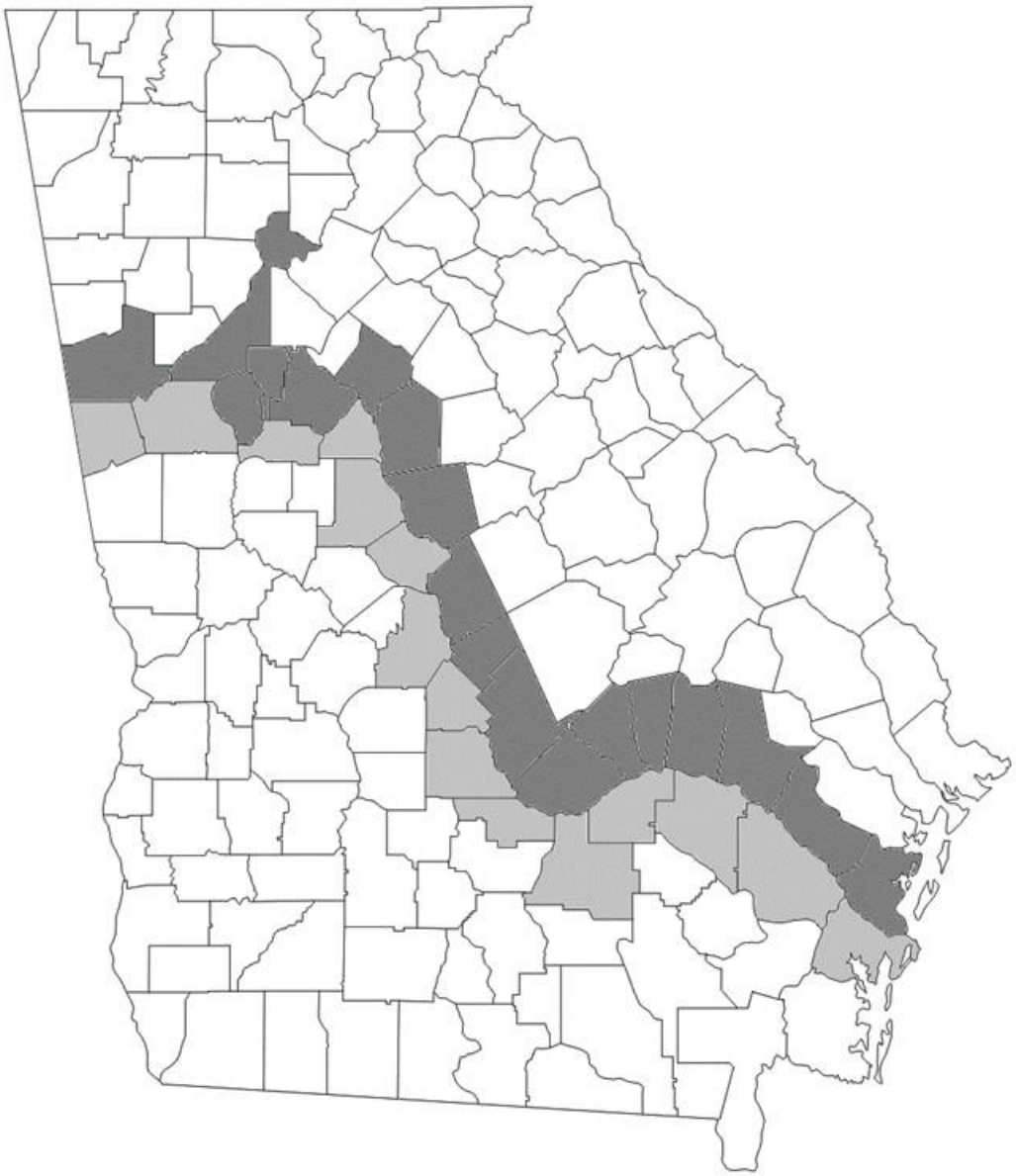

Figure 2: Slave Population Density by Trustee Status

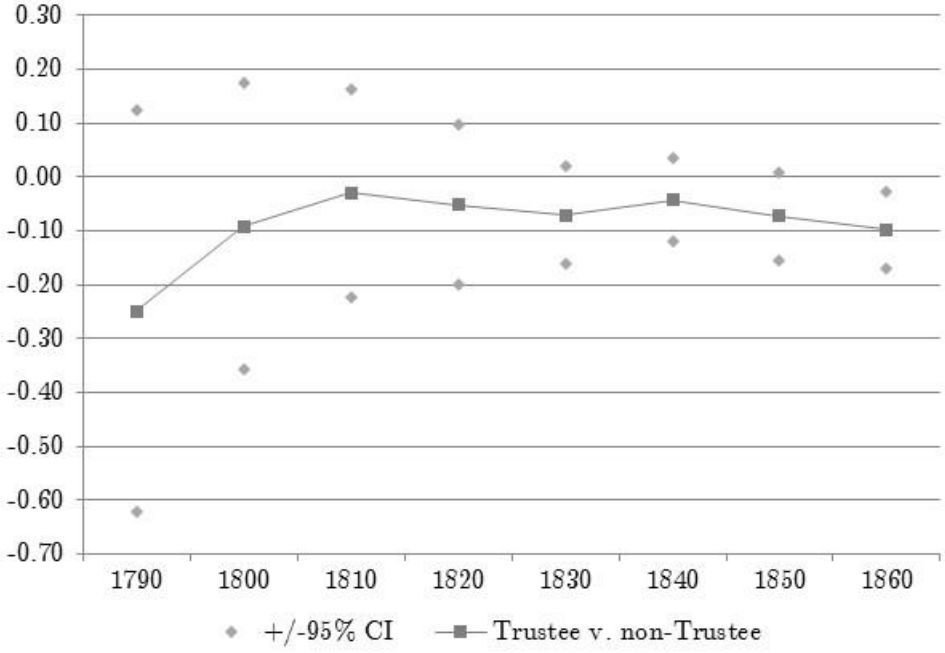

Table 1: Slavery, Income, and Poverty by Trustee Status

	Slave Population Ratio	Fraction of Farms >10 Slaves	(Log) 2010 Median Income	Poverty Rate
	(1)	(2)	(3)	(4)
Panel A: Main Sample				
1860	-0.098***	-0.081**		
	(0.04)	(0.03)		
2010			0.141***	-4.091***
			(0.04)	(1.01)
N	130	130	159	159
R^2	0.108	0.104	0.159	0.183
Panel B: Border Sample				
1860	-0.105*	-0.062		
	(0.05)	(0.06)		
2010			0.113*	-2.783**
			(0.06)	(1.26)
N	51	51	64	64
R^2	0.126	0.103	0.530	0.550

Notes: Each column reports estimated coefficients for average levels of the indicated dependent variable in the indicated year for Trustee versus non-Trustee counties. All regressions control for latitude, longitude, primary soil type, mean elevation, mean annual temperature and precipitation, and land and water area. Panel A results are for the main sample of all Georgian counties, Panel B for the sub-sample of border counties. Panel B regressions additionally control for contiguous border county pairs. Robust standard errors are reported in parentheses and clustered at the county level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Table 2: 2010 Income and Poverty Rate by Trustee Status and Slave Density

	Median Income	Poverty Rate
	(1)	(2)
Panel A: Main Sample		
Trustee	0.049	-3.106***
	(0.05)	(1.02)
Slave Density	-0.258*	5.432**
	(0.14)	(2.63)
N	130	130
