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**ABSTRACT**

Three factors help to explain why school enrollments in the Northern United States were higher than those in the South and in most of Europe by 1850. One was affordability: the northern states had higher real incomes, cheaper teachers, and greater local tax support. The second was the greater autonomy of local governments. The third was the greater diffusion of voting power among the citizenry in much of the North, especially in rural communities. The distribution of local political voice appears to be a robust predictor of tax support and enrollments, both within and between regions.

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## **“The Curious Dawn of American Public Schools”\***

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### ABSTRACT

The world has long known that advances in knowledge are crucial to economic growth, that broad mass education advances knowledge, and that the United States has had one of the world’s highest per-capita income levels since the nineteenth century. We have also believed that these familiar facts are linked. Ever since the British and others were struck by American technology exhibits at the Crystal Palace Exhibition in 1851, it has been natural to give American education much of the credit for this country’s advances in knowledge and its prosperity.

Scholars have shown that by 1850 the Americans had roughly caught up with Prussia, the earlier leader, in the share of GDP devoted to education and also in enrollments.<sup>1</sup> The enrollment leadership relative to other countries came much earlier in mass primary education than in higher education. The Americans were also leaders in raising public tax money to supplement the traditional reliance on private tuition.

American leadership in public mass schooling may seem puzzling to many non-specialists. Given the usual narrative flow, one would expect that the Founding Fathers wisely encouraged universal primary schooling from the very start. Yet their Constitution said essentially nothing on the subject, and most of them were not enthusiastic about involving the federal government in education. Jefferson’s attempts to raise tax money for schooling all whites bore no direct fruit, either in his native Virginia or in the nation as a whole. True, the federal government helped fund education with earmarked land grants to the states. Yet the land grants were not heavily used for schools in the early decades, especially in the new South.<sup>2</sup> As Claudia Goldin and Larry Katz have emphasized, the movement was largely decentralized and

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spontaneous.<sup>3</sup> Americans at the grass-roots level often developed their primary schools some decades before help arrived from above, and they did it largely by voting to tax themselves. How did education arise so soon and so spontaneously in a country that resembled Russia in its rich opportunities in agriculture, forestry, and mining? Those non-specialists who think of America's birth as anti-government and anti-tax may also be puzzled by the willingness of early Americans to lead the world in shifting from private tuition toward taxes for primary schools.

America's peculiarly high fertility makes the pattern even more puzzling. At the start of the nineteenth century, the United States had more children per adult than did Western Europe.<sup>4</sup> Common sense suggests that the relative abundance of children would have burdened any system attempting to educate them. Twentieth-century experience agrees, and our own analysis will find the expected negative effect of extra children on the schooling of the average child. How did the Americans manage to pay for so much schooling per child when families were so large?

Fortunately, specialists in the history of American education have advanced our understanding of these developments and the likely forces behind them. We know that the rise of primary schooling antedated the campaigns for state school systems led by Horace Mann, Henry Barnard, and Calvin Wiley.<sup>5</sup> Scholars have found both private and social motivations behind the early start. American households' demand for educating their own children are thought to have been reinforced by Protestant emphasis on the written Word, as well as by the desire to prepare their children for the commercial and professional opportunities of a fast-growing nation. The literature has given at least as much emphasis to social motivations to pay for the schooling of other people's children. There was widespread insistence that a literate and numerate made better citizens and neighbors, thereby strengthening the new Republic. Northeastern industrial areas worried greatly about the effects of immigration and the rise of manufacturing on the social fabric. Some of these forces have looked stronger than others, according to the careful analysis of Massachusetts experience by Carl Kaestle and Maris Vinovskis.<sup>6</sup> One other strand of scholarship has suggested for at least a century that something about American democracy and political voice favored education at public expense.<sup>7</sup>

This paper offers new evidence on how, where, and why mass education spread so much sooner in some parts of North America than elsewhere, and tests competing ideas about underlying causes. Our contrast between regions stresses the roles of three forces, one unfamiliar to the past literature and two familiar. The rural North led the world in the building of

schools, the hiring of teachers, and overall enrollments because (a) basic education was supplied more affordably there, (b) decentralized local governments had more autonomy there, and (c) political voice was spread more broadly within its communities.

The next section sets up the broad geographic contrasts in enrollment rates and in support per student, starting at the better-lit map of U.S. education in 1850. We summarize what is known about the earlier progress toward this 1850 pattern of education, describing the mixed private-public interplay of school finance in the era of “rate bills.” Section II offers evidence on three likely sources of the contrasts in enrollment and expenditure rates between regions and nations. Section III presents a straightforward theory about how the political voice mechanism interacts with parents’ private demand for schooling, to produce different degrees of public commitment in different settings. Section IV analyzes why counties’ public commitments to schools differed within the North and within the South as of 1840 and 1850. This analysis assumes that voting rights and voter participation are the same thing, and that their effect on education is exogenous. Doubts naturally arise about such assumptions, and Section V looks more deeply inside the votes-and-schools nexus, performing different kinds of experiments where the data permit. It will turn out that there is strong *prima facie* evidence for shifting the historiography of early American education into a deeper exploration of how political voice was distributed at the local level.

## I. THE PATTERNS TO BE EXPLAINED

To summarize how the timing of the rise of primary schooling differed between communities, let us begin with a broad international geography and with the relatively abundant information for the mid-nineteenth century. From this initial vantage point we then disaggregate among regions, and sketch how the geography and the style of American primary education seems to have evolved in the late eighteenth century and the early nineteenth.

Among nations in the mid-nineteenth century, the United States was already becoming a leader in several respects. The contrast best known to observers at the time showed up in enrollment rates like those that Table 1 displays for 1830-1850. By mid-century white children in the United States were already enrolled for as much primary schooling as children in any country

other than Prussia, and most of that instruction was delivered in what were called public or common schools. The extra enrollment did not mean crowded classrooms: The United States may have stood out even more in its supply of teachers than in the more publicized enrollment rates, as best we can judge from incomplete and not always comparable measures. As of 1850 this country's elementary and secondary schools had 2.7 teachers per hundred students in public schools and 2.9 per hundred in all schools. No other country except perhaps France seems to have matched this rate.<sup>8</sup> The striking supply of American teachers may have partly reflected two features to be discussed shortly: the use of part-time seasonal teachers, and the greater feminization of American teaching.

Antebellum America's distinction in the numbers of pupils and teachers was attained with a less outstanding level of expenditure on the part of its parents and taxpayers. Whether or not the United States was a leader at mid-century depends on the measure and concept one prefers. If one measures tax and tuition effort by the share of income spent on primary education, this country would again appear to have shared the lead with Prussia, both in public and in private expenditures. Yet it did not stand out in the generosity of public primary-school support per child as a percentage of the average income per adult. True, the United States was well ahead of Britain, when one measures a support ratio equal to (public primary-school expenditures per child of school age) divided by (GDP per adult). Yet it was not ahead of France, Belgium, or Germany in this support ratio, for two reasons. First, the United States had more children per adult than those European countries, especially France, so that our expenditures were not outstandingly generous per child.<sup>9</sup> Second, as we will note below, the same education services seem to have been cheaper in America.

Within the United States, states and regions differed greatly in their commitment to schooling. Tables 2 and 3 identify some of the striking spatial patterns revealed by the census snapshot of 1850. What emerges, and demands explanation, is a distinctive style of the rural North, which accounted for most of this nation's high rates of schooling. Specifically, the rural North had over 70 percent of the nation's students and over 70 percent of its teachers, both among public schools and among all schools combined -- even though the relative expenditures on schools were not so concentrated there.<sup>10</sup>

[Tables 2 and 3 about here, on facing pages.]

To spot these patterns within Tables 2 and 3, let us start with the expenditures supplied and then proceeding to the teachers hired and the enrollment response. At the top of each table, studying the total revenues per enrolled pupil yields clear contrasts. The South spent more than the North per pupil, and the cities spent more than the rural areas per pupil, partly because the South and the cities supplied a higher quality education through academies and colleges. The regional contrast was driven by private expenditures, with not much contrast in public expenditures per pupil. Cities outspent the rural areas, per pupil, both in public money and in private money. Clearly, rural Northern pupils attracted the fewest dollars. So did rural Northern teachers.

Yet the mirror image is just as striking: It was the rural North that had the most students and the most teachers, per student or per child, of school age. When we count people rather than dollars, the rural North stood out among regions in the same way that the United States stood out among countries. The strongest contrast favoring the rural North is shown by the row reporting the number of teachers per 100 free children of primary-school age: The rural North had twice as many as any other area. Enrollments were highest in the northernmost tier. Maine, New Hampshire, and Vermont led in this respect, at least from the 1830s on. From there the high enrollments seem to have spread west to Upper Canada and to Michigan.<sup>11</sup>

To chart the emergence of different education systems among and within states requires a methodological shift away from reliance on legal histories, and toward more studies of how school finance and administration actually operated at the community level. For example, one should resist the temptation to cite the earliest colonial laws as a source of schooling progress. True, both Connecticut and the Massachusetts Bay Colony passed laws in the 1640s and 1650s mandating universal elementary schooling. Localities and parents were subject to various fines if they did not comply. Yet progress was limited in the New England colonies, as in England itself, partly because only basic literacy and religion were mandated and partly because so little funding was provided.<sup>12</sup>

By studying the earliest history of school laws in the independent United States, without hard numbers, one could also get the patterns wrong in two ways. One mistake would be to date progress from the passage of states laws allowing their localities to levy taxes for local schools. That wave of laws *lagged behind* actual practice by years or decades, unlike the precocious

colonial cases just mentioned. The only such state laws before 1820 were those of Connecticut in 1786, New Hampshire 1789, and South Carolina in 1811.<sup>13</sup> Despite this last early law, the whites of South Carolina remained among the least schooled in America for the next two centuries. A more common disconnect with the law was the fact that local fiscal initiative actually preceded the arrival of state laws enabling localities to levy taxes for schools, as James G. Carter noted as early as 1824.<sup>14</sup> The main exception was New York State, where the state government led others in encouraging and monitoring schools, even though they were still largely private, as Nancy Beadie has emphasized.<sup>15</sup> We suspect that the future quantitative history of this era will agree with Carl Kaestle's summary of the state of schooling at the time of the Revolution: "Nowhere was schooling entirely tax supported or compulsory.... Even the oft-cited Massachusetts school laws of the seventeenth century had insisted only that towns maintain schools, not that they had to be free. No one had imagined anything as comprehensive as the plans of the Revolutionary generation."<sup>16</sup>

Another mistake would be to date the support of public schools from the establishment of a state permanent school fund. The most impressive case is the large fund set up by Connecticut in 1795, out of proceeds from selling off its Western Reserve lands in Ohio. Yet it has been argued that the fund got poor results, partly because it crowded out local funding. More serious, most states receiving the "permanent school fund" money either sat on it for a couple of decades or, as in the case of Tennessee, siphoned the money away to non-education uses.<sup>17</sup> This is not to argue that the new state funds played no role in promoting schools, but merely that their timing is not a reliable guide to the advance of schooling.

The contours of early American schooling can be drawn only very roughly, because schooling was a fluid, diverse, and voluntary experience before the Civil War, in ways that complicate our measurements. Students moved in and out of school on an irregular basis, blending work experience with further installments of school learning. They went to school more regularly in the winter and summer than in fall or spring, and responded to daily changes in work and weather. Children might begin their studies at three or four, and might be resuming them past the age of twenty, after long absences. Such student transience has probably inflated some of the enrollment and attendance rates of Tables 2 and 3, certainly for the United States and probably also for other countries before the late nineteenth century. There was probably some



double counting of students who attended the separate summer and winter session, especially when they went to different schools.<sup>18</sup>

Eclecticism also characterized the teaching and the financing of schools. Teacher credentials and the curriculum were not at all standardized. The primary and secondary levels were not sharply divided from each other, even in the more public common-school system, and unregulated academies and grammar schools played a major role.<sup>19</sup> The state and national data-collectors coped with this diversity by grouping schools into two broad categories, the first being “public” or “common schools” and the second consisting of academies and “private and select schools.” We shall follow the same rough but convenient distinction here.

The early rise of schooling and its sources of funds are clearer for New York than for other states, thanks to New York’s passing a bill in 1795 setting up a permanent school fund. Twenty years later the state fund had accumulated enough to begin spending, and we have the benefit of annual reports from the New York Superintendent of Common Schools starting as early as 1815.

Who paid for the schooling? The numbers for New York reveal the kind of private-public mix suggested by qualitative accounts for all Northern states. Total demand for primary schooling advanced ahead of public supply, and venture schools and academies stepped in to fill the gap.<sup>20</sup> Figure 1 shows the breakdown of public school funding given by the official reports on New York’s common schools. Parents and other private sources paid more than half of the cost of their children’s schooling up to 1838-1840, when the common schools got a fresh infusion of public money. Of the public funds, more than half came from local taxes until mid-century.

Thus the early mix of funds was a half-empty and half-full glass, both for New York and for the nation. One could reasonably emphasize the long persistence of private tuition. On the other hand, there are two reasons for emphasizing the public half of the glass: The Northern states were ahead of Europe and the South in the reliance on public money and publicly run schools, and eventually every country that has developed universal primary schooling came to rely primarily on taxes.

## II. THREE SOURCES OF AMERICAN LEADERSHIP IN PUBLIC SCHOOLING

If the emergence of high Northern levels of primary schooling, relying largely on public support, should be dated somewhere in the early nineteenth century, we still need to know why the early Americans had so much demand for schooling, and why the political preference for making it *public* schooling? Since the questions imply international comparisons, this section turns to broad evidence suggesting why the rural North America seemed to differ from Europe, from Northern cities, and from the South. The next section will test the power of the same ideas to explain differences at the county level.

In the broad contrasts among nations and regions, three differences stand out.

### *More Affordable Schooling*

Common folk in the northern states had higher labor incomes than their counterparts in Western Europe and the American South, and probably also faced lower prices of schooling, thanks largely to a more abundant supply of female teachers. We present some evidence first on the real income differences, and then on the price of schooling.

