Not For Publication

Online-Only Appendix and Supplementary Information to:

"Economic Geography, Political Inequality, and Public Goods in the Original 13 US States"

Appendix A - Supporting Figures and Tables as cited in the text of the paper

Appendix B – Instrumental Variable Estimates

Appendix C – Initial Conditions at the End of the Colonial Period

Support is provided that upon independence the choice of initial basis of legislative representation was not determined by unobserved factors

Appendix D – Measuring State level Political Inequality (*RRI*)

Information on how the variable county-level *Relative Representation Index, RRI*, was constructed

Appendix E – Public Education Spending in the Antebellum Era (1789-1860)

Information is provided regarding the development of public educational institutions in the US

Appendix A - Table A1 - Classifications of Original 13 States

State Name	State Abbreviation	Slave State	Biased (Fixed) Apportionment during Colonial Era	Biased Apportionment During Antebellum Era
Connecticut	CT	NO	YES	YES
Delaware	DE	YES	YES	YES
Georgia	GA	YES	YES	YES
Maryland	MD	YES	YES	YES
Massachusetts	MA	NO	YES	NO
New Hampshire	NH	NO	YES	NO
New Jersey	NJ	NO	YES	YES
New York	NY	NO	YES	NO
North Carolina	NC	YES	YES	YES
Pennsylvania	PA	NO	YES	NO
Rhode Island	RI	NO	YES	YES
South Carolina	SC	YES	YES	YES
Virginia	VA	YES	YES	YES

Appendix Table A2 – County-level Variables: Definitions and Sources

Variables	Variable Definitions	Source(s)
Political Inequality		
RRI	See Text and Appendix D	See Text and Appendix D
Dependent Variables		
State-level Public School (PS) Spending per White Pop., ages 5-19, 1850 ($)	log (county Public Educ. Spending ($) from State Sources per White Pop. (ages 5-19) in 1850)	1850 Census (Author Calculations). Data located at: www.icpsr.umich.edu
Private Tuition (Rate Bills) Share of Tot. Public Educ. Spending, 1850	log (county total tuition in public schools (Rate Bills) as share of total public education spending in 1850)	1850 Census (Author Calculations).
Tot. State & Local PS Spending per White Pop, 5-19, 1850 ($)	log (total county public educ. spending ($) from state and local sources per white pop. (ages 5-19) in 1850)	1850 Census (Author Calculations).
White Public School Teachers per White School-age Pop., 1850	log (county White Public School Teachers per White Pop. (ages 5-19) in 1850)	1850 Census (Author Calculations).
White Public School Teachers per White School-age Pop., 1890	log (county White Public School Teachers per White Pop. (ages 5-19) in 1890)	1890 Census (Author Calculations)
State Transfers Per Capita, 1957 (1957 $)	log (relative per capita transfers from state government to the county in 1957)	Census of Governments, 1957
Controls		
Wh. Pop. Density, Ages 5-19, 1850	log (total county white population, ages 5-19, in 1850, divided by the county square mileage size, as it existed in 1850	1850 Census. Historical county boundaries: http://publications.newberry.org/ahcbp/index.html
Urban Pop, 5000+, 1850 (%)	log (county's urban population of cities with 5000 or more people divided by the county's total population in 1850)	1850 Census (Author Calculations)
Share of Wh. Pop. Foreign-Born, 1850 (%)	log (county's white foreign-born population divided by a county's total white pop. in 1850)	1850 Census (Author Calculations)
Value of Manufacturing Capital per AWM, 1850	log (total value of manufacturing capital in a county divided by its Adult White Male (AWM) Pop. In 1850)	1850 Census (Author Calculations)
Native-born Wh. Adult Illiteracy Rate, 1850 (%)	log (county's native-Born Adult White Illiteracy Rate in 1850)	1850 Census (Author Calculations)
Gini Coeff. Land Inequality, 1860	log (Gini coefficient of the inequality of a county's land ownership distribution in 1860)	Nunn (2008). Data located at: http://scholar.harvard.edu/nunn/pages/data-0
Slave Pop. Share, 1850 (%)	log (county slave population divided by county total population in 1850)	1850 Census (Author Calculations)
Instrument		
Distance to Atlantic Coast (Meters)	log (direct distance from the center of a county to the Atlantic Coast based on county boundaries from a particular year). Years: 1775, 1790, 1850	Historical County Boundaries - http://publications.newberry.org/ahcbp/

Appendix - Table A3 - Descriptive Statistics

	Original 13 States	9 BAS	4 PAS
Dependent Variables			
State-level Public School (PS) Spending per White Pop, 5-19, 1850 ($)	***0.3***	***0.3***	***0.32***
	(0.3)	***(0.34)***	***(0.19)***
Private Tuition (Rate Bills) Share of Tot. Public Educ. Spending, 1850	0.264	0.344	0.062
	(0.36)	(0.392)	(0.1)
Total State & Local PS Spending per White Pop, 5-19, 1850 ($)	0.78	0.53	1.44
	(0.79)	(0.69)	(0.7)
State Transfers Per Capita, 1957 (1957 $)	64.3	58.2	79.5
	(28.5)	(18.5)	(40.8)
Control Variables			
Total Population, 1850	22,666	14,027	46,039
	(35,399)	(14,663)	(57,700)
Wh. Pop. Density, 5-19, 1850	26.9	8.65	76.4
	(234.2)	(16.1)	(447.8)
Urban Pop, 5000+, 1850 (%)	2.9	1.6	6.3
	(12.6)	(9.5)	(18.2)
Share of Wh. Pop. Foreign-Born, 1850 (%)	4.5	2.2	11.0
	(7.4)	(4.7)	(9.3)
Value of Manufacturing Capital per AWM, 1850	141.7	113.6	218.0
	(213.1)	(225.0)	(153.4)
Native-born Wh. Adult Illiteracy Rate, 1850 (%)	17.7	23.2	3.5
	(16.4)	(16.0)	(4.0)
Gini Coeff. Land Inequality, 1860	0.45	0.45	0.44
	(0.06)	(0.06)	(0.05)
Slave Pop. Share, 1850 (%)	22.9	31.3	0.0
	(23.6)	(22.3)	(0.0)
Instrument			
Distance to Atlantic Coast (Meters)	180718.6	175768.5	194296.9
	(136264.2)	(140153.4)	(124428.3)
N (Counties)	542	396	146

Appendix Figure A4 - Full OLS Regression Estimates for Table 2 (Columns 2, 3)

DV (each Column): County Educ. Spending per White Cap, 5-19, from State Sources, 1850 (log)

VARIABLES	(1) 9 BAS	(2) 4 PAS	(3) 9 BAS	(4) 4 PAS
log_RRI_1850	**0.649*** **	**0.00378**	**0.649*** **	**0.00378**
	(0.149)	**(0.238)**	**(0.149)**	**(0.238)**
log_Urban_Share_1850	-0.0418	-0.0298	-0.0418	-0.0298
	(0.0588)	(0.0437)	(0.0588)	(0.0437)
log_Foreign_Born_Share_1850	0.0606	-0.120	0.0606	-0.120
	(0.0780)	(0.0743)	(0.0780)	(0.0743)
log_Land_Gini_1860	0.642**	-0.572	0.642**	-0.572
	(0.268)	(0.418)	(0.268)	(0.418)
log_Manuf_Adult_Wh_Males_1850	-0.0211	0.0771	-0.0211	0.0771
	(0.0279)	(0.0993)	(0.0279)	(0.0993)
log_Wh5to19_Pop_Density_1850	0.00674	-0.0770	0.00674	-0.0770
	(0.0705)	(0.150)	(0.0705)	(0.150)
log_Slave_Share_1850	0.0157		0.0157	
	(0.0740)		(0.0740)	
log_Native_Wh_Adult_Illiteracy_1850	-0.0351	-0.912	-0.0351	-0.912
	(0.279)	(0.673)	(0.279)	(0.673)
log_Total_Pop_1850	0.149	0.120	0.149	0.120
	(0.0929)	(0.137)	(0.0929)	(0.137)
N (Counties)	308	144	308	144
R-squared	0.599	0.654	0.599	0.654
State FE	YES	YES	YES	YES
State Clustered SE	NO	NO	YES	YES

Columns 1, 2: Robust standard errors in parentheses
Columns 3, 4: Robust standard errors Clustered at the State level in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Appendix A – Table A5: Interaction Model for Pooled 13 Original States of the Split-Sample Models from Figure 5

