The Long Shadow of Economic Geography: Political Inequality and Public Goods Provision in the Original 13 US States

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Abstract

This paper contributes to the analysis of the long-run consequences of economic geography and colonial legacies. It studies the origins of malapportionment of the representation in US state legislatures at the time of independence and its impact on political inequality and public goods provision over two centuries. Critically, we isolate a political mechanism of transmission of the impact of economic geography on long-term development. Key to our identification strategy is to restrict our analysis to the original thirteen American states. Their joint independence created a unique juncture in which postcolonial elites simultaneously chose the legislative and electoral institutions under which they would operate. We show that the initial choice about re-apportionment of state legislatures is largely a function of economic geography, that such a choice generated persistent differences in representation patterns within states (political inequality), and that the latter shaped public goods provision and development outcomes in the long run.

"Men, who have more than a proper degree of power, are seldom known to surrender it freely."

Hugh Williamson, North Carolina politician on the persistence of the colony's malapportioned legislature (as cited in Zagarri 1987: 44)

In an effort to overcome the endemic inability to identify the causal mechanism behind today's uneven patterns of development, political economists have turned to both history and geography. The collection and analysis of historical data allows us to extend the analysis of the causal path until a plausible discontinuity provides leverage to isolate the mechanism of interest. Geography, in turn, enhances variation by exploiting differential responses to the discontinuity of interest across meaningful units. This simultaneous turn towards history and geography has generated large scholarly payoffs, particularly about the impact of legacies from colonial times on the variation in patterns of long-term development.[1]

The intellectual focus has been on a variety of mechanisms driving the "modified" geography hypothesis posited by Acemoglu, Johnson and Robinson (2001). The core idea is to go beyond the direct effects (Dell, Jones and Olken 2012) of geographic conditions (rainfall, temperatures) to understand its indirect influence on endowments, feasible production strategies, and societal organization (extraction vs. investment).[2] Ongoing controversies aside[3], all these efforts recognize how geography sets the stage for feasible economic activities. In turn, institutions mediate the incentives of political and economic elites, shaping innovation, investments in technology, and political strategies, and ultimately driving what David Landes dubbed as "answers to geography" (1999: 17).

This paper adds to this enterprise by exploiting an early choice of political institutions in the original 13 US states. During the British North American colonial era (1607-1775), a system of "corporate" representation was established in the colonial legislatures, in which the town, parish, or county was the basis of representation. In none of the 13 colonial legislatures was representation apportioned on a 'one (white) man, one-vote' basis (Zagarri 1987). Highly restricted, corporate representation was simply imported from

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[1] For instance, the past prevalence of enslaved labor has been shown to worsen contemporary economic development (e.g. Acemoglu, García-Jimeno and Robinson 2012, Nunn 2008). More generally, see Nunn (2014) for a survey of the historical comparative political economy literature.

[2] This line of work has offered multiple causal chains: from endowments and inequality to legal, financial, and educational institutions (Sokoloff and Engerman 2000); from the early choices in terms of extraction and investment to future patterns of public goods provision (Dell 2010; Iyer and Banerjee 2005); from the early forms of social organization to persistent patterns of human capital inequality (Bertocchi and Dimico 2014).

[3] Albouy (2012) provided evidence that the estimates reported in Acemoglu, Johnson and Robinson 2001 seminal paper are not robust to particular data coding assumptions in their settler-mortality instrument. Nunn (2008) found no evidence in the former North-American and Caribbean colonies to support Sokoloff and Engerman (2000) hypothesis. Using data from the Mita districts of colonial Peru, Dell (2010) found evidence contrary to the Engerman-Sokoloff hypothesis.

England, where the basis in the House of Commons was the county, borough, or university (Pole 1966).[4]

With the May 10th Resolutions of 1776, the Continental Congress, the de facto government of the federation of the 13 colonies, called on each colony to create new governing structures by writing their first sovereign constitutions (Adams 2001). Given this autonomy, elites in each new state had to determine, among other critical choices, whether to maintain colonial institutions that constrained the political power of the poor.[5] Despite the opportunity to institutionally entrench the colonial system of representation in their first sovereign state constitutions, elites in four states – Massachusetts, New Hampshire, New York, and Pennsylvania, implemented a system of representation based on population and regularly-scheduled reapportionment. The remaining nine continued with a corporate basis of representation in their first sovereign state legislatures. This proved to be a highly consequential choice that carried long-term effects in terms of: (1) patterns of political inequality within the states (until the US Supreme Court ruled in 1964 that unequal state-legislative representation is unconstitutional)[6]; (2) provision of public goods[7]; and (3) patterns of long-term development.

Figure 1a plots our measure of political inequality in the 9 states that kept the colonial corporate representation system (fixed-apportioned states or FAS) versus the 4 states that introduced population-based representation systems (re-apportioning states or RAS). Systematic state-legislative malapportionment affects the within-state distribution of representation, and we therefore require a sub-state measure of political inequality. We follow the approach in David and Eisenberg (1962) and Ansolabehere, Gerber and Snyder (2002) to measure county-level representation, which (like the latter authors) we call the Relative Representation Index (*RRI, henceforth*). To calculate each county's *RRI*, we identify each state's electoral laws specifying the number of representatives and senators, respectively, apportioned to each county of the origi-

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[4]Furthermore, an English Royal Proclamation in 1763 forbid the colonial legislatures from reapportioning representation despite rapid population growth and westward movements (Zagarri 1987: 43, Van Tyne 1922: 210).

[5]For instance, when a member of the Massachusetts (MA) Provisional Congress supported the expansion of suffrage with the end of the colonial era, John Adams, the primary author of this state's first (and only) constitution, wrote to this reformer in May of 1776, "...if you give to every Man, who has no Property, a Vote, will you not make a fine encouraging Provision for Corruption?....I would not advise (the MA state legislature) to make any alteration in the laws, at present, respecting the qualifications of voters."

[6]See *Reynolds v. Sims*, 377 U.S. 533 (1964).

[7]The effects of malapportioned state legislatures on the distribution of state spending in the 20th Century are well known (Ansolabehere, Gerber and Snyder 2002). Yet, surprisingly little work in political science has systematically linked the origins of this electoral institution to colonialism and slavery. Ansolabehere and Snyder (2008) attribute wide-scale state-legislative malapportionment in the mid 20th Century to the rise of urbanization in the late 19th Century. As we will show below, the three colonies with the largest cities at the end of the colonial period were 3 of the only 4 states at independence to implement a population basis of representation. This observation does not contradict their argument, but suggests a complementary explanation of the origins of malapportionment among the original US states.

nal 13 states for each decennial census year. We then divide each county's apportionment of representatives and senators, respectively, by each county's adult white male (AWM) population. For each county, we divide this ratio by another ratio: the state's total number of representatives and senators, separately, divided by the state's total AWM population. This results in a relative measure of representation for each county for each chamber of the (bicameral) state legislature. Any value greater than 1 indicates that the county is over-represented and any value less than 1 indicates it is underrepresented in the respective chamber of the state legislature. Our final measure of county-level political inequality is simply the average of each chamber's *RRI* for each county, and then the logarithmic value of this.[8] The y-axis in Figure 1a is a county-level index of *RRI in 1850*; the x-axis is the same index in 1790, date of the first US Census and our first measure of post-colonial representation.

Figure 1b plots, for the same two sub-groups of states, the relationship between *RRI in 1850* and the level of county education spending in 1850 from state sources per white youth (ages 5 to 19).[9] Figure 1c, in turn, plots the relationship between the latter proxy for public goods provision and two indicators of contemporary outcomes across the original 13 states: the county share of white adults with at least a high school degree (left) and the county white household median income (right) in 2000.