Since parents in richer areas usually have a higher total demand for schooling, the high enrollments would seem less puzzling if the colonial and newly independent Northerners had been as rich as the Western Europeans and white Southerners. That appears to have been the case, though showing it requires turning away from national income estimates toward real wage data. Using GDP per capita to measure relative prosperity has led to an unresolved debate over just when the United States overtook the United Kingdom. Some argue for a catch-up by the 1850s, while others argue that Britain led until the turn of the century.<sup>21</sup> The GDP issue is not easily resolved, given the severity of the index number problems with international comparisons of real incomes.

A clearer trans-Atlantic contrast in real incomes appears if we turn instead to a comparison of real wages for common occupational groups. Schooling has always been held back most severely for parents at lower income levels, who have less creditworthiness and less ability to invest in their children for a distant return. Economists have consistently found that the social rate of return is higher for poorer countries than for rich, and higher for primary education than for tertiary (e.g. university) education.<sup>22</sup> Those in higher income ranks can afford to pay for

schooling out of pocket or by borrowing. Their enrollment problem is not severe, even though their demand for school quality remains sensitive to their income levels. The poor, by contrast, often lack the ability to purchase any schooling at all. If poor white Americans were better off than the poor in other countries, they might have spontaneously demanded more education -- even if the nation as a whole had a lower real GDP per capita than Britain or the Netherlands.

What we are now learning about real wages around the world suggests that North American white workers in standard occupations could indeed buy more of the basics of life than workers anywhere else.<sup>23</sup> Figure 2 offers a simple first clue, by comparing the ability of three common kinds of workers to buy an eight-commodity bundle of consumer goods in Massachusetts versus England, the ostensible world leader in GDP per capita. For each of the three occupational comparisons, workers in Massachusetts could buy more of that bundle than their counterparts in England. Carpenters in Massachusetts could buy more than English building craftsmen, and Massachusetts common laborers could buy more than English laborers, whether they worked in the building trades or in agriculture. Nor is this contrast sensitive to the choice of weights in the eight-commodity bundle, since most of the commodities cost fewer days of labor each year in America than in Europe. The Massachusetts workers probably could also pay less for housing, though they presumably paid more for cloth. Workers who could afford more of most basic goods than workers anywhere else in the world would also have had a better chance to afford a few years of basic schooling for their children. Similarly, as a hint about North-South differences, between 1800 and 1860 farm workers in Massachusetts enjoyed nearly twice the ability to buy food with their daily wage as did farmers in Western Virginia.<sup>24</sup> Our estimates may be sensitive to unknown mismatches between wholesale and retail prices, or between wage rates that don't treat payments in kind (e.g. board and fuel) consistently. Yet the estimated real-wage advantages of Massachusetts over England or Western Virginia are great enough to withstand refinement of the measures.

Even if laborers in the northern United States could afford more basic consumer goods than their counterparts in England or the South, their demand for schooling might have been no greater if they had to pay more for schools and for teachers than elsewhere. Yet the few available clues suggest that schooling, like basic consumer goods, was actually cheaper for those better-off workers in the northern states. So say the Anglo-American data contrasts in Table 4.<sup>25</sup> Contrasts in the costs of schooling are complicated, of course, by differences in school quality, length of

school year, and the generosity of public subsidy. Nonetheless, schools seemed a bit cheaper in America than in England and Wales, both as a fee to be paid privately by parents and as a total annual cost per student. Let us compare the costs of educating a child for 18 weeks in 1840s New York and 1830s Manchester. The total private and public cost of that much primary schooling in New York in 1841-42 was only 0.39 weeks of common labor earnings, with the parents themselves paying less than half as much. By contrast, 18 weeks of primary schooling cost 0.62 weeks of common labor earnings in Manchester 1834, and more than that later. Table 4 offers other contrasts for various types of schools. In general, school was so much cheaper in New York than in England that we should doubt that the whole difference was explained by school quality.

How could schooling be cheaper in one country than in another, even when we are looking at the total costs shared by taxpayers, donors, and parents? Since school costs are dominated by teacher pay, one immediately wonders whether teachers were paid less in America than in England, relative to the earnings of common laborers. Panel B of Table 4 suggests an affirmative answer. Here again, as with fees, the comparison is complicated by differences in product, in this case the type of teacher. Still, it seems clear that on the average teachers were more affordable for common laborers and for parents of other occupations in New York than in England.

Teachers in the rural North might also have been cheaper than teachers in the South. For example, around 1853 Northern rural female teachers accepted lower monthly wages from common schools than teachers in North Carolina.<sup>26</sup> If deeper studies agree with these early hints, then rural Northern teachers may have been more affordable in the sense that paying for a teacher's services cost an ordinary Northern worker fewer days of his income than the cost faced by working families in England or the South.

One likely reason: The Northern states seem to have been world leaders in the feminization of teaching, a fact that may have made teachers less scarce relative to common laborers and other mostly-male occupations.<sup>27</sup> Behind the leadership in supplying female teachers lay an early lead in female literacy as well. We can now compare the signature literacy of brides (and bridegrooms) on both sides of the Atlantic from the seventeenth century on. Already by mid-eighteenth century the young women of the Northern colonies were more literate than the young women of England, Scotland, and continental Europe, the leading possible

competitors being women in Holland and Sweden.<sup>28</sup> Within the United States, females qualified to teach were more abundantly supplied in the lower-paying North, a fact reflected in the rise of Northern women as applicants for teaching jobs in North Carolina.<sup>29</sup> A renewed exploration of the international history of education supply is likely to feature Northern American women as world leaders in the supply of primary school teachers.

### *Local Autonomy*

By itself, greater affordability would only help to explain a higher private demand for education, and would not explain why taxes would be paid. In early settings, levying new taxes for schools was even more difficult than today, since the demand was still just emerging and public supply could be blocked by those with property, especially by those who wanted labor to remain unskilled and abundant. An institutional feature that made it easier to launch public education on a limited scale was decentralization in voting on school issues. The more local the voting mechanisms, the greater the chance that an exceptionally high-demand local population could choose to tax itself, unblocked by opponents from other parts of the country.

Such decentralization of government was the second salient feature of the Northern states, relative both to Europe and to the South. Even in the colonial era, British policy already tended to give towns more fiscal autonomy in the American colonies than in Britain. The U.S. Constitution reinforced this local autonomy, by using federalism and other safeguards to impede the exercise of central government authority. On the schooling front, local autonomy was often extensive even where a centralized state board kept accounts on all school districts. For New York State before 1850, we know that state law deferred to local autonomy in most decisions regarding funding. Even those state laws that were passed were confined to providing only partial support and little regulation or finance at the district level, at least until 1850.

This decentralization meant that schools were both financed and controlled more locally in the Northern states than in either Europe or the American South. The international contrast shows up in the revenue sources for schools in Europe and North America in the 1870s. The United States and Canada (along with Italy and the Netherlands) stood out by having schools paid for by local governments, rather than privately or by higher levels of government. England and Wales was the main bastion of reliance on private tuition.<sup>30</sup> The English and Welsh were

trapped into centralization by Parliamentary rulings that put insurmountable barriers in the way of localities wanting to tax themselves for schools.<sup>31</sup> Such barriers help to explain why England and Wales lagged in enrollments and school funding until a centralized fiscal solution was reached in 1891.

Decentralization also distinguished the North from the South. Historians have identified two Southern institutional tendencies that stood in the way of local school development: centralization of power throughout the region, and elitism in the laws governing membership in Southern legislatures. In both these institutional respects, the South resembled nineteenth-century England.

Throughout the South, power was relatively centralized. State legislatures dominated, and seem to have appointed judges and county officials and even governors more often than in the North. County officials, in turn, retained power that might have devolved to townships.<sup>32</sup> The effect was much the same as in the case of Parliament's stifling local government taxes and services in nineteenth-century England: Localities had little freedom to raise their own taxes for schools or infrastructure within a larger polity that lacked their enthusiasm for such public goods.

The South also tended toward elitism in public office, though democracy was gaining over time and was stronger in the newer states. The most elitist laws of political representation were those in five states: North Carolina, South Carolina, pre-1851 Maryland, pre-1835 Georgia, and pre-1845 Louisiana all had stiff property requirements for serving in the legislature. Many Southern states also denied membership in the legislature to ministers, or bankers, or non-Christians, or duelists, or U.S. government officials. Virginia had its own gerrymandered system of representation, explicitly designed to deny voice to the yeoman western counties and favor the slaveholding east, with the result that state budgets were biased toward developing the eastern lowland counties.<sup>33</sup> The elitism has been aptly summarized by Ralph Wooster's studies of legislators and county officials throughout the antebellum South. In nine states, a majority were also slaveholders. The chances of being a state legislator were far greater for planters, slaveholders, and realty owners than for others. While Northern legislators were presumably also richer than the average citizen, Southern representation was impressively stacked toward groups that would have seen little direct benefit in paying taxes for schools.<sup>34</sup> An additional mechanism might have translated the Southern propertied elite's aversion to taxes into lower votes for school funding. When the ballot was not secret, as it was not in the United States

before around 1890, the local elite could also easily determine who its opponents were on political issues. While we lack smoking-gun evidence that wealthy slave-owners pressured other voters at election time, the open ballot did give them a chance to do so.<sup>35</sup>

Local government autonomy may have expanded schooling more than it raised other kinds of government expenditure. Economists have found that economies of scale in public goods are least evident in the case of basic education.<sup>36</sup> There is a lower minimum-cost point for spending on education than on, say, flood control or highways or national defense. This could have bred schools that were local *and* tax-based *and* efficient in the township orientation of rural northern states. Small towns might have achieved a moderately efficient scale with a single schoolhouse, using lower tuition to assure a minimum necessary attendance in a sparse countryside. Correspondingly, there were fewer other projects for public spending that could have competed against schools in the small-town budget debates. As we shall see, this conjecture draws support from the public school patterns across the counties of the United States.

### *Voting and Voice*

The third broad force that delivered more schooling in the American North than elsewhere was the breath of political voice. The likelihood of voting for taxes to pay for schooling is generally higher, the greater the political voice heard from the lower income ranks. Here too, ordinary white Americans had an advantage over common men in the European countries they and their ancestors came from: They had more political voice relative to local elites, and increasingly so over the first half-century of independence. The United States led Britain, France, and the rest of Europe, just as Stanley Engerman and Kenneth Sokoloff have found that North Americans had more voting rights than Latin Americans.<sup>37</sup> The earlier suffrage of middling American white citizens seems to have accelerated the rise of public primary schooling, through mechanisms we will model and test in the next two sections.

North and South differed in political voice, broadly defined, though this was not because of any great difference between the two regions in white men's legal right to vote. On the contrary, the franchise rules were fairly similar between the two regions before the Civil War, once one sets aside the complete lack of political rights for slaves. Rather what limited the

political voice of ordinary white Southern men was the already-mentioned restraints on who could serve in the state legislature.

Within each region, there were very different patterns of the franchise among counties. Even after states had repealed their property requirements for suffrage, most of them retained residency and citizenship requirements. These had very different effects in different counties. Where a large share of men was just recently arrived from outside the county and state, voting was more concentrated among those with the most potentially taxable property. Thus even in mid-century counties differed in how far suffrage extended down the ranks, much as if the earlier property restrictions emphasized by England and Sokoloff were still in effect. We argue that this should have mattered to schooling in theory, and that it did matter in practice. We next present a theory featuring a link from political voice to public schools, and later find that the predicted political influences indeed played a role in the 1840s and 1850s.

### III. HOW VOICE COULD MATTER

Explaining the patterns in primary schooling means testing a model, one that simultaneously predicts how voting restrictions and other forces might have determined the levels of school attendance and of school financial support. This section sketches the assumptions and predictions of a simple formal model presented more fully elsewhere.<sup>38</sup>

The model must start from the schooling institutions of the rate-bill world before the 1850s. In this world, the local political process chose how many weeks of schooling to fund through local property taxes. Given that amount, parents would then decide whether to buy extra weeks' worth of schooling by paying rate bills, or whether to buy schooling in private academies, where the share paid by taxes was lower and the quality of schooling generally higher.

Within this institutional context, we model two kinds of optimizing behavior at once. Each parental household makes private decisions about whether to enroll each child in school, and whether to pay rate bills to lengthen the school year for their children. Their choices are shaped by their incomes, what the child could earn as a laborer instead of attending school, and the supply of tax-based schooling.



That supply of taxed-based schooling in turn is driven by the optimizing behavior of a decisive voter. Note that the decisive voter is *not* just a median individual from the whole population, but a power-weighted decisive voice among those who have any say in the local politics of school finance. The more restrictive the access to voice, the higher the decisive voter in the economic ranks, and the more inclined he would be to feel the burden of a higher rate of property tax. Given his position, he chooses a tax rate corresponding to a level of subsidized school quality. Quality manifests itself as a share of the year that children spend in school, and an average class size.

The model predicts that extending the franchise to men lower down the wealth ranks will increase tax support for common schools. Against this, some key negative influences would be a larger share of school-age children in the population and a higher wage rate for child labor. The tastes of parents and of decisive local voters are also affected by religion, urbanization, and adults' childhood experiences with schooling.

#### IV. DETERMINANTS OF SCHOOLING AT MID-CENTURY

We can exploit the diversity of conditions in antebellum communities to test our view of what made the whole country different from Europe, and to test more general theories of educational progress. Let us begin, however, with an explanation of why some popular ideas of the determinants of education *cannot* be tested in the laboratory of early America.

Three popular insights about education fail to explain the differences among American localities, even though they help to explain the overall demand for schools, and help to explain why North America was different. First, economists will naturally think that the decision to raised taxes for a local school will be driven by the durable insight published by Charles Tiebout back in the 1950s: People can shop for the local government they want by migrating toward a town that has an efficient mix of taxes and public goods, such as schooling. An equilibrium is eventually established in which some towns have residents who prefer their higher taxes and better schools, while other towns have residents that prefer their lower taxes and poorer schools.<sup>39</sup> But which places are which? To embody the idea in a statistical test that will separate

one American town from another, one must think of measurable proxies for residents' tastes for schooling and for the efficiency of local government. The Tiebout model adds nothing here.