VARIABLES	(1) State	(2) Total	(3) Teachers
log_RRI_1850	0.0777	0.330	-0.0118
	(0.212)	(0.216)	(0.163)
BAS_dummy	2.499***	-0.0447	-0.119*
	(0.261)	(0.0960)	(0.0619)
log_RRI_1850xBAS	**0.516****	**0.406***	**0.146**
	(0.224)	**(0.239)**	**(0.162)**
log_Urban_Share_1850	-0.0372	0.0551	-0.0349*
	(0.0360)	(0.0367)	(0.0199)
log_Foreign_Born_Share_1850	0.0173	0.0851	-0.0844**
	(0.0519)	(0.0584)	(0.0426)
log_Land_Gini_1860	0.320	0.490**	-0.165
	(0.236)	(0.239)	(0.129)
log_Manuf_AWM_1850	-0.0101	0.0536*	-0.0102
	(0.0269)	(0.0293)	(0.0186)
log_Wh5to19_Pop_Density_1850	-0.0362	0.0232	-0.177***
	(0.0802)	(0.0469)	(0.0324)
log_Slave_Share_1850	0.0138	0.164**	0.0428
	(0.0692)	(0.0757)	(0.0562)
log_Native_Wh_Adult_Illiteracy_1850	-0.0636	0.00243	-0.258
	(0.267)	(0.276)	(0.219)
log_Total_Pop_1850	0.116*	0.0712	-0.00669
	(0.0689)	(0.0642)	(0.0527)
N (Counties)	452	485	506
R-squared	0.599	0.697	0.489
State FE	YES	YES	YES

Note: Models 1, 2, and 3 are the models from Figure 5a, 5b and 5c, respectively, but run with the entire sample of counties from the Original 13 states. Instead of a split sample from Figure 5a, we model the correlation of RRI as an interaction with the initial choice of state into apportionment status (BAS Dummy = 1 if the state chose a Biased Apportionment; PAS=0 if it chose a population-basis of apportionment).
DV in Model 1 is County Education Spending per White Cap, 5-19, from State Sources, 1850 (log)
DV in Model 2 is County Local & State Educ. Spending per White Youth, Ages 5-19, in 1850 (log)
DV in Model 2 is the Public-School (PS) Teachers per White Pop, ages 5-19 in 1850 (log)
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Appendix A – Table A6 – Bivariate Models from 1850 to 1957

Panel A – RRI in 1850 and Public Education Spending

VARIABLES	(1) 9 BAS	(2) 4 PAS	(3) 9 BAS	(4) 4 PAS
log_RRI_1850	0.601***	0.108	0.799***	-0.268
	(0.09)	(0.21)	(0.13)	(0.21)
N (Counties)	324	144	360	146
R^2	0.585	0.625	0.472	0.349
State FE	YES	YES	YES	YES

Models 1, 2: DV = *(log) County Educ. Spending per White Cap, 5-19, from* ***State Sources*** *(only), 1850*
Models 3, 4: DV = *(log) County Educ. Spending per White Cap, 5-19, from* ***State + Local Sources****, 1850*
Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Panel B – State Education Revenues and other Education Outcomes, 1850

VARIABLES	(1) 9 BAS	(2) 4 PAS	(3) 9 BAS	(4) 4 PAS
State Educ. Revenues per White, Ages 5-19, 1850 (log)	0.874***	0.0997	0.286***	0.0693
	(0.06)	(0.17)	(0.062)	(0.067)
N (Counties)	324	144	324	143
R^2	0.716	0.353	0.306	0.234
State FE	YES	YES	YES	YES

Models 1, 2: DV = *(log) County Educ. Spending per White Cap, 5-19, from* ***State + Local Sources****, 1850*
Models 3, 4: DV = *(log) County Public School (PS) Teachers per White Cap, 5-19, 1850*
Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Panel C – RRI in 1890 & 1957 and State Education Spending

VARIABLES	(1) 9 BAS	(2) 4 PAS	(3) 9 BAS	(4) 4 PAS
log_RRI_1900	0.288***	0.533***		
	(0.0406)	(0.0798)		
log_RRI_1950			0.146***	0.530***
			(0.0231)	(0.0563)
N (Counties)	430	151	489	153
R-squared	0.289	0.462	0.613	0.838
State FE	YES	YES	YES	YES

Models 1, 2: DV = *(log) County Public School (PS) Teachers per White Cap, 5-19, 1890*
Models 3, 4: DV = *(log) State Transfers per Capita, 1957*
Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Appendix A – Table A7: Full Reg. Estimates for Post-1850 Estimates (Figure 6)

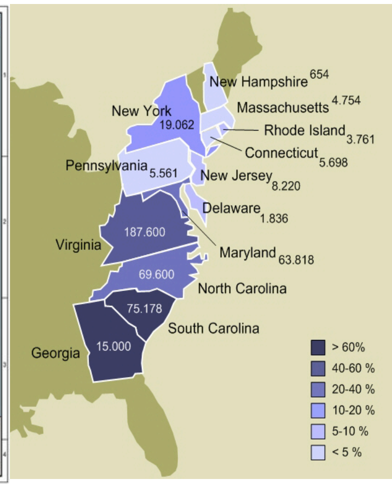
VARIABLES	(1) 9 BAS	(2) 4 PAS	(3) 9 BAS	(4) 4 PAS
log_RRI_1890	**0.301*** **	**0.165**		
	(0.0372)	**(0.104)**		
(log) Manuf. Capital p.c., 1890	0.00254	0.0612**		
	(0.0139)	(0.0285)		
(log) Total Pop., 1890	-0.0228	-0.132***		
	(0.0319)	(0.0311)		
(log) Foreign Born_Share_1890	1.335***	-1.512***		
	(0.515)	(0.497)		
log_RRI_1950			**0.102**	**0.0677**
			(0.07)	**(0.07)**
(log) Total Pop., 1950			-0.0600	-0.0803**
			(0.0470)	(0.0327)
White_Pop_Share_1950			0.254*	1.878**
			(0.152)	(0.902)
(log) Median Fam. Income, 1950			-0.0812	-0.808***
			(0.0740)	(0.166)
N (Counties)	416	151	489	153
R-squared	0.304	0.564	0.635	0.902
State FE	YES	YES	YES	YES

Models 1, 2: DV = *(log) County Public School (PS) Teachers per White Cap, 5-19, 1890*
Models 3, 4: DV = *(log) State Transfers per capita, 1957*
Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Appendix Figure A1 – Conditions at the End of the Colonial Era (1607-1775)

Population Density, 1775

Slave Population and Share by Colony, 1770



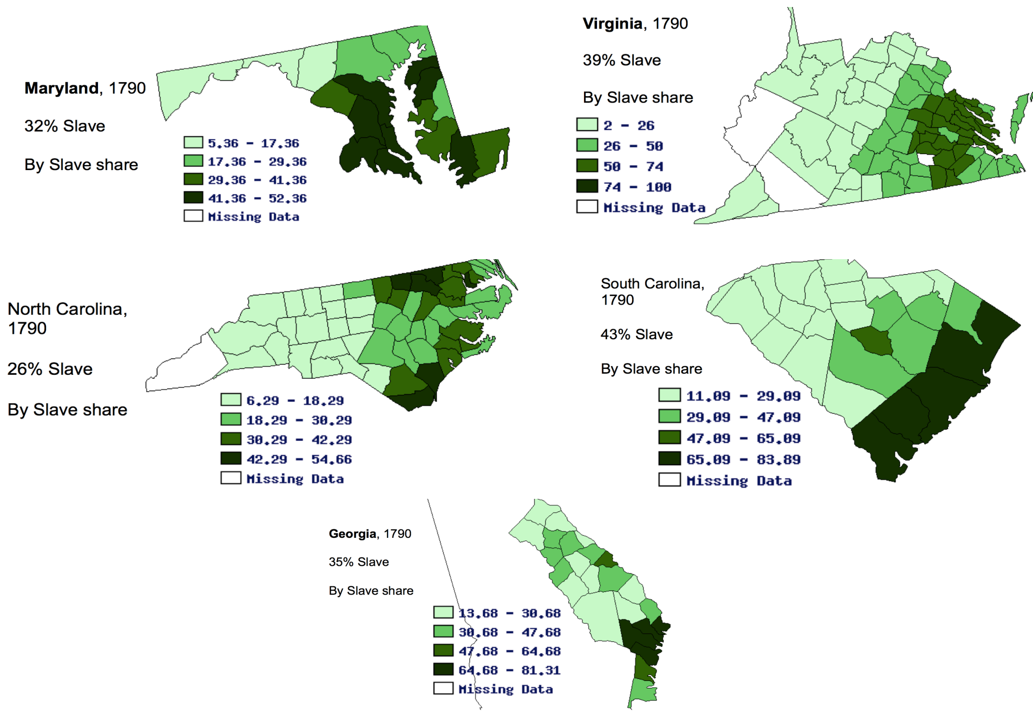
Sources: *Department of History, United States Military Academy;* Ira Berlin, 2003. *Generations of Captivity: A History of African-American Slaves*, London: The Belknap Press of Harvard University Press.

Appendix Figure A2 – Distribution of Colonial Rural Population in 1770.