R^2	0.167	0.192
Panel B: Border Sample		
Trustee	0.044	-2.025
	(0.06)	(2.22)
Slave Density	-0.306*	10.316*
	(0.18)	(5.13)
N	51	51
R^2	0.371	0.578

Notes: Each column reports estimated coefficients for average levels of the indicated dependent variable in the indicated year. All regressions control for latitude, longitude, primary soil type, mean elevation, mean annual temperature and precipitation, and land and water area. Panel A results are for the main sample of all Georgian counties, Panel B for the sub-sample of border counties. Panel B regressions additionally control for contiguous border county pairs. Robust standard errors are reported in parentheses and clustered at the county level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Table 3: Wealth, Output, Transport, and Manufacturing by Trustee Status

	Wealth per Capita	Output per Capita	Water Transport	Railroad Transport	Manufacturing Establishments	(Log)Capital Invested in Manufacturing
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Main Sample						
1860	-20.714	-11.321	0.001	0.014	-5.753	0.191
	(67.19)	(13.37)	(0.09)	(0.14)	(6.11)	(0.393)
1900	6202.796**					
	(2919.17)					
N	130 /130	130	130	130	130	130
R^2	0.103 / 0.130	0.238	0.224	0.056	0.033	0.027
Panel B: Border Sample						
1860	-274.363**	-7.356	-0.018	-0.190	-12.385	-0.635
	(127.05)	(17.74)	(0.16)	(0.23)	(13.15)	(0.41)
1900	17464.770					
	(11668.38)					
N	51 / 53	51	51	51	51	51
R^2	0.456 / 0.134	0.110	0.513	0.354	0.204	0.332