A second insight, that schools build national values, was as popular with writers in the newly independent nation as it is with today's historians of education. Surely, they thought, a more literate and numerate citizenry would make this democratic republic more harmonious and self-correcting. Today's economists agree, calling this an external benefit of education. Yet here again, as with the Tiebout model, there is no way to differentiate among American towns in the nineteenth century, since few towns opposed education in order to breed traitors. The national values argument cannot explain why Washington County Maine spent four times as much per white child of school age as Washington County Georgia in 1850.

A third insight about the demand for education that fails to differentiate about American towns is the fact that the children of richer families demand more schooling. It is true that at the level of the individual household, the children of richer parents attended school more faithfully and at higher expense.<sup>40</sup> Yet the same patterns fail to show so clearly at the county level in 1850, especially when we seek to explain public support and public school attendance rather than total attendance in all kinds of schools. So we conclude from county-level regressions in which IPUMS data allowed us to explore the effects of the level and inequality of real estate ownership on school enrollments and school finance in 1850. Even if a more positive wealth effect had shown up at the county level, it would have stirred up economists' usual suspicions of simultaneity bias and reverse causation that have always complicated attempts to estimate the demand for education. It is better to accept a reduced-form approach linking education to deeper causes that affect both income and education. Our reduced-form strategy also sets aside the use of economic sectoral shares, such as shares of the local economy that are in agriculture or industry, again because we anticipate economists' traditional concerns about third forces and reverse causation. Forces affecting education policy may also drive the local economy's comparative advantage in agriculture or industry.<sup>41</sup>

If all these forces are set aside, what systematic forces will explain the wide differences around the country, and how might we quantify the impact of these forces? While the search for reliable numbers on very early American schools continues, we are fortunate to have usable county-level census information from the middle of the nineteenth century. In 1840 and in 1850, U.S. towns and counties still differed greatly in those salient features that distinguished the

country as a whole. They particularly differed in their local distributions of political power. While it was necessary to clean and cross-check the underlying census data in a number of ways, we have been able to use the ICPSR county-level data files collated by Michael Haines to run tests on cross-sections of counties in 1840 and 1850.

Having information on both public schools and private schools allows us to compare effects on public schooling with effects on total schooling. Such comparisons reveal the extent to which a force that creates more public schooling crowds out private schooling. On this large issue, a clear pattern will stand out. In most cases, the effect of each featured variable on public schooling is about the same as its effect on total schooling, with no net “crowding out.” This striking result is possible because those who gathered our data in the early nineteenth century took care to distinguish public and private schooling.<sup>42</sup>

Some forces that made U.S. counties so different in the scale and character of their primary schooling are revealed in Tables 5 and 6. Noting that some of the measurable forces had their impact mainly at the local (county or district) level, while others operated through laws and budgets at the state level, we must take care to separate “fixed state effects” from local effects. Accordingly, Tables 5 and 6 display only results from regressions that have controlled for fixed state effects. We will then take the further step of explaining the state-level effects themselves, to extract further information about the underlying structure that shaped education across the land.

### *Political Voice 1: Voting Rights and the Voting Rate*

Our featured political voice variable has two main components: the share of free men having the legal right to vote on local schooling issues, and local elites’ dominance over other voters.

Measuring the first political voice variable, the share of local men having the right to vote, is not as straightforward as it might seem. We use one main proxy measure, and test its apparent influence against other measures. Our main proxy in the 1840 and 1850 samples is the share of free men who actually used their vote in a presidential election.<sup>43</sup> Later, using New York state data, we will look more directly at the franchise itself, i.e., the shares of men entitled to vote.

We have chosen to focus on the share of men entitled to vote and actually voting, rather than on the existence of state laws restricting the vote, because the latter offer less information than other scholars have hoped. The difficulty with binary measures of vote-restricting laws is to quantify the degree of restrictiveness. The laws themselves are too complex to summarize in a single restrictiveness index, and historians have found that actual practice varied greatly for any given state of the law.<sup>44</sup> Even with consistent application of fixed franchise rules, we would still need to know how many in each county actually met the qualifications. And in cases where the laws were suddenly changed, the actual franchise and voting rates moved more slowly.

We use the share of free men<sup>45</sup> who actually voted for president as a fair, though imperfect, proxy for the right to vote in local fights over schools and taxes. What share of a town or county's men actually voted on schools is the product of these three ratios:

(1) The ratio of men entitled to vote for president to those entitled to vote in local elections and referenda on school and tax issues. Fortunately, this ratio was effectively fixed at unity. Historians of local government find that the two rights were much the same in practice.<sup>46</sup>

(2) The share of all men enfranchised to vote for president. This key component reflected a mixture of the restrictiveness of *state* franchise law, the *local* distribution of property holding and of taxpaying, and transient *individuals'* propensity to meet the residency requirements and to register.

(3) The willingness to vote, or the share of franchised men that showed up on presidential election day. This wavered, over time and across states, with the intensity of the presidential race.

Our voting-share proxy nicely captures the first two components, but the third is more problematic. Were variations in the turnout rate among franchised citizens largely voluntary? If so, then the decision to vote or not vote might have been swayed by local attributes that also affected the willingness to educate children. In this case, the voting rate is not so exogenous as an influence on education. Alternatively, it may be that many declined to vote because they felt marginalized by the political process or were afraid to reveal their political preferences in an age when ballots were not secret. In this case, non-voting is akin to being denied the right to vote. We will later deal with these concerns in a number of ways, but the tests summarized in Tables 5

and 6 tentatively use the county-level voting *rate* as a measure of the distribution of voting *rights*.

The influence of the voting share on support for schools could easily be non-linear. Our tests allow for non-linearity by using a fourth-order polynomial in the voting share, with test statistics on the effects of specific changes in voting share. Here we report the effects of extra voting in the middle of the most common, and best-sampled range, from 60 percent of free men voting up to 80 percent voting.

At face value, the effects of the voting rate look strongly positive in the behavior of Northern U.S. counties in 1840 and 1850, as shown at the top of Tables 5 and 6. An increase from 60 percent voting to 80 percent tended to raise a Northern county's school attendance by almost 14 per hundred school-age children in 1840, and by almost 10 percentage points in 1850. The same extra voting raised government support by 38 cents per child in 1850, a noticeable share of the grand average support levels reported in Table 2 above. Additional regressions on the 1850 data confirm that all of this impact of extra voting took the financial form of extra local taxes, rather than state funds or endowments. These effects were roughly the same for all schools as for public schools alone, meaning that extra voting had no effect on private academies in the North. Extra voting, in other words, meant extra local tax support that did not "crowd out" any private support in the North.

In the South, by contrast, the voting rate had much less effect on enrollments or on support per child. The effects look vaguely positive but not significantly different from zero. This null result held in the South even though the shares of whites that voted were as high in the South as in the North.

### *Political Voice 2: Centralized Power in the South*

The South's lack of county-level response to voting rates derived from its distinctive political structure. To interpret the differences in educational policy between the two regions and within the South, let us start with a simple reading of some further county-level results for 1840 and 1850, before turning to the underlying role of state-level institutions.

Looking first at the effects of slavery on white children's school enrollments, looking at the county-level patterns would not reveal any clear relationship of a county's slave holding to

its white enrollments within a Southern state (Table 5). When we shift from enrollments to government financial support for schooling per white child, Table 6 adds an extra twist to the influence of local slavery: Among counties within a Southern state, a county's having more slaves meant *more* government money and more teachers per white child. Perhaps slave owners were able to divert state funds to their own children, and to supplement them with private tuition, while cutting overall state-level support for education in a way that explains the lower educational attainments of Southern whites as a whole.<sup>47</sup> So far, the regression clues suggest the sort of elitist imprint of slavery on education policy that past authors have described.<sup>48</sup> A further statistical clue can be found in state-level effects in the equations behind Tables 5 and 6. There is a general pattern to the fixed state-level effects: It is among states, not among counties, that slave holding shows up as a negative influence on the region's schooling for white children, presumably because the slaveholding interest exercised its power at the level of state legislatures.

A combination of statistical results and institutional history thus inclines us to the view that centralized restraints on political voice in the South held back the schooling of Southern white children of modest economic background. We cannot, however, give zero weight to the demand-side counter-argument that lower-income Southern whites wanted less schooling for their children and were politically passive for that reason.

### *The Age Distribution*

Both in the North and in the South, the provision of schooling per child was also affected by the age distribution of the local population, in ways that accord with our expectations. Not surprisingly, communities with more school-age children per adult delivered less public and private schooling per white child. Table 5 implied that, for each white man over 20, adding one child in the 5-14 age group would cut the enrollment rate, especially in the North. A community with more children per adult had a harder time supporting the education of the average child.<sup>49</sup>

Within the adult population, communities where the adults tend to be older might have had two opposing differences in the schooling of their children. The more commonly imagined negative effect turns out to have been offset by a positive effect of an older population, or rather a positive effect of the larger environment that an older population represents.

It is natural to imagine that older adults, who will not be sending more children into the school system, would be less favorably inclined toward raising taxes for schools. In 1851, one commentator in the New York debate over free schools thought so: “The childless, and those whose children have already received their education, deem it a hardship to be obliged to pay for the instruction of the children of their neighbors, and consequently vote against any appropriation.”<sup>50</sup> Yet the effect of an older adult population is not so clearly negative. Combining the men-over-40 results of Tables 5 and 6 suggests that an older population had higher enrollments and more teachers, but less government support per child. Overall, we tentatively suggest only that any negative lobbying effect of older adults was apparently offset by the fact that an older community tended to inherit more education infrastructure, and more teachers, because it was settled earlier.

*Cities and Migrants: Cubberley vs. Cubberley?*

Ellwood Cubberley’s influential classic, *Public Education in the United States*, pointed to the cities as having both the greatest champions of “free schools” for all and having the greatest social problems. In Cubberley’s view, the “new social problems in the cities,” the rise of immigrants, crime, industrialization, pauperism, and family breakdown in the cities convinced “two very dissimilar groups of people -- the humanitarians on the one hand and the new city laboring classes on the other -- [to unite] in a propaganda for tax-supported schools.” By mid-century the cities had emerged as the champions of educational progress:

“[T]he substantial progress in almost every phase of public education during the second half of the nineteenth century was made by the cities of our country, while the rural districts, often blind to their own best interests, lagged far behind.”

At the level of propaganda, Cubberley was surely correct: Historians have had no difficulty in quoting both urban humanitarians and labor spokesmen who favored universal education in the cities.<sup>51</sup>

Yet the quantitative geography of education patterns at mid-century challenges us to interpret the demand and supply of urban schooling in the North. The regression results of

Tables 5 and 6, along with the simple raw averages shown in Table 3, reveal these contrasts between Northern cities and the Northern countryside:

- (a) The cities spent much more government money and private money per pupil and per teacher, possibly improving the quality of education, but
- (b) they built fewer schools and hired fewer teachers per pupil,
- (c) they had slightly lower enrollments than did rural school districts,
- (d) rural families paid more in private tuition for their common schools than did those in the cities, and
- (e) the presence of extra foreigners did not raise either enrollments or aid per child.

What was higher in large cities was not the provision of mass public education, but rather a greater emphasis on expensive education, involving a mixture of longer school years and fewer, more highly paid, teachers. True, the cities subsidized minimalist schools for the very poor, but this was a less expensive alternative than universal schooling. The rural areas “blind to their own self interest” were ahead in the enrollment race,<sup>52</sup> topped up their common-school subsidies with greater private tuition payments, and hired more teachers per 100 pupils.

To reconcile these results with the view of the cities as champions of free schools for all, one should start by replacing Cubberley’s statements about the cities with two more durable ideas advanced by Cubberley himself in other contexts. First, he would have done better by grouping Northern cities with Rhode Island, Pennsylvania, and state further south, in the zone he saw as dominated by the “pauper school” idea plus subsidized education for top students. More importantly, he should have explained the urban-rural contrasts in terms of suffrage and political voice, a theme he sounded briefly when describing the greater sweep of nineteenth-century educational history.<sup>53</sup>

What we know about the governance of urban school systems before mid-century helps to explain why Tables 5 and 6 found a more durable role for the distribution of political voting power than for the urban and immigrant variables as such. Urban school districts were large and governed by top professionals with preferences tipped toward expensive schooling for higher-level students. In many cities they were appointed rather than elected, and even the elected ones answered to a smaller and more established electorate in cities than in small towns.



Cubberley's view that cities led the fight for free schools does not square with all his own evidence, and he may have misinterpreted the New York State experience that introduced his remark about urban leadership. In the key 1850 referendum, the rural vote against "free schools" was actually a vote against an 1849 law that forced rural areas to impose high property tax rates to replace the rate bills already being paid by parents, while the city voters faced no such burdens.<sup>54</sup> The countryside voted more negatively than the cities on a particular tax formula, and not against free schools.

### *Religion*

Communities' demand for schooling and their willingness to pay taxes were probably also shaped to some extent by their religion, their national origins, and whether they had a large share of migrants from other states.

Religious communities could affect schools in at least two ways: by enrolling their children, and by lobbying for or against school support. The census of 1850 gives us a chance to separate these two roles for membership in 22 major sects, watching their enrollment effects in Table 5 and implicit financial support in Table 6. The first point to note on the effect of religious communities is that most of the 22 left no clear imprint on school enrollments or finances in either the North or the South, despite a long literary tradition of emphasizing the written Bible as a force for education. Perhaps this was because no religion had the chance to dominate counties, states, or nations as much as it did on other continents.<sup>55</sup> Some sects, however, did show general patterns in the county-level data. Congregationalists in the North and Baptists in both regions clearly sent their children to public schools, and seemed to hire more public school teachers, than other sects. By contrast, Roman Catholics did not, and they clearly contributed more money to private academies than to public schools. Other sects had mixed influences.

## V. WHAT WAS BEHIND THE VOTING RATE?

A number of concerns about the large cross-sections of counties in 1840 and 1850 can be addressed with alternative data sets, particularly state-level data and national data featuring

changes between censuses. Here we offer three side-tests on New York state data for 1845, and three other tests suggesting that the franchise was indeed an exogenous influence on schooling.