Each dot represents 200 rural inhabitants. Circles represent urban areas.
Boundaries represent current state boundaries. Maine (1820) and West Virginia (1863) were part of Massachusetts and Virginia, respectively.

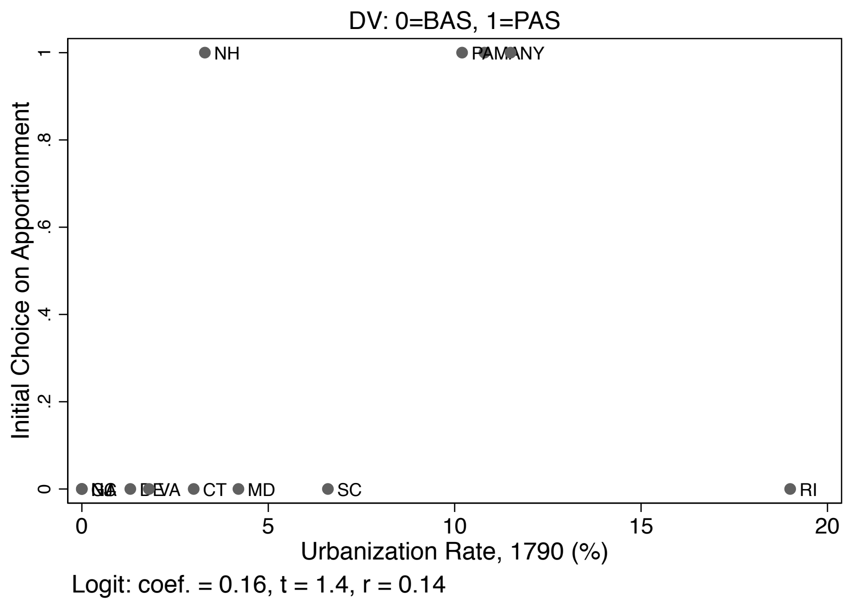
Source: Friis, Herman. 1940. "A Series of Population Maps of the Colonies and the United States" *American Geography Society: Geographical Review* 30(3): 463-470.

Appendix – Figure A3 – Within-State Distribution of Slave Share in Five Largest Slave States, 1790



Source: Historical Census Browser. Retrieved 2013 from the University of Virginia, Geospatial and Statistical Data Center: http://mapserver.lib.virginia.edu/collections/stats/histcensus/index.html

Appendix Figure A4: Urbanization Rate, 1790 and the Initial Choice of Representation



Note: The dependent variable is a binary indicator of whether a state chose a population basis of representation (PAS=1) or maintained the biased colonial system (BAS=0) upon independence. Urbanization rate is the state's share of its total population in 1790 living in cities of at least 5,000 residents.

Appendix B – Instrumental Variable (IV) Estimates

There are two primary concerns regarding the OLS estimates presented in Table 2. Measurement error in the political inequality variable, *RRI*, may be biasing the estimates. There may also be omitted factors that affect both *RRI* and public goods provision. 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 representation in the legislature. Since we cannot instrument at the county level for the state dummy, BAS, we cannot employ the same interaction model from Equation 2 of the main text. We therefore estimate the effects of *RRI* using a two-stage least squares (2SLS) model separately on the counties of the 9 BAS and 4 PAS. As an exogenous source of variation in *RRI* at the county level, we use the aforementioned county distance from the Atlantic coast as an instrument for each county's *RRI*.

The exclusion restriction requires that this instrument affects *RRI*, but does not directly influence the within-state allocation of state education revenues in 1850. County location (i.e., 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 this instrument. Looking at the relevant legislation for each state, we found no cases of this.[1] Instead these allocation formulas, which allocated some fixed and equal amount of revenues to each county regardless of population, are consistent with the effects of malapportionment on the ability of a minority of the population to pass legislation that disproportionately allocates state resources to their districts rather than the effects of within-state differences in development on variation in state-level provisioned public goods (Ansolabehere, Gerber and Snyder 2002). As a relevant counterfactual, county distance to the coast is not correlated to the within-state allocation of state resources in the 4 PAS. State-level education revenues in the PAS were allocated to each county or town based on each district's school-age population. We also include various controls in the first stage, such slavery and economic development, to control for many possible alternative channels.

Appendix B Table B1 (Columns 4-5) reports the 2SLS estimates. In the first stage, the Kleibergen-

[1]For instance, 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. 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 3/5 of the non-white 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 than average per capita share of state education revenues.

Paap (K-P) weak identification F-statistic of 68 in the counties of the 9 BAS states assuages any concern that the instrument is weak. As Column 4 of Table B1 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 PAS (Column 5). This is reassuring, as representation in the state legislatures of the 4 PAS was determined by population, and there should not be an exogenous source of variation that is correlated with its *RRI*.

Table 1: Public Education Spending and *RRI in 1850*

	Interaction Model	Split Sample			
	OLS	OLS		2SLS	
	13 States	9 BAS	4 PAS	9 BAS	4 PAS
	(1)	(2)	(3)	(4)	(5)
DV: County Educ. Spending per White Cap, 5-19, from State Sources, 1850					
RRI in 1850	0.08 (0.21)	**0.65***** **(0.15)**	**0.01** **(0.24)**	**0.88***** **(0.19)**	**-1.85** **(4.36)**
BAS	2.5*** (0.27)				
*(RRI in 1850)*x*(BAS)*	**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 BAS and 4 PAS, respectively. The instrument in the 2SLS models (col. 4 and 5) is: the nearest distance of the center of each county to the Atlantic Ocean in 1850. 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 is statistically weak, in which '5%' indicates the K-P F-stat exceeds the highest threshold of instrument weakness.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Appendix C – Initial Conditions of 13 Colonies at the Time of Independence

In line with the arguments and findings of ES (1997) and Easterly (2007), we might worry that the findings presented in this paper, and the choice of state's initial basis of apportionment, were due to the variation across 13 colonies in conditions at the end of the colonial era. The primary argument assuaging this concern is that non-slave states in both the mid-Atlantic and New England regions – states that were similar in conditions – implemented both fixed and re-apportioning systems of legislative representation. Second, it must be emphasized that original endowments of (measured) wealth, income, inequality, and human capital cannot account for the initial institutional choices of these states or their subsequent developmental paths. Appendix C – Table C1 shows that the slave colonies were wealthier, regardless of whether the value of enslaved property is included in the numerator, than the other colonies. Economic inequality is another reason often provided as a cause of the variation across countries in their initial political and economic institutions (ES 1997, Easterly 2007). While wealth inequality (among whites) was estimated to be slightly higher in the Southern states on the eve of independence, it was not significantly different than in the other regions. Income inequality in the slave states has been estimated to be lower than that in the Middle Atlantic Colonies.

This table also shows the extent to which the Southern states were attracting more white immigration than the other two regions prior to the creation of each state's first constitution. Using state militia rolls during the colonial period, Villaflor and Sokoloff (1982) estimated that roughly 50% of the whites born in the colony of Pennsylvania migrated to the Southern (slave) colonies. It was also widely believed during the Constitutional Convention of 1787 that the Southern states would soon have a majority of white citizens, as populations migrated 'south-westerly' along and over the Appalachian mountains (Farrand, Records of the Convention I: 605 1911 **?**). This belief was critical to some of the institutional protections that delegates from Northern states sought in the new federal government, and to the argument here that the findings below are not biased due to the omission of some unobserved factor existing in the relatively low slavery-intensive portions of the southern slave states. The possibility that some unobserved factor may explain why the under-represented non-coastal regions received less state-level education revenues can be ruled out, or at least these factors were not evident when institutional choices were being made at the end of the colonial era. The fact that movement into the Southern highland regions - the region that would be constitutionally underrepresented in the slave state legislatures and which was not geographically suited to the profitable use of slaves - came from the Mid-Atlantic states, and primarily from Pennsylvania, strengthens this argument. This pattern mitigates concerns that Southern colonial education policies are an unmeasured factor that were responsible for the antebellum era educational outcomes used in the empirics. It also strengthens the argument that labor scarcity concerns were important in states such as Pennsylvania.

As for initial differences across colonies in human capital, there is evidence to suggest that the regional differences were much smaller at the end of the colonial period than that which existed 75 years later. According to Galenson (1996: 193), adult male literacy in New England was near 90%, and 70% in Pennsylvania and Virginia. By 1850, Pennsylvania's native-born adult white illiteracy rate was less than one-fourth that of Virginia's. We also cannot attribute later differences to differences in public subsidies during the colonial era. Private tuition was the primary way education was funded in the colonies and the early US until the development of local and state subsidized common schools during the antebellum era (Go and Lindert 2010). Evidence is far from systematic, and all indications are that New England was much more developed at the time of independence in terms of provisioning some publicly subsidized education (Report of the Commissioner of Education 1895-1896). Yet, recall that half of the six New England states implemented fixed apportion systems. Until 1825, roughly 75% of total school revenues in New York were funded privately, while roughly half of the remaining 25% was funded at the state level and the half at the local level (Go and Lindert 2010: 6, New York Superintendent of Common Schools, Annual Report, 1820-1855). The share of total education spending that came from public sources only climbed above 50% around 1840. Furthermore, our primary dependent variable is state-level per capita white youth *spending* in 1850 at the county level (i.e., inputs), and not educational outcomes in the antebellum era. Instead, we use antebellum era educational outcomes (e.g., illiteracy rates) as controls for the effects of educational spending in 1850 on contemporary outcomes.