Notes: Each column reports estimated coefficients for average levels of the indicated dependent variable in the indicated year for Trustee versus non-Trustee counties. All regressions control for latitude, longitude, primary soil type, mean elevation, mean annual temperature and precipitation, and land and water area. Panel A results are for the main sample of all Georgian counties, Panel B for the sub-sample of border counties. Panel B regressions additionally control for contiguous border county pairs. Robust standard errors are reported in parentheses and clustered at the county level. *** p < 0.01, ** p < 0.05, * p < 0.10

Table 4: Literacy, School Enrollment, and Educational Establishments by Trustee Status

	Adult Literacy Rate	School Enrollment Rate	Colleges	Public Schools	Academies
	(1)	(2)	(3)	(4)	(5)
Panel A: Main Sample					
1850	0.088**	-0.034	0.014	-3.664*	-0.267
	(0.04)	(0.02)	(0.11)	(2.03)	(0.64)
N	93	93	93	93	93
R^2	0.174	0.403	0.133	0.291	0.245
Panel B: Border Sample					
1850	0.038**	0.019	-0.031	-0.946	-0.495
	(0.02)	(0.02)	(0.16)	(1.84)	(0.78)
N	43	43	43	43	43
R^2	0.390	0.547	0.499	0.606	0.497

Notes: Each column reports estimated coefficients for average levels of the indicated dependent variable in the indicated year for Trustee versus non-Trustee counties. All regressions control for latitude, longitude, primary soil type, mean elevation, mean annual temperature and precipitation, and land and water area. Regressions for columns (3), (4), and (5) additionally control for county population in 1850. Panel A results are for the main sample of all Georgian counties, Panel B for the sub-sample of border counties. Panel B regressions additionally control for contiguous border county pairs. Robust standard errors are reported in parentheses and clustered at the county level. *** p < 0.01, ** p < 0.05, * p < 0.10

Table 5: Land Inequality, Tenancy, and Output by Trustee Status

	Land Gini Coefficient	Fraction of Farms >500 Acres	Sharecropping Share of all Farms	Herfindahl Index of Total Output Diversity	Cash Crop Share of Crop Output	Orchard, Market Garden, Homemade Manufactures, and Livestock Output per Capita
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Main Sample						
1784	0.057**	-0.053**				
	(0.02)	(0.02)				
1860	0.032*	-0.017		-0.019***	-0.085***	86.127**
	(0.02)	(0.02)		(0.01)	(0.02)	(39.79)
1900			-0.098**			
			(0.05)			
1940			-0.041*	-0.073*	0.033	
			(0.02)	(0.04)	(0.034)	
N	32 / 130	32 / 130	135 / 159	130 / 159	130 / 159	130
R^2	0.410 / 0.129	0.251 / 0.110	0.250 / 0.400	0.197 / 0.341	0.172 / 0.409	0.226
Panel B: Border Sample						
1860	0.025	-0.023		-0.021*	-0.037*	105.136***
	(0.02)	(0.03)		(0.01)	(0.02)	(34.68)
1900			-0.078*			
			(0.04)			
1940			-0.066*	-0.136**	0.022	
			(0.04)	(0.06)	(0.05)	
N	51	51	53 / 64	51 / 64	51 /64	51
R^2	0.600	0.374	0.715 / 0.414	0.444 / 0.523	0.570 / 0.346	0.571

Notes: Each column reports estimated coefficients for average levels of the indicated dependent variable in the indicated year for Trustee versus non-Trustee counties. All regressions control for latitude, longitude, primary soil type, mean elevation, mean annual temperature and precipitation, and land and water area. Panel A results are for the main sample of all Georgian counties, Panel B for the sub-sample of border counties. Panel B regressions additionally control for contiguous border county pairs. Robust standard errors are reported in parentheses and clustered at the county level. *** p < 0.01, ** p < 0.05, * p < 0.10

Table 6: 2010 Income by Trustee Status and Economic Diversity

	(Log) 2010 Median Income		
	(1)	(2)	(3)
Trustee	0.013	0.031	0.023
	(0.06)	(0.04)	(0.05)
1860 Cash Crop Share	-0.317*		-0.193
	(0.18)		(0.20)
1860 Herfindahl		-1.890**	-1.452*
		(0.77)	(0.86)
N	130	130	130
R^2	0.209	0.215	0.222

Notes: Each column reports estimated coefficients for average levels of the indicated dependent variable in the indicated year for Trustee versus non-Trustee counties. All regressions control for latitude, longitude, primary soil type, mean elevation, mean annual temperature and precipitation, and land and water area. Robust standard errors are reported in parentheses and clustered at the county level. *** p < 0.01, ** p < 0.05, * p < 0.10