In the 9 states that chose upon independence to maintain this colonial basis of apportionment created what we term was a *fixed system* of representation that was remarkably persistent for nearly 200 years. On the other hand, none of the 4 states that committed initially to some form of representation based on population reneged on this commitment to one (adult white) man, one vote' during the antebellum era (1789-1860). As a result, the persistence of political inequality (as measured by the correlation between *RRI in 1790* and *RRI in 1850*) is much stronger in the former group (Figure 1a). Figure 1b in turn suggests that malapportionment strongly conditioned public goods provision in the 9 FAS, whereas in the RAS there is no apparent impact of *RRI* on the level of the state's educational effort in 1850. Finally, Figure 1c suggests, in line with Lindert (2004), that the level of state educational effort in 1850 is a good predictor of both future investments and economic prosperity. We find that a one standard deviation increase in *state*
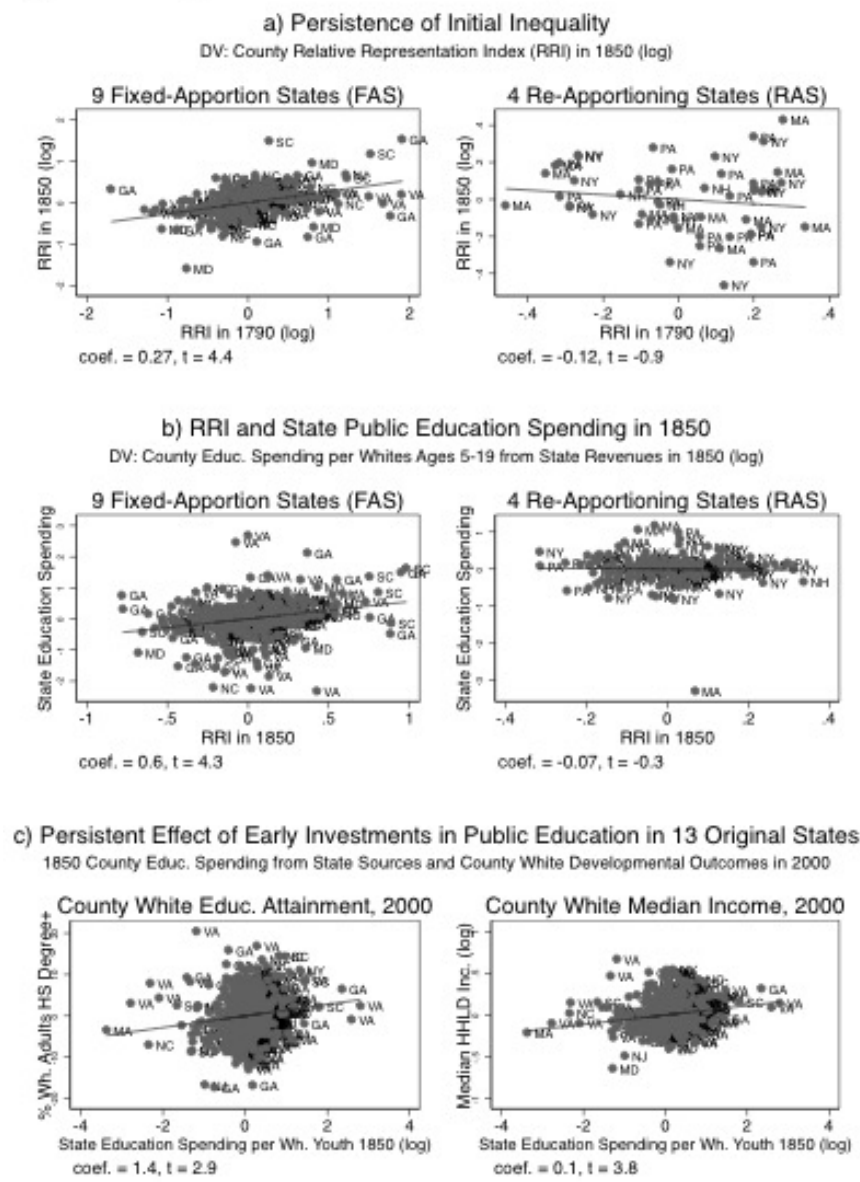
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[8]We use *RRI* throughout the paper to measure political inequality due to state-legislative malapportionment. For more details on how we calculate *RRI* and sources, see Online Appendix D.

[9]All specifications underpinning Figure 1 include state-level fixed effects. The correlational analysis in Figures 1b and 1c include controls for the county-level value in 1850 of the following variables: white population density, urbanization, manufacturing capital per white capita, share of foreign born white population, share of slave population, white illiteracy rate, and land inequality.

education spending per white youth capita is correlated with a 1.5% increase in the share of a county's white population, ages 25 and older, who have at least a high school (HS) degree in 2000. This is meaningful, as a 1% increase in the share of a county's white 25 or older population with at least a high school degree is associated with a roughly $1000 increase in white median household income.[10]

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[10]These values are in 2000$. The median white income in 2000 across the counties of the Original 13 states was $41,000.

Figure 1: Why the Choice of Initial Representation Mattered

a) Persistence of Initial Inequality

DV: County Relative Representation Index (RRI) in 1850 (log)

9 Fixed-Apportion States (FAS)

4 Re-Apportioning States (RAS)

coef. = 0.27, t = 4.4

coef. = -0.12, t = -0.9

b) RRI and State Public Education Spending in 1850

DV: County Educ. Spending per Whites Ages 5-19 from State Revenues in 1850 (log)

9 Fixed-Apportion States (FAS)

4 Re-Apportioning States (RAS)

coef. = 0.6, t = 4.3

coef. = -0.07, t = -0.3

c) Persistent Effect of Early Investments in Public Education in 13 Original States

1850 County Educ. Spending from State Sources and County White Developmental Outcomes in 2000

County White Educ. Attainment, 2000

County White Median Income, 2000

coef. = 1.4, t = 2.9

coef. = 0.1, t = 3.8

Note: Each figure depicts a partial correlation plot. Each specification includes state fixed effects.

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By explaining the origins of these institutional choices and precisely measuring their long-term implications, our analysis contributes to the literature on the link between geography, colonial legacies, and development in two ways. Theoretically, we correct the tendency to overlook electoral institutions, as opposed to constraints on power, state capacity or even economic and legal institutions, as transmission mechanisms for colonial legacies. We argue that early choices about legislative representation reflect to a large extent the labor needs of incumbent political and economic elites. In other words, geography shapes the elite's choice of malapportionement through its impact of labor scarcity and the importability of slaves. The shift to population-based apportionment takes place where labor scarcity is high and the access to coasts with a benign climate is limited. These are the conditions under which incumbent elites open-up representative institutions: as a way of increasing the economic base of their states by attracting new residents and stemming out-migration. By linking the literature on the effects of malapportionment (Samuels and Snyder 2001, Dragu and Rodden 2011, Ardanaz and Scartascini 2013) with the literature on colonial legacies and economic development (Iyer and Banerjee 2005, Dell 2010), we are able to identify a new mechanism of persistence of colonial legacies and reversals of fortune.[11] We posit a specific link between economic geography, labor needs, and electoral institutions. The relatively more egalitarian electoral institutions that developed in a few former New-World colonies were due to their need to retain residents and induce migrants to willingly settle. This initial choice created a systematic source of political inequality that persisted for nearly 200 years, shaping public goods provision and economic outcomes.

Our second contribution is empirical. By exploiting the variation among the original 13 US states we devise a plausible identification strategy that overcomes some of the flaws in the empirical literature using cross-national evidence to support the argument that historical institutional development causally affected economic development (Høyland, Moene and Willumsen 2012, Pande and Udry 2005, Treier and Jackman 2008, Glaeser et al. 2004). Several aspects of our empirical strategy are worth highlighting. First, focusing on the original 13 states allows us to control for many potential sources of heterogeneity as the original US state-level governments, with the exception of a few institutional features, were similar in their design (e.g., plurality electoral system, bicameral legislature, common law legal system (Adams 2001, Berkowitz

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[11]A more thorough review of this literature is presented in Online Appendix B.

and Clay 2011). Second, we eliminate concerns about reverse causality by exploiting the fact that the colonial system of representation was exogenously imposed on all 13 colonies though they differed in both size and economic structure (e.g., Van Tyne 1922, Zagarri 1987). Furthermore, post-independence public goods provisioning was not a concern of British rulers when creating the various colonial corporations and charters in the 17th Century that ultimately resulted in the original 13 states. The use of instruments capturing physical geographic features of the colonies further ameliorates concerns about reversed causality. Third, we present a consistent measure of political inequality at the county level for all 13 states through the period of interest, avoiding major measurement issues. Unlike the discrete variables that are common to the literature, the variable used here, *RRI*, provides a continuous measure of relative representation allowing for precise estimates of the effects of this source of political inequality on subsequent public goods provisioning.

Finally, to study the impact of early institutional choices on long-term development, we first analyze the impact of our measure of political inequality on the distribution of *state-level* public education spending in the antebellum period across the counties of the original 13 states. Subsequently, we trace the impact of these early investments on long-term levels of provisions, offering compelling evidence that initially under-represented areas in states which maintained the fixed colonial basis received lower levels of state education revenues, and have now significantly worse developmental outcomes. We provide significant evidence of an institutional channel through which colonialism and slavery affected the provision of public education in the 19th Century, and then evidence that this channel persisted long after the demise of both.

The rest of the paper is organized as follows: We first present our theoretical argument about the early choices of representative institutions. Subsequently, we provide evidence in support of each of the steps in our argument. Finally, we conclude with a discussion of the main implications of our findings.

I THE CHOICE OF REPRESENTATIVE INSTITUTIONS AS A DISTRIBU-TIVE CONFLICT FOR THE LONG RUN

What drove some of the original 13 colonies to abandon the fixed, and highly malapportioned, system of

electing representatives at work during colonial times and what drove other states to keep it even in a context

of major institutional innovation? To address this puzzle we build on a recent literature on political and

economic geography that approaches institutional choices as strategic decisions over distribution in the long

run (Boix 2003; Acemoglu and Robinson 2006; Beramendi 2012). The underlying assumption behind this

literature is as follows. When confronted with institutional reform, political elites choose strategies that

maximize two things: the current level of rent, and the political ability to preserve those rents in the future.

The design of representative institutions at the onset of state formation falls squarely at the very center of

these strategic calculations.

Our approach conceives of *political inequality* between counties within states as the result of a

strategic choice by political elites willing to maximize their current wealth and their future political influence.

The former adds to their economic welfare in the short run, the latter reduces their political and economic

risks in the long run.

Expressed in its crudest terms, the fundamental calculus of the local elite (e) is as follows:

$$U(c) = (1 - t)_t w_i + (1 - t)_{t+1} w_i \tag{1}$$

Where w_i captures the individual elite member pre-tax income. To further explore into the basics of the

decision making process of incumbent elites, we make the following assumptions:

1) The tax rate endured by the individual is a function of the distance between the system of representation

in place (R) and the system that would allow him to implement her most preferred tax rate (R*):

$$t = \frac{1}{2}(R - R_i^*)_t^2 y_t \tag{2}$$

2) Per capita output, y, is defined within the parameters of the conventional Solow growth model, $y = Ak^\alpha$

where A captures a constant of multifactor productivity, alpha the share of capital within the unit, which we

also assume constant, and k the ratio of the stock of capital (K) to the stock of labor (L), such that $k = \frac{K}{L}$.