New York State's county-level data offer a closer look at three forces not directly measured in the early national censuses. Table 7 uses the New York census of 1845 to provide three extra insights. First, it is clear in New York that the positive schooling effect of receiving extra migrants from other states was transmitted largely by the arrival of New Englanders. On this Yankee influence, quantitative analysis and narrative history now agree.<sup>56</sup> Looking at the geography of this effect finds it particularly strong in the far northeastern counties around Lake Champlain. This corner of the state might have been an education backwater were it not for the heavy inflows from New England.

Second, a reality check on New York data relieves some of our fears about using the voting rate as a proxy for voting rights. Starting from 1795, New York took special statewide censuses of the numbers of men legally entitled to vote. Table 7 uses 1845 data on the numbers franchised and gets the same strong positive effects that the larger samples got with the voting-rate proxy. Apparently, differences in counties' voter turnout did not introduce any distortions back in Tables 5 and 6.

A third use of the New York data takes advantage of that state's different measures of school attendance, as opposed to school enrollments. Table 7 confirms that the determinants are similar for each of these alternative ways of counting students.

A remaining concern is that all the results presented thus far may have introduced omitted-variable biases by leaning on spatial cross-sections of counties and states. Do we really know that changing the voting laws or changing the distribution of property and income would change schooling through their effects on the local balance of political power? Scholars rightly seek tests in which the featured force changed suddenly and exogenously, so that any subsequent movement in the dependent variable (here schooling) clearly reflects this sudden change. We have tried three kinds of experiments to test the separate influence of exogenous changes in the right to vote.

A conventional way to address the fears of omitted variables and reverse causation is to find clearly exogenous instruments for the variable suspected of being endogenous, in this case the voting rate. The instruments used here are the number of years of residency in the state required for voting, these interacted with the immigrant share from other states, the same

residency requirements interacted with the share foreign-born, and the existence of a state property requirement for voting. Instrumenting the voting rate in this way slightly yields the same kinds of results as in Tables 5 and 6, but only in the case of Northern enrollments are the instrument variables fully valid.<sup>57</sup> For Northern enrollments, at least, the influences in Table 5 re-emerged with the same signs and significance in the IV equations, and the effect of a shift in the voting rate was marginally stronger than in Table 5.

Second, a natural experiment arises from New York's switch to near-universal manhood suffrage between 1821 and 1826. Property requirements for voting were repealed in 1821, and taxpaying requirements were repealed in 1826, leaving residency as the main requirement.<sup>58</sup> Over that four year span the share of adult men who obtained their formal right to vote jumped from 66 percent to 83 percent. In 1827-1828 and again in 1832 the state legislature raised its common-school subsidies so much that by 1835 their real value per child 5-16 was more than double that of the year 1820. We do not know which counties' representatives in Albany voted for these major expansion of funds, but we do know that counties where the franchise was most extended tended to be those counties where common-school enrollments advanced fastest in this period. The aftermath of New York's franchise liberalization of 1821-1826 at least hints at confirmation of the findings presented earlier on the basis of national census samples.

Finally, we were able to use changes from 1840 to 1850 in a nation-wide sample of over 800 counties to test for the effects of changes in voting rights and voting rates on changes in enrollments, both in public schools and in all schools over that decade. This differences-in-differences approach allowed us to purge all purely fixed differences between counties and between states. Once again the voting rate showed a strong impact on enrollment rates, both for public schools and for all schools.

## VI. CONCLUSIONS AND AGENDA

It is much easier to explain the early onset of public schooling in America if one focuses on the link between political voice and support for funding schools. Part of that political voice was channeled through the right to vote. On this front, our findings support the suggestion that Engerman and Sokoloff derived from their study of state-level correlations: "The movement for

the establishment of public schools supported by local property taxes closely and successfully followed the expansion of the suffrage, which strongly suggests that the latter did indeed make a difference for policy.”<sup>59</sup> This paper has argued that the franchise, and the broader concept of political voice, helps to explain both America’s head start in enrollments and the differences among communities within this country.

The wider distribution of political voice inclined many counties in the rural North (and upper Canada) toward higher enrollments, though not toward high expenditures per pupil. In this respect the rural North differed from Northern cities, from the South, and from England, all of which had respectable expenditures per pupil but lower enrollment rates.

If the political voice effects seem to have been so strong in the antebellum era, what has happened to them since the Civil War? By the twentieth century they should have faded away, as suffrage became more universal and Southern planters and slaveholders’ grip was weakened. The differences in politics and education did indeed fade away gradually, both for the North and for Southern whites. The lingering post-bellum exception was the effect of Jim Crow voting laws after the Civil War. As Robert Margo has shown, differences in black voting rights helped to explain much of the differences between Southern states in their degree of racial discrimination in school policy.<sup>60</sup> Only from the 1930s on did blacks’ education converge clearly and rapidly toward that of whites.

For Southern whites, both their education and the region’s distinctive institutions converged very slowly toward the national standard. It took a century and a half for their enrollments to catch up. Political changes must have helped. Planters lost relative influence, both in the aftermath of the Civil War and in the region’s industrialization across the twentieth century. The South’s curious preference for more centralized government also faded gradually. As of 1902, it still existed to some extent, and it still correlated with lower public spending on education. Local school districts controlled only 13 percent of public education spending in the South versus 35 percent in the non-South, while state governments controlled 33 percent in the South and only 22 percent elsewhere, the remainder being controlled by county government. By 1982, the differences had nearly vanished. All states have delegated the task of spending on primary and secondary education to local governments, though some still control that spending with statewide regulations.<sup>61</sup> Thus convergence toward decentralized government and democracy has accompanied convergence toward high enrollment rates.

Where should the research frontier be pushed hardest in the political economy of early American schooling? Our view is that we need more detailed research on how the decisions were made and how they affected schooling at the town level. Part of the extra research can be econometric, and it can include the use of town-level data, which are available but take time to process. Our main plea, however, is for studies of how the decision-making process really worked in town meetings and in state legislatures. We know that the issue of schooling was hotly contested, but we still need to learn how the crucial political pressures were applied.

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**Table 1. School Enrollments per 100 Children Ages 5-14  
in the United States and Europe, 1830-1850**

	Public primary schools only			Public plus private schools		
	<u>1830</u>	<u>1840</u>	<u>1850</u>	<u>1830</u>	<u>1840</u>	<u>1850</u>
USA, whites		50.5	67.1		54.9	72.2
USA, whites in --						
6 Northeast states		96.4	98.7	105.8	103.6	105.5
2 Southern states		16.6	29.9	20.7	20.9	34.6
USA, all		45.3	56.7		49.2	61.0
England-Wales				27.4	35.1	49.8
Scotland			57.2			59.2
Belgium				34.6	52.6	54.9
Italy	2.8		12.4			
France		39.8	36.7	38.8	51.3	51.5
Norway	68.5	67.1	64.0			
Prussia	68.7	73.6	72.2	69.5	74.4	73.0

Sources and notes to Table 1:

The sources are the 1840 and 1850 US censuses plus Lindert (2004, vol. 2, App.

Table A.1) for non-US, and Fishlow (1966a, Table 1) for extrapolations to 1830.

The six Northeast states = ME, NH, MA, CT, RI, and NY.

The two Southern states = KY and VA.

For these eight states, we took Fishlow's (1966a, Table 1) ratio of 1830 to 1840 enrollment rates.

The U.S. private enrollments include a small number of secondary-school "academy" students.

**Table 2. U.S. Education in 1850, North versus South**

	Public schools	Academies	Colleges	Total
<b><u>A. Fifteen Northern States</u></b>				
Funds per pupil (\$ per year)				
Endowment (fed., state, & priv.)	0.05	1.07	17.59	0.19
Taxation (mainly local)	1.50	0.09	0.00	1.41
Public funds (mainly state)	0.66	0.49	1.66	0.66
Private tuition & other	0.24	14.15	42.41	1.19
Total	2.45	15.80	61.66	3.45
Teachers and enrollments				
Funds per teacher (\$ per year)	93	396	1052	127
Teachers per 100 pupils	2.6	4.0	5.9	2.7
Pupils per free child 5-14	0.82	0.05	0.004	0.87
Pupils per free child 5-19	0.58	0.03	0.003	0.61
<b><u>B. Fifteen Southern States</u></b>				
Funds per pupil (\$ per year)				
Endowment (fed, state, & priv.)	0.08	1.16	15.69	0.51
Taxation (mainly local)	0.84	0.00	1.29	0.72
Public funds (mainly state)	1.23	0.37	13.37	1.31
Private tuition & other	2.52	18.44	50.69	5.73
Total	4.67	19.97	81.03	8.27
Teachers and enrollments				
Funds per teacher (\$ per year)	141	427	1315	231
Teachers per 100 pupils	3.3	4.7	6.2	3.6
Pupils per free child 5-14	0.32	0.06	0.007	0.38
Pupils per free child 5-19	0.23	0.04	0.005	0.28

**Source and notes to Table 2:**

The source is the ICPSR electronic compilation of the 1850 census.

The fifteen Northern states are CT, IL, IN, Iowa, Maine, Massachusetts, Michigan, NH, NJ, NY, OH, PA, RI, VT, and WI.

The fifteen Southern states are AL, AR, DE, FL, GA, KY, LA, MD, MS, Missouri, NC, SC, TN, TX and VA.

The enrollments are "gross" enrollments, including all pupils of any age, not just in the age range at which the type of school is primary targeted.

**Table 3. U.S. Education in 1850, Urban and Rural Counties**

	Public schools only				All primary & secondary			
	Urban North	Rural North	Urban South	Rural South	Urban North	Rural North	Urban South	Rural South
Funds per pupil (\$ per year)								
Endowment (fed, state, & private)	0.07	0.04	0.24	0.07	0.32	0.07	1.51	0.16
Taxation (mainly local)	4.31	1.19	4.00	0.71	3.71	1.14	2.21	0.61
Public funds (mainly state)	1.01	0.62	2.63	1.17	0.93	0.62	1.46	1.08
Private tuition & other	0.13	0.26	2.75	2.51	2.89	0.75	11.24	4.53
Total	5.50	2.11	9.62	4.46	7.83	2.58	16.43	6.38
Teachers and enrollments								
All funds per teacher (\$ per year)	304	78	416	133	378	93	499	180
Public funds per teacher	294	67	286	56	224	63	112	48
Teachers per 100 pupils	1.8	2.7	2.3	3.4	2.1	2.8	3.3	3.5
Teachers per 100 free children 5-14	1.0	2.3	0.5	1.1	1.4	2.5	1.3	1.3
Pupils per free child 5-14	0.58	0.86	0.22	0.33	0.67	0.90	0.39	0.38
Pupils per free child 5-19	0.39	0.61	0.15	0.24	0.45	0.63	0.27	0.27
Total expenditures (\$ mill.)	1.51	5.26	0.23	2.49	2.50	6.72	0.70	4.11
Total public expend. (\$ mill.)	1.46	4.51	0.16	1.05	1.48	4.58	0.16	1.09
Total teachers (1000s)	5.0	67.7	0.5	18.8	6.6	72.2	1.4	22.8
Total enrolled pupils (1000s)	275	2495	24	558	319	2606	43	644

Source and notes to Table 3:

The source is the ICPSR electronic compilation of the 1850 census.

North and South refer to the 15-state regions covered in Table 2.

The 14 urban (over 2,500 population) counties of the North:

Middlesex and Suffolk MA; Providence RI; Essex NJ; Albany,

Erie, Monroe, Kings, New York, and Rensselaer in NY;

Allegheny and Philadelphia in PA; Cook IL; and Hamilton OH.

The six urban counties of the South:

St. Louis MO, Henrico VA, Orleans LA, Charleston SC, Jefferson KY, and Baltimore MD.

All other counties are called rural here.

As in Table 2, the enrollments are "gross" enrollments, including all pupils of any age, not just in the age range at which the type of school is primary targeted.

Public expenditures here equal taxes and "public funds", but not endowment income, which is harder to divide between public and private sources.

The data generally refer to the school year 1849-1850.

**Table 4. The Cost of Primary Schooling and Teachers, Relative to the Earnings of a Common Laborer in the U.S. and England, 1830s-1850s**

**Panel (A.) School fees:** The number of weeks' earnings for a non-agricultural laborer required to pay for a child's schooling

(1.) New York State, average common school 1841-1842

	<u>18 weeks</u>
Public funds	0.22
Private tuition (rate bills)	0.16
Total costs	0.39

(2.) Manchester, England, 1834 (private cost = total cost)

	<u>18 weeks</u>
In 230 dame schools (reading, needlework)	0.40
In 116 common boys' schools	0.83
In 63 common girls' schools	0.94
In 86 evening schools	0.71
School-weighted average	0.62

(3.) In 971 reporting English and Welsh schools, 1858

	<u>per ave. annual attendance</u>
Government grants	0.17
Fees paid by parents	0.41
Other income of schools	0.57
Total income (cost) of schools	1.15

**Panel (B.) Teachers' wages,** relative to the earnings of common labor

(1.) Average Northern U.S. school teachers

	Male teachers	Female teachers	All teachers, weighted
1841	1.09	0.60	0.75
1841-1850	1.04	0.58	0.72
1851	1.07	0.61	0.74
1851-1860	1.26	0.72	0.88
1861	1.29	0.75	0.91

**Table 4, continued**

(2.) Manchester, England, 1834/1835		
In 230 dame schools (reading + needlework)		0.45
In 116 common boys' schools		2.14
In 63 common girls' schools		1.39
In 86 evening schools		0.66
School-weighted average		1.00
(3.) Staffordshire and Warwickshire Charity Schools, England 1827-1861		
	1827	1.59
	1835	2.08
	1851	1.81
	1861	2.12

Sources and notes to Table 4:

School fees, Northern U.S.: New York State Superintendent for Common Schools, *Annual Reports* to the State Legislature, divided by the average laborer's wage for Northern states, 1841, from Burgess (1920, p. 71).