Finally, Appendix C-Table C1 shows that the South, did, indeed have a lower urbanization rate than the other regions. This may be a sign of large initial differences in development, as urbanization is often used as a proxy for historical economic development (e.g., AJR 2002; De Long and Shleifer 1993). Yet, these rather small differences should not lead us to infer that the North possessed an urbanized or proto-industrialized society at the end of the colonial era. Villaflor and Sokoloff (1982) argued that during the colonial era that internal migration was strictly from port cities to the rural frontiers: "Migration between rural and urban areas in the late 18$^{\text{th}}$ Century seems mostly to have been a matter of dispersing the multitudes of European immigrants and their American-born offspring who collected in the port cities (p. 549-550)." The northern cities of Boston, New York, and Philadelphia did not possess significantly better natural ports than, say, Baltimore, Norfolk, or Charleston, nor were they significantly larger at the end of the colonial era. Moreover, greater urbanization was no indicator of better initial institutional quality. The only state with an urbanization rate greater than 10% in 1790 (nearly 15 years after the end of colonialism) was Rhode Island, which at independence decided to retain its colonial charter as its governing structure. This meant that the most developed of these polities at the end of the colonial era began statehood with some of the new nation's most restrictive and unequal political institutions, both in terms of suffrage and legislative representation (Keyssar 2001: 71).

Lest one thinks that the continuation of this institution from colonialism was done naively and unknowingly, it is quite revealing that these four, large Southern states fought so vehemently at the 1787 constitutional convention for a population basis of apportionment at the federal level (e.g., Farrand 1911, Goldstone 2005). In Massachusetts, another of the large states that strongly supported a population basis at the federal level, Handlin's (1966) collection of the debates and petitions prior to the creation of Massachusetts' first state (and to this date only) constitution reveals that representation in the state legislature was a, if not the, primary issue of contention when creating the first state constitution. One such petition from an over-represented town reveals the importance to those in the over-represented areas of maintaining this political institution at the end of the colonial era, and that MA's choice to implement a population basis was not the continuation of an egalitarian colonial institution: "This state (MA) is constituted of a great number of distinct and very unequal corporations which corporations are the immediate constituent part of the state and individuals are only the remote parts." It was not just a major issue in the North. In Thomas Jefferson's famous "Notes on the States of Virginia", written in 1781, he said, "These 19,000 [electors]..living in one part of the country (Virginia's coastal tidewater section) give laws to upwards of thirty thousand living in another." This ratio would only worsen as the population shifted westward. In 1824, Jefferson wrote, "the equality of political rights is entirely prostrated by our constitution. Upon which principle of right or reason can any one justify the giving to every citizen of Warwick as much weight in the government as to twenty-two equal citizens in Loudoun, and similar inequalities among the other counties?"

A different interpretation, and one that is closer to Zagarri's (1987), is that in the small non-slave states inequality of state legislative representation was not very consequential for various reasons (e.g., greater homogeneity of economic interests due to small colony/state size, decentralization of political power and fiscal spending to the town-level). This argument can be countered with a bevy of evidence. For one, there was widespread dissatisfaction in these states regarding the effects of systematic overrepresentation of particular sectional interests. Even Zagarri outlines the great dissatisfaction in New Jersey over the effects of geographic malapportionment and the rule of the "Southern Junto" (Zagarri: 54). The Dorr Rebellion (1841), for instance, in Rhode Island was in no small part caused by anger over the extreme state-level malapportionment which gave a majority of representation to a small rural landholding elites in an increasingly urbanized and industrialized state (Keyssar: 71-76). Second, these small non-slave, malapportioned states, unlike their non-fixed New England and Middle Atlantic neighbors, raised a much higher share of their public educational revenues at the state-level (see Appendix E-Table E2, Column 2), and allocated them in an unequal manner (see Appendix E-Table E2, Column 4).

Appendix C-Table C1. Initial Conditions at the End of the Colonial Era (1607-1775)

	New England	Middle Atlantic	South
Migration			
Net Migration – 1730 – 1780			
Whites	-27,000	101,000	136,000
Slaves	-6,000	-1,000	150,000
Share of Whites Born in Region Residing in Other Two Regions	0.05	0.28	0.01
Wealth and Income, 1774			
Wealth per Capita (£)	36.6	41.9	54.7
Non-Human Wealth per capita (£)	36.4	40.2	36.4
Non-Human Wealth per free capita (£)	38	44.1	61.6
Gross Per Capita Income (in 1840 prices ($)	57.4	76.1	107.8
Inequality, 1774 (Gini Coefficient)			
Wealth Inequality	0.64	0.54	0.67
Income Inequality	0.35	0.42	0.38
Education, 1774			
White Illiteracy Rate	0.1	0.3	0.3
Urbanization Rate, 1790			
Share living in towns of 5000 or More	0.05	0.07	0.02

Notes:
New England includes: CT, MA, NH, and RI
Middle Atlantic includes: DE, NJ, NY, and PA
South includes: GA, MD, NC, SC, and VA

See Appendix A-Table A1 for state abbreviations.

Sources:
Migration (Villaflor and Sokoloff 1982, Galenson 1995, Gemery 2000); Wealth and Income (Jones 1980, Galenson 1995); Inequality (Jones 1980, Lindert and Williamson 2013); Education (Galenson 1995); Urbanization Rate (US Decennial Census, 1790).

Appendix C - Table C2. Conditions at Independence and the Apportionment Scheme Initially Adopted by Each State

State	Pop. Density, 1775 (1)	Slave Share, 1790 (%) (2)	Size, 1790 (sq. mileage) (3)	Share Frontier, 1790 (%) (4)	Miles of Shoreline / Size (5)	Initial Apportionment (6)
CT	37.3	1	5,543	0	0.11	Fixed (H); At-large (S)
RI	34.3	1	1,545	0	0.25	Fixed – Both
MD	20.0	32	12,407	0	0.26	Fixed – Both
DE	18.2	15	2,490	0	0.15	Fixed – Both
NJ	16.0	6	8,729	0	0.21	Fixed – Both
NH	9.4	0	9,350	0	0.01	White (H); Tax (S)
MA	7.2	0	43,969	63	0.11	White (H); Tax (S)
PA	7.1	1	46,055	49	0	Taxable Inhabitants
SC	5.6	43	32,020	0	0.09	Fixed – Both
VA	5.4	39	107,438	38	0.03	Fixed – Both
NC	5.2	26	53,865	0	0.06	Fixed – Both
NY	3.9	6	54,555	76	0.03	Voters (H); Freeholders (S)
GA	1.0	35	59,425	51	0.04	Federal Pop. (H); Fixed (S)

***Notes*:**
See Appendix Table A1 for state abbreviations. The size (Column 3) reported for each state reflects their territorial square mileage after the adoption of the US constitution. MA's and VA's measures include present-day Maine and West Virginia, respectively. Share Frontier (Column 4) measures the share of the state with fewer than 2 residents per square mile in 1790. *Miles of Shoreline to Size Ratio* (Column 5) is a state's miles of coastal shoreline divided by the state's square mileage.
In Column 6 (Initial Apportionment), H refers to a state's lower house, and S refers to a state's upper house. A fixed basis of apportionment refers to any representational system that does not reapportion at some prescribed period of time based on some population demographic. In the cases in which the apportionment was based on taxation, this usually referred to taxes on polls and closely resembled apportionment based on adult male population (both white and slave). The representatives to Connecticut's upper house were elected at large in a state-wide election. Apportionment to Georgia's lower house was based on federal numbers: white population plus 3/5th of non-white population.

Sources: Bureau of the Census, *A Century of Population Growth* (1909, Table 1, p. 9), 1790 US Decennial Census, Atlas of Historical County Boundaries, U.S. Congressional Districts, 1788-1841 (1978), PRISM Climate Data, Thorpe (1909).