Substituting (2) into (1) and maximizing the utility of consumption with respect to pre-tax income over the two periods, one obtains the following expression:

$$\frac{\partial U(c)}{\partial w_i} = -\frac{AK_t^\alpha}{AK_{t+1}^\alpha} - \frac{(R_{t+1} - R_i^*)^2}{(R_t - R_i^*)^2} \tag{3}$$

Expression (3) captures the fundamental calculus of incumbent economic elites. Their utility changes as a function of:

a. Inter-temporal balance in the level of output per worker. Those areas with levels of capital or labor below their production possibility frontier will therefore seek to increase the both factors to effectively increase the levels of k over time.

b. Inter-temporal changes in the system of representation. As the distance between the elite's optimal level of malapportionment and that actually in place increases, their utility of consumption decreases via an effective drop in disposable income associated with suboptimal taxation (from the perspective of the elite).

Ideally, when setting their preferred level of political inequality, incumbent elites will try to maximize future political influence (i.e., reduce the size of the second term in (3) above) without incurring sacrifices in terms of the factor composition of the economy (as captured by the first term in (3)). Critical to our argument is the idea that economic geography determines whether incumbents are able to jointly achieve their desired factor composition of the economy and future political influence or whether, by contrast, they face a trade-off between them when designing representative institutions.

The mechanism mediating this trade-off lies in the strategy pursued by each local economy (colony) to solve a fundamental economic challenge: labor scarcity, an especially pressing problem in economies characterized by low-capital intensity. In any emerging union, labor scarcity is not a uniform problem. Small, highly dense units do not face a problem of labor scarcity unless they suffer from extremely high levels of out-migration. By contrast, labor scarcity is bound to be a concern especially in large and sparsely populated units. Among the latter, there are two strategies to increase the stock of labor: to make themselves

attractive to new settlers in search of better economic fortunes, or to buy and import slave labor.[12] Both of these strategies were available at the time the post-colonial constitutions were to be written (Sokoloff and Engerman 2000: 220). The key analytical issue is what drove each colony to follow either path, and with what consequences for political inequality.

Our argument plays particular emphasis on two exogenous determinants of the politico-economic geography at the onset of the postcolonial era: the size of each colony and the access to coastal areas with benign climatic conditions. The colonial boundaries, and as such, the size of each state are exogenous to future elites choices about the post-colonial system of representation, as they were determined by colonial charters in the 17th Century (Stein 2008). Because the colonial population was largely arrayed along the Atlantic coast, colony size was almost perfectly inversely correlated with each colony's population density.[13] As Table 1 shows, larger colonies were significantly less densely populated, and therefore required migration to meet labor needs and populate the frontiers.

The second exogenous factor – climate and geography of each colony – also influenced the initial choice through its effect on the ability of coastal elites to profitably meet their labor needs through imported slaves. Elites in the various colonies attempted to solve this persistent problem in three very different ways: indentured servants, imported African slaves, and hired labor. Given that each colony had low capital-intensive (i.e., agriculture-based) economies, increasing output per capita, y, occurs primarily by increasing the stock of labor (L). This is accomplished either by inducing labor to willingly migrate or importing slave labor. If slaves could profitably be employed in sufficient numbers, then labor needs were met with this expensive source of labor (Galenson 1996: 176). As a result, an elite planter system based largely on slave labor developed near coastal waterways from Delaware to Georgia. In the mid-Atlantic region of New Jersey, New York, and Pennsylvania, labor needs of coastal elites were met with a mixture of slaves, indentured servants, and hired labor. Due to the minimum economies to large-scale agriculture in New England, meeting

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[12]According to Galenson (1996: 153), "The key economic success in colonial America, for individual planters as well as entire colonies, was to obtain an adequate supply of agricultural labor to grow crops that would satisfy the demands of the large European market or of the expanding markets of the colonies."

[13]In 1790, roughly $1/3^{rd}$ of the US population lived in a coastal county, which is the highest share on record. Therefore, a state's population density was largely a function of its size and miles of coastline to size in square miles ratio, and is unlikely to be endogenous to some unobserved factor. Furthermore, the correlation between population density in 1775 (Table 1, Col. 3) and two exogenous state-level measures, state size (Col. 1) and state coastline-to-size ratio, is -0.84 and 0.67, respectively (see also Figure 3 below). See Appendix Figures A1 and A2 for the geographic distribution of the population in the late colonial era.

the increased demand for labor depended entirely on the natural rate of population growth (Galenson 1996).

These two dimensions of economic geography shaped both the intensity and the solutions provided by each colony to the problem of labor scarcity, thus mediating the calculus of local elites under different structural conditions and ultimately shaping political inequality in the early post-colonial years. Table 1 shows the values for the core theoretical dimensions for each state. In Figure 2 we evaluate the predictions on the basis of expression (3) under four sets of structural conditions. The key analytical comparison for our argument is that between large colonies with (Case 3) and without (Case 4) suitable climatic conditions for the exploitation of slaves.

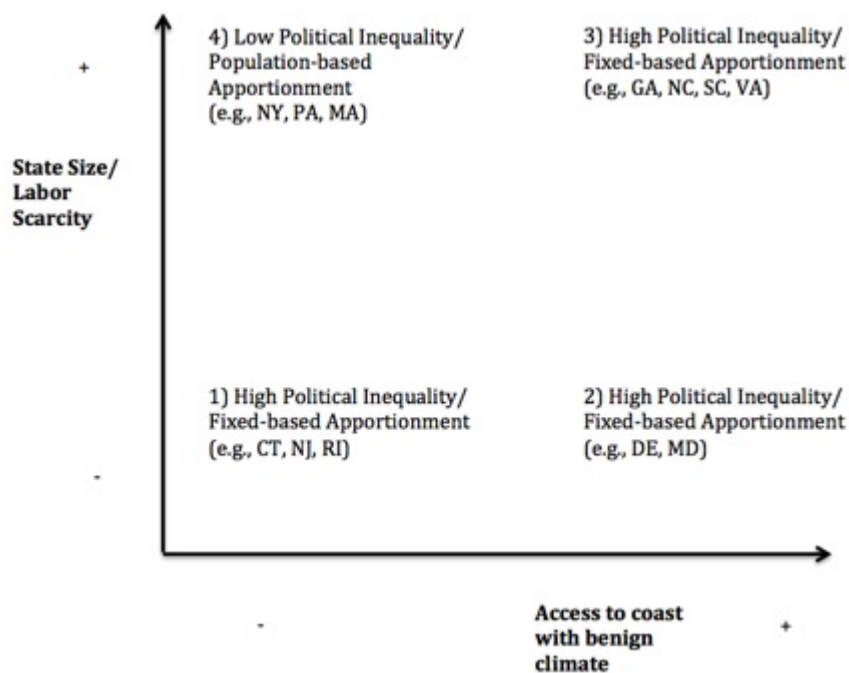Figure 2: Politico Economic Geography and Political Inequality

Table 1: Political-Economic Geography and Initial Political Inequality

State	Size, 1790 (sq. mi) (1)	Slave Share, 1790 (%) (2)	Pop. Density, 1775 (3)	Share Frontier, 1790 (%) (4)	Fixed Initial Representation (5)
Case 1					
CT	5,543	1	37.3	0	Y
RI	1,545	1	34.3	0	Y
NJ	8,729	6	16	0	Y
Case 2					
MD	12,407	32	20	0	Y
DE	2,490	15	18.2	0	Y
Case 3					
GA	59,425	35	1	51	Y
NC	53,865	26	5.2	0	Y
SC	32,020	43	5.6	0	Y
VA	107,438	39	5.4	38	Y
Case 4					
MA	43,969	0	7.2	63	N
NY	54,555	6	3.9	76	N
PA	46,055	1	7.1	49	N

Note: See Appendix-Tables A1 and A2 for state abbreviations and sources. Column 4 measures the share of each state with fewer than 2 inhabitants per square mile in 1790.

Case 1: Smaller Colonies with Unsuitable Climate.

Given their natural access to the coast, the smaller colonies had significantly higher population densities than the larger colonies. In fact, by the end of the colonial period, a sizeable landless labor force existed in most of the smaller colonies (Galenson 1996: 169, Nikolova 2011).[14] Therefore, the increase in pre-tax income of elites, w_i, due to an increase in current in-migration would not outweigh the loss in consumption due to rising taxation that would occur if representation were based on population. A large difference between preferred future representation and actual future representation would have a large negative effect on their future post-tax income, $(1-t)_{t+1}w_i$. The loss in terms of future consumption potential from greater taxation would outweigh the gain's due to an increase in non-compulsory in-migration (k). Elites in small states, therefore, had a strong incentive to maintain the fixed colonial basis.

Case 2: Smaller Colonies with Benign Coastal Climate.

As in Case 1, the lifetime consumption, C, of elites in these small colonies would decrease due to higher taxation if representation were based on population. Unlike the elites in Case 1, the coastal climates of these

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[14] Unsurprisingly, the states identified by historians as possessing a sizeable landless labor force were the states with no remaining frontier (Table 1, Column 4). Contemporary sources corroborate this (e.g. see Zagarri 1987: 38)

colonies allow elites to raise their pre-tax income by increasing k through the importation of slave labor. Thus, elites in these colonies have very little reason to risk future political control by allowing representation to be based on population.

Case 3: Larger Colonies with Benign Coastal Climate

In larger, sparsely populated colonies, the pre-tax income of elites, w_i, would gain significantly by attracting more labor. Yet, the climates of these colonies allow coastal elites to increase k through imported slave labor. Moreover, their loss in C due to higher taxation would outweigh the gain in k were they to pursue the attraction of non-compulsory in-migration via institutional change.