School fees in Manchester 1834: Gt. Britain, House of Commons, "Education in England and Wales - Select Committee Report with Minutes of Evidence." *Sessional Papers*, 1835 (465), vol. VII, pp. 111-112.

Teachers' wages and laborers' wages in the Northern U.S., 1841-1861:

Burgess (1920, pp. 32-33, 71). We have weighted Burgess's separate wage rates for rural versus urban and male versus female teachers by the 1860 non-South employment weights in Perlman and Margo (2001, p. 21).

Teachers' wages in Manchester 1834 are from the same pages of the 1835 *Sessional Papers* cited above. These are divided by the weekly earnings of non-agricultural common laborers used by Williamson (1982, the 2L series).

Teachers' weekly wages in Staffordshire and Warwickshire charity schools are from Williamson (1982, series 11H versus 2L).

School fees for England and Wales 1858 are from Great Britain, *Report of the Commissioners Appointed to Inquire into the State of Popular Education in England*. House of Commons, *Sessional Papers*, 2794-I, 1861.

The 18-week school year was the typical attendance in New York State in 1841-1842.

Manchester in 1834 could have had a similar attendance, given the share of dame schools and evening schools. The specially sampled English and Welsh public schools in 1858 may have had an atypically long school year to qualify for annual grants based on the number of students attending 176 days.

**Table 5. Influences on School Enrollments in U.S. Counties, 1840 and 1850**

	Enrollments per white child in the 5-14 age group				Enrollments per white child in the 5-14 age group			
	Public common schools				All schools (pre-tertiary)			
Region	North	North	South	South	North	North	South	South
Year	1840	1850	1840	1850	1840	1850	1840	1850
Raising the voting share -- from 60% to 80%	<b>0.136</b> **	<b>0.097</b> *	0.026	-0.016	<b>0.143</b> **	<b>0.095</b> *	<b>0.034</b> *	-0.0043
	(0.051)	(0.047)	(0.015)	(0.026)	(0.052)	(0.054)	(0.016)	(0.026)
Slaves per white man			-0.0001	-0.0022			<b>0.009</b> **	0.005
			(0.003)	(0.004)			(0.003)	(0.004)
Children 5-14	<b>-0.341</b> **	<b>-0.409</b> **	<b>-0.150</b> **	-0.021	<b>-0.368</b> **	<b>-0.439</b> **	<b>-0.193</b> **	-0.081
	(0.089)	(0.115)	(0.030)	(0.064)	(0.090)	(0.114)	(0.033)	(0.068)
Share of men over 40	<b>1.208</b> *	<b>1.485</b> **	0.197	0.113	<b>1.351</b> **	<b>1.577</b> **	0.292	0.238
	(0.476)	(0.479)	(0.137)	(0.315)	(0.484)	(0.474)	(0.149)	(0.313)
Free coloreds per white	<b>-3.884</b> **	<b>-2.682</b> *	<b>0.320</b> **	-0.153	<b>-3.704</b> **	<b>-2.794</b> **	<b>0.288</b> *	-0.141
	(0.871)	(1.073)	(0.102)	(0.197)	(0.884)	(1.063)	(0.112)	(0.195)
Urban share	-0.0017	-0.034	-0.103	-0.042	0.102	0.063	0.101	0.057
	(0.119)	(0.117)	(0.059)	(0.109)	(0.121)	(0.115)	(0.065)	(0.108)
Migrants from other states		0.272		-0.068		0.296		-0.025
		(0.164)		(0.090)		(0.163)		(0.090)
Foreigners		-0.139		0.028		-0.153		0.226
		(0.247)		(0.254)		(0.245)		(0.253)
Church accommod'ns per capita, + and - effects		bapt= + **		bapt= + *		bapt= + **		bapt = + *
		cong=+ *				cong=+ **		chris= + *
		tunk= + *				tunk= + *		
Number of counties	452	518	655	718	452	517	655	716
Number of zeroes	18	15	71	34	17	13	60	22

Sources and Notes to Table 5:

The main data sources are Haines, ICPSR02896-v2, 2005; and Clubb, Flanigan, and Zingale, ICPSR08611-v1, 2006. Our edited data sets are available at <http://www.econ.ucdavis.edu/graduate/sgo> and <http://econ.ucdavis.edu/faculty/fzlinder>.

Coefficient standard errors in parentheses.

\* significant at 5%; \*\* significant at 1%

The regression type is tobit, censored from below at zero. All equations are highly significant.

The South consists of all states in the band running from Missouri through Kentucky, Virginia, Maryland, and Delaware,

plus states further south, but excluding Texas. The North consists of all states north of this band.

Children 5-14 = White children in this age band, per white male over 20.

Share of men over 40 = white males 40+ / white males 20+, a measure that reflects the age of a community and its infrastructure. This demographic variable also tends to be a positive influence on average wealth.

Urban share = the share of the county's population living in cities of 2,500 or more inhabitants.

Religious membership = religious accommodations (seating capacity) of all kinds, per capita.

All regressions are also controlled for fixed state effects, geography variables, and (for 1850) the effects of church accommodations (seating capacity) per white population for 22 religious groups defined by the 1850 census and by Michael Haines's ICPSR code books.

The religious groups whose accommodations has significant effects are bapt = baptist, cong = congregationalist, chris = Christian (not elsewhere classified), and tunk = Tunker churches.

The geography variables are binaries for: The county is on the Great Lakes, on the Atlantic or the Gulf Coast, on the Mississippi, or on the Ohio River.



**Table 6. Influences on School Support, U.S. Counties in 1850**

	Teachers or dollars per white child in the 5-14 age group					
	Public common schools			All schools (pre-tertiary)		
	Teachers	Gov't funds	All funds	Teachers	Gov't funds	All funds
<b>Panel A. South</b>						
The effect of raising the voting share --						
from 60% to 80%	-0.0011 (0.0007)	0.23 (0.21)	0.15 (0.24)	-0.0009 (0.0007)	0.10 (0.22)	0.43 (0.38)
			*			
Slaves per white man	0.0002 (0.0001)	<b>0.40</b> ** (0.03)	<b>0.47</b> * (0.04)	<b>0.0006</b> ** (0.0001)	<b>0.42</b> ** (0.04)	<b>0.67</b> ** (0.06)
Children 5-14 as a share of pop.	-0.0001 (0.0018)	0.62 (0.54)	0.30 (0.60)	-0.0026 (0.0018)	0.35 (0.55)	<b>-1.95</b> * (0.89)
Share of men over 40	-0.0030 (0.0030)	-1.82 (2.59)	-2.07 (3.11)	<b>0.0181</b> * (0.0090)	-1.75 (2.69)	4.39 (4.61)
Free coloreds per white	0.0060 (0.0054)	1.28 (1.56)	1.61 (1.83)	0.0050 (0.0056)	2.04 (1.63)	3.98 (2.58)
Urban share	-0.0030 (0.0030)	-0.61 (0.88)	0.60 (1.00)	0.0032 (0.0031)	-0.60 (0.91)	<b>3.34</b> ** (1.57)
Migrants from other states	-0.0006 (0.0025)	1.05 (0.73)	0.09 (0.86)	0.0004 (0.0026)	1.51 (0.76)	0.27 (1.34)
Foreigners	-0.0004 (0.0070)	<b>4.90</b> * (2.07)	3.20 (2.40)	0.0075 (0.0072)	<b>6.49</b> ** (2.14)	<b>7.81</b> * (3.71)
Church accommodations per capita, + and - effects	bapt = + * free = + * presb = + *	bapt = + ** luth = + * presb = - *	(none)	bapt = + ** presb = + ** unit = + **	luth = + * bapt = - *	(none)
Number of counties	719	724	675	719	724	581
Number of zeroes	34	136	34	22	128	22

**Table 6. Influences on School Support, U.S. Counties in 1850, Continued**

Teachers or dollars per white child in the 5-14 age group

	Public common schools			All schools (pre-tertiary)		
	Teachers	Gov't funds	All funds	Teachers	Gov't funds	All funds
<b>Panel B. North</b>						
Raising the voting share from 60% to 80%	<b>0.0034</b> *	<b>0.38</b> *	<b>0.36</b> *	<b>0.0034</b> *	<b>0.39</b> **	<b>0.57</b> *
	(0.0013)	(0.16)	(0.18)	(0.0013)	(0.17)	(0.23)
Children 5-14	<b>-0.008</b> *	<b>-1.13</b> **	<b>-1.47</b> **	<b>-0.010</b> **	<b>-1.28</b> **	<b>-1.81</b> **
	(0.003)	(0.39)	(0.45)	(0.0032)	(0.40)	(0.58)
Share of men over 40	<b>0.069</b> **	-1.34	<b>-3.68</b> *	<b>0.074</b> **	-0.95	-2.02
	(0.014)	(1.61)	(1.83)	(0.014)	(1.69)	(2.34)
Free coloreds per white	-0.035	5.33	4.26	-0.027	5.15	4.33
	(0.030)	(3.59)	(4.06)	(0.030)	(3.75)	(5.11)
Urban share	<b>-0.007</b> *	<b>0.94</b> *	0.72	-0.0040	<b>1.03</b> *	<b>1.85</b> **
	(0.003)	(0.39)	(0.44)	(0.0033)	(0.41)	(0.55)
Migrants from other states	<b>0.019</b> **	0.40	-0.16	<b>0.020</b> **	0.55	1.16
	(0.005)	(0.53)	(0.61)	(0.0046)	(0.56)	(0.77)
Foreigners	-0.0005	-0.37	-1.15	-0.0010	-0.67	-0.62
	(0.0069)	(0.83)	(0.99)	(0.0070)	(0.87)	(1.25)
Church accommodations per capita, + and - effects	cong = + **	unit = + **	presb = + *	cong = + **	rcath = + *	episc = + **
	union = + **		unit = + **	union = + **	unit = + *	presb = + *
	univs = + *			univs = + *		rcath = + **
						unit = + **
Number of counties	522	526	520	520	526	488
No. of zeroes	15	22	15	13	22	13

Notes to Table 6:

See also the notes to Table 5.

\* significant at 5%; \*\* significant at 1%

School receipts of "government funds" consisted of endowment income, local tax support, and other public funds (subsidies), here expressed in dollars per white child 5-14 rather than per pupil.

Receipts of "all funds" include these receipts from government plus receipts from all "other" sources, consisting mainly of private tuition.

The religious groups whose accommodations has significant effects are cong = Congregationalist, epis = episcopalian, free = Free Churches, presb = Presbyterian, rcath = Roman Catholic, union = Union churches, unit = Unitarians, and univs = Universalists.

**Table 7. Influences on School Participation,  
the 59 Counties of New York State in 1845**

	Public common schools		All schools	
	Enrollments and attendance per 100 children 5-14			
	Enrollment	Average daily attendance	Attending any time in the year	Attending any time in the year
Percent franchised to vote	<b>1.69</b> <b>(0.33)</b>	<b>0.83</b> <b>(0.23)</b>	<b>1.88</b> <b>(0.29)</b>	<b>1.36</b> <b>(0.26)</b>
Children 5-14 as % of pop'n	1.14 (1.12)	0.34 (0.78)	1.00 (0.99)	-0.63 (0.88)
Share of men who are over 40	27.27 (62.06)	-20.15 (43.50)	-47.12 (54.64)	-59.43 (48.66)
Urban share	-0.075 (0.098)	-0.032 (0.069)	-0.011 (0.086)	0.075 (0.077)
Percentage of New York State population that immigrated --				
from New England	<b>1.08</b> <b>(0.36)</b>	<b>0.80</b> <b>(0.25)</b>	<b>1.20</b> <b>(0.32)</b>	<b>1.20</b> <b>(0.28)</b>
from other U.S. states	0.81 (0.62)	0.65 (0.44)	0.47 (0.55)	0.74 (0.49)
from other countries	0.41 (0.30)	0.16 (0.21)	0.42 (0.26)	0.10 (0.23)
Constant	-107.99 (51.70)	-27.22 (36.24)	-88.79 (45.52)	9.04 (40.53)
Adjusted R squared	.629	.455	.674	.536
Std. error of OLS estimate	11.45	8.03	10.09	8.98
Mean of dependent variable	86.1	52.8	89.9	100.02

Notes to Table 7:

The source is the New York State Census of 1845.

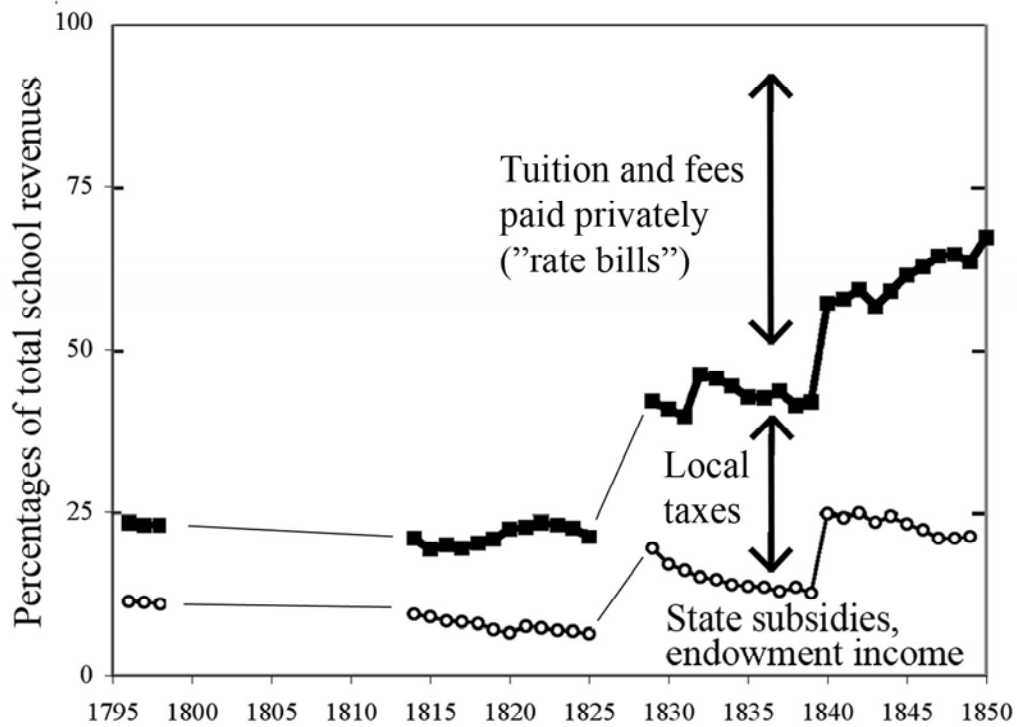
See also the notes to Table 5.