Appendix D – Measuring Political Inequality – Relative Representation Index (*RRI*)

In Appendix D, we detail how this measure of political inequality – *Relative Representation Index* (*RRI*) – is constructed. To measure the extent of political inequality due to the initial choice of the basis of state legislative representation, county population data is combined with each state's electoral laws on the number of representatives and senators apportioned to each county. Using US Census data at the county level and each state's basis of apportionment, we are able to estimate the number of adult white males (AWM) per representative and senator in the state legislature for each county in each of the original thirteen states at ten year intervals from 1790 to 1850. These values for each county for each measure – county apportionment of members of the lower house (HOUSE) per county population of AWM of the state legislature and county apportionment of members of the upper house (SENATE) divided by the county's AWM for each state legislature – are transformed into a relative measure of representation for each county for each variable. Thus, for each original state from 1790 to 1850, a county value for HOUSERRI and SENATERRI is estimated based on the number of senators and representatives each county is apportioned per AWM in the county relative to the state mean. For each county, a variable called, *RRI*, is generated that represents the average of HOUSERRI and SENATERRI. Any value that is greater than 1 indicates that this county is over-represented, relative to the state mean, in the state legislature. A value of less than 1 indicates relative under-representation (or less representation than their AWM population deserves under equal representation). The log of this resulting variable, which we call *RRI*, is the variable used in the empirics to measure the effects of political inequality across counties in this political institution.

The sources of each state's apportionment rules, which are necessary to estimate each county's *RRI* in each state every census decade from 1790 to 1850 are three-fold. If a state had a constitutionally-based apportionment basis, such as New Jersey's one senator per county, then this was the apportionment basis used to estimate, in this case, the SENATERRI for each county in that state while this basis existed. States that periodically reapportioned due to some demographic characteristic, such as apportionment based on white population, determined their electoral districts and the apportioned representation to each on scheduled, periodic basis in the legislature. In these cases, the state law for each state over time that stipulated, for example, how many delegates each county received, was used to estimate *RRI*. Most of these legislative acts for each state were located in the State Session Laws of the Library of Congress.

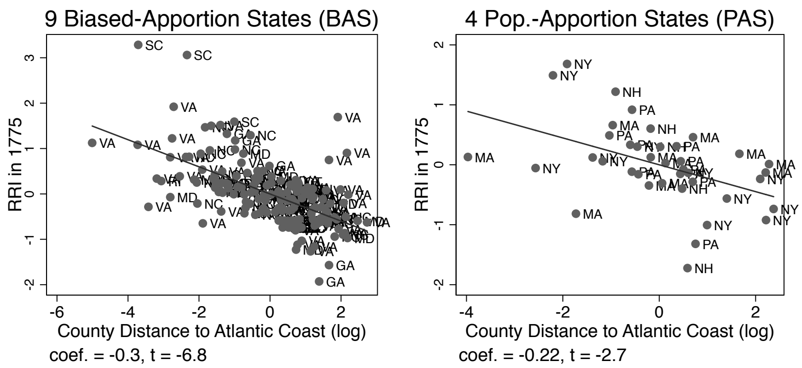
Determinants of Colonial RRI in 1775

We showed in Figure 3a that colonial policy caused over-representation of the coastal areas in the colonial legislatures of each of the 13 original colonies. This was shown by measuring the direct distance of a county's center (as it existed in 1775) from the Atlantic Coast. Colonial RRI in 1775 was shown to be inversely correlated with county distance from the coast. Continuing with a split sample in which the analysis was run separately on the 9 BAS and 4 PAS, we showed in Figure 3b that this relationship remained in the counties of 9 BAS but not in the 4 PAS in 1790. The basis of initial representation adopted in the post-colonial era continued to heavily favor the coastal areas in only the 9 BAS. In Figure D1, we show that this pattern persisted in the post-colonial period.

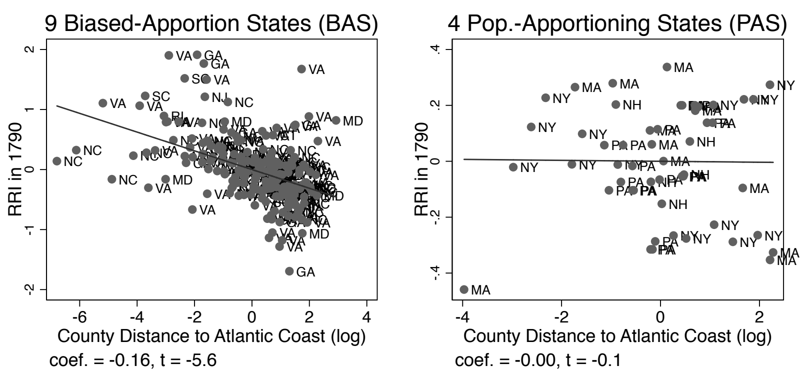
Systematically malapportioned representation was also carried over from colonialism to protect slave-owners from whites within their states who lived in areas unsuitable to large-scale profitable slavery. To capture county-level geographic suitability to profitably employing slave labor on a large scale, we measure a county's mean elevation as it existed in 1850. We do so 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. This geographic instrument alone is correlated with 26% of the variance across the counties of the 6 slave states in the share of their population enslaved in 1850. In Figure D2, we show that mean county elevation is strongly inversely correlated with county representation (RRI) in the colonial legislatures of both the 9 BAS and 4 PAS. Following independence, this pattern persists in the 9 BAS (left); but the direction of the relationship is actually positive in the 4 PAS, and is weakly correlated.

Figure D1: County Distance to the Atlantic Coast and RRI

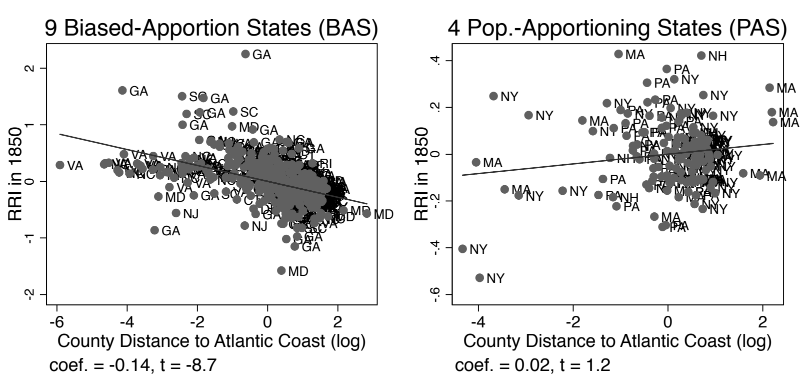
a) County Distance to the Atlantic Coast and Colonial RRI in 1775



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



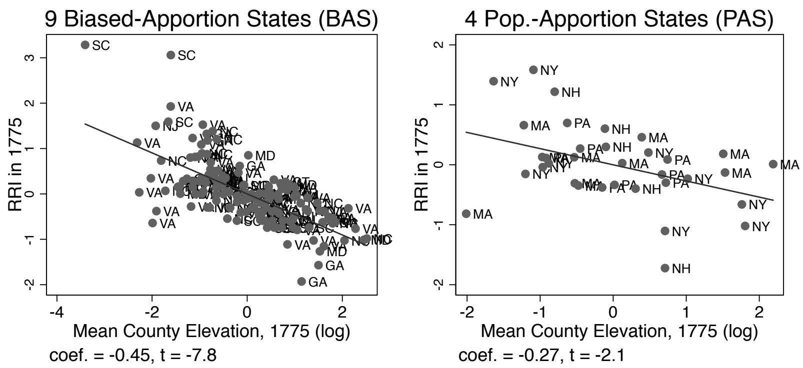
c) County Distance to the Atlantic Coast and RRI in 1850



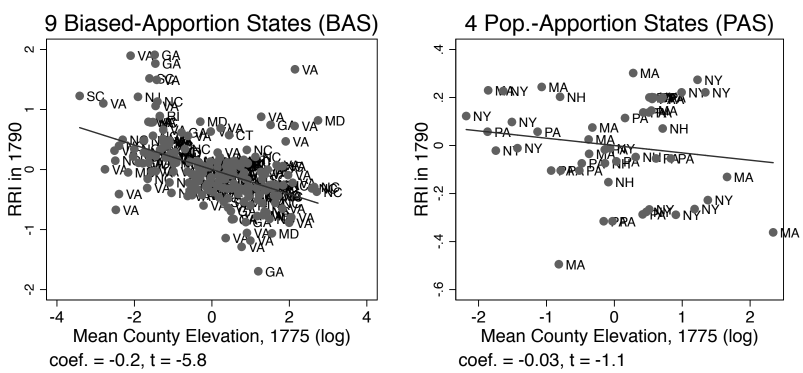
County boundaries as they existed in each year. Each model has state dummies.