There is little doubt that coastal elites in the slave colonies came to see geographically fixed representation as a means of protecting their interests from the rapidly-increasing yeoman populations in the upland, western regions of their own states (Green 1931). One must bear in mind the additional uncertainty in 1776 about whether slavery could profitably be extended beyond the coasts. Prior to the invention of the cotton gin in 1794, cotton was only profitably grown near the coasts of Georgia and South Carolina. Moreover, the ability to profitably employ slaves west of the piedmont of Virginia and North Carolina was thought to be low.[15] The coastal slave-owners feared that whites in regions within their state where slavery was not as profitable and widespread would specifically vote to tax a particular type of property – slaves – differently than other types of property. This explains why geographically-fixed apportionment of the state legislatures was the primary means of restricting political access over suffrage restrictions in the slave states after the colonial era.[16]

Speaking for South Carolina's coastal (i.e., 'low country') elites, one planter wrote that up-country whites (within SC) were "strangers to our interests, our customs, and our concerns.....Though we take you into our association (state).....we can never surrender ourselves into your hands with power to dispose of us as you please" (Schaper 1901: 280). This overriding concern of coastal elites, from Maryland to Georgia, to limit the ability of western populations to gain control of their state legislatures has been documented by historians (e.g., Green 1931, Schaper 1901, Harry 1902). In response to calls from the 'high country' of South

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[15] Appendix-Figure A3 shows the within-state distribution of the share of the population enslaved in 1790, and that it was roughly inversely correlated with distance from the coast.

[16] For instance, all AWM were given the right to vote in Georgia, Maryland, and South Carolina in 1798, 1802 and 1810, respectively (Engerman and Sokoloff 2005: 898).

Carolina to reapportion representation on a white population basis, one low-country politician succinctly described the strategy and concerns of the coastal slave-owning elites in these five states. "(If representation were apportioned equally), ...the system might be built up, the tax on lands might be entirely taken off, and laid wholly on negroes.....It might be arranged that without appearing to aim at the low country, that no estate below a certain value should pay any tax at all, while the tax on estates should be raised to equal the wants of the government. The standards might be fixed to exempt the estates of the upper, and include the generality of estates in the lower" (Phocion 1795: 19). The entrenchment of the colonial basis caused significant grievances, and these within-state, sectional conflicts persisted throughout the antebellum period in these five slave states (Green 1931). Virginian planter and former president, James Madison, expressed the same argument 40 years later at the Virginia constitutional convention of 1829, which was largely about apportionment in the state legislature, when he said: "It is apprehended, if the power of the Commonwealth (Virginia) shall be in the hands of a majority, who have no interest in this species of property, that, from the facility with which it may be oppressed by excessive taxation, injustice may be done to its owners." We show in the next section that a system created and preserved in the past to protect slavery persisted long after slavery's demise with the conclusion of the Civil War in 1865.

Case 4: Larger Colonies with Unsuitable Climate

Just as for the colonies in Case 3, the pre-tax income of elites in these large, sparsely populated colonies would gain significantly by attracting more labor. Yet, in this case, due to the climatic unsuitability of profitably increasing L through the import of slaves, labor must be induced to migrate willingly. In this case only, the elites maximize their inter-temporal utility of consumption by allowing representation to be determined by population in order to increase k through in-migration. To do so they must modify the inherited system of representation from a corporate to a population based one. Endowed with freedom, citizens are unlikely to move into areas where their political voice is known to be muted by the system of representation.

The interplay between the size of the colony and the relatively cost-free opportunities to move for settlers shaped the incentives of elites in colonies with unsuitable climates for large-scale slavery. These elites explicitly expressed fears that poorer interior populations would more heavily tax the wealthier coastal regions within their state (Pole 1966; Handlin 1966). Size meant that the colonial system of apportionment

created greater inequalities of representation in the larger colonies. Thus, the greatest losers of the colonial system were those settlers on the frontiers of the sparsely-populated large states, which caused significant grievances (Cappon, Petchenik and Long 1976: 100).[17] In addition, the lack of restrictions on inter-colony migration, along with the similarities across colonies in language and culture, lowered exit costs significantly among extant residents. In fact, the larger northern colonies experienced large out migration of their native-born (white) populations (Villaflor and Sokoloff 1982).[18] The economic need to both induce immigrants into their states and retain their own residents created a political motive to abandon the system of representation that had benefitted incumbent elites until then. Holding on to political power came at a very high cost in this particular set of colonies.

In terms of competing explanations, two points are worth highlighting. First, the initial choice of representation did not reflect variation in inequality across the colonies (Sokoloff and Engerman 2000). Furthermore, all available evidence suggests that differences across colonies in wealth, income, inequality, and human capital at the end of the colonial period *cannot* account for the initial choice of representative institutions of each state. Not only were the 9 FAS no poorer than the 4 RAS, there were no meaningful differences in income or wealth inequality (Lindert and Williamson 2013, Jones 1980).[19] Second, concerns about cultural and religious differences between the slave and non-slave states driving the process are mitigated by the fact that non-slave states within New England and the mid-Atlantic states chose both types of representation.

To summarize, our argument suggests two clear empirical implications, each of which are examined in the next section. First, the choice of whether to change the unequal colonial basis in favor of population-based representation in the newly-sovereign state legislature reflected the interaction of two dimensions of

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[17]According to Van Tyne (1922: 210), "Perhaps the worst sufferers (of the British rules regarding colonial representation) were the Scotch-Irish in the western part of Pennsylvania, who, deprived of proper representation in that legislature, pushed (down) the Great Valley into the Piedmont region of the Carolinas, where again they were deprived of proportional representation by the seaboard planters. But, the significant fact here and in other cases is that the refusal of proportional representation was resented. As freeman and English subjects', the Scotch-Irish and Germans of the interior protested against three Quaker counties of Pennsylvania having 24 of the 36 representatives in the colonial assembly, though they had less than half the population."

[18]At the end of colonial period, roughly half of Pennsylvania's native-born population was living in other colonies and for the most part had migrated to the southern slave colonies (Villaflor and Sokoloff 1982: 542). While New York did not suffer such a drastic rate of out-migration, this large and sparsely-populated colony received far fewer foreign immigrants compared to the mid-Atlantic and Southern slave colonies (Villaflor and Sokoloff 1982). Massachusetts was receiving neither much in the way of foreign or other colony in-migration, and was experiencing net outmigration. See Appendix C and Table C1 for more information regarding colonial-era migration patterns.

[19]According to Galenson (1996), Virginia and Pennsylvania had similar rates of adult white male illiteracy. Illiteracy rates in Connecticut are not thought to have been higher than in Massachusetts. See Online Appendix C and Table C1 for sources and more information regarding conditions at the end of the colonial period.

economic geography on the labor needs of elites within each state at the end of the colonial period. Second, this initial choice of representation generated a persistent source of political inequality, which had long-term consequences on the provision of public goods and contemporary outcomes.

II EMPIRICS: Persistent Political Inequality and Public Goods Provision

In this section, we provide evidence for each of the primary empirical implications of our theoretical argument. We proceed in three steps. First, we show that during the period of British rule representation in the legislatures of the 4 colonies that chose a population basis of representation upon independence was not appreciably different than in the colonies that chose to maintain the colonial fixed basis. We then provide evidence of our theory that economic geography affected the need for colonies to meet labor needs through voluntary migration and drove the initial choice of (mal)apportionment among the original 13 states. This exogenous source of variation across the colonies is critical to our ability to identify the effects of this institution on subsequent public goods provision. Second, we show that if a state chose to maintain its colonial basis of representation, the resulting political inequality persisted in the long run. Third, we establish that this source of persistent political inequality had a large effect on the provision of public goods until malapportionment was ruled unconstitutional in 1964, which in turn is strongly correlated with contemporary white education outcomes.

II.I *Shifting Away from a Common Inheritance: Economic-Geographic Determinants of Initial RRI*

We begin by using the measure of county-level representation in the state legislature, *RRI*, described above in the colonial era to examine one of the key assumptions to our identification strategy: British policy was imposed uniformly on each colony, and the subsequent choice to maintain or change the fixed basis of representation was not due to heterogeneity in British policy across the 13 colonies. To test this claim we examine a fundamental premise for our argument, namely that the colonial policy caused over-representation of the coastal regions in the various colonial legislatures.[20] Accordingly, a county's distance from the Atlantic

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[20]We use apportionment in each colonial legislature provided by Cappon (1975: 100-101) combined with 1775 population estimates from Sutherland (1936) to calculate the *RRI* for each existing county of the 13 colonies in 1775, the last year of British colonial rule.

Coast should be inversely related to representation during the colonial period in *both* of the 9 FAS and 4 RAS. We test this by generating a measure of county distance from the coast by combining county boundaries as they existed in 1775 with GIS software that determines the central point of each county. From this, the direct distance to the nearest point on the Atlantic coast is measured.[21] As Figure 3a shows, a county's distance from the coast is correlated with underrepresentation in the colonial legislatures in the counties of *both* the 9 FAS and 4 RAS.[22] This indicates that colonial policy did indeed create winners of the coastal residents throughout the 13 colonies, and with it the possibility to maintain this system upon independence.

Recall that our argument for why coastal elites would choose a system of initial representation that would forgo the opportunity to entrench their hold on power upon independence was conditional on labor needs at the end of the colonial era. Our argument depends on the fact that the demand for greater voluntary labor, which we proxy by using population density and population slave shares, was determined by factors that did not directly influence the choice of initial representation. Figure 3b shows that population density in 1775 was highly correlated with colony size (r=-0.84) and shoreline-to-size ratio (r=0.67).[23] The argument that the proportion of slaves in a colony's population is not endogenous to some unobserved factor is supported by the fact that slavery was legal in each of the colonies, and the prevalence of its use is widely attributed to geographically and climatically determined profitability (Sokoloff and Engerman 2000: 220). Support for this claim is shown in Figure 3c (left), which depicts the correlation of a variable measuring a state's average annual number of frost-free days from 1970 to 1999 and the share of a state's population who were slaves in 1790 (r=0.84).[24]

To assess whether the elites in the 4 RAS implemented a population-basis of representation, as we argue, as a means of retaining residents and attracting voluntary migrants, we model this initial choice as a binary logit in which a colony's size and average frost-free days predict the initial choice of whether to maintain the fixed colonial system of representation. These two variables predict the choice of initial

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[21]More information on how we generate the county-level geographic instruments can be found in the Appendix A-Table A2.