The age-group and student denominators include free colored children, unlike Tables 5-6.

Free coloreds were 1.7 percent of the state population.

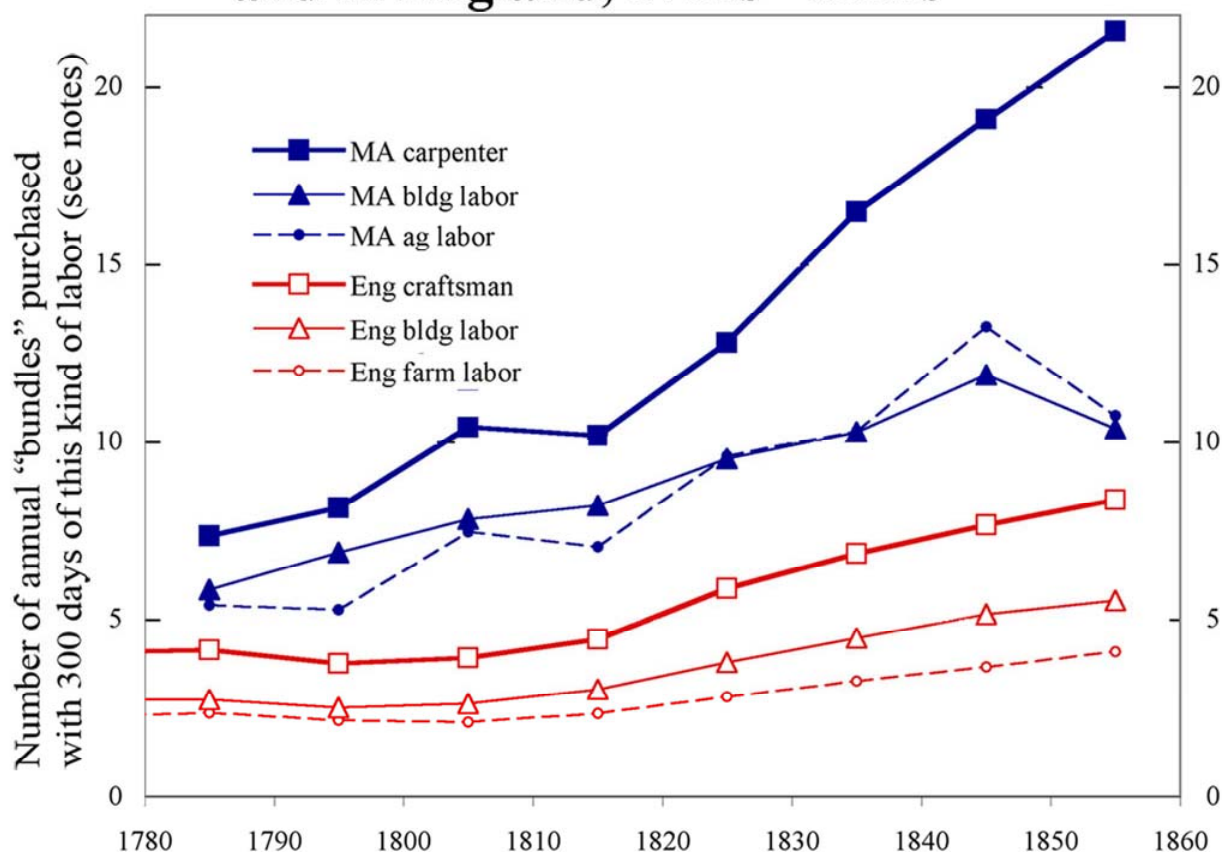
Standard errors are in the parentheses.

**Figure 1. Public and Private Shares of Common School Funding, New York State, 1796 - 1850**



*Source and notes to Figure 1:* The *Annual Report* of the New York Superintendent of Common Schools, 1820-1855. The shares for 1796-1798 and the rate bills for 1814-1825 are from a set of "conjectures" offered in the 1825 report.

**Figure 2. Real Wages of Workers in Massachusetts and in England, 1780s - 1850s**



*Sources and notes to Figure 2:* All price series have been converted into metric physical units, and both price and wage series were converted into silver money units. The Massachusetts series are those of Carroll Wright, and the England series are those of Gregory Clark. Both sets, and the real wage comparisons graphed here, are downloadable as Excel files from <http://gpih.ucdavis.edu>. Each real wage divides the nominal silver wage for 30 days per year by the local cost of an eight-commodity annual consumption "bundle" consisting of 135.1 kg of wheat flour, 26 kg of beef, 5.2 kg of butter, 4.33 dozen eggs, 1.8 kg sugar, one pair of shoes, 2.6 kg of soap, and 2.6 kg of tallow candles. The bundle is patterned after the Strasbourg 1746-1754 bundle reported by Robert C. Allen and co-authors in the first working paper on the same internet site, but with the addition of sugar based on the diets of poor English workers 1787-1796.

**APPENDIX A.**  
**A Simple Model of Public School Finance,**  
**Featuring Budget Votes**  
**When Public Schools Get Mixed Public-Private Financing**

We seek to model first a household's schooling preferences and then a decisive voter's tax-and-subsidy preferences, to predict influences on tax support and school attendance. The model is kept as simple as possible, while incorporating heterogeneous preferences and a few essentials of school finance. The model features two kinds of decisionmakers. First, parents and prospective parents choose how much public schooling each child should have, given the official length of the school year and the quality of the local public school. Second, a decisive voter chooses not only the amount of schooling for his own child but also the school budget and the length of the school year.

I. The Demand for Schooling in a Household with Children

A household utility function that is particularly handy in its tractability and relative realism is the  $i$ th individual's Stone-Geary function of the form

$$(1) \quad U_i = (C_i - C_{i0})^\alpha (S_i - S_{i0})^{1-\alpha}, \text{ where}$$

$C_i$  = consumption of everything but primary schooling, with  $C_{i0}$  being its positive necessary minimum subsistence level;

$\alpha$  = a preference-based coefficient for the  $i$ th household (we omit the  $i$ -subscript); and

$S_i$  = the share of the average school-age year that each child spends in public school, with  $S_{i0}$  being a base level of schooling that could be positive or negative, depending on preferences. We consider a negative sign more realistic, since it is consistent with the possibility of choosing zero public schooling, which was frequently observed in this historical period.

Note that the schooling demand being modeled here is a demand for *public* schooling. The demand for private schooling is separate and is folded into general consumption (C) here, to simplify the algebra.

For mathematical convenience, and without changing any aggregate implications, we convert the Stone-Geary utility function into its logged form:

$$(2) \quad \ln U_i = \alpha \ln(C_i - C_{i0}) + (1-\alpha) \ln(S_i - S_{i0})$$

The consumer (couple) maximizes this utility with respect to consumption ( $C_i$ ) and per-child schooling ( $S_i$ ), with all children being treated equally by their parents.

The income constraint plays its usual crucial role. Full-time income ( $Y_i$ ) consists of wage and property income components:  $Y_i = W_i + r P_L L_i$ , where  $W_i$  is the family's full-time labor earning power,  $r$  is the current-year rate of return on "land" (representing real estate, or taxable property),  $P_L$  is the purchase price (and assessed price) of land, and  $L_i$  is this  $i$ th household's holdings of land.

The household spends its income on consumption, on schooling above the subsidized level, and on taxes, so that the household's budget constraint is

$$(3) \quad W_i + r P_L L_i - C_i - n_i \phi (S_i - s) - n_i w_c S_i - t P_L L_i \geq 0.$$

There is no  $p_c$  price term in front of the real consumption term  $C_i$  because we normalize the price of consumer goods to be unity.

Here  $n_i$  = the number of children of school age,<sup>1</sup> and  $\phi$  is the fee cost of a full year's normal public schooling, from both private and public funds. Institutionally,  $s$  was the share of the year for which the fees were paid by taxpayers. Typically taxes covered a number of weeks of school, say twelve weeks, and parents wanting fuller schooling during the year paid the rest with rate bills. The annual wage rate on child labor is  $w_c$ . Having a child go to school deducts the child's labor time, as well as the school fees, from the family's potential earnings.

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<sup>1</sup> This appendix views the number of children as exogenous. The model could be extended to make fertility decisions simultaneous with schooling decisions.



The local government also has a budget constraint. For simplicity, we will assume that school subsidies are the only kind of local government expenditure and a proportional property (land) tax is the only source of government revenue. Ignoring any administrative costs, the budget constraint says that total revenue must cover total school expenditures:

$$(4) \quad t P_L L_{all} \geq s \phi \sum_i n_i S_i = s \phi N, \text{ so that the school-tax rate } t = \frac{s \phi N}{P_L L_{all}}$$

where  $P_L L_{all}$  is the assessed value of all real estate (quality-adjusted price  $P_L$  times quantity  $L_{all}$ ), and  $N$  is the locality's total number of children attending common schools anytime during the year. We will use Equation (4) later, to link the tax rate to the level of schooling and to model the decisive voter's self-interest.

We deal first with an interior solution in which the household demands more schooling days than the subsidized share  $s$ , and buys the extra  $(S_i - s)$  per child by paying rate bills (tuition). For this interior solution, the Lagrangian is

$$(5) \quad V = \alpha \ln(C_i - C_{i0}) + (1 - \alpha) \ln(S_i - S_{i0}) \\ + \lambda [W_i + r P_L L_i - C_i - n_i \phi (S_i - s) - n_i w_c S_i - t P_L L_i]$$

and the first order conditions are

$$V_C = \frac{\alpha}{C_i - C_{i0}} - \lambda = 0$$

$$V_S = \frac{1 - \alpha}{S_i - S_{i0}} - p_s \lambda = 0$$

Here the private price of schooling  $p_s$  is the sum of the opportunity cost of the child's time in school plus the private payments of any "rate bills" (tuition) beyond what is subsidized by taxpayers:

$$(6) \quad p_s = n_i w_c + n_i \phi$$

We use these first-order conditions to derive the Marshallian demands for schooling and consumption in this interior-solution case where the household reaches a level of schooling that involves some extra school days paid for by rate bills. The chosen rate of annual schooling per child is:

$$(7) S_i = \frac{1-\alpha}{\alpha} \left[ \frac{W_i + rP_L L_i - n_i \phi (S_i - s) - n_i w_c S_i - tP_L L_i - C_{i0}}{n_i(\phi + w_c)} \right] + S_{i0}$$

Collecting all the  $S_i$  terms yields the demand equation for public school attendance:

$$(8) S_i = (1-\alpha) \left[ \frac{W_i + rP_L L_i + n_i s \phi - tP_L L_i - C_{i0}}{n_i(\phi + w_c)} \right] + \alpha S_{i0}$$

The bracketed numerator is simply the full-time income left over after the minimum subsistence consumption has been met, and the bracketed denominator is the price of extra rate-bill schooling per child. The equation translates thus: The share of discretionary income spent on public schooling, at the observed real private price of that schooling, is shaped by the individual's relative taste for schooling ( $1-\alpha$  and  $S_{i0}$ ).

The partial derivatives of public-school attendance with respect to the exogenous parameters correspond to intuition. Raising any component of income ( $W_i$ ,  $L_i$ ,  $r$ , or  $P_L$ ) has a positive effect, meaning that being richer leads to more demand for schooling beyond what taxes will cover. That might not be obvious at first in the case of  $L_i$ , since having more property means paying more tax as well as getting more property return. Yet the tax was less than the return ( $r > t$ ), as a positive valuation of property ( $P_L > 0$ ) requires, so more property means more parental demand for schools. By contrast, the schooling level per child is negatively affected by having more children, or by a higher local wage rate for school-age children.

Of particular interest is the effect of raising the school subsidy on different individuals' demand for schooling. The effect is not necessarily positive, since the higher subsidy must be paid for with higher taxes. The partial derivative of attendance with respect to the share of the school year covered by taxes is:

$$(9) \quad \partial S_i / \partial s = (1 - \alpha) \left[ \frac{\phi(n_i - (NL_i / L_{all}))}{n_i(\phi + w_c)} \right].$$

The sign of this effect depends on the relationship of relative family size to relative property:

$$\text{sign} (\partial S_i / \partial s) = \text{sign} (n_i / N - L_i / L_{all}),$$

which is positive for those having relatively more children and relatively less property. That is, raising the subsidy to schooling will raise attendance by children of families that are bigger and/or less propertied. Those with smaller families and greater-than-average property will experience a net loss because their taxes will be raised by more than their use of subsidized schools, leading them to demand less public schooling for their children. Overall, a higher subsidy will make schooling more equal.

Raising the cost of public schooling of given quality (raising  $\phi$ ), e.g. by having public-school teachers become more expensive, would affect the same two groups the same way as raising the subsidy rate. That is, it would encourage public-school attendance by children from larger and poorer families, but discourage it among children of smaller and richer families, again making schooling more equal.

So far we have focused on the key group with sufficient demand for schooling to pay rate bills for extra schooling beyond what is subsidized (the interior solution with  $S_i > s$ ). Other groups will behave differently. Moving down the scale of relative demand for schooling, the next group would be those whose demand was sufficient only to utilize the tax-paid part of the school year ( $S_i = s$ ), because they perceive the private benefits of extra school to be somewhere between the opportunity cost of child labor and this plus the cost of private schooling (between  $w_c$  and  $(w_c + \phi)$ ). This group's attendance will not vary in response to small movements in any parameter, except for an increase in the subsidy. A third group would be those wanting less schooling than what taxes pay for ( $0 < S_i < s$ ). This group would respond to most parameters in the same manner as the group demanding more than the subsidized share. It too would raise attendance in response to any income variable, cut attendance either if the child wage rate rose or if schools became more costly. There is one difference, however, between the responses of this

lower-demand group ( $0 < S_i < s$ ) and the higher-demand group ( $S_i > s$ ). If the general subsidy ( $s$ ) is raised along with the tax rate, members of this lower-demand group having any property would respond by *cutting* school attendance because the higher tax would be a pure income loss for them. Those with no property will be completely unaffected. A fourth group is the one with so little taste for schooling that they consume zero of it. For this group, as for the second group, parameter shifts will do nothing to school attendance.