Figure D2: Mean County Elevation and RRI over time

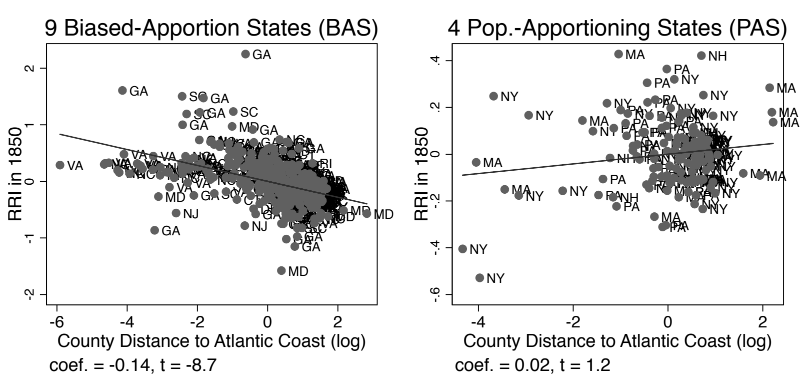
a) Mean County Elevation and Colonial RRI in 1775



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



c) County Distance to the Atlantic Coast and RRI in 1850



Each model includes state fixed effects

We estimate the following interaction model, which is the previous models estimated over the entire sample of counties from the 13 states.

$$RRI1790 = B_S + B_1 DistanceCoast + B_2 BAS + B_3(DistanceCoast * BAS) + SFE$$

where B_1 measures the relationship between a county's distance to the Atlantic coast (in 1790) and its *RRI in 1790*. BAS is a dummy indicating whether the county is in one of the 9 biased-apportioned states. Our coefficient of interest is B3, which measures the difference in the relationship between the interaction of a county's distance to the Atlantic Coast if it is one of the 9 BAS and *RRI in 1790*. We expect B_1 to have no relationship and for the magnitude to be small. We expect B_3 to significantly inversely related to county distance to the coast. Table D1 shows that this is exactly what we observe.

Appendix Table D1 - Interaction Model of Pooled 13 Original States of the Split-Sample Models from Figure 3

VARIABLES	(1) RRI in 1790	(2) RRI in 1850	(3) RRI in 1850
Distance to Atlantic Coast in 1850 (log)		0.0207	
		(0.0173)	
FAS Dummy		1.684***	1.111***
		(0.278)	(0.191)
(Distance to Atlantic Coast in 1850)x(FAS)		-0.161***	
		(0.0236)	
Distance to Atlantic Coast in 1790 (log)	0.00825		
	(0.0298)		
(Distance to Atlantic Coast in 1790)x(FAS)	-0.163***		
	(0.0410)		
Mean Elevation in 1850			0.0464*
			(0.0239)
(Mean Elevation in 1850)x(FAS)			-0.222***
			(0.0292)
Counties	254	539	539
R-squared	0.391	0.270	0.329
State FE	YES	YES	YES

Notes: County distance to the Atlantic Coast is measured as the county boundaries existed in the year indicated. Mean County elevation in 1850 is measured as the county boundaries existed in 1850. See Table A2 and A3 for variable definitions and sources.
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Did the Colonial Basis Persist following Independence? Is this relationship RRI persistent in the 9 BAS? 4 PAS?

We showed in Figure 4 that the colonial basis of representation persisted in the 9 BAS and not in the 4 PAS. The evidence showed various post-colonial values for *RRI* regressed on the colonial *RRI* in 1775 run separately on the counties of the 9 BAS and 4 PAS. Here we run the following model on the entire sample of counties from the Original 13 states:

$$RRI1790 = B_S + B_1 DistanceCoast + B_2 BAS + B_3(RRI1775 * BAS) + SFE$$

where B_1 measures the relationship between *RRI* in 1775 and *RRI* in 1790 (the first post-colonial measure of *RRI*) in the 4 PAS. The coefficient of interest is B_3, which measures the relationship of the interaction of *RRI* in 1775 and the dummy variable indicating whether the county is a fixed apportion state (BAS) and *RRI* in 1790. We expect B_1 to indicate 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 BAS. Table D2 reports the estimates of this model between the colonial *RRI in 1775* and the post-colonial *RRI in 1790* (Model 1), 1850 (Model 2), and 1950 (Model 3).

Appendix Table D2 - Interaction Model of 13 Original States of the Split-Sample Models from Figure 4

VARIABLES	(1) RRI in 1790	(2) RRI in 1850	(3) RRI in 1950
Colonial RRI in 1775	0.0537	-0.0111	-0.0263
	(0.0452)	(0.0588)	(0.0709)
FAS Dummy	-0.0396	0.0546	0.385**
	(0.0755)	(0.0890)	(0.186)
(RRI in 1775)x(FAS)	***0.650****	***0.294****	***0.197***
	(0.0735)	(0.0738)	(0.0955)
Counties	209	213	202
R-squared	0.848	0.390	0.208
State FE	YES	YES	YES

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Here we report the estimates that were discussed in the empircal section of the paper. To further measure persistence, we estimate the following specification to measure persistence of political inequality in county i:

$$RRI1850_i = B_S + B_1 RRI1790_i + B_2 BAS_i + B_3(RRI1775_i * BAS_i) + SFE + e_{Si}$$

The coefficient of interest is B_3, which measures the interaction of *RRI in 1790* and a dummy indicating whether the county is one of the nine biased-apportion states (BAS). We expect that the coefficient, B1, which measures the persistence of *RRI in 1850* in prior decades in the 4 PAS, to be statistically insignificant. Finally, each specification includes state fixed effects, and the standard errors are clustered at the state level. Table D3 shows the relationship when *RRI in 1850* is regressed separately on *RRI* for each decade from 1790 (Column 1) to 1840 (Column 5). As Table D3 indicates, the coefficient on the interaction of *RRI in 1850* and the dummy indicating whether county is in a BAS is statistically significant for every decade from the first census following the end of the colonial period. The coefficient on *RRI*, which measures persistence in the 4 PAS, only becomes statistically significant in 1830, and *RRI in 1790* actually has statistically significant inverse relationship with *RRI in 1850*. This is crucial, as it shows that this form of political inequality persisted throughout the antebellum era in the 9 BAS, but did not last in the 4 PAS.

Appendix D - Table D3: Persistence of *RRI* Over Time

DV (Each Column): RRI in 1850

	1790 (1)	1810 (2)	1820 (3)	1830 (4)	1840 (5)
RRI	-0.157** (0.054)	0.071 (0.041)	0.166 (0.124)	0.319** (0.124)	0.52** (0.172)
Fixed Apportion State (FAS)	-0.043*** (0.002)	-0.03*** (0.004)	-0.029*** (0.003)	-0.048*** (0.005)	-0.03*** (0.009)
***RRI* x FAS**	**0.481*** (0.114)**	**0.38*** (0.14)**	**0.41*** (0.14)**	**0.4*** (0.134)**	**0.4* (0.19)**
N (Counties)	258	375	408	452	498
R^2	0.31	0.43	0.51	0.6	0.68

Note: The DV in each model is *RRI* in 1850. The variable of interest in each model is the interaction of county *RRI* and a dummy variable measuring whether the county is in a Fixed- Apportion State (FAS), in which column 1 is *RRI in 1790*, column 2 is *RRI* in 1810, column 3 is *RRI* in 1820, column 4 is *RRI* in 1830, and column 5 is *RRI* in 1840. Each model is OLS with state fixed effects and robust standard errors clustered at the state level in parenthesis.

Why are Adult White Males (AWM) used as the only eligible voting population?