[22]Instead of splitting the sample between counties in the 9 FAS and 4 RAS, we also ran an interactive model in which county distance to the Atlantic Coast is interacted with a dummy indicating whether the county is in what would become a FAS. A Wald test of the difference in coefficients between the reference group (counties in the 4 RAS) and the comparison group (counties in the 9 FAS) yields a p-value of 0.4. This indicates that we cannot reject the null that there is no statistical difference in the relationship between county distance from the coast and *RRI* in 1775 across the soon-to-be 9 FAS and 4 RAS.

[23]The correlations are nearly identical when using more accurate population data from the 1790 US Census.

[24]See Appendix Table A2 for more information on how state-level frost-free days is measured and its source.

representation perfectly (Figure 3c, right).[25] Neither variable alone predicts initial choice particularly well. Of the 5 largest states, 3 chose to retain their fixed colonial basis. Of 6 lowest slave share states, only 3 chose a population basis of representation. The switch towards population-based representation took place only in large states with climatic conditions hostile to the development of slave-based agriculture.
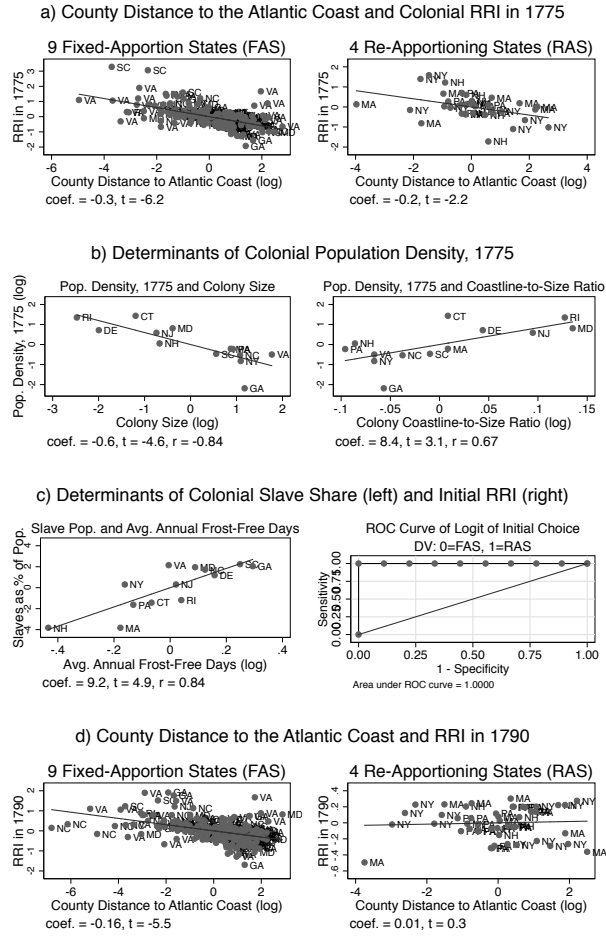
Figure 3d shows how the choice of the 4 states to implement a population basis of representation did indeed affect the geographic distribution of representation in these states. By 1790, the year of the first post-colonial national Census, there is no relationship in the 4 RAS between a county's distance to the coast and its *RRI in 1790*.[26] The choice to implement population-based representation in their initial constitutions resulted in electoral institutions that no longer favored the coastal regions. On the other hand, in the 9 FAS states, county distance from the coast remains significantly inversely correlated with a county's *RRI in 1790*.[27] That is, we observe that the initial choice in the 9 FAS preserved the colonial basis as we argued in the previous section.

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[25]Each independent variable is continuous and the results are not due to a collinearity problem.

[26]Figure 3a and 3d uses county boundaries as they existed in 1775 and 1790, respectively.

[27]The Wald test of difference in coefficients between the 9 FAS and 4 RAS has a p-value of less than 0.000 indicating that we can reject the null that there is no difference in the relationship between county distance from the coast and *RRI in 1790* across the 9 FAS and 4 RAS

Figure 3: Geographic Determinants of *RRI*

a) County Distance to the Atlantic Coast and Colonial RRI in 1775

9 Fixed-Apportion States (FAS)

coef. = -0.3, t = -6.2

4 Re-Apportioning States (RAS)

coef. = -0.2, t = -2.2

b) Determinants of Colonial Population Density, 1775

Pop. Density, 1775 and Colony Size

coef. = -0.6, t = -4.6, r = -0.84

Pop. Density, 1775 and Coastline-to-Size Ratio

coef. = 8.4, t = 3.1, r = 0.67

c) Determinants of Colonial Slave Share (left) and Initial RRI (right)

Slave Pop. and Avg. Annual Frost-Free Days

coef. = 9.2, t = 4.9, r = 0.84

ROC Curve of Logit of Initial Choice
DV: 0=FAS, 1=RAS

Area under ROC curve = 1.0000

d) County Distance to the Atlantic Coast and RRI in 1790

9 Fixed-Apportion States (FAS)

coef. = -0.16, t = -5.5

4 Re-Apportioning States (RAS)

coef. = 0.01, t = 0.3

Each model in a) and d) includes state fixed effects

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II.II   *Persistence of Political Inequality*

The second empirical implication from our theoretical argument is that the initial choice of representation created a persistent source of political inequality in the 9 FAS, as opposed to the 4 RAS. We first assess this contention by measuring whether over-represented counties at the end of the colonial period remained over-represented following independence in the 9 FAS that kept the colonial system of representation. To test this, we estimate the following equation on the entire sample of counties from the Original 13 states:

$$RRI1790 = B_S + B_1 RRI1775 + B_2 FAS + B_3(RRI1775 * FAS) + SFE + E \qquad (4)$$

where B_1 measures the relationship between *RRI in 1775* and *RRI in 1790* (the first post-colonial measure of *RRI*) in the 4 RAS. The coefficient of interest is B_3, which measures the relationship of the interaction of *RRI in 1775* and a dummy variable indicating whether the county is a fixed apportion state (FAS) and *RRI in 1790*. We expect B_1 to exhibit no meaningful relationship between the colonial *RRI* (in 1775) and the first post-colonial *RRI in 1790*. And, we expect B_3 to show a strong positive and large relationship between *RRI in 1775* and *RRI in 1790* in the counties of the 9 FAS. Indeed, the coefficient on B_3 is statistically significant at the 99.9% level, and indicates that a 10% increase in the *RRI in 1775* is correlated with a roughly 7% increase in *RRI in 1790* in the counties of the 9 FAS. On the other hand, B_1 shows that there is no meaningful relationship between the colonial *RRI* and the first post-colonial *RRI* in the counties of the 4 RAS.[28] *SFE* indicates that the model is estimated with state fixed effects. Finally, *E* refers throughout to the error term.

Figures 4a and 4b show the relationship between county *RRI* in the colonial era (1775) and *RRI in 1850* and 1950, respectively, separately in the 9 FAS and 4 RAS.[29] Remarkably, the coefficient on *RRI in 1775* in the 9 FAS is only slightly smaller for 1950 (4b) than 1850 (4a). This shows that the choice to maintain the colonial basis in 9 FAS resulted in a highly persistent source of political inequality. Measuring
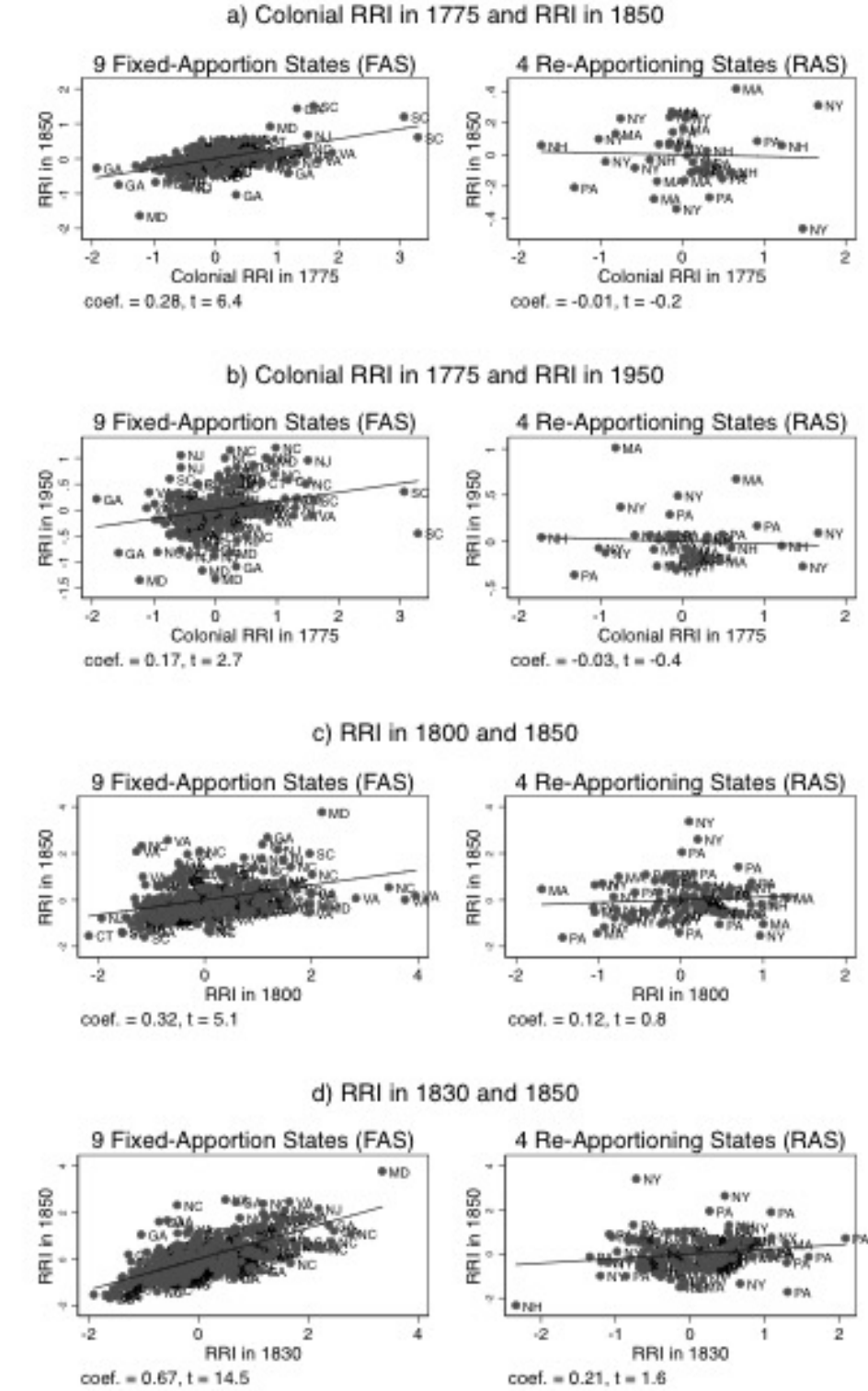
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[28]The Wald test of the differences in the relationship between *RRI in 1790* and *RRI in 1775* across counties in FAS and RAS produced a p-value of 0.0001. These estimates for Equation 4 are shown in Appendix Table D2.