The aggregate responses of school attendance to changes in market and policy parameters will be a mixture of the responses of these four groups. The functional form of the aggregate response is uncertain, but the signs of these responses are likely to resemble the high-demand first group, which actually paid some rate bills ( $S_i > s$ ).

## II. Voter Preferences Regarding Public School Subsidy and Property Tax

Our portrayal of the influence of voting and political voice on the tax support for schools, and thus on the amount and distribution of school attendance, proceeds in two main steps. First, we show how a voter's preferences regarding property tax rate and a school subsidy would align with his self-interest as a taxpayer and a parent.<sup>2</sup> This optimization closely follows the household model just introduced, though the individual is now free to shape public school finance as well as his own child's education. Second, we will use the clear predictions of this optimization to suggest how education finance would have been driven by the distribution of the extension of political voice in such a setting where public schools mixed public and private money.

A voter's optimization is the same problem already visited, except that the household now chooses how to vote on  $s$  and  $t$  as well as on how much schooling their children should have. We posit the same logged utility function as in Equation (2) above, sticking for now to the case in which the voter of interest has children. This time, however, the household budget constraint is different. With the freedom to set the tax rate  $t$  and the subsidized share of the school year ( $s$ ), a decisive  $i$ th voter can set  $s$  equal to his demand for schooling per child ( $S_i$ ), and

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<sup>2</sup> We set aside the case of the childless voter who does not care about schooling the children of others. Clearly, the greater the share of such voters, the lower the taxes for schools, and our econometric tests will incorporate this effect within the influence of the child/adult ratio.

push through a result that avoids his paying any rate bills, so that  $S_i = s$ . The household budget constraint is therefore a variant of Equation (3) above, specifically

$$(10) W_i + r P_L L_i - C_i - n_i w_c s - s \phi N L_i / L_{all} \geq 0.$$

This formulation has used the government budget balance from Equation (4) to state the tax burden on this individual as a function of the school subsidy itself, eliminating the tax rate  $t$ .<sup>3</sup> A derivation like that used above implies that the voter will prefer to subsidize public primary schools up to his own demand for public schooling. Setting  $S_i = s$  slightly changes the Lagrangian to

$$(11) V = \alpha \ln(C_i - C_{i0}) + (1 - \alpha) \ln(s - S_{i0}) \\ + \lambda [W_i + r P_L L_i - C_i - n_i w_c s - s \phi N L_i / L_{all}]$$

This makes the first-order conditions

$$V_C = \frac{\alpha}{C_i - C_{i0}} - \lambda = 0$$

$$V_s = \frac{1 - \alpha}{s - S_{i0}} - \lambda [n_i w_c + \phi N L_i / L_{all}] = 0$$

Solving for the subsidized share of the public school year yields

$$(12) s = (1 - \alpha) \left[ \frac{W_i + r P_L L_i - C_{i0}}{n_i w_c + \phi N L_i / L_{all}} \right] + \alpha S_{i0}$$

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<sup>3</sup> The decisive voter might consider the possible reverse influence of schooling-cum-taxes ( $s$ ) on property values, as Charles Tiebout had envisioned migrants' doing. This effect could be incorporated into the model by making  $P_L$  an inverted-U function of  $s$ , to reflect the fact that there is a most efficient level of tax-based schooling. We set aside such algebra here, and only note that it would make the decisive voter choose levels of  $s$  closer to the property-value peak of the inverted U than he would if there were no such feedback to  $P_L$ .

That is, the preferred subsidy share depends on the voter's tastes for schooling ( $1-\alpha$  and  $\alpha S_{i0}$ ), his discretionary income above a bare subsistence consumption level, and a private price deflator specific to public schooling.

The parametric influences on the rate of public school subsidy resemble the influences on a household's decisions about school attendance. The greater his gross household income, the more a voter favors a longer subsidized school year and a bigger budget. On the other hand, his preferred budget per child would be smaller, the greater is his opportunity cost in terms of child labor ( $n_i w_c$ ), or the total school cost per child ( $\phi$ ), or the average number of children in all families ( $N$ ). This last effect suggests that adding disenfranchised immigrants, or having more children per family, lowers the budget per child.

The partial derivative of greatest interest here is the one that is the most complex algebraically: How is the decisive voter's choice of  $s$  affected by his owning more taxable real estate ( $L_i$ ) relative to the holdings of others in the same locality? To ease the task of viewing a quotient-rule derivative, we first gather some terms on the left in a re-defined dependent variable:

$$(12) \quad s^* = \frac{s}{1-\alpha} - \alpha S_{i0} = \frac{W_i + rP_L L_i - C_{i0}}{n_i w_c + \phi N L_i / L_{all}}$$

Calling the whole right-hand denominator  $p_s$  and differentiating with respect to the voter's property holdings yields

$$(13) \quad \frac{\partial s^*}{\partial L_i} = \frac{p_s r P_L - (W_i + r P_L L_i - C_{i0}) \phi N / L_{all}}{p_s^2}$$

Expanding on the definition of  $p_s$  in the numerator alone yields a cancellation of two terms in the numerator, so that

$$(14) \quad \frac{\partial s^*}{\partial L_i} = \frac{1}{1-\alpha} \frac{\partial s}{\partial L_i} = \frac{r P_L n_i w_c - (W_i - C_{i0}) \phi N / L_{all}}{p_s^2}$$

The crucial result is the sign of the unfriendly-looking numerator on the right-hand side.

Dividing through by parts of it yields the key sign result:

$$(15) \operatorname{sign}\left(\frac{\partial s}{\partial L_i}\right) = \operatorname{sign}\left[\frac{n_i w_c}{W_i - C_{i0}} - \frac{\phi N}{r P_L L_{all}}\right]$$

$$= \operatorname{sign}\left[\frac{\text{full-time child earning power}}{\text{discretionary earning power of the whole family}} - \frac{\text{full-year school costs}}{\text{the locality's property income}}\right]$$

The right-hand term is likely to have values like ten percent. In the case of antebellum America, this likelihood stems from the school tax rates and the rates of return on property. The school tax rates on assessed property value tended to be around five mills (0.05), and if the rate of return was on the order of five percent (0.05), the right-hand ratio would have been one-tenth, or ten percent.

In today's modern economy, or in the antebellum era, the left-hand term would have been well below ten percent for a decisive voter. Today children have almost no earning power during the school-age years, making the first term effectively zero. In today's setting, therefore, the more propertied the decisive voter (higher  $L_i$ ), the lower would be the tax support for schooling ( $s$ ). The result for antebellum America would already have approached this condition, to the extent that restrictions on political voice would have put the decisive votes in the hands of those who were rich enough that their discretionary income would not have depended at all on child earnings. Then, too, schooling would have been limited by the property ownership of the decisive voter.

The only setting in which greater property for key voters could have raised their support for school taxes would have been a setting highly dependent on child labor, so that the first term could dominate in Equation (15). Such settings would be rare. To be sure, most of human history consisted of impoverished agricultural settings in which children's labor would have been much needed by poor parents. But in those same settings, political voice was restricted to those owning large amounts of property. Again the reliance on child labor would have been below ten percent for those with political voice, leaving the result that restricting voice to those with above-average land holdings meant less support for schools.

### III. The Implied Predictions

Given the decisive voter's setting the amount of tax support for schools, the individual households would choose their enrollments ( $S_i$ 's) as modeled in Part I of this appendix. Thus does the interplay of voting power and the distribution of property influence the enrollments and the public and private expenditures on common schools. The combined model yields the predicted coefficients for cross-sectional regressions on antebellum U.S. counties shown in Appendix Table A.1.

Note in particular that the featured voting variables are a mixture of constraints and voter preferences. The main constraint is the share of all free men who are franchised. The tighter this is, the higher is the property position of the decisive voter ( $L_i$ ), and the lower the predicted support for schooling. The voter preferences are represented in the tradition of Meltzer and Richard (1981), as well as in the present model, by skewness in the distribution of property. More skewness would make the decisive voter favor more taxes and schools. Skewness is represented in mirror image by the median/mean ratio in this table.



## Appendix Table A.1. Predicted Coefficients: Aligning the Model with the Regressions

<u>Model variable</u>	<u>Corresponding empirical variable(s) in county samples, with predicted signs of effect on subsidies and enrollments</u>
<i>Dependent variables:</i>	
$s, \phi$	public expenditures per common-school pupil, in the census
$S_i$	share of school-age children enrolled and attending common schools

<i>Featured independent variables:</i>	
Decisive voter's $L_i$	(1) franchise share (+); (2) share owning no property (-), in the 1850 IPUMS.

<i>Other independent variables:</i>	
$P_L L_{all}$	real estate value per free man in that county (+)
$w_c$	None used here, for want of an easy proxy
$W_i$	None used here (could proxy with occupational mix, but at the risk of endogeneity)
$N, n_i$	School-age share of total population (-)
$\alpha$	Religion, urban share, etc.

(State fixed effects cannot be assigned to any one model variable.)

**APPENDIX B.**  
**Instrumental-Variable Equations**  
**For Northern Counties' Enrollment Rates in 1850**

As noted in the main text, the instruments used here are the number of years of residency in the state required for voting, these interacted with the immigrant share from other states, the same residency requirements interacted with the share foreign-born, and the existence of a state property requirement for voting.

Equations for expenditures per child and teachers per child did not pass the tests for instrument strength (validity) and/or exogeneity. On the criteria for instrument strength, see Staiger, D., and J. H. Stock, "Instrumental Variables Regression with Weak Instruments," *Econometrica*, Vol.65, No.3, May 1997, pp.557-586.

**Appendix Table B.1. OLS Determinants of Northern Counties' Enrollment Rates in 1850, with Instrumented Values for Votes per White Man**

	Public school enrollments per white child 5-14			Total enrollments per white child 5-14	
	coeff.	(s.e.)		coeff.	(s.e.)
Votes per white man (instrumented)	1.31	(0.61)	*	<b>1.32</b>	(0.61)
Slaves per white man	-0.11	(24.56)		2.22	(24.55)
Free coloreds per white Children 5-14 as a pop. share	-4.17	(1.20)	**	-4.30	(1.20)
Share of men over 40	-0.80	(0.14)	**	-0.85	(0.14)
Urban share	2.64	(0.47)	**	2.71	(0.47)
Migrants from other states	0.01	(0.11)		0.11	(0.11)
Foreigners	-0.08	(0.12)		-0.09	(0.12)
County is on the Great Lakes	-0.09	(0.27)		-0.10	(0.27)
Atlantic coast	0.05	(0.06)		0.05	(0.06)
Ohio River	0.06	(0.08)		0.06	(0.08)
Mississippi River	0.06	(0.07)		0.06	(0.07)
<i>Church accommodations per capita</i>	-0.01	(0.13)		-0.03	(0.13)
Baptists	0.41	(0.15)	**	0.42	(0.15)
Christian n.e.c.	-0.38	(0.26)		-0.35	(0.26)
Congrational	0.00	(0.26)		0.06	(0.26)
Congrational orthodox	3.17	(6.71)		2.46	(6.71)
Dutch Reformed	-0.17	(0.39)		-0.18	(0.39)
Episcopal	-0.07	(0.50)		0.05	(0.50)
Free Churches	-0.10	(1.25)		-0.18	(1.25)
Friends or Quakers	-0.42	(0.30)		-0.34	(0.30)

German Reformed	-0.43	(0.64)	-0.27	(0.64)
Jewish	2.32	(11.28)	0.50	(11.27)
Lutheran	-0.17	(0.26)	-0.22	(0.26)
Mennonite	-0.93	(2.30)	-1.15	(2.30)
Methodist	0.022	(0.09)	0.028	(0.09)
Moravian	0.01	(0.66)	-0.07	(0.68)
Presbyterian	-0.06	(0.17)	-0.04	(0.17)
Roman Catholic	-0.33	(0.27)	-0.25	(0.27)
Swedenborgian Churches	-1.45	(12.86)	-3.55	(12.85)
Tunker Churches	1.94	(1.41)	1.87	(1.41)
Union Churches	0.94	(0.51)	1.07	(0.51)
	coeff.	(s.e.)	coeff.	(s.e.)
Unitarian Churches	-0.27	(1.09)	-0.56	(1.09)
Universalist Churches	0.86	(0.76)	0.92	(0.76)
Minor Sects	0.58	(0.63)	0.60	(0.63)
New = 1/(years since statehood)	0.30	(0.27)	0.27	(0.27)
Constant	-0.15	(0.31)	-0.10	(0.31)

Observations	518	517
F	9.672	10.9469

Standard errors in brackets

\* significant at 5%; \*\* significant at 1%

Shea Partial R2	0.082	0.082
Partial R2	0.082	0.082
F (First Stage)	10.7	10.6
df	4	4
df_r	479	478
p(F First)	2.66E-08	2.84E-08
Sargan Hansen	0.539	0.625
p(S-H)	0.910	0.891
dof(S-H)	3	3

## ENDNOTES

<sup>1</sup> On the share of education expenditures in GDP in 1850, see Fishlow, “American Investment in Education”. On enrollment rates, see the sources cited in Table 1 below.

<sup>2</sup> Cubberley, *Public Education* 1934, pp. 82-110.

<sup>3</sup> Goldin and Katz 1997, Goldin 2001, Goldin and Katz 2003.

<sup>4</sup> In 1830, children in the 5-14 age band were 27.5 percent of the US population, versus only 23.0 percent in England and Wales, 18.0 percent in France, 20.7 percent in Belgium, 21.7 percent in the Netherlands, and 21.3 percent in Norway, according to the historical statistics volumes of Brian Mitchell and the United Nations.