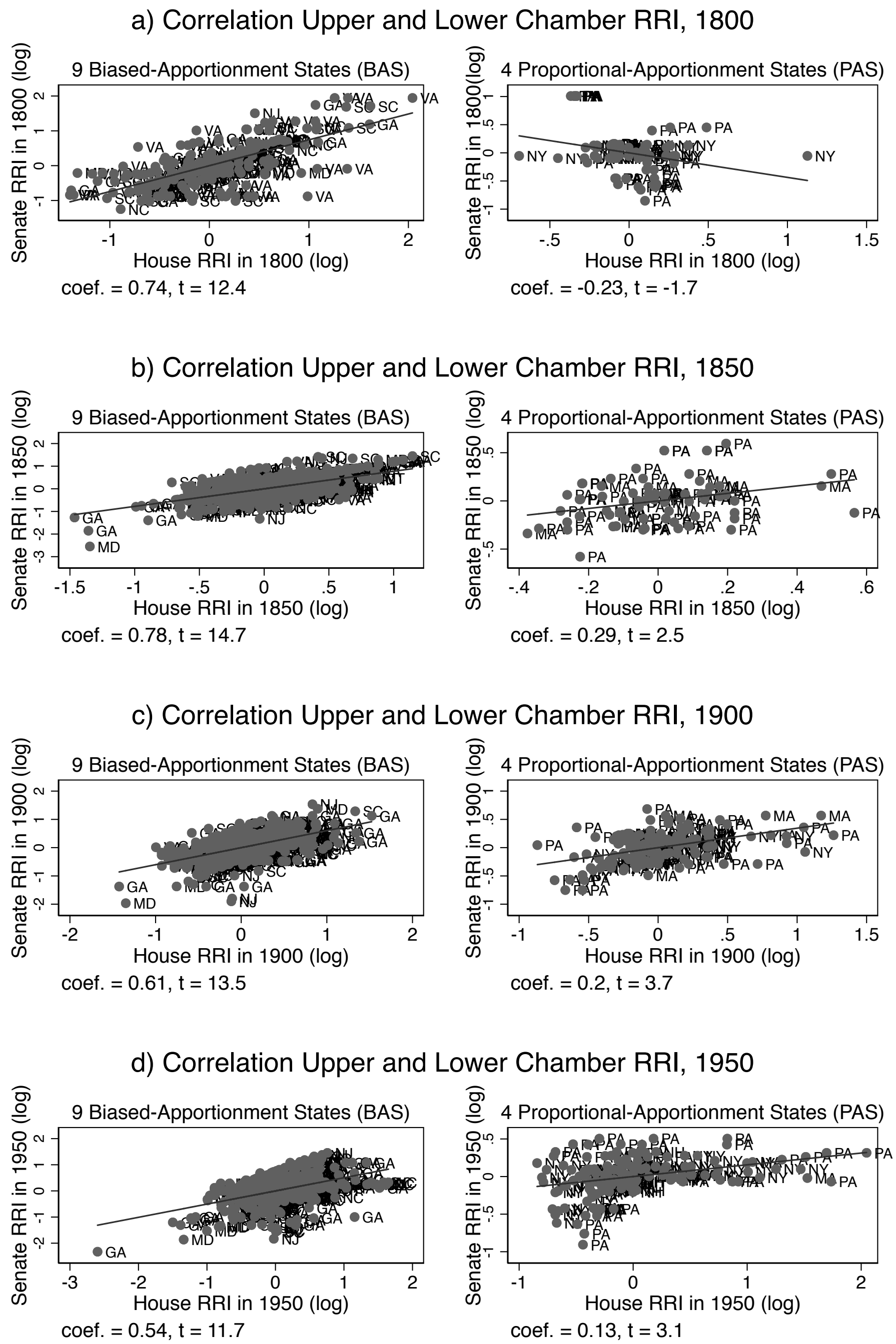
In this study, the relevant voting eligible population is assumed to be only adult white males (AWM). There are instances in which other demographics were eligible to vote to an extremely limited extent. For instance, in New Jersey from 1776 to 1807, widows of sufficient property were eligible to vote. In the few states that permitted free African-American males the right to vote, CT, MD and NJ eliminated this right by 1820. NC, PA, and NY soon followed suit in the next twenty years. Of the original 13 states, only MA, NH, and RI allowed black adult males the franchise (and RI had the highest economic requirements to voting in the US) in 1850 (Keyssar 2000: 55). No attempt is made to estimate the effect of free black males on this measure of political inequality. Doing so would not affect the results, as the total free black population of these states constituted 0.8%, 0.2%, 2.5%, respectively, of these three state's total population in 1850.

Do the upper and lower chambers represent systematically different sets of constituents?

As mentioned above, we follow Ansolabehere, Gerber and Snyder (2002) by using the average RRI across the upper and lower chambers for each county's value of relative representation. This approach may obscure the fact that elites may have structured representation in each chamber to represent different sets of elites (e.g., rural elites vs. urban industrialists) or constituents (e.g., lower house based on population and the upper representing some elite interests). Indeed, as reported above in column 6 of Table C2, many of the states used a different basis in each chamber. While six of the nine BAS states had a fixed basis in both chambers (Delaware, Maryland, North Carolina, Rhode Island, South Carolina and Virginia), the other three had a different basis by chamber. And, the formulas used for the fixed chamber mostly persisted for the nearly 200 years of our study. For instance, the fixed formulas in New Jersey (1 senator per county), Connecticut (1 or 2 representatives per town), Rhode Island (1 senator per town) remained unreformed until the 1964 Supreme Court ruling.

Yet, as we now show, in practice over(-under)representation in one chamber predicted to a significant degree whether a county was over(-under)represented in the other. This can be seen in Figure D3, which plots the county-level measure of RRI in one chamber (House RRI on the x-axis) versus its same value in the other chamber (Senate RRI on y-axis) over fifty year intervals between 1800 and 1950. The left plot for each year shows the results for the counties of 9 BAS and the right for the 4 PAS. As we are pooling counties across states, we include state fixed effects in each model. Given that we know that an over(under)represented county tended remain over(under)represented throughout the period of study, these models show that this bias largely occurred in both chambers.

Figure D3: Representation in Upper vs Lower Chambers



Each model includes state fixed effects

Appendix E: Public-Education Spending in the Antebellum Era

Appendix E provides further details regarding patterns of public spending on education in the antebellum era. This section also provides empirical support for numerous claims made in the paper. We show here that our estimates from Equation - the primary evidence that RRI affected public goods provision - are robust to including voter turnout. Go and Lindert (2010: 20) find that higher voter turnout among AWM in presidential elections at the county level is positively correlated with education spending at the county level in the North, but not in the South (while noting that Southern turnout was nearly as high as in the North). County-level variation in turnout is more likely to be correlated with variation in public education funding in the North because a much greater share of Northern funding occurred at the local level (see Table E2, Column 3). To control for the possibility that turnout affected spending, in each specification presented in this paper, a variable measuring the average share of AWMs whom turned out to vote in the 1848 and 1852 presidential elections was included. This variable does not affect the statistical significance or magnitude of the *RRI in 1850* coefficient. The inclusion of presidential voting data, however, would omit all data from SC data (as it selected its electoral college electors in the state legislature) and various other counties with missing data.

Of the total amount of public subsidies to education in the 13 Original States in 1850, as measured by the 1850 Census, roughly 70% were financed by local-level taxation. Yet, this overall figure obscures the variation across and within states in spending that existed in the share of public subsidies derived from local sources in 1850. The 18 counties (out of 541) in which there was an urban area with at least 20,000 inhabitants spent more than 40% of the total local public education spending in these 13 states in 1850. Yet, only 21% of the white school-aged population resided in these urbanized counties. The vast majority of the white school-aged population lived in rural areas in each of these states, and the more rural the county the greater the likelihood that the county's education revenues came from state sources. The average county value for the share of public spending deriving from local sources in 1850 across the counties was only 40% (compared to the overall share of 71%). Yet, only 40% of the total school-aged population lived in a county that derived a majority of its funding from the state. A clear distinction here occurs across the slave and non-slave states, and to be more precise between the fixed and non-fixed apportion states. In the six slave states, only 71 counties out of 363 had more public spending come from local sources than state sources. In the non-slave states, 140 of 179 counties did. Yet, more than half of counties in the three non-slave, fixed apportion states financed a majority of their public education spending at the state level (19 out of 33 counties). By comparison, in the four non-slave, non-fixed apportioning states, only 20 out of 146 counties received a majority of their public education funding from the state level. The exact proportion for each

Table E1 – Robustness Check with Election Turnout

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

VARIABLES	(1) 9 FAS	(2) 4 RAS
RRI in 1850 (log)	0.497***	-0.0449
	(0.154)	(0.232)
Urban Pop. Share, 1850 (log)	-0.0454	-0.0104
	(0.0628)	(0.0327)
Share Wh. Foreign Born Pop., 1850 (log)	0.0380	-0.118
	(0.0792)	(0.0915)
Land Inequality, 1860 (log)	0.628**	-0.512
	(0.282)	(0.369)
Manufacturing Cap. Per White Pop (log)	-0.0236	0.0718
	(0.0295)	(0.0972)
White Pop. Density, 1850 (log)	0.0559	-0.0242
	(0.0725)	(0.103)
White Adult Illiteracy Rate, 1850 (log)	0.148	-1.154
	(0.293)	(0.817)
Pop. Slave Share, 1850 (log)	0.0733	
	(0.0706)	
Avg. Presidential Turnout (1848 and 1852)	0.000749	0.000939
	(0.00419)	(0.00438)
Observations	279	144
R-squared	0.610	0.647
State FE	YES	YES

Note: Includes county-level Presidential Turnout in the 1848 and 1852 Presidential elections as a robustness check (Go and Lindert 2010). SC selected its presidential electors in the state legislature and therefore has no observations.
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

subset in which a county derived a majority of its public education revenues at the state level (in 1850) is: in the 9 FAS (311/396); in the 4 RAS (20/146). These 146 counties in the 4 RAS comprised 62% of the white school-aged population and 80% of the publicly financed education spending in 1850 in the original 13 states (Table E2, Columns 6, 7).