[29]In the paper, all figures present a split-sample estimation strategy in which the left figure shows the estimates on only the counties of the 9 FAS, and the right for only the 4 RAS. For all split-sample models presented in this paper, the appendix includes estimates for models including an interaction between a dummy for whether a county is in a FAS and *RRI* pooling the counties across the 13 states (i.e., as with Equation 4). The split sample estimation strategy used for the figures provides a more stringent test, as it is estimated with fewer observations and allows relevant covariates (such as county slave share) to vary across the FAS and RAS.

the same relationship in the counties of 4 RAS results in a different sign, and no correlation whatsoever. We also show the relationship between *RRI in 1850* and two previous periods, *RRI in 1800* (Figure 4c) and 1830 (Figure 4d).[30] The persistence of initial representation in the 9 FAS is shown clearly as the over-represented counties strongly tend to remain over-represented throughout this period. For instance, a 10% increase in *RRI in 1830* is correlated with a nearly 7% increase in *RRI in 1850*. Reassuringly, there is very little evidence of persistence of this form of political inequality in the 4 RAS.

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[30]Figure 1a shows the relationship between the county values for *RRI in 1790* and *RRI in 1850* separately in the 9 FAS and 4 RAS. Using the model from Equation (4), we estimated the conditional relationship between *RRI in 1850* and *RRI* in each previous decade. These estimates are reported in Online Appendix D-Table D1.

Figure 4: Persistence of Initial Inequality

a) Colonial RRI in 1775 and RRI in 1850

coef. = 0.28, t = 6.4   coef. = -0.01, t = -0.2

b) Colonial RRI in 1775 and RRI in 1950

coef. = 0.17, t = 2.7   coef. = -0.03, t = -0.4

c) RRI in 1800 and 1850

coef. = 0.32, t = 5.1   coef. = 0.12, t = 0.8

d) RRI in 1830 and 1850

coef. = 0.67, t = 14.5   coef. = 0.21, t = 1.6

Each model includes state fixed effects

II.III   *The Long Run Effects of Political Inequality on Public Goods*

The third empirical implication of our argument is that the persistent political inequality identified in the previous section shaped public goods provision in the long run. To allay concerns that our measure of county-level political inequality (RRI) is measured with error or that the estimates are biased by omitted factors, we instrument RRI with geographical factors that affected initial political inequality but which did not directly affect the subsequent allocation of state revenues. Crucially, this initial choice of representation occurred before state governments were involved in publicly supporting education (Goldin and Katz 2009: 137). This alleviates concern of reverse causation from more education to more egalitarian institutions. Another strategy we employ is to use state-level inputs into public education provisioning as opposed to measures of educational outcomes, such as illiteracy rates (which we use as a control). By using inputs into public goods provisioning, as opposed to outcomes which could be determined by many hard-to-observe factors, we are much less likely to violate the exclusion restriction on the IV model. This evidence is supported with numerous other late antebellum era county-level measures of public education provisioning. We conclude by showing that initial county-level political inequality is correlated with county-level public education outcomes today.

To examine the effects of political inequality due to malapportionment in the state legislatures on the distribution of public goods, we use county-level spending on education that is derived *from state sources* in 1850. This value is then divided by the county's white school-aged (5-19) population in 1850 to generate a measure of state spending per capita at the county level. This data was located in the 1850 Census, and is the only systematic nation-wide measure of education spending, both public and private and by level of government (i.e., state and local), across the U.S. that provided county-level information during the antebellum era.[31] This allows us to measure early investments in public education, which economic historians have found to be correlated with contemporary public goods and development (Nunn 2014). Figure 1c above offered suggestive evidence corroborating this argument for the original 13 states. Furthermore, this was a critical time of the development of the US public education system. Goldin and Katz (2009: 129) argue that,

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[31]While there is, of course, measurement error in these data, concerns about bias are mitigated by a few factors. For one, as Nunn (2008: 9) argues that, "because all data are from the US Census, using similar procedures and administration, the data are reliable and any measurement errors and biases should be similar across states." Our concerns should be further assuaged given the greatest source of measurement error is in the dependent variables (Wooldridge 2012: 303).

"the key features of US education institutions – which we term virtues – that were present in 1900.....had emerged prior to the Civil War. These virtues would determine US educational development in the 20th Century."

Estimation Framework

We compare public education investments from state sources between counties of the FAS and RAS by estimating equation (5) below:

$$S_i = B_S + B_1(RRI1850) + B_2FAS + B_3(RRI1850*FAS) + B_SX_i + SFE + E \tag{5}$$

where S_i is county-level education spending from state sources per white school-aged capita, ages 5 to 19, in 1850 in county i, *RRI in 1850* is the measure of political inequality of county i in 1850, FAS is a binary measure of whether the county is in a fixed-apportioned state, X_i is a vector of county-level controls, and SFE are state fixed effects.

The choices of covariates are an attempt to control for variation across counties in both demand for public education and the ability to supply higher levels of public subsidies. While these choices are also based on factors that have been identified in the economic history literature to have influenced education spending in this era, most seem more appropriate to understanding the determinants of *locally*-provisioned public education spending. We include both the share of a county's population living in urban areas of 5000 people or more and the county population density of whites, ages 5 to 19, in 1850. Both are proxies for economic development and the demand for and possible economies of scale of provisioning education. We also include a variable measuring the total county value of capital invested in manufacturing per its AWM population. This is another measure of development, as well as a county's demand for and ability to supply public goods. Numerous studies have shown a negative relationship between public goods and ethnic diversity (e.g., Alesina, Baqir and Easterly 1999), which justifies controlling for the share of foreign-born among each county's white population in 1850. Greater economic inequality, in particular, land inequality in largely agricultural economies, has been shown to negatively affect public goods provision (e.g., Ramcharan 2010, Galor, Moav and Vollrath 2009). We therefore control for this by including a measure of county

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inequality of land ownership (Nunn 2008). Some scholars have argued that previous findings showing the importance of 'good' institutions simply reflect the effects of existing human capital on development (e.g., Glaeser et al. 2004). Accordingly, we control for the adult illiteracy rate among native-born whites in 1850. We also include a variable measuring the share of a county's total population that was enslaved in 1850. Finally, *SFE* are state fixed effects, which are included to control for unobserved state-level heterogeneity that might affect the *levels* of state spending per white school-age child.[32]

OLS Estimates

The estimates for Equation 5 are reported in column 1 of Table 2. The coefficient on the interaction of *RRI in 1850* and the dummy indicating whether a county was in an FAS shows that representation in the 9 FAS has a large effect on a county's allocation of state educational revenues. A 10% increase in *RRI in 1850* is correlated with a county receiving roughly 6% more in state education spending per white youth capita in the 9 FAS. The estimate of B_1 indicates that there is no appreciable relationship in the counties of the 4 RAS. We find similar results when this model is estimated separately on the counties from the 9 FAS and 4 RAS, respectively. These estimates are reported in Columns 2 and 3 of Table 2.[33] When estimated on only the counties of the 9 FAS, the coefficient on *RRI in 1850* is statistically significant at the 99% level with a similarly large magnitude. A one standard deviation increase in a county's value for *RRI in 1850* in the 9 FAS is associated with an increase in state-level spending per white school aged capita of 36% controlling for the covariates in Equation 5. The coefficient on *RRI in 1850* in 4 RAS is actually negative. As predicted, it is statistically insignificant, and the magnitude is small.

Instrumental Variable (IV) Estimates

There are two primary concerns regarding the OLS estimates. Measurement error in the political inequality variable, *RRI*, may be biasing the estimates. More importantly, there may be omitted factors that affect both

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[32]Within states, there is no reason to think errors are not independent. Furthermore, our models are cross-sectional, and state dummies are included to control for differences across states. That said, the estimates are robust to clustering the standard errors at the state level (see Appendix A-Table A6). The estimates (as shown in Appendix Table E1) are also robust to including county-level (AWM) turnout by using the average of county turnout in the 1848 and 1852 Presidential elections (Go and Lindert 2010).