<sup>5</sup> Fishlow “Common School Revival” 1966.

<sup>6</sup> Kaestle, *New York City* 1973; Kaestle and Vinovskis “Quantification” 1974; Kaestle “Scylla” 1976; Kaestle and Vinovskis *Massachusetts* 1980; and Kaestle, *Pillars* 1983.

<sup>7</sup> Carleton, *Economic Influences* 1906, pp. 33-36; Cubberley, *Public Education* 1934; Engerman, Mariscal, and Sokoloff 2002, Engerman and Sokoloff 2005; and again Goldin and Katz 1997, Goldin 2001, Goldin and Katz 2003.

<sup>8</sup> Lindert, *Growing Public*, Vol. 2, Appendix A.

<sup>9</sup> Fishlow, “American Investment in Education” (1966); Lindert, *Growing Public* (2004), Vol. 2, Appendix C.

<sup>10</sup> We are not the first to note that the Northern countryside had higher primary school enrollment rates, even without higher expenditures per student, than the cities. For example, Kaestle and Vinovskis underlined this pattern for Massachusetts (*Massachusetts* 1980, *passim*).

<sup>11</sup> Upper Canada’s enrollments seemed to have taken off only after the 1830s, though they had caught up to the levels of the Northern United States by 1870. Their institutional evolution was also quite similar to what is described here for the Northern states. See Glazebrook *Life in Ontario* 1968, pp. 82-89; Wilson *et al. Canadian Education* 1970, Part Two; Katz and Mattingly *Education and Social Change* 1975, pp. 3-81; Lewis and Urquhart “Upper Canada” 1999, especially pp. 168-173.

<sup>12</sup> Probably a better starting point, one suggesting actual practice rather than law, would be the evidence of a Dutch public schools in New Netherland starting in 1638. The schools were tiny and few, however, and their meager funding was a variable mix of public and private funds. Kilpatrick 1912; Finegan 1971, Chapter 1.

<sup>13</sup> Cremin 1980, p.127.

<sup>14</sup> Carter *Letters on the Free Schools* 1824.

<sup>15</sup> Beadie, “Toward a History of Education Markets;” Beadie, “Tuition-Funding in Common Schools;” Beadie, *Education and the Creation of Capital*; and Beadie and Tolley (eds.) 2002.

<sup>16</sup> Kaestle, *Pillars*, pp. 4, 8.

<sup>17</sup> Swift *Public Permanent Common School Funds* (1911); Knight, *Public Education in the South* 1922, pp. 145-155, 173-177. Dabney *Universal Education in the South* (1936), pp. 287-295; Knight, *Education in the United States* 1951, pp. 255-257.

<sup>18</sup> For more on the attendance practices, see Randall 1844, New York State Census of 1845, *Annual Report* of the Superintendent of Common Schools January 1849, and Beadie, “Tuition-Funding.”

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Actual attendance was lower than the enrollments, of course. Official figures from 1845 implied that for common schools the number in “average attendance” (averaged over several days) was 63 percent of the number of the pupils “on teachers’ list.” Of those New York students attending at all, the average months of attendance (any time in the month) was 4.0 for 1842/43, 4.3 for 1847/48, and 4.5 for 1851/52.

Attendance shares of those enrolled in England and Wales were similar to the shares for New York. Specifically, David Mitch has reported an average attendance of about 68 percent of students enrolled in government-inspected schools between 1865 and 1875. Mitch, *Rise of Popular Literacy*, pp. 187-188. The Parliamentary sources cited in Table 4 add some attendance rates for Manchester 1834 and England and Wales in 1858, and *The Statistical Abstract of the United Kingdom* gives annual rates for inspected primary schools from 1854 on.

<sup>19</sup> The institutional variations are well sketched in Cubberley 1934, especially on Page 140; and the writings of Nancy Beadie cited above. Kaestle and Vinoskis 1983, pp. 28-33 summarize the pitfalls of data on enrollments and attendance.

<sup>20</sup> Beadie, “Toward a History of Education Markets.”

<sup>21</sup> Maddison 1995; Maddison 2001; Ward and Devereux “Measuring British Decline,” 2003; Ward and Devereux “Relative British and American Income Levels” 2005.

<sup>22</sup> For a convenient summary of the global literature on rates of return to education, see Psacharopoulos and Patrinos 2002.

<sup>23</sup> This paragraph and Figure 2 are based on the real wage comparisons that are emerging in the Global Price and Income History project. The data sets are downloadable at <http://gpih.ucdavis.edu>.

<sup>24</sup> The real wage comparison between Massachusetts and West Virginia 1800-1860 used estimates of the ability to buy flour, beef, butter, and sugar in the proportions used in Figure 2’s calculations. See the file “Massachusetts vs. England, WV.xls” at <http://gpih.ucdavis.edu>.

<sup>25</sup> The low price of schooling in New York state has also been noted by Nancy Beadie’s research on tuition in antebellum Lima, New York (“Tuition Funding”). Beadie suggests that parents could pay a child’s annual tuition in the more subsidized common schools for about a dollar, which was about 1-2 day’s wage rate for common labor in New York state. The tuition at a local private academy was about five times as much, presumably because of the academy’s higher quality and lower subsidies.

<sup>26</sup> As of 1853, a median monthly wage of \$17.50 was paid to North Carolina’s teachers in common schools (of whom over 91 percent were male). While Northern urban teachers and rural male teachers got that much or more at the time, the heavily employed rural female Northern teachers only received an average of \$14.57. We thank Paul Rhode for supplying us with data from the *Second Annual Report* of North Carolina’s Superintendent of Common Schools (Raleigh: W.W. Holden, 1855.) See also the comparison of Northern and North Carolina teacher wages in Tolley and Beadie, “Socioeconomic Incentives to Teach.”

<sup>27</sup> As of 1860, women filled 71 percent of the teaching positions in the non-South sample drawn by Perlmann and Margo (*Women’s Work?* 2001, p. 22). By contrast, they had only 39 percent of the Southern teaching jobs and also 39 percent in Great Britain’s non-infant schools (46 percent if infant schools are included). At that time, French

primary schools were just shifting toward employing more women than men: The female share of teachers in all primary schools, public plus private rose from 37% in 1843 to 54% in 1863. Male teachers continued to dominate in German cities as late as 1900. (U.S. Commissioner of Education, *Annual Report* of 1900-1901 (pp. 123-124, 1003). See also Linda Carter and Robert A. Margo, "The Feminization of Teaching in the United States" (forthcoming).

<sup>28</sup> Compare the clues on signature literacy in Monaghan, *Learning*, 2005; Cressy, *Literacy*, 1980, Chapter 8; and the many studies cited there. Sweden's high literacy meant the ability to read the Bible but probably little ability to write or sign.

<sup>29</sup> Tolley and Beadie, "Socio-economic Incentives to Teach."

<sup>30</sup> Lindert 2004, Table 5.6.

<sup>31</sup> Prest, *Liberality and Locality* 1990, pp. 1-17.

<sup>32</sup> Einhorn *American Slavery* 2006, pp. 104-109, 218-230.

<sup>33</sup> Thorpe *Federal and State Constitutions* 1909, Green *Constitutional Development* 1930 (1969), Green *Democracy* 1946 (1966), Wooster *Lower South* 1969, Wooster *Upper South* 1975. On biased representation and public spending in Virginia, see Majewski, *House Dividing*, pp. 135-138.

<sup>34</sup> For example, slaveholders were a majority of all Southern state legislators in 1850, as were those classified as either planters or farmers. Wooster's tabulations show similar, though less extreme, biases in the allocation of county offices. By contrast only 39 percent of Massachusetts legislators in 1840 were farmers (Kaestle and Vinovskis 1983, pp. 211-212).

<sup>35</sup> Daniel Crofts's in-depth study of Southampton County Virginia (1992, pp. 155-169) does show that localities tended to cluster into increasingly solid Democratic and Whig blocs as the rich and influential applied pressure before each election. The role of the open ballot is implicit. The link to school policy is not clear, however, except for the fact that all local government policy was in the hands of court officials not inconvenienced by electoral competition.

<sup>36</sup> See Fox and Gurley-Calvez 2007 on world patterns in the economies of government consolidation, and Lockwood and Barankay 2006 on Swiss education under federalism.

<sup>37</sup> On the Americas, again see Engerman, Mariscal, and Sokoloff 2002; and Engerman and Sokoloff 2005. The role of democracy and the fullness of suffrage has also been emphasized by Carlton 1906, pp. 33-36; Cubberley 1934, pp. 151-154; Goldin 2001; Goldin and Katz 2003; and Lindert 2004, Chapter 5.

<sup>38</sup> See Appendix A of the revised NBER Working Paper version of this paper.

<sup>39</sup> Tiebout, "Pure Theory" 1956.

<sup>40</sup> See, for example, the school attendance patterns estimated in Galenson, "Ethnic Differences" 1998, and his other studies cited there.

<sup>41</sup> Readers interested in possible industrial influences on schooling should consult the tests offered by Alex Field "Massachusetts 1855" 1979 and Kaestle and Vinovskis 1980.

<sup>42</sup> In one case, our data providers failed to design the public-private distinction correctly, and were roundly criticized for that mistake. The 1840 census asked localities to report the number of pupils who were "at public charge." This question gave incurably misleading results in a setting where most schooling was financed both privately and

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publicly at the same time. Fortunately, the same 1840 census also included the clearer separate returns from public common schools, from private academies, and from universities. The 1850 census dropped the bad question and kept the useful ones, while also giving breakdowns of the public and private funding sources separately for publicly managed schools and for privately managed academies.

<sup>43</sup> The turnout for presidential elections has been consistently higher than the turnout for congressional elections in the alternative even-numbered years. It is therefore a closer approximation to the share that was entitled to vote. For the 1850 census regressions, we averaged each county's voting rates in the 1848 and 1852 elections.

<sup>44</sup> Porter 1918, Williamson 1960, Keyssar 2000, Engerman and Sokoloff 2005.

<sup>45</sup> Free colored men were still only a small share of all free men before the Civil War. In what follows, we focus on white men, and use the share of free coloreds as a control variable in our statistical work. It appears that the free-colored share had no clear effect on education policy behavior.

<sup>46</sup> Randall 1844; Griffey 1936, pp. 51-55; Keyssar 2000, especially pp. 30-31.

<sup>47</sup> Those who prefer to emphasize geography as a causal influence on institutions have a potential line of attack here. Slaves were found in warmer places: At the interstate level, the coefficient of correlation between the mean January temperature and slaves per white man in 1850 was highly positive (0.87). Would the warm South have had less educated whites than the North even without slavery? Was it cold weather that kept Northern children in school? Any such argument would have to explain why Southern whites have little education deficit today.

<sup>48</sup> See, for example, Kaestle "Scylla" 1976 and Wright 1986 and 2006.

<sup>49</sup> One might suspect that the share of children 5-14 in the population might be determined simultaneously with enrollments per child, since households choose between greater fertility and greater inputs per child. Omitting the 5-14 age group share alters the other coefficients slightly, but leaves the general magnitudes and significance levels consistent with the language of the text.

<sup>50</sup> Benedict, T.H. "Report of the majority on the committee on colleges, academies and common schools" to the New York State Assembly, February 6, 1851, as reprinted in Finegan 1971, p. 450.

<sup>51</sup> Cubberley 1934, pp. 150 (on urban ills), 202 (on cities as champions of free schools).

<sup>52</sup> That attendance was more universal in the Northern countryside than in the cities has also been noted by Kaestle 1983, Soltow and Stevens 1981, Vinovskis 1988, and Beadie, "Tuition Funding".

<sup>53</sup> Cubberley 1934, pp. 104 (on strong states versus pauper school states and indifferent states), and 150-154 (on the role of suffrage).

<sup>54</sup> We should note also that the 1849 and 1850 referenda was the first time that ordinary voters in New York City were able to vote directly on school finance rather than being governed by an educational board. Furthermore, most of the urban voters owned no taxable property. See Go, "Free Schools in America, 1850-1870" 2008.

<sup>55</sup> On this our results echo the doubts voiced about the importance of religion in Massachusetts schooling by Kaestle and Vinovskis 1980, p. 136 and p. 232. Note, however, that our results are based on an 1850 snapshot. Across the first half of the century Protestant sentiments had shifted toward relatively public schools, while Catholics had shifted toward religious academies. See Drake *American School in Transition*, Chapter 8.

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<sup>56</sup> Cubberley 1934, Cross 1950, Kaestle and Vinovskis 1974. The Yankee influence was made even more explicit in J. P. Foote's *The Schools of Cincinnati* 1855, as cited by Carleton 1906, pp. 111-112:

“A majority of the legislators of our State [Ohio] were, a few years before the establishment of our school systems, natives, or descendents of natives, of New England, and, in due time, they gave efficient aid to the enactment of the school law. In the middle and southern portions of our State, most of the first settlers were from Pennsylvania, and states further south... The early immigrants to Ohio from New England considered schools and churches as among their first wants... those from Pennsylvania considered them the last... while those from New Jersey, and the few from Maryland, Virginia, the other Southern states, had their views of education fixed upon so high a scale that nothing less than colleges, or seminaries of the highest class could claim much of their attention, or seem to require any extraordinary efforts for their establishment.”

<sup>57</sup> See Appendix B of the revised working paper version for the two IV enrollment equations.

<sup>58</sup> On New York's political fight over suffrage reform in the 1820s, see Chilton Williamson, *American Suffrage*, pp. 195-207.

<sup>59</sup> Engerman and Sokoloff 2005, pp. 908-909.

<sup>60</sup> Margo, *Race and Schooling in the South* 1990.

<sup>61</sup> The spending results for 1902 and 1982 are from Sylla, Legler, and Wallis, ICPSR file 6304, 1995. In 1902, the share of education spending done at the local district level had an interstate correlation of + 0.25 with an educational support ratio defined as (public expenditures per child in the 5-19 age range) / (state income per person 15-64).