Appendix E-Table E2. Education Spending in the Original 13 States, 1850

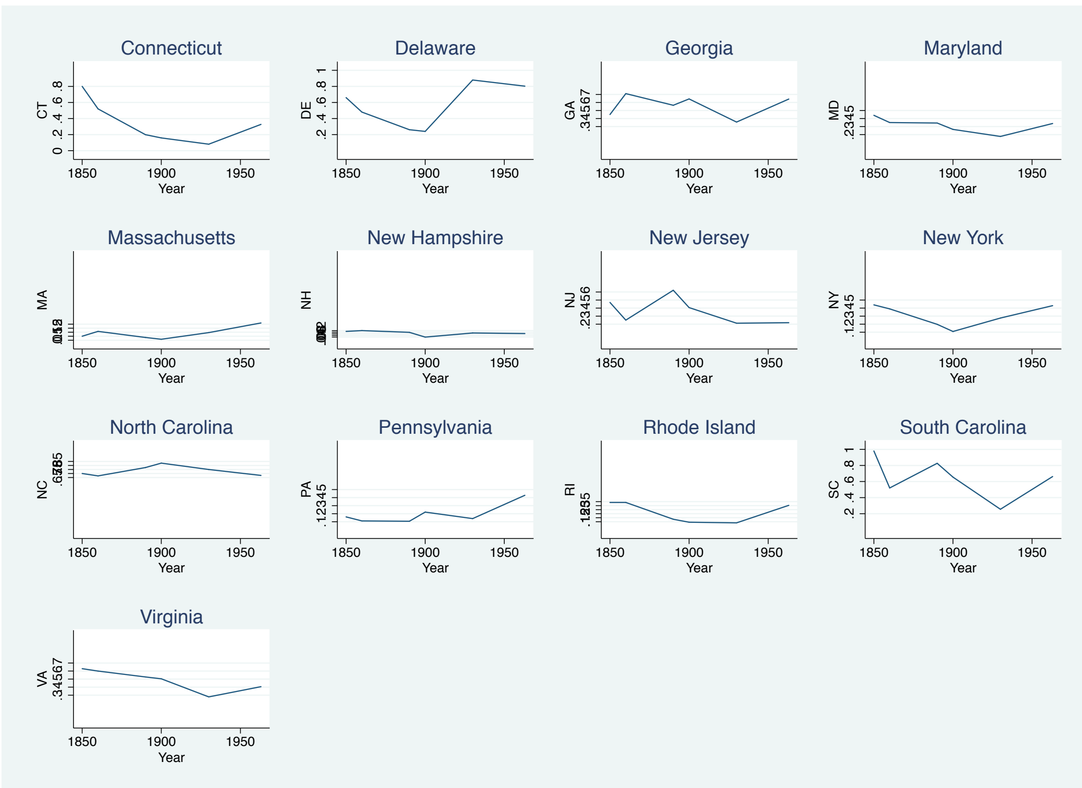
	1	2	3	4	5	6	7
	Total Education Spending per White Pop., 5-19 ($)	Public Spending Share of Total Education Spending (%)	Share of Public Education Spending at State-Level (%)	CV of Within-State Public Educ. Spending per White Pop., 5-19	Share of State White Pop, 5-19, residing in majority state-level public educ. counties (%)	State Share of Original 13 States White Pop., 5-19 (%)	State Share of Original 13 States Public Education Spending (%)
Fixed Apportion, Slave States							
DE	4.09	39	66	0.1	100	0.7	0.9
GA	1.84	10	45	2.13	77	5.9	0.8
MD	3.82	29	44	0.67	46	4	3.2
NC	1.8	37	69	1.17	92	5.9	3
SC	4.66	8	97	1.86	92	3	0.8
VA	2.05	17	58	1.93	88	9.4	2.4
AVG (1-5) / Totals (6-7)	**3.04**	**23.3**	**64.3**	**1.31**	**82.5**	**28.9**	**11.1**
Fixed Apportion, Non-Slave State							
CT	3.77	47	80	0.11	100	3.1	4.2
NJ	3.16	28	47	0.43	39	4.5	3
RI	3.48	60	34	0.38	23	1.2	1.9
AVG (1-5) / Totals (6-7)	**3.47**	**45**	**53.7**	**0.31**	**54**	**8.8**	**9.1**
Non-Fixed Apportion, Non-Slave States							
MA	4.69	69	4	0.4	0.4	8.3	20.7
NH	2.12	72	10	0.23	0	2.9	3.3
NY	2.34	57	43	0.29	38	28.4	28
PA	2.56	63	14	0.37	0.6	22.6	27.7
AVG (1-5) / Totals (6-7)	**2.93**	**65.3**	**17.8**	**0.32**	**10**	**62.2**	**79.7**
Original 13 Averages	**3.11**	**41.2**	**47**	**0.78**	**53.5**		

Source: US Decennial Census, 1850.

Notes: State abbreviations are in Appendix-Table A1. Column 1 reports the state average of total public and private education spending per white capita, age 5 to 19 in 1850. Column 2 reports the share of total education spending (Column 1) funded with public revenues. Column 3 reports the share of public education spending in each state that occurred at the state level in 1850. Column 4 reports each state's Coefficient of Variation (CV) of county public education spending per white capita, aged 5 to 19 in 1850. A higher CV, which is the standard deviation of county public spending per capita divided by the mean of county public spending per white school-age capita, indicates that this state has more within state variation in public spending per white capita across the state's counties. Column 5 measures the share of a state's white school age population living in a county in which a majority of its public education revenues were derived from state-level sources. Column 6 reports the share of the total white school-age population in the Original 13 states residing in each state in 1850. Column 7 reports the share of total public education spending of the Original 13 states in 1850 that was spent in each of each of these states.

Figure 6 of the paper showed that within 9 BAS, early development of a centralized system of public funding tended to persist. Figure E1 shows each state's share of public education revenues derived from state sources. This persistence of state-level spending in the former slave states is central to argument that state malapportionment had large long-term effect on educational and development outcomes.

Appendix E-Figure E1 – State Share of Public Education Revenues, Individual States (1850-1963)



Notes: Each plot shows the share of total public education revenues financed at the state level for each state in the years: 1850, 1860, 1890, 1900, 1925, and 1963.

Sources: Decennial Federal Census, 1850, 1860. Report of the Commissioner of Education, 1890. 1900. Biennial Survey of Education, 1924-1926. Statistics of State School Systems, 1963-1964.

Go and Lindert (2010) argued that there were differences across the regions of the US, as well as across rural versus urban areas, in the production function of education during the antebellum era. Specifically, they argued that the rural North (mostly involving states and counties that entered after the original 13) were able to provide more public school teachers per white school-age inhabitant at lower public expense, as they employed more female teachers (2010: 7). While we primarily control for this possible confounder by examining the relationship between *RRI in 1850* and state-level spending on public education within each region of the original 13 states (and by including state fixed effects), it is also instructive to look at the relationship between state-level public spending and *total* (state and local) public education spending and public school teachers per white youth. If variation across counties in state-level public education spending did not meaningfully and significantly explain variation across counties in total public education spending and the production function of provisioning education (i.e., teachers per white school-age capita), then the findings presented above would not be very important. Instead, as Table E2 shows, when state-level public education spending per white school-age youth, our previous dependent variable, is used as explanatory variable (along with same covariates in Model 2 above), the coefficient on state-level spending per white youth is statistically significant at the 99% level in the 9 FAS for both dependent variables: total public (state and local) education spending per white school-aged youth in 1850 and public school teachers per white school-age youth in 1850. The coefficient on state-level public education spending per white school-age capita in 1850 is not statistically significant for either of these two dependent variables in the 4 RAS.

Appendix E – Table E3 – 1850 Public Education Robustness Tests

Panel A

VARIABLES	(1) 9 BAS	(2) 4 PAS	(3) 9 BAS	(4) 4 PAS
log_RRI_1850	**0.748***** **(0.166)**	**0.175** **(0.193)**	**0.123** **(0.117)**	**-0.0955** **(0.172)**
N (Counties)	339	146	361	145
R-squared	0.575	0.516	0.319	0.689
Antebellum-era Controls	YES	YES	YES	YES
State FE	YES	YES	YES	YES

Models 1, 2: DV = *(log) County Educ. Spending per White Cap, 5-19, from* ***State*** *+* ***Local Sources****, 1850*
Models 3, 4: DV = *(log) County Public School (PS) Teachers per White Cap, 5-19, 1850*
Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Panel B

VARIABLES	(1) 9 BAS	(2) 4 PAS	(3) 9 BAS	(4) 4 PAS
(log) State Educ. Revenues per White, ages 5-19, 1850	0.827*** (0.0642)	0.175* (0.100)	0.269*** (0.0677)	-0.0322 (0.0724)
N (Counties)	308	144	308	143
R-squared	0.796	0.555	0.389	0.697
Antebellum-era Controls	YES	YES	YES	YES
State FE	YES	YES	YES	YES

Models 1, 2: DV = *(log) County Educ. Spending per White Cap, 5-19, from* ***State*** *+* ***Local Sources****, 1850*
Models 3, 4: DV = *(log) County Public School (PS) Teachers per White Cap, 5-19, 1850*
Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

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