[33]The partial regression plot for *RRI in 1850* for this model is shown in Figure 1b. Plots of the bivariate relationship between state-level public education spending per white youth and *RRI in 1850* are shown in Appendix-Figure A4.

RRI and public goods provisioning. Ideally, we would use the exogenous sources of variation for each state's initial choice of representation – state size and suitability for slavery – to instrument for *RRI*. Yet, these are state-level factors that influenced a state-level choice, but one which affects the distribution of within-state political power. Since we can not instrument at the county level for the state dummy, FAS, we cannot employ the same interaction model from Equation 5. We therefore estimate the effects of RRI using a two-stage least squares (2SLS) model separately on the counties of the 9 FAS and 4 RAS. We need exogenous sources of variation at the county level that affect *RRI* but not the state allocation of public education revenues. We use county distance from the Atlantic coast and mean county elevation as instruments for each county's *RRI in 1850.* We generate this variable by combining historical county boundaries with NASA's Shuttle Radar Topology Mission (SRTM) data, which measures elevation every 10 meters, to generate an extremely accurate measure of mean county elevation in each period.[34]

The exclusion restriction requires that these geographic instruments affect *RRI*, but do not directly influence the within state allocation of state education revenues in 1850. Greater elevation negatively affects the profitability of slavery, which we established influenced the initial choice of representation. We claim it has no direct effect on the allocation of state resources in 1850. Geography, though its effects on development, could certainly affect the level of locally-provisioned public goods. Yet, our dependent variable only measures what a county receives from the state government in public education expenditures as share of the county's white (5-19) population in 1850. Legislation passed in the state legislature stipulated the formulas by which state education revenues were to be allocated. The exclusion restriction would be violated if the amount each county was allocated was due, at least in part, to local-level factors that could be influenced by these geographic instruments. We found that none of the state legislation outlining the formula by which education revenues were allocated included factors that could be affected by local-level development. The statute in North Carolina that stipulated each county's share of the state education revenues was allocated according to a county's federal population (i.e., total white population and 3/5th of the non-white (i.e., slave) population; Commissioner of Education for the Year 1896-97: 1422). Since only white children were allowed to be educated publicly, white children in heavily enslaved counties received a much higher

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[34]See Appendix D for information on the sources and measurement of this geographical variable.

than average per capita share of state education revenues. In Maryland, the formula specified that half the state education revenues would be split equally among the counties, and that the other half would be apportioned based on population (Harry 1902). In Connecticut, the "Town Deposit Fund", half of which was specified to be spent on education, was allocated based on town, regardless of population. These allocation formulas are consistent with the effects of malapportionment on the ability of a minority of the population to pass legislation that unequally allocates state resources to their districts rather than the effects of within state differences in development on variation in state-level provisioned public goods. Furthermore, these geographic instruments are not correlated to the within state allocation of state resources in the 4 RAS. State-level education revenues in the RAS were allocated to each county or town based on each district's school-age population.

Table 2 (Columns 4-5) reports the 2SLS estimates. In the first stage, the Kleibergen-Paap (K-P) weak identification F-statistic of 68 in the counties of the 9 FAS states assuages any concern that the instruments are weak. As Column 4 of Table 2 shows, the IV estimates for *RRI in 1850* produces coefficients significant at the 99.9% level. While the IV coefficient is slightly larger than the OLS (Column 2), a Hausman test fails to reject the null that the OLS and IV coefficients are equal. The F-stat of less than 1 indicates that the instruments are very weakly correlated in the first stage with *RRI in 1850* in the 4 RAS (Column 5). This is reassuring, as representation in the state legislatures of the 4 RAS was determined by population, and there should not be an exogenous source of variation that is correlated with its *RRI*.

Table 2: Public Education Spending and *RRI in 1850*

	Interaction Model	Split Sample			
	OLS	OLS		2SLS	
	13 States	9 FAS	4 RAS	9 FAS	4 RAS
	(1)	(2)	(3)	(4)	(5)

DV: County Educ. Spending per White Cap, 5-19, from State Sources, 1850

	(1)	(2)	(3)	(4)	(5)
RRI in 1850	0.04	**0.59***	**-0.04**	**0.88***	**-1.85**
	(0.21)	**(0.14)**	**(0.23)**	**(0.19)**	**(4.36)**
FAS	2.5***				
	(0.27)				
*(RRI in 1850)*x*(FAS)*	**0.52****				
	(0.22)				
1850 Covariates	Y	Y	Y	Y	Y
K-P Weak Ident. F-stat.				68.0	0.8
Stock-Yogo Test				<5%	>25%
N (Counties)	452	308	144	308	142

Notes: Column 1 reports OLS estimates using all the counties of the 13 states. Columns 2-5 report estimates when the sample is split into counties from the 9 FAS and 4 RAS, respectively. The instruments in columns 4 and 5 are: 1) the nearest distance of the center of each county to the Atlantic Ocean in 1850 and 2) mean county elevation. K-P Weak Identification F-stat refers to the Kleibergen-Paap F-statistic of the first stage of the excluded instrument. Stock-Yogo test refers to the null hypothesis that the instrument(s) are statistically weak, in which '5%' indicates the K-P F-stat exceeds the highest threshold of instrument weakness.

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

Robustness

The models from columns 2 and 3 of Table 2 were used to generate the expected values for county public education spending from state sources per white youth in 1850 in the 9 FAS and 4 RAS, respectively, across variation in *RRI in 1850* (Tomz, Wittenberg and King 2003).[35] The resulting Figure 5a reveals a strongly positive relationship between over-representation and the allocation of state educational revenues in the 9 FAS, and no relationship in the 4 RAS. While the coefficients on the OLS and 2SLS models in Table 2 are large, this does not *per se* provide definitive evidence that this source of political inequality was of major practical significance. In addition, to ensure that the findings do not depend on the choice of a particular indicator, we run the same specification on two additional measures of county-level public education provision each derived from the 1850 Census: share of public school (PS) spending from rate bills and total county-level public education spending per white youth in 1850.[36] These are indicators of whether the over-allocation of state public education revenues to the overrepresented districts lowers the share of public education spending derived from private tuition (i.e., rate bills) and increases the amount of total county-level public education spending, respectively. That is, we expect that in the overrepresented counties of the 9 FAS, there should be a lower share from private rate bills and more total county-level public education spending. Furthermore, we expect to see no relationship between *RRI* and these county-level measures of public education in the 4 RAS. Figures 5b and 5c confirm that this is the case, and provides further evidence that the choice of elites at the time of independence had large effects on long-term public spending in the overrepresented counties of the 9 FAS.[37] We also find that in the overrepresented counties a greater share of the total (public and private) county-level education spending came from public sources and that these counties had more public school teachers per white youth.[38]

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[35] Each figure was created with Clarify, which uses postestimated simulations to generate expected values of the dependent variable at various levels of *RRI in 1850* (when each 1850 county-level covariate is set to its mean). Each figure includes (shaded) 95% confidence intervals of the expected values.

[36] It was common in this era for public revenues to subsidize a portion of the costs of public education, and the pupil to pay the rest, which were known as rate bills (Goldin and Katz 2009).

[37] The level of public education revenues raised locally is surely determined, in part, by economic development, which can be influenced by geography. Therefore, we cannot employ the same IV strategy in these models, as it is possible that the exclusion restriction is violated.
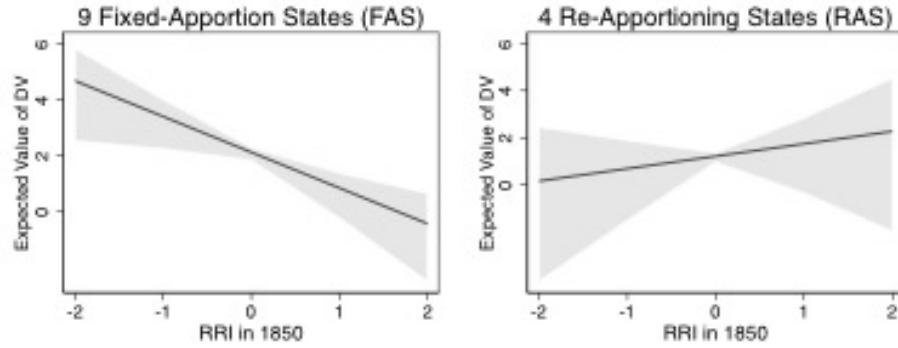
[38] These results are shown in Appendix E-Table E2.

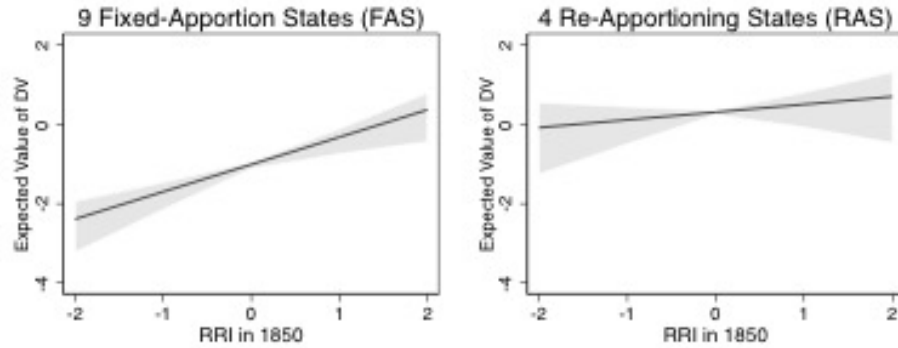Figure 5: RRI and Public Education Spending in 1850

a) DV: County Educ. Spending per Whites, 5-19, from State Sources, 1850 (log)
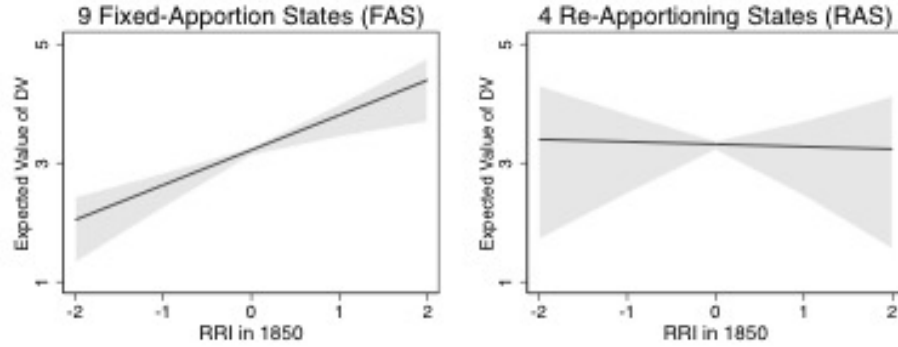
b) DV: Share of County Public Educ. Spending from Tuition 1850 (log)

c) DV: County Local and State Educ. Spending per Whites, 5-19, 1850 (log)

Note: Each figure was generated with Clarify, and shows the expected value of each dependent variable with (shaded) 95% confidence intervals against the values of *RRI in 1850*, holding all other covariates at their mean. Each model includes state fixed effects. The OLS and IV estimates for 5a are reported in Table 2. The OLS estimates for Figures 5b and 5c are reported in Appendix E.

II.IV   *The Persistent Effect of Initial Political Inequality on Public Goods*

The evidence above should provide much confidence that we are identifying a very strong relationship between persistent political inequality due to an initial choice and the distribution of state-level education spending 75 years after the end of colonialism. Recall that in Figure 1c we showed that variation in our dependent variable from equation 5 (Table 2) is highly correlated with white adult educational attainment and median white income in 2000 across the counties of the 13 states. While we do not have a viable strategy for identifying the effect of *RRI in 1850* on white education and development outcomes in 2000, we now provide evidence of a plausible channel through which this source of political inequality could cause this observed pattern.

In the 9 FAS, the unweighted average of public education spending in 1850 that was derived from state, as opposed to local, revenues was 60%. By comparison, this figure was only 17% in the 4 RAS.[39] Greater centralization of public goods provisioning combined with the observed unequal allocation of state-level resources strongly suggests that the consequences of being underrepresented were significant in the FAS. Figure 6 shows that the 9 FAS states continued to finance a large share of public education revenues at the state level until the US Supreme Court ended systematic malapportionment in 1964. Similarly, Figure 7a, which shows the expected value of *RRI in 1960* against *RRI in 1850*, reveals that the distribution of representation in the 9 FAS remained systematically biased over 100 years later in favor of the over-represented counties of the mid-19th Century. Despite the massive changes wrought by urbanization and industrialization, a 10% increase in *RRI in 1850* is correlated with a greater than 3% increase in *RRI in 1960*. Taken further, the basis of representation chosen at independence tended to overrepresent the same counties nearly 200 years later in the 9 FAS. By contrast, this pattern does not exist in the 4 RAS. We argue that this is the primary channel through which the effects of the choice of initial political inequality continue to be observed to this day. Highly malapportioned states financed a relatively greater share of their public education spending at the state level for nearly 100 years after the end of slavery and spending was disproportionately allocated to the overrepresented districts. Capture by privileged districts leads to larger levels of spending but also to higher levels of inequality of access to public goods.

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[39]Then, as now, there was great variation across and within states in the source of public education revenues. Online Appendix E provides more details regarding public education financing in the Original 13 states following the end of colonialism.

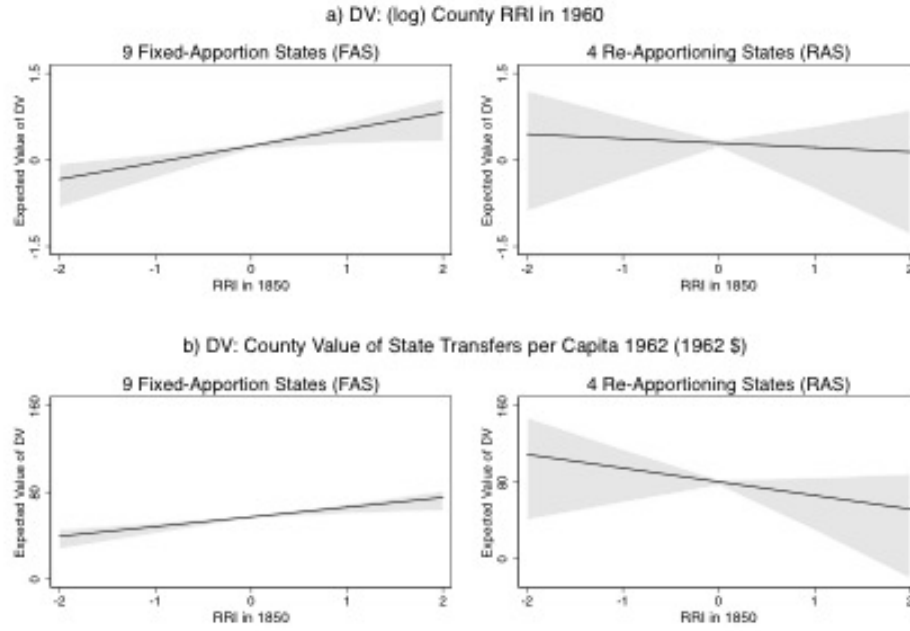Figure 6: Share of Public Educ. Spending from State Revenues, 1850-1963

The 1962 Census of Governments reports the amount of direct state transfers to the counties. According to Ansolabehere, Gerber and Snyder (2002: 769), this comprised a little more than a third of all state revenues, and approximately half of these direct transfers from the state were allocated for educational purposes. Figure 7b shows that the expected value of county-level transfers from the state in the 9 FAS is highly positively correlated with *RRI in 1850* when holding all 1850 county-level covariates at their mean.[40] By contrast, the expected value of state transfers is negatively correlated with *RRI in 1850* in 4 RAS. Consistent with our argument, the available evidence suggests that persistent political inequality continued to affect the allocation of public goods in the 9 FAS, but not in the 4 RAS.

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[40]Controls for county-level economic development in 1850, such as population density, urban population share, foreign population share, native-born white adult illiteracy, Manufacturing capital per AWM, slave share, and land inequality, are included in each specification.

Figure 7: Persistence in Initial Political Inequality

a) DV: (log) County RRI in 1960

9 Fixed-Apportion States (FAS)   4 Re-Apportioning States (RAS)

b) DV: County Value of State Transfers per Capita 1962 (1962 $)

9 Fixed-Apportion States (FAS)   4 Re-Apportioning States (RAS)

Note: Each figure was generated in Clarify, and shows the expected value of each dependent variable with (shaded) 95% confidence intervals against the values of *RRI in 1850*, holding all other covariates at their mean. Each model includes state fixed effects. The OLS estimates for each figure are reported in Appendix E.

CONCLUSION

This paper has shown how legislative malapportionment at the time of independence has carried the legacy of colonialism and slavery even after their demise. We have shown that two exogenous factors – state size and climate and geography – explain whether constitution-makers in each of the original 13 states created legislatures in which representation was apportioned according to white population or whether it was fixed to preserve the interests of the coastal and rural elites. This initial choice created systematic political inequality in the nine fixed-apportionment states, a variable for which we provide a new measure here, that in turn shaped public education provisioning at the end of the antebellum period. Finally, we have also shown that the effects of this political institution continue to be large to this day. This persistence is all the more striking when one considers the massive economic and social changes that have occurred within the US over the past two centuries, the fact that labor movement is unrestricted, and the significant increase in federal-level redistribution.

This paper provides an institutional channel that explains, in part, the puzzle of why whites whom currently reside in the formerly heavily-enslaved areas of the former slave states are wealthier than whites residing in the formerly less slavery-intensive areas. Past studies that have identified this correlation have been unable to provide evidence of a mechanism by which slavery continues to influence contemporary outcomes (Nunn 2008). While some scholars have noted that *public* education spending on whites in the antebellum era was higher in the more enslaved areas of the slave states (Kaestle 1976), the common narrative in the literature is that the antebellum South's low public goods provisioning was due to their suppression by slave-owning elites (e.g., Fogel 1994, Wright 2006). Instead, the findings presented above suggest a more nuanced story: malapportioned legislatures created to protect slavery at the time of the nation's founding allowed whites in heavily enslaved areas to disproportionately allocate state resources to – and provision public goods in – the overrepresented portions of the slave states.

This study also speaks to the literature on democratic transitions, and, in particular, the ability of elites to design institutions that preserve their political power even after major political and economic changes (e.g., Acemoglu and Robinson 2006). Of critical importance to this literature, we show that these initial institutions can persist long after this transition period. Despite implementation occurring prior to

industrialization, state-legislative malapportionment persisted through the early 1960s, when an exogenous federal-level decision of the Supreme Court ended it. Given the duration of this systematic political inequality, and its demonstrated effect on the within-state distribution of public goods provisioning, it is therefore unsurprising that this measure of inequality is so highly correlated with subsequent within-state patterns of development. Most importantly to the CPE literature, we provide evidence of an institutional channel through which the effects of colonialism and slavery continue to be observed today. The identification strategy of precisely measuring one US state-level political institution, and estimating its within-state effects, means that this finding does not suffer from the usual biases incurred in cross-national studies trying to estimate the effects of institutions on development.

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